Biological Health of River Ganga

Central Pollution Control Board

Ministry of Environment, Forest & Climate Change

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Ministry of Environment, Forest & Climate Change
"Parivesh Bhawan", C.B.D. Cum-Office Complex,
East Arjun Nagar, Shahdara, Delhi - 110032

January 2017

CPCB, 200 Copies, 2016

Prepared & Published by : PR Division, Central Pollution Control Board on Behalf of Dr. A.B. Akolkar, Member Secretary, CPCB.

Printing Supervision : Shri Shriance Jain, Ms. Anamika Sagar and

Shri Satish Kumar.

Printed at : India Offset Press, New Delhi | www.indiaoffsetpress.com

Table of Contents

एस.पी.एस. परिहार, भा.प्र.से.
अध्यक्ष
S.P.S. PARIHAR, I.A.S.
Chairman

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
(भारत सरकार)
CENTRAL POLLUTION CONTROL BOARD
Ministry of Environment, Forest & Climate Change
(Government of India)

Foreword

Bottom fauna of macro-invertebrates of River Ganga vary greatly according to their sensitivity to climatic changes in environmental conditions. River Ganga is a glacial fed river and therefore water temperature and river flow play important role in biological establishment. Unpolluted water supports variety of native sensitive species. Whereas polluted water reduces the number of such species thereby causing an increase in the number of tolerant species. The proportion of benthic macro-invertebrates, comprising insects, crustaceans, molluscs, annelids and Platyhelminthes communities, vary with respect to each fresh water body which represents a major static food chain among all the biotic components.

Presence and absence of these communities in surface waters reflect the impact of change in environmental conditions. Contents of this book provide the current status of water quality and composition of benthic macro-invertebrates in the entire stretch of river Ganga and tributaries in the states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. It has been a very painstaking work for which the entire team of CPCB deserves compliment. I hope this work would facilitate further research on the subject.

(S.P.S. Parihar)
18/01/17

'परिवेश भवन', सी.बी.डी.-कम-ऑफिस कॉम्पलैक्स, पूर्वी अर्जुन नगर, दिल्ली-110032
'PARIVESH BHAWAN', C.B.D.-CUM-OFFICE COMPLEX, EAST ARJUN NAGAR, DELHI-110 032
PHONE : 22307233, TEL. / FAX : +91-11-22304948, e-mail : ccb.cpcb@nic.in

Contributors

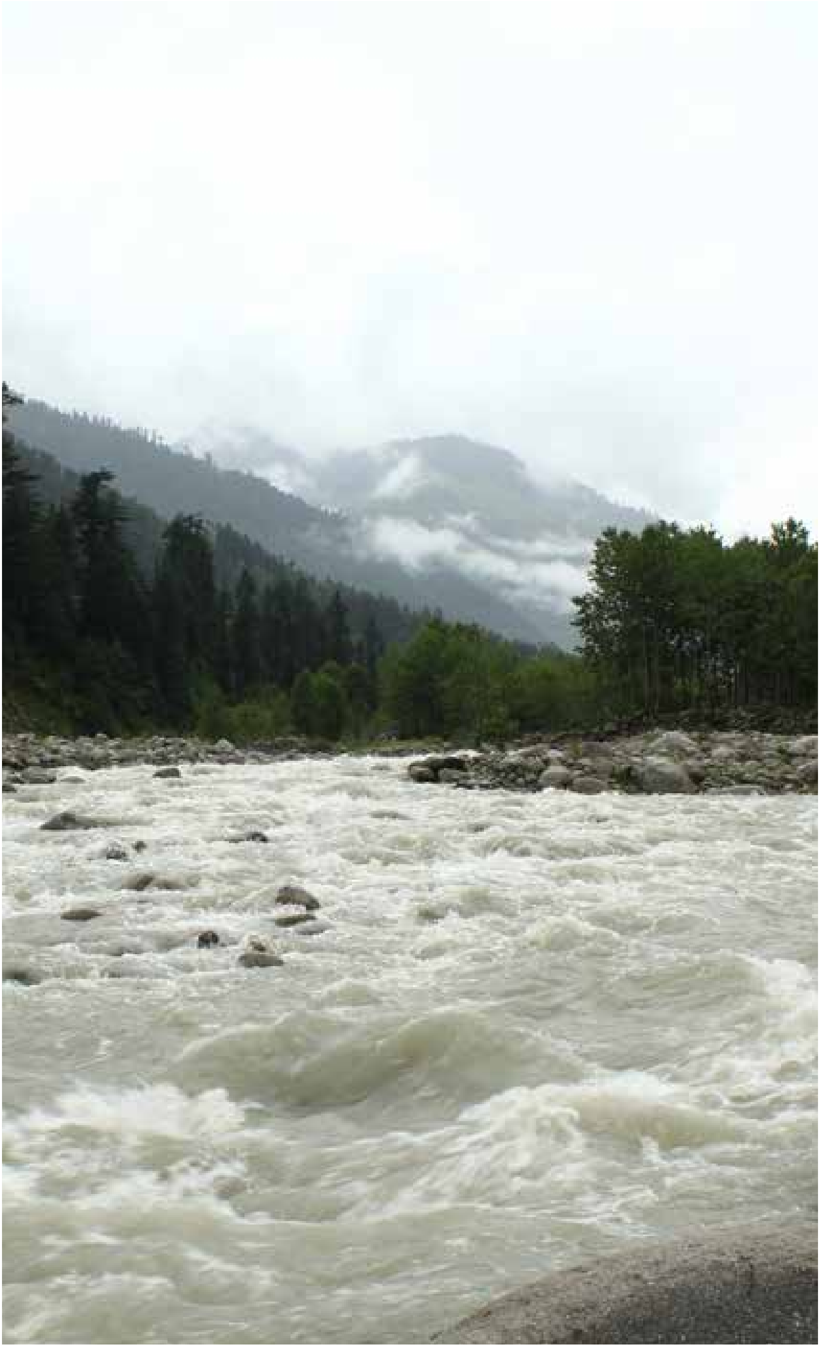
Team of Central Pollution Control Board

Dr.	(Mrs.) Pratima Akolkar
Dr.	Jaya Sharma
Dr,	Annu Goel
Dr.	Firoz Ahmad
Dr.	Ishaq Ahmad

In association with

Team of State Pollution Control Board, Uttarakhand, Uttar Ptradesh, Bihar, Jharkhand, West Bengal, and Regional Directorate of Central Pollution Control Board at Lucknow and Kolkata

The project on River Ganga has been sponsored by NGRBA cell of Ministry of Water Resources, Govt. of India.



Executive Summary

- ✓ A biological system can be considered healthy when its inherent potential is realized, its condition is stable, its capacity for self-repair when perturbed, is preserved, and minimal external support for management is needed.
- ✓ River Ganga is the third largest river having a total length of approximately 2525km. People drink and bath in its water all along its course. With the increasing rate of urbanisation, water quality of River Ganga is threatened from various sources of pollution and therefore it is a cause of concern to the 400 million people who live close to the river. Thus pollution threatens not only humans, but also the endangered fauna and flora inhabiting the river.
- ✓ Water quality management system based on physical and chemical parameters is not sufficient to assess the quality status in terms of "Health" of River Ganga. Assessment of aquatic biota of river provides the biological integrity of aquatic ecosystem.
- ✓ Biological surveillance of benthic macro-invertebrate communities with special emphasis on characterizing taxonomic richness and composition, is therefore the most sensitive view of river health and is essential to identify the biological responses of river to human activities.
- ✓ Climate change is an emerging issue in recent past, in view of changing flow and water temperature in glacial melt rivers such as River Ganga. The impact of climate change can be visualised on the habitats of benthic fauna of River Ganga.
- ✓ In the present investigation, bio-monitoring of River Ganga has been carried out to determine the biological health of the river from Rishikesh in Uttarakhand to Diamond Harbour in West Bengal, through two phase monitoring.
- ✓ Benthic macro-invertebrates have been collected from stretch of River Ganga in Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal during the year 2014,2015 and 2016.
- ✓ Bio-assessment of River Ganga, was done by evaluation of saprobic score and diversity score using Biological Water Quality Criteria. Taxonomic identification of benthic macro-invertebrates up to species level provided biological composition of River Ganga at upstream and downstream of towns/and cities located on the entire bank of River

Ganga in the state of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.

- ✓ Biological water quality was assessed in the habitats of Gangetic dolphins (*Platanista gangetica*) a national aquatic animal in River Ganga.
- ✓ A total of 93 unique locations at different latitude, longitude and altitudes, have been selected on River Ganga and its tributaries, for biological water quality assessment. Based on assessment, biological water quality was ascertained as clean, slight pollution, moderate pollution, heavy pollution and severe pollution assigned a classification of Class A, B, C, D and E with a colour coding of blue, light blue, green, orange and red respectively. None of the location on River Ganga, was severely polluted during two phase bio-monitoring.
- ✓ Clean water quality in River Ganga was observed in three stretches of river at Rishikesh barrage and Ganga Nahar at downstream of Har ki Paori, during June 2014, and at upstream of Jagjeetpur STP outfall at Haridwar. Heavy pollution in biological water quality was observed in river stretch of Haridwar at downstream of Jagjeetpur STP outfall during month of June 2014, in the state of Uttarakhand.
- ✓ There was only one stretch of River Ganga which indicated slight pollution in biological water quality after confluence of River Tons near Sirsa, at downstream of Allahabad. The entire stretch of River Ganga in Uttar Pradesh state, was moderately polluted.
- ✓ Biological water quality was slightly polluted in River Ganga at Barari ghat, Bhagalpur in Bihar state, during January 2016. At downstream of Patna, biological water quality in River Ganga, was heavily polluted during December 2015. At all the other locations on River Ganga in Bihar stretch, biological water quality was moderately polluted during summer and winter season.
- ✓ Biological water quality of River Ganga was moderately polluted at all the four locations in Jharkhand state.
- ✓ Biological water quality improved to slight pollution at upstream of Farakka barrage, downstream of Farakka Thermal Power Station (FTPS), Farakka Raghunathganj near bridge during the month of May 2015 and at Shibpur ghat near Vidyasagar setu at Howrah downstream in West Bengal stretch of River Ganga during February 2016.
- ✓ Heavy pollution was observed in River Ganga stretch at upstream of Tribeni during May 2015 and downstream of Nabadwip during February 2016, in West Bengal. On rest of the other locations of River Ganga in West Bengal, the biological water quality indicated moderate pollution.

- ✓ Bio-assessment was carried out for 12 tributaries and one nullah, joining to River Ganga in the states of Uttarakhand, Uttar Pradesh and Bihar, namely River Alaknanda at Rudra Prayag in Uttarakhand, River Saloni at Sukartal ghat, River Ramganga downstream of Moradabad at Shahbad and before confluence to River Ganga at Kanpur-Farrukhabad road, River Garra at Sandi, River East Kali at Kanpur Farrukhabad road and Mehandipur village in Kanpur, River Yamuna at Rajapur and NH-27 in Allahabad, River Tons near Panasa, River Varuna at SH-98 and near bridge in Varanasi and River Gomti at Rajwari in Uttar Pradesh, River Ghagra near Manjhi, River Sone at Koilwar, River Gandak at Hajipur and nullah at Patna 3b in Bihar state.
- ✓ Biological water quality of River Alaknanda in Uttarakhand, was found to be clean during June 2014 whereas the biological water quality in River Alaknanda was slightly polluted during November 2015. Among 8 number of tributaries of River Ganga in Uttar Pradesh, heavy pollution in biological water quality was observed in River Ramganga at downstream of Moradabad during December 2014 and May 2016 and River Ramganga at Shahbad during May 2016. Heavy pollution was also observed in River Varuna at Varanasi during March 2016. Other tributaries joining in Uttar Pradesh stretch of River Ganga, were moderately polluted. Out of four number of tributaries joining River Ganga in Bihar state, only River Gandak at Hajipur, was showing slight pollution in biological water quality during April 2015, and other three tributaries were moderately polluted.
- ✓ Bio-assessment of water quality of River Ganga, with respect to species composition of benthic macro-invertebrates, was carried out at upstream and downstream location of 41 towns/cities situated on the bank of entire stretch of River Ganga from Rishikesh to Diamond Harbour through states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. Two towns namely, Rishikesh and Haridwar in Uttarakhand, 12 towns namely, Bijnor, Garhmukteshwar, Anupshahar, Narora, Badaun, Farrukhabad, Bithoor, Kanpur, Allahabad, Mirzapur, Varanasi and Ghazipur in Uttar Pradesh state, 7 towns in Bihar namely Buxar, Patna, Mokamah, Munger, Sultanganj, Bhagalpur and Kahalgaon, two towns in Jharkhand namely, Sahibganj and Rajmahal, and 18 towns/cities in West Bengal namely Farakka, Raghunathganj, Jiaganj, Beharampore, Murshidabad, Kalyanpur, Katwa, Nabadwip, Tribeni, Chinsura, Palta, Serampore, Belgharia, Kolkata/Howrah, Uluberia, Falta, Diamond Harbour and Haldia.

- ✓ Species composition of benthic macro-invertebrates provided an insight of each water quality components with respect to seasonal variation which affected or responsible for the presence and absence of sensitive and tolerant species. Difference in maximum dominance of particular species has been indicated at upstream and downstream location with respect to seasonal changes.
- ✓ In Uttarakhand state, 50% dominance of tolerant species of *Hyphydrus* and *Antocha* indicated moderate pollution in River Ganga at upstream of Rishikesh at Luxmanjhula during July 2014 whereas during November 2015, domonance of 25% of sensitive species of *Cynigmina* and *Potamiya* and 13.3% of *Antocha* indicated slight pollution in biological water quality. On the contrary, at downstream of Rishikesh at barrage, clean water quality in River Ganga was indicated by dominance of sensitive species of 38% *Rhithrogena* during June 2014, and sensitive species *Ameletus* was 46 % dominant during November 2015. Similarily, a tolerant species *Ilyocoris* was 50% dominant in River Ganga at upstream of Haridwar at barrage during June 2014 and 23% dominance of *Cynigmina* indicated slight pollution in biological water quality. At downstream of Haridwar Jagjeetpur sewage treatment plant (JSTP), 100% dominance of *Physa (Haitia) mexicana* indicated heavy pollution in biological water quality of River Ganga during summer month of June 2014. The water quality improved to moderate pollution indicated by mixture of sensitive and tolerant species of 89% of *Rhithrogena* and 11% dominance of *Hydropsyche*.
- ✓ In Uttar Pradesh, moderate pollution in biological water quality of River Ganga at upstream and downstream locations of Bijnor, was indicated by 48% *Chironominae*, 46% of *Hydrovatus* at upstream and 20% dominance of *Chironominae* and 58% of *Physa (Haitia) Mexicana* during summer and winter months respectively. Similar trend was observed in water quality of River Ganga at Garhmukteshwar during winter and summer whereas, *Physa (Haitia) mexicana* was dominant by 23% and Chironominae was 17% dominant respectively. At Anupshahar improvement was observed in moderate pollution of biological water quality indicated by dominance of 33% of *Sinictinogomphus* during winter and 23% dominance of *Macrobrachium lopopodus* and *Caridina elongapoda*. At downstream Anupshahar, *Melanoides pyramis* was dominant by 13% and 12% of *Chironominae* species.
- ✓ Moderate pollution in biological water quality of River Ganga at Narora upstream and downstream during winter and summer months, was indicated by dominance of 29% of *Sinictinogomphus*, 23% of

Lymnaea accuminata, 18% of *Physa (Haitia) mexicana* and 13% of *Caridina thambipillai* respectively. The species composition changed in moderate pollution in biological water quality of River Ganga at Badaun, indicated by dominance of 25% of *Radiatula occata* and 24% of *Sinictinogomphus* during winter and dominance of 24% of *Lyriothemis* in summer month of May.

- ✓ Moderate pollution in biological water quality of River Ganga at Farrukhabad, was indicated by 14% dominance of *Hyphydrus* and *Helochares* during winter and 45% dominance of *Digoniostoma pulchella* during summer season. Moderate pollution in River Ganga at Bithoor, was indicated by dominant species of 31% of *Cheumatopsyche*. Appearance of 4% dominance of a sensitive species *Eatongenia* indicated improvement during winter season but appearance of 38% of *Bellamya bengalensis* indicated deterioration in water quality during summer.
- ✓ At upstream of Kanpur, moderate pollution in biological water quality in River Ganga was indicated by 33% dominance of *Macrobrachium idae* during winter and 17% dominance of *Hydrovatus* during summer. At downstream of Kanpur, deterioration in water quality of River Ganga was indicated by presence of 39% of *Chironominae* during winter and 61% dominance of *Chironominae* during summer month of June.
- ✓ In upstream stretch of River Ganga at Allahabad, moderate pollution in biological water quality was shown by 28% dominance of *Chironominae* during February and dominance of 49% of *Macrobrachium lopopodus* during November, whereas at downstream Allahabad, 56% dominance of *Agraptocorixa* during February and 72% dominance of *Macrobrachium lopopodus* was observed in River Ganga.
- ✓ In upstream of Mirzapur, moderate pollution in River Ganga was supported by 25% of *Nephthys polybranchia* during March and 33% dominance of *Macrobrachium lopopodus*, during October month. Whereas, at downstream of Mirzapur, the water quality in River Ganga supported dominance of 22% dominance of *Physa (Haitia) mexicana* during March and 38% dominance of *Thiara(Tarebia) lineata* during October month.
- ✓ At upstream of Varanasi, moderate pollution in biological water quality of River Ganga was indicated by 24% dominance of *Nephthys polybranchia* during March and 44% dominance of *Macrobrachium lopopodus* during October. At downstream of Varanasi, the species composition in River Ganga was dominated by 36% of *Physa*

(Haitia) mexicana and 33% of *Chironominae* indicating deterioration in moderately polluted biological water quality of River Ganga at downstream Varanasi during March and dominance of 40% of *Thiara (Tarebia) lineata* and 31% of *Melanoides pyramis* during October month.

- ✓ Ghazipur downstream at Tarighat is the last location on River Ganga in Uttar Pradesh, where deterioration in moderately polluted biological water quality in River Ganga was indicated by the presence of 22% *Chironominae* and 18% of *Physa (Haitia) mexicana* during March and water quality improvement was indicated by dominance of 22% of *Radiatula caerulea* and 21% of *Parreysia favidens favidens* during October month.
- ✓ In Bihar stretch of River Ganga, slight pollution was observed at only one location at Bhagalpur, supporting dominanceof 18% of *Pila globosa* juveniles and 17% of *Thiara (Tarebia) granifera* during winter month whereas, moderate pollution in biological water quality was observed at Buxar with dominance of 38% *Diplonychus* and 29% *Bellamya bengalensis* at upstream and 23% dominance of *Chironominae* at downstream of Buxar, at upstream Patna, presence of 67% dominance of *Gangemysis assimilis* and 25% *Physa (Haitia) mexicana* and at downstream Patna, heavy pollution in River Ganga was indicated by 85% dominance of *Thiara (Tarebia) lineata* during winter. At Mokamah, there was an improvement in moderate pollution indicated by 22% dominance of sensitive species of *Eatongenia*.
- ✓ At upstream of Munger, moderate pollution in biological water quality in River Ganga was indicated by appearance of 23% dominance of *Novaculina gangetica* and at downstream Munger, *Sinictinogomphus* was dominant by 21% and 20% of *Thiara (Tarebia) lineata*. Dominance of 22% of *Radiatula occata* indicated moderate pollution in River Ganga at Sultanganj, and water quality of River Ganga at Kahalgaon supported dominance of 31% of *Thiara (Tarebia) lineata* and 27% of *Corbicula bensoni*.
- ✓ In Jharkhand state, moderate pollution in biological water quality was observed at upstream and downstream location of Sahibganj and Rajmahal on River Ganga during winter season. The water quality of River Ganga, was indicated by the presence of 23% of *Chironominae*, 65% *Thiara (Tarebia) lineata*, 32% *Mekongia crassa* and 14% of *Oreodytes* larva respectively.
- ✓ In West Bengal, biological water quality in River Ganga was supported by different species composition. Farakka upstream was the first location on River Ganga in West Bengal stretch.

Slight pollution in biological water quality, at Farakka barrage, was indicated by a number of species in a dominance sequence of *Assamenia fraincaise>Prodesineura autumnalis>Digoniostoma pulchella>Melanoides pyramis>Corixa>Bellamya bengalensis>Hyphydrus>Stenothyra ornate>Physa (Haitia) mexicana>Parreysia favidens* juvenile during May 2015, whereas moderate pollution was indicated by dominance sequence of *Physa (Haitia) mexicana>Digonistoma pulchella>Lymnaea accuminata>Bellamya bengalensis>Prodesineura autumnalis>Indoplanorbis exustus> Thiara (Sermyla) requeti>Tramea* during February. At Farakka FTPS, the moderate pollution supported dominance of 67% of *Physa (Haitia) mexicana* and 87% of *Thiara (Tarebia) lineata* during May and February months respectively. Slight pollution in biological water quality of River Ganga was indicated by 17% dominance of *Macrobrachium idae* during May and 58% dominance of *Mekongia crassa* indicating moderate pollution in River Ganga during February.

✓ Slight pollution was also observed in biological water quality of River Ganga at Raghunathganj, supporting 23% dominance of *Mekongia crassa* during May and moderate pollution indicated by 14% dominance of *Melanoides pyramis* and *Assamenia fraincaise* during February. At Jiaganj, moderate pollution in River Ganga was indicated by 34% dominance of *Stenothyra ornate* during May. Whereas, moderate pollution in water quality of River Ganga at Behrampore, was supported by maximum dominance of 22% of *Mekongia crassa* during February. At Murshidabad upstream and downstream location on River Ganga, moderate pollution was indicated by 15% and 34% dominance of *Assamenia fraincaise* respectively. *Corbicula bensoni* was 46% dominant in moderately polluted water quality of River Ganga at Kalyanpur. A similar species composition with 47% dominance was observed in River Ganga at Katwa during May and 58% dominance of *Thiara (Tarebia) lineata,* during February.

✓ Heavy pollution in biological water quality was observed during February month, in River Ganga at Nabadwip downstream with 67% dominance of *Chironominae. Lymnaea accuminata* was dominant by 21% during May thus indicating moderate pollution in River Ganga. However, at Tribeni upstream, dominance of 39% of *Idiopoma dissimilis*, 26% of *Annina*, 20% *Nerocilea deprassa* and 7% of *Isolapotamon* combinedly indicated heavy pollution in River Ganga during May. At downstream of Tribeni at transmission tower, moderate pollution was supported by dominance of 44% *Idiopoma dissimilis* and 20% *Cirolana parva* during during months of May and March respectively. *Idiopoma dissimilis* was dominant by 53% in moderately polluted biological water quality of River Ganga at Chinsura during March. At Palta water intake, moderate pollution in biological water quality was indicated by dominance of 29% *Lepidothelphusa* and 25% of *Stenasellus* during February.

- ✓ Moderate pollution was supported by dominance of 29% of *Assamenia fraincaise* and 19% of *Johora at* Serampore, during summer month of May. Moderate pollution in River Ganga at Belgharia was indicated by dominance of 83% of *Neritina (Dostia) violacea* and 17% of *Geosesarma* during low tide during May wheras due to high tide no animals could be collected during February. At upstream of Kolkata at Bali bridge, moderate pollution was indicated by dominance of 36% of *Sesarmoides* and 16% of *Varuna* among other species during February whereas, during the same season at downstream Kolkata at Bata nagar, moderate pollution was indicated by 49% dominance of *Varuna*. Dominance of *Varuna* increased to 61% in moderate pollution of biological water quality of River Ganga at Kalibari in Uluberia. At Falta, *Caridina endehensis* dominated other species by 58% in River Ganga. Seasonal variations in species composition was very prominent in moderate pollution of biological water quality in River Ganga at Diamond Harbour, supporting 33% of *Macrobrachium idae* during May and 54% of *Gangemysis assimilis* during February. Haldia, the last stretch on River Ganga in West Bengal, was moderately polluted due to dominance of 23% *Nemalycastis abiuma* and 16% of *Idiopoma dissimilis*.
- ✓ Biological health of River Ganga, is also evaluated by the presence of Gangetic dolphins. Gangetic dolphins (*Platanista gangetica*), a national aquatic animal of River Ganga, feed on several species of fishes, invertebrates, turtles and birds. Biological water quality was assessed at habitats of number of dolphins in different segments of River Ganga. In segment of River Alaknanda and River Ganga from Rudraprayag to Haridwar, dolphins were not observed. In this segment, biological water quality ranged from clean to slightly polluted and rarely moderately to heavily polluted. Biological water quality in River Ganga, was moderate to polluted in the stretch Bijnor to Narora, inhabiting about 56 number of dolphins as reported by WWF. In Kachlaghat to Kanpur segment, only 3 dolphins were observed in moderate pollution of biological water quality. 79 number of dolphins have been reported in the moderately polluted and at times slightly polluted river stretch from Kanpur downstream to Allahabad. Number of dolphins have been increased to 172 in the moderately polluted river stretch from Varanasi downstream to Ghazipur in Uttar Pradesh. Maximum number of 808 of dolphins have been reported

in mostly moderately polluted and rarely with heavy and slight pollution in biological water quality of River Ganga in Buxar to Bhagalpur downstream stretch in Bihar state. Thereafter, number of dolphins reported to be 24 in slight to moderate pollution in biological water quality of river stretch from Bhagalpur downstream (Bihar) to Farakka in West Bengal. In West Bengal, 119 number of dolphins have been reported in rarely slightly polluted, mostly moderately polluted and sometimes heavily polluted biological water quality in River Ganga. River Ganga stretch from downstream of Tribeni to Diamond Harbour/Haldia, a total of 97 number of dolphins have been reported in mostly moderately polluted and rarely slightly polluted biological water quality in River Ganga.

- ✓ The concept of Bio-mapping of River Ganga, is based upon use of biological system for classification and zoning of river stretches according to their level of ecological degradation. Bio-mapping is classification of biological water quality data of river basin in the form of a colour map of various biological classes in terms of blue, light blue, green, orange indicating clean, slight pollution, moderate pollution, heavy pollution and severe pollution respectively. Bio mapping of River Ganga has been carried out for the period of 2014, 2015 and 2016.
- ✓ Flow in River Ganga varies primarily due to glacial melt water, barrages, rain water and confluences of tributaries and drains. Seasonal and locational variations have been observed for flow velocity (meter/seconds), water temperature at all the locations and Dissolved oxygen content in water quality of River Ganga at few locations. In Uttarakhand state, flow velocity was more in River Ganga at all the locations during 2014-15 compared to year 2015-16. Similar conditions were observed in Uttar Pradesh stretch of River Ganga from upstream of Bijnor, Kachlaghat in Badaun whereas in Garhmukteshwar, Anupshahr and Narora, the flow was more during 2015-16. Minimum flow was observed in river Ganga at Madhya Ganga barrage and Narora barrage upstream of Kanpur during 2014-15 whereas at Ghazipur downstream (downstream Kanpur) minimum flow velocity in River Ganga was observed during 2015-16. In Bihar stretch of River Ganga, minimum flow was observed at Mokamah during 2014-15. In Jharkhand, almost uniform flow was observed during 2015-16. In West Bengal stretch maximum flow in River Ganga was observed at Farakka FTPS and Bata nagar in Howrah whereas minimum flow velocity in River Ganga was observed at upstream of Raghunathganj at origin of outlet of Hoogly canal, Jiaganj, upstream of Tribeni and Serampore during 2015-16.

- ✓ Variation in water temperature during winter and summer season, indicated higher water temperature in River Ganga at all locations during 2014-15 compared to year 2015-16. In Uttarakhand stretch of River Ganga, minimum water temperature was higher and maximum water temperature was lower compared to downstream stretches of Uttar Pradesh, Bihar, Jharkhand and West Bengal. In Uttar Pradesh, water temperature was higher at all the locations on River Ganga during 2015-16. In Bihar, higher water temperature was observed in River Ganga at upstream of Buxar, Danapur Patna and upstream of Patna in 2014-15. Minimum water temperature was observed in River Ganga at downstream of Buxar, Mokamah, Munger, Sultanganj, Bhagalpur and Kahalgaon during 2015-16. In Jharkhand, minimum water temperature was observed at Sahibganj downstream during 2014-15. In West Bengal stretch of River Ganga, water temperature was high in 2014-15 compared to year 2015-16. Minimum water temperature in River Ganga was observed at Raghunathganj, Behrampore, Kalyanpur, Belgharia Howrah bridge, Bata nagar at Kolkata during 2015-16. Maximum water temperature in River Ganga, was observed at Farakka FTPS, Jiaganj and upstream of Tribeni during 2015-16.
- ✓ Dissolved oxygen content in River Ganga stretch of Uttarakhand, was higher during 2015-16 compared to year 2014-16. Minimum dissolved oxygen was observed in Gang Nahar at Har ki Paori in Haridwar and downstream of Haridwar during 2014-15 whereas during 2015-16 minimum dissolved oxygen was at upstream of JSTP Hardwar. In Uttar Pradesh dissolved oxygen was never lowest in River Ganga. In Bihar stretch of River Ganga, lowest dissolved oxygen was observed in Patna and Mokamah during 2014-15.
- ✓ Substratum composition of river is one of the most important physical environmental variable that affects the taxa richness and density of benthic macro-invertebrates. Substratum of River Ganga composed of boulders, cobbles, pebbles, gravel, sand, silt, clay, detritus and macrophytic vegetation. In Uttarakhand state river bed substratum of River Ganga composed of mainly boulders and cobbles. In Uttar Pradesh stretch of River Ganga, substratum composed of mainly sand, silt, clay and detritus and macrophytic vegetation, which changed with respect to seasonal variation. In Bihar stretch of River Ganga, substratum was covered by macrophytic vegetation during pre-monsoon and silt and clay during post-monsoon. Sandy substratum was observed at Buxar and Patna. In Jharkhand stretch of River Ganga, the river bed substratum composed of mainly clay content. In West Bengal stretch of River Ganga macrophytic vegetation dominated

during pre-monsoon whereas clay content increased in substratum of River Ganga during post –monsoon period.

- ✓ Biological water quality in River Ganga is based upon saprobic score of benthic macro-invertebrates, which determines that water quality is suitable for colonisation of sensitive or tolerant species. Marginal variation in saprobic score may not change the biological water quality but changes the species composition. Low saprobic score indicated deterioration in biological water quality, whereas increasing trend in saprobic score determined improvement in water quality. Maximum saprobic score was observed in Uttarakhand stretch of River Ganga supporting very sensitive species of benthic macro-invertebrates. Seasonal variations indicated a lowest saprobic score at Haridwar downstream after confluence of Jagjeetpur STP outfall to River Ganga. In Uttar Pradesh stretch of River Ganga, lowest saprobic score was also observed at Madhya Ganga barrage at Bijnor during 2014-15. During 2015-16, lowest score was observed in River Ganga at Sirsa. In Bihar stretch, lowest saprobic score was observed at Patna downstream during 2015-16. In Jharkhand state, lowest saprobic score in River Ganga, was observed at upstream of Rajmahal. In West Bengal stretch of River Ganga, lowest saprobic score was observed at Belgharia followed by upstream of Tribeni.
- ✓ Diversity score of benthic macro-invertebrates individually, does not indicate water quality status. Diversity score combined with saprobic score provides the wholesomeness in water quality by observing presence of sensitive and tolerant species and their suitability to habitat for colonisation. Low and high diversity score of benthic macro-invertebrates is mainly dependent of habitat preference. Lowest and highest diversity score could be of sensitive or tolerant species of benthic macro-invertebrates, for example, in Uttarakhand state lowest diversity score was observed at Haridwar downstream during 2014-15, whereas, in Uttar Pradesh stretch of River Ganga, lowest diversity score was observed at Dengurpur village in downstream of Allahabad during October, 2016. In Patna stretch of River Ganga in Bihar, scored low diversity whereas in Jharkhand, low diversity in River Ganga, was observed at Sahibganj downstream. Lowest diversity of benthic macro-invertebrates was collected at Belgharia in West Bengal stretch of River Ganga.
- ✓ Study on Jaccard Coefficient of similarity at all the locations selected for assessment of biological health of River Ganga in Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, in summer and winter season indicated a clear view that none of the location is exactly

similar or almost similar with another location, in terms of species composition, with another location. So, all the locations are important and none can be excluded for assessment of biological health of River Ganga.

- ✓ Impact of climate change on flow velocity and water temperature in relation to the dominance of macro-invertebrate communities, has been assessed on glacial fed River Ganga, in Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. A total of 86 observations on entire stretch of River Ganga, indicated water temperature ranging from 10°C to 37.5°C within a flow velocity ranging from 0.04 meter/seconds (m/s) to 0.53 m/s. Only at one observation, maximum water temperature was reported for 40.5°C at a flow velocity of 0.72 m/s in River Ganga at Farakka FTPS in West Bengal. A correlation study has indicated that, such increase in water temperature may have deleterious impact on aquatic fauna and flora of River Ganga.
- ✓ Correlation of dominance of macro-invertebrate with chemical characteristics, such as BOD, chloride, conductivity, fluoride, calcium, COD, dissolved oxygen, magnesium, nitrate, phosphate, sodium, total dissolved solids, pH, potassium, sulphate, total alkalinity and total hardness, has indicated +ve and –ve correlation of individual parameters with individual species/family of macro-invertebrates.
- ✓ Validation study has been made for each variable used for accreditation of field protocol used for bio-assessment of health of River Ganga and its tributaries.
- ✓ List of organisms indicated total collection from River Ganga and tributaries, during year 2014, 2015 and 2016. A total of 21,804 benthic macro-invertebrates have been collected. Thus, in Uttarakhand, a total of 1778, in Uttar Pradesh, a total of 8090, in Bihar, a total of 4673, in Jharkhand, a total of 908 and in West Bengal, a total of 6355 benthic macro-invertebrates have been collected from River Ganga.
- ✓ A total of 21,804 number of benthic macro-invertebrates were collected during two phase of bio-monitoring of River Ganga and its tributaries, in the states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. Out of these, 1778 benthic macro-invertebrates were collected from river stretch in Uttarakhand, 8090 in Uttar Pradesh, 4673 in Bihar, 908 in Jharkhand and 6355 in river stretch of West Bengal.
- ✓ A total of 22,338 number of benthic macro-invertebrates collected from entire stretch of River Ganga, including samples collected for NGT inspections, were classified for Class A,B,C,D and E with respect to Clean, Slight pollution, Moderate pollution, Heavy pollution and

Severe pollution in biological water quality in River Ganga and its tributaries. Out of 22,338 number of benthic macro-invertebrates, 108 indicated clean biological water quality (Class ‘A ‘)in 4 river stretches of Uttarakhand state, 2712 indicated slight pollution (Class ‘B’) in 13 river stretches of Uttarakhand, Uttar Pradesh, Bihar and West Bengal, 17,435 indicated Moderate pollution (Class ‘C ‘) in 91 river stretches in Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal states, 2083 indicated Heavy pollution (Class ‘D’) in 9 river stretches in Uttarakhand, Uttar Pradesh, Bihar and West Bengal states.

- ✓ A total of 20 indicators were identified in Clean water (Class ‘A’), 116 indicators were identified in Slight pollution (Class ‘B’), 161 indicators were identified in Moderate pollution (Class ‘C’) and 50 indicators were identified in Heavy pollution (Class ‘D’) biological water quality in river stretches of River Ganga and tributaries. None of the river stretch indicated Severe pollution (Class ‘D’) in River Ganga and its tributaries (Reference: BIOLOGICAL INDICATORS OF WATER QUALITY IN RIVER GANGA).
- ✓ In India, almost 25 number of laboratories from, Central Pollution Control Board, State Pollution Control Boards, PCCs and other laboratories, were evaluated for proficiency testing in taxonomic identification of benthic macro-invertebrates of River Ganga.

1 Introduction

River Ganga rises at the foot of Gangotri glacier at Gaumukh in Uttarakhand, at an elevation of 3,892 m (12,769 ft), flows south and east through the Gangetic plain of North India in Uttar Pradesh, Jharkhand, Bihar and West Bengal and finally falls into the Bay of Bengal (Sagar dweep). River Ganga is the third largest river by discharge. The total length of River Ganga is approximately 2525 Km., meeting a large number of tributaries on the way to Bay of Bengal. The River Ganga is a sacred river along every fragment of its length. All along its course, people drink and bath in its waters. Ritual bathing at the bank of river in Haridwar and Allahabad during Kumbh Mela is of particular importance. Kumbh Mela is one of the world's largest human gathering on planet Earth. Gangetic plains harbour impressive populations of wildlife including wild Asian elephants, rhinoceros, sloth bear, tigers and many others. The river's most famed fauna is the freshwater dolphin *Platanista gangetica gangetica*, the Ganges river dolphin, recently declared as India's national aquatic animal. River Ganga basin with its fertile soil is instrumental to the agricultural economy of the country and its tributaries provide a perennial source of irrigation to a large area. Along the banks of the river, presence of swamps and lakes provide a rich growing area for crops such as legumes, chillies, mustard, sesame, sugarcane and jute. There are also many fishing opportunities along the river. River Ganga is threatened from various sources of pollution and is cause of concern to 400 million people who live close to the river. Sewage from many cities along the river's course, industrial waste and religious offerings wrapped in non-degradable plastics add large amount of pollution load to the river as it flows through densely populated areas. The problem is exacerbated by the fact that many poor people rely on the river on a daily basis for bathing, washing, and cooking. Pollution threatens not only humans, but also more than 140 fish species, 90 amphibian species and the endangered gangetic dolphin.

Water quality management system based on physical and chemical parameters is not sufficient to assess the quality status in terms of the health of the water body. The river water quality assessment has been traditionally done so far by measuring physical, chemical and few biological characteristics. Litrature indicated that these measurements may have been efficient in regulation of effluents and sewage discharged in a river channel and checking the possible hazardous effect of the polluted water on human health but these measurements are not very effective in management of large scale effect on the catchment areas or the protection of biological fauna and ecological health and stability of the river assessment of aquatic biota of a river provides the status of physical and functional veracity of ecosystems and has lately been used on large scale for determination of ecological health of a river ecosystem. A biological system has been defined and considered to be healthy when its inherent potential is realized, its condition is stable, its capacity for self-repair when perturbed is preserved, and minimal external support for management is needed. The examination of inter-dependency between environmental parameters that have direct effect on aquatic biota, as structure of habitat, water flow, energy sources, water quality and interactions among biotic components and prevailing life conditions are required for assessment of biological health of a river. The biological health of a river ecosystem directly or indirectly affects the health of human beings and other living beings which are dependent on that particular river. One of the long term objective for pollution control authorities, is that all the natural surface water bodies should remain free from harmful effects, caused by pollution discharges, to man and aquatic life in aquatic environment. Bio-monitoring of water quality can play a vital role in planning effective pollution control strategy, in order to restore the biological health of a river. Biological assessment relies on the fact that pollution of water bodies will cause change in physical and chemical environment of the water and that these changes will disrupt the ecological balance of the system. Thus, by measuring the extent of ecological upset, the severity of pollution can be estimated. Use of benthic macro-invertebrates for bio-monitoring is based upon community effects and the most frequent response of a community which is expressed in terms of saprobic score and diversity score for determination of biological water quality using Biological Water Quality Criteria. Biological monitoring and biological parameters provides the most assimilative view of river health and is essential to identify the biological response of river to human activities. Biological surveillance of benthic macro-invertebrate communities, with special emphasis on characterizing taxonomic richness and composition, is therefore the most sensitive tool now available for quickly and accurately detecting alterations in aquatic ecosystems. The outcome of biological monitoring may provide the actual picture of river health and its catchment which may be helpful to pinpoint the causes of degradation and subsequently to develop restoration plans. It is imperative that biological monitoring systems be developed to follow environmental changes and, equally importantly, that corrective action be taken when this monitoring indicates trouble. The ultimate goal of the monitoring of a river system for physical and biological parameters is to regulate the factors which are culprit of disturbing the stability and diversity of the river ecosystem. To obtain statistically accurate determination, benthic macro-invertebrates are of particular interest because they are a diverse group of long-lived, sedentary species that react strongly and often, predictably to changes in water quality. When the resident biota is unhealthy (lacking species, containing pollution-tolerant forms), then action can be taken to manage not only point sources but nonpoint sources and structures that may have altered stream habitat. This project has concentrated on bio-monitoring of River Ganga to determine the biological health of the river from Rudra Prayag in Uttarakhand to Haldia in West Bengal, through two phases. The benthic macro-invertebrates have been collected from river stretch of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal during the year 2014, 2015 and 2016.

2 Method of Assessment of Biological Health of River Ganga

2.1 Need for Assessment

Bio-monitoring is the biological surveillance of benthic macro-invertebrate (BMI) communities dwelling in fresh water bodies. Water quality of River Ganga is being monitored at various locations and assessed based on the physico-chemical and bacterial parameters (including BOD, COD, DO, temperature, pH, total coliforms, faecal coliforms etc.). They are of particular importance but provide only the momentary account of water quality i.e. water quality that prevails at that particular time of monitoring. Biological monitoring, on the other hand, has much longer dimension since the aquatic biota can be affected by chemical and/or hydrological events that may have lasted only a few days, some months or even years before monitoring was carried out. Biological monitoring, thus, provides an effective, easy to understand, less time consuming and cost-effective method to determine cumulative impact of pollution in surface waters. To obtain statistically accurate determination, benthic macro-invertebrates are of particular interest because they are a diverse group of long-lived, sedentary species that react strongly and often, predictably to changes in water quality. When the resident biota is unhealthy (lacking species, containing pollution-tolerant forms), then action can be taken to manage not only point sources but nonpoint sources and structures that may have altered stream habitat. Biological surveillance of benthic macro-invertebrate communities with special emphasis on characterizing taxonomic richness and composition is therefore the most sensitive tool now available for quickly and accurately detecting alterations in aquatic ecosystems. It is imperative that biological monitoring systems be developed to follow environmental changes and, equally importantly, that corrective action be taken when this monitoring indicates trouble.

2.2 Use of Benthic Macro-Invertebrates for Assessment

The benthic macro-invertebrates, have been considered as the most suitable biological parameter for water quality evaluation due to the following facts:

- The benthic macro-invertebrates are visible to unaided eye and are retained on a sieve with a mesh size of 0.6 mm diameter.
- Macro-invertebrates are inhabiting the different substratum of rivers, streams, lakes and other water bodies.
- Water bodies having different quality, support diverse macro-invertebrate communities.

- Their taxonomy is well developed.
- They demonstrate an integrated effect of pollution.
- They provide good experimental possibilities.
- They are useful in assessing the impact of municipal, industrial and agricultural wastes.
- Community response is sensitive to organic loading, thermal impacts, substrate alterations and toxic pollution.

2.3 Saprobic Score

This method involves a quantitative inventory of the presence of macro-invertebrate benthic fauna up to family/genus level of taxonomic precision. All possible families having saprobic indicator value are classified on a score scale of 1to 10 according to their preference for saprobic water quality. The families which are most sensitive to pollution score higher and are getting a maximum score of 10 while the most pollution tolerant families are getting a score of 1 and 2. The other intermediately sensitive families are placed in between the scoring scale of 10 to1.

Enter different species within one family separately, and indicate abundancy as:

Abundance scale:

A = single (one individual)

B = scarce (2-10 individuals)

C = common (10-50 individuals)

D = abundant (50-100 individuals)

E = excessive (more than 100 individuals or only one species)

2.4 Diversity Score

The evaluation of the benthic fauna diversity level can easily be done utilizing: the same animals collected for estimating the saprobic score. Take photograph of the living animals in the field for evidence. Since the method only involves a pair –wise comparison of sequentially encountered individuals and the differences of two specimens can easily be observed up to the genus/species level, no taxonomic skill is required. First observed animal is always different and scored as 1 run. When the next observed animal is different from the last, a new run starts. The encounter of an individual which cannot be discerned for the last does not increment the number of runs. Size differences only do NOT change the run.

SAME RUN is 0 (organism is same as the previous)

NEXT RUN is 1 (organism is different from the previous)

2.5 Biological Water Quality Criteria

For assessment of the actual health of water bodies, CPCB has derived a Biological Water Quality Criteria (BWQC) for water quality evaluation. This system is based on the range of saprobic and diversity score of the benthic macro-invertebrate families with respect to water quality. The system has been developed after extensive field trials and calibration on the saprobic and diversity information of different taxonomic groups of benthic animals collected from artificial substratum and natural substratum of various water bodies. To indicate changes in water quality to different grades of pollution level, the entire taxonomic groups, with their range of saprobic score from 1 to 10, in combination with the range of diversity score from 0 to 1 has been classified into five different classes of water quality (Table 2.5.1) The abnormal combination of saprobic score and diversity score indicates sudden change in environmental conditions. The biological water quality is evaluated using benthic fauna by combining the observed saprobic score and diversity score within a given range and the biological water quality class is determined.

Table 2.5.1: Biological Water Quality with respect to range of Diversity and Saprobic score

Range of Saprobic Score(0-10)	**Range of Diversity Score (0 -1)**	**Water Quality**	**Biological Water Quality Class**	**Indicator colour**
7 and more	0.2-1.0	Clean	A	Blue
6-7	0.5-1.0	Slight Pollution	B	Light Blue
3-6	0.3-0.9	Moderate Pollution	C	Green
2-5	0.4-less	Heavy Pollution	D	Orange
0-2	0-0.2	Severe Pollution	E	Red

3 Scope of Assessment of Biological Health of River Ganga

Biological health of River Ganga was monitored from its stretch starting from upstream of Rishikesh in Uttarakhand and passing through Uttar Pradesh, Bihar, Jharkhand and West Bengal. A number of tributaries were also included before joining to River Ganga at various locations. These locations have been identified with respect to their significance for impact of pollution sources. Two rounds of monitoring covered seasonal variations also i.e. pre-monsoon and post-monsoon period. Some of the locations could not be monitored twice covering seasonal variation such as some locations in Bihar, Jharkhand and West Bengal. Details of locational description will help in identifying the same location for re-assessment.

4 Location Description of Monitoring Stations on River Ganga

Total 93 unique locations covered in two rounds of bio-monitoring of River Ganga in five states namely Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.

4.1 Description of Locations For Assessment of Biological Health of River Ganga in Uttarakhand

Sr. No.	Location Code	Location Name	Location Description
1.	UK 1	River Alaknanda after confluence with River Mandakini downstream of Rudra Prayag	Rudraprayag is located on Haridwar-Badrinath Road (NH-58) via road at a distance of approximately 370 Km. from Delhi. The sampling location is situated arround 500 meter downstream to confluence of River Mandakini and River Alaknanda at downstream of Rudra Prayag.
2.	UK B	River Ganga at Byasi/Singtali	This location near Byasi village is situated at distance of around 105 Km. from the previous upstream location at Rudra Prayag. This sampling location of River Ganga is situated at upstream of Rishikesh at a distance of about 270 Km. from Delhi and 30 Km. from Rishikesh at Amkholi village near Byasi on Rishikesh-Badrinath Road (NH-58). This location is accessible from Delhi, travelling on Delhi-Haridwar Road (NH-58) and continuing on NH-58 on Haridwar - Badrinath stretch.
3.	UK 4	U/s Rishikesh, Luxman Jhula	This location is situated at a distance of around 28 Km. from the previous upstream location near Byasi village. Atfter confluence of River Bhagirathi and River Alaknanda at Dev Prayag River Ganga passes through Byasi village and reaches Luxman Jhula in Rishikesh. River rafting and other water sports activities are performed at this stretch of River Ganga. Laxman Jhula is accessible by road from Delhi via Haridwar located at about 30 Km. road distance from Haridwar city on Haridwar-Badrinath Road (NH-58). Rishikesh town is located at a distance of around 240 Km. from Delhi.

Sr. No.	Location Code	Location Name	Location Description
4.	UK 5	Barrage at Rishikesh	This location is situated at a distance of around 12 Km. from previous location at Luxman Jhula, Rishikesh. Rishikesh Barrage is located at around 5 Km. downstream of Rishikesh town. This location is accessible by road from Delhi, located at about 25 Km. road distance on SH-9, from Haridwar city to Haridwar-Badrinath Road or via Chilla Road through Rajaji National Park. This location can be reached by road from Delhi via NH-58 and SH-9 by covering a distance of around 230 Km..
5.	UK 6	Haridwar Barrage	The location near Haridwar barrage is situated at a distance of around 22 Km. downstream of previous location at Rishikesh barrage. Haridwar Barrage is located on Haridwar-Dehradun Road at Haridwar where the River Ganga water is diverted towards Har-ki-Paori. Haridwar barrage can be reached from Delhi by travelling on NH-58 for a distance of around 200 Km.. from Delhi. River Ganga enters the northern plains after flowing down from uphill location of Rishikesh.
6.	UK 7	Dam Kothi on Ganga Nahar, downstream Har-ki-Paori	Dam Kothi is located on River Ganga Nahar, originating from Haridwar Barrage, gets large volume of water diverted from Haridwar Barrage flowing through Har-ki-Paori, an important religious place. This sampling point is not located on main stem of River Ganga but on the Ganga Nahar, flowing through Har-ki-pauri at a road distance of around 3.0 Km. from the previous location near Haridwar Barrage. It is accessible by Road from Delhi via NH-58 (Haridwar-Dehradun Road) reaching Haridwar after passing Roorkee, at a distance of around 200 Km. from Delhi.
7.	UK 8a (u/s)	River Ganga upstream of STP outlet at Jagjeetpur	Jagjeetpur is located on the main stem of River Ganga at distance of around 6.5 Km. by road from the previous location of Dam Kothi near Har-ki-Pauri. Jagjeetpur is located on the main stem of River Ganga just d/s of Haridwar city near Kankhal. Sample has been taken from slightly upstream location of the outfall of STP located at Jagjeetpur on Laksar-Haridwar Road (SH-25). Jagjeetpur can be reached via Delhi-Haridwar Road NH-58 then taking a right turn before Hardiwar city on Hardiwar-Laksar Road (SH-25) for 5 Km. to the exact location on Ganges. Total distance from Delhi to Jagjeetpur STP is approximately 200 Km.

Sr. No.	Location Code	Location Name	Location Description
8.	UK 8 down-stream	River Ganga downstream of Haridwar JSTP	This location on the main stem of River Ganga is at distance of around 6.5 Km. by road from the previous location of Dam Kothi near Har-ki-Pauri. This sampling location at Jagjeetpur is at the downstream point of the outfall of STP located at Jagjeetpur on Laksar-Haridwar Road (SH-25). This STP receives sewage from a large portion of Haridwar city and Kankhal region. The total distance from Delhi to Jagjeetpur STP is approximately 200 Km. via Delhi-Haridwar Road (NH-58) and travelling around 5 Km. then off the Hardiwar-Laksar Road (SH-25) to the exact location on Ganges.

4.2 Description of Locations for Assessment of Biological Health of River Ganga in Uttar Pradesh

Sr. No.	Location Code	Location Name	Location Description
1.	UP 1	Balawali Railway & Road Bridge (Upstream Bijnor)	Balawali Railway bridge is located on River Ganga upstream of Bijnor (Madhya Ganga barrage), on the border of Uttarakhand and Uttar Pradesh, when River Ganga reaches the plains, situated at a distance of around 30 Km. downstream from Haridwar. This location is accessible by road from Delhi at a distance of around 170 Km. travelling via NH-24 Ghaziabad then on NH-58 upto Meerut, further NH-119 takes through Bijnor city and past Bijnor bypass for 30 Km. on MDR -93W (Bijnor-Haridwar Road) may be taken to reach Balawali. It is situated in a semi-urban area with human activities on River Ganga used for religious activities, cremation and seasonal farming on the banks of the river.
2.	UP 2	Madhya Ganga barrage	Madhya Ganga barrage is located at a distance of around 28 Km. from the previous upstream location near Balawali bridge, located on Meerut-Bijnor Road 10 Km. west of Bijnor town. This barrage provides water to the Madhya River Ganga Canal. This barrage is located at about 125 Km. distance from Delhi on Meerut-Pauri National Highway and can be reached from Delhi by NH-58 (upto Meerut) then NH-119 and SH-26 towards Mawana to River Ganga barrage.

Sr. No.	Location Code	Location Name	Location Description
3.	UP 3	Sukartal Ghat at Saloni River	Sukartal Ghat is located on Saloni River in Muzaffarnagar district of Uttar Pradesh at distance of around 28 Km. by road from the previous location at Madhya Ganga barrage on the main stem of River Ganga. It is an ancient place of religious importance located on the banks of Saloni River. Sukartal is located at a Road distance of about 145 Km. from Delhi and can be reached taking Delhi-Haridwar Road (NH-58) upto Muzaffarnagar then taking a right-turn on Bhopa Road (SH-12) towards Sukratal Ghat. The sampling location was Sukratal Ghat on Saloni River.
4.	UP 4	Brij Ghat Road Bridge NH-24 at Garhmukteshwar	Brij Ghat road bridge on River Ganga is located at distance of around 95 Km. from the previous upstream location on River Ganga at Madhya Ganga barrage. Brij ghat is located in Garhmukteshwar in Hapur district on Delhi-Moradabad Road (NH-24), a place of high religious importance. It is located on NH-24 at a distance of around 105 Km. from Delhi. It is the nearest location of River Ganga from Delhi.
5.	UP 6	Bridge at Anupshahr upstream Anupshahr	Anupshahr is a town located in the Bulandshahr district downstream of Garhmukteshwar at a road distance of around 70 Km. from the previous upstream location at Garhmukteshwar on River Ganga main stem. Anupshahr is located at around 125 Km. from Delhi and around 42 Km. from Bulandshahr district headquarter. This location is easily accessible by road from Delhi via Delhi-Kanpur Highway (NH-91) upto Bulandshahr bypass and then Bulandshahr – Anupshahr Road (MDR-58). The sampling location is near the bridge on River Ganga located upstream of town of Anupshahr.
6.	UP 6A	River Ganga near Mastram Ghat downstream of Anupshahr	Mastram Ghat on River Ganga is located at distance of around 3 Km. downstream from the previous location of bridge at Anupshahar upstream. This sampling point is located downstream of Anupshahr town in Bulabdshahr district situated at around 130 Km. from Delhi and around 45 Km.s from Bulandshahr district headquarter. This location is easily accessible by road from Delhi via Delhi-Kanpur Highway

Sr. No.	Location Code	Location Name	Location Description
			(NH-91) upto Bulandshahr bypass and then Bulandshahr – Anupshahr road (MDR-58). The sampling location is near Mastram Ghat downstream of Anupshahr.
7.	UP 7	Bridge upstream of Narora at Rajghat	Railway bridge at Rajghat in Narora is located on River Ganga at a road distance of around 33 Km. from the previous sampling point on River Ganga at downstream of Anupshahr. Rajghat is an important ghat of this area with human activities including creamtion, bathing and other religious rituals on River Ganga. The road distance of Rajghat from Delhi is about 140 Km. which can be reached by travelling on Delhi-Kanpur highway (NH-91) and then Bulandshahr-Narora Road (SH-18) via Dibai.
8.	UP 8	Barrage at Narora	Narora barrage is located at a distance of 10 Km. downstream to Rajghat rail bridge. The Narora barrage diverts a major volume of water from River Ganga to Lower River Ganga Canal. This Barrage is located near Aligarh in Bulandshahr district. The road distance between Delhi to Narora Barrage is around 145 Km. on the Delhi-Badaun Road (NH-93).
9.	UP 9	Kachla Ghat Bridge at Badaun	Kachla Ghat is located in the District of Badaun in Uttar Pradesh, downstream of Narora at a road distance of around 80 Km. from the previous location at Narora on River Ganga main stem. Kachla is situated at distance of around 225 Km. from Delhi accessible by road from Delhi via Delhi-Kanpur road (NH-91) NH-93 and then SH-18 to Kachla in Badaun district of Uttar Pradesh. The sampling location at Kachla was selected near the Rail and Road bridge at Kachla.
10.	UP 10M	River Ramganga downstream of Muradabad	This location on River Ramganga is located at Moradabad near Katghar under bridge road at an approximate distance of 160 Km. from Delhi. This location can be reached from Delhi via Delhi-Moradabad Road (NH-24) and then in the Moradabad city to reach Katghar Railway station.

Sr. No.	Location Code	Location Name	Location Description
11.	UP 10	River Ramganga at SH-29 at Shahabad	River Ramganga flows towards Shahabad from Moradabad city. This sampling location is located near Shahabad in the district of Rampur at downstream of previous location of Moradabad city at about 50 Km. by road from previous location, can be reached via NH 24 from Delhi and then taking turn towards Shahabad from Moradabad. Total distance from Delhi to River Ramganga at Shahabad, is approximately 200 Km., can be reached via NH-24 from Delhi and then taking turn towards Shahabad from Moradabad.
12.	UP 12	Bridge on River Garra at Sandi	Sandi is located approximately at a distance of 125 Km. from Kanpur on Kanpur-Bareilly Road (MDR 26 C). This location on River Garra at Sandi can be reached easily travelling via NH-91 from Kanpur upto Bilhaur and then taking the Bilhaur-Bangarmau Road across River Ganga and further taking SH-38 from Bangarmau to Sandi.
13.	UP 13	Bridge at River East Kali at Kanpur-Farrukhabad Road	This is a location downstream after confluence of River Ganga and River East Kali at downstream of Kannauj near Mehndipur Village on Kanpur-Farrukhabad Road. This location is easily accessible from Kanpur city via Kanpur-Delhi Road (NH-91) just before Kannauj. The total distance between Mehndipur Village on Kanpur Farrukhabad-Road is around 85 Km.
14.	UP 14	Bridge at Ghatiaghat, Farrukhabad	Ghatighat is located on River Ganga in the Farrukhabad district of Uttar Pradesh on Farrukhabad-Shahjahanpur Road (NH-93). The distance of this location is around 120 Km. by road from the previous upstream location on main stem of River Ganga at Kachla Ghat in Budaun district. This location is at a distance of about 145 Km. from Kanpur city, travelling by road. This location can be reached travelling on Kanpur-Delhi Road (NH-91) upto Kannauj and then taking right turn on NH-93 on Farrukhabad-Shahjahanpur Road.

Sr. No.	Location Code	Location Name	Location Description
15.	UP 17 (UP I)	River Ramganga before confluence to River Ganga	This location is situated at 12 Km. North-East of Ghatia Ghat at Farrukhabad- Barreily Road (SH-29) near Hullapur Village. The previous location of River Ramganga near Shahabad in Rampur district is around 175 Km. upstream to this location. This location is at a distance of approximately 160 Km. from Kanpur City travelling by road. This location can be reached travelling on Kanpur-Delhi Road (NH-91) upto Kannauj and then taking right turn on Farrukhabad-Shahjahanpur Road (NH-93/SH-29).
16.	UP II	River East Kali before confluence to River Ganga	This location is situated on River East Kali near village Nahar Ghati just before its confluence with River Ganga on upstream of Mehndipur Village in Kanpur Dehat. River East kali flows through western Uttar Pradesh and receives discharge from various industries located in its basin. This location is around 90 Km. from Kanpur City. This location can be reached from Kanpur travelling via GT Road NH-91 (Kanpur-Delhi Road) and taking a turn towards Mehndipur Ghat to reach Nahar Ghati village.
17.	UP 18	Bridge at Bithoor	Bridge at Bithoor over River Ganga is located on Pariyar Road at Bithoor in Kanpur at a distance of 125 Km. downstream of the previous location at Ghatia Ghat in Farrukhabad. The nearby Brahmvarat Ghat on River Ganga is of utmost religious importance and this region has remained historically as well as religiously important for local people. Bithoor is located at a distance of around 24 Km. from Kanpur City, which can be reached travelling on old G.T. Road (NH-91) from Kanpur upto Mandhana, further taking Mandhana-Bithoor Road.

Sr. No.	Location Code	Location Name	Location Description
18.	UP 19	Barrage upstream Kanpur	Kanpur Barrage is located on NH-91 bypass in the upstream of main Kanpur city and is located downstream to the previous location at Bithoor at a distance of 18 Km. Kanpur Barrage is located at just 10 Km. from Kanpur Central Railway Station on River Ganga. Kanpur city draws drinking water from River Ganga through this barrage. This location can be reached via VIP Road and Sitapur-Kanpur Road from Kanpur Central Railway Station.
19.	UP 29	Bridge 2 at Kanpur-2 at NH-25	The Bridge -2 at Kanpur on Kanpur-Lucknow Road (NH-25) is located near the Jajmau tannery area and it is located at downstream of the previous upstream location at Kanpur barrage at a distance of around 18 Km. by road. The area is situated in Kanpur City at a distance of around 12 Km. from Kanpur Central station. Jajmau is easily accessible by various route from Kanpur and Delhi. It can be reached from Delhi-Kolkata Highway beyond Panki going straight towards Lucknow on NH-25.
20.	UP DG (UP A)	Dhondhi ghat downstream Kanpur	This location at Dhondhi ghat is a downstream location of Kanpur on River Ganga further downstream to the previous location near Jajmau near Rooma on Kanpur-Allahabad Highway (NH-2) at a distance of around 18 Km. from the bridge at Kanpur on Lucknow Road (NH-25). This location is situated at a distance of around 25 Km. East of Kanpur City on the right bank of River Ganga. Dhondhi can be reached from Delhi via train to Kanpur and then by road off NH-2 near Rooma.
21.	UP 32	Bridge near Fatehpur	This bridge on River Ganga near Fatehpur is situated at Tanda Village on Fathepur-Lalganj Road (SH-13A) located at a distance of around 82 Km. from the previous upstream location of Dhondhi Ghat near Kanpur. This location is easily accessible from Kanpur and Allahabd. The road distance of this bridge on River Ganga is around 120 Km. from Allahabad city travelling on Allahabad - Rae Bareli Road (NH-24B).

Sr. No.	Location Code	Location Name	Location Description
22.	UP 33	Bridge on River Yamuna, MDR,26B near Rajapur	At this location sample has been taken from Yamuna River near the bridge on MDR 26 B near Rajapur in Uttar Pradesh. This location is situated at a distance of around 80 Km. from Allahabad towards west. This location can be reached via Allahabad-Delhi Road (NH-2) and further taking SH-94 near Bharwari towards Rajapur.
23.	UP 38	Bridge on River Yamuna at NH-27	This location on Yamuna River in Allahabad city is located at a distance of around 92 Km. by road from the previous upstream location on River Yamuna near Rajapur. This location is situated on River Yamuna in Allahabad city, just before confluence at Sangam at a distance of around 6 Km. from Allahabad Railway station. Sampling location is near the new Naini Road bridge (NH-27) in Allahabad.
24.	UP 39	Bridge on River Tons near Panasa	River Tons is tributary of River Ganga having its confluence with River Ganga downstream of Allahabad (Sangam). It is around 30 Km. from the Allahabad city on Allahabad – Mirzapur Road (NH-76) near Panasa village.
25.	UP 40	Bridge downstream of River Tons near Sirsa	Distance of this location from the previous upstream location on River Ganga at Allahabad bridge on NH-2 is around 45 Km. by road. This location near bridge on River Ganga is located near Sirsa at downstream of Allahabad after confluence of River Tons. This location is situated at a distance of around 45 Km. from Allahabad city towards east on Allahabad-Mirzapur Road (NH-76) then taking a turn towards Sirsa at Meja Road on MDR-111.
26.	UP 41	Bridge on Allahabad Bypass	This location on bridge on Allahabad bypass is on River Ganga upstream of Allahabad just after start of Allahabad bypass from (Delhi-Varanasi Road) towards Varanasi. The location is situated downstream to the previous location on River Ganga near Fatehpur at a distance of around 105 Km.. This location is situated at a distance of around 40 Km. from Allahabad bypass travelling through Allahabad-Delhi Road (NH-2).

Sr. No.	Location Code	Location Name	Location Description
27.	UP 44	Bridge Lord Curzen Allahabd Right	Lord Curzon Bridge on River Ganga is located in the just upstream of Allahabad City near this sampling location. It is located at downstream to the previous location on Allahabad-bypass bridge on River Ganga at a distance of about 35 Km. travelled by road. This bridge is situated on NH-96 and SH-38 towards Allahabad bypass connecting Allahabad and Varanasi at a distance of around 10 Km. from the Allahabad Station.
28.	UP 47	Bridge on NH-2 right	This sampling location on Allahabad- Varanasi Road (NH-2) is situated on River Ganga near the Sangam (u/s of sangam) of River Ganga, Yamuna and Mythical Saraswati River. The previous sampling location at upstream of this location, The Lord Curzon Bridge, is situated at a distance of around 9 Km. upstream to this location in Allahabad city. This area is of utmost religious importance, visited by around 10 million people for Holy dip on the occasion of KumBh Mela held once in 12 years. This location is situated at a distance of around 7 Km. from Allahabad Railway Station.
29.	UP AL1	Bridge near village Mahewa Kalan Kachar, Dengurpur	Mahewa Kalan kachhar is located at a distance of around 55 Km. from the Allahabd city towards east. The sampling location just upstream of this location is at Sirsa, situated at a distance of around 25 Km. by road from Mahewa Kalan. This sampling location is situated on River Ganga u/s of Mirzapur-Vindhyachal. This location can be reached from Allahabad travelling via. Allahabad-Mirzapur Road (NH-76) upto Manda Road and then taking a turn towards Mahewa Kalan to reach Mahewa Kalan.

Sr. No.	Location Code	Location Name	Location Description
30.	UP 49	Bridge SH-74 upstream Varanasi	This location on SH-74 (Varanasi-Kachwa-Mirzapur Road) is near Chunar Fort across the River Ganga. This location is situated at around 38 Km. by road from the previous upstream location on River Ganga at Mirzapur. This location is at a distance of around 28 Km. from Varanasi Cantt Railway Station towards south, travelling on SH-74 towards Kachhwa across the NH-2. At this location River Ganga flowing downstream from Mirzapur towards eastwards takes a sharp northward turn towards Varanasi and flows South to North upto Rajwari (confluence point of River Gomti) where it again turns towards east.
31.	UP 50	River Varuna at Bridge SH-98 at Varanasi	This bridge on SH-98 is located on River Varuna, in upstream of Varanasi, a tributary of River Ganga. This sampling point is located on SH-98 north of Kapsethi near village Bajardiha. It is situated at a distance of around 35 Km. from Varanasi travelling via Varanasi-Bhadohi Road (SH-87) and taking a right turn on SH-98 towards Kapsethi to reach the River Varuna bridge.
32.	UP 51	Bridge at Ramnagar Road near Varanasi	This location at upstream of Varanasi is located at distance of around 23 Km. from the previous upstream monitoring location on River Ganga at SH-74 near Chunar. This Road bridge on Ramnagar Road (AH-1) near Varanasi city stands over River Ganga near Ramnagar. This location is situated at around 10 Km. distance in south end of Varanasi city by road from Varanasi Railway station. The Road over this bridge is a diversion from NH-2 and reaches Chandauli district (Mughalsarai) across the river.
33.	UP 53	Bridge NH-2 at Varanasi (Rajghat)	This old iron made Malviya Bridge is used for Rail-Road traffic, dates back to the British Raj connecting Ramnagar to Varanasi near Rajghat on River Ganga. This sampling location is situated at distance of around 3 Km. from the previous upstream location on River Ganga at Dasashwamedh Ghat. This location is situated before the confluence of river Varuna with River Ganga. The Kashi railway station is located nearby. The distance of this location near Rajghat on Ramnagar Road from Varanasi Cantt Station is around 8 Km..

Sr. No.	Location Code	Location Name	Location Description
34.	UP 54	Bathing Ghta-1, Varanasi	One of the most important bathing ghat at Varanasi is Dashashwamedh Ghat, which is the location of sampling for bio-monitoring in Varanasi region. This location is situated at a distance of about 7 Km. from the previous upstream sampling location of bridge on Ramnagar road. This is located at around 6 Km. from the Varanasi Cantt. Railway station.
35.	UP 55 (UP 56 in first round)	Bridge on River Varuna in Varanasi	This location is near Chowka Ghat on a bridge on Varuna River in the heart of the Varanasi city just 2.0 Km. from the Cantt railway station. This sampling location on Varuna River is located at distance of around 32 Km. by road from the previous upstream sampling point at SH-98 near Kapsethi. It is located on the road Sanskrit University Road (NH-56) at Varanasi.
36.	UP 56 (UP 57 in first round)	River Gomti at Rajwari	Rajwari is located at a distance of around 30 Km. east of Varanasi city, it is located at a distance of around 25 Km. from the previous upstream location on River Ganga main stem in Varanasi near NH-2 bridge at Rajghat. The sampling location on River Gomti at Rajwari is near a bridge on Varanasi-Ghazipur Road (NH-29).
37.	UP III	Vindhyachal Ghat, Mirzapur upstream	Vindhyachal Ghat is a major pilgrimage site, located in the district of Mirzapur in Uttar Pradesh on the banks of River Ganga. This sampling location at Vindhyachal Ghat is located at a distance of around 28 Km. from the just upstream location on River Ganga at Mahewa Kalan near Dengurpur off the NH-76. This sampling point is situated in south-west of Varanasi city at Vindhyachal at a road distance of around 66 Km. from Varanasi off the NH-76.
38.	UP IV	Mirzapur downstream, after confluence of two drains	The sampling location on River Ganga at Mirzapur is located near Civil Lines Road at Mirzapur city located at a distance of around 55 Km. from Varanasi. This sampling point is situated at distance of 10 Km. from the sampling point at Vindhyachal Ghat located upstream to this point. Mirzapur city can be reached via Varansi-Delhi Road (NH-2), Bhadohi-Mirzapur Road (SH-5) and NH-76.

Sr. No.	Location Code	Location Name	Location Description
39.	UP G	Tarighat downstream Ghazipur	Tarighat is located on the main stem of River Ganga downstream of Ghazipur city in Eastern Uttar Pradesh. The nearest sampling point in the upstream of this point on River Ganga is situated at Rajghat around 75 Km. upstream of this location and at around 50 Km. upstream to this location in West at Rajwari, Gomti river joins River Ganga. This location is situated at a distance of around 80 Km. from Varansi city towards east direction. This location is situated on NH-97 passing through Tarighat bridge on River Ganga.

4.3 Description of Locations for Assessment of Biological Health of River Ganga in Bihar

Sr. No.	Location Code	Location Name	Location Description
1.	Bh 3(I)	Chausa water intake point upstream Buxar	Chausa is located on the border of Bihar and Uttar Pradesh near Buxar where River Ganga enters Bihar having a confluence with River Karamnasa. This sampling point at Chausa is located at distance of around 40 Km. by road downstream of the previous location at Tarighat in Ghazipur district. This sampling point is located at a distance of around 135 Km. from Patna and can be reached from Patna travelling via Danapur –Arrah Road (NH-30) and Arrah-Buxar Road (NH-84) upto Buxar then taking SH-13 upto Chausa Water Intake Point.
2.	Bh 3	Bridge at Buxar, downstream of Buxar	The sampling location at Buxar downstream is near a bridge on River Ganga connecting Buxar with Ballia in Uttar Pradesh across the Ganges. The previous upstream location from this sampling point at Chausa water intake point is situated at distance of around 10 Km. from this bridge at Buxar on River Ganga. This sampling location is situated at a distance of around 120 Km. from Patna, capital city of Bihar and can be reached via Danapur – Arrah Road (NH-30) and Arrah Buxar Road (NH-84). Buxar lies on Delhi-Patna main rail line and is a major railway station.

Sr. No.	Location Code	Location Name	Location Description
3.	Bh 4	Bridge on River Ghagra near Manjhi	Ghagra River is a major tributaory of River Ganga having a confluence point near Revelganj in Chapra. The distance of this sampling point from the location on River Ganga before the confluence at Buxar is around 90 Km. from this location. This sampling location on River Ghagra before confluence with River Ganga at Manjhi in Bihar, is near Uttar Pradesh Border. It is located at a road distance of around 95 Km. from Patna and can be reached travelling through NH-19 via Hajipur, Sonepur and Chhapra town.
4.	Bh SK	River Sone at Koilwar near Rail-road bridge	Koilwar is situated on the banks of River Sone which forms border of Patna and Bhojpur district. The confluence of River Sone with River Ganga is situated at distance of around 80 Km. from the previous monitoring location on River Ganga at Buxar. This sampling location on River Sone is located at a road distance of about 38 Km. from Patna, accessible via Danapur – Arrah Road (NH-30), and by train from Patna.
5.	Bh 5	Bridge near Danapur Patna 2 (Digha rail bridge)	The sampling location at Digha at upstream of Patna is situated near newly constructed Digha-Sonepur rail road bridge over River Ganga. This sampling point is located at distance of around 120 Km. from the previous upstream sampling location on River Ganga at bridge in Buxar. This sampling point is located at approximately 9 Km. from Patna Junction station on the Patna-Arrah main road near Danapur.
6.	Bh 8	River Gandak at Hajipur near Rail bridge	River Gandak is major Himalayan tributary of River Ganga with a confluence with River Ganga near Hajipur in Bihar. This sampling location is situated at Hajipur near the Konhara Ghat Rail bridge on Hajipur-Sonpur section, over River Gandak at a distance of around 18 Km. from the previous location on River Ganga at Danapur near Patna. This location can be reached from Patna through NH-19 via Mahatma Gandhhi Setu road bridge and Hajipur by travelling around 19 Km. from Patna junction.

Sr. No.	Location Code	Location Name	Location Description
7.	Bh 11	Nalla in Patna3b	This sampling location in Patna town is situated at about 6 Km. from Patna Junction on River Ganga where major drains meet the river near Patna College Ghat. The previous sampling point on River Ganga, is situated upstream of this location is at distance of 10 Km. upstream near Danapur rail-road bridge.
8.	Bh 12 A	Gandhi Ghat upstream of Mahatma Gandhi Setu	This sampling station is situated at around 6 Km. from Patna junction towards east in the city of Patna near Gandhi Ghat (Behind NIT, Patna) which is an upstream location to Mahatma Gandhi Setu located around 3.5 Km. downstream. The previous sampling location at Patna College Ghat was situated at around 1.5 Km. upstream to this location.
9.	Bh 12	Downstream Bridge Mahatma Gandhi right near Gai Ghat	Mahatma Gandhi Setu is a bridge connecting South Bihar to North Bihar via Patna and Hajipur and is major road link between the two parts of Bihar. The sampling location is situated near the Gai Ghat on Ashok Raj Path in the city of Patna on the eastern side of the city. The previous upstream location at Gandhi Ghat is situated at a distance of around 4 Km. from this location at Gai Ghat near Mahatma Gandhi Setu. This site lies on the Patna-Chapra Road (NH-19) at a distance of around 7.5 Km. from Patna Junction.
10.	Bh M	River Ganga at Mokamah near Hatidah Rail bridge	Sampling location at Mokamah on River Ganga is situated near the Hatidah Rail-Road bridge on River Ganga. This location is situated at a distance of around 95 Km. from the previous sampling point in upstream of this location at Mahatma Gandhi Setu near Gai Ghat in Patna City. The site is located at a distance of around 105 Km. from Patna railway station at the eastern most boundary of Patna district. This location can be reached from Patna city by road travelling from Patna on Patna-Bakhtiarpur Road (NH-30) and then taking NH-31 from Bakhtiarpur to Hatidah off Mokameh.

Sr. No.	Location Code	Location Name	Location Description
11.	Bh V	Kastharni Ghat at Munger Fort area (upstream Munger)	This sampling point on River Ganga at Munger is located near Kastharni Ghat on the verge of Historical Munger Fort on River Ganga bank. This point is situated at distance of around 75 Km. from the previous upstream location on River Ganga at Hatidah near Mokamah. This location is accessible by road from Bhagalpur town at a distance of about 60 Km. and accessible through Bhagalpur-Munger Highway (NH-80). This location is situated in the upstream direction of Munger city.
12.	Bh VI	River Ganga near Sitakundih village downstream Munger	This is the downstream location to Munger city situated on River Ganga near Sitakundih village, Sitakundih is located about a distance of 200 meters from River Ganga. This sampling point near Sitakunddih village is located at around 8 Km. downstream of the previous upstream location at Kastharni Ghat. This site can be reached by Road travelling via NH-80 on Bhagalpur-Munger Road, situated at a distance of around 55 Km. from Bhagalpur town.
13.	Bh S	River Ganga at Sultanganj near Jahaz Ghat	Sultanganj in Bhagalpur district is famous for the Ajgaibinath Temple on the banks of River Ganga which has important religious activity attached during Shravani mela in month of Shravan when devotees carry water of River Ganga to take Kanwar to Deoghar. This sampling point is situated at a distance of around 32 Km. from the previous location on River Ganga near Sitakunddih village downstream of Munger. This location is situated at around 25 Km. upstream of Bhagalpur town. The location can be reached by travelling on Bhagalpur-Munger Road (NH-80) upto Sultanganj.
14.	Bh 13	River Ganga at Barari Ghat Bhagalpur	Barari Ghat is located near the Vikramshila Setu connecting Bhagalpur town with Naugachia over River Ganga. This sampling point is situated at a distance of around 32 Km. at downstream position to the previous location near Sultanganj ferry ghat upstream to this point. This sampling location is situated in the city of Bhagalpur at a distance of around 7.0 Km. from Bhagalpur station.

Sr. No.	Location Code	Location Name	Location Description
15.	Bh K	River Ganga at Kahalgaon	Kahalgaon is located at downstream of Bhagalpur city at a distance of around 35 Km. towards east. Kahalgaon Jahazghat is located at a distance of around 28 Km. downstream to the previous upstream sampling location at Barari Ghat in Bhagalpur city. This location can be reached by road from Bhagalpur travelling on the Bhagalpur-Sahibganj Road (NH-80). The sampling location at Kahalgaon is situated near the Jahazghat at Kahalgaon.

4.4 Description of Locatios for Assessment of Biological Health of River Ganga in Jharkhand

Sr. No.	Location Code	Location Name	Location Description
1.	Jh 1	Brahampur Ghat (upstream Sahibganj)	Sahibganj is the first city on the bank of River Ganga in the state of Jharkhand, located at a distance of around 80 Km. from Bhagalpur town and accessible by train as well as road travelling on NH-80 from Bhagalpur. This sampling point on River Ganga at Sahibganj is situated at distance of around 45 Km. from the previous upstream sampling location at Kahalgaon in Bihar. This sampling location in the upstream of Sahibganj city at Brahampur ghat is located at around 2.0 Km. from Sahibganj station.
2.	Jh 2	Jahazghat near Water Intake Point (downstream Sahibganj	Sampling location at Jahazghat is a downstream point of Sahibganj city on River Ganga in Jharkhand. The previous upstream sampling location at Sahibganj near Brahampur is located at distance of around 3 Km. from this sampling point. This location is situated at a distance of about 1.5 Km. from Sahibganj on Habibpur Pipe Road.

Sr. No.	Location Code	Location Name	Location Description
3.	Jh 3	Mangal Haat Syed Bazar, upstream Rajmahal	This sampling location is situated in the upstream of the Rajmahal town at a distance of about 34 Km. from Sahibganj district headquarter on Sahibganj-Rajmahal Road (NH-80). The previous sampling location at Sahibganj upstream of this point is located at a distance of 32 Km. at Sahibganj LTC Ghat. The sampling point is located near the Government Middle School near bank of River Ganga at Mangal Haat, Syed Bazar.
4.	Jh 4	Ferryghat downstream Rajmahal	The downstream sampling point at Rajmahal is situated near the Jahazghat at Rajmahal, which is located at a distance of around 35 Km. from Sahibganj district headquarter. The upstream sampling location to this point of sampling is situated at around 3 Km. from the previous location near Sayed Bazar upstream of Rajmahal. This sampling locaiton can be reached by travelling on NH-80 Bhagalpur-Rajmahal Road.

4.5 Description of Locations for Assessment of Biological Health of River Ganga in West Bengal

Sr. No.	Location Code	Location Name	Location Description
1.	WB 1	Farakka Barrage (upstream of Barrage)	Farakka Barrage is located in the state of West Bengal after River Ganga enters West Bengal. This barrage diverts water to the Hooghly shoot of River Ganga flowing through Murshidabad district to Kolkata and the major channel downstream of barrage enters into Bangladesh as Padma. This sampling location at Farakka is situated at distance of around 48 Km. downstream from the previous upstream location at Rajmahal Ferryghat in Jharkhand state. This sampling location at Farakka barrage is situated at a distance of approximately 280 Km. from Kolkata and just 2 Km. from Farraka railway station. Farakka can be reached from Kolkata on the Kolkata-Siliguri Highway (NH-34).

Sr. No.	Location Code	Location Name	Location Description
2.	WB 2	Farakka FTPS	The Farakka FTPS site is located just 2 Km. downstream of the Farakka barrage on the Hooghly River canal originating from the barrage. The first sampling location on River Ganga in West Bengal, is situated upstream to this location. This sampling location is situated near the outlet of the FTPS canal to the Hooghly. The distance of this location from Farakka station is around 5 Km. and it is off the NH-34 near Farraka town.
3.	WB 3	River Ganga downstream of FTPS Farakka	This location is situated near Farakka at a distance of about 9 Km. downstream of Farakka railway station and 10 Km. from Farakka barrage. The previous upstream sampling location to this point is situated near the Farkka FTPS at around 4.5 Km. upstream to this location. This site is located near a bridge on Hooghly river at Anuppur village off the Behrampore-Farakka Highway (NH-34).
4.	WB 4	River Ganga upstream of outlet to natural river	This sampling location on the River Ganga is located upstream to Raghunathganj where the Hooghly Canal originating from the Farakka barrage meets the natural stream of River Ganga. This sampling point is situated at around 26 Km. downstream to the previous sampling location near Annuppur village in Farakka (downstream of FTPS Farakka). This location is situated at a distance of around 40 Km. downstream from Farakka Railway Station and around 10 Km. from Raghunathganj.
5.	WB 5	First inlet stream (Falgu River) from west on NH-34 D/S Farakka	This sampling location is on the first inlet stream (Falgu River) after the Bhagirathi Canal flows downstream of Farakka barrage. This point is situated just off the Behrampore-Farakka Expressway (NH-34) near Ahiron at around 5 Km. from the previous point of sampling on Hooghly. Samples were taken near the Check-dam on the stream opposite Kisan Bazar. The location is on the NH-34 located at a distance of around 260 Km. from Kolkata.

Sr. No.	Location Code	Location Name	Location Description
6.	WB 6	Second inlet stream on Miapur-Ajgarpura Road bridge	This sampling location is on the second inlet stream downstream of Farakka barrage on the Miapur-Ajgarpara link road near Raghunathganj off the NH-34 located at a distance of around 255 Km. from Kolkata. Sampling location is situated just near the bridge on the Miapur – Ajgarpura link road at a distance of around 5 Km. from the previous location on first natural inlet stream from West (on Falgu River) near Ahiran Krushak Bazar.
7.	WB 7	River Ganga at Raghunathganj near bridge	Raghunathganj is located in Murshidabad district of West Bengal at a distance of around 260 Km. from Kolkata. Raghunathganj is located on the banks of River Ganga and it can be reached travelling on Kolkata-Siliguri Highway (NH-34) from Kolkata and further off the NH-34 on SH-11A towards Jangipur. This sampling point is located at distance of around 14 Km. downstream of the previous location on River Ganga at upstream of outlet of natural river near Ahiran bridge. The sampling location is situated near the road bridge on SH-11 at Raghunathganj.
8.	WB 9	River Ganga upstream of Jiaganj	The monitoring location at Jiaganj is situated at a distance of around 45 Km. downstream of the preceding monitoring upstream of Murshidabad near Raghunathganj bridge. Jiaganj is located in the upstream location of Behrampore (u/s of Murshidabad) in West Bengal. It is located at a distance of around 205 Km. from Kolkata and can be reached by road from Kolkata travelling through Kolkata-Farakka-Siliguri Road (NH-34) upto Behrampore and then taking SH-11A from Behrampore towards Raghunathganj.
9.	WB 10	River Ganga at Road bridge at Behrampore	Behrampore is located at a distance of around 20 Km. downstream of Jiaganj, the preceding sampling position on River Ganga at upstream. The sampling location at Behrampore is situated near the road bridge (Ramendra Sundar Tribedi bridge) over River Ganga built on NH-34 near Behrampore city. This location is situated on Kolkata-Farakka Highway (NH-34) at a distance of around 200 Km. from Kolkata.

Sr. No.	Location Code	Location Name	Location Description
10.	WB 11	River Ganga at downstream of Murshidabad (downstream Behrampore) near Begpur Village	This location is situated downstream of Behrampore (downstream of Murshidabad) near Begpur village. The previous upstream location of this sampling point at Behrampore near bridge is located at around 6 Km. upstream of this location. This location is situated at around 8 Km. downstream off the Kolkata-Farakka Road (NH-34) from Behrampore road bridge over River Ganga.
11.	WB 12	River Ganga at Kalyanpur after confluence with Bablah Nallah	Sampling location at Kalyanpur is located near Kalyanpur Ghat downstream of confluence point of Bablah river with Bhagirathi (River Ganga) at Kalyanpur. This sampling site is situated at a distance of around 20 Km. by Road from Katwa and around 10 Km. upstream from Katwa and the nearest upstream sampling point to this site is situated at distance of around 55 Km. by road at d/s of Behrampore near Begpur village. This site can be reached travelling through Kolkata-Farakka Road (NH-34) upto Krishnangar and then taking SH-8 towards Nawadwip and then from Nabadwip towards Katwa on SH-6. From Katwa Kalyanpur can be reached travelling via Salar and Maugram route. The Road distance of Kalyanpur from Kolkata is around 175 Km.
12.	WB 13	River Ganga at Katwa	Katwa is sitauated on the banks of River Ganga is a municipal town in Burdwan district of West Bengal. The nearest upstream location to this point of sampling on River Ganga is situated at Kalyanpur village at around 10 Km. upstream to this point in Katwa. It is located at a distance of around 150 Km. from Kolkata and can be reached travelling through Kolkata-Farakka road (NH-34) upto Krishnangar and then taking SH-8 towards Nawadwip and from Nabadwip to Katwa on SH-6.

Sr. No.	Location Code	Location Name	Location Description
13.	WB 14	River Ganga downstream Nabadwip	Nawadwip is located on the River Ganga in the Nadia district of West Bengal at around 120 Km. from Kolkata. The previous upstream sampling point to this location on River Ganga is situated at a distance of approximately 45 Km. by road. The sampling location in Nabadwip is situated in downstream of Nabadwip town near the Sri Gouranga Setu (bridge). This location is reached from Kolkata by road travelling through Kolkata-Farakka Road (NH-34 upto Krihnanagar and the taking Gouranga Setu to (SH-8) to reach Nabadwip.
14.	WB 15	River Ganga upstream Tribeni	This location at upstream of Tribeni is located at a distance of around 65 Km. from Kolkata on Tribeni-Shibpur Road at upstream of Ishwar Gupta Setu. The sampling location upstream to this point is situated at Nabadwip at around 60 Km. upstream. This sampling location can be reached from Kolkata via Kolkata-Barrackpore road and then taking Barrackpore-Kalyani Expressway (SH-6) across the Ishwar Gupta Setu.
15.	WB16	River Ganga at transmission tower upstream of Tribeni	The preceding sampling point on River Ganga upstream to this point is located at around 8 Km. upstream to this sampling point. This location is located in Tribeni near the transmission tower and water Intake point near Bansberia Mahakalitala downstream of Ishwar Gupta Setu. This location is situated at a distance of around 60 Km. from Kolkata and can be reached by road from Kolkata travelling via. Kolkata-Barrackpore road and then taking Barrackpore-Kalyani Expressway (SH-6) across the Ishwar Gupta Setu taking a left turn after bridge towards Bandel.

Sr. No.	Location Code	Location Name	Location Description
16.	WB17	River Ganga at Chinsura	Sampling location at Chinsura is located at around 8 Km. downstream to the previous location at Tribeni near Transmission Tower in Bansberia. The location at Chinsura is situated in upstream of Bali bridge in Hooghly district of West Bengal at a distance of around 55 Km. from Kolkata. Sampling location in Chinsura is located near the Jubilee rail bridge and Hooghly jail in Hooghly district and can be reached from Kolkata taking Kolkata- Barrackpore road and then taking Ishwargupta Setu (SH-6) towards Bandel.
17.	WB19	River Ganga at Palta water intake	The Palta water Intake point is a sampling location on left bank of River Ganga situated at upstream of Kolkata near Barrackpore. The distance of this point is around 17 Km. from downstream of Chinsura, the previous monitoring location upstream of this site. It is located at a distance of around 25 Km. from Kolkata city and can be reached travelling via Kalyani Expressway from Kolkata.
18.	WB 21	Ghat downstream of Serampore	Serampore is located on the right bank of River Ganga upstream of Bali bridge at a distance of around 25 Km. from Kolkata. The Serampore location is situated downstream to the Palta water intake point at around 7 Km. downstream of this location. This sampling point is located on William Carreys Sarani near Serampore College of Engineering in the Hooghly district.
19.	WB 23	River Ganga at Belgharia	Belgharia is located in Kolkata at a distance of around 13 Km. from Sealdah railway station under Kamarhati Municipality. The sampling location just upstream to this sampling point is located at 10 Km. upstream at Serampore. This location is situated on left bank of River Ganga upstream of Bally bridge and Dakshineshwar temple.

Sr. No.	Location Code	Location Name	Location Description
20.	WB 25	River Ganga at Bali bridge	Bali bridge is located near Dakshineswar Kali temple in Kolkata on River Ganga. It is located at a distance of around 5 Km. from the previous upstream location on River Ganga near Belgharia by road and at a distance of 12 Km. from Sealdah station in Kolkata. The sampling location is located towards Howrah side of Bali bridge near the Vivekanada and Nivedita Setu.
21.	WB 27	River Ganga at Howrah Bridge	Howrah bridge is located on River Ganga connecting Howrah to Kolkata near the Howrah railway station. This sampling point is situated at a distance of around 7 Km. downstream to the previous upstream location near Bali bridge. This location is situated outside the Howrah Railway station at a distance of around 500 meters.
22.	WB 28	Shibpur Ghat near Vidyasagar Setu	Shibpur ghat is situated at downstream of Howrah bridge in Howrah district of West Bengal. The previous upstream location on River Ganga is situated at around 4 Km. upstream to this location, near the Howrah bridge. This sampling location is situated at distance of around 8 Km. from Sealdah railway station near the Vidya Sagar Setu (New Howrah bridge) on NH-117.
23.	WB 31	River Ganga at Bata Nagar	Bata Nagar is located at downstream of Kolkata on the left bank of River Ganga in West Bengal. The sampling location at Bata Nagar is situated at a distance of around 17 Km. downstream of the previous upstream location at Shibpur Ghat near second Howrah bridge. It is situated at a distance of around 20 Km. from Sealdah railway Station in Kolkata off NH-117 on Budge Budge Trunk Road.
24.	WB 32	River Ganga near Uluberia (Near Kalibari)	The sampling location on River Ganga at Uluberia is situated near the Kalibari on the right bank of River Ganga downstream of Howrah. This location is situated at a downstream location at a distance of around 12 Km. from the preceding upstream sampling point at Bata Naga and at a distance of around 45 Km. from Kolkata city travelling by road via NH-117 towards Howrah then taking NH-6 towards Haldia to reach Uluberia Kalibari.

Sr. No.	Location Code	Location Name	Location Description
25.	WB 34F	River Ganga at Falta	Sampling location on River Ganga at Falta is situated at a distance of around 48 Km. from Kolkata city in South 24-Pargana district of West Bengal. This sampling point is situated at a distance of around 22 Km. downstream of the preceding sampling point at Uluberia. This location can be reached from Kolkata travelling via Diamond Harbor Road (NH-117) from Kolkata upto Rajarhat and then taking a turn towards Falta sampling point.
26.	WB 34	River Ganga at Diamond Harbor	Diamond harbour sampling point is located in South 24-Pargana district of West Bengal at a distance of around 60 Km. from Kolkata city and at a distance of around 20 Km. downstream to the previous upstream location at Falta. It can be reached travelling via road on Kolkata-Diamond Harbour Road (NH-117) from Kolkata. This location is receiving tidal waves from the sea.
27.	WB 35	River Ganga at Haldia	The sampling location at Haldia is situated on River Ganga at upstream of the confluence of River Ganga and Haldi river near Haldia Jetty in the Purba Mednipur district of West Bengal. This sampling point is situated at downstream of the preceding sampling point near Diamond Harbour at around 25 Km. distance. The Location is situated at a distance of around 120 Km. from Kolkata city travelling via NH-117 from Kolkata to take Bombay Highway Road (NH-6) upto Kolaghat, further travelling on NH-41 from Kolaghat to Haldia.

5 Latitude, Longitude and Altitude (MSL) of Monitoring Stations

5.1 Uttarakhand

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude (°N)	Longitude (°E)
1.	UK 1	River Alaknanda after confluence with River Mandakini d/s of Rudraprayag	640 meter	30°17.12	78°58.40
2.	UK B	River Ganga at Byasi near Singtali u/s Rishikesh	410 meter	30°03.21	78°28.45
3.	UK 4	u/s Rishikesh, Luxman Jhula	359 meter	30° 07.38	78°19.47
4.	UK 5	Barrage at Rishikesh	330 meter	30° 05.31	78°17.21
5.	UK 6	Haridwar Barrage	290 meter	29° 58.16	78°11.03
6.	UK 7	Dam Kothi on River Ganga Nahar d/s Har-ki-Paori	288 meter	29°56.50	78°09.41
7.	UK 8A	River Ganga u/s of STP outlet at Jagjeetpur	274 meter	29°53.59	78°08.29
8.	UK 8	River Ganga d/s of Haridwar JSTP	272 meter	29°53.56	78°08.30

5.2 Uttar Pradesh

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
1.	UP 1	Balawali Railway & Road Bridge (u/s Bijnor)	230 meter	29°38.13	78°06.33
2.	UP 2	Madhya Ganga barrage	220 meter	29°22.22	78°02.29
3.	UP 3	Sukartal Ghat at Saloni River	225 meter	29°29.31	77°59.25
4.	UP 4	Brij Ghat Road Bridge NH-24 at Garhmukteshwar	195 meter	28°45.42	78°08.31
5.	UP 6	Bridge at Anupshahr (u/s Anupshahr)	182 meter	28°21.53	78°16.19

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
6.	UP 6A	River Ganga near Mastram Ghat d/s of Anupshahar	180 meter	28°20.37	78°16.23
7.	UP 7	Bridge u/s of Narora at Rajghat	176 meter	28°14.29	78°21.51
8.	UP 8	Barrage at Narora	180 meter	28°11.42	78°24.11
9.	UP 9	Kachla Ghat Bridge at Badaun	165 meter	27°55.47	78°51.26
10.	UP 10M	River Ramganga d/s of Muradabad	193 meter	28°49.34	78°47.53
11.	UP 10	River Ramganga at SH-29 at Shahabad	180 meter	28°33.17	79°02.58
12.	UP 12	Bridge on River Garra at Sandi	132 meter	27°16.19	79°57.01
13.	UP 13	Bridge at River East Kali at Kanpur-Farrukhabad Road	127 meter	27°00.37	79°59.12
14.	UP 14	Bridge at Ghatiaghat, Farrukhabad	140 meter	27°23.54	79°37.38
15.	UP 17 (UP I)	River Ramganga b/c to River Ganga	140 meter	27°29.53	79°41.45
16.	UP II	River East Kali b/c to River Ganga	130 meter	27°01.15	79°58.20
17.	UP 18	Bridge at Bithoor	117 meter	26°36.50	80°16.29
18.	UP 19	Barrage u/s Kanpur	115 meter	26°30.24	80°19.04
19.	UP 29	Bridge 2 at Kanpur-2 at NH-25	115 meter	26°26.05	80°24.30
20.	UP DG (UP A)	Dhondhi ghat d/s Kanpur	113 meter	26°22.40	80°29.26
21.	UP 32	Bridge near Fatehpur	102 meter	26°03.15	81°02.00
22.	UP 33	Bridge on River Yamuna, MDR,26B near Rajapur	94 meter	25°46.51	80°31.55
23.	UP 38	Bridge on River Yamuna at NH-27	90 metre	25°25.48	81°51.38
24.	UP 39	Bridge on River Tons near Panasa	81 meter	25°16.12	82°02.44
25.	UP 40	Bridge d/s of River Tons near Sirsa	79 meter	25°16.03	82.05.32
26.	UP 41	Bridge on Allahabad Bypass	84 meter	25°35.20	81°32.54
27.	UP 44	Bridge Lord Curzen Allahabad Right	79 meter	25°30.35	81°51.55
28.	UP 47	Bridge on NH-2 right	81 meter	25°26.20	81°53.00

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
29.	UP AL1	Bridge near village Mahewa Kalan Kachar, Dengurpur	80 meter	25°10.29	82.14.44
30.	UP 49	Bridge SH-74 u/s Varanasi	72 meter	25°07.54	82°52.18
31.	UP 50	Bridge SH-98 at Varanasi	77 meter	25°23.15	82°44.06
32.	UP 51	Bridge at Ramnagar Road near Varanasi	71 meter	25°15.19	83°01.29
33.	UP 53	Bridge NH-2 at Varanasi (Rajghat)	70 meter	25°19.42	83°02.32
34.	UP 54	Bathing Ghta-1, Varanasi	72 meter	25°18.25	83°00.38
35.	UP 55 (UP 56 in first round)	Bridge on River Varuna in Varanasi	75 meter	25°20.03	82°59.45
36.	UP 56 (UP 57 in first round)	River Gomti at Rajwari	70 meter	25°30.22	83°08.28
37.	UP III*	Vindhyachal Ghat, Mirzapur u/s	75 meter	25°10.15	82°29.41
38.	UP IV	Mirzapur d/s, a/c of two drains	72 meter	25°09.29	82°35.04
39.	UP G	Tarighat d/s Ghazipur	67 meter	25°34.50	83°36.31

5.3 Bihar

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
1.	BH 3(I)	Chausa water intake point u/s Buxar	66 meter	25°31.246	83°54.144
2.	BH 3	Bridge at Buxar, d/s of Buxar	61 meter	25°35.275	83°59.322
3.	BH 4	Bridge on River Ghagra near Manjhi	58 meter	25°49.396	84°35.116
4.	BH SK	River Sone at Koilwar near Rail-road bridge	60 meter	25°34.180	84.47.550
5.	BH 5	Bridge near Danapur Patna 2 (Digha rail bridge)	52 meter	25°39.9	85°05.27

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
6.	BH 8	River Gandak at Hajipur near Rail bridge	55 meter	25°41.551	85° 11.742
7.	BH11	Nalla in Patna3b	52 meter	25°37.19	85°09.55
8.	BH 12 u/s	Gandhi Ghat u/s of Mahatma Gandhi Setu	51 meter	25°37.18	85°10.17
9.	BH 12 d/s	Bridge Mahatma Gandhi right near Gai Ghat	49 meter	25°36.50	85°12.12
10.	BH M	River Ganga at Mokamah near Hatidah Rail bridge	43 meter	25°22.13	85°59.26
11.	BH V	Kastharni Ghat at Munger Fort area (u/s Munger)	42 meter	25°22.55	86°27.34
12.	BH VI	River Ganga near Sitakundih Village d/s Munger	40 meter	25°22.02	86°32.39
13.	BH S	River Ganga at Sultanganj near Jahaz Ghat	37 meter	25°15.16	86°44.22
14.	BH 13	River Ganga at Barari Ghat Bhagalpur	35 meter	25°16.09	87°01.40
15.	BH K	River Ganga at Kahalgaon	34 meter	25°15.53	87°13.34

5.4 Jharkhand

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
1.	JH 1	Brahampur Ghat (u/s Sahibganj)	29 meter	25°15.06	87°37.47
2.	JH 2	Jahazghat near Water Intake Point (d/s Sahibganj	28 meter	25°14.55	87°38.30
3.	JH 3	Mangal Haat Syed Bazar, u/s Rajmahal	28 meter	25°03.34	87°48.03
4.	JH 4	Ferryghat d/s Rajmahal	27 meter	25°03.23	87°49.59

5.5 West Bengal

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
1.	WB 1	Farakka Barrage (u/s of Barrage)	26 meter	24°48.378	87°55.205
2.	WB 2	Farakka FTPS	25 meter	24°45.528	87°54.509
3.	WB 3	River Ganga d/s of FTPS Farakka	26 meter	24°43.554	87°54.695
4.	WB 4	River Ganga upstream of outlet to natural river	25 meter	24°32.474	88°02.032
5.	WB 5	First inlet stream (Falgu River) from west on NH-34 d/s Farakka	25 meter	24°30.23	88°01.51
6.	WB 6	Second inlet stream on Miapur-Ajgarpura Road bridge	25 meter	24°30.23	88°11.51
7.	WB 7	River Ganga at Raghunathganj near bridge	22 meter	24°27.42	88°04.13
8.	WB 9	River Ganga u/s of Jiaganj	20 meter	24°11.33	88°15.49
9.	WB 10	River Ganga at Road bridge at Behrampore	20 meter	24°06.40	88°14.52
10.	WB 11	River Ganga d/s of Murshidabad (d/s Behrampore) near Begpur village	19 meter	24°03.41	88°13.42
11.	WB12	River Ganga at Kalyanpur a/c Bablh nullah	15 meter	23°43.51	88°10.37
12.	WB13	River Ganga at Katwa	15 meter	23°38.38	88°08.40
13.	WB14	River Ganga d/s Nabadwip	10 meter	23°23.36	88°21.06
14.	WB15	River Ganga u/s Tribeni	9 meter	22°59.08	88°24.07
15.	WB16	River Ganga at transmission tower u/s Tribeni	8 meter	22°57.29	88°24.21
16.	WB17	River Ganga at Chinsura	8 meter	22°54.359	88°24.184
17.	WB19	River Ganga at Palta water intake	8 meter	22°47.898	88°21.428
18.	WB21	Ghat d/s of Serampore	7 meter	22°45.09	88°21.07
19.	WB23	River Ganga at Belgharia	6 meter	22°40.001	88°21.485
20.	WB 25	River Ganga at Bali bridge	6 meter	22°39.188	88°21.201
21.	WB 27	River Ganga at Howrah Bridge	6 meter	22°33.898	88°20.321

Sr. No.	Location Code	Location Name	Elevation from Mean Sea Level	Latitude	Longitude
22.	WB 28	Shibpur Ghat near Vidyasagar Setu	5 meter	22°33.728	88°19.656
23.	WB 31	River Ganga at Bata Nagar	5 meter	22°30.966	88°13.450
24.	WB 32	River Ganga near Uluberia (Near Kalibari)	5 meter	22°27.804	88°06.856
25.	WB 34F	River Ganga at Falta	3 meter	22°18.024	88°06.315
26.	WB34	River Ganga at Diamond Harbor	3 meter	22°10.623	88°11.765
27.	WB35	River Ganga at Haldia	3 meter	22°01.29	88°04.27

u/s = upstream, d/s = downstream, a/c = after confluence, b/c = before confluence, STP= Sewage Treatment Plant, FTPS = Farakka Thermal Power Station, CETP = Common Effluent Treatment Plant

6 Description of Confluences, Discharges and other Human Activities at Bio-monitoring Locations of River Ganga

6.1 Uttarakhand

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
1.	UK 1	River Mandakini joins River Alaknanda at upstream Rudra Prayag.	-	Forest, rocky mountainous area, occasional religious activity
2.	UK 4	Seasonal rivulets join River Ganga from both bank	STP in upstream which was non-functional, domestic discharges	Open defecation, forest area in vicinity, religious activities
3.	UK 5	-	-	Ritual bathing, forest
4.	UK 6	Chilla Canal meets River Ganga upstream of this location	River Ganga Nahar is diverted towards Har – ki – Paori from this location	Bathing, ritual purpose
5.	UK 7	-	-	Dredging, sand recovery for maintenance, washing of clothes, bathing and other religious rituals
6.	UK 8A	-	Discharge of Jagjeetpur STP outlet in downstream of the location	Cattle wading, dredging, sand recovery, arable land in surruounding
7.	UK 8 (d/s)	-	Discharge from outlet of Jagjeetpur STP just upstream of this location	Dredging, cattle wading, sand recovery, arable area in surrounding
8.	UK B	Confluence of, generally dried, rainy season nallah on opposite bank near the location	-	Construction activities, hotels and resorts in upstream and downstream, camping sites and rafting

6.2 Uttar Pradesh

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
1.	UP 1	-	-	Cremation, melon farming, construction activity, arable land in surrounding area
2.	UP 2	Saloni River has its confluence at upstream of Madhya Ganga barrage sampling location near Ranjitpur village	Madhya River Ganga Canal draws water from this barrage	Bathing, cremation, boating
3.	UP 3	-	-	Bathing, farming, grazing, religious activity, arable land in surrounding area
4.	UP 4	-	One drain on upstream of the sampling location	Boating, bathing, fishing, religious activity
5.	UP 6	-	-	Bathing, boating, arable surrounding area, cattle grazing
6.	UP 6A	-	Outlet of STP near Mastram ghat just upstream of the sampling location	Cremation, religious activity, defecation etc.
7.	UP 7	-	-	Religious activity, boating, arable land nearby, cattle grazing
8.	UP 8	-	Origin of lower River Ganga Canal	Boating, religious bathing at Narora Ghat
9.	UP 9	-	Small inlet channel from opposite bank in upstream	Melon farming, cattle wading, religious activity, boating, rural human habitat
10.	UP 10M	-	Several drains (over 20) from upstream of this location discharges into River Ramganga in Moradabad city	Cattle wading, bathing

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
11.	UP 10	-	Rampur drain in upstream of this location	Bathing, pumping out water, melon farming, cremation
12.	UP 12	-	Drain from Sandi just upstream of this location	Children wading in water, cattle wading, trapa cultivation etc.
13.	UP 13	Confluence of River East Kali with River Ganga near the bridge at Mehndipur ghat	-	Arable land in surrounding area, cattle wading, melon farming
14.	UP 14	River Ramganga and East Kali has confluence at downstream of this location	Many small domestic discharge from nearby habitat	Melon farming, cattle wading, cremation on opposite bank
15.	UP 17 (UP I*)	-	-	Bathing, farming, small scale fishing and boating
16.	UP II**	Confluence of River East Kali with River Ganga at around 2 Km. downstream of this location	Several small channels of domestic discharges from nearby village	Cattle wading, bathing, boating
17.	UP 18	-	-	Religious activity, ritual bath and navigation
18.	UP 19	-	Canal from Kanpur Dehat discharges in River Ganga near barrage	Religious activity and boating, fishing
19.	UP 29	-	Drain from upstream and downstream of sampling location, discharging effluent from Tannery area	Fishing, bathing in some areas
20.	UP DG (UP A)	-	Discharge from CETP and STP irrigation canal at upstream of location	Boating, fishing, bathing, cremation

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
21.	UP 32	-	Small canal discharge from opposite bank at upstream of this location	Cattle wading, farming, boating, arable surrounding land use
22.	UP 33	River Ken has its confluence with Yamuna River just upstream of this location	-	Capture fishery, bathing, arable surrounding land use
23.	UP 38	Confluence of River Yamuna with River Ganga in downstream of this location	Small channels from Allahabad city carrying household sewage at upstream to this location, discharge from STP at opposite bank	Cremation, boating, bathing, arable land in opposite bank
24.	UP 39	Confluence of River Tons at downstream to this location with River Ganga	-	Melon farming, cucumber, cereal and pulse farming, arable land in surrounding
25.	UP 40	Confluence of River Tons just upstream of this location near Sirsa	-	Cereal and pulses cultivation, religious activity, boating, arable land in surrounding
26.	UP 41	-	-	Melon farming, cucumber, pulse, cereal farming, boating, fishing
27.	UP 44	-	Small drains discharge household sewage to both banks of River Ganga	Cattle wading, boating, fishing
28.	UP 47	River Yamuna has its confluence with River Ganga at just downstream of this location near Tribeni Sangam	Discharge from STP at upstream and many small nallah conatinging household sewage coming to River Ganga at u/s and d/s to this location	Mass bathing, religious activity, Kumbh mela site nearby at Sangam

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
29.	UP AL1	Confluence of River Tons with River Ganga at around 20 Km. upstream of this location	-	Arable land in surrounding, cereal, pulse, vegetable farming, boating, fishing
30.	UP 49	-	Small waste water discharge from opposite bank of River Ganga in Chunar	Cattle wading, cremation, bathing, melon farming in nearby area
31.	UP 50	-	-	Cattle wading, bathing etc., cultivation land in surrounding
32.	UP 51	-	Small drain discharge from upstream of this location on opposite bank discharged in River Ganga	Cattle wading, fishing, boating, bathing
33.	UP 53	River Varuna joins River Ganga just downstream of this sapling location near Rajghat	Rajghat drain discharges a very large volume of sewage water from Varanasi city just upstream of sampling location	Cattle wading, bathing, melon farming, fishing
34.	UP 54	River Varuna confluence with River Ganga at downstream to this location near Rajghat	-	Mass bathing and boating hub
35.	UP 55 (UP 56 in first round)	River Varuna confluence with River Ganga at downstream to this location	Small drains from Varanasi city discharges into Varuna river near this location	Cattle wading, fish market on the bank
36.	UP 56 (UP 57 in first round)	River Gomti meets River Ganga near Rajwari	-	Cattle wading, arable, grazing, bathing and fishing

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
37.	UP III*	-	Discharge of sewage from Vindhyachal city joins to bank of River Ganga downstream city.	Cattle wading, bathing, religious activity
38.	UP IV	-	Small discharges from localities on river bank	Cattle wading, bathing, boating
39.	UP G	-	-	Cattle wading, vegetable farming, cucumber, pumpkin, arable and grazing land use in surrounding

6.3 Bihar

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
1.	Bh 3(I)	Confluence of Karamnasa River at about 2.5 Km. upstream to sampling point	Water intake point near the location and domestic discharges from nearby population at Chausa	Boating, farming, arable land in surrounding area
2.	Bh 3	Thora River confluence in upstream location at about 5 Km..	Small discharges from a canal and domestic discharges near the location in upstream from Buxar town	Farming, construction activity just near the sampling site
3.	Bh 4	Confluence of River Ghagra with River Ganga at around 9 Km. downstream to this location near Revelganj	-	Boating, fishing, arable area nearby, bathing and washing of clothes by villagers
4.	Bh SK	Confluence with River Sone with River Ganga near Maner in Patna district at about 15 Km. downstream to this location	-	Sand recovery

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
5.	Bh 5	Confluence of two canals in upstream	Canal in upstream also carry some waste water from nearby localities	Construction activity, Kiln, Human habitation, bathing, creamation area nearby,
6.	Bh 8	Confluence point of River Gandak with River Ganga at about 4 Km. downstream of this location	-	Religious activity, open defecation, on the opposite bank at Sonpur ghat major bathing and religious rituals takes place
7.	Bh 11	-	Major drains like Kurji Nallah, Rajapur Nallah, Mandiri Nallah and Bakarganj Nallah, in upstream of this locations meets in a channel which discharge its waste water at upstream of this location near Patna College	Urban area, boating, small scale fishing
8.	Bh 12 u/s	Confluecen of River Gandak in downstream of this location on opposite bank	-	River tourism and NCC naval Wing office, religious activities and River Ganga aarti
9.	Bh 12 d/s	Confluence of River Gandak from opposite bank upstream of this location	Small domestic dishcrages from localities on the bank of river	Religious activities and inland waterways jetty nearby
10.	Bh M	Confluence of River Punpun at around 75 Km. upstream to this location	Small domestic discharges from Mokamah town	Arable land nearby with very less human activities of religious bathing
11.	Bh V	-	-	Boating, fishing, religious activities and ritual bathing near the Temple of Kastharni Mata

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
12.	Bh VI	Confluence of River Budhi Gandak coming from Noorthern Bihar on the opposite bank at upstream of Sitakaundih village	-	Bathing, fishing, boating, religious activity
13.	Bh S	Small channels from south with limited flow	-	Religious activities in plenty specially in Shravan month, cremation, boating
14.	Bh 13	Champanala meets River Ganga in upstream of this location at Bhagalpur near Nathnagar	-	Religious bathing and other activity, defection on the banks of river
15.	Bh K	River Kosi meets River Ganga at downstream from this location near Kursela around 15 Km. from Kahalgaon on the opposite bank (northern bank)	Nallahs from Kahalgaon residential areas containing domestic sewage discharge in River Ganga near sampling point	Religious activity, boating, navigation, bathing

6.4 Jharkhand

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
1.	Jh 1	Fulahar River joins River Ganga at downstream location to Sahibganj at around 40 Km. downstream near Rajmahal.	Drains containing domestic sewage discharges the waste water downstream to this location	Boating, grazing, arable surrounding land, semi urban
2.	Jh 2	Fulahar River joins River Ganga at downstream location to Sahibganj at around 37 Km. downstream near Rajmahal.	Several small channels containing domestic sewage from Sahibganj city meets River Ganga at upstream and downstream of the sampling point	Cremation, bathing, boating and small scale fishing in nearby areas

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
3.	Jh 3	Fulahar River confluence point just 3 Km. downstream to this location on opposite bank	-	Bathing, boating, kiln and mining activity
4.	Jh 4	Fulahar River confluence point on opposite side on left bank of the river at this location	-	Boating, bathing, and fishing

6.5 West Bengal

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
1.	WB 1	A channel from west meets River Ganga just upstream of Farakka barrage	Hooghly River, in the form of Farakka Feeder Canal, diverts just downstream to this point, major dishcrage of river flows towards Bangladesh downstream to Farakka Barrage in the form of Padma River	Semi urban land use, cremation, bathing and boating
2.	WB 2	-	Discharge from the Farakka FTPS outlet, just near the sampling location	Boating, bathing
3.	WB 3	A natural rivulet meets Bhagirathi River (River Ganga) at downstream of this location	-	Boating, fishing
4.	WB 4	Falgu River joins River Ganga just downstream of this location	-	Bathing, boating, arable land in surrounding

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
5.	WB 5	The Falgu River meets River Ganga at downstream 2 Km. to this location	-	Bathing, cloth washing
6.	WB 6	This channel meets River Ganga at about 1.2 Km. downstream to this location	Small discharges of household drains from nearby village	Washing of cloths, Utensils, and bathing
7.	WB 7	The second inlet stream from west meets River Bhagirathi at upstream of Raghunathganj	-	Bathing, washing of cloths and miscellaneous uses for local populace
8.	WB 9	-	-	Religious rituals, bathing, small scale fishing etc.
9.	WB 10	-	-	Ferry service, open defecation, bathing and cloth washing
10.	WB 11	-	-	Dredging for construction, arable surrounding use, rural area
11.	WB12	River Bablah has its confluence with River Ganga just upstream of sampling site at Kalyanpur village	-	Cattle wading, grazing, farming in surrounding area
12.	WB13	Confluence point of river Ajai with River Hooghly just upstream of Katwa town	STP (oxidation pond) outlet and Small outlet discharges household sewage in upstream of sampling location	Cremation, bathing, washing of cloths and fishing, arable surrounding land, grazing of cattle
13.	WB14	Confluence of river Jalangi at upstream of sampling location near Mayapur on left bank (opposite bank to sampling location), c/f of Kharria river around 15 Km. downstream to Nabadwip	-	Farming, boating, and fishing

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
14.	WB15	River Kunti has its confluence with River Ganga at upstream to this location around 2 Km. and river Saraswati at downstream to this location	Bandel Thermal Power station outlet in upstream to this location	Religious activities nearby, bathing and boating
15.	WB16	River Kunti has confluence at around 7 Km. upstream of this location, tiny river Saraswati meets River Ganga at about 2 Km. upstream of this location	Bandel thermal power plant outlet at about 4 Km. upstream	Boating, navigation
16.	WB17	-	Small domestic discharges from areas near the river bank	Boating, bathing, washing of cloths
17.	WB19	-	Badiyabati Canal discharge, very small discharges from different channels from both the banks	Boating, religious activity, fishing, bathing
18.	WB21	-	Drain discharge near Golaghat and Birghat on the opposite bank of river (towards Barrackpore)	Boating, bathing, washing of cloths
19.	WB23	-	-	Boating, ferry service, bathing
20.	WB 25	-	Bally khal discharge near Bally bridge	Bathing, boating, religious rituals
21.	WB 27	-	Circular Canal meets river Hooghly near Chitpur in upstream of Howrah bridge	Religious activity, boating, ferry, bathing and washing
22.	WB 28	-	-	Religious activity, bathing, ferry services

Sr. No.	Location Code	Confluences	Discharges	Activities and surrounding Land use
23.	WB 31	-	Dishcarge from drain near Bakultala on Howrah side	Navigation, bathing etc.
24.	WB 32	Banaspati Canal and Kana Damodar two small rivulets meets River Hooghly upstream to this sampling location	-	Religious activity, boating
25.	WB 34F	River Damodar has confluence with River Hooghly at around 5 Km. upstream of Falta on the opposite bank and River Roopnarayan meets River Hooghly at around 10 Km. downstream to this location	-	Boating, navigation and bathing
26.	WB34	River Roopnarayan confluence with River Hooghly at around 14 Km. upstream on opposite bank	Canal discharges water at around 2 Km. upstream of sampling site	Fish collection and navigation, tourism
27.	WB35	Haldi River confluence with River Hooghly just downstream of sampling location.	-	Inland dockyard, Industrial area nearby and fishing in small scale

7 Statewise Bio-assessment of River Ganga and Tributaries

Benthic macro-invertebrate samples were collected from each selected location and analysed for calculation of Diversity Score and Saprobic Score. Based on the range of both parameters, biological health of River Ganga was assessed as per Biological Water Quality Criteria (Table 2.5.1, Table 8.1).

7.1 Bio-assessment of River Ganga in Uttarakhand

It was observed that in Uttarakhand state, in summer sampling, 2 of the locations viz., Barrage at Rishikesh (UK 5) and Dam Khoti on River Ganga Nahar d/s Har ki paori (UK 7) comply with 'A' class water quality. Location Haridwar Barrage (UK 6) comply with 'B' class water quality. To an exception, sampling location upstream Rishikesh Luxmanjula (UK 4) found to be moderately polluted. This may be due to the discharge from nearby STP which was non-functional. Sampling site River Ganga d/s Haridwar JSTP (UK 8b) was observed to be heavily polluted. This may be due to the discharge from Jagjeetpur STP. Seasonal variation in water quality was observed with the fact that in winter sampling all locations comply with 'B' class water quality except River Ganga d/s Haridwar JSTP (UK 8b) which was found to be moderately polluted (Table 7.1.1).

Table 7.1.1 Biological Water quality of River Ganga in Uttarakhand

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
1.	UK 4	June 2014	5.00	0.75	C	Moderate Pollution	Green
		November 2015	6.28	0.70	B	Slight pollution	Light Blue
2.	UK 5	June 2014	7.30	0.63	A	Clean	Blue
		November 2015	6.35	0.57	B	Slight pollution	Light Blue
3.	UK 6	June 2014	6.50	0.79	B	Slight pollution	Light Blue
		November 2015	6.28	0.68	B	Slight pollution	Light Blue
4.	UK 7	June 2014	8.33	0.25	A	Clean	Blue
		October 2015	6.30	0.69	B	Slight pollution	Light Blue

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
5.	UK 8a	June 2014	-	-	-	-	-
		October 2015	7.50	0.80	A	Clean	Blue
6.	UK 8b	June 2014	3.00	0.03	D	Heavy Pollution	Orange
		October 2015	4.86	0.58	C	Moderate Pollution	Green

7.2 Bio-assessment of River Ganga in Uttar Pradesh

In Uttar Pradesh stretch of River Ganga during winter sampling, all locations were observed to be moderately polluted and comply with 'C' class water quality. Moderate pollution is due to various drains meeting River Ganga at various sites. One of the location i.e. Bridge d/s of tributary near Sirsa (UP 40) was observed to be slightly polluted. Slight pollution is due to the confluence of River Tons just upstream of this location (Table 7.2.1).

Table 7.2.1 Biological Water quality of River Ganga in Uttar Pradesh

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
1.	UP 1	December 2014	4.50	0.81	C	Moderate Pollution	Green
		April 2016	4.25	0.520	C	Moderate Pollution	Green
2.	UP 2	December 2014	3.70	0.54	C	Moderate Pollution	Green
		April 2016	4.17	0.77	C	Moderate Pollution	Green
3.	UP 4	December 2014	5.04	0.78	C	Moderate Pollution	Green
		May 2016	5.44	0.7	C	Moderate Pollution	Green
4.	UP 6	December 2014	5.09	0.89	C	Moderate Pollution	Green
		May 2016	4.44	0.658	C	Moderate Pollution	Green
5.	UP 7	December 2014	4.45	0.79	C	Moderate Pollution	Green
		May 2016	4.59	0.85	C	Moderate Pollution	Green

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
6.	UP 8	December 2014	4.54	0.77	C	Moderate Pollution	Green
		May 2016	5.13	0.849	C	Moderate Pollution	Green
7.	UP 9	December 2014	5.43	0.77	C	Moderate Pollution	Green
		May 2016	5.3	0.80	C	Moderate Pollution	Green
8.	UP 14	January 2015	4.60	0.79	C	Moderate Pollution	Green
		June 2016	5.27	0.61	C	Moderate Pollution	Green
9.	UP 18	January 2015	5.78	0.71	C	Moderate Pollution	Green
		June 2016	5.0	0.675	C	Moderate Pollution	Green
10.	UP 19	January 2015	5.33	0.78	C	Moderate Pollution	Green
		June 2016	4.809	0.70	C	Moderate Pollution	Green
11.	UP 29	January 2015	4.72	0.46	C	Moderate Pollution	Green
		June 2016	4.0	0.76	C	Moderate Pollution	Green
12.	UP DG (UP A)	January 2015	5.50	0.70	C	Moderate Pollution	Green
		June 2016	4.75	0.49	C	Moderate Pollution	Green
13.	UP 32	February 2015	4..80	0.73	C	Moderate Pollution	Green
		October 2016	5.66	0.59	C	Moderate Pollution	Green
14.	UP 40	February 2015	6.20	0.61	B	Slight Pollution	Light Blue
		October 2016	4.28	0.54	C	Moderate Pollution	Green

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
15.	UP 41	February 2015	4.78	0.58	C	Moderate Pollution	Green
		October 2016	5.25	0.54	C	Moderate Pollution	Green
16.	UP 44	February 2015	5.05	0.61	C	Moderate Pollution	Green
		October 2016	5.14	0.666	C	Moderate Pollution	Green
17.	UP 47	February 2015	5.10	0.54	C	Moderate Pollution	Green
		October 2016	5.42	0.50	C	Moderate Pollution	Green
18.	UP AL-1	February 2015	5.11	0.56	C	Moderate Pollution	Green
		October 2016	5.66	0.42	C	Moderate Pollution	Green
19.	UP 49	March 2015	4.40	0.56	C	Moderate Pollution	Green
		October 2016	5.41	0.65	C	Moderate Pollution	Green
20.	UP 51	March 2015	5.26	0.53	C	Moderate Pollution	Green
		October 2016	5.0	0.58	C	Moderate Pollution	Green
21.	UP 53	March 2015	4.55	0.53	C	Moderate Pollution	Green
		October 2016	5.30	0.47	C	Moderate Pollution	Green
22.	UP 54	March 2015	4.90	0.59	C	Moderate Pollution	Green
		October 2016	4.90	0.68	C	Moderate Pollution	Green
23.	UP III*	March 2015	5.11	0.62	C	Moderate Pollution	Green
		October 2016	5.80	0.61	C	Moderate Pollution	Green

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
24.	UP IV	March 2015	4.90	0.62	C	Moderate Pollution	Green
		October 2016	5.76	0.68	C	Moderate Pollution	Green
25.	UP G	March 2015	4.65	0.54	C	Moderate Pollution	Green
		October 2016	5.61	0.59	C	Moderate Pollution	Green

7.3 Bio-assessment of River Ganga in Bihar

Seasonal variation had no major impact on water quality of River Ganga in Bihar stretch. Most of the locations were observed to be moderately polluted in both the seasons. Only at 1 locations i.e. Bridge Mahatma Gandhi right in Patna (BH 12 d/s), water quality deteriorated in winter season. Heavy pollution of BH 12 d/s site may be due to discharge from various drains of Patna city. River Ganga at Barari Ghat Bhagalpur (BH 13) was found to be slightly polluted in winter sampling.

Table 7.3.1 Biological health of River Ganga in Bihar

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
1.	Bh3 (I) (Bh 3 in round 1)	April 2015	4.81	0.71	C	Moderate Pollution	Green
		December 2015	5.0	0.61	C	Moderate Pollution	Green
2.	Bh3	-	-	-	-	-	-
		December 2015	5.35	0.62	C	Moderate Pollution	Green
3.	Bh5	April 2015	6.11	0.40	C	Moderate Pollution	Green
		December 2015	5.25	0.66	C	Moderate Pollution	Green
4.	Bh 12 d/s	April 2015	5.08	0.76	C	Moderate Pollution	Green
		December 2015	3.71	0.16	D	Heavy pollution	Orange

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
5.	Bh -M	-	-	-	-	-	-
		December 2015	5.86	0.55	C	Moderate Pollution	Green
6.	Bh V	-	-	-	-	-	-
		January 2016	5.61	0.63	C	Moderate Pollution	Green
7.	Bh VI	-	-	-	-	-	-
		January 2016	5.68	0.75	C	Moderate Pollution	Green
8.	Bh S	-	-	-	-	-	-
		January 2016	5.45	0.58	C	Moderate Pollution	Green
9.	Bh 12 u/s	April 2015	4.83	0.74	C	Moderate Pollution	Green
		-	-	-	-	-	-
10.	Bh 13	-	-	-	-	-	-
		January 2016	6.0	0.68	B	Slight Pollution	Light Blue
11.	BH K	January 2016	5.38	0.5	C	Moderate Pollution	Green

7.4 Bio-assessment of River Ganga in Jharkhand

Table 7.4.1 Biological Health of River Ganga in Jharkhand

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
1.	Jh 1	January 2016	4.95	0.74	C	Moderate Pollution	Green
2.	Jh 2	January 2016	5.62	0.71	C	Moderate Pollution	Green
3.	Jh 3	January 2016	3.76	0.90	C	Moderate Pollution	Green
4.	Jh 4	January 2016	4.81	0.83	C	Moderate Pollution	Green

7.5 Bio-assessment of River Ganga in West Bengal

In summer season, as the river enters in West Bengal state at Farakka Barrage (WB 1), it is slightly polluted and comply with 'B' class water quality (Table 7.5.1). Further, discharge from nearby Farakka Thermal Power Station at WB 2 deteriorated water quality. At this location, water was found to be moderately polluted. Moving further downstream towards Diamond Harbour, water quality improved to 'B' class at River Ganga d/s of FTPS Farakka (WB 3) and River Ganga at Raghunathganj (WB 7). All other locations downstream to Raghunathganj were observed to be moderately polluted except River Ganga u/s of Tribeni (WB 15) where river water was found to be heavily polluted. This may be due to the discharge from nearby Bandel Thermal Power Station. In winter season, all the locations were found to be moderately polluted except River Ganga d/s of Nabadwip (WB 14) which was found to be heavily polluted.

Table 7.5.1 Biological health of River Ganga in West Bengal

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
1.	WB1	May 2015	6.33	0.79	B	Slight pollution	Light Blue
		February 2016	5.27	0.88	C	Moderate Pollution	Green
2.	WB2	May 2015	5.00	0.73	C	Moderate Pollution	Green
		February 2016	5.57	0.45	C	Moderate Pollution	Green
3.	WB3	May 2015	6.42	0.76	B	Slight pollution	Light Blue
		February 2016	4.74	0.58	C	Moderate Pollution	Green
4.	WB4	-	-	-	-	-	-
		February 2016	5.1	0.87	C	Moderate Pollution	Green
5.	WB5	-	-	-	-	-	-
		February 2016	5.6	0.81	C	Moderate Pollution	Green
6.	WB6	-	-	-	-	-	-
		February 2016	5.1	0.67	C	Moderate Pollution	Green

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
7.	WB7	May 2015	6.14	0.63	B	Slight pollution	Light Blue
		February 2016	5.55	0.79	C	Moderate Pollution	Green
8.	WB9	May 2015	5.47	0.67	C	Moderate Pollution	Green
		-	-	-	-	-	-
9.	WB10	-	-	-	-	-	-
		February 2016	5.94	0.65	C	Moderate Pollution	Green
10.	WB11	May 2015	4.65	0.70	C	Moderate Pollution	Green
		February 2016	5.86	0.58	C	Moderate Pollution	Green
11.	WB12	-	-	-	-	-	-
		February 2016	5.25	0.71	C	Moderate Pollution	Green
12.	WB13	May 2015	5.14	0.47	C	Moderate Pollution	Green
		February 2016	5.58	0.74	C	Moderate Pollution	Green
13.	WB14	May 2015	4.90	0.81	C	Moderate Pollution	Green
		February 2016	4.73	0.40	D	Heavy Pollution	Orange
14.	WB15	May 2015	4.46	0.36	D	Heavy pollution	Orange
		-	-	-	-	-	-
15.	WB16	May 2015	5.03	0.54	C	Moderate Pollution	Green
		March 2016	4.86	0.78	C	Moderate Pollution	Green
16.	WB17	May 2016	5.72	0.73	C	Moderate Pollution	Green
		March 2016	5.30	0.52	C	Moderate Pollution	Green

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
17.	WB19	May 2015	4.83	0.87	C	Moderate Pollution	Green
		February 2016	5.04	0.65	C	Moderate Pollution	Green
18.	WB21	May 2015	5.69	0.66	C	Moderate Pollution	Green
		-	-	-	-	-	-
19.	WB23	May 2015	6.00	0.33	C	Moderate Pollution	Green
		February 2016	0.00	0.00	-	No Collection	High Tide
20.	WB25	May 2015	0.00	0.00	-	No Collection	High Tide
		February 2016	4.60	0.53	C	Moderate Pollution	Green
21.	WB27	-	-	-	-	-	-
		February 2016	6.0	0.38	C	Moderate Pollution	Green
22.	WB28	-	-	-	-	-	-
		February 2016	6.0	0.87	B	Slight Pollution	Light Blue
23.	WB31	-	-	-	-	-	-
		February 2016	4.56	0.55	C	Moderate Pollution	Green
24.	WB32	-	-	-	-	-	-
		February 2016	6.0	0.47	C	Moderate Pollution	Green
25.	WB 34F	-	-	-	-	-	-
		February 2016	5.40	0.57	C	Moderate Pollution	Green
26.	WB34	May 2015	5.61	0.58	C	Moderate Pollution	Green
		February 2016	5.45	0.59	C	Moderate Pollution	Green

Sr. No.	Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
27.	WB35	-	-	-	-	-	-
		February 2016	5.35	0.65	C	Moderate Pollution	Green

7.6 Bio-assessment of Tributaries of River Ganga

Name of Tributaries	Location Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UTTARAKHAND							
River Alaknanda at Rudra Prayag	UK 1	June 2014	7.66	0.72	A	Clean	Blue
		November 2015	6.80	0.75	B	Slight pollution	Light Blue
UTTAR PRADESH							
River Saloni at Sukartal Ghat	UP 3	December 2014	4.20	0.84	C	Moderate Pollution	Green
		May 2016	4.93	0.78	C	Moderate Pollution	Green
River Ramganga d/s of Muradabad	UP 10 (UP 10M in second round	December 2014	3.80	0.40	D	Heavy Pollution	Orange
		May 2016	4.25	0.40	D	Heavy Pollution	Orange
River Ramganga at SH-29 at Shahabad	UP 11 (UP 10 in second round	December 2014	5.18	0.82	C	Moderate Pollution	Green
		May 2016	4.94	0.386	D	Heavy Pollution	Orange
River Garra at Sandi	UP 12	Januaury 2015	4.71	0.72	C	Moderate Pollution	Green
		June 2016	4.96	0.76	C	Moderate Pollution	Green
River East Kali at Kanpur-Farrukhabad Road	UP 13	Januaury 2015	5.00	0.56	C	Moderate Pollution	Green
		June 2016	5.90	0.74	C	Moderate Pollution	Green

Name of Tributaries	Location Code	Month & Year of sampling	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
River Ramganga before confluence to River Ganga	UP I (UP 17)	Januaury 2015	4.50	0.81	C	Moderate Pollution	Green
		June 2016	4.92	0.78	C	Moderate Pollution	Green
River East Kali b/c to River Ganga	UP II	Januaury 2015	5.00	0.66	C	Moderate Pollution	Green
		June 2016	4.375	0.701	C	Moderate Pollution	Green
River Yamuna, MDR,26B near Rajapur	UP 33	February 2015	5.41	0.77	C	Moderate Pollution	Green
		October 2016	5.31	0.62	C	Moderate Pollution	Green
River Yamuna at NH-27	UP 38	February 2015	5.00	0.61	C	Moderate Pollution	Green
		October 2016	5.76	0.57	C	Moderate Pollution	Green
River Tons near Panasa	UP 39	February 2015	4.85	0.92	C	Moderate Pollution	Green
		October 2016	5.40	0.43	C	Moderate Pollution	Green
River Varuna at Bridge SH-98 at Varanasi	UP 50	March 2015	5.42	0.71	C	Moderate Pollution	Green
		October 2016	5.09	0.79	C	Moderate Pollution	Green
River Varuna at bridge in Varanasi	UP 55 (UP 56 in first round)	March 2015	3.83	0.30	D	Heavy Pollution	Orange
		October 2016	4.35	0.79	C	Moderate Pollution	Green
River Gomti at Rajwari	UP 56 (UP 57 in first round)	March 2015	5.60	0.64	C	Moderate Pollution	Green
		October 2016	5.40	0.65	C	Moderate Pollution	Green

Name of Tributaries	**Location Code**	**Month & Year of sampling**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
BIHAR							
River Ghagra at bridge near Manjhi	BH 4	April 2015	5.75	0.72	C	Moderate Pollution	Green
		December 2015	5.66	0.57	C	Moderate Pollution	Green
River Sone at Koilwar near Rail-road bridge	BH SK	-	-	-	-	-	-
		December 2015	5.51	0.56	C	Moderate Pollution	Green
River Gandak at Hajipur near Rail bridge	BH 8	April 2015	6.0	0.68	B	Slight Pollution	Light Blue
		December 2015	5.27	0.63	C	Moderate Pollution	Green
Nalla in Patna3b	BH 11	April 2015	5.07	0.73	C	Moderate Pollution	Green
		-	-	-	-	-	-

8 Bio-assessment of Health of River Ganga at Upstream and Downstream of Towns/Cities Located on the bank of River Ganga

The biological assessment of water quality was made at upstream and downstream locations of each town located on the bank of River Ganga, by using Biological Water Quality Criteria in terms of Saprobic score range between 1.0 to 10 in combination with respective diversity score range of 0.0 to 1.0. The Biological water quality is ascertained with a concept that higher the Saprobic score with respective diversity score better the biological water quality (Table 8.1). In a broad range of water quality levels, seasonal variation in saprobic score and diversity score depicts same water quality. However, variations in saprobic score differentiated the level of water quality in a particular class. Such variations can be observed clearly by evaluation of species composition of benthic macro-invertebrates at upstream and downstream locations of each location. The dominance sequence of species of benthic macro-invertebrates is shown as > in a decreasing order of percent dominance.

Table 8.1: Criteria for Biological Water Quality Evaluation

Range of Saprobic Score	Range of Diversity	Water Quality	Water Quality Class	Indicator Colour
7 and more	0.2 – 1	Clean	A	Blue
6 – 7	0.5 – 1	Slight Pollution	B	Light Blue
3 – 6	0.3 – 0.9	Moderate Pollution	C	Green
2 – 5	0.4 & less	Heavy Pollution	D	Orange
0 – 2	0 – 0.2	Severe Pollution	E	Red

8.1.1 Seasonal Variation in Biological Water Quality and Species Composition at Upstream and Downstream Locations of Towns/ Cities Located on the bank of River Ganga in Uttarakhand

Table 1 Rishikesh

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
UK4	Upstream Rishikesh, Luxman jhiula	24.6.2014	5.0	0.75	C	Moderate Pollution	Green
		4.11.2015	6.28	0.70	B	Slight Pollution	Light Blue
UK5	Barrage at Rishikesh	25.6.2014	7.30	0.63	A	Clean	Blue
		18.11.2015	6.35	0.57	B	Slight Pollution	Light Blue

Biological composition of benthic macro-invertebrates in River Ganga at Rishikesh

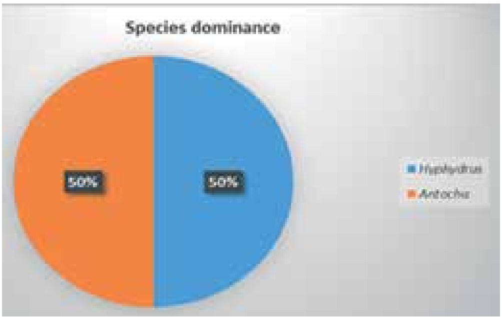


Figure 1a	UK4	24.07.2014	Upstream Rishikesh, Luxman jhula

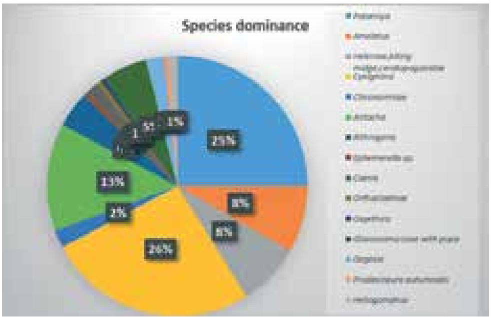


Figure 1b	UK4	4.11.2015	Upstream Rishikesh, Luxman jhula

UPSTREAM RISHIKESH: The biological water quality of River Ganga changes with the seasonal variation. During June 2014, water quality of River Ganga upstream at Luxman jhula, showed moderate pollution (Table 1) supported by dominance of only *Hyphydrus* and *Antocha* species whereas during November, water quality improves to slight pollution supported by dominance sequence of *Cynigmina> Potamiya> Antocha> Glossosoma> Rhithrogena* etc. (Figure 1a,1b)

DOWNSTREAM RISHIKESH: On the contrary, water quality in River Ganga improved to clean water at downstream Rishikesh at barrage, during June 2014, supported by dominance sequence of species namely *Rhithrogena> Choroterpedes> Chematopsyche> Antocha and Tetropina*, but water quality changes to slight pollution with a dominant species composition of *Amele tus>Cheumatopsyche>Orthocladinae>Neoephemeropsis* and *Cynigmina* during November 2015. (Figure 1c, 1d). The waste water/ storm water joins River Ganga in Rishikesh through Triveni drain, Saraswathi nalla, Rambh River, Lakkar ghat STP drain, IDPL-STP drain and Swargashram STP drain.

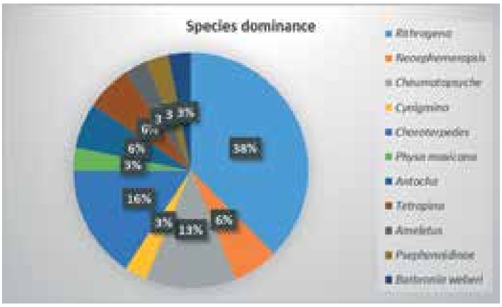


Figure 1c	UK5	25.6.2014	Barrage at Rishikesh

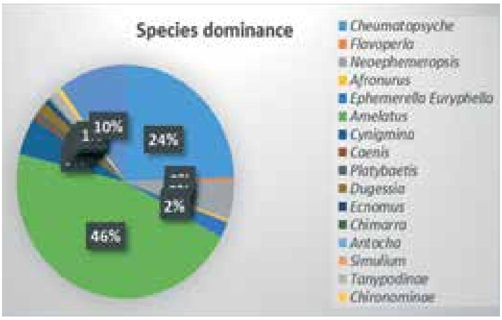


Figure1d	UK5	18.11.2015	Barrage at Rishikesh

Table 2 Haridwar

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UK6	Haridwar Barrage	20.6.2014	6.50	0.79	B	Slight Pollution	Light Blue
		3.11.2015	6.28	0.68	B	Slight Pollution	Light Blue
UK8b	Downstream of Jagjeetpur STP, Haridwar	26.6.2014	3.0	0.03	D	Heavy Pollution	Orange
		27.11.2015	4,86	0.58	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Haridwar

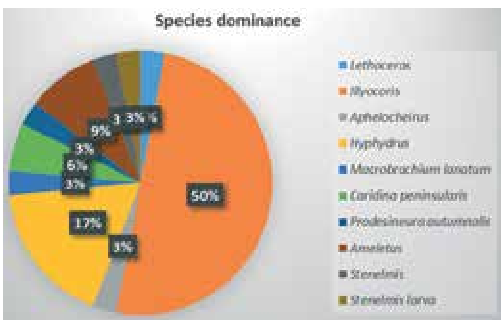


Figure 2a	UK6	20.06.2014	Barrage at Haridwar

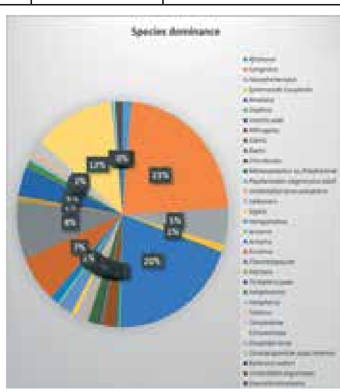


Figure 2b	UK6	3.11.2015	Barrage at Haridwar

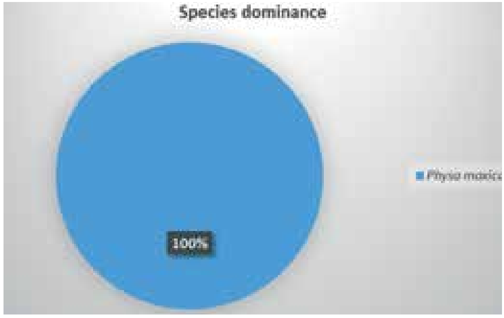


Figure 2c	UK8	17.06.2014	Downstream of Haridwar Jagjeetpur STP

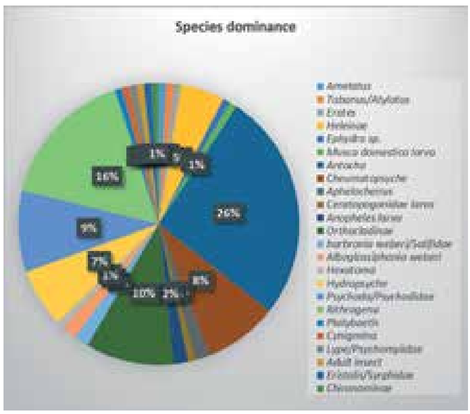


Figure 2d	UK8	27.10.2015	Downstream of Haridwar Jagjeetpur STP

UPSTREAM HARIDWAR: There was no change in slightly polluted biological water quality at upstream Haridwar barrage during June 2014 and November 2015. The saprobic score was slightly higher during month of June compared to November (Table 2). There was marked seasonal variation in dominance sequence of benthic macro-invertebrates species. In the month of June 2014 few species were dominant such as *Ilyocoris*> *Hyphydrus*>*Ameletus* >*Caridina peninsularis*. Whereas during November 2015, the species composition changed to *Cynigmina*> *Ameletus*>*Chironominae*>*Cheumatopsyche*>*Ecnomus*>*Neoephemeropsis* etc. (Figure 2a and 2b).

DOWN STREAM HARIDWAR: At downstream of Haridwar, the water quality in River Ganga downstream of Jagjeetpur STP, deteriorated to heavy pollution (Table 2) during June 2014, supported by 100% dominance of *Physa (Haitia)mexicana* but at this location water quality improved to moderate pollution just after monsoon during October 2015. Biological composition also improved with dominance sequence of species namely *Antocha*>

Rhithrogena> *Orthocladiinae*> *Psychoda*> *Cheumatopsyche*> *Heleinae*> *Hydropsyche* etc. (Figure 2c,2d). Waste water/storm water joins River Ganga in Haridwar through Jagjeetpur STP drain, Kassavan drain, Pandey wala drain, Rawlrao drain, and Laksar drain.

8.1.2 Seasonal Variation in Biological Water Quality and Species Composition at Upstream and Downstream Locations of Towns/ Cities Located on the bank of River Ganga in Uttar Pradesh

Table 3 Bijnor

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP 1	Upstream Bijnor at Balawali	December 2014	4.50	0.81	C	Moderate Pollution	Green
		26.4.2016	4.25	0.520	C	Moderate Pollution	Green
UP 2	Madhya Ganga barrage	December 2014	3.70	0.54	C	Moderate Pollution	Green
		26.4.2016	4.17	0.77	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Bijnor

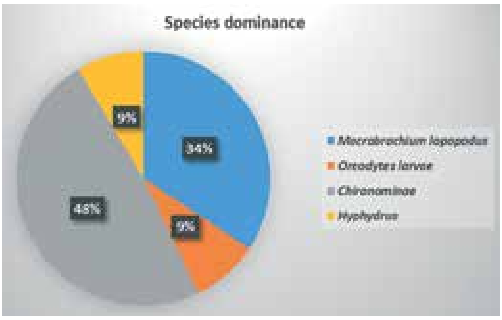


Figure 3a	UP 1	December 2014	Balawali rail & road bridge, upstream Bijnor

UPSTREAM BIJNOR: There was no seasonal change in biological water quality of River Ganga at upstream of Bijnor at Balawali. However, saprobic score was slightly higher during December compared to April (Table 3). Species composition showed deterioration in moderately polluted water during December 2014 compred to April 2016. Water quality of River

Ganga preferred dominance sequence of Chironominae>*Macrobrachium lopopodus*>*Oreodytes larva*>*Hyphydrus* wheras during April 2016 sequence of species dominance changed to *Hyphydrus*> *Physa (Haitia) mexicana* > *Sinictinogomphus*. (Figure 3a,3b).

DOWN STREAM BIJNOR: Similarly, water quality at downstream location of Bijnor at Madhya Ganga barrage, was moderately polluted during December 2014 and April 2016. On the contrary to upstream location, higher saprobic score was observed during April compared to December (Table 3) with seasonal variation in species composition. *Physa (Haitia) mexicana*>Tanypodinae>*Gyraulus convexiusculus* were dominant species during December and Chironominae>*Caridina thambipilaii*>*Canthydrus*> *Hippeutis umbalicalis* etc. were predominantly observed during April 2016 (Figure 3c, 3d). Dominance of Chironominae and Tanypodinae indicated influence of sewage on water quality of River Ganga. Waste water/stormwater enters River Ganga in Bijnor, through Banganga River at Shukratal, Hemraj drain, Bijnor sewage drain, Malan River and Chhoiya drain.

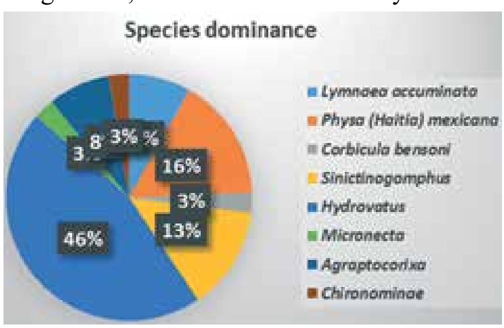


Figure 3b	UP 1	26.4.2016	Balawali rail & road bridge, upstream Bijnor

Figure 3c	UP 2	December 2014	Madhya Ganga barrage

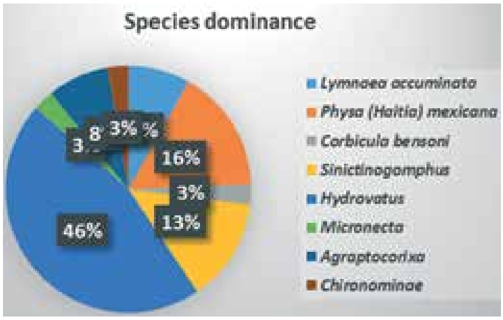


Figure 3d	UP 2	26.4.2016	Madhya Ganga barrage

Table 4 Garhmukteshwar

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP4	Brijghat road bridge at Garhmukteshwar	December 2014	5.04	0.78	C	Moderate Pollution	Green
		28.4.2016	5.44	0.7	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Garhmukteshwar

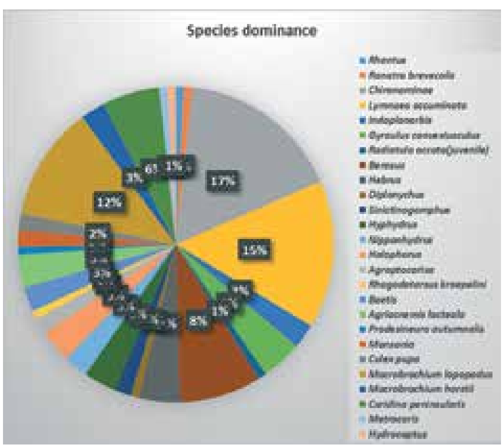


Figure 4a	UP4	December 2014	Brijghat, Garhmukteshwar

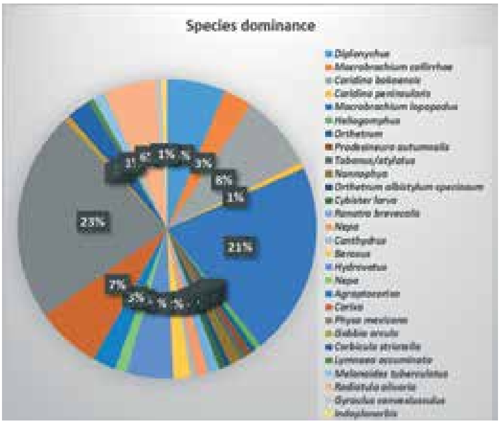


Figure 4b	UP4	28.4.2016	Brijghat, Garhmukteshwar

GARHMUKTESHWAR: Although biological water quality was moderately polluted at Garhmukteshwar during December 2014 and April 2016. Saprobic score was higher during April (Table 4). Species composition of benthic macro-invertebrates clearly depicted influence of sewage on water quality by the presence of dominant species of Chironominae>*Lymnaea accuminata*> *Macrobrachium lopopodus*>*Berosus* etc during month of December and presence of *Physa (Haitia) mexicana*>*Macrobrachium lopopodus*>*Caridina bakoensis*>*Corixa*>*Diplonychus*>*Radiatula olivaria* during April 2014 (Figure 4a,4b). The waste water/storm water enters River Ganga at Garhmukteshwar, through Bagad River, Garh drain at Babrala and Fuldehra drain at Garh.

Table 5 Anupshahr

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP 6	Bridge at upstream Anupshahr	December 2014	5.09	0.89	C	Moderate Pollution	Green
		10.5.2016	4.44	0.658	C	Moderate Pollution	Green
UP 6A	Downstream Anupshahr near Shavdah grah	16.5.2016	5.36	0.9	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Anupshahr

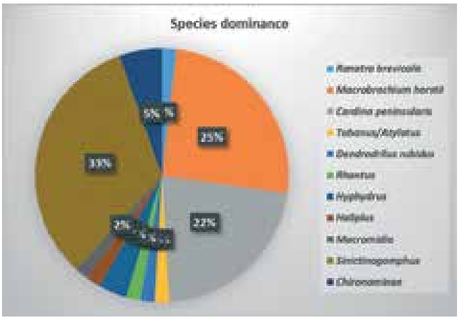


Figure 5a	UP 6	December 2014	Upstream Anupshahr

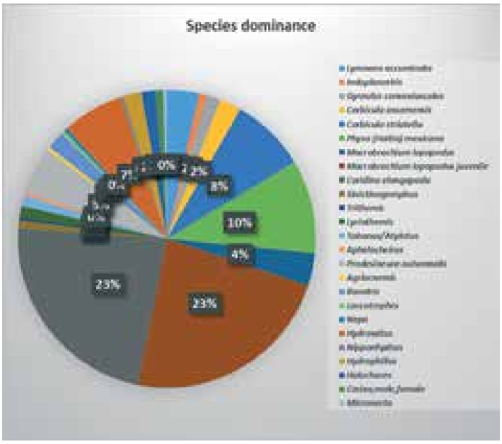


Figure 5b	UP 6	10.5.2016	Upstream Anupshahar

UPSTREAM ANUPSHAHR: There was no impact of seasonal variation on biological water quality of moderate pollution in River Ganga at upstream Anupshahr during Decenber 2014 and May 2016. Saprobic score was higher during December compared to April month (Table 5). However Species composition varied with a dominance sequence of *Sinictinogomphus*> *Macrobrachium horstii, Caridina penensularis*>Chironominae during December and presence of *Macrobrachium lopopodus, Caridina elongapoda*> *Physa (Haitia) mexicana*>*Corbicula striatella*>*Hydrovatus* during May 2015 Figure 5a,5b).

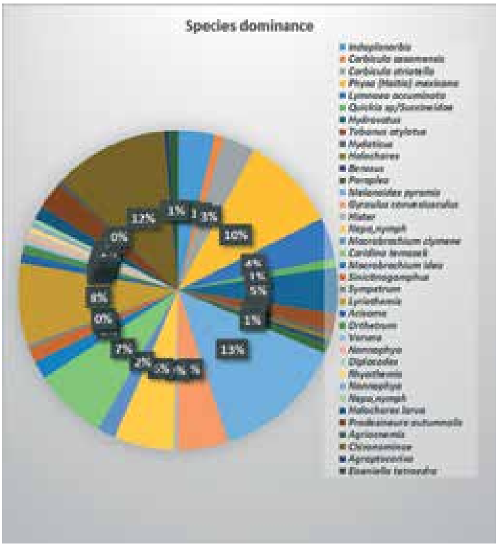


Figure 5c	zbgp,	16.5.2016	Anupshahr downstream

DOWNSTREAM ANUPSHAHR: A major difference in species composition in moderately polluted water quality was observed at downstream location of Anupshahr near Shavdahgraha during May 2016. Saprobic score was highest in River Ganga at downstream of Anupshahr indicating improvement in water quality compared to upstream Anupshahr (Table 5). *Melanoides pyramis*>Chironominae>*Physa (Haitia) mexicana*>*Lyriothemis*> *Caridina tamasek*>*Nepa*>*Gyraulus convexiusculus*>*Hydrovatus* were the dominant species at this location (Figure 5c). Waste water enters River Ganga at this location, through Anupshahr STP drain 1 and drain 2.

Table 6 Narora

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
UP 7	Upstream Narora , Rajghat	December 2014	4.45	0.79	C	Moderate Pollution	Green
		11.5.2016	4.59	0.85	C	Moderate Pollution	Green
UP 8	Barrage at Narora	December 2014	4.54	0.77	C	Moderate Pollution	Green
		11.5.2016	5.13	0.849	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Narora

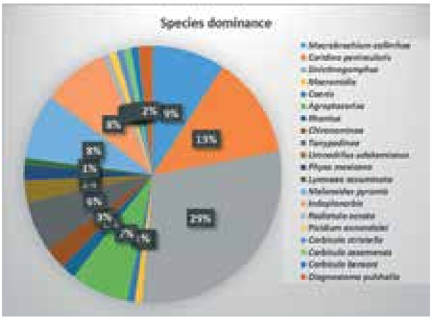


Figure 6a	UP7	December 2014	Narora bridge, at Rajghat

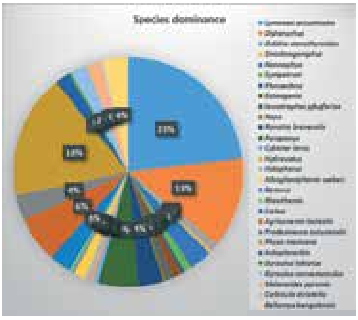


Figure 6b	UP7	11.5. 2016	Narora bridge, at Rajghat

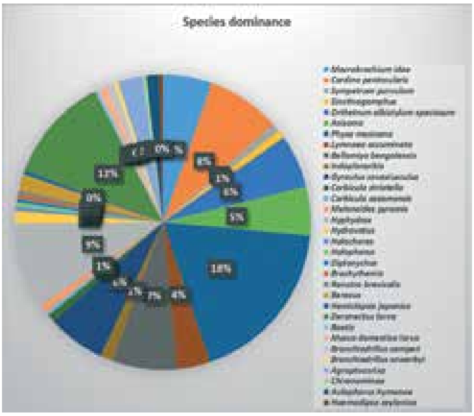


Figure 6c	UP 8	December 2014	Barrage at Narora

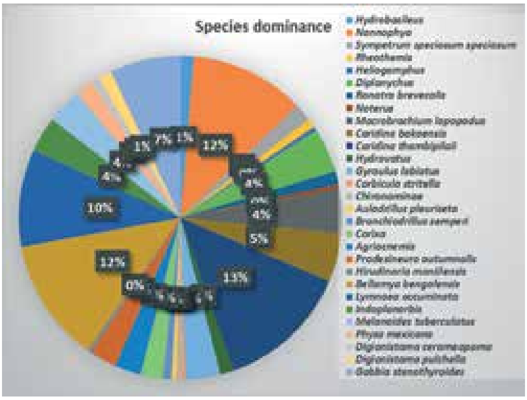


Figure 6d	UP8	11.5.2016	Barrage at Narora

UPSTREAM NARORA: Moderate pollution in biological water quality was observed at upstream of Narora at Rajghat during December 2014 as well as May 2016. Saprobic score was lower in December month compared to saprobic score during May (Table 6). Species composition changed with dominance of *Sinictinogomphus>Caridina peninsularis>Macrobrachium callirrhoe>Melanoides pyramis>Indoplanorbis* during December 2014 with presence of *Lymnaea accuminata>Physa (Haitia) mexicana> Diplonychus> Agriocnemis lacteola> Paraponyx* during May 2016 (Figure 6a, 6b).

DOWN STREAM NARORA: Moderately polluted biological water quality at Narora barrage, was observed during December 2014 and May 2016. Saprobic score was higher in downstream stretch of River Ganga, compared to upstream of Narora (Table 6), with species composition of *Physa (Haitia) mexicana>Deronectus larva>Hyphydrus>Caridina peninsularis>Bellamya bengalensis>Gyraulus convexiusculus>Orthetrum albistylum speciosum>Acisoma >Macrobrachium idea* etc. and dominance of *Caridina thambipilaii>Bellamya bengalensis>Nannophya>Lymnaea accuminata>Gabbia stenothyroides* respectively (Figure 6d). Narora drain and Narora STP drain enters River Ganga in vicinity of Narora.

Table 7 Badaun

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP 9	Kachla ghat bridge. Badaun	December 2014	5.43	0.77	C	Moderate Pollution	Green
		17.5.2016	5.3	0.80	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Badaun

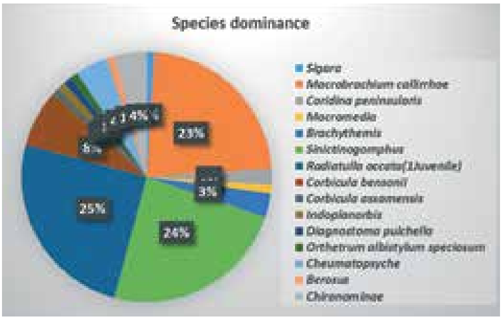


Figure 7a	UP 9	December 2014	Kachlaghat bridge at Badaun

BADAUN: Moderate pollution in biological water quality was observed at Kachlaghat location in Badaun during December 2014 and May 2016. Although saprobic score was almost similar during December and May (Table 7), the difference in species composition was observed in *Radiatula occata>Sinictinogomphus>Macrobrachium callirrhoe>Corbicula bensoni* during December and *Lyriothemis>Corbicula assamensis>Sinictinogomphus>Corbicula striatella>Physa (Haitia) mexicana>Lymnaea accuminata* during May 2016 Figure 7a,7b). Water and waste water enters River Ganga through Badaun sewage drain, Sot River, Kasganj drain at Amarour village, Cherat drain near Krishi Vigyan Kendra, Aligarh in vicinity of Badaun.

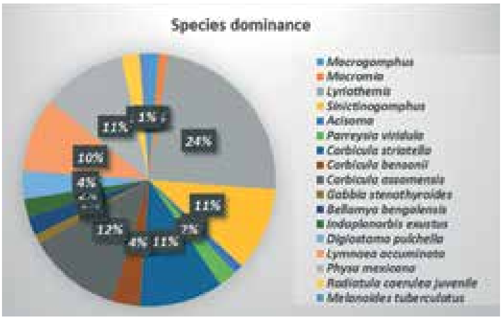


Figure 7b	UP9/ JBUP9	17.5.2016	Kachlaghat bridge at Badaun

Table 8 Farrukhabad

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP 14	Ghatiaghat, Farrukhabad	January 2015	4.60	0.79	C	Moderate Pollution	Green
		7.6.2016	5.27	0.61	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Farrukhabad

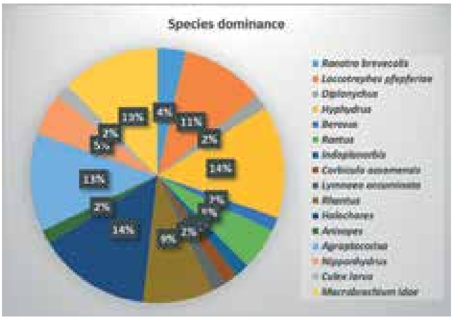


Figure 8a	UP 14	13.01.2015	Ghatiaghat, Farrukhabad

FARRUKHABAD: Moderate pollution in biological water quality was observed during January, 2015 and June, 2016. Saprobic score was higher during June compared to in the month of January (Table 8). In the month of January, dominance of *Hyphydrus*> *Helochares*> *Agraptocorixa*> *Macrobrachium idae*>*Laccotrephes pfepferiae*>*Rhantus* etc was observed whereas during June, 2016 dominance of *Digoniostoma pulchella*>*Physa (Haitia) mexicana*>*Quickia sp.* etc. was observed (Figure 8a,8b). A number of waste water and storm water drains, such as Farrukhabad drain, STP drain, Hathikhana drain, Nakatiya nulla, Chawari nulla, Deverranaiya nulla and Patta nulla at downstream location of Kannauj, join River Ganga in vicinity of Farrukhabad.

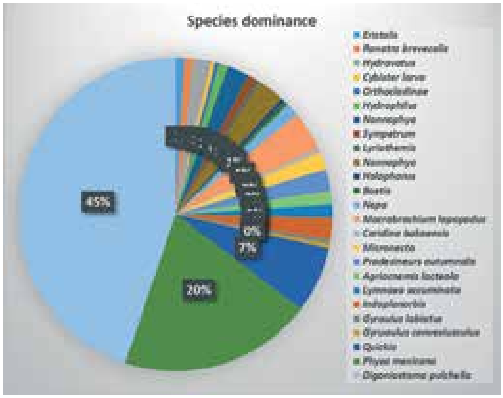


Figure 8b	UP14	7.6.2016	Ghatiaghat, Farrukhabad

Table 9 Bithoor

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
UP 18	Bridge at Bithoor	January 2015	5.78	0.71	C	Moderate Pollution	Green
		8.6.2016	5.0	0.675	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Bithoor

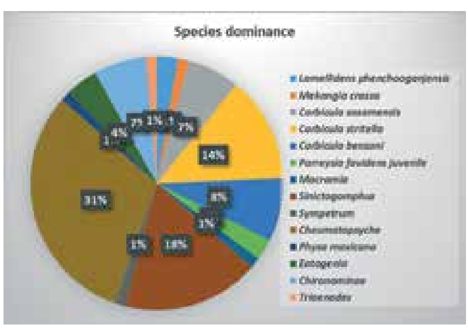


Figure 9a	UP 18	15.1.2015	Bridge at Bithoor

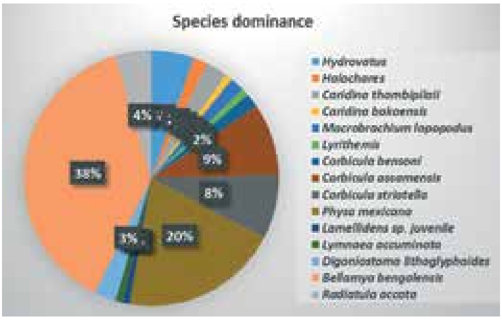


Figure 9b	UP 18	8.6.2016	Bridge at Bithoor

BITHOOR: Moderate pollution in biological water quality was observed in River Ganga at Bithoor, during January 2015 and June 2016. Saprobic score was higher in the month of January as compared to June (Table 9). *Cheumatopsyche*>*Sinictinogomphus*>*Corbicula striatella*>*Corbicula bensoni*>*Corbicula assamensis*>Chironominae> *Eatongenia*. *Eatongenia* appeared as the most sensitive species with low dominance at this location. During January whereas *Bellamyia bengalensis*>*Physa (Haitia) mexicana*>*Corbicula assamensis*>*Corbicula striatella* appeared during June 2016 (Figure 9a,9b).

Table 10 Kanpur

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
UP 19	Barrage, upstream Kanpur	January 2015	5.33	0.78	C	Moderate Pollution	Green
		9.6.2016	4.8	0.70	C	Moderate Pollution	Green
UP A	Dhondhi ghat, downstream Kanpur	January 2015	5.5	0.7	C	Moderate Pollution	Green
		9.6.2016	4.75	0.49	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Kanpur

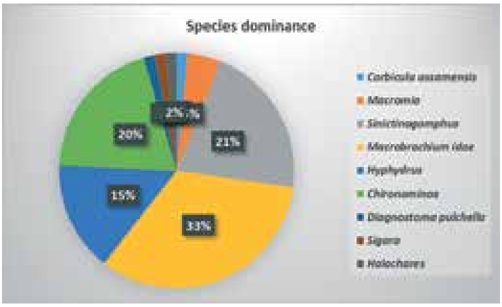


Figure 10a	UP 19	14.01.2015	Barrage at upstream Kanpur

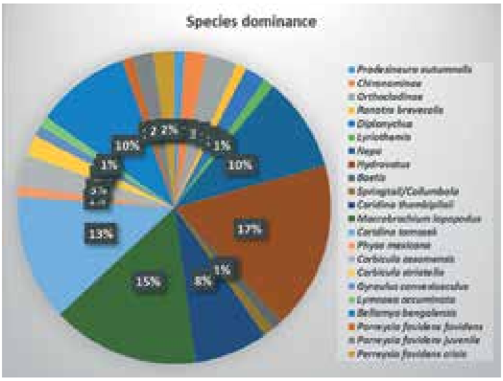


Figure 10 b	UP19	9.7. 2016	Barrage at upstream Kanpur

UPSTREAM KANPUR: Kanpur stretch of River Ganga also indicated moderate pollution in biological water quality of River Ganga at barrage, upstream Kanpur during January 2015 and June 2016. The saprobic score was higher in the month of January compared to June (Table 10). *Macrobrachium idae*> *Sinictinogomphus*>Chironominae>*Hyphydrus* were the dominant species during January while *Hydrovtus*>*Macrobrachium lopopodus*>*Caridina tamasek, Nepa, Bellamya bengalensis, Caridina thambipilaii* were dominant during June 2016 (Figure 10a,10b).

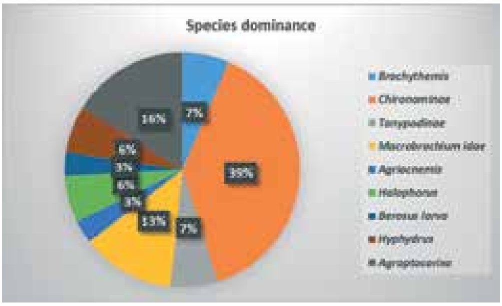


Figure 10c	UPDG/UP A	16.01.2015	Dhondhighat, downstream Kanpur

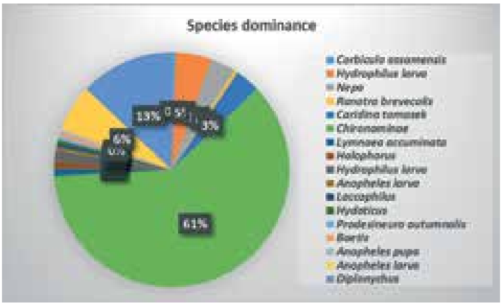


Figure 10d	UPDG/UP A	9.6.2016	Dhondhighat, downstream Kanpur

DOWN STREAM KANPUR: Moderate pollution was also observed at downstream location of Kanpur at Dhondhighat during January 2015 and June 2016. The saprobic score was heigher in River Ganga at downstream of Kanpur as compared to upstream locations, during January (Table 10). Chironominae>*Agraptocorixa*>*Macrobrachium idae* were most dominant species among all, during January 2015. Similarly, Chironominae>*Diplo nychus*>*Anopheles larva*>*Hydrophillus larva*>*Nepa*>*Caridina tamasek* were dominant during June 2016 (Figure 10c,10d). Chironominae was most dominant species indicating impact of domastic waste water on water quality of River Ganga at downstream Kanpur. The waste water joins River Ganga directly through Dabka nulla-1,2,3, Shetla bazar nalla, Wazidpur nulla, Satti chaura drain, Golaghat nulla, Sisamau nalla, and Permiya nalla. Other drains like City jail drain at Unnao, Pandu River (Fatehpur to Raibareily), Seepage River (Fatehpur to Raibareily) and Ariihari drain (Fatehpur to Raibareily) also join River Ganga in vicinity of Kanpur city.

Table 11 Allahabad

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP 41	Bridge on Allahabad Bypass	February 2015	4.78	0.58	C	Moderate Pollution	Green
		6.10.2016	5.25	0.54	C	Moderate Pollution	Green
UP 47	Bridge on NH-2 right bank	February 2015	5.10	0.54	C	Moderate Pollution	Green
		5.10.2016	5.42	0.50	C	Moderate Pollution	Green
UP AL-1	Bridge near Mehawa Kalan Kachar, Dengurpur	February 2015	5.11	0.56	C	Moderate Pollution	Green
		4.10.2016	5.66	0.42	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Allahabad

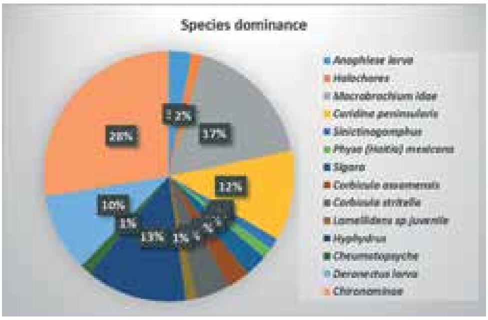


Figure 11a	UP 41	February 2015	Bridge on Allahabad bypass

UPSTREAM ALLAHABAD: Moderate pollution in biological water quality was also observed in River Ganga at upstream Allahabad bypass during February 2015 and October 2016. Saprobic score was more in October compared to February (Table 11). Deterioration in water quality was depicted through dominant species composition of Chironominae>*Macrobrachium idea*>*Hyphydrus*>*Caridina peninsularis, Deronectus larva* during February and dominance of *Macrobrachium lopopodus*>*Thiara (Tarebia) lineata*>*Sinictinogomphus*>*Parreysia favidens favidens* during October 2016 (Figure 11a, 11b).

DOWN STREAM ALLAHABAD: Moderate pollution was observed at two downstream locations during February 2015 and October 2016 in River Ganga at Bridge on NH-2 right bank and bridge near Mehawa Kalan Kachar, Dengurpur respectively. At NH-2, saprobic score in River Ganga was almost similar in February and October whereas , at Dengurpur, saprobic score increased during October, compared to all the locations in Allahabad (Table 11). During February 2015 the species composition in River Ganga at NH-2 was *Agraptocorixa*>Chironominae>*Hyphydrus and* at Dengurpur *Assamenia fraincaise*>*Parreysia virudula*>Chironominae>*Macrobrachium idea* respectively. During October, the dominance sequence of species was *Macrobrachium lopopodus*>*Corbicula striatella*>*Caridina tamasek*>*Nepa*>*Physa (Haitia) mexicana* at NH-2 and *Macrobrachium lopopodus*>*Manayunkia/Brandtika* at Dengurpur (Figure 11c,11d). A number of drains carrying waste water joining River Ganga in vicinity of upstream and downstream Allahabad. These drains are, Rasulabad drain-1, drain-2, drain-3, drain-4, Nehru drain, Kodar drain, Pongaghat drain, Salori drain, Maviya drain, and Mugalaha drain.

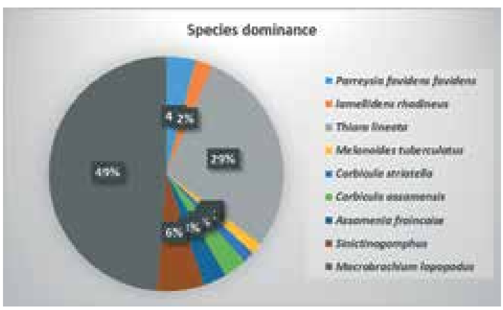


Figure 11b	UP41	6.10.2016	Bridge on Allahabad bypass

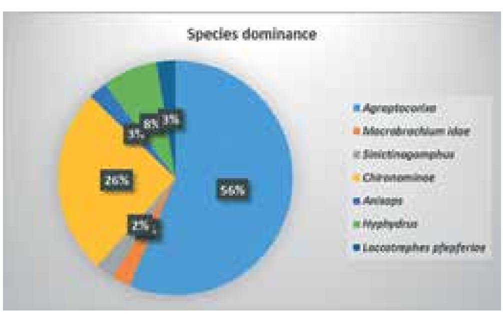


Figure 11c	UP 47	February 2015	Bridge on NH-2 right bank

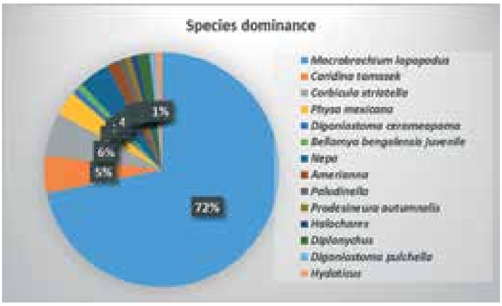


Figure 11d	UP47	5.10. 2016	Bridge on NH-2 right bank

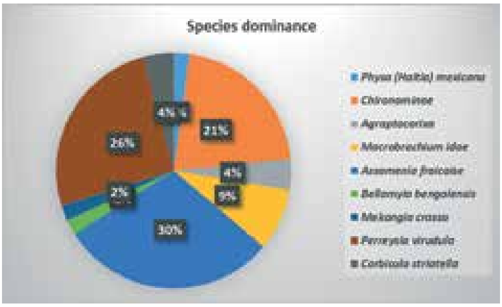


Figure 11e	UP AL-1	February 2015	Bridge at village Mahewa Kalan Kachar, Dengurpur

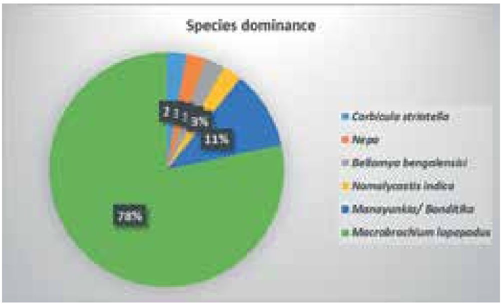


Figure 11f	UPALI	4.10.2016	Bridge at village Mahewa Kalan Kachar, Dengurpur

Table 12 Mirzapur

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP III	Vindhyachal ghat, Mirzapur upstream	11.3.2015	5.11	0.62	C	Moderate Pollution	Green
		20.10.2016	5.8	0.61	C	Moderate Pollution	Green
UP IV	Mirzapur downstream	11.3.2015	4.9	0.62	C	Moderate Pollution	Green
		20.10.2016	5.76	0.68	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Mirzapur

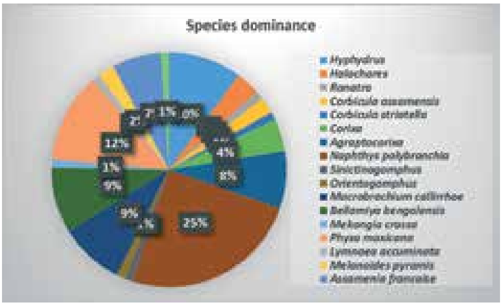


Figure 12a	UP III	11.3. 2015	Vindhyachal ghat, Mirzapur upstream

UPSTREAM MIRZAPUR: Moderate pollution in biological water quality was observed in River Ganga at Vindhyachal ghat, during March 2015 and October 2016. Saprobic score in River Ganga, was higher during October as compared to saprobic score in March (Table 12). Dominant species during March were *Nephthys polybranchia> Physa (Haitia) mexicana>Hyphydrus>macrobrachium callarrhoe>Bellamya bengalensis* and during October *Macrobrachium lopopodus>Thiara (Tarebia) lineata>Bellamya bengalensis>Namalycastis indica>Sinictinogomphus >Melanoides pyramis leopardina*, were most dominant among all species (Figure 12a, 12b).

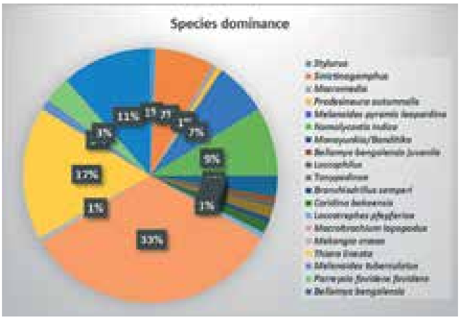


Figure 12b	UP III	20.10.2016	Vindhyachal ghat, Mirzapur upstream

DOWN STREAM MIRZAPUR: Moderate pollution in biological water quality was also observed at downstream of Mirzapur after confluence of Ghore Saheed drain and Khandwa drain to River Ganga during March 2015 and October 2016. Saprobic score in River Ganga was higher during October as compared to saprobic score in March (Table 12c, 12d). *Physa (Haitia) mexicana>Caridina celebensis>Ranatra>Laccotrephes pfepferiae>Helochares* were among the dominant species collected during March whereas, *Thiara (Tarebia) lineata>Macrobrachium lopopodus>Caridina bakoensis>Bellamya bengalensis* were dominant during the month of October.

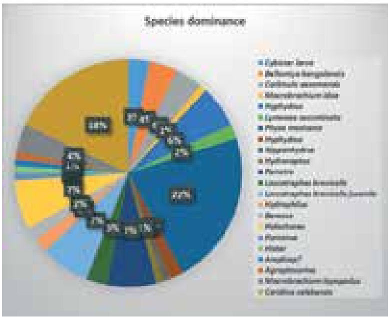


Figure 12c	UP IV	11.3.2015	Mirzapur downstream after confluence two drains

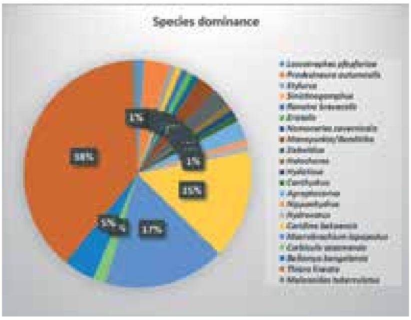


Figure 12 d	UPIV	20.10.2016	Mirzapur downstream after confluence two drains

Table 13 Varanasi

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
UP 49	Upstream Varanasi at Bridge SH-74	12.3.2015	4.40	0.56	C	Moderate Pollution	Green
		20.10.2016	5.41	0.65	C	Moderate Pollution	Green
UP 53	Downstream Varanasi at Bridge NH-2, (Rajghat)	10.3.2015	4.55	0.53	C	Moderate Pollution	Green
		19.11.2016	5.3	0.47	C	Moderate Pollution	Green

UPSTREAM VARANASI: Moderate pollution in biological water quality was observed at bridge SH-74 at upstream of Varanasi during March 2015 and October 2016. Saprobic score was lower during March compared to November (Table 13). The species composition changed significantly in both the season. *Nephthys polybranchia>Corixa>Hyphydrus>Agraptocorixa>Lymnaea accuminata>Physa (Haitia) mexicana* were dominant during March whereas *Macrobrachium lopopodus>Parreysia corrugata laevirostris>Corbicula as samensis>Orthocladiinae>Lamellidens rhadineus>Parreysia virudula* were dominant during October month (Figure 13a, 13b).

Biological composition of benthic macro-invertebrates in River Ganga at Varanasi

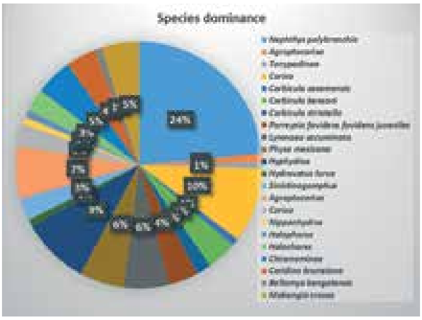


Figure 13a	UP 49	12.3.2015	Bridge SH-74 at Upstream Varanasi

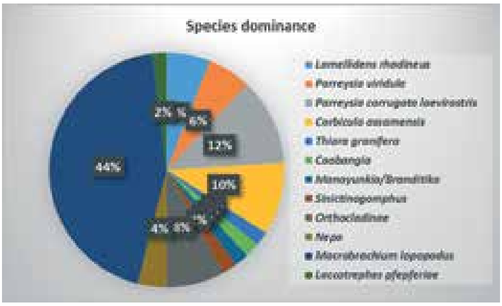


Figure 13b	UP49	20.10.2016	Bridge SH-74 at Upstream Varanasi

DOWN STREAM VARANASI: Moderate pollution in biological water quality was observed at downstream location of Varanasi, in River Ganga at Rajghat, NH-2 bridge during March 2015 and November 2016. Like upstream location, saprobic score was lower during March compared to November (Table 13). *Physa (Haitia) mexicana*> Chironominae >*Thiara (Tarebia) lineata* were most dominant during March and *Thiara (Tarebia) lineata*> *Melanoides pyramis*>Chironominae were dominant during November month (Figure 13c, 13d). Major drains, carrying waste water, joining River Ganga, were Rajghat drain, Nagwa drain, Ramnagar drain, Varuna River, Shivala drain in the vicinity of Varanasi.

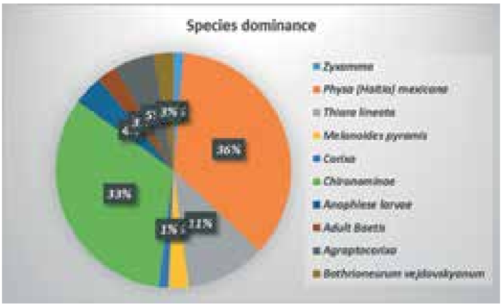


Figure 13c	UP -53	10.3.2015	Rajghat, bridge NH-2, Varanasi

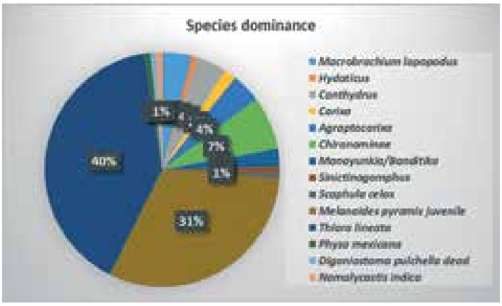


Figure 13d	UP53	19.10.2016	Rajghat, bridge NH-2, Varanasi

Table 14 Ghazipur

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
UP G	Tarighat downstream Ghazipur	13.3.2015	4.65	0.54	C	Moderate Pollution	Green
		18.10.2016	5.61	0.59	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Ghazipur

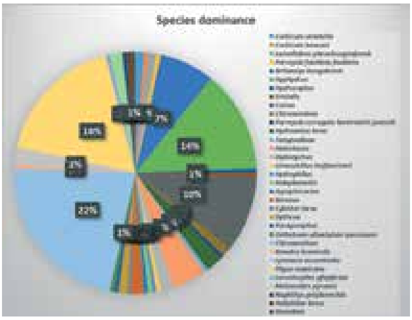


Figure 14a	UP G	13.3.2015	Tarighat, downstream Ghazipur

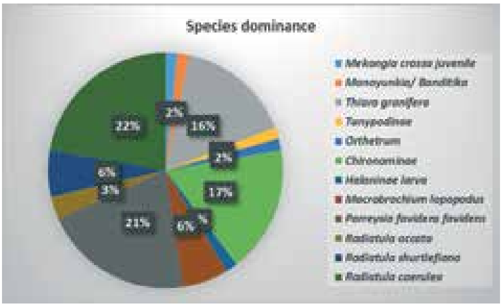


Figure 14b	UP G	18.10.2016	Tarighat, downstream Ghazipur

GHAZIPUR: Moderate pollution in biological water quality was observed at Tarighat location downstream of Ghazipur during March 2015 and October 2016. Saprobic score was lower in the month of April compare to saprobic score during December (Table 14). Chironominae>*Physa (Haitia) mexicana*>*Hyphydrus*>*Corixa*>*Bellamya bengalensis* were most dominant during March whereas, *Radiatula caerulea*>*Parreysia favidens favidens*>Chironominae>*Thiara granifera*>*Macrobrachium lopopodus*>*Radiatula shurtlefiana* were common species among all during month of October(Figure14a,14b).

8.1.3 Seasonal Variation in Biological Water Quality and Species Composition at Upstream and Downstream Locations of Towns/ Cities Located on the bank of River Ganga in Bihar

Table 15 Buxar

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh (1)	Upstream Buxar at Chausa water intake	28.4.2015	4.81	0.71	C	Moderate Pollution	Green
		29.12.2015	5.0	0.61	C	Moderate Pollution	Green
Bh 3	Downstream of Buxar, at bridge	29.12.2015	5.35	0.62	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Buxar

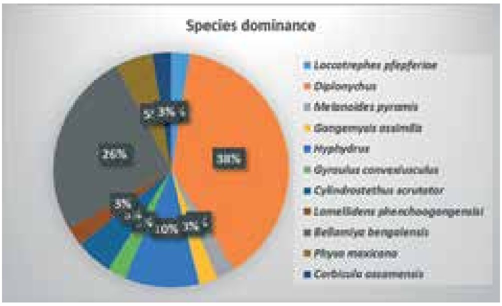


Figure 15a	Bh 1/Bh 3	28.4. 2015	Chausa water intake point, upstream Buxar

UPSTREAM BUXAR: Moderate pollution in biological water quality was observed in Bihar stretch of River Ganga at upstream of Buxar near Chausa water intake, during April 2015 and December 2015. Saprobic score was lower during April compared to December (Table 15). *Diplonychus*>*Bellamya bengalensis*>*Hyphydrus* were most common in their dominance sequence at this location during April while Chironominae>*Thiara (Tarebia) lineata*>*Bellamya bengalensis*>*Caridina bakoensis*>*Digoniostoma pulchella* were commonly found dominant in River Ganga during December month. (Figure 15a,15b). Dominance of Chironominae indicated impact of sewage on water quality of River Ganga during December.

DOWN STREAM BUXAR: Moderate pollution was observed in biological water quality of River Ganga at downstream location of Buxar near bridge during December 2015. The saprobic score was higher than at upstream locations, which indicated improvement in water quality (Table 15). Species dominance showed decreasing trends of dominance as *Bellamya bengalensis>Melanoides pyramis>Caridina endehensis> Thiara (Tarebia) lineata> Diplonychus> Bellamya (Falopaludina) bengalensis* (Figure 15c). A number of drains carrying waste water/storm water join River Ganga in vicinity of Buxar. These drains are Sidhharth drain, Sati ghat drain, Nath baba drain, Tadka drain, Sariupur drain etc.

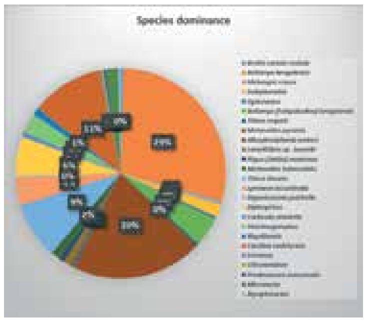


Figure 15 b	Bh(I)	29.12.2015	Chausa water intake point, upstream Buxar

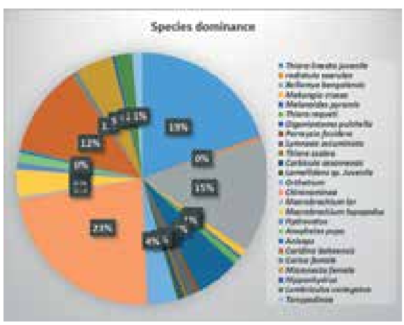


Figure 15c	Bh 3	29.12.2015	Bridge at downstream of Buxar

Table 16 Patna

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh 5	Danapur Patna 2	27.4.2015	6.11	0.4	C	Moderate Pollution	Green
		31.12.2015	5.25	0.66	C	Moderate Pollution	Green

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh 12 d/s	Downstream Patna, M.G.bridge near Gai ghat	27.4.2015	5.08	0.76	C	Moderate Pollution	Green
		28.12,2015	3.71	0.16	D	Heavy Pollution	Orange

Biological composition of benthic macro-invertebrates in River Ganga at Patna

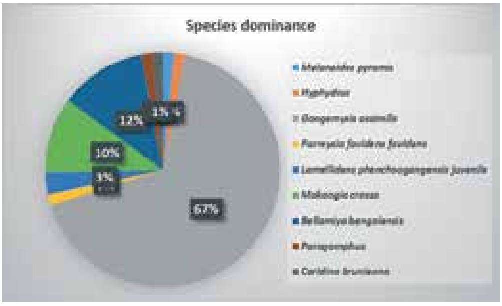


Figure 16a	Bh 5	27.4. 2015	Bridge near Danapur Patna 2 (Digha rail bridge)

UPSTREAM PATNA: Moderate pollution was observed in biological water quality of River Ganga at upstream of Patna 2 near Danapur, during April 2015 and December 2015. The saprobic score was highest during April compared to December (Table 16). During April, the dominant species were *Gangemysis assimilis>Bellamya bengalensis>Mekongia crassa>Lamellidens phenchoogangensis juvenile* whereas during December the dominant species were *Physa (Haitia) mexicana>Lamellidens rhadineus>Bellamya bengalensis>Sinictinogomphus* (Figure 16a,16b).

DOWN STREAM PATNA: Heavy pollution was observed in River Ganga at downstream location of Patna near Gai ghat, during December 2015 as compared to moderate pollution during April 2015. Saprobic score was lowest during December compared to April (Table 16). The dominant species were *Bellamya bengalensis>Physa (Haitia) mexicana>Melanoides pyramis>Corixa>Agriocnemis lacteola>Megalestes chengi*. Whereas during December heavy pollution in River Ganga was supported by dominant species of *Thiara (Tarebia) lineata>Lymnaea accuminata>* Chironominae>*Limnodrilus hoffmeisteri*. (Figure 16c, 16d). Waste water joins River Ganga in vicinity of Patna, through Digha ghat drain, Kurzi drain, Rajapur drain, Bansh ghat drain, Collectorate drain, Mittan ghat drain, Mahavir drain, Badshahi drain etc.

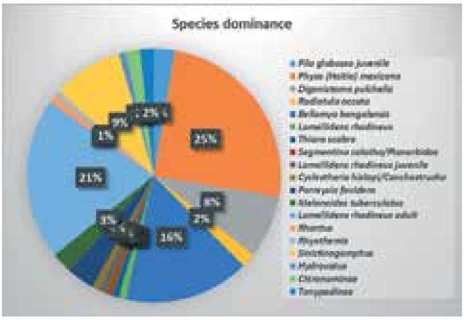


Figure 16b	Bh 5	31.12.2015	Bridge near Danapur Patna 2(Digha rail bridge)

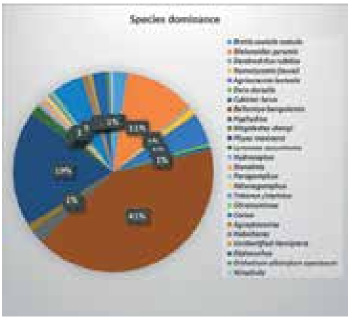


Figure 16c	Bh12 downstream	27.4.2015	M.G. bridge,right bank near Gai ghat, Patna

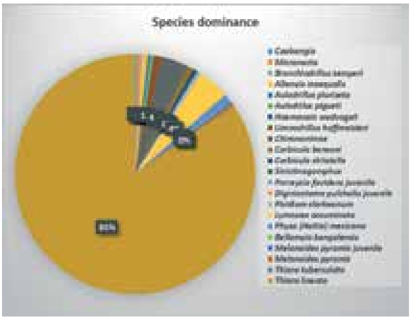


Figure 16 d	Bh12 downstream	28.12.2015	M.G. bridge,right bank near Gai ghat, Patna

Table 17 Mokamah

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh M	Hathidah rail bridge	30.12.2015	5.86	0.55	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Mokamah

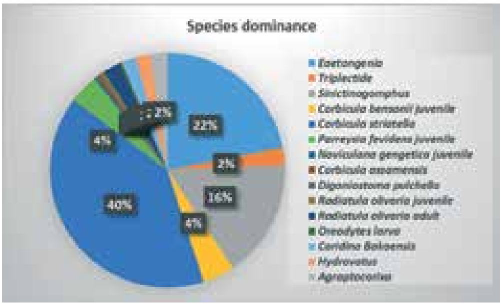


Figure 17a	Bh M	30.12.2015	Near Hathidah rail bridge, Mokamah

MOKAMAH : Moderate pollution in biological water quality was observed in River Ganga at Mokamah near Hathidah rail bridge during December, 2015 with a batter saprobic score compared to Patna (Table 17). The water quality of River Ganga was supported by dominant species of *Corbicula striatell a>Eatongenia>Sinictinogomphus>Corbicula bensoni juvenile>Parreysia favidens juvenile>Triplectides>Radiatula olivaria>Agraptocorixa* (Figure 17a). Presence of *Eatongenia and Triplectides* indicated improvement in biological water quality of River Ganga at Mokamah.

Table 18 Munger

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh V	Kastharni ghat	12.1.2016	5.61	0.63	C	Moderate Pollution	Green
Bh VI	Downstream Munger, Sitakundih village	12.1.2016	5.68	0.75	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Munger

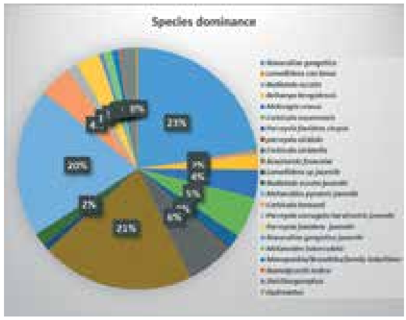


Figure 18a	Bh V	12.1.2016	Kastharni ghat, Fort area, upstream Munger

UPSTREAM MUNGER: At Munger, biological water quality was moderately polluted at Kastharni ghat during January 2016 (Table 18) supported by entirely different species composition of *Novaculina gangetica>Assamenia fraincaise>Melanoides pyramis juvenile>corbicula striatella>Corbicula assamensis>Corbicula bensoni>Mekongia crassa>Parreysia favidens favidens* (Figure 18a)

DOWN STREAM MUNGER: Moderate pollution in biological water quality in River Ganga, was also observed at downstream Munger at Sitakundih but with higher saprobic score during same period in January, 2016 Table 18). Sensitive species were also dominant having decreasing trend of *Sinictinogomphus> Thiara granifera>Radiatula caerolea juvenile>Melanoides tuberculatus>Pisione garciavaldecasai>Corbicula bensoni* (Figure 18b). Waste water joining River Ganga in Munger, through two drains namely, ITC drain and Lal Darwaja drain.

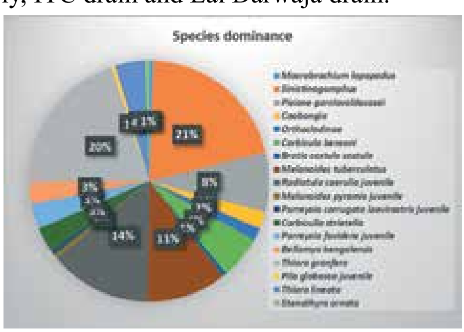


Figure 18b	BhVI	12.1.2016	Sitakundih village, downstream Munger

Table 19 Sultanganj

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh S	Sultanganj near Jahaz ghat	12.1.2016	5.45	0.58	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Sultanganj

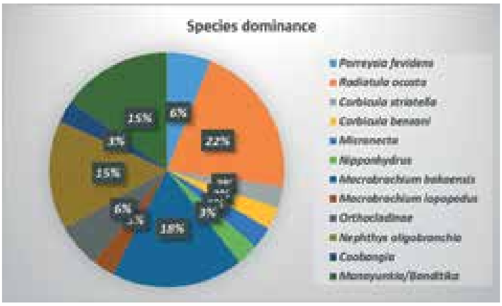


Figure 19a	Bh -S	12.1.2016	Near Jahaz ghat, Sultanganj

SULTANGANJ: Moderate pollution was observed in River Ganga at Sultanganj, near Jahajghat in Bihar stretch of River Ganga, during January 2016. (Table 19). The composition of species in River Ganga at Sultanganj, was *Radiatula occata*> *Macrobrachium bakoensis*> *Nephthys oligobranchia*> *Manaunkia/Branditika* (Figure 19a).

Table 20 Bhagalpur

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh 13	Bararighat, Bhagalpur	15.1.2016	6.0	0.68	B	Slight Pollution	Light Blue

Biological composition of benthic macro-invertebrates in River Ganga at Bhagalpur

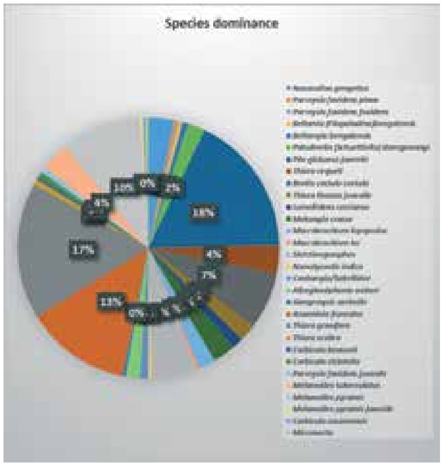


Figure 20a	Bh 13	15.1.2016	Barari ghat, Bhagalpur

BHAGALPUR: Biological water quality of River Ganga at Bararighat in Bhagalpur, improved to a great extent. Slight pollution in biological water quality was observed in River Ganga at Bhagalpur during January 2015 (Table 20). The species dominance at Bhagalpur stretch, was represented by *Pila globosa juvenile>Thiara granifera>Assaminia fraincaise>Melanoides pyramis>Brotia costula costula> sinictinogomphus> Thiara (Sermyla) requeti> Melanoides tuberculatus>Novaculina gangetica* etc. (Figure 20a). Many drains carrying waste water join River Ganga in vicinity of Bhagalpur, such as Jamunia drain, Adampur drain, Sarikal drain, Saklichand drain, Hathiya drain, Chama drain and Barari ghat drain.

Table 21 Kahalgaon

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Bh K	Kahalgaon	13.1.2016	5.38	0.5	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Kahalgaon

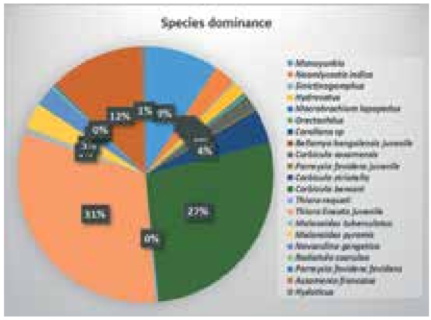


Figure 21a	Bh K	13.1.2016	Kahalgaon

KAHALGAON: This is the last location on River stretch in Bihar state. The biological water quality of River Ganga turns to moderately polluted at Kahalgaon during January 2016 (Table 21). The species composition also changes to *Thiara (Tarebia) lineata juvenile*> *Corbicula bensoni*>*Assaminea francaise*> *Manayunkia/Brandtika*> *Corbicula striatella*> *Melanoides pyramis* (Figure 21a). Kowa drain and Kagzil drain, carrying wastewater of Kahalgaon, join River Ganga.

8.1.4 Seasonal Variation in Biological Water Quality and Species Composition at Upstream and Downstream Locations of Towns/ Cities Located on the bank of River Ganga in Jharkhand

Table 22 Sahibganj

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Jh 1	Upstream Sahibganj, Brahampur ghat	14.1.2016	4.95	0.74	C	Moderate Pollution	Green
Jh 2	Downstream Sahibganj, Jahazghat near water intake point	14.1.2016	5.62	0.71	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Sahibganj

Figure 22a	Jh 1	14.1.2016	Brahampur ghat, upstream Sahibganj

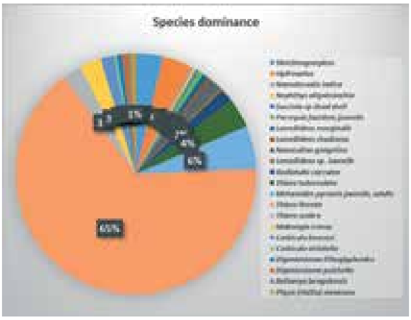


Figure 22b	Jh 2	14.1.2016	Jahaz ghat near water intake point, downstream Sahibganj

UPSTREAM SAHIBGANJ: Moderate pollution was observed in Jharkhand stretch of River Ganga at Brahampur ghat during January 2016 (Table 22). The water quality supported dominant species of Chironominae>*Melanoides tuberculatus*>*Bellamya bengalensis*>*Mekongia crassa*>*Digoniostoma pulchella*>*Corbicula bensoni* (Figure 22a).

DOWN STREAM SAHIBGANJ: Moderate pollution was also observed in River Ganga at downstream Sahibganj, Jahazghat near water intake point, but with higher saprobic score compared to upstream Sahibganj, in January,2016 (Table 22). The improvement in water quality was depicted by the presence of *Thiara (Tarebia) lineata*>*Melanoides pyramis*>*Thiara tuberculate*>*Hydrovatus*> *Sinictinogomphus* (Figure 22b). Waste water join River Ganga through Gopalpur nullah and Jharna nullah in Sahibganj stretch of Jharkhand.

Table 23 Rajmahal

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
Jh 3	Upstream Rajmahal, Mangal Haat, Syed Bazar	14.1.2016	3.76	0.90	C	Moderate Pollution	Green
Jh 4	Downstream Rajmahal, Ferryghat	14.1.2016	4.81	0.83	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Rajmahal

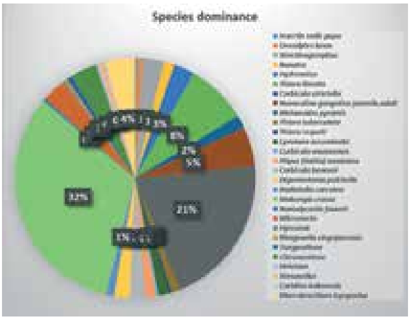


Figure 23a	Jh 3	14.1.2016	Mangal Haat Syed Bazar,upstream Rajmahal

UPSTREAM RAJMAHAL: Moderate pollution was observed in River Ganga at upstream of Rajmahal at Mangal haat, Syed bazar with a low saprobic score during January 2016 (Table 23). The water quality of River Ganga supported dominant species of *Mekongia crassa*>*Melanoides pyramis*>*Thiara (Tarebia) lineata*>*Novaculina gangetica juvenile+adults*> *Macrobrachium lopopodus*>Chironominae (Figure 23a).

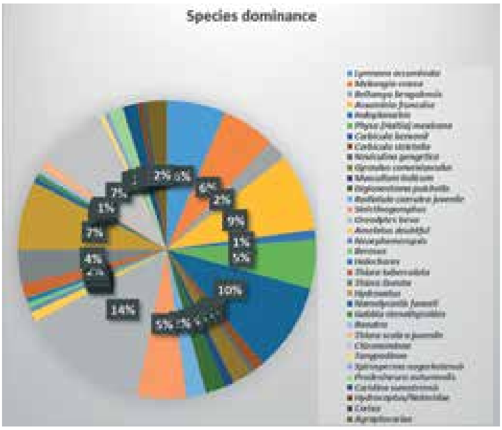


Figure 23b	Jh 4	14.1.2016	Ferryghat, downstream Rajmahal

DOWNSTREAM RAJMAHAL: Moderate pollution was also observed in River Ganga at downstream location of Rajmahal at Ferryghat with improvement in saprobic score during January 2016 (Table 23). This location is the end of Jharkhand stretch of River Ganga. The species dominance sequence changed to *Oreodytes larva*>*Corbicula bensoni*>*Assamenia fraincaise*> *Hydrovatus*>Chironominae>*Lymnaea accuminata*>*Mekongia crassa*>*Physa (Haitia) mexicana*>*Sinictinogomphus* (Figure 23b).

8.1.5 Seasonal Variation in Biological Water Quality and Species Composition at Upstream and Downstream Locations of Towns/ Cities Located on the bank of River Ganga in West Bengal

Table 24 Farakka

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 1	Farakka Barrage	26.5.2015	6.33	0.79	B	Slight Pollution	Light Blue
		29.2.2016	5.27	0.88	C	Moderate Pollution	Green
WB 2	Farakka FTPS	27.5.2015	5.0	0.73	C	Moderate Pollution	Green
		29.2.2016	5.57	0.45	C	Moderate Pollution	Green
WB 3	Downstream Farakka FTPS	27.5.2015	6.42	0.76	B	Slight Pollution	Light Blue

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
		29.2.2016	4.74	0.58	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Farakka

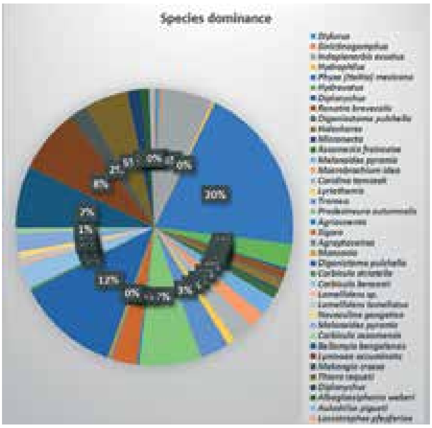


Figure 24a	WB1	29.2. 2016	Upstream Farakka Barrage

UPSTREAM FARAKKA: This is the first location on River Ganga in West Bengal stretch. There was slight pollution in River Ganga at upstream location of Farakka barrage, during May 2015. However, the water quality deteriorated to moderate pollution during February 2016 at Farakka barrage (Table 24). Further downstream at Farakka FTPS, water quality remained moderately polluted in River Ganga during May 2015 and February 2016. The species dominance during May, composed of *Assaminea fraincaise>Prodesineura autumnalis>Digoniostoma pulchella > Melanoides pyramis> Corixa> bellamya bengalensis>Hyphydrus>Stenothyra ornata>Physa (Haitia) mexicana>Parreysia favidens* juvenile. During February, moderate pollution in River Ganga was supported by species dominance of *Physa (Haitia) mexicana>Digonistoma pulchella>Lymnaea accuminata>Bellamya bengalensis>Prodesineura autumnalis>Indoplanorbis exustus>Thiara (Sermyla) requeti.* (Figure 24a,24b). The influence of FTPS was clearly depicted in moderately polluted biological water quality of River Ganga, having low saprobic score during May, with species dominance of *Physa (Haitia) mexicana>Helochares>Nipponhydrus* and high saprobic score during February with species dominance of *Thiara (Tarebia) lineata>Novaculina gangetica>Corbicula bensoni* (Figure 24c, 24d).

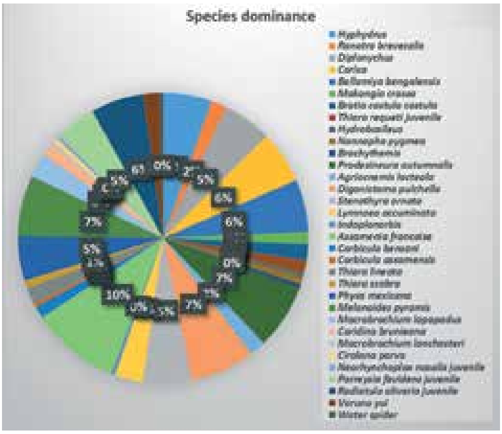


Figure 24b	WB 1	26.5. 2015	Upstream Farakka Barrage

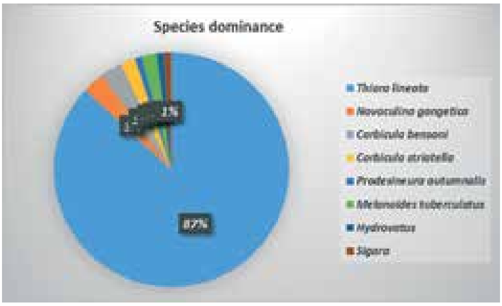


Figure 24c	WB2	29.2. 2016	Farakka FTPS

DOWN STREAM FARAKKA: Slight pollution in biological water quality of River Ganga was observed at downstream location of Farakka FTPS during May 2015 (Table 24). At this location, species compositon in River Ganga, was dominated by *Macrobrachium idae*>*Gyraulus convexiusculus*>*Melanoides pyramis*>*Physa (Haitia) mexicana*> Chironominae>*Macrobrachium lopopodus*>*Stenothyra ornate*. However, during February, biological water quality comes back to moderate pollution with low saprobic score and supported by *Mekongia crassa*> *Physa (Haitia) mexicana*>*Novaculina gangetica* (Figure 24e,24f). Thermal water from NTPC is discharged in to River Ganga in Farakka stretch in West Bengal.

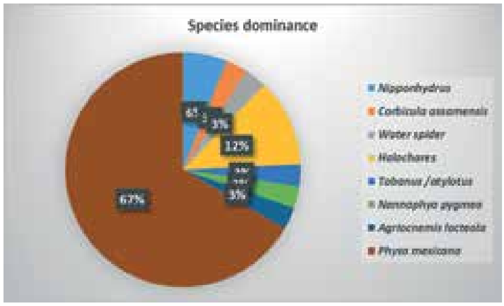


Figure 24d	WB 02	27.5. 2015	Farakka FTPS

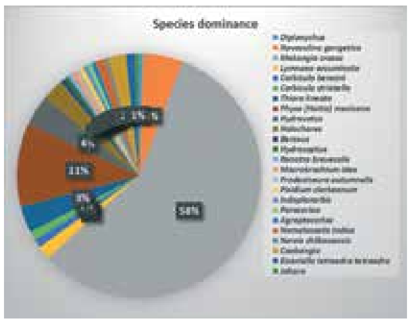


Figure 24e	WB3	29.2. 2016	Downstream Farakka FTPS

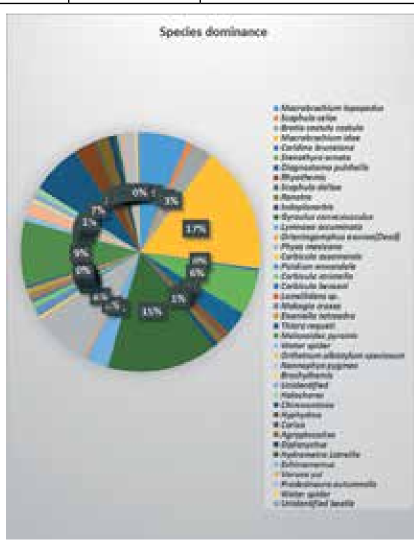


Figure 24f	WB 3	27.5. 2015	Downstream Farakka FTPS

Table 25 Raghunathganj

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 7	Raghunath ganj near bridge	27.5.2015	6.14	0.63	B	Slight Pollution	Light Blue
		27.2.2016	5.55	0.79	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Raghunathganj

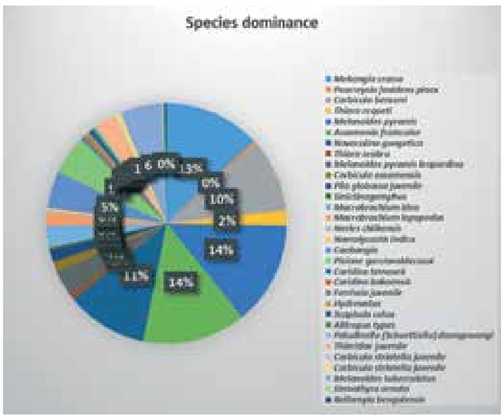


Figure 25a	WB7	27.2. 2016	Raghunathganj near bridge

RAGHUNATHGANJ: Slight pollution was observed in River Ganga near bridge at Raghunathganj during May 2015 (Table 25. The dominant species were *Mekongia crassa*>*Thiara (Sermyla) requeti*>*Melanoides pyramis*>*Assaminea fraincaise*>*Macrobrachium lopopodus*>*Lymnaea accuminata*>Chironominae etc (Figure 25a). However, during February 2016 moderate pollution regains in River Ganga with species dominance of *Melanoides pyramis*>*Assaminea fraincaise*>*Mekongia crassa*>*Novaculina gangetica*>*Melanoides tuberculatus*>*Pision garciavaldecasai*> *Caobangia*>*Melanoides pyramis leopardina* (Figure 25 b).

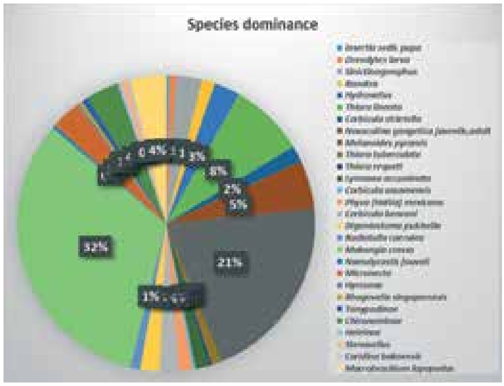


Figure 25b	WB 7	27.5. 2014	Raghunathganj near bridge

Table 26 Jiaganj

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 9	Upstream Jiaganj	27.5.2015	5.47	0.67	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Jiaganj

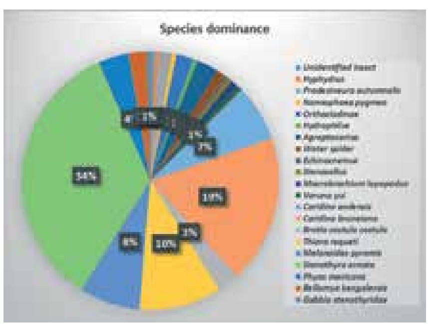


Figure 26a	WB 9	27.5.2015	Upstream Jiaganj

JIAGANJ: Moderate pollution was observed in River Ganga at upstream Jiaganj during May 2015 (Table 26). The species compositon was entirely different in River Ganga at upstream of Jiaganj. The dominant species were *Stenothyra ornate>Caridina bruneiana>Thiara (Sermyla) requeti>Melanoides pyramis>Caridina endehensis>Physa (Haitia) mexicana* (Figure 26a). Jangipur drain carrying waste water join River Ganga at Jiaganj.

Table 27 Behrampore

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
WB 10	Road bridge , Behrampore	26.2.2016	5.94	0.65	C	Moderate Pollution	Green

BEHRAMPORE: Moderate pollution was observed in River Ganga at road bridge of Berahampore, with high saprobic score during February 2016 (Table 27). The species composition in River Ganga, was *Mekongia crassa>Thiara (Tarebia) lineata>Assaminidae juveniles>Thiara (Sermyla) requeti>Assaminea fraincaise>Sinictinogomphus* (Figure 27a).

Biological composition of benthic macro-invertebrates in River Ganga at Behrampore

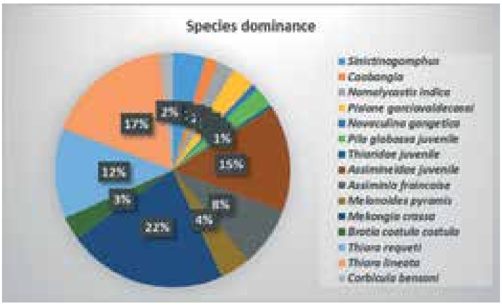


Figure 27a	WB 10	26.2.2016	Behrampore

Table 28 Murshidabad

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
WB 11	Downstream Murshidabad near Begpur village	27.5.2015	4.65	0.70	C	Moderate Pollution	Green
		27.2.2016	5.86	0.58	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Murshidabad

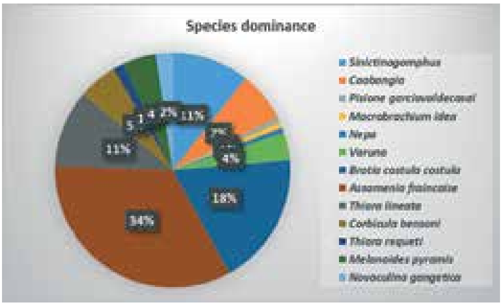


Figure 28a	WB 11	27.2.2016	Downstream Murshidabad near Begpur village

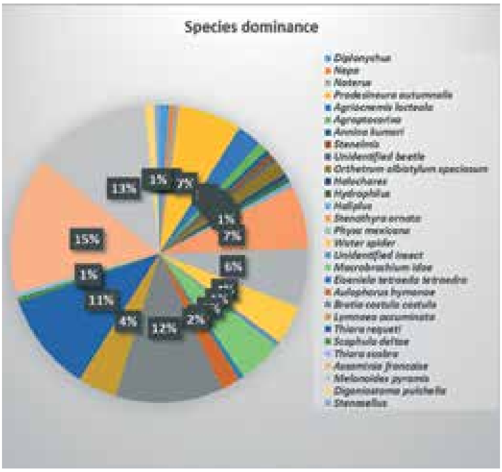


Figure 28b	WB 11	27.5.2015	Downstream Murshidabad near Begpur village

MURSHIDABAD: Moderate pollution in biological water quality was observed in River Ganga at downstream location of Murshidabad near Begpur village during May 2016 and February 2016 with reduction in saprobic score during May (Table 28). At Begpur village, the species composition was *Assamenia fraincaise>Brotia costula costula>Thiara (Tarebia) lineata >Sinictinogomphus>Caobangia*. Whereas, during February the species composition was *Assaminea fraincaise>Melanoides pyramis>Brotia costula costula>Thiara (Sermyla) requeti>Prodesineura autumnalis>Stenothyra ornata>Physa (Haitia) mexicana* (Figure 28a, 28b).

Table 29 Kalyanpur

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 12	After confluence Bablah nulla, Kayanpur	26.2.2016	5.25	0.71	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Kalyanpur

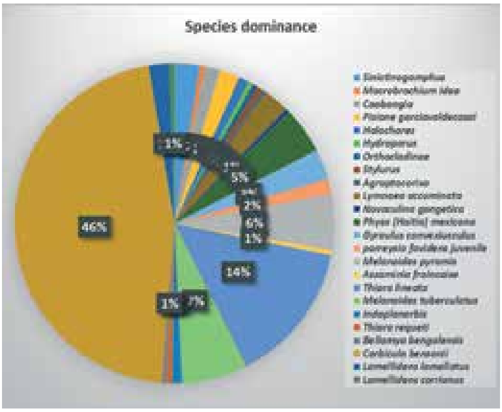


Figure 29a	WB 12	26.2.2016	Kalyanpuur after confluence Bablah nulla

KALYANPUUR: The biological water quality of River Ganga was moderately polluted after confluence of Bablah nulla at Kalyanpur (Table 29). The species composition was dominated by *Corbicula bensoni*> *Thiara (Tarebia) lineata*>*Melanoides tuberculatus*>*Melanoides pyramis*>*Physa (Haitia)mexicana* (Figure 29a).

Table 30 Katwa

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 13	Katwa	23.5.2015	5.14	0.47	C	Moderate Pollution	Green
		25.2.2016	5.58	0.74	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Katwa

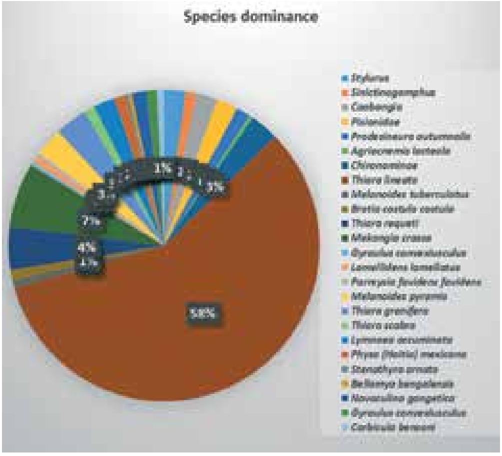


Figure 30a	WB 13	25.2.2015	Katwa

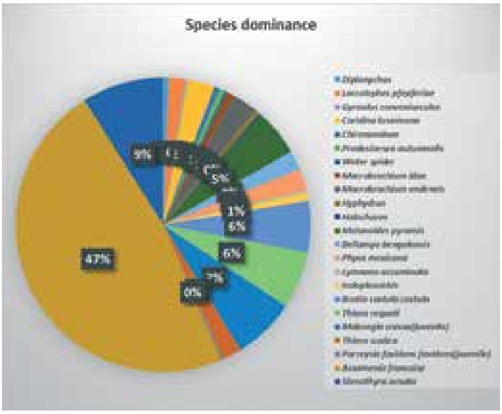


Figure 30b	WB 13	23.5. 2015	Katwa

KATWA: Moderate pollution in biological water quality of River Ganga was observed at Katwa during May 2015 and February 2016 with improvement in saprobic score during February (Table 30). The dominant species during May were *Thiara (Tarebia) lineata*>*Mekongia crassa*>*Thiara (Sermyla) requeti*>*Thiara granifera*>*Melanoides pyramis*. During February species composition at the same location changed to *Assaminea fraincaise*>*Stenothyra ornata*>*Mekongia crassa*>*Thiara (Sermyla) requeti*>*Brotia costula costula*>*Melanoides pyramis*>*Caridina bakoensis* (Figure 30a, 30b).

Table 31 Nabadwip

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 14	Downstream Nabadwip	23.5.2015	4.90	0.81	C	Moderate Pollution	Green
		28.2.2016	4.73	0.40	D	Heavy Pollution	Orange

Biological composition of benthic macro-invertebrates in River Ganga at Nabadwip

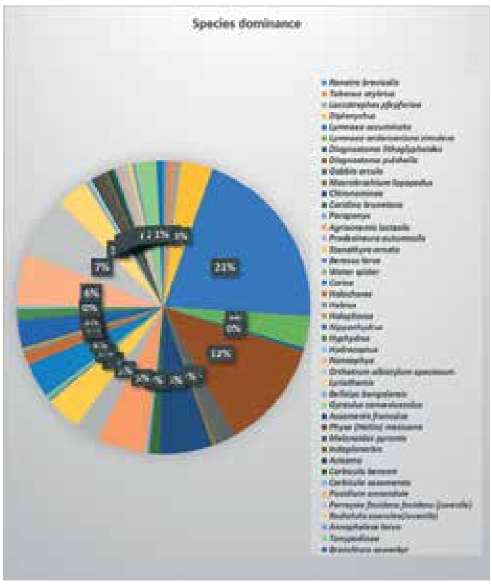


Figure 31a	WB 14	23.5.2015	Nabadwip downstream

NABADWIP: Heavy pollution was observed in biological water quality of River Ganga at downstream of Nabadwip during February 2016, whereas the water quality improved to moderate pollution during May month of 2015 (Table 31). The heavy pollution was indicated by dominance of Chironominae>*Lymnaea accuminata>Sinictinogomphus>Diplonychus> Corbicula bensoni>Anopheles larva* etc. Whereas, during May the species composition in River Ganga changed to *Lymnaea accuminata>Digonistoma pulchella>Orthetrum albistylum speciosum> Nannophya*>Chironominae> *Agriocnemis lacteola>Stenothyra ornata>Corixa* (Figure 31a, 31b). Waste water joins River Ganga through Mandir drian outlet at Nabadwip.

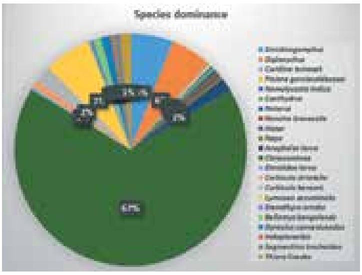


Figure 31b	WB 14	28. 2 2016	Nabadwip downstream

Table 32 Tribeni

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 15	Upstream Tribeni	21.5.2016	4.46	0.36	D	Heavy Pollution	Orange
WB 16	Upstream Tribeni Transmission tower	21.5.2015	5.03	0.54	C	Moderate Pollution	Green
		3.3.2016	4.86	0.78	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Tribeni

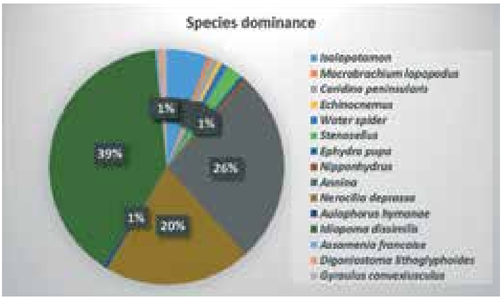


Figure 32a	WB 15	21.5.2015	Tribeni

TRIBENI: Heavy pollution was observed in River Ganga at upstream of Tribeni during May 2016 (Table 32). The species composition in River Ganga showed dominance sequence of *Idiopoma dissimilis>Anina>Novaculina deprassa> Isolapotamon* (Figure 32a). Biological water quality in River Ganga at Transmission tower on upstream Tribeni, improved to moderate pollution during May 2015 with relatively higher saprobic score but during March 2016 moderate pollution in River Ganga showed decrease in saprobic score. During May, the species dominated by *Idiopoma dissimilis>Cirolana parva>Stenasellus>Bellamya bengalensis>Sesarmops*. Whereas, during March 2016 species composition was *Thiara (Tarebia) lineata>Melanoides tu berculatus>Sesarmoides>Alboglossiphonia weberi, Bellamya bengalensis> Perithelphusa juvenile>Thiara (Sermyla) requeti>Assaminea fraincaise* at the same location (Figure 32b,32c). There are two drains namely, ITC outfall and Kesoram drain carrying waste water from Tribeni, to River Ganga.

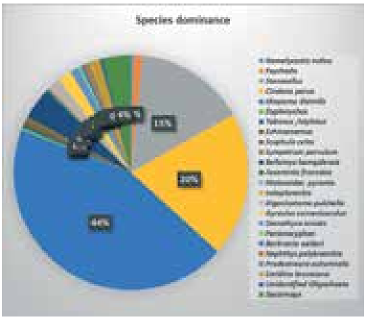


Figure 32b	WB 16	21.5.2015	Upstream Tribeni, Transmission tower

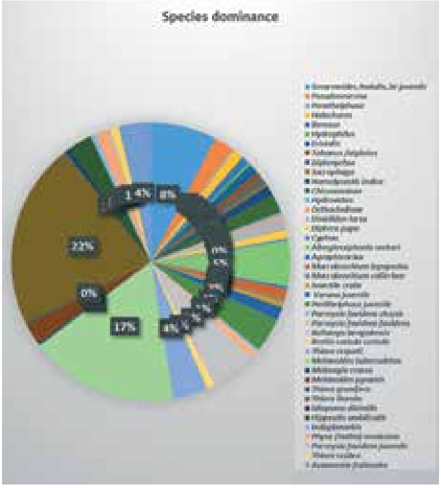


Figure 32c	WB 16	3.3. 2016	Upstream Tribeni, Transmission tower

Table 33 Chinsurah

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 17	Chinsurah	21.5.2015	5.72	0.73	C	Moderate Pollution	Green
		3.3.2016	5.30	0.52	C	Moderate Pollution	Green

CHINSURA: Moderate pollution was observed in River Ganga at Chinsurah during May 2015 and March 2016. The saprobic score in River Ganga was higher at this location during May compared to March (Table 33). The dominant species encountered during May, were in sequence of *Assaminea fraincaise>Brotia costula costula>Idiopoma dissimilis>Melanoides pyramis >Perithelphusa>Stenasellus*. During March month the sequence of dominant species was *Idiopoma dissimilis>Thiara (Tarebia) lineata>Manayunkia/ Brandtika>Sesarmoides* (Figure 33a, 33b). Water quality of River Ganga is affected by two drains namely, Majher rasta drain and drain near Harumandal ghat in Chinsurah.

Biological composition of benthic macro-invertebrates in River Ganga at Chinsurah

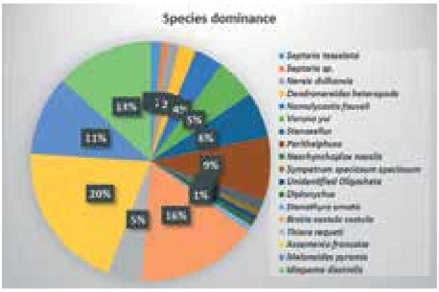


Figure 33a	WB 17	21.3. 2015	Chinsurah

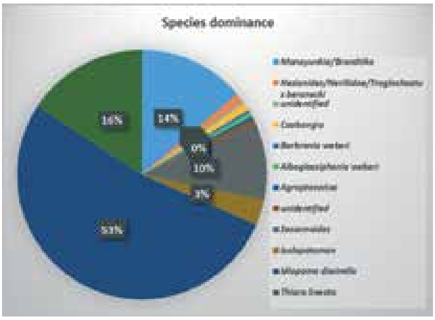


Figure 33b	WB 17	3.3. 2016	Chinsurah

Table 34 Palta

Location Code	**Location name**	**Month/ year**	**Saprobic score**	**Diversity score**	**BWQC**	**Biological water quality**	**Indicator colour**
WB 19	Palta water intake	18.5.2015	4.83	0.87	C	Moderate Pollution	Green
		27.2.2016	5.04	0.65	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Palta

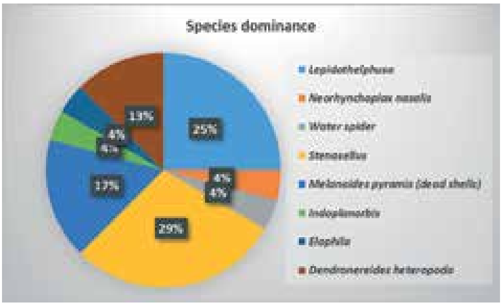


Figure 34a	WB 19	18.5. 2015	Palta Water Intake

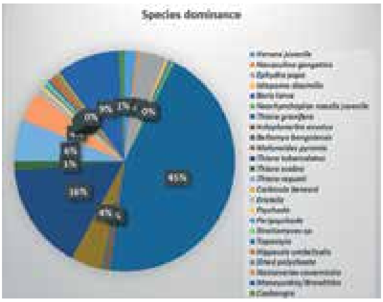


Figure 34b	WB 19	27. 2.2016	Palta Water Intake

PALTA: Moderate pollution was observed in River Ganga at Palta water intake during May 2015 and February 2016 with higher saprobic score during February (Table 34). The dominant species during May indicated a decreasing trend of *Lepidothelphusa*> *Stenasellus*>*Melanoides pyramis*>*Dendronereides heteropoda* whereas the sequence was different in February such as *Thiara granifera*>*Melanoides tuberculatus*>*Manayunkia/ Brandtika*>*Thiara (Sermyla) requeti*>*Corbicula bensoni* >*Melanoides pyramis* >*Ephydra pupa* (Figure 34a,34b). S.P. Bunglow drain which is a part of Palta and Barrakpore, joins River Ganga at Palta.

Table 35 Serampore

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 21	Downstrem Serampore, Ghat	22.5.2015	5.69	0.66	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Serampore

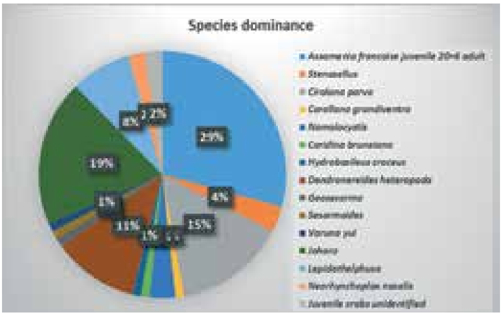


Figure 35a	WB 21	22.5.2015	Serampore

SERAMPORE: Moderate pollution was observed in biological water quality of River Ganga at downstream of Serampore at Ghat, during May 2015 (Table 35). The dominant species of benthic macro-invertebrates at this location included *Assamenia fraincaise juvenile>Johora>Cirolana parva>Dendronereides heteropoda>Lepidothelphusa* (Figure 35a). Waste water joins River Ganga through Ganga darshankhal and drain at Bhagirathi lane, Mahesh in Serampore.

Table 36 Belgharia

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 23	Belgharia	18.5.2015	6.0	0.33	C	Moderate Pollution	Green
		27.2.2016	High tide	No collec tion			

Biological composition of benthic macro-invertebrates in River Ganga at Belgharia

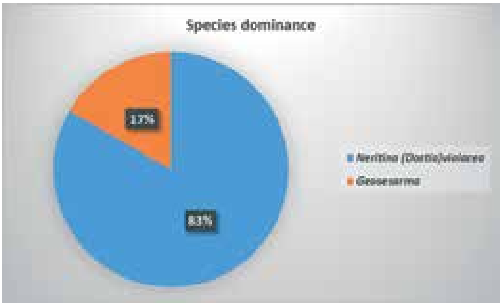


Figure 36a	WB 23	18.5.2015	Belgharia

BELGHARIA: Moderate pollution was observed in biological water quality of River Ganga at Belgharia during May 2015 with a higher saprobic score (Table 36). Few species were collected from River Ganga at this location with dominance of *Neritina (Dostia)violacea>Geosesarma* (Figure 36a). There was no collection of freshwater benthic macro-invertebrate species in River Ganga at Belgharia, due to high tidal influence during February 2016.

Table 37 Kolkata/Howrah

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 25	Bali bridge	18.5.2015	0.0	0.0 high tide		No collection	
		23.2.2016	4.6	0.53	C	Moderate Pollution	Green
WB 31	Bata Nagar	27.2.2016	4.56	0.55	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Kolkata/Howrah.

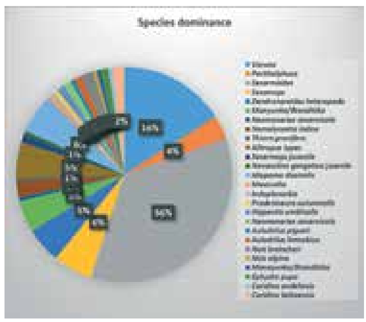


Figure 37a	WB 25	23.2.2016	Kolkata/Howrah

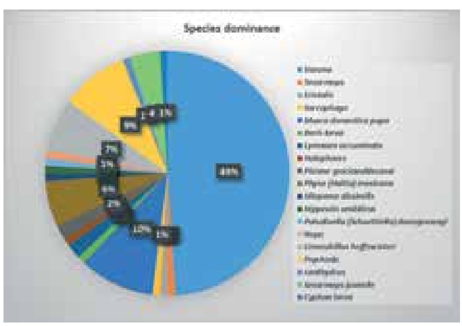


Figure 37b	WB 31	27.2.2016	Kolkata/Howrah

UPSTREAM KOLKATA/HOWRAH: Moderate pollution in biological water quality was observed in River Ganga at upstream Kolkata/Howrah at Bali bridge, during February 2016 (Table 37). There was no collection of benthic macro-invertebrates in River Ganga during May 2015 due to high tidal influence. The species composition, during February 2016, composed of *Sesarmoides>Varuna>Sesarmops>Idiopoma dissimilis>Dendronereides heteropoda>Alitropus typus>Manayunkia/ Brandtika* (Figure 37a,37b). Waste water join River Ganga in vicinity of Kolkata through a number of drains namely, Tolly nullah, Dhankheti khal, drain at James Prinsep Ghat, drain at Judge ghat, Akhra food ghar drain, Muni khali khal and Nimtala khal. In Hawrah, waste water joins River Ganga through drain near Ramkrishna ghat, drain near Chintamani ghat, drain near Golabari launch ghat and Shalimar coal depot.

Table 38 Uluberia

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 32	Near Kalibari	25.2.2016	6.0	0.47	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Uluberia

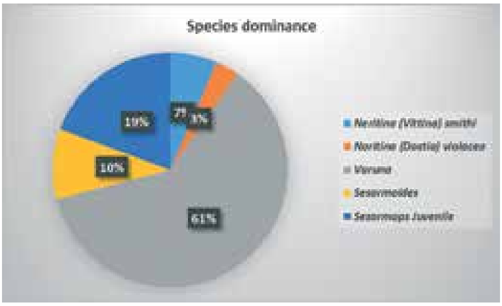


Figure 38a	WB 32	25.2.2016	Uluberia, near Kali Bari

ULUBERIA: Moderate pollution in biological water quality was observed in River Ganga near Kalibari at Uluberia during February 2016 (Table 38). The dominant species observed included *Varuna>Sesarmops juvenile>Sesarmoides>Neritina (vittina)smithi>Neritina (Dostia) violacea* (Figure 38a).

Table 39 Falta

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 34f	Falta	26.2.2016	5.40	0.57	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Falta

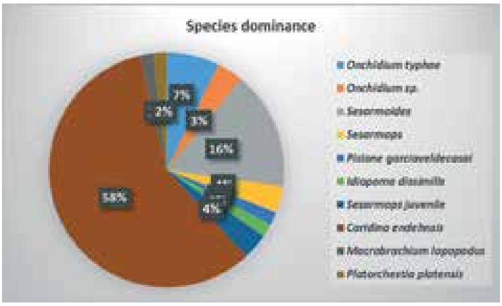


Figure 39a	WB 34F	26.2.2016	Falta

FALTA: Moderate pollution was observed in River Ganga at Falta, during February 2016 (Table 39). The dominant species encountered at this location were, *Caridina endehnsis>Sesarmoides>Onchidium typhae>Onchidium sp.>Sesarmops juvenile* (Figure 39a).

Table 40 Diamond Harbour

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 34	Diamond Harbour	29.5.2015	5.61	0.58	C	Moderate Pollution	Green
		26.2.2016	5.45	0.59	C	Moderate Pollution	Green

DIAMOND HARBOUR: Moderate pollution was observed in River Ganga before confluence to Bay of Bengal at Diamond Harbour during May 2015 and February 2016. The saprobic score was higher during May as compared to February (Table 40). The dominant species during May included *Macrobrachium idae>Caridina endehensis>Sesarmoides>Perithelphusa >Salangathelphusa juvenile>Macrobrachium lopopodus* (Figure 40a) and *Gangemysis assimilis>Dugesia>Neoniphargus>Varuna>Sesarmoides* were dominant species during February 2016.

Biological composition of benthic macro-invertebrates in River Ganga at Diamond Harbour

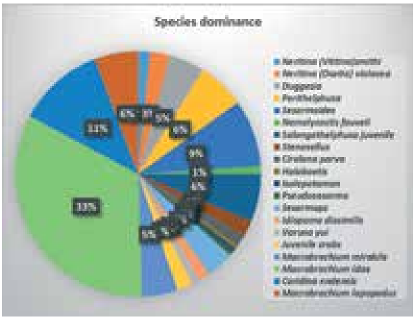


Figure 40a	WB 34	29.5.2015	Diamond Harbour

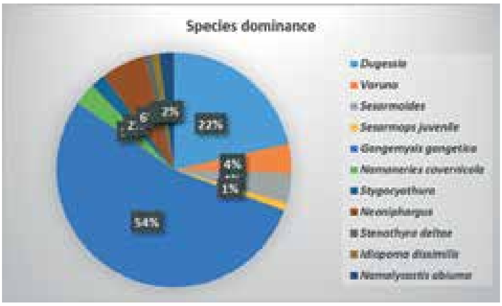


Figure 40b	WB 34 Jelly fishes were collected from this location	26.1.2016	Diamond Harbour

Table 41 Haldia

Location Code	Location name	Month/ year	Saprobic score	Diversity score	BWQC	Biological water quality	Indicator colour
WB 35	Haldia	24.2.2016	5.35	0.65	C	Moderate Pollution	Green

Biological composition of benthic macro-invertebrates in River Ganga at Haldia

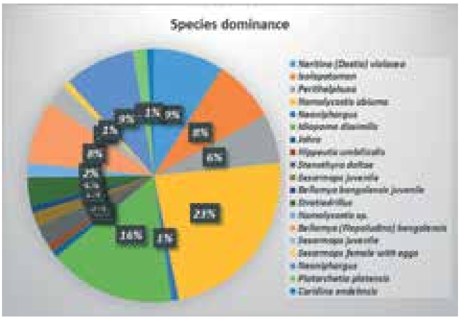


Figure 41a	WB 35	24.2.2016	Haldia

HALDIA: Moderate pollution was observed in River Ganga at Haldia, during February 2016 (Table 41). The dominant species of benthic macro-invertebrates at this locations, were *Nemalycastis abiuma>Idiopoma dissimilis>Neritina (Dostia) violacea>Neoniphargus>Bellamya (Filopaludina) bengalensis>Isolapotamon>Perithelphusa* (Figure 41a). In Haldia, waste water joins River Ganga through Greenbelt canal.

9 Bio-assessment of River Ganga in Ecological Habitats of Gangetic dolphin *(Platanista gangetica)*

Gangetic dolphin *(Platanista gangetica)* is the national aquatic animal. Its presence in river water indicated biological health of River Ganga. Biological water quality has been assessed in various stretches of River Ganga, where dolphin population has been recorded by WWF. A background information has been collected to understand requirement of water quality of Gangetic dolphins in River Ganga.

9.1 Gangetica dolphin *(Platanista gangetica)* Background

The Gangetic dolphin, (*Platanista gangetica gangetica*) is one of the most charismatic mega-fauna of the Indian subcontinent. There are three recognised obligate species of river dolphins, which inhabit rivers and estuaries in Asia and South America, and all are among the most engdangered cetaceans on earth. One species, the 'baiji' or Chinese River Dolphin, was declared functionally extinct In 2006 as reported by Turney et al 2007; Hopkin 2007. The remaining species are the Amazon River Dolphin, The Gangetic Dolphin and the Indian River Dolphin. Although some marine dolphin species are facultative and commonly found in rivers quite far upstream, river dolphins are morphologically and phylogenetically distinct from marine dolphins and most are restricted to fresh water ecosystems. Because rivers are more vulnearable to degradation than the oceans, river dolphins are facing worse situation compared to the marine cetaceans. Due to a continued decline in its population, the IUCN changed its status from 'Vulnerable' to Endangered in 1996. The first efforts in 20th centuary, to document the status and threats faced by Gangetic dolphin, were made under 'River Ganga Action Plan (GAP)I (1985) and II (1991) through research and conservation projects. These provided baseline scientific information about the species, including the fact that habitat degradation, through pollution and reduced water flow, and poaching were threatening its existence. The Than Prime Minister declared the Gangetic dolphin as the national Aquatic Animal in the first meeting of the National River Ganga River Basin Authority (NGRBA) on the 5th of October, 2009. The ministry of Environment and Forest (MoEF) subsequently notified the Gangetic dolphin on the 10th of May 2010. Thus India became the first country in the world to have a cetacean fauna as National Aquatic Animal.

9.2 Factors Responsible for Decline

Numerous factors exist for this decline; the deliberate killing of Gangetic dolphin for oil and meat still occurs. The demand for these products means that there is little incentive for fishermen to reduce the by-catch or to release dolphin that are still alive when they are found entangled in nets. The construction of more than 50 dams and barrages, within the Gangetic dolphines historic range, has drastically altered its habitat and fragmented the mega-population. Construction of embankment as flood control measure in eastern Uttar Pradesh, Bihar and West Bengal has disrupted the connections between the river and its flood plains and wetlands. About 3500 Km. of embankment were constructed in Bihar post-independence resulting in the increase of the flood prone area from 2.5 million ha to almost 7.0 million ha. Similarly, 1811 Km. and 1184 Km. of embankment were constructed in Uttar Pradesh and West Bengal respectively. Embankments interrupt access to the spawning habitat for flood plain dependent fish and eliminate eddy-counter currents where the Gangetic dolphins spend much of their time. Dredging and the removal of stones, sand and woody debris also compromise the ecological integrity of the riverine environment, especially in small tributaries. Increasing pollution in the river may adversely affect dolphin health and their bio-accumulation may have serious consequences. Rapid conservation actions are required before the Gangetic dolphin population declines irreversibly. Freshwater dolphin in Asia, is among the world's most endangered mammals and there is an urgent need to establish conservation priorities based on scientifically credible abundance estimates.

9.3 Importance of the Species

The Gangetic dolphin is an indicator species for the river ecosystem and is placed at the apex of the food chain. It is an endemic and rare aquatic mammal found only in the Indian subcontinent and is part of our natural aquatic heritage.

9.4 Habitat

Water levels in River Ganga, are seasonal in nature. Peak flows occur between July and September when the river is fed by monsoon run-off and Himalayan melt-water, while leanest flows occur from February to March. Flow in River Ganga and tributaries, is regulated and the natural flow regime has been disrupted by the construction of dams and barrages.

9.5 Habitat Preference

Although the Gangetic dolphin is fluviatile in habitat, it may also be found in brackish water, though it never enters the sea. It is generally assumed that salinity defines the downstream limits of its distribution, while physical barriers and low prey densities at high elevations define the upstream limits. Dolphins are abundant in the long stretches of deep water in association with shallow water, meanderings, confluences and mid-channel sand bars. The primary habitats preferred by the Gangetic dolphin are characterised by an eddy-counter current system in the main river flow caused by a point–bar formed from sediments and deposits, a convergent stream branch, or by an upstream meander. They are also found below sand bars and bridges where eddies are formed. Being a mammal, the Gangetic dolphin can survive a wide range of temperature fluctuations. It can tolerate temperature as low as 5ºC in River Karnali in winter in Nepal and as high as 35ºC in summer in the plains of Uttar Pradesh and Bihar. They have also been found in highly turbid water in monsoon and it is thus assumed that the water temperature and turbidity are not significant factors in determining the distribution of the species.

9.6 Habitat Fragmentation

The complex geomorphology of fresh water and esturine systems tend to concentrate the distribution of cetacean in counter-currents associated with confluences, meanders and mid–channel Islands. The Gangetic dolphin population was fragmented by construction of the dams and barrages on the main stem of the River Ganga and its tributaries. Barrages are low gated diversion dams comprised of a series of gates used to control the elevation of an upstream' head pond'. Barrages also restrict the movement of river dolphins and other aquatic mega –fauna, thereby separating them into sub populations. Individuals may occasionally move downstream through barrages. Dolphins in the main channel of River Ganga were split in to two sub-populations in 1975 when Farakka Barrage was commissioned. The lower River Ganga Barrage in Narora (1966) and the middle River Ganga Barrage at Bijnor (1984) further fragmented the River Ganga main stem population in to four sub–populations. Dolphins have now been extirpated above the Middle River Ganga Barrage at Bijnor. Today they occur in three-populations bounded by Bijnor, Narora and Farakka Barrage.

9.8 Conservation Status

This species has been included in schedule 1 of the Indian Wildlife (Protection) Act, 1977, in Appendix -1 of the Convention on International Trade in Endangered species. (CITES), in Appendix II of the Convention on Migratory species (CMS) and categorised as Endangered on the International Union for the Conservation of Nature (IUCN) Red List.

9.9 Body Size

Body size of dolphins, is about 2.0 meter to 2.2 meter in males and 2.4 meter to 2.6 meters in females. At the time of birth, they measure 70–90 centimeters and weigh between 4kg to 7.5 kg. while adults usually weigh between 70kg and 90 kg. An adult female 97-114 kg (2.5 meter length).

9.10 Food and Feeding

Gangetic dolphins are catholic feeders and feed on several species of fishes, invertebrates and possibly tutrtles and birds. Relatively high densities of dolphins are found at sites where river joins or just downstream of shallow stretches, in areas where the current is relatively weak, off the mouths of irrigation canals and near villages and ferry routes.

9.11 Biological Assessment of Water Quality in Wildlife Habitats of Gangetic dolphins in River Ganga

Segment 1- Rudraprayag to Haridwar (Number of Dolphins – NIL)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
1.	UK B	River Ganga at Byasi/ Singtali	-	-	-	-	-	-
			25 April 2016	6.82	0.84	B	Slight pollution	Light Blue
2.	UK 4	u/s Rishikesh, Luxman Jhula	24 June 2014	5.00	0.75	C	Moderate Pollution	Green
			4 November 2015	6.28	0.70	B	Slight pollution	Light Blue
3.	UK 5	Barrage at Rishikesh	25 June 2014	7.30	0.63	A	Clean	Blue
			18 November 2015	6.35	0.57	B	Slight pollution	Light Blue
4.	UK 6	Haridwar Barrage	20 June 2014	6.50	0.79	B	Slight pollution	Light Blue
			3 November 2015	6.28	0.68	B	Slight pollution	Light Blue
5.	UK 7	Dam Kothi on River Ganga Nahar d/s Har-ki-Paori	26 June 2014	8.33	0.25	A	Clean	Blue
			28 October 2015	6.30	0.69	B	Slight pollution	Light Blue
6.	UK 8a (u/s)	River Ganga u/s of STP outlet at Jagjeetpur	-	-	-	-	-	-
			27 October 2015	7.50	0.80	A	Clean	Blue
7.	UK 8b (d/s)	River Ganga d/s of Haridwar JSTP	26 June 2014	3.00	0.03	D	Heavy Pollution	Orange
			27 October 2015	4.86	0.58	C	Moderate Pollution	Green

Segment 2 – Bijnor to Narora (Number of Dolphins – 56)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
26.	UP 1	Balawali Railway & Road Bridge (u/s Bijnor)	December 2014	4.50	0.81	C	Moderate Pollution	Green
			26 April 2016	4.25	0.520	C	Moderate Pollution	Green
27.	UP 2	Madhya Ganga barrage	December 2014	3.70	0.54	C	Moderate Pollution	Green
			26 April 2016	4.17	0.77	C	Moderate Pollution	Green
28.	UP 4	Brij Ghat Road Bridge NH-24 at Garh mukteshwar	December 2014	5.04	0.78	C	Moderate Pollution	Green
			28 April 2016	5.44	0.7	C	Moderate Pollution	Green
29.	UP 6	Bridge at Anupshahr (u/s Anupshahr)	December 2014	5.09	0.89	C	Moderate Pollution	Green
			10 May 2016	4.44	0.658	C	Moderate Pollution	Green
30.	UP 6A	River Ganga d/s of Anupshahr near Mastram Ghat	-	-	-	-	-	-
			16 May 2016	5.36	0.90	C	Moderate Pollution	Green
31.	UP 7	Bridge u/s of Narora at Rajghat	December 2014	4.45	0.79	C	Moderate Pollution	Green
			11 May 2016	4.59	0.85	C	Moderate Pollution	Green
32.	UP 8	Barrage at Narora	December 2014	4.54	0.77	C	Moderate Pollution	Green
			11 May 2016	5.13	0.849	C	Moderate Pollution	Green

Segment 3 – Kachlaghat (Budaun) to Kanpur (Number of Dolphins – 3)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
1.	UP 9	Kachla Ghat Bridge at Badaun	December 2014	5.43	0.77	C	Moderate Pollution	Green
			17 May 2016	5.3	0.80	C	Moderate Pollution	Green

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
2.	UP 14	Bridge at Ghatiaghat, Farrukhabad	January 2015	4.60	0.79	C	Moderate Pollution	Green
			7 June 2016	5.27	0.61	C	Moderate Pollution	Green
3.	UP 18	Bridge at Bithoor	January 2015	5.78	0.71	C	Moderate Pollution	Green
			8 June 2016	5.0	0.675	C	Moderate Pollution	Green
4.	UP 19	Barrage u/s Kanpur	January 2015	5.33	0.78	C	Moderate Pollution	Green
			9 June 2016	4.809	0.70	C	Moderate Pollution	Green
5.	UP 29	Bridge 2 at Kanpur-2 at NH-25	January 2015	4.72	0.46	C	Moderate Pollution	Green
			9 June 2016	4.0	0.76	C	Moderate Pollution	Green
6.	UP DG (UP A)	Dhondhi ghat d/s Kanpur	January 2015	5.50	0.70	C	Moderate Pollution	Green
			9 June 2016	4.75	0.49	C	Moderate Pollution	Green

Segment 4 – Kanpur downstream to Allahabad (Number of Dolphins – 78)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
1.	UP 32	Bridge near Fatehpur	February 2015	4..80	0.73	C	Moderate Pollution	Green
			6 October 2016	5.66	0.59	C	Moderate Pollution	Green
2.	UP 40	Bridge d/s of River Tons near Sirsa	February 2015	6.20	0.61	B	Slight Pollution	Light Blue
			4 October 2016	4.28	0.54	C	Moderate Pollution	Green
3.	UP 41	Bridge on Allahabad Bypass	February 2015	4.78	0.58	C	Moderate Pollution	Green
			6 October 2016	5.25	0.54	C	Moderate Pollution	Green
4.	UP 44	Bridge Lord Curzen Allahabd Right	February 2015	5.05	0.61	C	Moderate Pollution	Green
			5 October 2016	5.14	0.666	C	Moderate Pollution	Green

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
5.	UP 47	Bridge on NH-2 right	February 2015	5.10	0.54	C	Moderate Pollution	Green
			5 October 2016	5.42	0.50	C	Moderate Pollution	Green
6.	UP AL-1	Bridge near village Mahewa Kalan Kachar, Dengurpur	February 2015	5.11	0.56	C	Moderate Pollution	Green
			4 October 2016	5.66	0.42	C	Moderate Pollution	Green

Segment 5 – Allahabad downstream to Ghazipur (Varanasi downstream) (Number of Dolphins – 172)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
1.	UP 49	Bridge SH-74 u/s Varanasi	12 March 2015	4.40	0.56	C	Moderate Pollution	Green
			20 October 2016	5.41	0.65	C	Moderate Pollution	Green
2.	UP 51	Bridge at Ramnagar Road near Varanasi	10 March 2015	5.26	0.53	C	Moderate Pollution	Green
			19 October 2016	5.0	0.58	C	Moderate Pollution	Green
3.	UP 53	Bridge NH-2 at Varanasi (Rajghat)	10 March 2015	4.55	0.53	C	Moderate Pollution	Green
			19 October 2016	5.30	0.47	C	Moderate Pollution	Green
4.	UP 54	Bathing Ghat-1, Varanasi	12 March 2015	4.90	0.59	C	Moderate Pollution	Green
			19 October 2016	4.90	0.68	C	Moderate Pollution	Green
5.	UP III*	Vindhyachal Ghat, Mirzapur u/s	11 March 2015	5.11	0.62	C	Moderate Pollution	Green
			20 October 2016	5.80	0.61	C	Moderate Pollution	Green
6.	UP IV	Mirzapur d/s, a/c of two drains	11 March 2015	4.90	0.62	C	Moderate Pollution	Green
			20 October 2016	5.76	0.68	C	Moderate Pollution	Green

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
7.	UP G	Tarighat d/s Ghazipur	13 March 2015	4.65	0.54	C	Moderate Pollution	Green
			18 October 2016	5.61	0.59	C	Moderate Pollution	Green

Segment 6 – Buxar to Bhagalpur downstream (Number of Dolphins – 808)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
12.	BH3 (I) (BH 3 in round 1)	Chausa water intake point u/s Buxar	28 April 2015	4.81	0.71	C	Moderate Pollution	Green
			29 December 2015	5.0	0.61	C	Moderate Pollution	Green
13.	BH3	Bridge at Buxar, d/s of Buxar	-	-	-	-	-	-
			29 December 2015	5.35	0.62	C	Moderate Pollution	Green
14.	BH5	Bridge near Danapur Patna 2 (Digha rail bridge)	27 April 2015	6.11	0.40	C	Moderate Pollution	Green
			31 December 2015	5.25	0.66	C	Moderate Pollution	Green
15.	BH 12 D/S	Bridge Mahatma Gandhi right near Gai Ghat	27 April 2015	5.08	0.76	C	Moderate Pollution	Green
			28 December 2015	3.71	0.16	D	Heavy pollution	Orange
16.	BH 12 U/S	Gandhi Ghat u/s of Mahatma Gandhi Setu	27 April 2015	4.83	0.74	C	Moderate Pollution	Green
			-	-	-	-	-	-
17.	BH -M	River Ganga at Mokamah near Hatidah Rail bridge	-	-	-	-	-	-
			30 December 2015	5.86	0.55	C	Moderate Pollution	Green
18.	BH V	Kastharni Ghat at Munger Fort area (u/s Munger)	-	-	-	-	-	-
			12 January 2016	5.61	0.63	C	Moderate Pollution	Green

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
19.	BH VI	River Ganga near Sitakundih Village d/s Munger	-	-	-	-	-	-
			12 January 2016	5.68	0.75	C	Moderate Pollution	Green
20.	BH S	River Ganga at Sultanganj near Jahaz Ghat	-	-	-	-	-	-
			12 January 2016	5.45	0.58	C	Moderate Pollution	Green
21.	BH13	River Ganga at Barari Ghat Bhagalpur	-	-	-	-	-	-
			15 January 2016	6.0	0.68	B	Slight Pollution	Light Blue

Segment 7 – Bhagalpur downstream to Farakka (Number of Dolphins – 24)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
1.	BH K	River Ganga at Kahalgaon	13 January 2016	5.38	0.5	C	Moderate Pollution	Green
			-	-	-	-	-	-
2.	JH 1	Brahampur Ghat (u/s Sahibganj)	14 January 2016	4.95	0.74	C	Moderate Pollution	Green
3.	JH 2	Jahazghat near Water Intake Point (d/s Sahibganj	14 January 2016	5.62	0.71	C	Moderate Pollution	Green
4.	JH 3	Mangal Haat Syed Bazar, u/s Rajmahal	14 January 2016	3.76	0.90	C	Moderate Pollution	Green
5.	JH 4	Ferryghat d/s Rajmahal	14 January 2016	4.81	0.83	C	Moderate Pollution	Green
6.	WB1	Farakka Barrage (u/s of Barrage)	26 May 2015	6.33	0.79	B	Slight Pollution	Light Blue
			29 February 2016	5.27	0.88	C	Moderate Pollution	Green
7.	WB2	Farakka FTPS	27 May 2015	5.00	0.73	C	Moderate Pollution	Green
			29 February 2016	5.57	0.45	C	Moderate Pollution	Green

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
8.	WB3	River Ganga d/s of FTPS Farakka	27 May 2015	6.42	0.76	B	Slight Pollution	Light Blue
			29 February 2016	4.74	0.58	C	Moderate Pollution	Green

Segment 8 – D/s Farakka to Tribeni (West Bengal) (Number of Dolphins – 119)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
1.	WB4	River Ganga upstream of outlet to natural river	-	-	-	-	-	-
			29 February 2016	5.1	0.87	C	Moderate Pollution	Green
2.	WB5	First inlet stream (Falgu river) from West on NH-34 d/s Farakka	-	-	-	-	-	-
			27 February 2016	5.6	0.81	C	Moderate Pollution	Green
3.	WB6	Second inlet stream on Miapur-Ajgarpura Road bridge	-	-	-	-	-	-
			27 February 2016	5.1	0.67	C	Moderate Pollution	Green
4.	WB7	River Ganga at Raghunath ganj near bridge	27 May 2015	6.14	0.63	B	Slight pollution	Light Blue
			27 February 2016	5.55	0.79	C	Moderate Pollution	Green
5.	WB9	River Ganga u/s of Jiaganj	27 May 2015	5.47	0.67	C	Moderate Pollution	Green
			-	-	-	-	-	-
6.	WB10	River Ganga at Road bridge at Behrampore	-	-	-	-	-	-
			26 February 2016	5.94	0.65	C	Moderate Pollution	Green
7.	WB11	River Ganga at d/s of Murshidabad (d/s Behrampore) near Begpur Village	27 May 2015	4.65	0.70	C	Moderate Pollution	Green
			27 February 2016	5.86	0.58	C	Moderate Pollution	Green

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
8.	WB12	River Ganga at Kalyanpur after confluence with Bablah Nallah	-	-	-	-	-	-
			26 February 2016	5.25	0.71	C	Moderate Pollution	Green
9.	WB13	River Ganga at Katwa	23 May 2015	5.14	0.47	C	Moderate Pollution	Green
			25 February 2016	5.58	0.74	C	Moderate Pollution	Green
10	WB14	River Ganga d/s of Nabadwip	23 May 2015	4.90	0.81	C	Moderate Pollution	Green
			28 February 2016	4.73	0.40	D	Heavy Pollution	Orange
11.	WB15	River Ganga u/s of Tribeni	21 May 2015	4.46	0.36	D	Heavy Pollution	Orange
			-	-	-	-	-	-
12.	WB16	River Ganga at transmission tower u/s of Tribeni	21 May 2015	5.03	0.54	C	Moderate Pollution	Green
			3 March 2016	4.86	0.78	C	Moderate Pollution	Green

Segment 9 – D/s Tribeni to Diamond Harbour/Haldia (Number of Dolphins – 97)

Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
1.	WB17	River Ganga at Chinsurah	21 May 2016	5.72	0.73	C	Moderate Pollution	Green
			3 March 2016	5.30	0.52	C	Moderate Pollution	Green
2.	WB19	River Ganga at Palta water intake	18 May 2015	4.83	0.87	C	Moderate Pollution	Green
			27 February 2016	5.04	0.65	C	Moderate Pollution	Green
3.	WB21	Ghat d/s of Serampore	22 May 2015	5.69	0.66	C	Moderate Pollution	Green
			-	-	-	-	-	-

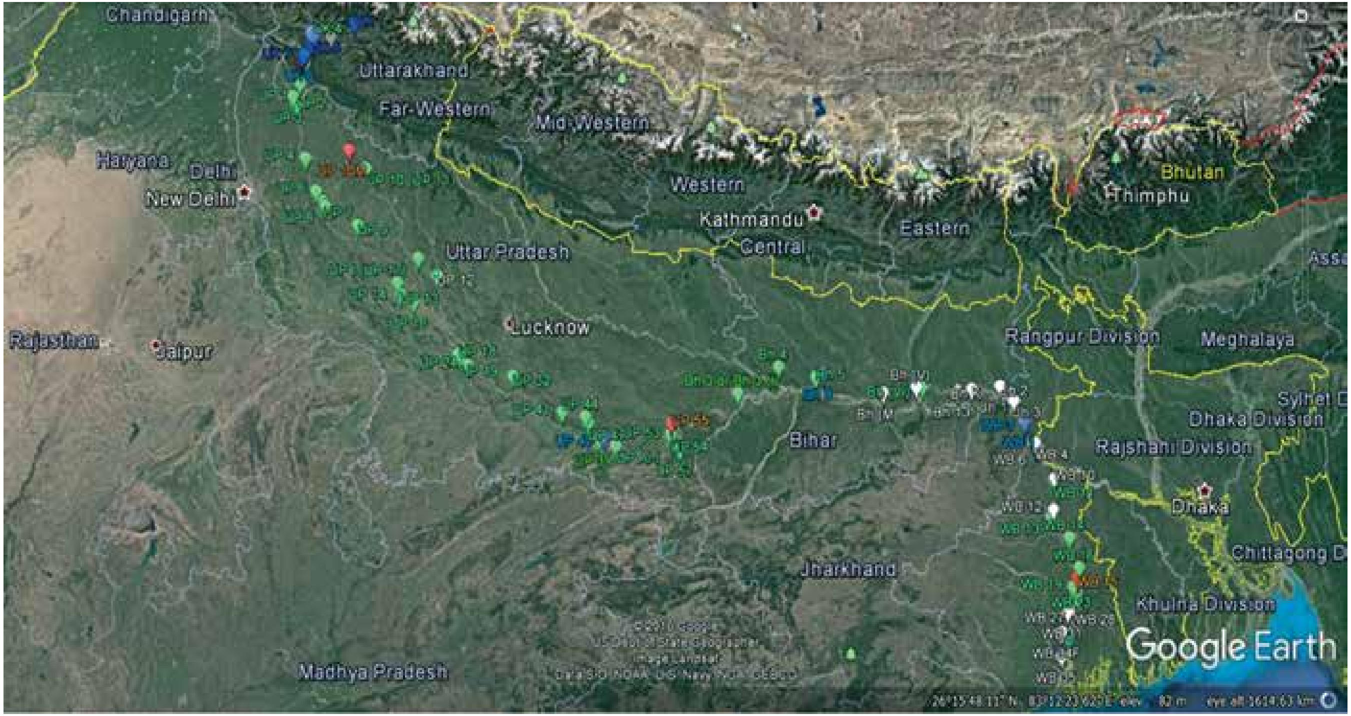
Sr. No.	Location Code	Location Name	Month & Year of sampling	Saprobic score	Diversity score	BW QC	Biological water quality	Indicator colour
4.	WB23	River Ganga at Belgharia	18 May 2015	6.00	0.33	C	Moderate Pollution	Green
			27 February 2016	0.00	0.00	-	No Collection	High Tide
5.	WB 25	River Ganga at Bali bridge	18 May 2015	0.00	0.00	-	No Collection	High Tide
			23 February 2016	4.60	0.53	C	Moderate Pollution	Green
6.	WB 27	River Ganga at Howrah Bridge	-	-	-	-	-	-
			25 February 2016	6.0	0.38	C	Moderate Pollution	Green
7.	WB 28	Shibpur Ghat near Vidyasagar Setu	-	-	-	-	-	-
			23 February 2016	6.0	0.87	B	Slight Pollution	Light Blue
8.	WB 31	River Ganga at Bata Nagar	-	-	-	-	-	-
			27 February 2016	4.56	0.55	C	Moderate Pollution	Green
9.	WB 32	River Ganga near Uluberia (Near Kalibari)	-	-	-	-	-	-
			25 February 2016	6.0	0.47	C	Moderate Pollution	Green
10.	WB 34F	River Ganga at Falta	-	-	-	-	-	-
			26 February 2016	5.40	0.57	C	Moderate Pollution	Green
11.	WB 34	River Ganga at Diamond Harbor	29 May 2015	5.61	0.58	C	Moderate Pollution	Green
			26 February 2016	5.45	0.59	C	Moderate Pollution	Green
12.	WB 35	River Ganga at Haldia	-	-	-	-	-	-
			24 February 2016	5.35	0.65	C	Moderate Pollution	Green

10 Bio-mapping of River Ganga

Bio-monitoring or biological monitoring is generally defined as the systematic use of living organisms or their responses to determine the condition or changes of the environment. Bio-monitoring is a valuable assessment tool that is receiving increased use in water quality monitoring programs of all types. Bio-monitoring serves for bio-assessment of the health of freshwater body and an impact of pollution on aquatic life which in turn determines suitability of water for human consumption. It also indicates the migration and disappearance of native species due to various hydrological interventions and suggests the nature and extent of pollution due to domestic and industrial waste. Benthic macro-invertebrates are the best suitable indicators of surface water quality. Their presence in water body having high saprobic and diversity score ensures better water quality. Lower score determines deterioration in water quality.

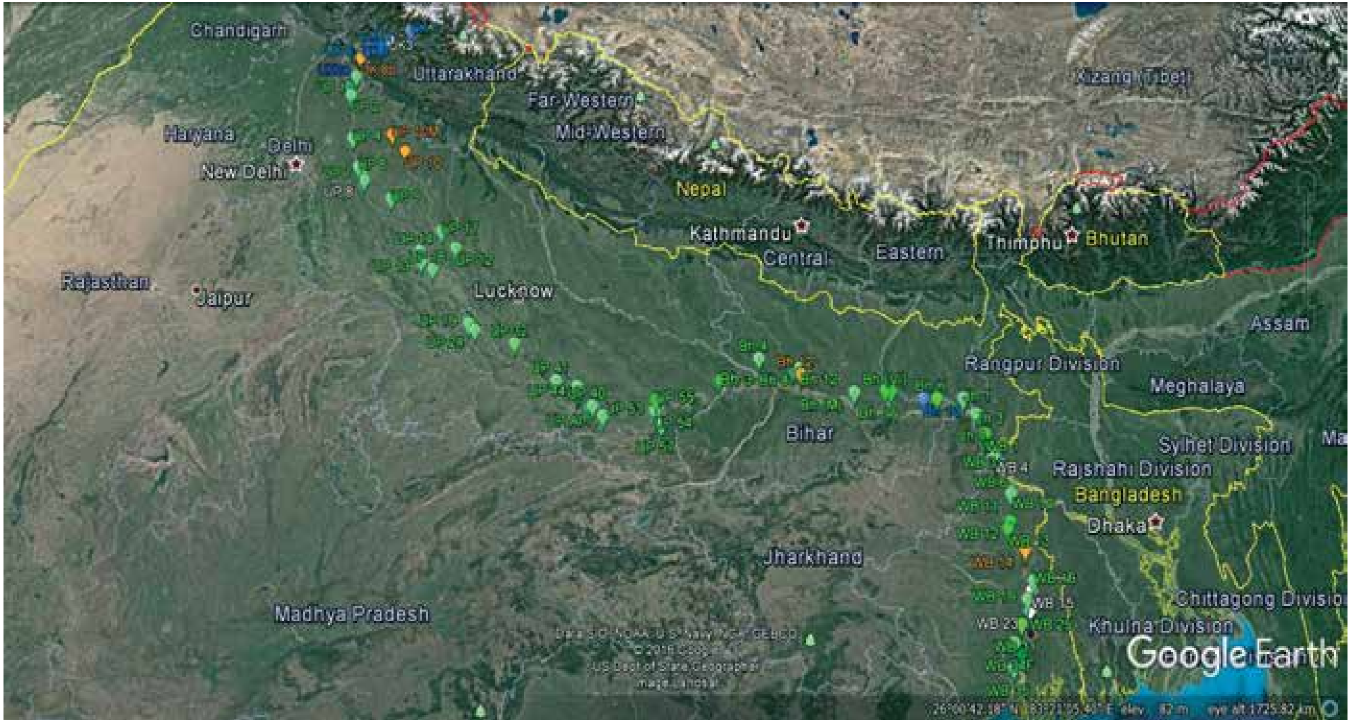
Bio-mapping based on bio-monitoring is a quick, easy, compact and comprehensive way of depicting the biological water quality status and ecosystem health of freshwater body. Bio-maps of entire stretch of River Ganga has been obtained which provided a comparative information on seasonal change in locational biological water quality status of an entire stretch of River Ganga during 2014-2015 and 2015-2016 (Bio-map 10.1, 10.2). Clean and Slight pollution water quality status of locations on River Ganga based on Biological Water Quality Criteria (BWQC), is shown by blue and light blue indicator colour of place-marks respectively (Bio-map 10.1, 10.2). The green indicator colour of place-marks in bio-map, depicted moderate pollution in biological water quality status of River Ganga, observed at various locations. Orange and red indicator colour of place–marks shown on bio-map, indicated locations having heavy and severe pollution in biological water quality status of River Ganga (Bio-map 10.1, 10.2). White colour of place – marks indicated sampling not done for the locations visited but could not be assessed for biological water quality due to unsuitable field conditions during bio-monitoring (Bio-map 10.1, 10.2).

Bio-map 10.1 Location-wise Biological Water Quality Status of River Ganga (2014-15)



Clean Slight Pollution Moderate Pollution Heavy Pollution Severe Pollution Not Done (ND)

Bio-map 10.2 Location-wise Biological Water Quality Status of River Ganga (2015-16)



Clean | Slight Pollution | Moderate Pollution | Heavy Pollution | Severe Pollution | Not Done (ND)

11 Seasonal and Locational Variation in Field Parameters of River Ganga

11.1 WATER FLOW

Water quality varies naturally with the spatio-temporal variation of water flow i.e. the flow regime. Flow regime takes into account that flowing water affects ecosystem in different ways depending on the season and level of discharge e.g. contrasting events such as flood and low flow relate to different combination of biota in river. Worldwide, biota have adapted to the variation in these variables. Many anthropogenic activities impact natural river environment and may lead to change in community structure of macro-zoobenthos inhabiting river substratum. Thus, water flow rate is an important parameter that affects quality of river water. It is measured in meter/ second denoted by 'm/s'.

In high altitudes of Himalayas (Table 5.1), water flow was observed to be higher than all other states. In summer sampling, flow rate was higher than winter. At River Alaknanda after confluence with River Mandakini d/s of Rudraprayag (UK 1), River flow attained highest rate (3.0 m/s during summer and 2.5 m/s in winter). In summer, flow rate is observed to be almost constant at 1.1 m/s while during winter, slight variation from 0.4 m/s to 0.6 m/s was observed (Figure 11.1a).

River Ganga in Uttar Pradesh, covers largest stretch of about 1140 Km. Sampling was carried out on 39 locations on entire stretch of River Ganga in Uttar Pradesh. For the sake of graphic representation, river stretch has been divided into 4 segments. The river segment from Haridwar to Narora is depicted as UP NH segment from Haridwar to Narora, which included, 10 locations. The river segment from Narora to Kanpur is designated as UP NK which included 9 locations. River segment starting from Kanpur to Allahabad is designated as UP KA which covered 10 locations. River segment from Allahabad to Varanasi is designated as UP AV which included 10 locations.

In UP HN segment from Haridwar to Narora, river flow was at comparatively slower rate than in Uttarakhand. At one location i.e. Barrage at Narora (UP 8), river flow was observed to be very low (0.04m/s) than rest of the locations. This may be due to the Narora Barrage at this location. At other locations, flow decreased from 0.77 to 0.37 m/s as expected with decreasing latitude and longitude of locations (Figure 11.1b), (Table 5.2).

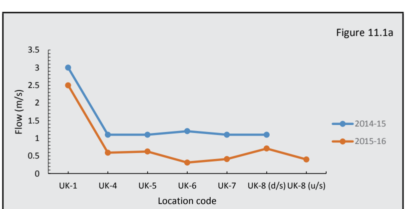
In UP NK segment, from Narora to Kanpur, there was not much difference in summer and winter river flow. In winter, flow varied from 0.31 to 0.43 m/s. Respective flow values in summer, were 0.21 to 0.41 m/s. High flow rate of

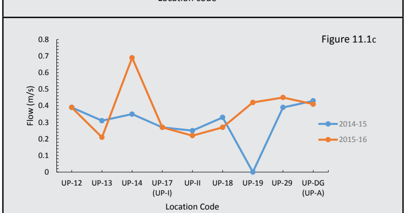
0.69 m/s was observed at Bridge at Ghatiaghat, Farrukhabad (UP 14) location during summer sampling (Figure 11.1c).

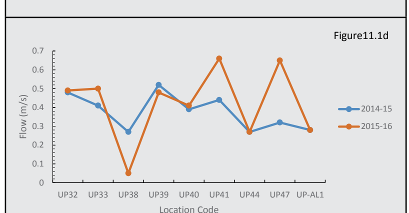
In UP KA segment from Kanpur to Allahabad, winter flow rate varied between 0.48 to 0.27 m/s (Figure 10.1d) while in UP AV segment, from Allahabad to Varanasi, flow rate decreased and varied between 0.17 to 0.43 m/s (Figure 10.1e). During summer season (2015–16), river flow rate was found to be comparatively higher at all the locations. One location which is confluence of River Ganga with River Yamuna, flow rate was lowest i.e. 0.05 m/s. At other locations river flow rate varied from 0.27m/s to 0.65m/s.Water flow rate in UP AV segment of River Ganga, from Allahabad to Kanpur, during summer season (2015-16) varied between 0.1m/s to 0.67m/s.

Flow data of summer sampling (2014-15) in Bihar and in West Bengal stretch, was not available. In winter sampling in Bihar stretch, river flow rate was observed to vary from 0.30 to 0.67 m/s. An anomaly in flow rate (1.0 m/s) was observed at River Sone at Koilwar near rail-road bridge (BH SK) location, one of the tributary of River Ganga at 60 meter above mean sea level (Table 5.3), (Figure 11.1 f).

In Jharkhand stretch of River Ganga, summer sampling in 2014-15 has not been done. In winter (January 2015), almost uniform flow rate ranging from 0.12 to 0.15 m/s, was observed at all locations on River Ganga in Jharkhand state, at an altitudinal variation ranging from 29 to 27 msl ((Table 5.4), (Figure 11.1 g). In West Bengal stretch, a large variation in flow was observed. Flow rate varied from 0.1 to 0.74 m/s. A sudden increase in flow rate of 0.72 m/s at Farakka FTPS (WB 2) location may be due the discharge from nearby thermal power plant. Anomalous increase of flow in River Ganga at Howrah Bridge (WB 27), Shibpur Ghat near Vidyasagar Setu (WB 28), River Ganga at Bata Nagar (WB 31) and River Ganga near Uluberia (Near Kalibari) (WB 32) may be due to low tidal effect (Table 5.5), (Figure 11.1.h).







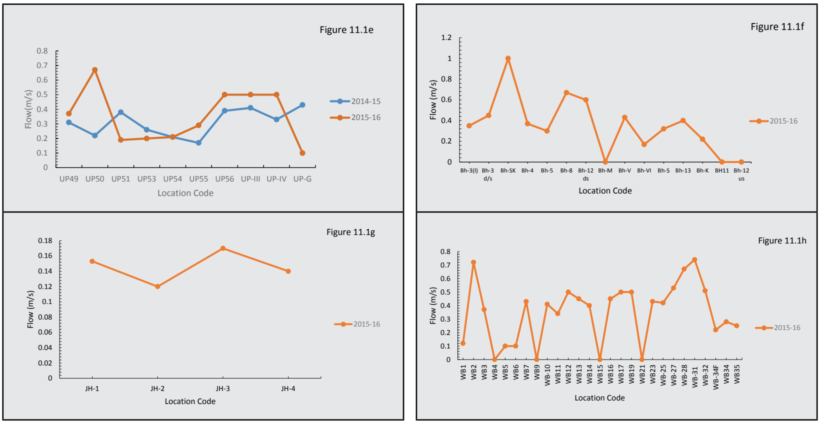


Figure 11.1 Seasonal and locational variation in water flow of River Ganga in (a) Uttarakhand (b) Uttar Pradesh- Haridwar to Narora (c) Uttar Pradesh- Narora to Kanpur (d) Uttar Pradesh- Kanpur to Allahabad (e) Uttar Pradesh- Allahabad to Varanasi (f) Bihar (g) Jharkhand (h) West Bengal

11.2 WATER TEMPERATURE

Temperature is an objective comparative measurement of hotness or coldness of the water body. In the present study, it is measured using a calibrated thermometer and expressed in degree celsius denoted by °C. Water temperature is one of the most important factor that determines benthic macro-invertebrate community structure. Seasonal temperature alteration influences the taxonomic composition and abundance of benthic macro-invertebrate fauna. Sudden and abrupt thermal changes may result in complete depletion of benthic invertebrate communities. So, temperature is an important physical parameter to study in bio-monitoring of river water.

Present study was carried out during June 2014 to October 2016. Samples were collected twice i.e. summer and winter in summer and winter (monsoon season was excluded due to flooding in river).

In 310 km long Uttarakhand stretch of River Ganga, summer sampling was done at all selected locations during June-July 2014 while winter sampling during October–November 2015. In summer sampling, water temperature varied between 17-21.5°C. Temperature range in winter sampling was observed to be 12-19°C (Figure 11.2a).

In Uttar Pradesh, which covers largest, 1,140 km. stretch of River Ganga, sampling was done at 39 locations. For the purpose of presentation, complete stretch was divided into 4 segments. The river segment from Haridwar to Narora was represented as UP HN. This segment included 10 bio-monitoring locations. At all locations, winter sampling was done during December 2014 and observed temperature range was 10-19°C. Summer sampling was done during April-May 2016. Water temperature varied between 26-35°C (Figure 11.2b). The river segment from Narora to Kanpur is designated as UP NK. This segment includes 9 bio-monitoring locations. One of the location i.e. River Ramganga before confluence with River Ganga was thought to be important from pollution status point of view, so, sampling was done at this location in second round of bio-monitoring. Water temperature range in winter sampling during January 2015 was 11-17°C. Summer sampling was done In June 2016 and UP NK segment of River Ganga from Narora to Kanpur, experienced highest range of water temperature between 30 – 38 0 C (Figure 11.2 c). The river segment which flows from Kanpur to Allahabad, was designated as UP KA and this segment covered 10 bio-monitoring locations. In this segment, winter sampling was done in February 2015 with observed water temperature range was 16-21°C. Summer sampling was done in October 2016 (Figure 11.2d) where water temperature was observed to be same at all locations and varied from 30˚C-33˚C. Further downstream towards Bihar, the river segment which flows from Allahabad to Varanasi, was cognominated as UP AV. This segment encompassed 10 bio-monitoring locations. At all locations, winter sampling was done during March 2015. Water temperature range in this segment was 19-27°C. In summer season (2015-16) temperature ranged between 29˚C to 34˚C at all locations of this segment (Figure 11.2e).

About 445 Km. long stretch of River Ganga which flows through Bihar state, included 13 bio-monitoring locations. Summer sampling was done in April 2014, while winter assessment was done in December-January 2015-16. Certain locations like BH 3 d/s, BH SK, BH M to BH K were found to be important so included in second round of bio-monitoring. During summer, sample collection, temperature range between 25-30°C. Winter water temperature varies from 16-20°C (Figure 11.2f).

Four locations, in a 40 km long stretch of River Ganga in Jharkhand, were assessed in January 2015 and observed temperature range is 17-19°C. (Figure 11.2g).

23 locations were selected for the purpose of water quality assessment in 520 Km. long stretch of River Ganga in West Bengal. Summer sampling was done in May 2015 with observed water temperature range of 29-35°C. Winter samples were collected in February-March 2016. Water temperature ranged between 23-28°C. During both rounds of bio-monitoring, abnormally high temperature (39 and 41°C) was observed at one location i.e. Farakka STPS (WB 2). This was due to thermal pollution of nearby thermal power plant (Figure 11.2h)

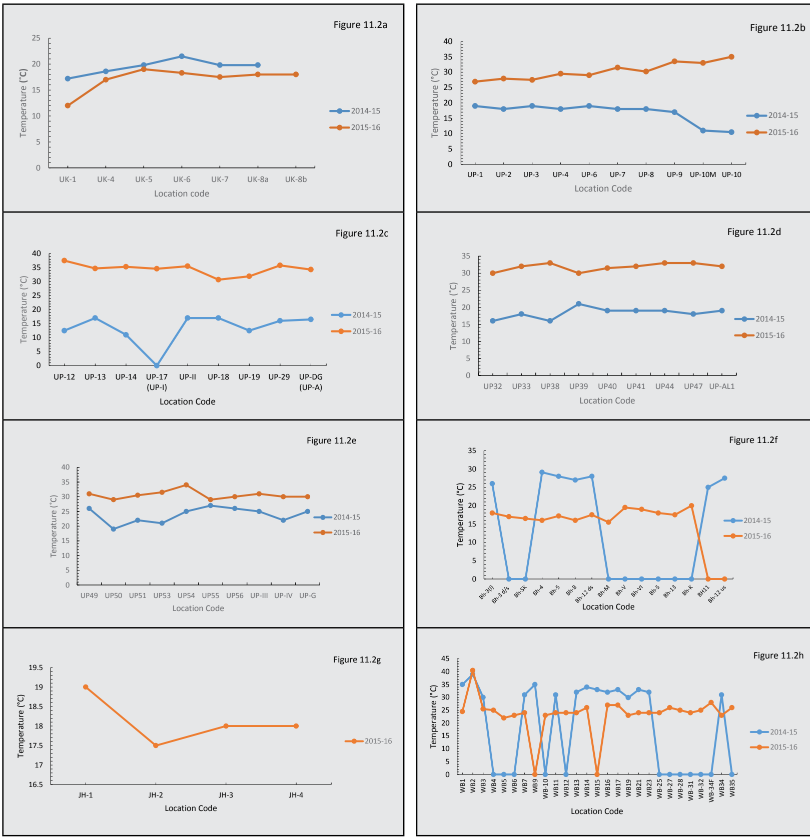


Figure 11.2 Seasonal and locational variation in water temperature of River Ganga in (a) Uttarakhand (b) Uttar Pradesh- Haridwar to Narora (c) Uttar Pradesh- Narora to Kanpur (d) Uttar Pradesh- Kanpur to Allahabad (e) Uttar Pradesh- Allahabad to Varanasi (f) Bihar (g) Jharkhand (h) West Bengal

11.3 DISSOLVED OXYGEN (DO)

Dissolved oxygen is an important parameter to measures biological activity of the water masses. Levels of dissolved oxygen vary with various factors including water temperature, time of day, season, depth, altitude, and rate of flow. Water at higher temperatures and altitudes will have less dissolved oxygen. Dissolved oxygen was measured in terms of mg/l using Winkler's method at all locations of River Ganga in all 5 states in summer and winter season for two consecutive years.

During first round of bio-monitoring (2014-15), in Uttarakhand, sampling was carried out in the month of June-July, where dissolved oxygen was found to be in the range of 5.6 to 6.8mg/l whereas in second round (2015-16) during

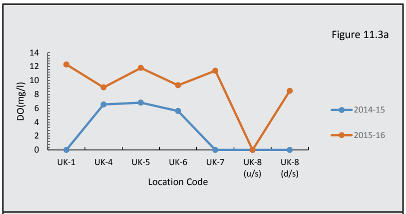
October-November, it ranged from 8.5 to 12.3mg/l (Figure 11.3a).

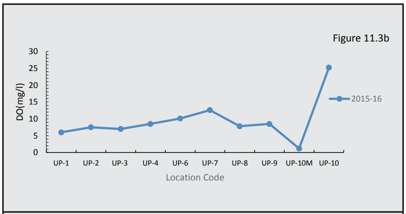
Uttar Pradesh stretch has been shown in different segments for graphical presentation of DO values. UP HN segment of River Ganga, from Haridwar to Narora, segment covering 10 locations, showed DO in the range of 1.2 to 25.2mg/l. In this segment, water quality in Ramganga at Moradabad, was found to have very less DO i.e. 1.2 mg/l, which is due to the surrounding discharges (Figure 10.3b). UP NK segment of River Ganga, from Narora to Kanpur covering 9 monitoring sites, has indicated an almost constant range of dissolved oxygen i.e. from 7.3 to 13.65mg/l (Figure 11.3c). DO values of other locations in UP KA segment from Kanpur to Allahabad and UP AV segment of River Ganga from Allahabad to Varanasi, were not available.

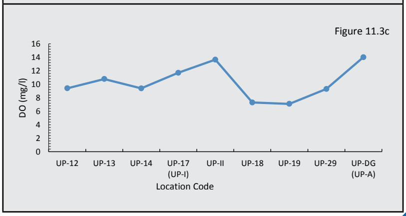
Similarly, a total no of 13 locations in Bihar stretch of River Ganga, were covered during second round of bio-monitoring in the month of December 2015 and dissolved oxygen observed were found to be In a range of 6.8 to 12.3 mg/l which showed good water quality at almost all sites on River Ganga in Bihar (Figure 11.3 d). Abrupt increase in dissolved oxygen was mainly contributed through profuse growth of macrophytic vegetation in River Ganga and tributaries.

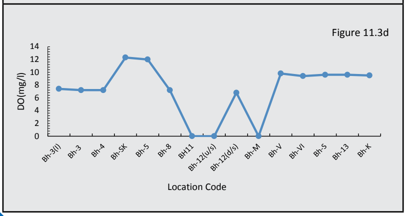
In Jharkhand stretch of River Ganga, dissolved oxygen was measured during winter season (2015-16) which showed a constant range of DO at all 4 locations from 9.1 to 9.4 mg/l (Figure 11.3e).

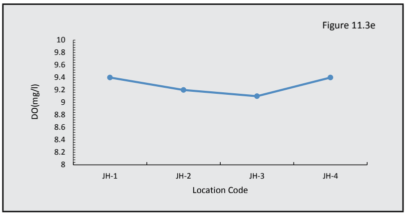
Total 23 locations on River Ganga in West bengal showed different values of DO at different locations such as River Ganga at Howrah Bridge (WB 27), River Ganga at Bata Nagar (WB 31), River Ganga near Uluberia (Near Kalibari) (WB 32) and River Ganga at Haldia (WB 35) showed low DO values i.e. 4.4,3.4,4 and 4.4 respectively whereas locations from Farakka barrage (WB 1) to Bali bridge (WB 25) and Shibpur Ghat near Vidyasagar setu (WB 28) showed a constant range of DO (5.2 to 7.6mg/l) (Figure 11.3f). Data of summer season (2014-15) was not available.











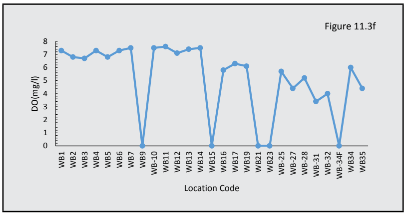


Figure 11.3 Seasonal and locational variation in dissolved oxygen of River Ganga in (a) Uttarakhand (b) Uttar Pradesh- Haridwar to Narora (c) Uttar Pradesh- Narora to Kanpur (d) Bihar (e) Jharkhand (f) West Bengal

11.4 SUBSTRATUM COMPOSITION

Substratum composition of river is one of the most important physical environmental variable that affects the taxa richness and density of benthic macro-invertebrates. River-bed substratum provide habitat to the macro-invertebrates and many benthic taxa exhibit different preferences for substrate characteristics like particle size, heterogeneity etc. like on large boulders (>256 mm) and cobbles (255-264 mm), may fly and stone fly nymphs belonging to the order Ephemeroptera and Plecoptera inhabits while on sandy and clayey substratum favours the colonization of molluscs and crustaceans. Any alteration in nature of river-bed substratum by the addition of pollutants like municipal sewage discharge leads to accumulation of silt on boulders and cobbles. This changes the smoothness of boulders & cobbles and results in complete elimination of sensitive species of Ephemeropteran and Plecopteran nymphs.

Viewing the importance, study on river-bed substratum composition is taken into account. In the present study, substratum composition expressed in percentage (%) depicted the composition of substratum at locations from where particular samples were collected. Seasonal variation was observed due to change in water level and width of river. The depression in graph at a particular location indicated samples have not been collected from that location.

In Uttarakhand stretch, river-bed substratum mainly consisted of cobbles and boulders with small percentage of pebbles and gravels as depicted clearly by the graphs (Figure 11.4 a & b). At u/s Rishikesh near Luxman jhula (UK 4), 8-10% of sand was also observed in both the seasons.

In UP HN segment of River Ganga from Haridwar to Narora, substratum was mainly composed of sand and macrophytic vegetation with small percentage of each of silt, clay and detritus (Figure 11.4 c & d). Clay percentage was found to be more in summer sampling (Fig 10.3d) than in winter sampling (Figure 11.3c). In winter sampling, at one of the location, Bridge at Anupshahr (u/s Anupshahr) (UP 6), sand % was found to be maximum 90% than all other locations (Figure 11.4c). In summer sampling, at 3 locations viz. Kachla Ghat Bridge at Badaun (UP 9), River Ramganga at SH-29 at Shahabad (UP 10) & River Ramganga D/s of Muradabad (UP 11), silt percent was found to be more than all other locations (Figure 11.4d). This may be due to the fact that these locations are on River Ramganga, one of the tributary of River Ganga. Clay (%) was found to be more in summer sampling (10-35%) than in winter sampling (2-10%) on most of the locations (Figure 11.4 c & d).

In UP NK segment of River Ganga from Narora to Kanpur in winter sampling (2014-15), sand (5 -35%), silt (5-20%), clay (5-25%), detritus (5-20%) and macrophytic vegetation (5-35%) were found to be in almost equal proportion. Only exception was Bridge at Bithoor (UP 18) where river–bed substratum composed of 80% clay and bridge on River Garra at Sandi (UP 12), Barrage u/s Kanpur (UP 19) with 70% sand. In summer sampling too, absence of sand from River Ramganga b/c to River Ganga (UP 17) and River East Kali b/c to River Ganga (UP II) was seen due to the reason that these locations were on River Ramganga and River East Kali before confluence with River Ganga. At both these sites, substratum was mainly composed of silt 40-45% (Figure 11.4 e & f).

Moving further down towards Allahabad, in UP KA segment of River Ganga from Kanpur to Allahabad in winter sampling, substratum was mainly composed of clay (60-85%) except Bridge on NH-2 right (UP 47) where 80% of substratum composed of sand (Figure 10.4 g). Summer sampling in October 2016 revealed that substratum was mainly formed of silt and clay. Detritus and sand was found to be in lesser percentage (5-10%) except at location Bridge on River Tons near Panasa (UP 39) (65% detritus) and at location bridge on Allahabad bypass (UP 41) (50% sand). Macrophytic vegetation found In lowest percentage of 0 – 5% (Figure 11.4h).

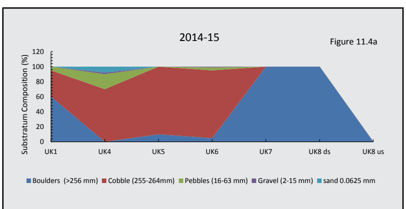
In UP AV segment of River Ganga, from Allahabad to Varanasi, during winter sampling macrophytic vegetation predominated (35-60%) followed by sand and silt each of 10-30% and clay 5-20% with detritus in very small proportion 5-10%. At one site, bridge at Ramnagar Road near Varanasi (UP 51), detritus percent was found to be exceptionally high (45%) (Figure 10.4i). In Summer sampling, substratum was mainly formed of clay and silt while sand and detritus were found in small proportion (Figure 11.4j)

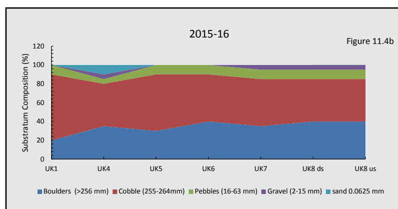
In Bihar stretch of River Ganga, during summer sampling in the month of April, the macrophytic vegetation was found to be dominating (35-45%) followed by almost equal proportion of sand (10-20%), silt (15-35%), and clay (10-30%). Detritus form only 5% of substratum (Figure 10.4k). In winter sampling, macrophytes were found to have least contribution (3-10%). In upstream stretch sand % was found to be more. Downstream stretch of River

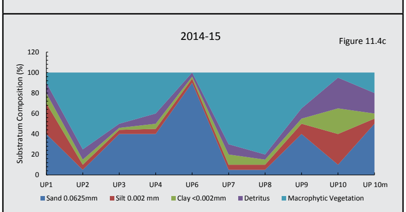
Ganga in West Bengal, silt percent increased from 10-30% to 60-70% (Figure 11.4l).

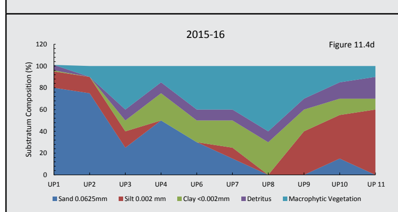
In Jharkhand stretch during winter sampling, clay % predominated at an average of about 60-65% of the substratum at different sampling location. Each of the sand, silt, detritus and macrophytic vegetation were found to be in almost equal percentage (Figure 11.4m).

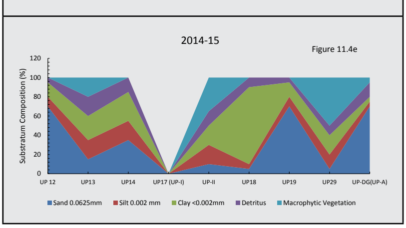
Summer sampling in West Bengal stretch of River Ganga revealed that major portion of substratum was formed of macrophytic vegetation (40-55%) followed by clay (15-35%). Sand (5-15%) and silt (10-20%) were in almost equal proportion. Detritus formed a lowest percent of 5 – 10% only (Figure 11.4n). In winter, river-bed substratum was mainly composed of clay (45-95%). Moving on River Ganga from River Ganga at Farraka Barrage (WB 1) to River Ganga at Belgharia (WB 23) clay % observed to be 50 – 75%. Thereafter, River Ganga at Bali bridge (WB 25) to River Ganga at Diamond Harbour (WB 34), clay percent increased to 80 – 95%. One exception was observed at location on River Ganga at Haldia (WB 35) where river-bed substratum composed of 90% detritus. Exceptionally high percentage of detritus was observed at another 2 locations Farakka FTPS (WB 2) and River Ganga u/s of outlet to natural river (WB 4). On rest of other locations, detritus was found to be only 5-10% (Figure 11.4o).

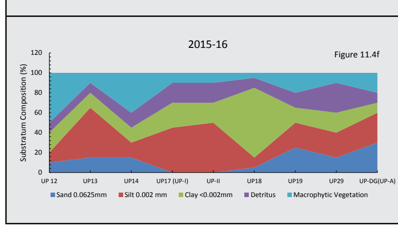












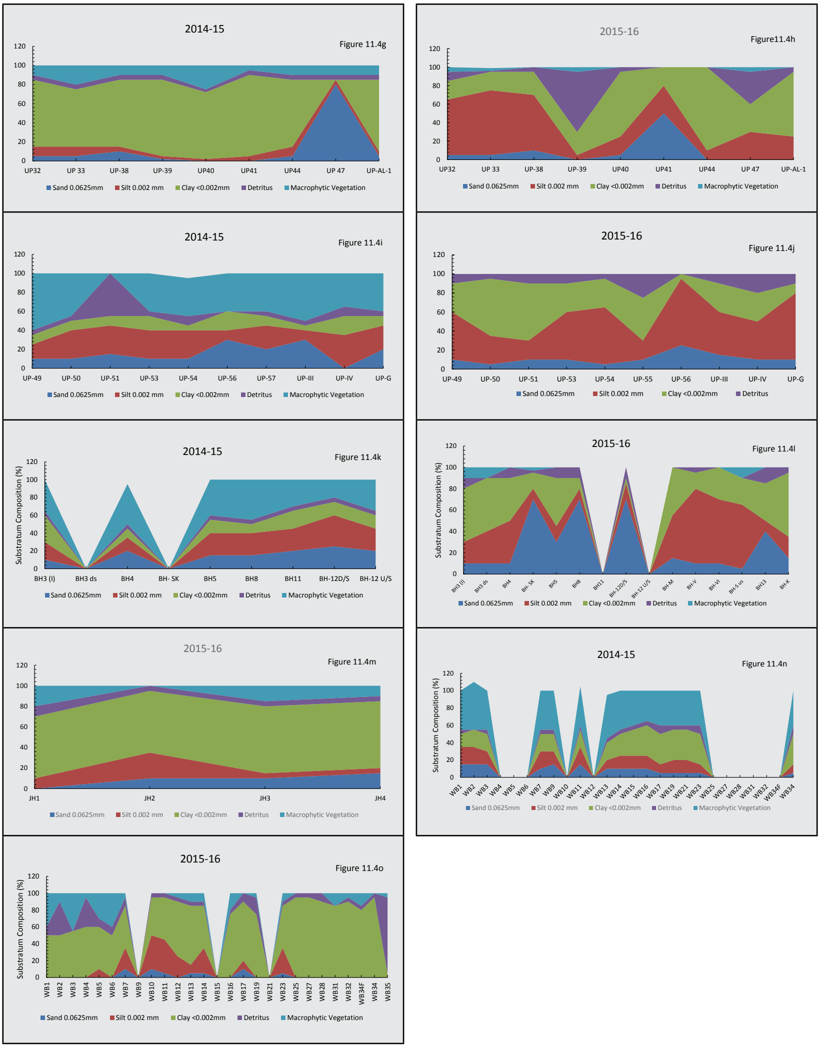


Figure 11.4 Seasonal and locational variation in substratum composition of River Ganga in (a) & (b) Uttarakhand (c) & (d) Uttar Pradesh- Haridwar to Narora (e) & (f) Uttar Pradesh- Narora to Kanpur (g) &(h) Uttar Pradesh- Kanpur to Allahabad (i) & (j) Uttar Pradesh- Allahabad to Varanasi (k) & (l) Bihar (m) Jharkhand (n) & (o) West Bengal

11.5 SAPROBIC SCORE

Most organisms living in a water body are sensitive to any changes in their environment, whether natural (such as increased turbidity during floods) or unnatural (such as chemical contamination or decreased dissolved oxygen arising from sewage inputs). Different organisms respond in different ways. Every species has a specific dependency of decomposing organic substances and thus the oxygen content. This tolerance is expressed in a saprobic indicator value which has been used to assess the water quality of River Ganga. It is based on the saprobic scoring system, developed by the British Biological Monitoring Working Party (BMWP) for British rivers. It has been applied with some modification for River Ganga, Yamuna and all other types of surface water bodies. This method involves a qualitative inventory of the presence of macro-invertebrate benthic fauna upto family/ generic/ species level of taxonomic precision. All possible families having saprobic indicator value are classified on a score scale of 1 to 10 according to their preference for saprobic water quality. The BMWP score is calculated by summing the scores for each family represented in the sample. The families which are most sensitive to pollution such as Ephemeridae etc. are on the top of the list and are getting a score of 10, while Molluscs score 3 and oligochaete worms and blood worms (Chironomous) which are tolerant and placed on bottom of score scale list, are getting a score of 1 and 2 respectively. Other intermediately sensitive families are placed at an appropriate place in the scoring scale. Individual scores of all families registered, are averaged to produce saprobic score.

Water quality is assessed with a combination of diversity and saprobic score therefore saprobic score for all the samples collected from River Ganga in all the 5 states, was calculated. Results showed that during summer season (2014-15) saprobic score was highest i.e. 8.33 at downstream of Har-ki-podi location in Uttarakhand and lowest 3 saprobic score was found at UK8 location at downstream of Jagjeetpur STP, Haridwar. Other 3 locations had saprobic score in range between 5 to 7.3. Similarly, in winter season (2015-16), lowest saprobic score, 4.86 was recorded at UK8 location (d/s of Jagjeetpur STP, Haridwar) and highest saprobic score,7.5 was recorded at UK8 A which is u/s of Jagjeetpur STP, Haridwar and at other locations saprobic score was almost same in range between 6.28- 6.8 (Figure 11.5a).

Sampling of winter season (2014-15) in Uttar Pradesh was done during December-March 2015 whereas, in summer season (2015-16) sampling was done in the months of April-June and October 2016. Saprobic score was calculated for each location on River Ganga and tributaries. It was observed that saprobic score in Haridwar to Narora stretch of Uttar Pradesh, ranged between 3.7 to 5.43. No major changes were observed in comparison to winter season. Saprobic score of locations on River Ganga in Haridwar to Narora stretch, ranged between 4.17 to 5.44. (11.5b) In Narora to Kanpur stretch of Uttar Pradesh, highest saprobic score (5.9) was found at UP 13 location which is the confluence point of River East Kali with River Ganga. In comparison to winter season, saprobic score was observed to be in same range at all locations and varied from 4.6 to 5.78. (11.5c). Saprobic score of locations on River Ganga from Kanpur to Allahabad stretch, ranged between 4.7 to 6.2 during winter season and values ranged from 4.28 to 5.76 in summer season. (11.5d) During winter season in Allahabad to Varanasi stretch of Uttar Pradesh, saprobic score was found to be lowest (3.86) in River Gomti at Rajawari. At other locations, saprobic score was found to be ranged between 4.4 to 5.6. In summer season (2015-16), 2 locations were introduced which were bridge at Varanasi (UP 50) and bridge on River Varuna in Varanasi. In this stretch, saprobic score was recorded ranging from 4.3 to 5.89. (Figure 11.5e)

In Bihar, saprobic score of River Ganga and tributaries on 6 locations, was recorded during summer season (2014-15) which showed BH 3 (Bridge at Buxer) and BH 12 (u/s of Mahatma Gandhi bridge) has lowest saprobic score i.e. 4.81 and 4.83 respectively whereas locations BH 5 (bridge near Danapur, Patna) and BH 8 (bridge near Hajipur near tributory) are having higher saprobic score 6.11 and 6. Similarly, locations at BH 4 (bridge on River Ghagra), BH11(Nalla near Patna), BH 12 (Mahatma Gandhi bridge) showed saprobic score of 5.0. During winter season (2015-16), some new locations were introduced in comparison to summer season (2014-15) and samples were collected from total 13 locations. Lowest saprobic score 3.71 was recorded at BH 12 of Mahatma Gandhi bridge and saprobic score at other locations was in range between 5-5.8 (Figure 11.5f).

In Jharkhand stretch of River Ganga, samples were collected during winter season (2015-16) only from 4 locations and saprobic score was recorded in the range between 3.76 to 5.62 (Figure 11.5g).

In river stretch of West Bengal, during summer season (2014-15), River Ganga locations at Tribeni and d/s of Nabadwip had poor water quality with saprobic score 4.46 and 4.9 respectively. Otherwise all 14 locations from Farakka upto Diamond harbour showed saprobic score in same range from 5.03 to 6.4. In winter season (2015-16), few more locations were added for water quality assessment of complete stretch of River Ganga in West Bengal. Results showed that, River Ganga at Howrah bridge, Shibpur ghat near Vidyasagar setu and near Uluberia, had highest saprobic score i.e.6. whereas River Ganga at FTPS Farakka, Katwa, u/s of Tribeni, Bali Bridge and at Bata Nagar, showed less saprobic score i.e. 4.74, 4.73, 4.86, 4.6, 4.56 respectively. Saprobic score at other locations, was found to be in the range between 5.04 to 5.94 (Figure 11.5h)

Figure 11.5 Seasonal and locational variation in Saprobic score of benthic macroinvertebrates of River Ganga in (a) Uttarakhand (b) Uttar Pradesh- Haridwar to Narora (c) Uttar Pradesh- Narora to Kanpur (d) Uttar Pradesh- Kanpur to Allahabad (e) Uttar Pradesh- Allahabad to Varanasi (f) Bihar (g) Jharkhand (h) West Bengal

11.6 DIVERSITY SCORE

Stable ecosystems are characterised by a great diversity of species, most of which are represented by relatively few individuals. However, where the range of habitats or niches, is restricted by physical or chemical factors, high numbers of individuals of only a few species occur. Such reduced diversity can be brought about by the inflow of wastewater into a watercourse, where the increase of nutrients and reduced competition from other species enables a few species to develop to high population densities. As long as all natural factors (e.g. current velocity, temperature, light intensity, sediment structure and stability) are comparable from one sampling point to another, differences in diversity of species can be used to detect changes in water quality or changes over time at the same site. It is important to realise, however, that species diversity can also increase as a result of slight pollution causing nutrient enrichment, although this may not be considered ecologically desirable. Diversity can also be very low where it is naturally limited by the conditions of the habitat, such as in small springs and headwaters.

Abundance or diversity indices are most suitable for use with benthic organisms since plankton are mobile and may reflect the situation elsewhere in the water body rather than at the monitoring site. Therefore, diversity score calculation was done for samples collected in different seasons (summer and winter) from all the locations of River Ganga. Samples collected by a standard method are sorted into species and diversity score was calculated.

Diversity score is based on the principle that among the collected sample, there are variety of morphologically dissimilar pair- wise sequentially encountered specimens scored as "1" and pair- wise sequentially encountered similar specimens scored as "0". Ratio of the total number of morphologically dissimilar specimen of benthic macro-invertebrates considered as "1" (sum of all 1's) and the total number of all the dissimilar and similar organisms (sum of all 0 and 1's) encountered. The ratio thus obtained (diversity) has a value between 0 and 1.

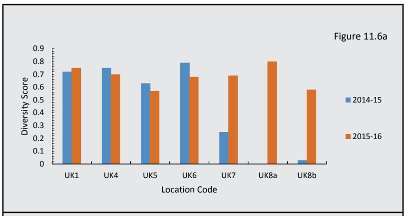
Results indicated that in summer season, (2014-15) higher diversity of families of benthic macro-invertebrates, was found in upper regions of Uttarakhand stretch of River Ganga, ranging from 0.63 to 0.79 and very low diversity was observed at locations in lower regions such as location at d/s of Har – ki – Paori, the water quality has diversity score of 0.25 and due to discharge from sewage treatment plant location at d/s Haridwar JSTP has diversity score very low i.e. 0.03. Whereas, in winter season (2015-16) diversity score was found to be ranging between 0.5 to 0.8 (Figure 11.6a).

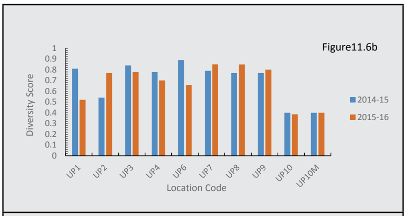
In Uttar Pradesh stretch, bio-monitoring was done in 4 river segments in summer (2014-15) and winter (2015-16) season. In summer season, diversity score in Haridwar to Narora stretch was found to be in 0.40 to 0.89 range, Narora to Kanpur stretch showed diversity score 0.46 to 0.78 range. Similarly, Kapur to Allahabad and Allahabad to Varanasi stretch showed diversity score in the range between 0.54-0.92 and 0.3-0.64 respectively. Whereas in winter season, River Ramganga at SH-29 location between Haridwar to Narora stretch showed lowest diversity score i.e. 0.386 and highest diversity score (0.849) was found at Bridge u/s of Narora at Rajghat location. Other lcoations has diversity score in the range between 0.4 to o.84. Diversity score in Narora to Kanpur stretch, was found to be in the range from 0.49 to 0.78. Kanpur to Allahabad segment had almost same diversity at all locations in the range between 0.42 to 0.78. Allahabad to Varanasi segment showed lowest diversity score (0.47) at NH-2 bridge whereas diversity score at all other locations was found to be in the range between 0.58 to 0.79.

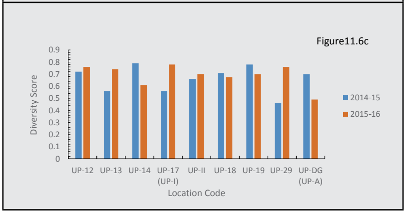
In Bihar, at one location on River Ganga at bridge near Danapur, Patna has very low diversity with score 0.4 and other all locations were having diversity score ranging between 0.6 to 0.76. In winter season (2015 – 16), new locations were added which showed highest diversity at location near Sitakundih village d/s Munger and lowest diversity was found at location d/s of Mahatma Gandhi bridge with diversity score 0.16. All other locations showed almost same diversity score ranging between 0.5 to 0.75 (Figure 11.6f).

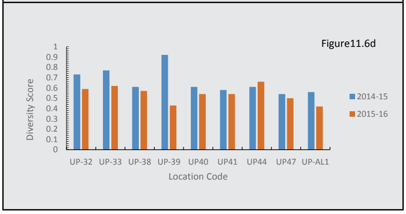
In Jharkhand stretch of River Ganga sampling was done in winter season (2015-16) only. Diversity score of this stretch was found to be highest at u/s of Rajmahal i.e. 0.9 and other three locations such as u/s and d/s of Sahibganj and d/s of Rajmahal showed diversity score 0.71,0.74 and 0.83 respectively (Figure 11.6g).

West Bengal stretch of River Ganga showed rich bio-diversity in winter season (2015-16) at almost all 21 locations on River Ganga. Low diversity score i.e. 0.45,0.38,0.47 was observed at locations d/s of Nabadwip, Howrah bridge and near Uluberia locations of River Ganga. Highest diversity score was found at Farakka Barrage site of River Ganga i.e. 0.88 whereas diversity score at all other locations was found to be in the range between 0.53 to 0.87. While in summer season (2014-15), low diversity score 0.47,0.36,0.54 and 0.33 was found at locations of River Ganga near Katwa, u/s of Tribeni, at transmission tower u/s of Tribeni and near Belgharia. Other 11 locations were found to have diversity score ranging between 0.58 to 0.87 (Figure 11.6h).









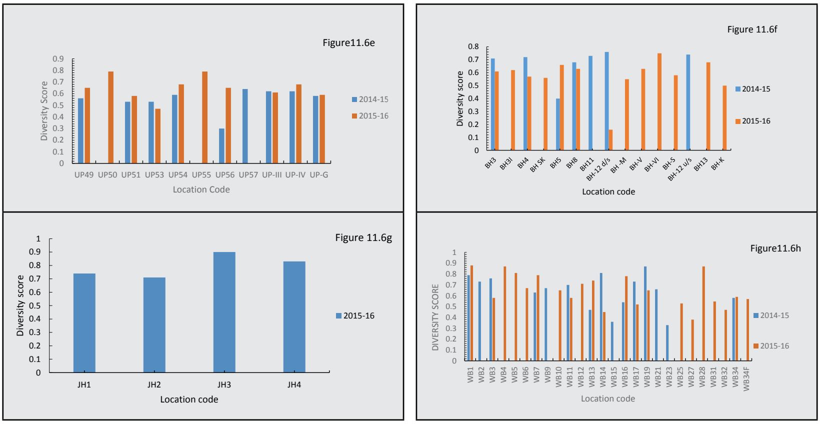


Figure 11.6 Seasonal and locational variation in Diversity score of benthic macroinvertebrates of River Ganga in (a) Uttarakhand (b) Uttar Pradesh- Haridwar to Narora (c) Uttar Pradesh- Narora to Kanpur (d) Uttar Pradesh- Kanpur to Allahabad (e) Uttar Pradesh- Allahabad to Varanasi (f) Bihar (g) Jharkhand (h) West Bengal

11.7 SIMILARITY INDEX

Similarity index between different locations of river was calculated as Jaccard Coefficient. This measures the degree of similarity between two locations in terms of presence or absence of ffamilies of benthic macro-invertebrates. Coefficient values range from 0 to 1. Jaccard Coefficient is calculated as:

$$\text{Jaccard Coefficient} = \frac{a}{a + b + c}$$

where, a – number of taxa common to both locations

b – number of taxa present in location B but not in A

c – number of taxa present in location A but not in B

Similarity index between location UK 1 (River Alaknanda at Rudra Prayag) and UK 4 (River Ganga at u/s Rishikesh, Luxman Jhula), in summer season, was observed to be 1.0 but in winter season value dropped down to 0.40 (Table 11.7.1). Viewing the seasonal impact, it can be concluded that both locations are dissimilar and important to study separately. At all other locations in all five states on River Ganga, in both seasons, similarity index found not to exceed beyond 0.50. A slight ascension in similarity index i.e. 0.55 between location Mangal Haat Syed Bazar, u/s Rajmahal (JH 3) and Ferryghat d/s Rajmahal (JH 4) in Jharkhand (Table 11.7.7); 0.57 between locations River Ganga at Road bridge at Behrampore (WB 10) and River Ganga at d/s of Murshidabad (d/s Behrampore) near Begpur Village (WB 11); 0.54 between River Ganga at Kalyanpur after confluence with Bablah nullah (WB 12) and River Ganga at Katwa (WB 13) and 0.53 between River Ganga at Raghunathganj near bridge (WB 7) and River Ganga at Road bridge at Behrampore (WB 10) (Table 11.7.8b) in winter season is not of much significance.

Thus, a thorough study on Jaccard Coefficient of similarity of all locations selected for assessment of biological health of River Ganga in all five states in both seasons indicated a clear view that none of the location is exactly similar or almost similar in terms of taxa composition with another location. Thus, all locations on River Ganga, are important and none can be excluded for assessment of biological health of River Ganga.

Table 11.7.1: Similarity index of locations in Uttarakhand state based on bio-assessment

Location A	Location B	Jaccard Coefficient	
		Summer (Jun-Jul 2014)	Winter (Oct-Nov, 2015)
UK 1	UK4	1.00	0.40
UK4	UK5	0.09	0.47
UK5	UK6	0.05	0.28
UK6	UK7	0.09	0.23
UK7	UK8 d/s	0	0.25
UK8 d/s	UK8 u/s	-	0

Table 11.7.2: Similarity index of locations in Uttar Pradesh (Haridwar to Narora) segment based on bio-assessment

Location A	Location B	Jaccard Coefficient	Jaccard Coefficient
		Summer (April-May, 2016)	Winter (Dec, 2014)
UP1	UP2	0.25	0.07
UP2	UP3	0.37	0.26
UP3	UP4	0.50	0.50
UP4	UP6	0.65	0.26
UP6	UP7	0.52	0.28
UP7	UP8	0.56	0.46
UP8	UP9	0.72	0.36
UP9	UP10	0.21	0.13
UP10	UP 11	0.33	0.28

Table 11.7.3: Similarity index of locations in Uttar Pradesh (Narora to Kanpur) segment based on bio-assessment

Location A	Location B	Jaccard Coefficient	Jaccard Coefficient
		Summer (Jun, 2016)	Winter (Jan, 2015)
UP 12	UP 13	0.40	0.33
UP 13	UP 14	0.43	0.40
UP 14	UP 17 (UP I)	0.40	0.11
UP 17 (UP I)	UP II	0.35	0.21
UP II	UP 18	0.25	0.13
UP 18	UP 19	0.47	0.18
UP 19	UP 29	0.20	0.20
UP 29	UP DG (UP A)	0.18	0.42

Table 11.7.4: Similarity index of locations in Uttar Pradesh (Kanpur to Allahabad) segment based on bio-assessment

Location A	Location B	Jaccard Coefficient	Jaccard Coefficient
		Summer (Oct, 2016)	Winter (Feb, 2015)
UP 32	UP 33	0.20	0.50
UP 33	UP 38	0.19	0.35
UP 38	UP 39	0.11	0.47
UP 39	UP 40	0.05	0.19
UP 40	UP 41	0.09	0.18
UP 41	UP 44	0.18	0.33
UP 44	UP 47	0.11	0.33
UP 47	UP AL1	0.13	0.25

Table 11.7.5: Similarity index of locations in Uttar Pradesh (Allahabad to Varanasi) segment based on bio-assessment

Location A	Location B	Jaccard Coefficient	Jaccard Coefficient
		Summer (Oct, 2016)	Winter (Mar, 2015)
UP 49	UP 50	0.50	0.26
UP 50	UP 51	0.25	0.50

Location A	Location B	Jaccard Coefficient	Jaccard Coefficient
		Summer (Oct, 2016)	**Winter (Mar, 2015)**
UP 51	UP 53	0.41	0.24
UP 53	UP 54	0.35	0.23
UP 54	UP 56	0.11	0.14
UP 56	UP 57	0.13	0.14
UP 57	UP III	0.18	0.50
UP III	UP IV	0.36	0.50
UP IV	UP G	0.11	0.40

Table 11.7.6a: Similarity index of locations in Bihar state based on bio-assessment in Summer season

Location A	Location B	Jaccard Coefficient
		Summer (April, 2015)
BH 3(I)	BH 4	0.23
BH 4	BH 5	0.38
BH 5	BH 8	0.25
BH 8	BH 12 d/s	0.17
BH 12 d/s	BH 11	0.29
BH11	BH 12 u/s	0.15

Table 11.7.6b: Similarity index of locations in Bihar state based on bio-assessment in Winter season

Location A	Location B	Jaccard Coefficient
		Winter (Dec- Jan, 2015-16)
BH 3(I)	BH 3 d/s	0.40
BH 3 d/s	BH 4	0.39
BH 4	BH 5	0.27
BH 5	BH 8	0.23
BH 8	BH 12 d/s	0.28
BH 12 d/s	BH M	0.26
BH M	BH V	0.23
BH V	BH VI	0.41

Location A	Location B	Jaccard Coefficient
		Winter (Dec- Jan, 2015-16)
BH VI	BH S	0.33
BH S	BH 13	0.17
BH 13	BH K	0.42
BH K	BH SK	0.26

Table 11.7.7: Similarity index of locations in Jharkhand state based on bio-assessment

Location A	Location B	Jaccard Coefficient	Jaccard Coefficient
		Summer	Winter (Jan, 2016)
JH 1	JH 2	-	0.50
JH 2	JH 3	-	0.45
JH 3	JH 4	-	0.55

Table 11.7.8a: Similarity index of locations in West Bengal state based on bio-assessment in Summer season

Location A	Location B	Jaccard Coefficient
		Summer (May, 2015)
WB1	WB2	0.21
WB2	WB3	0.11
WB3	WB7	0.26
WB7	WB9	0.37
WB9	WB11	0.31
WB11	WB13	0.36
WB13	WB14	0.47
WB14	WB15	0.21
WB15	WB16	0.26
WB16	WB17	0.31
WB17	WB19	0.19
WB19	WB21	0.21
WB21	WB23	0.18
WB23	WB34	0.17

Table 11.7.8b: Similarity index of locations in West Bengal state based on bio-assessment in Winter season

Location A	Location B	Jaccard Coefficient
		Winter (Feb-Mar, 2016)
WB1	WB2	0.19
WB2	WB3	0.25
WB3	WB4	0.48
WB4	WB5	0.33
WB5	WB6	0.47
WB6	WB7	0.24
WB7	WB10	0.53
WB10	WB11	0.57
WB11	WB12	0.32
`WB12	WB13	0.54
WB13	WB14	0.37
WB14	WB16	0.14
WB16	WB17	0.13
WB17	WB 19	0.15
WB 19	WB25	0.34
WB25	WB27	0.31
WB27	WB28	0.30
WB28	WB31	0.15
WB31	WB32	0.11
WB32	WB34F	0.11
WB34F	WB34	0.14
WB34	WB35	0.33

12 Impact of Climate Change on Benthic Macro-invertebrates of River Ganga and Tribuatries

The world is getting warmer, whether the cause is human activity or natural variability. The preponderance of evidence says it's humans –thermometer readings all around the world, have risen steadily since the beginning of the industrial revolution. According to an ongoing temperature analysis conducted by scientist at NASA, the average global temperature on earth has increased by about 0.8°C since 1880. Two third of the warming has occurred since 1975, at a rate of roughly 0.15-0.20°C per decade. The global temperature record represents an average over the entire surface of the planet. The temperature we experience locally and in short periods can fluctuate significantly due to predictable cyclical events (night and day, summer and winter) and hard- to- predict wind and precipitation patterns, But the global temperature mainly depends on how much energy the planet receives from the Sun and how much it radiates back into space – quantities that change very little. The amount of energy radiated by the earth depends significantly on the chemical composition of the atmosphere, particularly the amount of heat-trapping greenhouse gases. A one –degree global change is significant because it takes a vast amount of heat to warm all the oceans atmosphere, and land by that much. In the past, a one – to two-degree drop was all it took to plunge the Earth into the Little Ice Age. A five – degree drop was enough to bury a large part of North America under a towering mass of ice 20,000 years ago. Various regions of the world have warmed or cooled when compared with a base period of 1951-1980. (The global mean surface air temperature for that period was estimated to be 14°C with an uncertainty of several tenths of a degree). Global temperature records start around 1880 because observations did not sufficiently cover enough of the planet prior to that time. The period of 1951-1980 was chosen largely because the U.S National Weather Service uses a three-decade period to define 'normal" or average temperature. The GISS temperature analysis effort began around 1980, so the most recent 30 years was 1951-1980. Though there are minor variations from year to year, all four records show peaks and valleys in sync with each other. All show rapid warming in the past few decades, and all show the last decade as the warmest. Temperature in a given year or decade might rise 5 degrees in one region and drop 2 degrees in another. Exceptionally cold winters in one region might be followed by exceptionally warm summers. Or a cold winter in one area might be balanced by an extremely warm winter in another part of the globe. Generally, warming is greater over land than over the oceans because water is slower to absorb and release heat (thermal inertia). Warming may also differ substantially within specific land masses and ocean basins. Due to increase in atmospheric temperature as a result of impact of climate change, the process of glacial melt in most Himalayan rivers, has been affected consequently an abrupt change in flow of glacial fed rivers, is expected. River Ganga is a glacial fed river. Flow in River Ganga increases mainly due to glacial melt during summer months, rain water during monsoon, discharge from the barrages and STP outlet and various drains and tributaries joining River Ganga. In the present investigation, during year 2014 to 2016 in two phase monitoring, river flow in River Ganga and its tributaries from Uttarakhand to West Bengal, attained maximum flow of 3.0 m/s during summer month in July at water temperature of 17.2°C and at water temperature of 12°C, the flow in River Alaknanda at downstream of Rudra Prayag in Uttarakhand, was lowest of 2.5 m/s during winter month of November. With the further increase in water temperature, flow decreased in River Ganga and its tributaries (Figure 12.1). A total of 86 observations, selected for study on entire stretch of River Ganga, indicated a water temperature ranging from minimum of 10.5°C to water temperature of 37.5°C, within a flow rate in River Ganga, ranged between 0.04 to 0.53 m/s. Only at one observation, maximum water temperature was reported for 40.5°C at a flow rate of 0.72 m/s in River Ganga at Farakka FTPS in West Bengal (Figure 12.1). Such increase in water temperature may have deleterious impact on aquatic life in River Ganga. A correlation study has been undertaken to understand the impact of flow and water temperature on percent dominance of benthic macro-invertebrates of River Ganga (Figure 12.2 to Figure 12. 31).

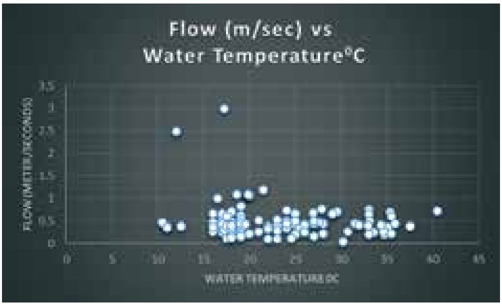


Figure 12.1

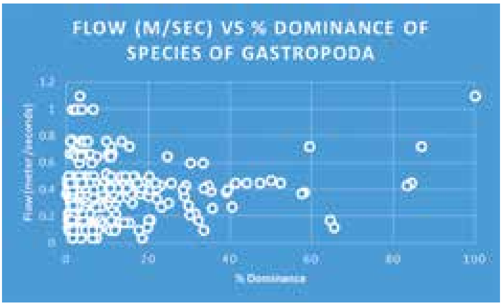


Figure 12.2

Gastropod species at various flow velocities in River Ganga, were collected from a total of 88 locations in states of Uttarakhand (3) Uttar Pradesh (36), Bihar (18), Jharkhand (4) and West Bengal (27) during year 2014 to 2016. Gastropod dominance ranged from 0.003% to 100% in a total of 491 observations at various location on entire stretch of River Ganga from Rishikesh to Diamond harbour. *Physa (Haitia) mexicana* was most dominant among all the gastropods at Haridwar downstream Jagjeetpur STP outlet in Uttarakhand during June 2014, followed by *Thiara (Tarebia) lineata* at Farakka FTPS (Farakka Thermal Power Station) in West Bengal. Rare occurrence (0.0013%) was observed for *Bellamya bengalensis and Melanoides tuberculatus* in River Ghagra near Manjhi in Bihar stretch, during December 2015. *Physa (Haitia) mexicana* could resist a maximum flow rate of 1.1m/s at downstream Haridwar. This increased flow rate was mainly contributed through Jagjeetpur STP (Sewage Treatment Plant) outlet combined with glacial melt water in River Ganga at Rishikesh barrage during June 2014. However flow in River Sone was around 1.0 m/s at at Koilwar in Bihar where presence of *Digonistoma pulchella, Melanoides tuberculatus, Indoplanorbis, Thirara (Tarebia) lineata* and *Bellamya bengalensis* was observed between 1-6% dominance. *Physa (Haitia) mexicana, Lymnaea accuminata, Bellamya bengalensis, Indoplanorbis and Gyraulus convexiusculus* were dominant between 1 to 18% at minimum flow velocity (0.04 m/s) of River Ganga at Narora barrage in Uttar Pradesh. 86% dominance of *Thiara (Tarebia) lineata* was observed at a flow rate of 0.72 m/s in River Ganga at Farakka FTPS followed by 83% of *Neritina* (Dostia) *violacea* at a flow velocity of 0.43 m/s in River Ganga at Belgharia in West Bengal (Figure 12.2).

Makongia crassa ***Thiara tuberculata***

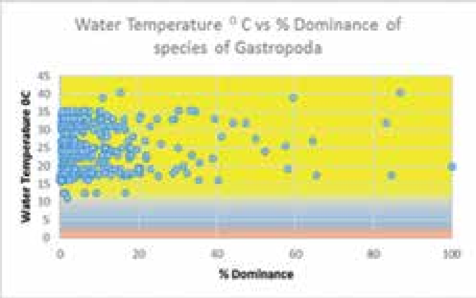


Figure 12.3

Water Temperature played an important role in survival of sensitive and abundancy of tolerant species of gastropods. Gastropods were Collected at a minimum water temperature of 11ºC from River Ganga at Ghatiaghat in Farrukhabad in Uttar Pradesh during January 2015. At this water temperature, tolerant species like *Indoplanorbis* and *Lymnaea accuminata* were having very low dominance of 1.7%. Gastropods were also collected at a highest water temperature of 40.5ºC from River Ganga at Farkka FTPS in West Bengal during 2016. At this water temperature *Thiara (Tarebia) lineata* was dominant by 86% and *Melanoides tuberculatus* was having 15.3% dominance level. A number of other species clustered at 20% dominance from 15 to 35ºC water temperature (Figure 12.3).

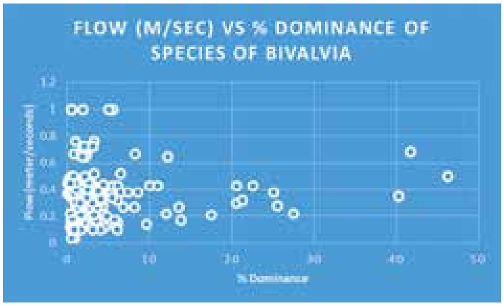


Figure 12.4

Bivalves were collected in a total of 66 locations in River Ganga in state of Uttar Pradesh (28), Bihar (17), Jharkhand (4), and West Bengal (17). Bivalves were not found in River Ganga in the stretch of Uttarakhand. Bivalves also indicated their percent occurrence with respect to flow rate in River Ganga at different locations. Their dominance was lower, compared to gastropods, ranged from 0.0013 to 46% in almost 243 number of observations. Presence of bivalves preferred a flow rate in River Ganga, ranging from 0.04 to 1.0 m/s. *Corbicula bensoni* was most dominant bivalve among all the species collected from River Ganga at a flow velocity of 0.5 m/s at Kalyanpur after confluence of Bablah nullah in West Bengal during February 2016. Presence of rare occurrence of bivalve species indicated their sensitivity to water quality. *Parreysia favidens favidens* was having lowest dominance of 0.37 m/s in River Ghagra near Manjhi in Bihar. *Radiatulla caerulea, Corbicula assamensis* and *juveniles* of *Lamellidens sp.* were among the next rare species preferred a flow rate of 0.45 m/s at downstream of Buxar in Bihar during December 2015. Few species like juveniles of *Parreysia favidens, Corbicula assamensis, Lamellidense sp.* and *Parreysia viridula* preferred highest flow rate of 1.0 m/s in River Sone, with a low dominance range of 0.4 – 1.8% at Koilwar in Bihar (Figure 12. 4).

Water temperature influenced the dominance of bivalves species. *Corbicula assamensis* survived a minimum water temperatutre of 11 ºC with a low dominance of 1.7 % in River Ramganga downstream of Muradabad in Uttar Pradesh during January 2015 whereas, *Novaculina gangetica, Corbicula bensoni*, and *Corbicula striatella* were dominant by 2 -3 % and were tolerant to a highest water temperature of 40.5ºC in River Ganga at Farakka FTPS in West Bengal (Figure 12. 5).

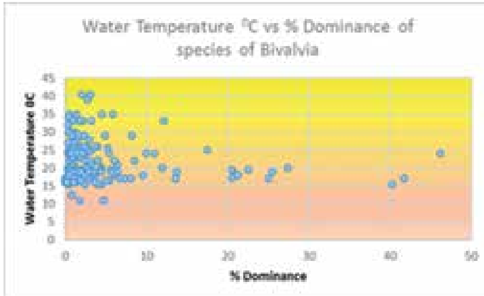


Figure 12.5

Parreysia triembolus

Novaculina gangetica

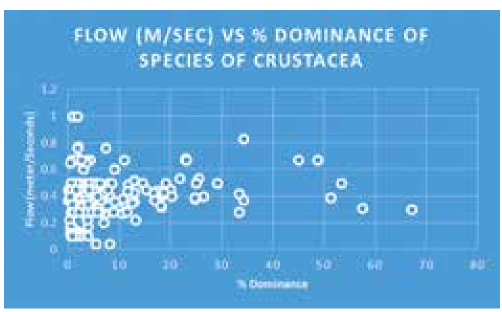


Figure 12.6

In a total of 81 locations, presence of crustaceans was observed in entire stretch of River Ganga in Uttarakhand (1), Uttar Pradesh (36), Bihar (16), Jharkhand (3) and in West Bengal (25). Crustaceans required a particular flow and water temperature conditions to increase its dominance. In River Ganga and its tributaries, their dominance ranged from 0.0013 – 67.16 % among a total of 193 observations. Dominance of *Macrobrachium idae* and *Caridina peninsularis*, was 5.38%, 8.07% respectively at a lowest flow rate of 0.04 m/s in River Ganga at Narora barrage in Uttar Pradesh during 2014. Whereas dominance of *Macrobrachium idae* reduced to 0.9% at a maximum flow rate of 1.0 m/s in River Sone at Koilwar in Bihar. At the same location, dominance of rare species of *Caridina tamasek* was 1.8%. However, maximum species of crustaceans within 20% dominance preferred a flow rate ranging from <0.2 to 0.8 m/s (Figure 12.6). Among all the crustaceans *Gangemysis assimilis* was most dominant (67.1%) at a flow velocity of 0.3 m/s in River Ganga at Danapur Patna in Bihar, followed by *Macrobrachium idae* was most dominant (57.4%) at a flow rate of 0.31 m/s in River East Kali at Kanpur – Farrukhabad road in Utter Pradesh during January 2015. At a lowest flow velocity of 0.04 m/s in River Ganga at Narora barrage in Uttar Pradesh, dominance of *Macrobrachium idae* was 5.38% and *Caridina peninsularis* was 8.07% during January 2015 (Figure 12. 6).

Macrobrachium clymene

Perithelphusa

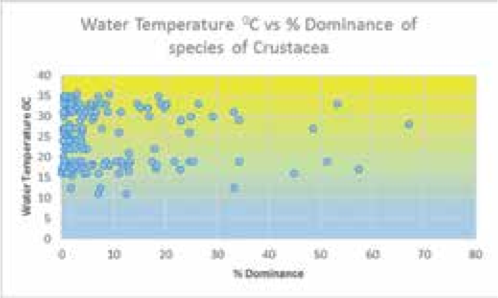


Figure 12.7

In a total of 193 observations, crustaceans were observed at a water temperature range of 11 – 35.5ºC in River Ganga. *Macrobrachium idae* was most tolerant species having 12.5% dominance at a lowest water temperature of 11ºC in River Ganga at Ghatiaghat in Farrukhabad, Uttar Pradesh during January, 2015. Whereas, three species namely *Macrobrachium lopopodus* with 3% dominance, *Caridina bakoensis* (male and female) with 9%

dominance and *Caridina thambipilaii* with 3% dominance, were found to be tolerant to a maximum water temperature of 35.5ºC in River Ganga at Narora during June 2016. Maximum dominace of 67.1% was observed for *Gangemysis assimilis* at water temperature of 28ºC in River Ganga at Danapur Patna in Bihar followed by *Macrobrachium idae* (57.4%) was observed at water temperature of 17ºC in River East Kali at Kanpur – Farrukhabad road bridge in Uttar Pradesh, during January 2015. Lowest dominance of sensitive species of *Macrobrachium lopopodus* (0.0013%) and *Caridina endehensis* with 0.003% dominance at 16ºC in River Ghagra near *Manjhi* and *Macrobrachium lar* with 0.004% dominance at water temperature of 17ºC, were observed in River Ganga at Barari Ghat at Bhagalpur in Bihar. Within 10% dominance maximum number of species of crustaceans were collected at water temperature range from 15 – 35ºC (Figure 12.7).

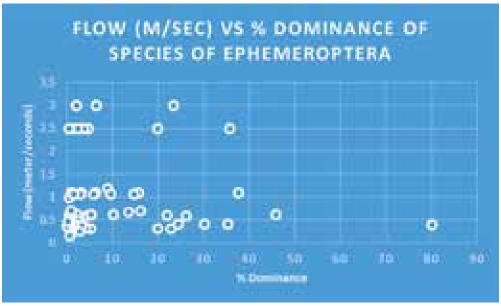


Figure 12.8

Choroterpes

Eatongenia

All the species of Ephemeroptera were collected from 23 locations in River Ganga stretch in the states of Uttarakhand (11), Uttar Pradesh (7), Bihar (4). None of the Ephemeroptera species was observed in West Bengal stretch of River Ganga. Most species of Ephemeroptera were sensitive to water temperature and flow velocity in River Ganga. Dominance of all the species ranged between 0.0039 - 80% within a range of flow velocity of

0.15 – 3.0 m/s in a total of 74 observations on entire stretch of River Ganga. *Rhithrogena* was most dominant species collected from a flow velocity of 0.4 m/s in River Ganga at confluence to outlet of Jagjeetpur STP, Haridwar, during October. Its dominance reduced to 35.6% with the increase in flow of 2.5 m/s in River Alaknanda during November 2015. *Ameletus* was next dominant species (45%) at flow velocity of River Ganga 0.62 m/s at Rishikesh barrage during November 2015. *Cynigmina* was another commonly observed species collected with 38% dominance at flow velocity of 1.1 m/s in River Alaknanda during June 2014. Adults of another rare *Eatongenia* species of ephemeroptera, were collected at a flow rate of 0.37 m/s from River Ghagra near Manjhi in Bihar whereas their nymphs were collected with a dominance of 21.9% at a flow rate between o.43 to o.6 m/s at Mokamah near Hathidah rail bridge in Bihar during December 2015. Dominance of *Eatongenia* reduced to 4.05% at Bithoor in Uttar Pradesh during January 2015, with a lower flow velocity of 0.33 m/s in River Ganga. *Baetis* species was collected with low dominance of 0.6% at lowest flow velocity of 0.15 m/s at Brahampur ghat upstream of Sahibganj in Bihar during January 2016. Likewise, many species of Ephemeroptera were collectively present at a maximum flow velocity of 3.0 m/s in River Alaknanda in Uttarakhand during July 2014. Among them *Ameletus* was most dominant (23%) followed by *Neoephemeropsis* and *Pseudocloeon* 6.38%, *Rhithrogena* and *Torleya* each with 2% dominance. Thus, a large number of ephemeroptera species within a range of 10-40% dominance were observed within a flow velocity of 1.1 m/s (Figure 12.8).

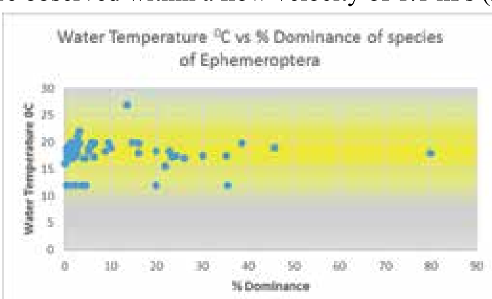


Figure 12.9

Water temperature range of all the species of ephemeroptera collected from River Ganga, was between 12-27ºC. *Rhithrogena* was most dominant (35%) at 12ºC. Many other species with their low dominance were also collected at 12ºC water temperature in River Alaknanda in Uttarakhand.during November 2014, Among them *Platybaetis* was next dominant (19.9%) and *Ameletus* was 4.6% dominant. *Ephemera/Aethephemera* was tolerant to a maximum water temperature of 27ºC with a dominance of 13.5% in River Gandak near rail bridge at Hajipur in Bihar whereas, maximum dominance of *Rhithrogena* (80%), was observed at upstream of Jagjeetpur STP outlet, Haridwar during October 2015. A lowest dominance of *Baetis* (0.15%) was collected at water temperature of 16ºC from River Ganga at bridge near Fatehpur in Uttar Pradesh. Thus, within 10 – 50% dominance of large number of species of ephemeroptera preferred water temperature in River Ganga between15 – 20ºC (Figure 12.9).

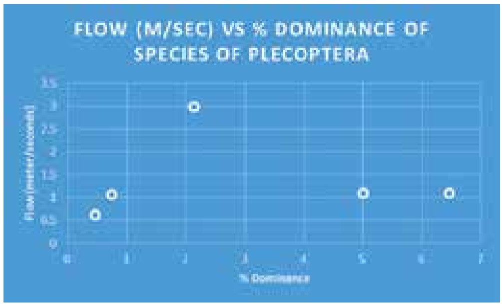


Figure 12.10

Plecoptera species were found in Uttarakhand stretch of River Ganga and its tributaries. The dominance ranges of plecoptera species varied from 0.45 – 6.45% at a flow velocity of 0.625 – 3.0 m/s. Only two species of plecoptera were collected from River Ganga and its tributaries in Uttarakhand state. *Tetropina* was most commonly observed with a dominance range of 2.12% at a maximum flow velocity of 3.0 m/s in River Alaknanda in Uttarakhand during July 2014. *Tetropina* with a dominance of 0.73% was also collected from River Ganga at a flow velocity of1.07 m/s from Byasi, Singtali during April 2016, Maximum dominance of 6.41% of *Tetropina* was observed in River Ganga at Rishikesh barrage (UK 5), during June 2014 whereas, its 5% dominance was observed at flow velocity of 1.1 m/s in River Ganga during same period. *Tetropina* species preferred a higher flow velocity ranging from 1.07 to 3.0 m/s.in River Ganga and its tributaries, especially during months from April to July. Thus, *Tetropina* represented impact of glacial melt water quality during summer. On the other hand, *Flevoperla* of the same family Perlidae was collected only once at Rishikesh barrage during winter month of November 2015 when flow velocity in River Ganga was minimum of 0.625 m/s (Figure 12.10).

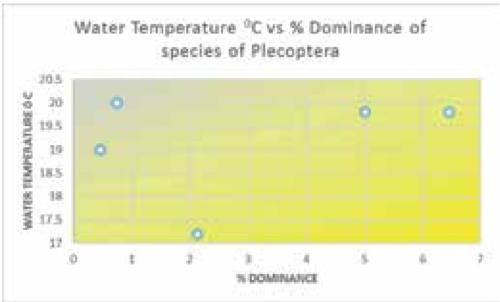


Figure 12. 11

Species of Perlidae family of plecoptera preferred a very narrow range of water temperature ranging from 17.2 to 20ºC. Within this range of water temperature, *Tetropina* specis was commonly observed within a dominance range from 0.7 -6.45% especially during summer months of April 2014, at Singtali, June 2014 at Rishikesh barrage, Dhamkothi on River Ganga Nahar downstream Har-ki-Paori and July 2014, in River Alaknanda in Uttarakhand state. Minimum water temperature during summer, indicated impact of glacial melt water whereas during winter, the species were observed at 19ºC in River Ganga. At this water temperature in River Ganga, *Flavoperla* species was observed at Rishikesh barrage. Thus, species of plecoptera were sensitive to a very narrow range of water temperature both during summer and winter months i.e. 17.2 – 20ºC (Figure 12.11).

Chimarra

Triplectides

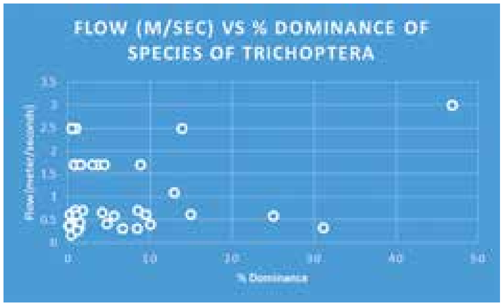


Figure 12.12

Trichoptera species were confined to a limited stretch of River Ganga at a total of 17 locations in the state of Uttarakhand (10), Uttar Pradesh (5), Bihar (1) and Jharkhand (1). They were not observed in West Bengal stretch of River Ganga. Their dominance ranged between 0.02 – 46.8% in a total of 43 observations. Its preference to flow velocity in River Ganga, ranged between 0.17 to 3,0 m/s. Maximum dominance was observed for a tolerant species of *Cheumatopsyche* at a highest flow velocity of 3.0 m/s in River Alaknanda during July 2014. Dominance of *Cheumatopsyche* reduced to 31% with decrease in flow rate of o.33 m/s at Bithoor in Uttar Pradesh during January 2015. Sensitive species of trichoptera such as, *Polycentropus* was having lowest dominance of 0.02% at a flow velocity of 0.37 m/s in River Ghagra near Manjhi in Bihar during January 2016 whereas another sensitive species *Incertae sedis* with low dominance of 0.3% was also collected at low flow velocity of 0.17 m/s in River Ganga at Mangal haat, Syed Bazar, upstream of Rajmahal in Jharkhand, during January 2016. The same species was also found with a dominance level of 0.34% and relatively higher flow velocity of 0.31 m/s in River Ganga at Haridwar barrage in Uttarakhand. A number of trichoptera species were collectively observed at a flow velocity of 1.7 m/s in River Ganga near Byasi, Singtali during April 2016. Among them *Ecnomus* (3.6%), *Triplectides* (0.7%), *Stenopsyche* 4.4%, *Cheumatopsyche* 8.8%, *Chimarra* 0.7%, *Agapetus* 2,9%, *Orthotrichia* 1,4% and pupa of *Agapetus* and other species of family Hydroptilidae were dominant by only 1.45%. Thus, maximum species of trichoptera were observed within 1.7 m/s flow velocity and up to 20% dominance level (Figure 12.12).

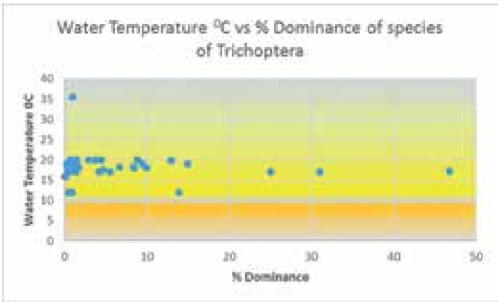


Figure 12.13

Water temperature range of all trichoptera species collected from River Ganga, was between 12 – 35.5ºC and their dominance ranged between 0.02 to 46.8%. *Cheumatopsyche* was most tolerant and dominant among all, at water temperature of 12ºC in River Alaknanda during July 2014 whereas sensitive species of *Polycentropus* survived a water temperature of 16ºC at a lowest dominance level of 0.02 % in River Ghagra near Manjhi in Bihar state. Many species of trichoptera like *Brachycentrus, Hydropsyche, Ecnomus, Diplectrona, Potamyia* and *Stenopsyche* collectively preferred a water temperature of 12ºC in River Alaknanda in Uttarakhand during November 2015.Among them *Potamyia* was having highest dominance of 13.8% and others ranged between only 0.4 – 0.9%. *Diplectrona* species was collected from River Ganga at highest water temperature of 35.5ºC with only 1% dominance at Narora during June 2016. Thus, a wide range of trichoptera species within 50% dominance preferred a water temperature range of 12 to 20ºC (Figure 12.13)

Heliogomphus

Diplacodes

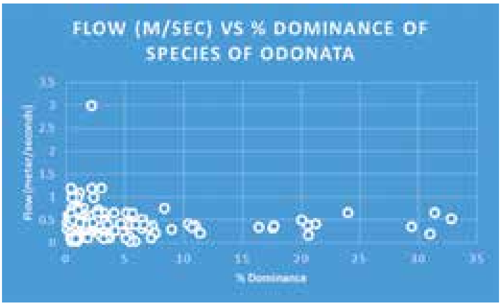


Figure 12.14

Odonates were having a common occurrence throughout the stretch of River Ganga at a total of 85 locations in the states of Uttarakhand (4), Uttar Pradesh (37), Bihar (18), Jharkhand (4) and West Bengal (22) in a total of 191 observations. Their dominance ranged between 0.002 – 32.7% within a range of flow velocity from 0.04 – 3.0 m/s. Among all the odonates, *Sinictinogomphus* species was predominantly observed and their maximum dominance of 32.7% was observed at a flow velocity of 0.67 m/s in River Gandak near rail bridge at Hajipur in Bihar. *Macromia* was least dominant (0.0026%) species among odonates at a flow velocity of 0.3 m/s in River Ganga at Digha rail bridge near Danapur, Patna 2 in Bihar. Lowest flow velocity of 0.04 m/s in River Ganga supported variety of odonate species in River Ganga at Patna 2, such as *Sympetrum* and *Sinictinogomphus* with a dominance of 0.89%, *Orthetrum* 5.8%, *Acisoma* 5.38% and *Brachythemis* with 0.4% dominance during December 2014. On the contrary highest flow velocity of 3.0 m/s did not support diversity of odonates except for *Euphaea decorata* with a low dominance of 2.12% in River Alaknanda during July 2014. Thus, most of the odonate species within 32.7% dominance preferred a flow velocity up to 1.2 m/s in River Ganga (Figure 12.14).

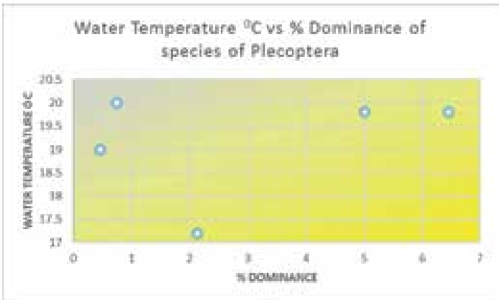


Figure 12.15

Odonates were having a wide range of water temperature requirement from 11 – 40.5ºC in entire stretch of River Ganga, in a total of 192 observations. In this range of water temperature, their dominance ranged from 0.0026% to 32.7%. *Macromia* was least dominant species collected at water temperature of 17.2ºC. *Sinictinogomphus* was most dominant (32%) at water temperature of 19ºC in River Ganga at bridge on upstream Anupshahr in Uttar Pradesh. 10% dominanc of *Orthetrum* and *Acisoma* was observed at lowest water temperature of 11ºC in River Ramganga downstream of Moradabad in Uttar Pradesh during September 2015. At the same location, dominance of *Brachythemis* was 3%, *Sympetrum* 2.3% and occurrence of a rare species *Tramea* was 0.78%. *Prodesineura autumnalis* was the most tolerant species of odonates, observed at highest water temperature of 40.5ºC in River Ganga at Farakka FTPS during February 2016 followed by *Nannophya pygmea* and *Agriocnemis lacteola* each with 2.7% dominance were collected at water temperature of 39ºC at same location of Farakka FTPS in 2015. Thus, 11 – 35ºC water temperature in River Ganga, was most suitable for 10% dominance of many odonate species and 15 -20ºC water temperature range was suitable for dominance level up to 32.7% in River Ganga (Figure 12.15).

Paraplea

Aphelocheirus

Insect communities belonging to Hemiptera, were commonly found in a total 77 locations on River Ganga in Uttarakhand (5), Uttar Pradesh (37), Bihar (12), Jharkhand (3) and West Bengal (19). They were counted in total 190 observations within a range of 0.0013 – 90% dominance in River Ganga within a flow velocity of 0.04 – 1.2 m/s. Among all the species of hemipteran collected from River Ganga, *Aphelocheirus* was most dominant and sensitive species (90%) collected at flow velocity of 1.1 m/s in River Ganga at Dhamkothi on Gang Nahar at downstream of Har – ki –Paori in Haridwar. Another sensitive species was *Ilyocoris* having 50% dominance at highest flow velocity of 1.2 m/s at Haridwar barrage during June 2014. Among tolerant species *Agraptocorixa* was dominant by 56% collected at low flow velocity of 0.31 m/s at bridge on NH-2 on Right bank of River

Ganga at Allahabad in Uttar Pradesh during 2015. *Agraptocorixa* was also least dominant (0.0013%) at almost same flow velocity of 0.37 m/s in River Ghagra near Manjhi in Bihar (Figure 12.16).

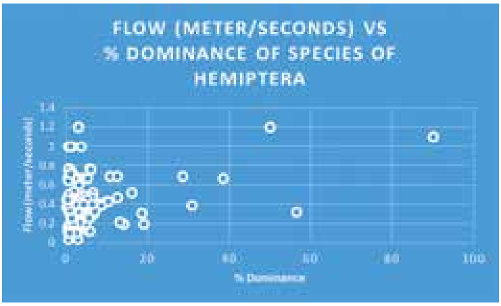


Figure 12.16

Anisops was another species with rare occurrence of 0.004% but preferred a more flow velocity of 0.45 m/s in River Ganga at bridge on downstream Buxar in Bihar during December 2015. Lowest flow velocity of 0.04 m/s was preferred by *Ranatra brevecolis* and *Agraptocorixa* at a dominance range of 0.4 -2.69% in River Ganga on Narora barrage in Uttar Pradesh. Maximum flow velocity was preferred by *Lethoceros* with 2.94% dominance at Haridwar barrage during June 2014 along with *Aphelocheirus* and *Ilyocoris*. Thus, maximum number of species up to 40% dominance were collected from River Ganga at a flow velocity up to 0.8 m/s (Figure 12.16)

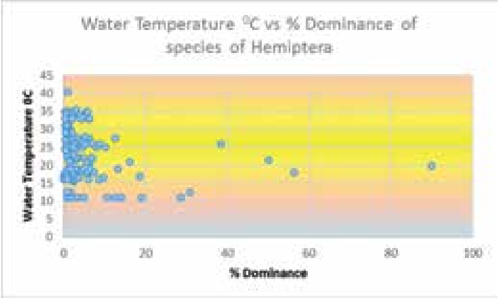


Figure 12.17

Among 190 observation of hemipteran species, the dominance ranged between 0.0013 – 90% distributed in a water temperature range of 11 – 40.5ºC. *Aphelocheirus* with 90% dominance was collected at water temperature of 19.8ºC in River Ganga at Dham Kothi downstream of Har-ki – Paori, Haridwar during June 2014 and 50% of *Ilyocoris* were collected from Haridwar barrage at water temperature of 21.5ºC during same period. *Agraptocorixa* was among lowest dominant species collected from River

Ghagra at water temperature of 16ºC from Manjhi in Bihar during December 2015. Many species of hemipteran were collectively observed at a minimum water temperature of 11ºC in River Ganga at Ghatiaghat in Farrukhabad, Uttar Pradesh during January 2015. The dominance level of *Ranatra brevecolis* was 28.5%, *Laccotrephes pfepferiae* 10.7%, *Diplonychus* and *Anisops* each with 1% and *Agraptocorixa* with 12.5%. *Sigara* at 1% dominance was most tolerant to highest water temperature of 40.5ºC in River Ganga at Farakka FTPS in West Bengal. Thus, a variety of other species of hemipteran within 40% dominance preferred a water temperature range from 11 – 35ºC (Figure 12.17).

Hydrophilus

Hydaticus

Species of coleoptera were collected from 88 locations on River Ganga in the state of Uttarakhand (7), Uttar Pradesh (40), Bihar (17), Jharkhand (4) and West Bengal (19). Coleoptera species were widely distributed within 50% dominance among 246 observations in River Ganga. Their preference to flow velocity in River Ganga, ranged from 0.004 to 3.0 m/s. Among all the species, *Hyphydrus* was most dominant at flow velocity of 1.1 m/s in River Ganga at upstream Rishikesh, near Luxman Jhula, during July 2014. Larvae of Gyrinidae family were rarely observed in River Ghagra near Manjhi in Bihar, having flow velocity of 0.37 m/s during 2015. *Deronectus* larvae with 11.6% dominance preferred a lowest flow velocity of 0.04 m/s in River Ganga at Narora barrage in Uttar Pradesh whereas *Stenelmis* larvae and *Cyphon* each with 2.1% dominance were collected at a highest flow velocity of 3.0 m/s in River Alaknanda in Uttarakhand during July 2014 and June 2014 respectively. Thus, within 50% dominance, a large population of coleopteran species preferred a flow velocity within 1.2 m/s in River Ganga (Figure 12.18).

Coleoptera species also preferred a wide range of water temperature from 10.5ºC to a maximum of 39ºC in River Ganga. At minimum dominance of 0.0013% Gyrinidae larvae preferred a water temperature of 16ºC in River Ghagra near Manjhi in Bihar whereas most dominant *Hyphydrus* preferred water temperature of 18.6ºC at upstream Rishikesh near Luxman Jhula in Uttarakhand. *Hydrovatus* was next dominant (39.5%) species collected in water temperature of 32.9ºC at downstream confluence of River Ganga to Choiya drain at Punjabi dera (Bijnor district in Uttar Pradesh) during June 2016. *Hyphydrus, Helophorus, Helochares* and *Nipponhydrus* were collectively present each with 3.1% dominance at a lowest water temperature of 10.5ºC in River Ramganga at SH-29 at Shahbad in Uttar Pradesh. Among all the species of coleopteran, *Nipponhydrus* and *Halochares* were tolerant to a highest water temperature of 39ºC in River Ganga at Farakka FTPS in West Bengal. Thus, within 20% dominance of most of the coleopteran species preferred a water temperature range from 10.5ºC to 39ºC (Figure 12.19).

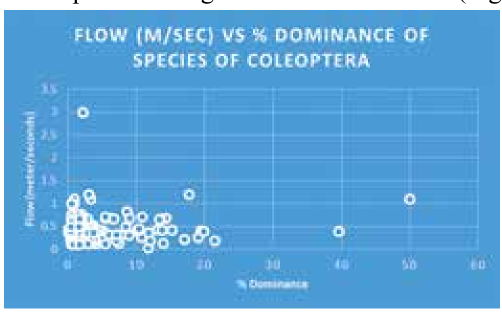


Figure 12.18

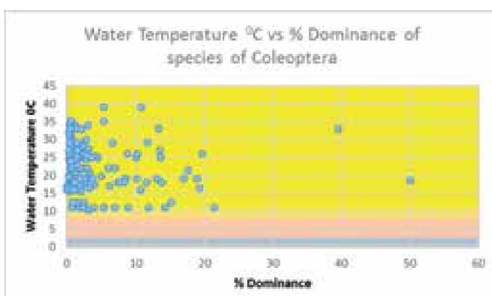


Figure 12.19

Species of Diptera were collected from altogether 64 locations on entire stretch of River Ganga in the state of Uttarakhand (10), Uttar Pradesh (30), Bihar (10), Jharkhand (3) and West Bengal (11). Dominance of diptera species ranged from 0.0129 - 83.8% in River Ganga stretches where flow velocity ranged between 0.1 – 3.0 m/s in a total of 138 observations. Species of subfamily Chironominae was widely distributed in entire stretch of River Ganga at various flow velocities in River Ganga especially at Dhondhi ghat downstream Kanpur in Uttar Pradesh during January 2015. Chironomous dominance was maximum of 83.8% at a flow velocity of 0.41 m/s. They were also dominant (67.3%) in River Ganga at flow velocity of 0.4 m/s at downstream of Nabadwip in West Bengal, followed by 48.5% at flow velocity of 0.83 m/s at Balawali rail and road bridge at upstream of Bijnor during February 2014. Occurrence reduced to minimum for *Anopheles* pupa at a flow velocity of 0.45 m/s at downstream of Buxar in Bihar, during December 2015. *Antocha* was a sensitive species having 50% dominance at a flow velocity of 1.1.m/s in River Ganga at upstream Rishikesh at Luxman Jhula during July 2014. At lowest flow velocity of 0.1 m/s in River Falgu in West Bengal (WB 5). Tanypodinae was dominant by 1.5% and Chironominae was dominant by 0.5% at this location. *Simulium* was the only sensitive species of diptera which survived a maximum flow velocity of 3.0 m/s in River Alaknanda during July 2014. Except few, almost all the species up to 83.6% dominance preferred flow velocity up to 1.1 m/s in River Ganga. Orthocladiinae, Heleinae pupa, Tanypodinae and *Antocha* commonly preferred flow velocity of 2.5 m/s within 8% dominance in River Alaknanda during November 2015 (Figure 12.20).

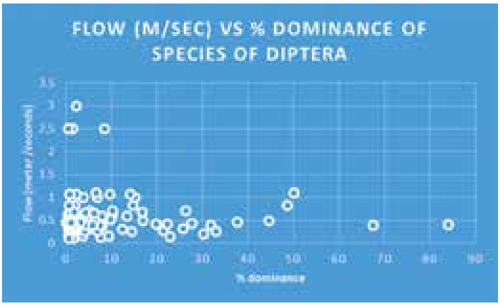


Figure 12.20

A total of 138 observations were made for diptera species in River Ganga with dominance range of 0.012 - 83.8% at a water temperature range of 10.5ºC to 35ºC. Species of subfamily Chironominae were 83.6% dominant at water temperature of 16.5ºC at Dhondhi ghat downstream Kanpur during January 2015 whereas, lowest dominant species of *Anopheles* pupa and Tanypodinae were observed at 18ºC at downstream Buxar in Bihar during December 2015.

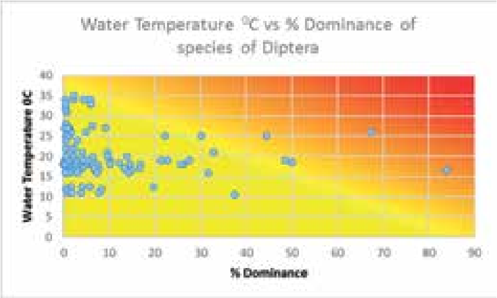


Figure 12.21

Eristalis ***Anopheles larva***

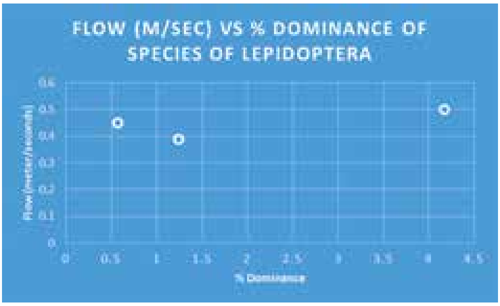


Figure 12.22

All the three species of Lepidoptera were having a water temperature preference of 26ºC, 28ºC and 29.9ºC in River Gomti at Rawari in Uttar Pradesh, River Ganga at Gai ghat in Patna Bihar and at Palta Water Intake in West Bengal respectively (Figure 12. 23).

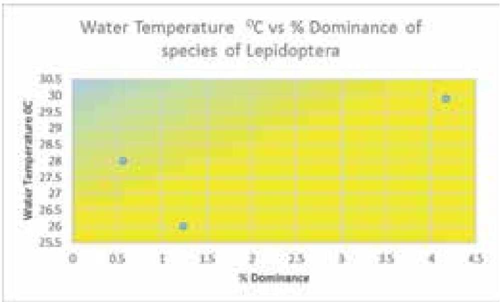


Figure 12.23

Nymphula

Polychaetes were confined to a limited stretch of River Ganga at 30 locations in Uttar Pradesh (3), Bihar (10), Jharkhand (3) and West Bengal (14) with their species in altogether 51 observations. Their dominance ranged between 0.0013 to 24.7% in a flow velocity of 0.1 to 0.67 m/s. *Namalycastis indica* was having a lowest dominance in flow velocity of 0.37 m/s in River Ghagra near Manjhi in Bihar and *Nephthys polybranchia* was most dominant, 24.7% at flow velocity of 0.41 m/s at Vindhyachal ghat at Mirzapur upstream followed by its dominance of 23.5% at flow velocity of 0.31 m/s in River Ganga at upstream Varanasi on SH-74 bridge in Uttar Pradesh. 1.5% dominance of *Caobangia* and 0.5% species of Pisionidae were collected at a lowest flow velocity of 0.1 m/s in River Ganga at first inlet stream (Falgu River) from west on NH-34 at downstream Farakka in West Bengal. *Namalycastis fauveli* was collected at a highest flow velocity of 0.67 m/s at a dominance of 2.7% at nulla in Patna 3b in Bihar. However, within 5% of dominance large number of species within range of 0.1 – 0.5 m/s of flow velocity in River Ganga (Figure 12.24).

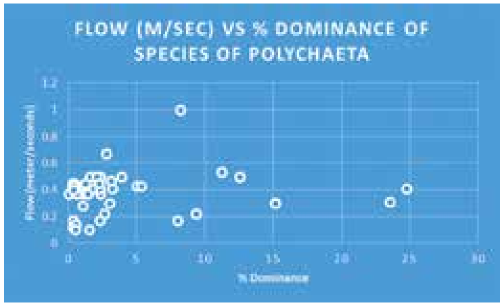


Figure 12.24

Manayunkia/Brandtika

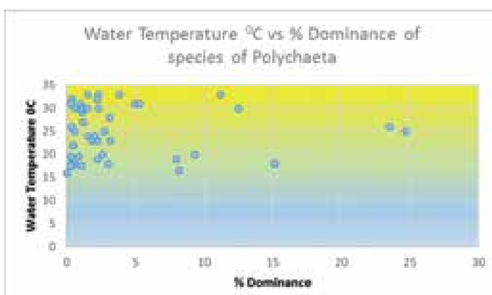


Figure 12.25

In 52 observations at 31 locations, polychaetes dominance ranged from 0.0013 % to 24.7% in River Ganga at water temperature ranging from 16 – 33ºC. *Namalycastis indica* at its lowest dominance was observed at a water temperature of 16ºC in River Ghagra near Manjhi in Bihar. Maximum dominance of 24.7% of *Nephthys polybranchia* was observed in water temperature of 25ºC in River Ganga at Vindhyachal ghat in Mirzapur upstream in Uttar Pradesh. Polychaetes preferred a minimum water temperature of

16ºC for a lowest dominance of *Namalycastis indica* in River Ghagra near Manjhi in Bihar. Whereas their dominance was 1.5% for *Nereis chilkansis* and 2.3% for *Dendronereides heteropoda* at a maximum water temperature of 33ºC in River Ganga at Chinsura in West Bengal. Thus, water temperature preference of most polychaetes within 25% dominance, was between 16-33ºC (Figure 12.25).

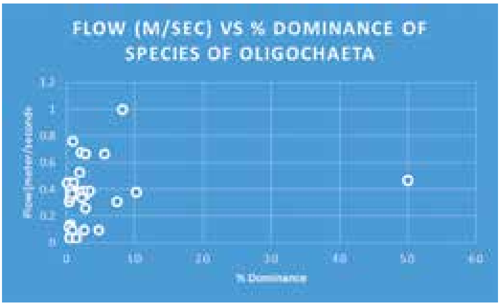


Figure 12.26

Oligochaete species were most tolerant to water quality. Except in one location inUttarakhand stretch of River Ganga, they were widely distributed in a total 31 locations in Uttarakhand (1), Uttar Pradesh (3), Bihar (10), Jharkhand (3) and West Bengal (14). Oligochaetes were observed in 49 observations at a total of 31 locations in entire stretch of River Ganga in states of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal. Oligochaete dominance ranged from 0.021 – 50 % at a flow velocity ranging from 0.04 – 1.0 m/s. *Limnodrilus hoffmeisteri* was most dominant for 50% at flow velocity of 0.47 m/s in River Ramganga at Shahabad on SH-29 in Uttar Pradesh (Figure 12.26).

Limnodrilus sp.

Only one species of *Eiseniella tetraedra tetraedra* was observed at a flow velocity of 0.31 m/s, in River Ganga in Uttarakhand stretch of Haridwar Barrage (UK 6) during November 2015.

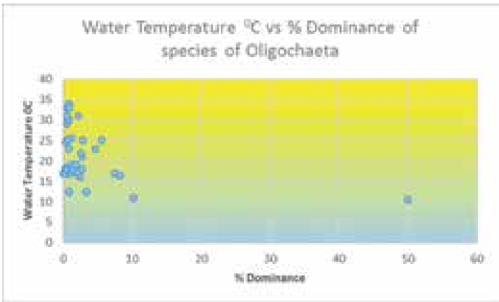


Figure 12.27

Among all the species of oligochaetes, *Lumbriculus variegatus* was lowest dominant at flow velocity of 0.45 m/s at downstream of Buxar in Bihar during December 2015. *Branchiodrilus semperi, Branchiodrilus sowerbyi* and *Aulophorus hymanae* were observed between a dominance range of 0.4 - 1.3% at a lowest flow velocity of 0.04 m/s in River Ganga at Narora barrage in Uttar Pradesh. Their presence at a highest flow velocity of 1.0 m/s was observed for *Branchiodrilus semperi* having dominance of 8.1% in River Sone at Koilwar near rail–road bridge in Bihar. Oligochaetes commonly preferred up to 1.2 m/s of flow velocity within 3.5% dominance (Figure 12.28).

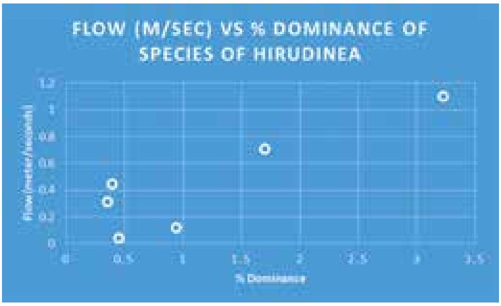


Figure 12.28

Alboglossiphonia weberi

Up to 10% dominance, oligochaete species preferred water temperature ranging from 10–35°C and 50% dominance was observed at lowest water temperature of 10°C (Figure 12.27).

A total of 7 observations have been collected on dominance of species of hirudinea from a total 6 locations in entire stretch of River Ganga out of which 3 locations in Uttarakhand, one in Uttar Pradesh and to locations in West Bengal. *Barbronia weberi* was most dominant (3.2%) with maximum flow velocity of 1.1 m/s in River Ganga at Rishikesh barrage in Uttarakhand. Its dominance was lowest 0.34% at a flow velocity of 0.3 m/s in River Ganga at Haridwar barrage. *Haemadipsa zeylanica* was 0.4% dominant species at a minimum flow velocity of 0.04 m/s in River Ganga at Narora barrage in Uttar Pradesh (Figure 12.28).

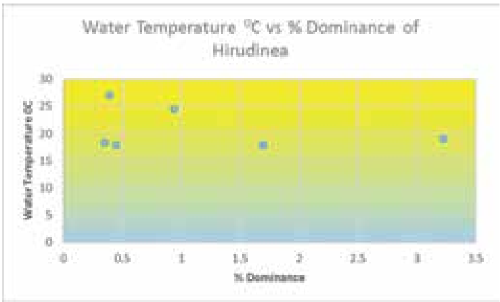


Figure 12.29

Species of hirudinea preferred a very narrow range of 18 - 27 ºC water temperature in River Ganga at a narrow dominance range of 0.34 - 3.2% (Figure 12.29). *Barbronia weberi, Alboglossiphonia weberi* and *Haemadipsa zeylanica* preferred the lowest water temperature of 18ºC in River Ganga at downstream of Jagjeetpur STP outlet in Haridwar in Uttarakhand and Narora barrage in Uttar Pradesh. *Barbronia weberi* was collected at maximum water temoerature of 27ºC in River Ganga at transmission tower at upstream of Tribeni in West Bengal during April 2016.

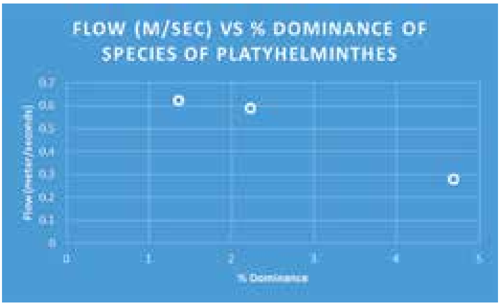


Figure 12.30

Only one species of *Dugesia* was collected with dominance of 2.22% and 1.3% at a flow velocity of 0,59 - 0.62 m/s in River Ganga at upstream Rishikesh near Luxman Jhula and Rishikesh barrage in Uttarakhand respectively during November 2015. *Dugesia* like species were collected from River Ganga at Diamond Harbour in West Bengal. It was dominant species 4.68% at a low flow velocity of 0.28 m/s (Figure 12.30).

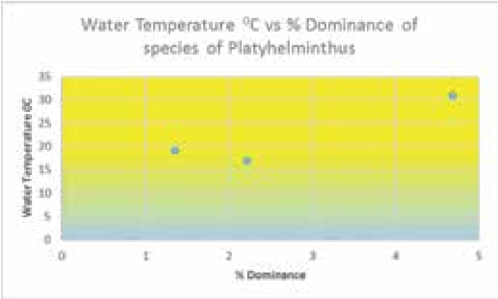


Figure 12.31

Dugesia preferred a water temperature range of 17-19°C in River Ganga at upstream Rishikesh near Luxman Jhula and Rishikesh barrage in Uttarakhand. Whereas *Dugesia* like species preferred a highest water temperature of 31ºC in River Ganga at Diamond Harbour in West Bengal (Figure 12.31).

12.1 Correlation of Dominance of Benthic Macro-invertebrates with Chemical Parameters

+ve Correlation

Ephemeroptera: Caenidae family was tolerant to BOD, Calcium, COD, Chloride, Sodium levels. Families of ephemeroptera lived in high levels of Dissolved Oxygen, Fluoride, Sulphate in water. Optimum pH in water is required by most families of ephemeroptera. Among all the families of ephemeroptera, Caenidae and Ephemeridae were most tolerant families to increased level of Sodium in water. Ephemeridae was tolerant to BOD, Sodium and Total Alkalinity in water (Figure 12.1.3a).

Trichoptera: Some families of trichoptera can sustain low levels in water. Fluoride level was required by families of trichoptera especially by the caseless free living caddisflies. Magnesium in water, was preferred by all the families of trichoptera. Among trichoptera *Orthotrichia* species of family Hydroptilidae and Philopotamidae were most tolerant to increased sulphate levels in water (Figure 12.1.3b).

Hemiptera: All the families of hemiptera, such as Corixidae, Ranatridae, Aphelocheiridae, Belastomatidae and Notonectidae indicated their tolerant habitat towards BOD level in water. All the families collected from River Ganga, showed tolerance to Calcium, Conductivity, levels in River Ganga. Families such as Corixidae, Ranatridae, Belastomatidae and Notonectidae were most tolerant to Chloride levels (Figure12.1.3c).

Coleoptera: Among coleopteran, only Dytiscidae family was positively correlated and thus, showed tolerance to pH, BOD., DO, Calcium, Conductivity, Potassium, Sodium, Nitrate. Among coleopteran families, Psephenidae was tolerant to increase in Nitrate, Phosphate, Fluoride levels in water. Increased level of Total Alkalinity was preferred by Hydrophilidae. Others were sensitive to Total Alkalinity in water (Figure 12.1.3d).

Diptera: Family Tabanidae and Chironomidae were quite tolerant to increasing levels of pH, BOD, Calcium, COD, Potassium, TDS, Total Hardness and Total Alkalinity of River Ganga. Among Chironomidae family, only subfamily Chironominae was tolerant to BOD, Sodium, Sulphate levels. Tabanidae family was most tolerant to Chloride in water, among all. Most dipterans survived high levels of Dissolve Oxygen (Figure 12.1.3e).

Mollusca: Some molluscs families preferred increasing levels of BOD, Chloride in River Ganga. Species of family Lymnaeidae, Physidae, Bithyniidae, Planorbidae, Corbiculidae, Viviparidae, *Radiatulla occata* and *Radiatula caerulea* of family Amblemidae preferred high levels of Calcium content in water. Very few species of mollusca such as *Lymnaea accuminata, Gyraulus convexiusculus* and *Bellamya bengalensis* were tolerant to COD levels in River Ganga. Maximum molluscs species were tolerant to Conductivity, Dissolved Oxygen, Nitrate, Potassium, Sodium, Total Alkalinity and Total Hardness, Sulphate levels in River Ganga. Except few families most of the families were tolerant and required higher pH in water for their growth. Except for *Gyraulus* and *Corbicula stiatella*, all the species of mollusca are tolerant and preferred high levels of TDS in water (Figure 12.1.3f).

Crustacea: All crustacean families such as Palaemonidae and Atyidae preferred high levels of BOD, Calcium, Conductivity, Nitrate, pH, Fluoride, Potassium, Sulphate, TDS, Total Alkalinity and Total Hardness in River Ganga (Figure 12.1.3g).

Oligochaeta: Oligochaetes were most tolerant especially family Tubificidae can withstand high levels of BOD, Chloride, COD, Potassium, and Sodium content in water. Few oligochaetes were tolerant to Conductivity levels in water quality of River Ganga. All the families of oligochaetes were tolerant to Nitrate, Dissolved Oxygen, Fluoride levels in water. Among oligochaetes families, Naididae was most tolerant to increasing levels of Magnesium, Fluoride and Nitrate but tolerant to low levels of Dissolved Oxygen in water (Figure 12.1.3g).

Platyhelminthes, Lepidoptera and Megaloptera: Families of Platyhelminthes, Lepidoptera and Megaloptera were tolerant to Conductivity, Magnesium and Nitrate levels in River Ganga (Figure 12.1.3h).

Odonata: Families of odonates collected from River Ganga indicated their preference to increasing levels of BOD, Calcium, Chloride, Conductivity, Dissolved Oxygen, Nitrate, pH and Potassium in water quality. Coenagrionidae family was most tolerant to high levels of Fluoride content. Among families of odonatan, Coenagionidae was most tolerant family to increase in Sulphate levels. Except for Coenagrionidae, families of odonata were tolerant to increasing TDS levels in water. Except for Coenagrionidae, all the families of odonata were tolerant to increased levels of Total Alkalinity and Total Hardness in water (Figure 12.1.3i).

-ve Correlation

Ephemeroptera: Among ephemeroptera, almost all families were sensitive to BOD, Chloride, TDS and Total Hardness levels in River Ganga. Among ephemeroptera, family Caenidae and Ephemerelidae were resistant to Conductivity levels. Leptophlebidae and Heptagenidae were sensitive to high levels of Dissolved Oxygen. Caenidae and Ephemeridae were sensitive to Fluoride, Magnesium, Potassium, Phosphate levels. Among families of ephemeroptera such as, Leptophlebiidae Ephemeridae, Heptageniidae were sensitive to Nitrate levels in water. Baetidae and Siphonuridae were very sensitive to change in pH and Sulphate levels in water. Except for Ephimeridae, all the families were sensitive to Total Alkalinity levels in water (Figure 12.1.3a).

Trichoptera: All trichoptera families such as Orthotrichia species of family Hydroptilidae, Philopotamidae, Hydropsychidae and Glossosomatidae were negatively correlated with BOD. Increase in BOD levels in water was harmful for survival of trichoptera families. High Calcium, Chloride, COD, Conductivity, pH, Phosphate, Potassium, Sodium, TDS, Total Alkalinity and Total Hardness levels in water quality of River Ganga, was not suitable for colonization of families of trichoptera in River Ganga. Among all the families of trichoptera *Orthotrichia* species of family Hydroptilidae and family Philopotamidae showed their sensitivity towards Nitrate levels in water (Figure 12.1.3b).

Hemiptera: Aphelocheiridae and Belastomatidae were sensitive to COD levels among all the families of hemiptera, collected from River Ganga, whereas families like Corixidae, Aphelocheiridae and Belastomatidae were sensitive to high levels of DO in water. Families of hemiptera were most sensitive to Fluoride, Magnesium, Phosphate levels. Some of the families of hemiptera such as Corixidae was most sensitive to Nitrate levels in water. (Figure 12.1.3c).

Coleoptera: Family Psephenidae showed extreme sensitivity to Calcium COD, Sulphate levels in water. Among coleoptera, Dytiscidae family showed its resistance to Chloride, Magnesium levels in River Ganga. Families of coleoptera were sensitive to TDS and Total Hardness levels in water. Most families of coleoptera did not prefer high levels of Dissolved Oxygen in water except family Dytiscidae (Figure 12.1.3d).

Diptera: Many families of diptera such as, Tipulidae, Simulidae lived in clean water and thus, showed a negative correlation with BOD in River Ganga. Among Chironomidae family, subfamilies Tanypodinae and Orthocladiinae were very sensitive to BOD levels in River Ganga. Few families were normally sensitive to Chloride, COD, Phosphate and Total Alkalinity levels. Tabanidae family survived low level of Dissolved Oxygen. Among all the families of diptera, Chironomidae family was most sensitive to Fluoride and Magnesium levels. Among families of diptera, Chironomidae and Tabanidae were most sensitive to Nitrate levels in water (Figure 12.1.3e).

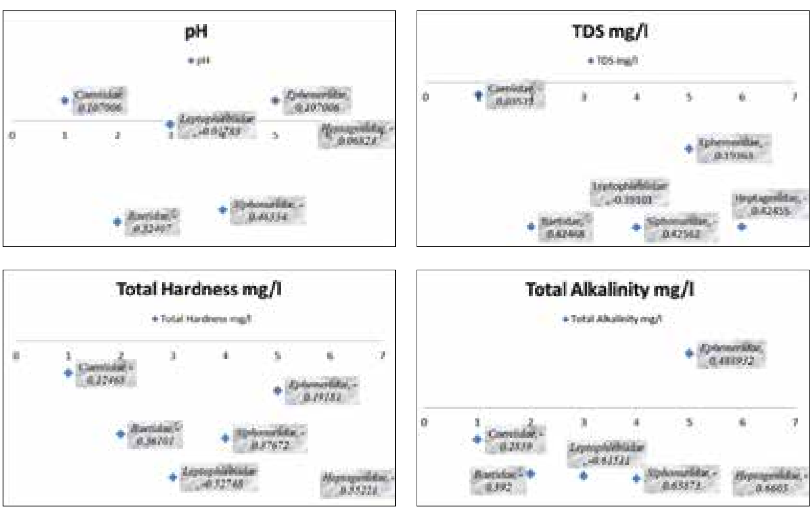
Mollusca: Among the species of molluscs families, *Thiara (Thiara) scabra* and *Melanoides tuberculatus* of family Thiaridae, *Lamellidens marginalis, L. rhadineus* of family Unioniidae and *Parreysia corrugate, Radiatula olivaria* of family Amblemidae and *Assiminea francesiae* of family Assimineidae possessed no correlation with BOD. Presence of species of *Lamellidens marginalis, Lamellidens rhadineus* of family Unionidae, *Thiara (Thiara) scabra* of family Thiaridae, *Assiminea francesiae* of family Assimineidae and *Parreysia corrugata* and *Radiatula olivaria* of family Amblemidae indicated utilization of Calcium content for construction of calcareous shells and thus did not show any correlation with Calcium level in water. Few families were sensitive to increased Dissolved Oxygen levels. Tolerant species of molluscs such as, *Lymnaea, Gyraulus, Physa, Corbicula* etc. were more sensitive to Fluoride levels compared to sensitive species. Most of the families of gastropoda and bivalvia were sensitive to Magnesium levels in water. Some species were quiet sensitive to Sodium and Sulphate levels in water. Some Families were sensitive to Nitrate levels in water. All the species of gastropods and bivalvia were most sensitive to increasing levels of Phosphate in water. *Lymnaea* and *Gyraulus* were sensitive to Total Alkalinity in water. Except for *Gyraulus convexiusculus,* and *Corbicula striatella* were sensitive to Total Hardness in water (Figure 12.1.3f).

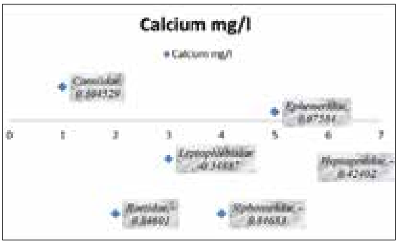
Crustacea: Crustaceans were also sensitive to Chloride Magnesium, Phosphate, Sodium, and COD in water quality. Among crustaceans, Atyidae preferred less Dissolved Oxygen compared to Palaemonidae (Figure 12.1.3g).

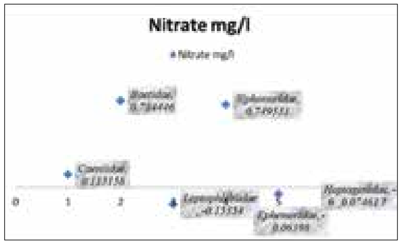
Oligochaeta: Family Naididae did not prefer water quality with low BOD levels. Naididae family of oligochaetes indicated extreme sensitivity to pH, Calcium, Sulphate, levels in water. Oligochaetes were sensitive to low levels of Phosphate, TDS, Total Alkalinity and Total Hardness in water (Figure 12.1.3g). Thus, family Tubificidae was negatively correlated with Magnesium, Nitrate, Phosphate, TDS, Total Alkalinity and Total Hardness in water. Similarily, family Naididae was sensitive to low levels of Phosphate, Potassium, Total Alkalinity, Total Hardness, TDS, pH, Calcium, Sulphate, COD, Conductivity, BOD and Chloride.

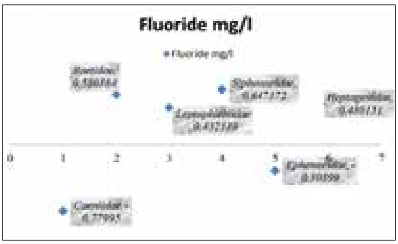
Platyhelminthes, Lepidoptera and Megaloptera: Family Dugesiidae of Planaria, Pyrulidae of Lepidoptera and Corydalidae of Megaloptera were found sensitive to BOD, Calcium, Chloride, COD, Fluoride, pH, Dissolved Oxygen, Phosphate, Potassium, Sodium, TDS, Total Alkalinity and Total Hardness levels in River Ganga (Figure 12.1.3h).

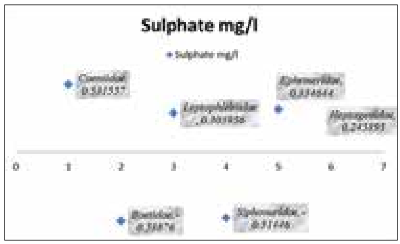
Odonata: Among all the odonates, only Gomphidae family was found to be sensitive to COD levels. All the families of odonata were sensitive to Magnesium and Phosphate levels in water. Among all the families of odonata, Libellulidae was most sensitive family to increasing levels of Sodium, Sulphate, Phosphate, Fluoride and COD levels in water (Figure 12.1.3i).

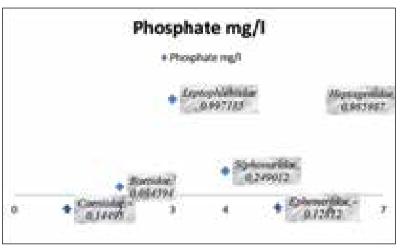


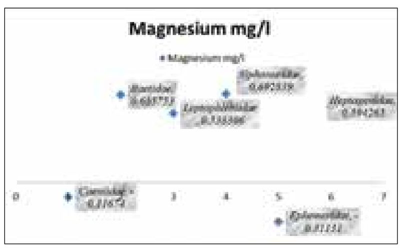

Calcium mg/l
Calcium mg/l

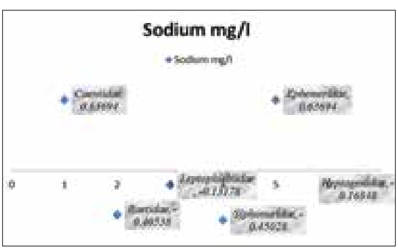

Nitrate mg/l
Nitrate mg/l

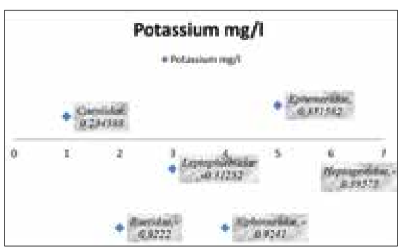

Fluoride mg/l
Fluoride mg/l

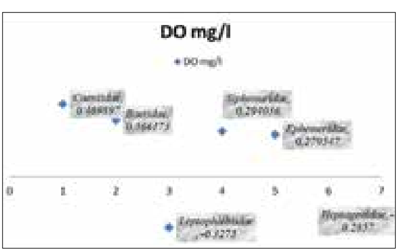

Sulphate mg/l
Sulphate mg/l

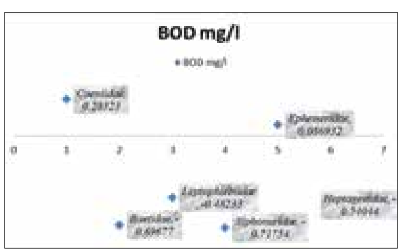

Phosphate mg/l
Phosphate mg/l


Magnesium mg/l
Magnesium mg/l


Sodium mg/l
Sodium mg/l


Potassium mg/l
Potassium mg/l


DO mg/l
DO mg/l


BOD mg/l
BOD mg/l

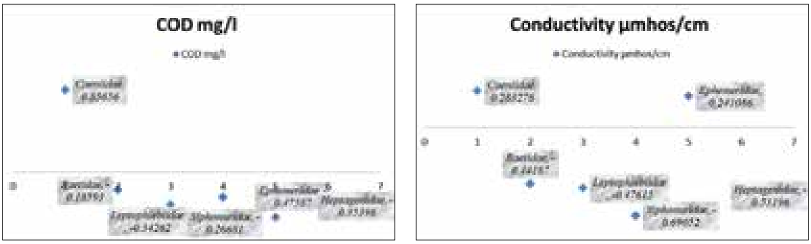
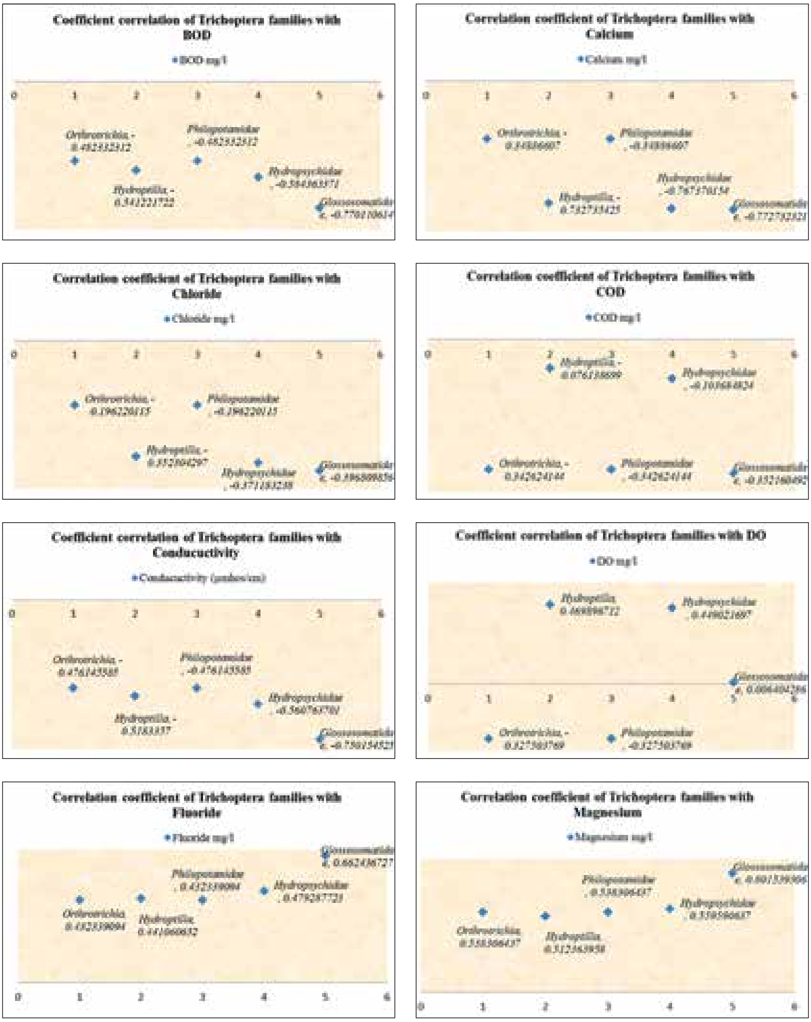
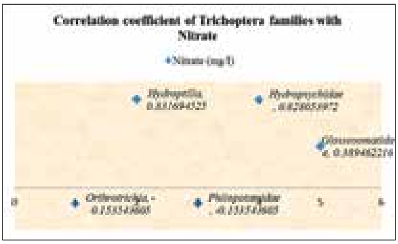
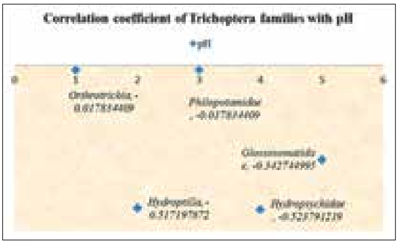
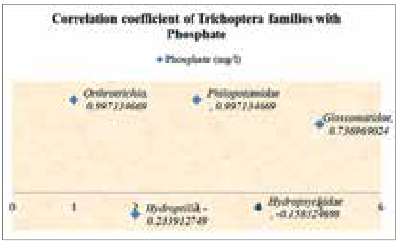


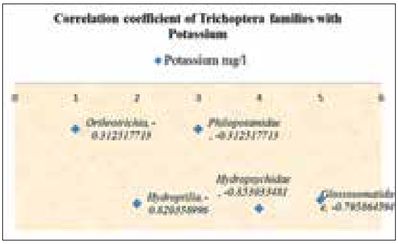
Figure 12.1.3a: Correlation coefficient of % dominance of different families belonging to the order Ephemeroptera with chemical parameters

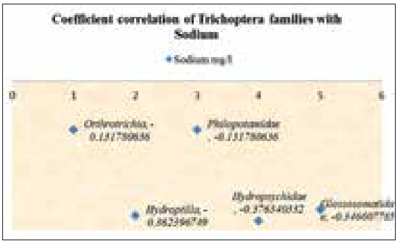


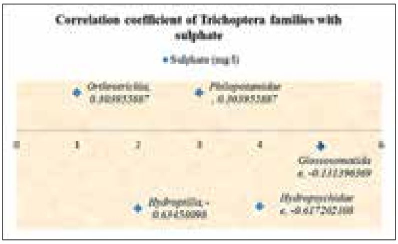

Correlation coefficient of Trichoptera families with Nitrate
Nitrate (mg/l)

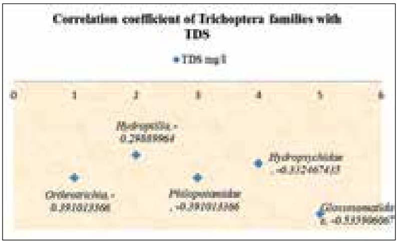

Correlation coefficient of Trichoptera families with pH
pH

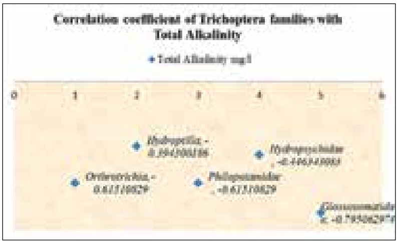

Correlation coefficient of Trichoptera families with Phosphate
Phosphate (mg/l)


Correlation coefficient of Trichoptera families with Potassium
Potassium mg/l


Coefficient correlation of Trichoptera families with Sodium
Sodium mg/l


Correlation coefficient of Trichoptera families with sulphate
Sulphate (mg/l)


Correlation coefficient of Trichoptera families with TDS
TDS mg/l


Correlation coefficient of Trichoptera families with Total Alkalinity
Total Alkalinity mg/l

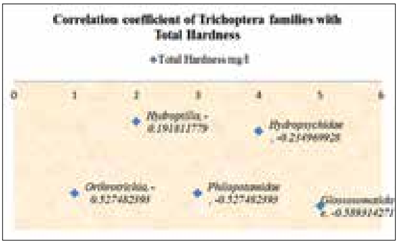
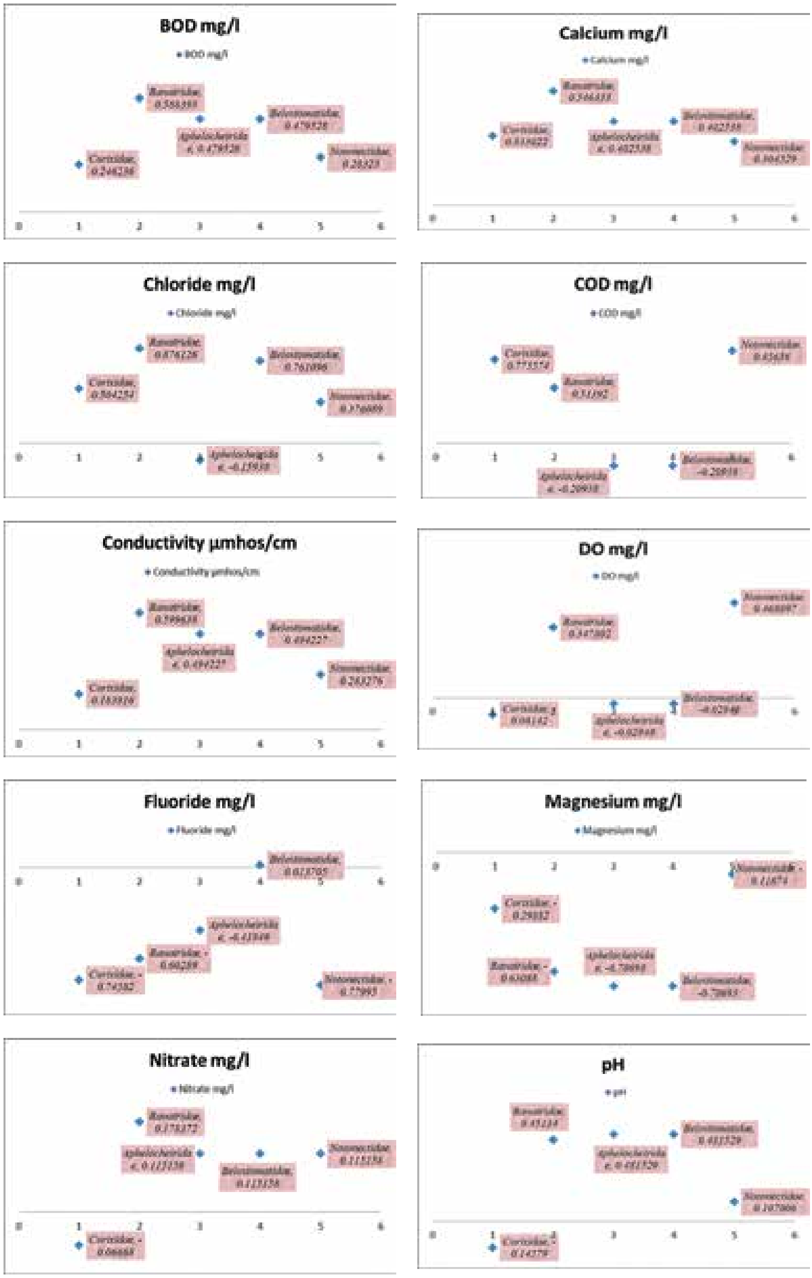

Correlation coefficient of Trichoptera families with Total Hardness
Total Hardness mg/l

Figure 12.1.3b: Correlation coefficient of % dominance of different families belonging to the order Trichoptera with chemical parameters.



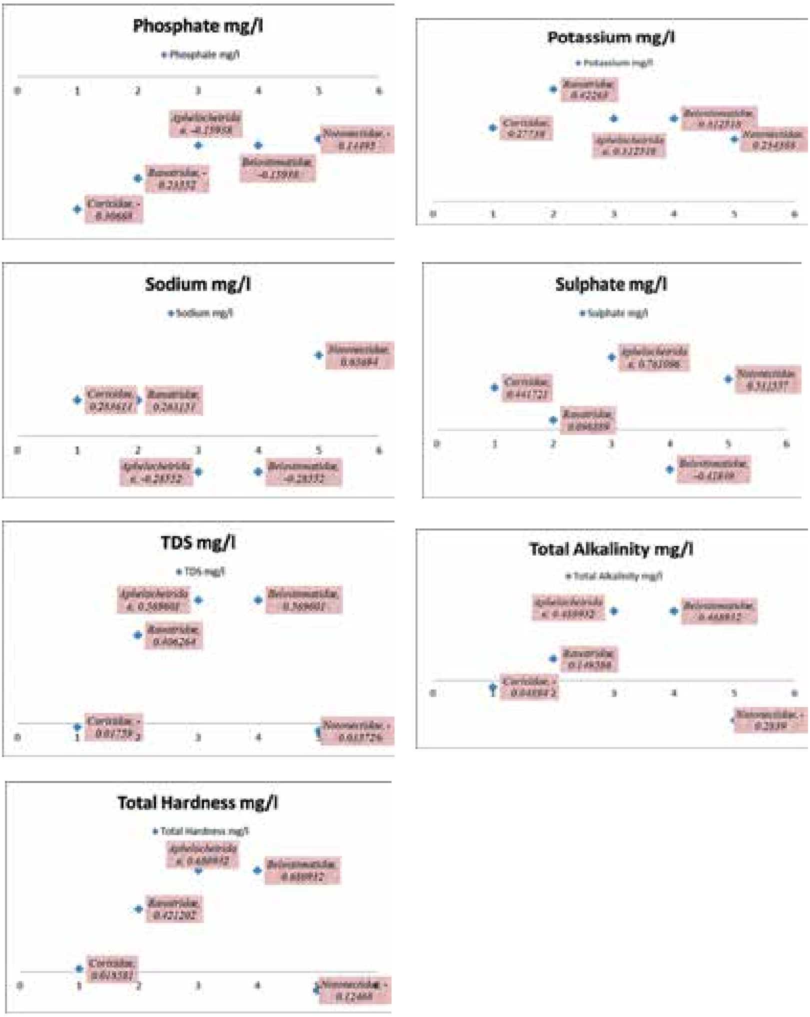
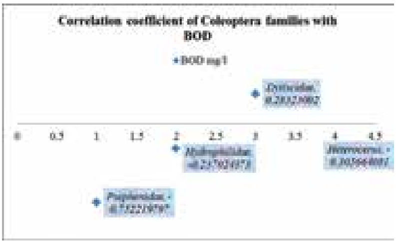
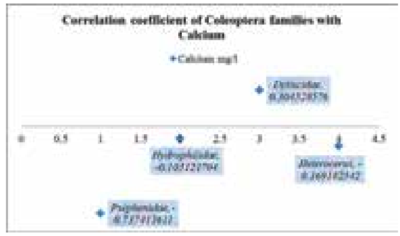
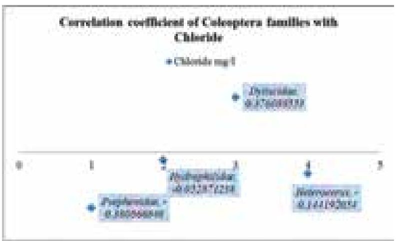
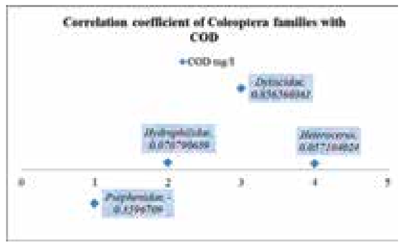


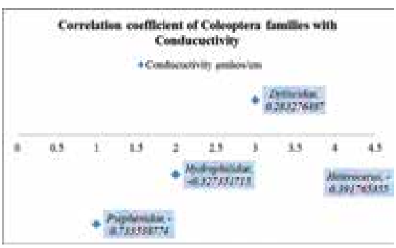
Figure12.1.3c: Correlation coefficient of % dominance of different families belonging to the order Hemiptera with chemical parameters

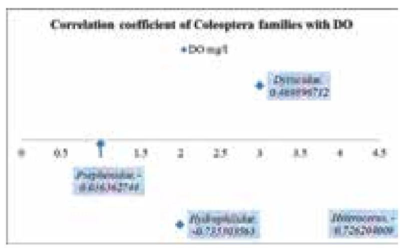

Correlation coefficient of Coleoptera families with BOD
BOD mg/l

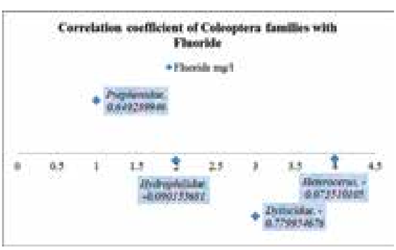

Correlation coefficient of Coleoptera families with Calcium
Calcium mg/l

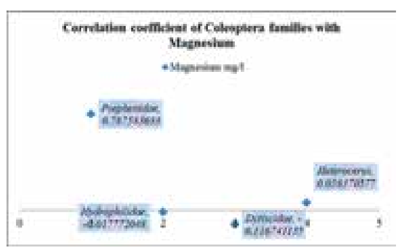

Correlation coefficient of Coleoptera families with Chloride
Chloride mg/l

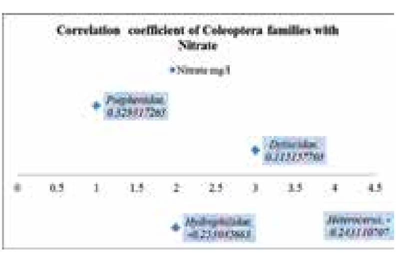

Correlation coefficient of Coleoptera families with COD
COD mg/l

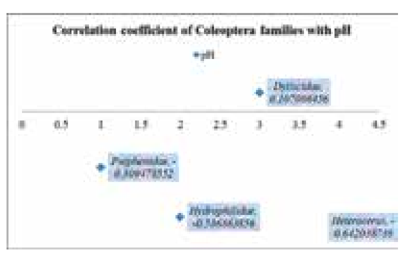

Correlation coefficient of Coleoptera families with Conducuctivity


Correlation coefficient of Coleoptera families with DO
DO mg/l


Correlation coefficient of Coleoptera families with Fluoride
Fluoride mg/l


Correlation coefficient of Coleoptera families with Magnesium
Magnesium mg/l


Correlation coefficient of Coleoptera families with Nitrate
Nitrate mg/l


Correlation coefficient of Coleoptera families with pH
pH

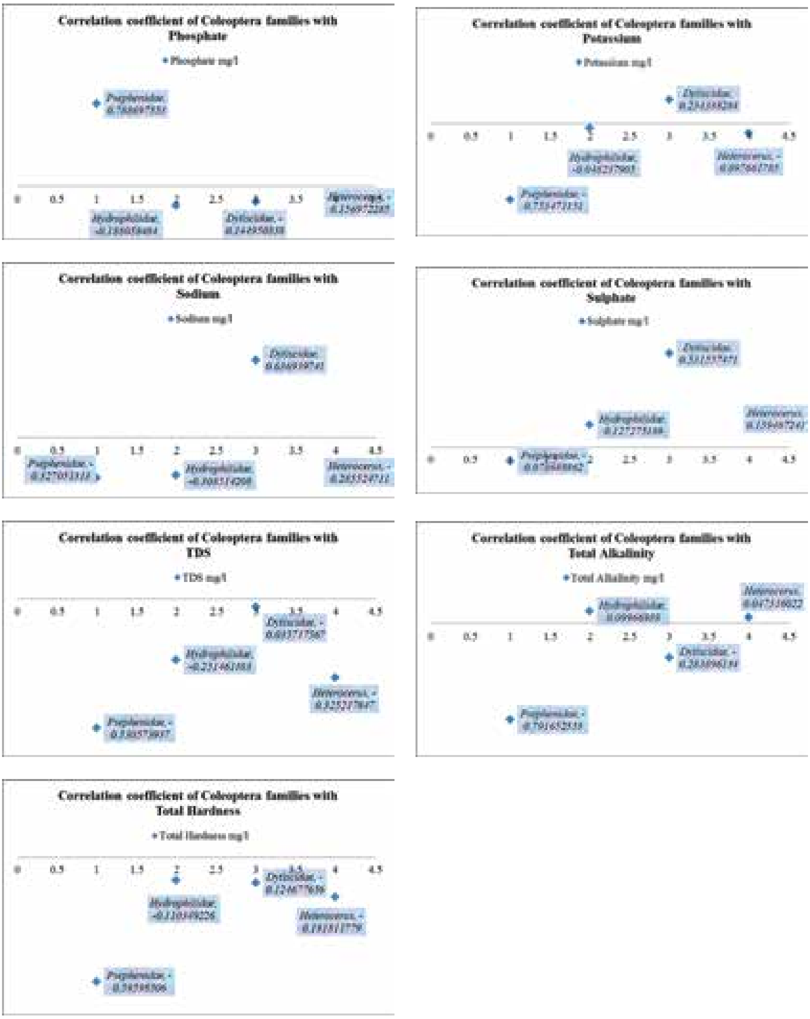
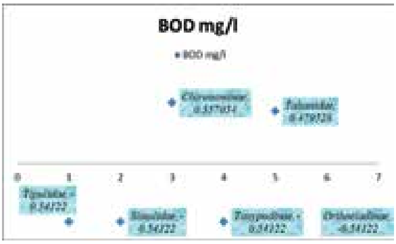
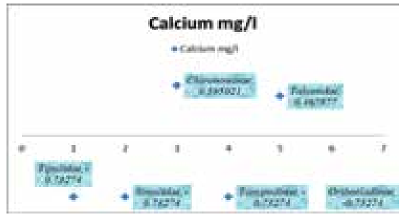
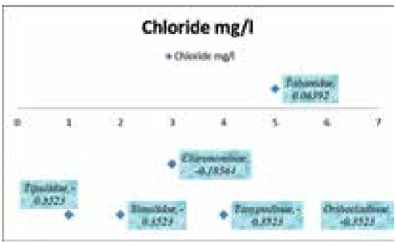
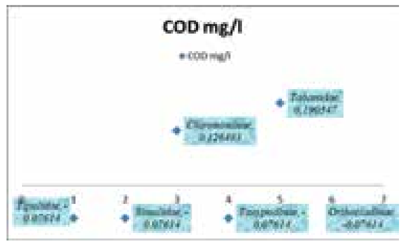


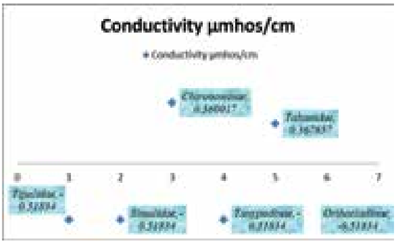
Figure 12.1.3d: Correlation coefficient of % dominance of different families belonging to the order Coleoptera with chemical parameters.

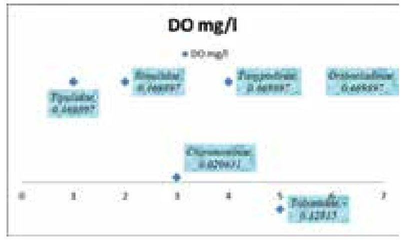

BOD mg/l
BOD mg/l

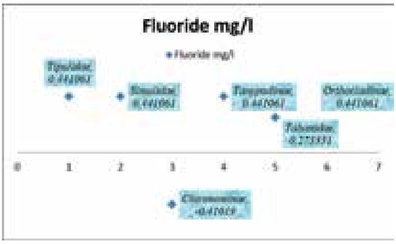

Calcium mg/l
Calcium mg/l

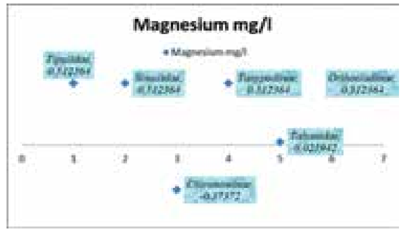

Chloride mg/l
Chloride mg/l

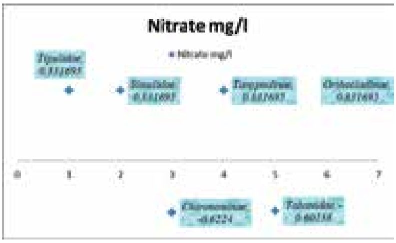

COD mg/l
COD mg/l

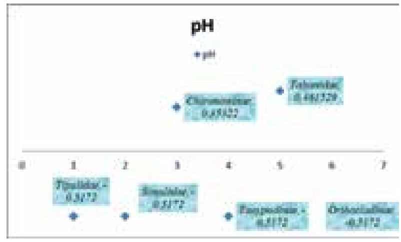

Conductivity µmhos/cm
Conductivity µmhos/cm


DO mg/l
DO mg/l


Fluoride mg/l
Fluoride mg/l


Magnesium mg/l
Magnesium mg/l


Nitrate mg/l
Nitrate mg/l


pH
pH

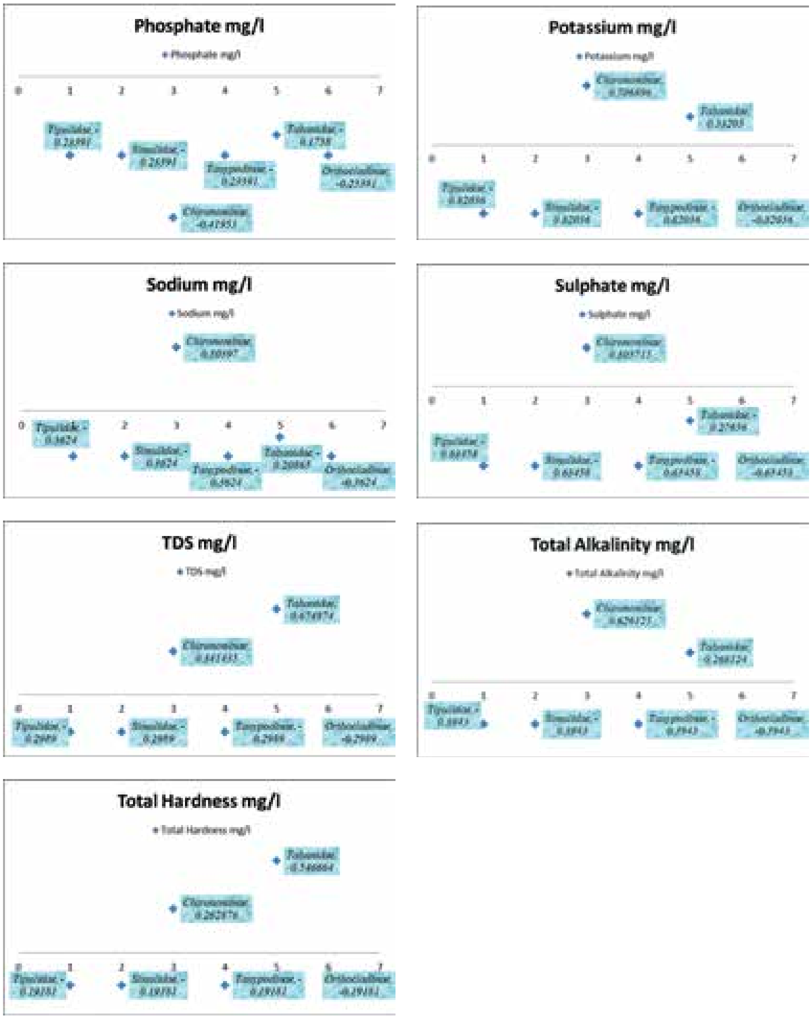
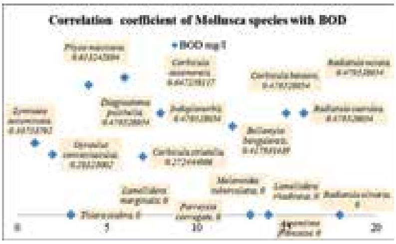
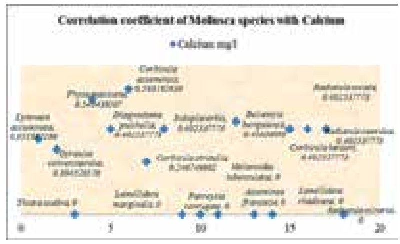
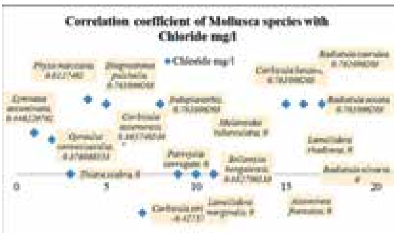
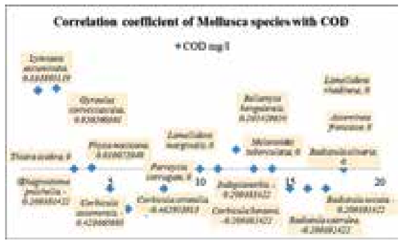


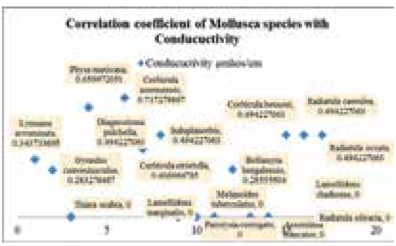
Figure 12.1.3e: Correlation coefficient of % dominance of different families belonging to the order Diptera with chemical parameters.

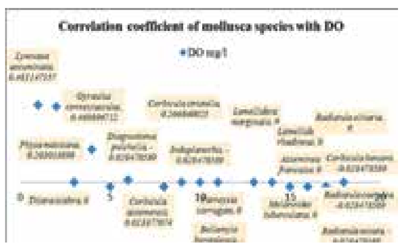

Correlation coefficient of Mollusca species with BOD
BOD mg/l

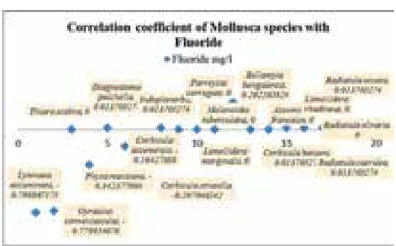

Correlation coefficient of Mollusca species with Calcium
Calcium mg/l

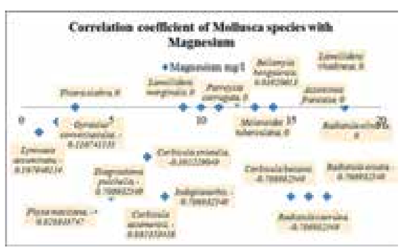

Correlation coefficient of Mollusca species with Chloride mg/l
Chloride mg/l

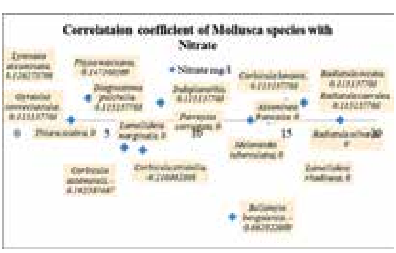

Correlation coefficient of Mollusca species with COD
COD mg/l

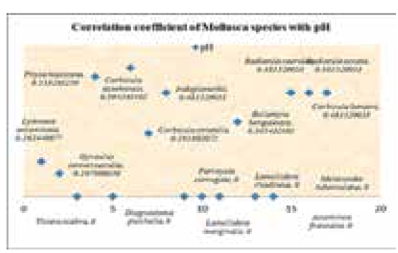

Correlation coefficient of Mollusca species with Conducuctivity


Correlation coefficient of mollusca species with DO
DO mg/l


Correlation coefficient of Mollusca species with Fluoride
Fluoride mg/l


Correlation coefficient of Mollusca species with Magnesium
Magnesium mg/l


Correlataion coefficient of Mollusca species with Nitrate
Nitrate mg/l


Correlation coefficient of Mollusca species with pH
pH

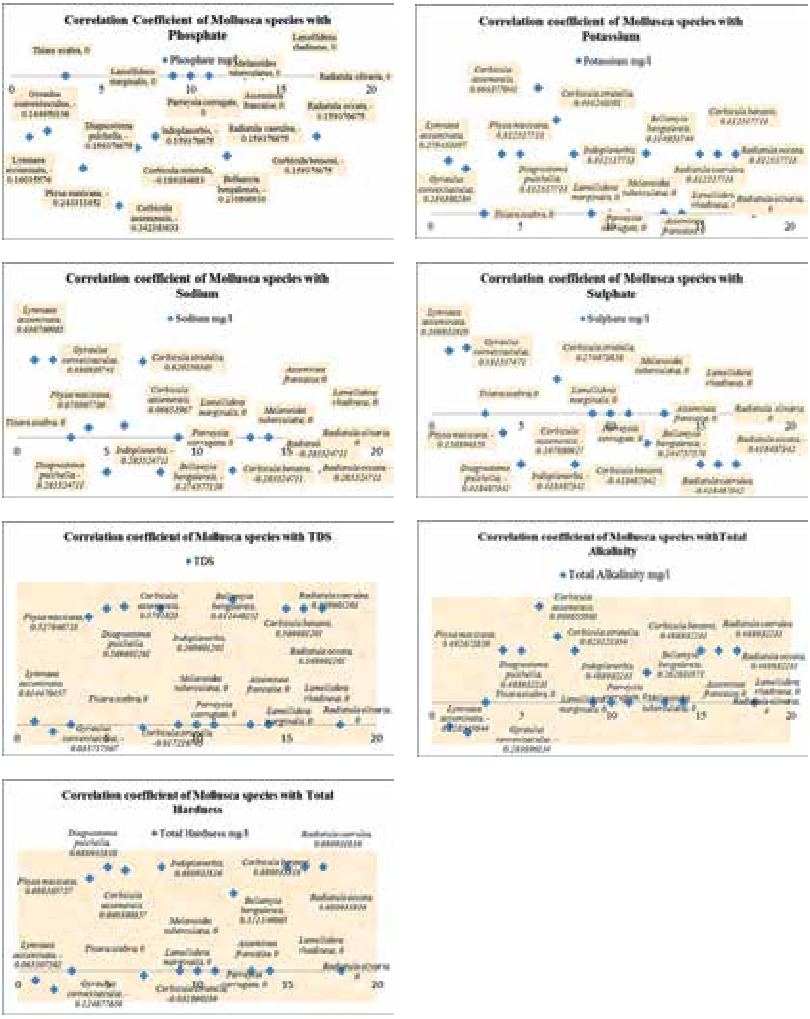
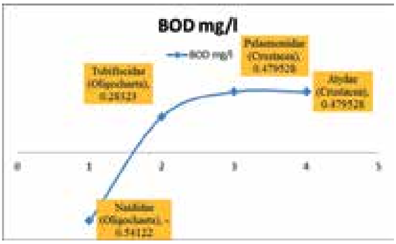
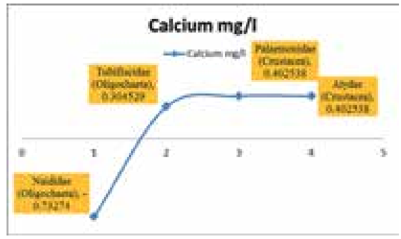
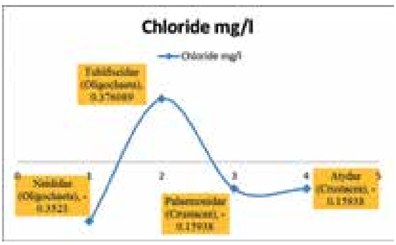
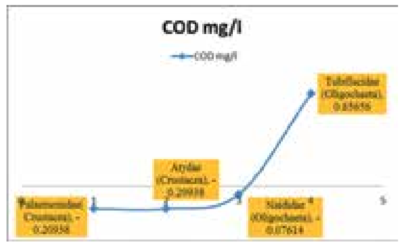


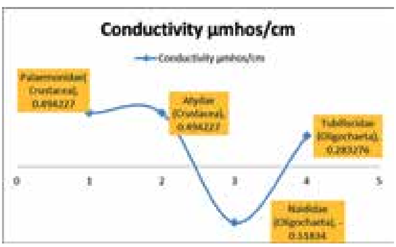
Figure 12.1.3f: Correlation coefficient of % dominance of different families belonging to the order Mollusca with chemical parameters.

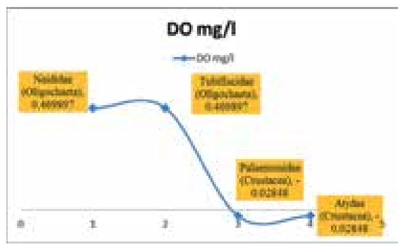

BOD mg/l
BOD mg/l

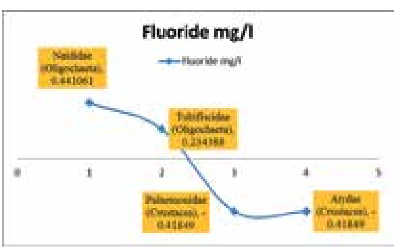

Calcium mg/l
Calcium mg/l

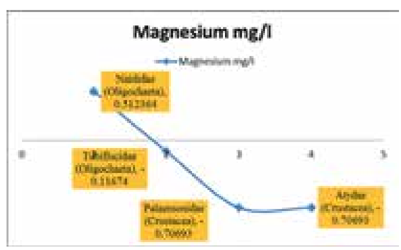

Chloride mg/l
Chloride mg/l

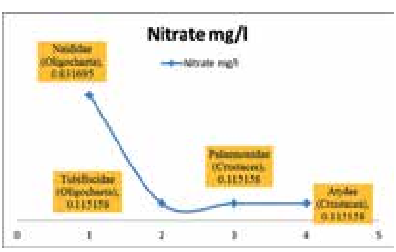

COD mg/l
COD mg/l

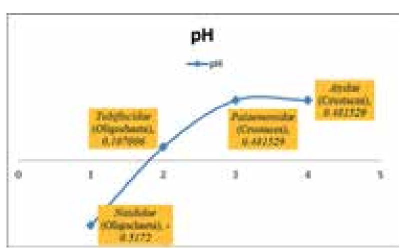

Conductivity µmhos/cm
Conductivity µmhos/cm


DO mg/l
DO mg/l


Fluoride mg/l
Fluoride mg/l


Magnesium mg/l
Magnesium mg/l


Nitrate mg/l
Nitrate mg/l


pH
pH

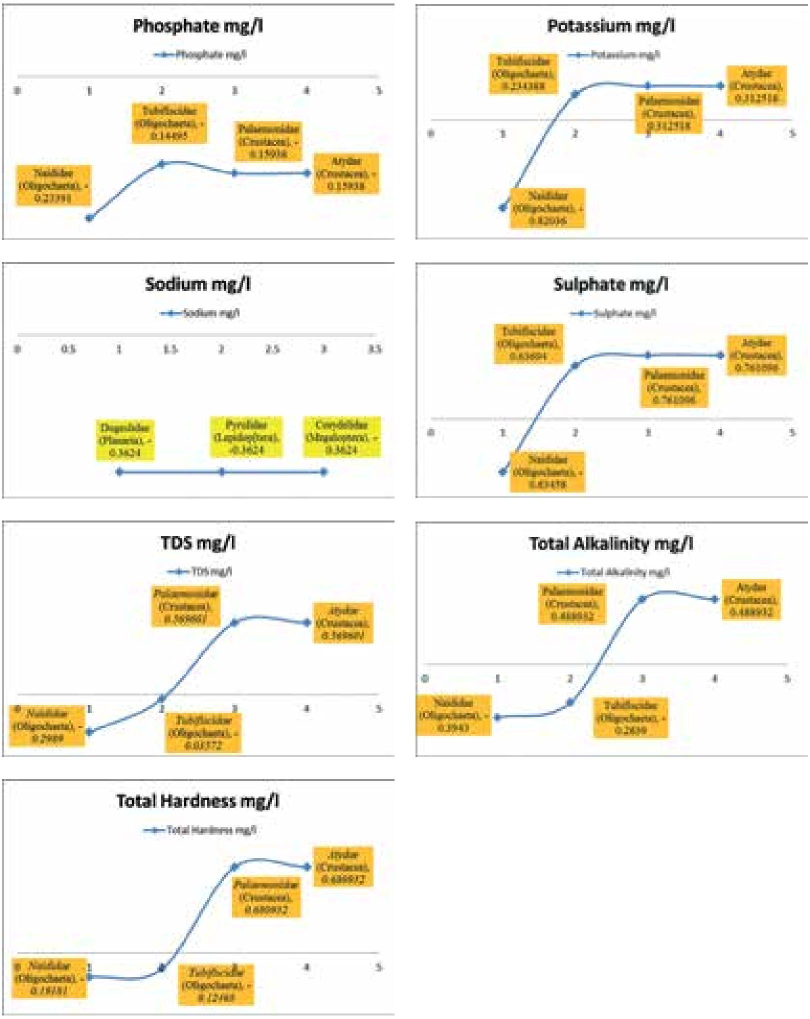
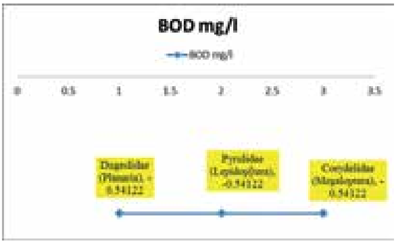
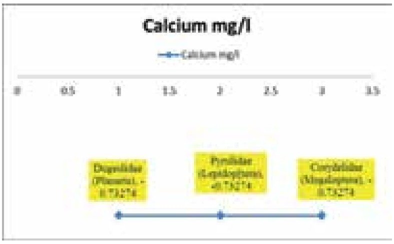
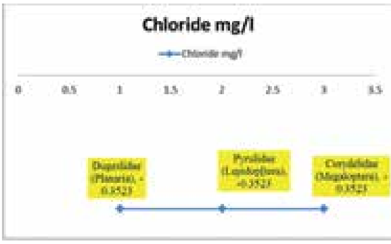
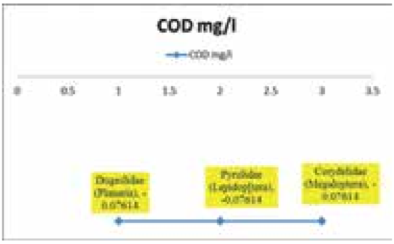


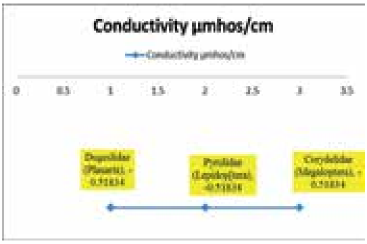
Figure 12.1.3g: Correlation coefficient of % dominance of different families belonging to the order Oligochaeta and class Crustacea with chemical parameters

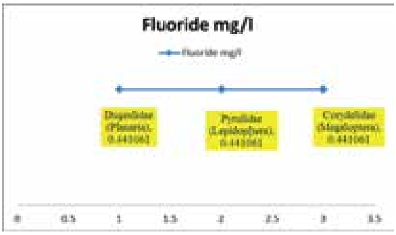

BOD mg/l
BOD mg/l
0 0.5 1 1.5 2 2.5 3 3.5

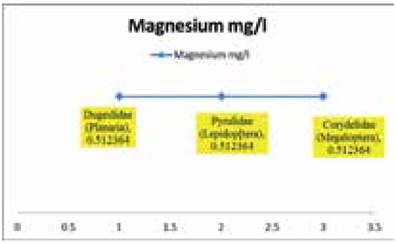

Calcium mg/l
Calcium mg/l
0 0.5 1 1.5 2 2.5 3 3.5

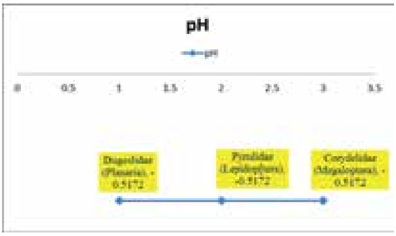

Chloride mg/l
Chloride mg/l
0 0.5 1 1.5 2 2.5 3 3.5

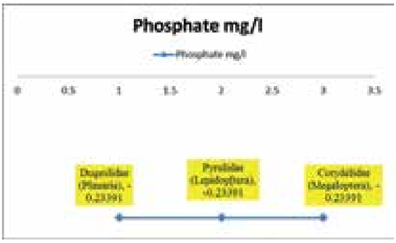

COD mg/l
COD mg/l
0 0.5 1 1.5 2 2.5 3 3.5

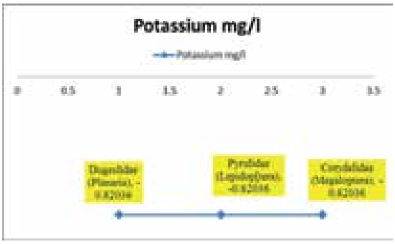

Conductivity µmhos/cm
Conductivity µmhos/cm
0 0.5 1 1.5 2 2.5 3 3.5


Fluoride mg/l
Fluoride mg/l
0 0.5 1 1.5 2 2.5 3 3.5


Magnesium mg/l
Magnesium mg/l
0 0.5 1 1.5 2 2.5 3 3.5


pH
pH
0 0.5 1 1.5 2 2.5 3 3.5


Phosphate mg/l
Phosphate mg/l
0 0.5 1 1.5 2 2.5 3 3.5


Potassium mg/l
Potassium mg/l
0 0.5 1 1.5 2 2.5 3 3.5

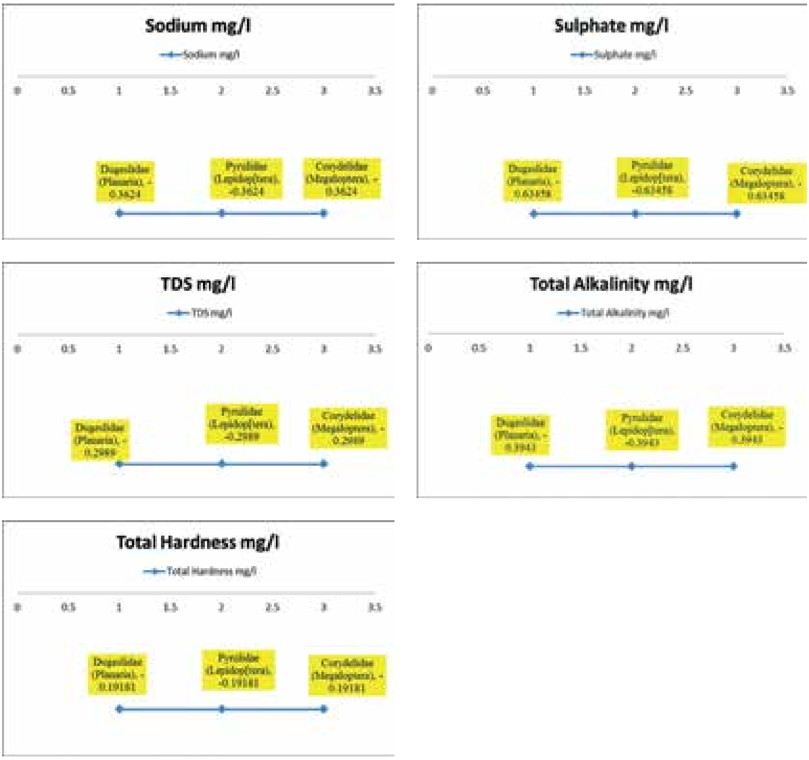
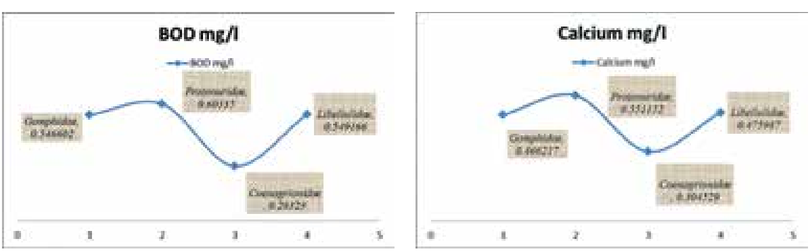
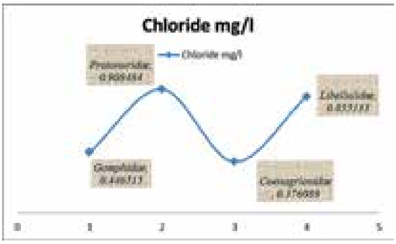
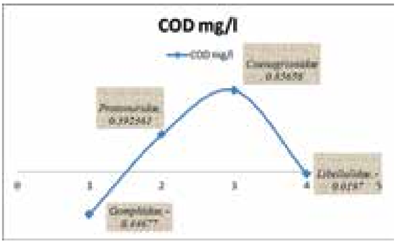
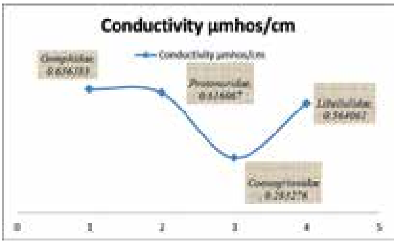


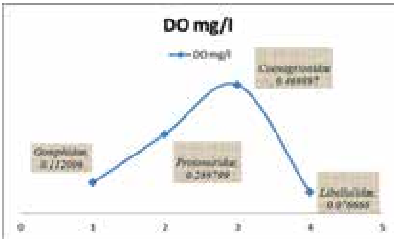
Figure 12.1.3h: Correlation coefficient of % dominance of different families belonging to the Phylum Platyhelminthes, order Lepidoptera and Megaloptera with chemical parameters

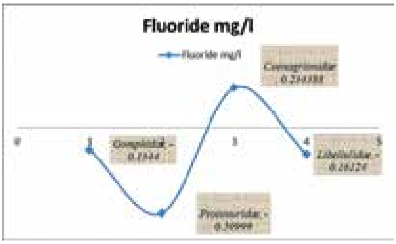


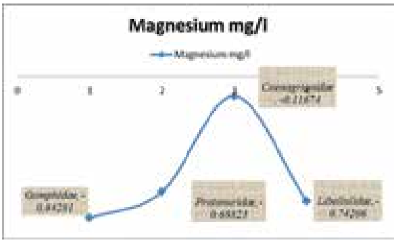

Chloride mg/l
Chloride mg/l

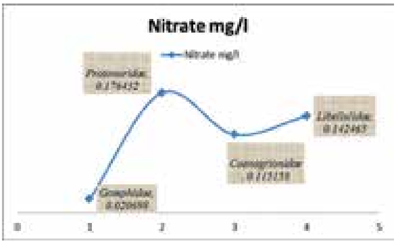

COD mg/l
COD mg/l

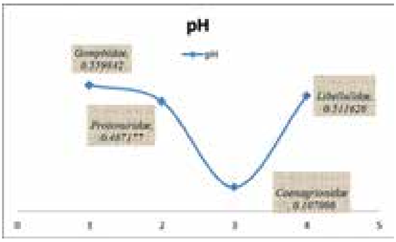

Conductivity µmhos/cm
Conductivity µmhos/cm

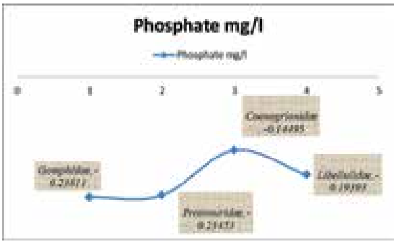

DO mg/l
DO mg/l

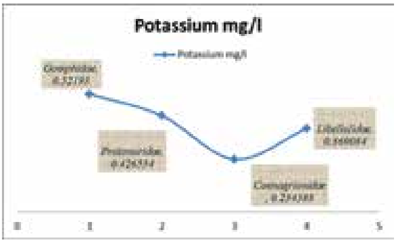

Fluoride mg/l
Fluoride mg/l


Magnesium mg/l
Magnesium mg/l


Nitrate mg/l
Nitrate mg/l


pH
pH


Phosphate mg/l
Phosphate mg/l


Potassium mg/l
Potassium mg/l

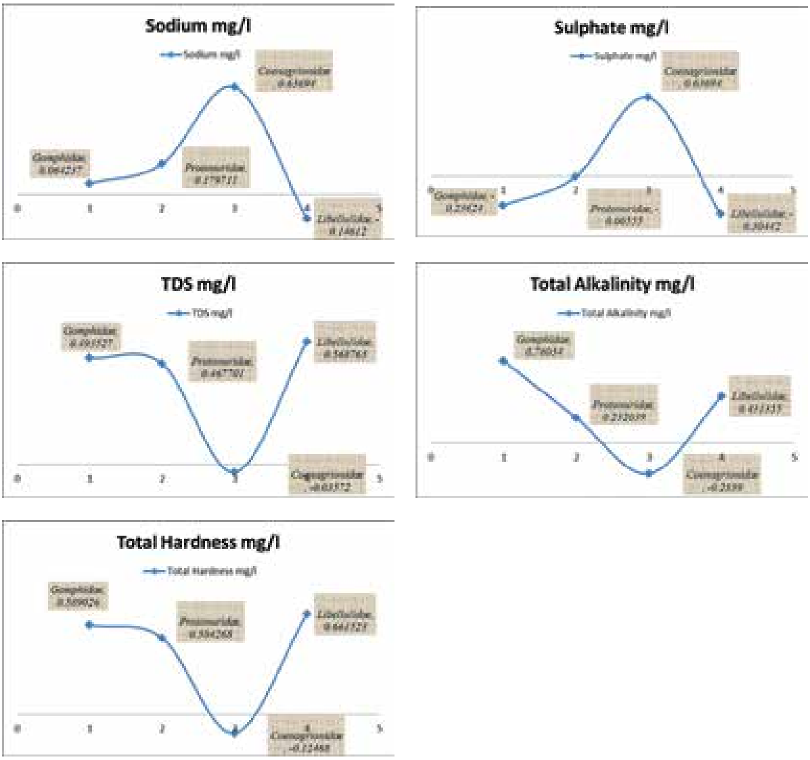


Figure 12.1.3i: Correlation coefficient of % dominance of different families belonging to the order Odonata with chemical parameters

13 Validation for Bio-monitoring Field Protocol

13.1 Validation of sampling event details:

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Field Protocol	**Field Protocol number:** Used for identification and traceability of sampling records	100	100
Water body	**Name of water body:** Biomonitoring is carried out only for fresh water rivers, streams, canals, lakes, ponds etc.	99	99
Location	**Name of Location:** Location name of water body is required in view of assessing the impact of pollution sources on biological water quality.	100	100
Date of sampling	Provides the status of water quality on a particular occasion/event/episode as per the planned activities of an objective.	100	100
Time of sampling	**Starting time:** To be written to ascertain the actual duration for sampling required during enough sun light at particular location on water body, for sample collection and data recording. Macro-invertebrates, in a water body, are available during ample intensity of sun light and not during rainy season. It also ensures sampling performed as per schedule. **Ending time:** To be written to ensure completion of sampling before sun set.	75	100
Sampling team	**Name of sampling team:** Bio-monitoring sample is require to be collected by a team of trained and qualified officials having complete acquaintance with the sampling procedures and safety measures to be taken during sampling for bio-monitoring.	100	50

13.2 Location details:

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Depth (meter or feet)	Based on depth of water body, sampling area is decided either horizontally on the river bank or vertically towards opposite bank. Habitat of benthic macro-invertebrates communities change with the variation in depth of a water body. Measurement of depth of water body to be sampled, ensure safety of sampling team from drowning.	25	75
Width of water body (meter)	Sampling area to be decided horizontally on the bank or vertically towards opposite bank. Waste water discharges on both the banks of water body determines the survival of benthic invertebrates.	25	75
Main stream flow (Meter/ seconds)	Abrupt change in stream flow due to sudden discharge from barrages and dams may disturb various habitats of macro invertebrates, in the downstream reaches of water bodies.	25	75
Description of water	A river may have various hydrological conditions in its entire stretch, such as; pool, slack, riffles, run, depositing, eroding, and turbulent. Different types of water bodies influence the availability of variety of macro-invertebrates. **Pool:** Odonates, Bivalves, Gastropods, Coleoptera, Hemiptera, Diptera, Polychaets, Oligochaetes etc. or none. **Slack:** Ephemeroptera, Trichoptera, Crustacea, Odonates, Bivalves, Gastropods, Coleoptera, Hemiptera, Diptera, Polychaets, Hirudinea, Planaria, Oligochaetes etc. **Riffles:** Ephemeroptera, Plecoptera, Trichoptera, Megaloptera, Hemiptera, Coleoptera, Diptera, Molluscs etc or none. **Run:** Running waterbodies may have mix varieties of taxa of benthic macro-invertebrates or none. **Depositing:** None, Crustacea, Diptera, Coleoptera, Hemiptera, Odonata, Mollusca, Oligochaete etc. **Eroding:** None, Ephemeroptera, Trichoptera, Diptera **Turbulent:** None	100	100

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Substratum composition of unpolluted natural and manmade water bodies/ wetlands	**Boulders (> 256 mm):** Boulders provide habitat for settlement of families of Ephemeroptera, Plecoptera, cased Trichoptera, Diptera, Planaria, Megaloptera, Neuroptera, or none. **Cobbles (255-64 mm):** Ephemeroptera, cased Trichoptera, or none. **Pebbles (63-16 mm):** Ephemeroptera, cased Trichoptera, or none. **Gravel (15-2 mm):** Ephemeroptera, Plecoptera, Hemiptera or none. **Sand (0.0625 mm):** Ephemeroptera, or none. **Clay (0.002 mm):** Ephemeroptera, **Artificial substratum:** Mixed colonization depending upon water quality.	100	100
Substratum composition of polluted natural and manmade water bodies/ wetlands	**Boulders (> 256 mm):** boulders provide habitat for settlement of families of Ephemeroptera, Trichoptera, Diptera, Odonata, Hemiptera, Hirudenia, Oligochaeta etc., or none. **Cobbles (255-64 mm):** Ephemeroptera, Trichoptera, Diptera, or none. **Pebbles (63-16 mm):** Ephemeroptera, Trichoptera, Diptera or none. **Gravel (15-2 mm):** Hemiptera, Coleopteran, Odonata, Oligochaete, Diptera or none. **Sand (0.0625 mm):** Ephemeroptera, Odonata, Polychaetes, Oligochaetes, Molluscs, Crustacea, Hemiptera, Coleoptera, or none. **Silt (0.002 mm):** Diptera, Oligochaetes, Molluscs, Odonates or none. **Clay (0.002 mm):** Ephemeroptera, Crustacea, Molluscs, Polychaetes, Hirudinea or none, **Detritus:** Coleoptera, Hemiptera, Odonata, Diptera, Hirudinea or none. **Macrophytic vegetation:** Crustacea, Odonates, Gastropods, Hemiptera, Coleoptera, Hirudinea, Diptera. **Artificial substratum:** Mixed colonization depending upon water quality.	100	100

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Human influences	**Cattle wading:** Disturb the settlement of benthic macro-invertebrates on river bed substratum composed of sand, silt, detritus and macrophytic vegetation. **Dredging:** dredging of stones from river bed substratum remove the colonization of very important habitat of indicators of clean waters. **Sand recovery:** sand recovery from river bed increase the depth of a water body and thereby replace the native species. **Melon farming:** Pesticides used for cultivation activities may add to water body through surface run offs and thus kill the native species of insect larvae and nymphs in river bed substratum.	100	100
Wet land plants	Provide substratum to habitats of various species of invertebrates. Increase dissolve oxygen level in water for aquatic life. Also provide breeding grounds to many Crustaceans and Odonates.	100	100
Macrophytic cover/ Name	Variety of submerged and floating macrophytic vegetation provide feeding habitats to different aquatic invertebrates such as Odonates, Hemiptera, Coleoptera, Diptera, Crustacea etc.	100	100
Birds/ Wildlife habitat	Presence of aquatic birds and wildlife habitats such as Gangetic Dolphin in River Ganga indicates existence of an healthy colonisation of benthic macro-invertebrates.	50	50
Surrounding land use	**Urban:** Urban activities are the point and non-point sources of pollution affecting directly to the water quality which impact the settlement of sensitive and tolerant species of aquatic animals. **Arable:** Arable land on the banks of water body, is suitable for growing crops which may contribute pesticide and other toxicants residue through surface runoff to water body and thus harm the insect communities. It also prevents siltation in water body through soil erosion in view of protection of river bed substratum for settlement of aquatic animals. **Grazing land:** Cattle wading and related human activities disturb the river bed substratum and water quality of water body. **Forest:** Forest cover in the surrounding area prevent siltation in water bodies due to soil erosion.	100	100

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Sun Intensity	**Nil:** Nil intensity of sun during heavy cloud and night time sampling creates problem in identifying the live animals from sediments. **Moderate:** Moderate sun intensity is always good for sample collection and identification. **Heavy:** Heavy sunlight during afternoon of summers allow most benthic invertebrates to hide themselves under safe places and thus reducing the collection numbers.	75	100
Altitude	At a very high altitude, sampling is difficult under extreme environmental conditions.	50	100
Discharges	Discharge of untreated effluents, solid waste etc. to water body leads to elimination of sensitive species of aquatic life or replaced by tolerant species.	100	100
Confluences	Confluence of two water bodies change the hydro biological and chemical composition of individual water bodies and thereby affect the species composition at downstream of confluence.	50	50
Drawing	Drawing an sketch of the sampling site provides an overview and landmark as well as indicated the direction of flow of water bodies	100	100

13.3 Check list for bio-monitoring

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Sieve with 0.6 mm mesh size	Removal of all particle size substratum more than 0.6 mm such as from sediment sample for collection of macro-invertebrates. Sieve with more than 0.6 mm mesh size will not retain smaller macro-invertebrates and sieve with less than 0.6 mm mesh size will clog the sieve with clay and silt particles.	100	100
Hand net	Generally used from sample collection from water bodied having all types of river bed substratum like pebbles, gravel, sand, silt clay, detritus and macrophytic vegetation.	100	100
Shovel	Shovel is used to collect sandy substratum to sieve for collection for benthic macro-invertebrates. Sand, silt and clay washout from shovel while transferring from sediments to out of water.	100	100

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Scrapper	Scrapper is used to scrap the attached habitats such as bryophytes (mosses) invertebrates from hard and stony substratum of river.	100	100
Depth measurement device – folding stick etc.	For safety purposes while sample collection from water body. Species composition of benthic macro-invertebrates vary with varying depths in water body,	100	100
Plastic ball, measuring tape & stop watch for flow measurement	Flow measurement provides an idea of safety measure for undercurrents in waterbody. Species composition vary with varying flow velocity.	75	75
Gum boots and hand gloves	Gumboots and hand gloves protect human body from harmful animals and prevents exposure from contact with toxicants , cold and hot water temperature	100	100
pH Strips, DO Bottles & Reagents	pH strips provide approximate indication of pH in water quality and DO bottles and reagents are used to preserve the existing dissolved oxygen levels at sampling location. They are the functional parameters used to validate the results	100	100
Thermometer	To measure atmospheric temperature and water temperature of water body to be sampled. Temperature of more than 5 °C of the ambient water temperature of waterbody eliminates the biological life and dissolve oxygen level whereas biological life persists with low diversity at very low water temperature. Avoid using mercury – containing thermometers because glass breakage may release mercury vapour into the air.	100	100
White enamel trays	To observe live animals and identify individual animal collected from sediments and for evaluation of diversity and saprobic score in field. Dark coloured enamel tray leaves unidentified animal.	50	50
Small plastic bucket & rope	For collection of field water from a bridge or long distance, to be used for washing the sediments.	100	100
Wide mouth polyethylene bottle	Wide mouth tarson bottle prevents damage of big size animals for collection and preservation. Narrow mouth bottles do not allow bigger animals for collection and preservation.	100	100

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Forceps, needles & convex hand lens	Forceps are used to collect soft tissue animals. Without forceps animals cannot be segregated for the sediments. Convex hand lens is used to identify live animals from the sediments/substratum.	100	100
Formalin (4%) or Alcohol (70%)	Formalin and alcohol preserves the structure of animals. Unpreserved animals are perished very soon after collection.	100	100
Stickers & marking pen	Stickers and marking pen are used to write all the details of sample collection. Without labelling, sample is of no use.	100	100
Artificial substratum & its accessories for lined canals etc.	Artificial substratum provides proper habitat to benthic macroinvertebrates within six weeks of its launching in waterbodies having poor substratum such as lined canals. In polluted waters the system does not work due to siltation.	50	50
First aid box, soap disinfectant & towel	Used to provide first aid in case of any injury takes place in the field. Towel and disinfectant is used to wash and apply to disinfect the body part.	100	100
One big plastic box/ crate to accommodate artificial substratum for bio-monitoring of benthic macro invertebrates of canals.	After two week dipped in water body, the artificial substratum is taken out of waterbody and placed in a plastic box/crate to collect colonized benthic macro-invertebrates for bio-assessment. In the absence of crate, the colonized animals will come out in absence of field water, and run away from artificial substratum.	100	100
Field protocols	Field protocol is a detailed worksheet to be used in field for recording all the field observations. Without field protocol necessary field observations cannot be recorded properly.	100	100
Camera for site photograph if required, caps etc.	Camera is used to take a record of sampling event. Cap protects from extreme heat and winter.	50	50
Water proof file/ bag for placing the field protocols, pen, pencil etc.	Normally, field protocol is kept away from water so that the written information is not washout with the touch of any drop of water. To avoid this, dot pen or pencil should be used in place of ink pen.	50	50

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Life jacket	Life jackets will help in cases of drowning in deep water body and fast flow.	100	100
Taxonomic key for identification of benthic macro-invertebrates on site itself	For on the spot judgement of biological water quality or using APP on bio-monitoring, correct identification of macro-invertebrates, is essential by using available taxonomic key.	50	50
APP on Bio-monitoring of surface water quality	Mobile Application (APP) on on bio-monitoring provides online transmission of data on biological water quality and other field observations during any survey programme. Without APP, the sample may be preserved and analysed in the laboratory	50	50
Excavator, only if available at particular location	If a water body is very deep from the bank itself, then help from a local excavator can be made on payment basis to dredge out sediments from deep waters. Otherwise avoid bio-monitoring be performed at that location.	100	100

13.4 Safety precautions for bio-monitoring team members to be followed strictly in field

Parameters	Validation factor
Do not enter into polluted water body without wearing wader suit/ gumboots	Wader suits should not be used in marshy and high sediment areas. Polluted water may be harmful in contact with body parts if wader suit is not used.
Any untrained person should not go near water body alone, they should be accompanied by experienced person.	Approaching waterbodies may be dangerous.
Beware of harmful animals (Snakes, crocodiles, turtles or any other wild animal) on location.	Sampling in water bodies located near a wild life sanctuary and forested, marshy areas may be dangerous.
Always collect pre-information about the water body regarding the dangers in water and surrounding area from any authorised official or local inhabitant.	Local inhabitants are familiar with the local environmental conditions at sampling site. Danger can be avoided with proper communication.
Bio-monitoring should not be done during monsoon season.	River bed sediments are washed away with the floods leaving no substratum to be sampled in river bed.

Parameters	Validation factor
Bio-monitoring should never be done from the downstream area of barrage/ dam.	There may be abrupt increase in flow due to sudden discharge from the barrage leading to floods in downstream area.
Do not approach water bodies immediately after flood.	The river banks may be marshy and high sedimentation area.
Marshlands should be avoided for bio-monitoring.	Marshlands are prone to drowning.
The exercise to be done by scientific personnel having relevant background.	Heavy and repeated encroachment in the sampling area destroys the biological habitats.

13.5 Checklist for bottle type for sample collection

Validation Parameters	Bottle type	Validation factors	Accuracy %	Reproducibility %
Physico-chemical composition	Polyethylene Carboy	Use inert plastic material. Chemicals like silica, sodium and boron may be leached from soft glass but not plastic containers.	100	100
Ammonia	Glass Narrow Mouth	Certain cations are subject to loss by adsorption to, or ion exchange with the walls of glass containers.	100	100
Heavy metals	Polyethylene Narrow Mouth	Certain cations are subject to loss by adsorption to, or ion exchange with the walls of glass containers. Metals may sorb onto the walls of glass container. Sample loss due to spill over can be avoided in narrow mouth bottle. Hexavalent chromium may be reduced to trivalent chromium.	100	100

Validation Parameters	Bottle type	Validation factors	Accuracy %	Reproducibility %
Mercury	Glass Narrow Mouth	Contaminants from plastic container may leach into sample because of potential contamination from phthalate ester. Zero head space is important in preservation of samples with volatile organic compound and radon. Narrow mouth bottle can avoid loss of volatile materials by collecting sample in a completely filled container	100	100
Pesticides	Glass Narrow Mouth (Brown), except those of fluorinated polymers such as PTFE (Polytetrafluoro ethylene)	Pesticides may sorb onto the walls of glass container. Sample loss due to spill over can be avoided in narrow mouth bottle. Some analytes e.g. bromine – containing compound and some pesticides are light-sensitive. Amber-coloured glass containers minimize photo degradation. Mercury concentration may increase in samples stored in plastic bottles in mercury – contaminated laboratories.	100	100
PAH + PCB + etc.	Glass Narrow Mouth (Brown)	Some analytes (e.g. Poly nuclear aromatic compound, volatile organic, semi-volatile organics, PCBs are light-sensitive. Amber-coloured glass containers minimize photo degradation.	100	100
Oil and Grease	Glass Narrow Mouth (Brown)	Some analytes of oil & grease are light-sensitive. Amber-colored glass containers minimize photo degradation	100	100
Phenol	Glass Narrow Mouth	Amber-colored glass containers minimize photo degradation	100	100
Chlorophyll	Glass Narrow Mouth (Brown)	Chlorophyll content of the sample may be changed due to sun-light exposure in glass bottle.	100	100

Validation Parameters	Bottle type	Validation factors	Accuracy %	Reproducibility %
Total Coliform and Fecal Coliform	Glass Narrow Mouth Sterilized	Unsterilized bottles may contaminate the original sample with additional bacteria.	100	100
Heavy metals in Sediments	Polyethylene Wide Mouth	Iron and manganese are readily soluble in their lower oxidation states but relatively insoluble in their higher oxidation states, therefore, these cations may precipitate or they may dissolve from a sediment depending upon the pH.	100	100
Pesticides + PAH +PCB + etc in Sediments	Glass Wide Mouth	Some analytes (e.g. Poly nuclear aromatic compound, volatile organic, semi-volatile organics, PCBs are light-sensitive. Amber-coloured glass containers minimize photo degradation.	100	100
Heavy metals in biological samples(Fish, mussels, water hyacinth etc.)	Polyethylene bag	Biological samples are voluminous and can be accommodated in bags.	100	100
Pesticides + PAH +PCB + etc in biological samples	Glass Wide Mouth	Some analytes (e.g. Poly nuclear aromatic compound, volatile organic, semi-volatile organics, PCBs are light-sensitive. Amber-colored glass containers minimize photo degradation.	100	100
Benthic Macro-invertebrates	Polyethylene Wide Mouth	Big sized animals can be preserved without damaging the morphological structure used for identification.	100	100
Effluent toxicity	Polyethylene Carboy	Chemicals like silica, sodium and boron may be leached from soft glass but not plastic containers.	100	100
UP stream dilution water	Polyethylene Carboy	Chemicals like silica, sodium and boron may be leached from soft glass but not plastic containers.	100	100

13.5 Checklist for volume of sample collection

Validation Parameters	Bottle volume	Validation factors	Accuracy %	Reproducibility %
Physico-chemical composition	5 litre	For certain determinations, larger samples may be required as per the requirement of analysis. Enough sample volume in the appropriate container may be collected in order to comply with sample handling, storage and preservation requirements.	100	100
Ammonia	1 litre	Enough sample is required for Ammonia analysis.	100	100
Heavy metals	500 ml		100	100
Mercury	1 liter	Normally in fresh waters the level of mercury is in traces which can be detected only in large volume of sample.	100	100
Pesticides	1litre		100	100
PAH + PCB+ etc.	1litre		100	100
Oil and Grease	1litre		100	100
Phenol	1litre		100	100
Chlorophyll	1litre		100	100
Total Coliform and Fecal Coliform	125 ml	125 ml sample is sufficient to perform Total and Fecal Coliform using MPN technique. 55.5 ml sample is required for 5-5-5 multiple tube dilution method for one parameter.	100	100
Heavy metals in Sediments	100 gms	Level of heavy metals are more in sediments than water column.	100	100
Pesticides + PAH +PCB + etc in Sediments	1liter	Normally in fresh waters the level of mercury is in traces which can be detected only in large volume of sample.	100	100
Heavy metals in biological samples (Fish, mussels, water hyacinth etc.)	-	Level of heavy metals are more in biological samples as a result of bio-accumulation, than in sediments and water column.	100	100

Validation Parameters	Bottle volume	Validation factors	Accuracy %	Reproducibility %
Pesticides + PAH +PCB + etc in biological samples	1litre	Normally in fresh waters the level of mercury is in traces which can be detected only in large volume of sample.	100	100
Benthic Macro-invertebrates	0.1 – 0.5 litre	To accommodate small to big size biological specimen to be filled by field water and preservative so that the specimen is completely dipped in water.	100	100
Effluent toxicity	25 litre	Large volume is required for toxicity testing	100	100
UP stream dilution water	25 litre	Large volume are required for making dilution water.	100	100

13.6 Checklist for sample preservation

Validation Parameters	Sample preservation	Validation factors (No single method of preservation is entirely satisfactory) Preservation methods are intended to retard biological action, retard hydrolysis of chemical compounds and complexes and reduce volatility of constituents.	Accuracy %	Reproducibility %
Physico-chemical composition	Cooled in Ice	Temperature changes quickly; pH may change significantly in a matter of minutes; dissolve gases (oxygen, carbon dioxide) may be lost. Many organic compounds are sensitive to change in temperature resulting in reduced concentration during storage. Change in pH-alkalinity-carbon dioxide balance may cause calcium carbonate to precipitate, decreasing the values for calcium and total hardness.	100	100

Validation Parameters	Sample preservation	Validation factors (No single method of preservation is entirely satisfactory) Preservation methods are intended to retard biological action, retard hydrolysis of chemical compounds and complexes and reduce volatility of constituents.	Accuracy %	Reproducibility %
Ammonia	2 ml H_2SO_4	At low pH, ammonia remains in solution as ammonium hydroxide and at higher pH, it escapes from the solution. Most reliable results are obtained on fresh samples. If samples are to be analysed within 24 hrs of collection, refrigerate un acidified at 4ºC. By acidifying to pH <2 and storing at 4ºC, the samples can be preserved for 28 days. Microbial activity may affect the nitrate-nitrite , ammonia content, Ammonia starts liberating in the form of NH3 which is toxic at high pH whereas NH4 is not toxic at acidic pH.	100	100
Heavy metals	1 ml HNO_3	Acidification with nitric acid to a pH below 2.0 to minimize precipitation and adsorption on container walls. After acidifying sample store it in refrigerator at approximately 4ºC to prevent change in volume due to evaporation. Metal ions are converted in to nitrate form which is highly water soluble. Nitrate and chloride salts are easily ionized during atomization process for analysis.	100	100
Mercury	1 ml HNO_3 + 5 ml $K_2Cr_2O_7$	During acidification nitrate salts are easily ionized during atomization process for analysis. Potassium dichromate is used to convert the mercury in oxidized stable form.	100	100
Pesticides	-	-	-	-

Validation Parameters	Sample preservation	Validation factors (No single method of preservation is entirely satisfactory) Preservation methods are intended to retard biological action, retard hydrolysis of chemical compounds and complexes and reduce volatility of constituents.	Accuracy %	Reproducibility %
PAH + PCB+etc.	-	-	-	-
Oil and Grease	Cooled in ice	To minimize the potential for volatilization or bio-degradation between sampling and analysis	100	100
Phenol	Cooled in ice	Microbial activity may affect the phenol, BOD or reduction of sulphate to sulphide if not preserved in cold conditions.	100	100
Chlorophyll	-		100	100
Total Coliform and Fecal Coliform	Cooled in ice	Microbial counts may increase or decrease in number if not preserved. Preservation in ice cold conditions arrest the microbiological activities.	100	100
Heavy metals in Sediments	Cooled in ice		100	100
Pesticides + PAH +PCB + etc in Sediments	Cooled in ice		100	100
Heavy metals in biological samples(Fish, mussels, water hyacinth etc.)	Deep frozen	Preservation in deep frozen conditions arrest the microbiological activities to decompose the biological tissues and proteins and enzyme activities which may cause change in composition of analytes.	100	100
Pesticides + PAH +PCB + etc in biological samples	Deep frozen		100	100
Benthic Macro-invertebrates	Alcohol 70% or Formalin (4%)	Preserves all morphological characteristics of specimen for proper identification and to prevent decomposition of biological tissues for longer period.	100	100

Validation Parameters	Sample preservation	Validation factors (No single method of preservation is entirely satisfactory) Preservation methods are intended to retard biological action, retard hydrolysis of chemical compounds and complexes and reduce volatility of constituents.	Accuracy %	Reproducibility %
Effluent toxicity	None	-	-	-
UP stream dilution water	None	-	-	-

13.7 Checklist for sampling plan

Validation Parameters	Tick mark the sample collected from the site	Validation factors	Accuracy %	Reproducibility %
Physico-chemical composition	✓	Tick marked parameters will ascertain analysis to be carried out for defined purposes.	100	100
Ammonia	✓			
Heavy metals	X			
Mercury	X			
Pesticides	X			
PAH + PCB+ etc.	X			
Oil and Grease	X			
Phenol	X			
Chlorophyll	X			
Total Coliform and Fecal Coliform	✓			
Heavy metals in Sediments	X			
Pesticides + PAH +PCB + etc in Sediments	X			
Heavy metals in biological samples(Fish, mussels, water hyacinth etc.)	X			
Pesticides + PAH +PCB + etc. in biological samples	X			
Benthic Macro-invertebrates	✓			
Effluent toxicity	X			
UP stream dilution water	X			

13.8 Field measurements

Validation Parameters	Validation factors	Accuracy %	Reproducibility %
Time	Time should be noted at the time of temperature recording to validate the results because temperature of atmosphere and water varies with respect to time	100	100
Date	Date of temperature recording is essential to validate the water temperature	100	100
Water Temperature °C	**Temperature observed:** Temperature observed by the field thermometer **Correction factor:** correction factor with respect to reference thermometer should be mentioned to derive actual water temperature. **Actual Temperature:** Temperature observed ± correction factor	100	100
DO Titration (mg/l)	Dissolved Oxygen at the time and place of sampling is essential to validate the results of bio-monitoring	100	100
pH Strip	Gives an idea of any deviation from normal range of pH in water due to impact of pollution.	100	100

13.9 Validation protocol for saprobic (bmwo) score of benthic macro-invertebrates

Taxonomical Group	Taxonomical families	BMWP Score	Validation factors	Accuracy %	Reproducibility %
Ephemeroptera	Siphlonuridae	10	Similar ecological conditions throughout the year except monsoon. Fast flow, shallow, clean water having substratum of Boulders, cobbles, pebbles, gravel, sand, clay and attached mosses.	100	100
	Heptageniidae				
	Leptophlebiidae				
	Ephemerellidae				
	Pothaminthidae				
	Ephemeridae				
	Prosopistomatidae				

Taxonomical Group	Taxonomical families	BMWP Score	Validation factors	Accuracy %	Reproducibility %
Plecoptera	Taeniopterygidae	10	Similar ecological conditions throughout the year except monsoon. Fast flow, shallow, clean water having substratum of Boulders and cobbles	100	100
	Leuctridae				
	Capniidae				
	Perlodidae				
	Perlidae				
Hemiptera	Aphelocheiridae	10	Similar ecological conditions throughout the year except monsoon. Fast flow, shallow, clean to slightly polluted water quality having substratum of Boulders cobbles, pebbles and gravel	100	100
Trichoptera	Leptoceridae	10	Similar ecological conditions throughout the year except monsoon. Fast flow, shallow, clean to slight pollution in water quality having substratum of boulders, cobbles and pebbles	100	100
	Goeridae				
	Lepidostomatidae				
	Brachycentridae				
	Sericostomatidae				
Odonata	Euphaeidae	8	Similar ecological conditions throughout the year except monsoon. Fast flow, shallow, clean biological water quality, having substratum of boulders cobbles and pebbles	100	100
	Protoneuridae	8	Similar ecological conditions throughout the year except monsoon. Stagnant water to slow flowing river having slight to moderate pollution in biological water quality with river bed substratum of sand, silt, clay, detritus and macrophytic vegetation	100	100
	Plathycnemidae				
	Gomphidae				
	Cordulegasteridae				
	Aeshnidae				
	Corduliidae				
	Libellulidae				
Trichoptera	Psychomyiidae	8	Similar ecological conditions throughout the year except monsoon. Fast flowing river having clean to slight pollution in biological water quality with river bed substratum composed of boulders, cobbles, pebbles, gravel, sand, silt.	100	100
	Philopotamidae				

Taxonomical Group	Taxonomical families	BMWP Score	Validation factors	Accuracy %	Reproducibility %
Ephemeroptera	Caenidae	7	Similar ecological conditions throughout the year except monsoon. Slow to fast flowing water bodies having slight to moderate pollution in biological water quality with boulders, cobbles, pebbles, gravel, sand silt, clay detritus and macrophytic vegetation	100	100
Plecoptera	Nemouridae				
Trichoptera	Rhyacophilidae				
	Polycentropodidae				
	Stenopsychidae				
	Limnephillidae				
Mollusca	Neritidae	6	Similar ecological conditions throughout the year except monsoon. Stagnant to slow running waterbodies having slight to moderate pollution in biological water quality with river bed substratum composed of Boulders, sand, silt, clay detritus, macrophytic vegetation.	100	100
	Viviparidae				
	Thiaridae				
	Pleuroceridae				
	Bithyniidae				
	Amblemidae				
	Ancylidae				
	Unionidae				
Trichoptera	Hydroptilidae	6	Similar ecological conditions throughout the year except monsoon. Fast flowing river having clean to slight pollution in biological water quality with river bed substratum composed of boulders, cobbles, pebbles, gravel, sand , silt.	100	100
Crustacea	Atyidae	6	Similar ecological conditions throughout the year except monsoon. Stagnant to slow running water bodies having moderate to heavy pollution in biological water quality with river bed substratum composed of boulders, sand, silt, clay, detritus and macrophytic vegetation	100	100
	Gammaridae				
	Palaemonidae				
	Potamidae				
	Parathelphusidae				
Polychaeta	Nereidae Nephtyidae	6	Similar ecological conditions throughout the year except monsoon. Stagnant to slow running waterbodies having moderate pollution in biological water quality with river bed substratum composed of sans, silt, clay detritus and macrophytic vegetation.	100	100

Taxonomical Group	Taxonomical families	BMWP Score	Validation factors	Accuracy %	Reproducibility %
Odonata	Agriidae/ Calopterygidae		Similar ecological conditions throughout the year except monsoon. Stagnant to slow running water bodies having moderate pollution in biological water quality with river bed substratum composed of sand, silt, clay, detritus and macrophytic vegetation	100	100
	Coenagrionidae				
Hemiptera	Mesovelidae	5	Similar ecological conditions throughout the year except monsoon .Stagnant to slow running water bodies having slight to moderate pollution in biological water quality with river bed substratum composed of boulders, cobbles, pebbles, gravel, sand, silt, clay, detritus and macrophytic vegetation.	100	100
	Hydrometridae				
	Gerridae				
	Nepidae				
	Ranatrinidae				
	Naucoridae				
	Notonectidae				
	Pleidae				
	Veliidae				
	Hebridae				
	Belastomatidae				
	Corixidae				
Coleoptera	Haliplidae	5	Similar ecological conditions throughout the year except monsoon. Rarely in clean to slight pollution in biological water quality having river bed substratum composed of boulders, cobbles, pebbles and gravel. Mostly live in moderate to heavy pollution in biological water quality having river bed substratum composed of sand , silt, clay, detritus and macrophytic vegetation	100	100
	Hygrobidae				
	Dytiscidae				
	Gyrinidae				
	Hydrophilidae				
	Dryopidae				
	Elminthidae				
	Noteridae				
	Psephenidae				
Trichoptera	Hydropsychidae	5	Slow to fast runnin water bodies having slight to moderate pollution in biological water quality with river bed substratum composed of sand, silt, clay and macrophytic vegetation.	100	100

Taxonomical Group	**Taxonomical families**	**BMWP Score**	**Validation factors**	**Accuracy %**	**Reproducibility %**
Diptera	Tipulidae Tabanidae Culicidae Nymphomyiidae Blepheroceridae Stratiiomyiidae Simulidae	5	Fast flowing to stagnant waterbodies having clean to moderate pollution in biological water quality with river bed substratum composed of boulders, cobbles, pebbles, gravel.	100	100
Planaria	Planaridae Dendrocoelidae	5	Fast flowing, clean biological water quality having substratum composition of mostly boulders, cobbles and pebbles.	100	100
Ephemeroptera Megaloptera Hirudinea	Baetidae Corydalidae Piscicolidae	4	Stagnant to fast lowing waterbodies having clean to moderate pollution in biological water quality with substratum composed of boulders, cobbles, pebbles, gravel, macrophytic vegetation	100	100
Mollusca	Lymnaeidae Physidae Planorbidae Sphaeridae Corbiculidae	3	Stagnant to slow running water bodies having moderate to heavy pollution in biological water quality with substratum composed of boulders, cobbles, sand, silt, clay ,detritus and macrophytic vegetation	100	100
Hirudinea	Glossiphonidae Hirudidae Erpobdellidae	3	Stagnant to slow running water bodies having moderate to heavy pollution in biological water quality with substratum composition of sand, silt, clay detritus and macrophytic vegetation	100	100
Planaria	Dugesiidae	3	Stagnant to slow running waterbodies having moderate to heavy pollution in biological water quality with substratum composed of sand clay detritus and macrophytic vegetation	100	100

Taxonomical Group	Taxonomical families	BMWP Score	Validation factors	Accuracy %	Reproducibility %
Crustacea	Asellidae	3	Slow to fast flowing waterbodies having moderate to heavy pollution in biological water quality with substratum composed of sand, silt, clay, detritus, macrophytic vegetation	100	100
	Cirolanidae				
Diptera	Syrphidae	2	Stagnant to slow flowing water bodies having heavily polluted biological water quality with substratum composed of Sand, silt, clay, detritus, macrophytic vegetation.	100	100
	Chironomidae				
	Ephydridae				
Oligochaeta	Tubificidae	1	Stagnant to fast flowing waterbodies having moderate to heavy pollution in biological water quality with substratum composed of sand,silt, clay, detritus, macrophytic vegetation	100	100
	Naididae				
	Octochaetidae				
	Lumbricidae				
	Lumbriculidae				
	Megascolicidae				
	Moniligasteridae				
	Microchaetidae				

13.10 Validation protocol for calculation of saprobic score of benthic macro-invertebrates

Saprobic score calculation (10.0 – 1.0)	Validation factors	Accuracy %	Reproducibility %
Grand Total Multiplied Score/ Grand Total Number of Families/ genus/ species encountered	Correct taxonomic identification of benthic macroinvertebrates to family/ genus/species level is essential to arrive the correct evaluation of Saprobic score. Wrong identification may lead to totally wrong biological water quality assessment of surface water bodies.	100	100

13.11 Validation protocol for saprobic score range of benthic macro-invertebrates

Saprobic score range (10.0 – 1.0)	Validation factors	Accuracy %	Reproducibility %
7.0 and more	Sample of benthic macro-invertebrates should predominantly belong to Taxonomical group having BMWP score of 10 with a combination of very few od 8, and 7.	100	100
6.0 – 7.0	Sample of benthic macro-invertebrates should predominantly belong to Taxonomical group having BMWP score of 10,8, and 7	100	100
3.0 – 6.0	Sample of benthic macro-invertebrates should predominantly belong to Taxonomical group having BMWP score of 8,7,6 and 5.	100	100
2.0 -5.0	Sample of benthic macro-invertebrates should predominantly belong to Taxonomical group having BMWP score of 5,4, 3, 2 and 1	100	100
0.0 – 2.0	Sample of benthic macro-invertebrates should predominantly belong to Taxonomical group having BMWP score of 3,2, 1 and none	100	100

13.12 Validation protocol for diversity score range of benthic macro-invertebrates

Diversity score range (0.0 – 1.0)	Validation factors	Accuracy %	Reproducibility %
0.2 – 1.0	Rivers at high altitude such as Himalayan rivers etc., having clean biological water quality with substratum composed of rocks, boulders, the diversity of benthic macro-invertebrates may be as low as 0.2. Sometimes due to abnormal environmental conditions, abundancy of a single species dominates the entire sample, than the diversity may go as low as < 0.2, On the other hand river beds having boulders, cobbles, pebbles, gravel the diversity may be as high as 1.0	90	90
0.5 – 1.0	Rivers with fast flow, having slight pollution in biological water quality with substratum composed of boulders, cobbles, pebbles, gravel and sand, the diversity starts from 0.5 -1.0	100	100

Diversity score range (0.0 – 1.0)	Validation factors	Accuracy %	Reproducibility %
0.3 – 0.9	Rivers may have pool conditions to slow running water with moderate pollution in biological water quality with substratum composed of cobbles, sand, silt, detritus and macrophytic vegetation, the diversity may be as low as 0.3 and as high as 0.9	100	100
0.4 - Less	Stagnant water to slow running water bodies having heavy pollution in biological water quality with substratum composed of sand, silt, clay, detritus and macrophytic vegetation, the diversity is less than 0.4	100	100
0.0 – 0.2	Slow running to stagnant water bodies having severe pollution and biologically dead with substratum composed of sand, silt and clay. Sometimes Fast flowing clean rivers may be biologically dead due to non-availability of natural substratum. Sometimes due to abnormal environmental conditions the diversity goes as low as 0.2 and less when abundancy of a single tolerant species dominates in the entire sample.	100	100

13.13 Validation protocol for calculation of diversity score of benthic macro-invertebrates

Diversity score calculation (0.0 – 1.0)	Validation factors	Accuracy %	Reproducibility %
Sequential Comparison Method	Correct identification of pairwise sequentially encountered morphologically similar and dissimilar live/preserved benthic macroinvertebrates, is essential to arrive at the correct evaluation of Diversity score. Counting without making pair wise sequentially encountered specimen may lead to wrong calculation of diversity score.	75	75

13.14 Validation of biological water quality criteria

Range of Saprobic score (0-10)	Range of Diversity score (0.0-1.0)	Biological Water quality			Validation factor	Accuracy %	Reproducibility %
		Biological Water quality	Biological Water Quality Class	Indicator colour			
7 and more	0.2-1.0	Clean	A	Blue	Under normal and uniform ecological conditions with no change in water quality due to sudden discharge, the combination of Saprobic score and diversity score ascertain the assigned water quality of a waterbody. The abnormal environmental conditions may be due to climatic change, human influences, and habitat degradation due to substratum disturbances may be responsible for abnormal combination. Damming of rivers may cause a river stretch devoid of water or change of running water into pool/stagnant water body with the development of reservoir.	100	100
6-7	0.5-1.0	Slight Pollution	B	Light Pollution		90	90
3-6	0.3-0.9	Moderate Pollution	C	Green		100	100
2-5	0.4 -less	Heavy Pollution	D	Orange		100	100
0-2	0.0-0.2	Severe Pollution	E	Red		100	100

13.15 Validation protocol for functional parameters through Positive correlation with chemical parameters vs families of each taxonomical group of macro-invertebrates

Ephemeroptera	**Caenidae**	**Baetidae**	**Leptophlebiidae**	**Siphlonuridae**	**Ephemeridae**	**Heptageniidae**
	pH, Calcium, Nitrate, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	Nitrate, Fluoride, Phosphate, Magnesium, Dissolved Oxygen	Fluoride, Sulphate, Phosphate, Magnesium	Nitrate, Fluoride, Phosphate, Magnesium, Dissolved Oxygen	pH, Carbonate Alkalinity, Calcium, Sulphate, Sodium, Potassium, Dissolved Oxygen, BOD, Conductivity	Fluoride, Sulphate, Phosphate, Magnesium

Diptera	**Tipulidae**	**Simulidae**	**Chironominae**	**Tanypodinae**	**Orthocladiinae**	**Tabanidae**
	Nitrate, Fluoride, Magnesium, Dissolved Oxygen	Nitrate, Flouride, Magnesium, Dissolved Oxygen	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	Nitrate, Fluoride, Magnesium, Dissolved Oxygen	Nitrate, Fluoride, Magnesium, Dissolved Oxygen	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Fluoride, Magnesium, Potassium, BOD, COD, Conductivity

Hemiptera	**Corixidae**	**Ranatrinidae**	**Aphelocheiridae**	**Belastomatidae**	**Notonectidae**
	Total Hardness, Calcium, Sulphate, Chloride, Sodium, Potassium, BOD, COD, Conductivity	PH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	PH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Sulphate, Potassium, BOD, Conductivity	pH, TDS, ,Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Sulphate, Potassium, BOD, Conductivity	pH,Calcium, Nitrate, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity

Planaria	**Dugesiidae**				
	Nitrate, Fluoride, Magnesium, Dissolved Oxygen				
Lepidoptera	**Pyrulidae**				
	Nitrate, Fluoride, Magnesium, Dissolved Oxygen				
Crustacea	**Palaemonidae**	**Atyidae**			
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Sulphate, Potassium, BOD, Conductivity				

Odonata	**Gomphidae**	**Protoneuridae**	**Coenagrionidae**	**Libellulidae**
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Chloride, Sodium Potassium, Dissolved Oxygen, BOD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate	pH, Calcium, Nitrate, Fluoride, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, Conductivity

Oligochaeta	**Naididae**	**Tubificidae**	**Megaloptera**
	Nitrate, Fluoride, Magnesium, Dissolved Oxygen	pH, Calcium, Nitrate, Fluoride, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	Nitrate ,Fluoride, Magnesium, Dissolved Oxygen

Gastropoda	**Lymnaeidae**	**Planorbiidae**	**Physidae**	**Bithyniidae**	**Viviparidae**
	pH, TDS, Calcium, Nitrate, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	pH, Calcium, Nitrate, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity, Total Hardness, Carbonate Alkalinity, Fluoride	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Fluoride, Chloride, Potassium, BOD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, fFuoride, Chloride, Magnesium, Potassium, BOD, COD, Conductivity

Bivalvia	**Corbiculidae**	**Amblemidae**
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Chloride, Sodium Potassium, Dissolved Oxygen, BOD, Conductivity, Sulphate, Nitrate, Fluoride, Phosphate, Magnesium	Ph, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Fluoride, Chloride Potassium, BOD, Conductivity

Coleoptera	**Psephenidae**	**Hydrophilidae**	**Dytiscidae**	**Heteroceridae**
	Nitrate, Fluoride, Phosphate, Magnesium	Carbonate Alkalinity, Sulphate, COD	pH, Calcium, Nitrate, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	Carbonate Alkalinity, Sulphate, Magnesium, COD

Trichoptera	**Hydroptilidae**	**Philopotamidae**	**Hydropsychidae**	**Glossosoatidae**
	Fluoride, Sulphate, Chloride, Phosphate, Magnesium, Nitrate, Dissolved Oxygen	Fluoride, Sulphate, Chloride, Phosphate, Magnesium	Nitrate, Fluoride, Magnesium, Dissolved Oxygen	Nitrate, Fluoride, Chloride, Phosphate, Magnesium, Dissolved Oxygen

13.16 Validation protocol for functional parameters through Negative correlation with chemical parameters vs families of each taxonomical group of macro-invertebrates

Ephemeroptera	**Caenidae**	**Baetidae**	**Leptophlebiidae**	**Siphlonuridae**	**Ephemeridae**	**Heptageniidae**
	TDS, Total Hardness, Carbonate Alkalinity, Fluoride, Phosphate, Magnesium	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Sodium, Potassium, BOD, COD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Sodium, Potassium, BOD, COD, Conductivity	TDS, Total Hardness, Nitrate, Fluoride, Chloride, Phosphate, Magnesium, COD	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium,, Nitrate, Chloride,Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity

Diptera	**Tipulidae Simulidae**	**Chironominae**	**Tanypodinae**	**Orthocladiinae**	**Tabanidae**
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity	Nitrate, Fluoride, Chloride, Phosphate, Magnesium	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity	Nitrate, Sulphate, Phosphate, Sodium, Dissolved Oxygen

Hemiptera	**Corixidae**	**Ranatrinidae**	**Aphelocheiridae**	**Belastomatidae**	**Notonectidae**
	pH, TDS, Carbonate Alkalinity, Nitrate, Fluoride, Phosphate, Magnesium, Dissolved Oxygen	Fluoride, Phosphate, Magnesium	Fluoride, Chloride, Phosphate, Magnesium, Sodium, Dissolved Oxygen, COD	Sulphate, Phosphate, Magnesium, Sodium, Dissolved Oxygen, COD	TDS, Total Hardness, Carbonate Alkalinity, Fluoride, Phosphate, Magnesium

Planaria	**Dugesiidae**	
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity	
Lepidoptera	**Pyrulidae**	
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity	
Crustacea	**Palaemonidae**	**Atyidae**
	Fluoride, Chloride, Phosphate, Magnesium, Sodium, Dissolved Oxygen, COD	

Odonata	**Gomphidae**	**Protoneuridae**	**Coenagrionidae**	**Libellulidae**
	Fluioride, Sulphate, Phosphate. Magnesium, COD	Fluoride, Sulphate, Phosphate, Magnesium	TDS, Total Hardness, Carbonate Alkalinity, Phosphate, Magnesium	Fluoride, Sulphate, Phosphate, Magnesium, Sodium, COD

Oligochaeta	**Naididae**	**Tubificidae**	**Megaloptera**
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity	TDS, Total Hardness, Carbonate Alkalinity, Phosphate, Magnesium	TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity

Gastropoda	**Lymnaeidae**	**Planorbidae**	**Physidae**	**Bithyniidae**	**Viviparidae**
	Total Hardness, Carbonate Alkalinity, Fluoride, Phosphate, Magnesium	TDS, Total Hardness, Carbonate Alkalinity, Fluoride, Phosphate, Magnesium, Sulphate, Sodium, Dissolved Oxygen, COD	Fluoride, Sulphate, Phosphate, Magnesium	Sulphate, Phosphate, Magnesium, Sodium, Dissolved Oxygen, COD	Nitrate, Fluoride, Phosphate, Sodium, Dissolved Oxygen

Bivalvia	**Corbiculidae**	**Amblemidae**
	TDS, Total Hardness, Nitrate, Fluoride, Chloride, Phosphate, Magnesium, COD, TDS, Total Hardness, Sulphate, Dissolved Oxygen	Fluoride, Phosphate, Magnesium, Sodium, Dissolved Oxygen, COD

Coleoptera	**Psephenidae**	**Hydrophilidae**	**Dytiscidae**	**Heteroceridae**
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	pH, TDS, Total Hardness, Calcium, Nitrate, Fluoride, Chloride, Phosphate, Magnesium, Sodium, Potassium, Dissolved Oxygen, BOD, Conductivity	TDS,Total Hardness, Carbonate Alkalinity, Fluoride, Phosphate, Magnesium	pH, TDS, Total Hardness, Calcium, Nitrate, Fluoride, Chloride, Phosphate, Sodium, Potassium, Dissolved Oxygen, BOD, Conductivity

Trichoptera	**Hydroptilidae**	**Philopotamidae**	**Hydropsychidae**	**Glossosoatidae**
	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate Sulphate, Chloride, Phosphate, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Nitrate, Sodium, Potassium, Dissolved Oxygen, BOD, COD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Chloride, Phosphate, Sodium, Potassium, BOD, COD, Conductivity	pH, TDS, Total Hardness, Carbonate Alkalinity, Calcium, Sulphate, Sodium, Potassium, BOD, COD, Conductivity

13.17 Ranges of functional parameters in water

Parameters	Minimum	Maximum
Saprobic score	3.44	7.6
Diversity score	0.42	0.89
Air Temperature °C	12.3	36.6
Water Temperature °C	8.8	28.1
pH	7.0	8.2
Total Dissolved Solids (TDS) /mg/l	84	220
Total Hardness as ($CACO_3$) mg/l	58.42	80
Free CO_2 mg/l	1.62	4.89
Carbonate Alkalinity mg/l	39	52
Calcium mg/l	16.2	33
Ammonical Nitrogen mg/l	BDL	BDL
Nitrate mg/l	0.20	0.39
Fluoride mg/l	NT	0.175
Sulphate mg/l	9.8	20.1
Chloride mg/l	5.9	9.57
Phosphate mg/l	0.041	0.56
Magnesium mg/l	2.77	5.65
Silicate mg/l	0.89	7.02
Sodium mg/l	2.11	2.69
Potassium mg/l	1.13	2.32
Dissolved Oxygen (DO) mg/l	7.4	9.6
Biochemical/Biological Oxygen Demand (BOD) mg/l	0.6	1.6
Chemical Oxygen Demand(COD) mg/l	3.8	8.8
Conductivity(µmhoc/cm)	148	220

14 INDEX 1: Benthic Macro-invertebrates in Biological Water Quality of River Ganga

14.1 List of species in Uttarakhand

UK-1	01.07.2014	Family	Genus	Abundancy
		Heptageniidae	*Rhithrogena*	1
		Perlidae	*Tetropina*	1
		Euphaeidae	*Euphaea decorata*	1
		Hydropsychidae	*Cheumatopsyche*	22
		Heptageniidae	*Cynigmina*	1
		Simulidae	*Simulium*	1
		Siphlonuridae	*Ameletus*	11
		Ephemerellidae	*Torleya*	1
		Neoephemeridae	*Neoephemeropsis*	3
		Baetidae	*Pseudocloeon*	3
		Elmidae	*Stenelmis larva*	1
		Scritidae	*Cyphon larva*	1
			Total number	47

UK-1	24.11.2015	Family	Genus	Abundancy
		Chironomidae	*Orthocladiinae*	18
		Brachycentridae	*Brachycentrus*	1
		Hydropsychidae	*Hydropsyche*	1
		Ecnomidae	*Ecnomus*	1
		Ceratopogonidae	*Bezzia sp., pupa*	1
		Baetidae	*Platybaetis*	43
		Heptageniidae	*Rhithrogena*	77
		Baetidae	*Baetis*	1
		Siphlonuridae	*Ameletus*	10
		Chironomidae	*Tanypodinae*	2
		Hydropsychidae	*Diplectrona*	2
		Hydropsychidae	*Potamiya*	30
		Heptageniidae	*Ironodes*	1

UK-1	24.11.2015	Family	Genus	Abundancy
		Heptageniidae	*Epeorus*	1
		Heptageniidae	*Afronurus*	1
		Hepatgeniidae	*Cynigmina*	8
		Heptageniidae	*Epeorus Epeorus*	2
		Heptageniidae	*Ironodes*	5
		Ephemerellidae	*Ephemerella Eurylophella*	1
		Ephemerellidae	*Drunella*	5
		Tipulidae	*Antocha*	3
		Chironomidae	*Tanypodinae*	1
		Stenopsychidae	*Stenopsyche*	1
			Total number	216

UK-B	25.4.2016	Family	Genus	Abundancy
		Tipulidae	*Antocha*	19
		Caenidae	*Caenis*	2
		Neoephemeridae	*Neoephemeropsis*	4
		Heptageniidae	*Cynigmina*	8
		Heptageniidae	*Rhithrogena*	13
		Ecnomidae	*Ecnomus*	5
		Ephemerellidae	*Ephemerella Eurylophephella*	2
			Adult insect	2
		Leptoceridae	*Triplectides*	1
			Pupa of Trichoptera in empty case	4
		Stenopsychidae	*Stenopsyche*	6
		Hydropsychidae	*Cheumatopsyche*	12
		Ceratopogonidae	*Bezzia sp., pupa*	13
		Philopotamidae	*Chimarra*	1
		Simulidae	*Simulium*	3
			Empty case of Hydroptilidae larva	1
		Hydroptilidae	*Hydroptilidae pupa*	

UK-B	25.4.2016	Family	Genus	Abundancy
			Empty shells of Trichoptera	
		Siphlonuridae	*Ameletus*	20
		Glossosomatidae	*Agapetus*	4
		Glossosomatidae	*Pupa of Agapetus*	1
			Insect larva	
			Pupa in trichoptera case	1
		Hydroptilidae	*larva with case*	1
		Hydroptilidae	*Orthotrichia*	2
		Chironomidae	*Tanypodinae*	1
		Chironomidae	*Orthocladiinae*	3
		Chironomidae	*Chironominae*	1
		Hydroptilidae	*Empty case barrel-shaped of Stactobia*	1
		Hydroptilidae	*Agapetus pupa in case*	2
		Hydroptilidae	*Pupa of Stactobiella in case*	2
		Perlidae	*Tetropina*	1
			Total number	136

UK- 4	24.7.2014	Family	Genus	Abundancy
		Dytiscidae	*Hyphydrus*	1
		Tipulidae	*Antocha*	1
			Total number	2

UK-4	4.11.2015	Family	Species	Abundancy
		Hydropsychidae	*Potamiya*	45
		Siphlonuridae	*Ameletus*	15
		Ceratopogonidae	*Bezzia sp.,biting midge*	14
		Heptageniidae	*Cynigmina*	47
		Chironomidae	*Chironominae*	4
		Tipulidae	*Antocha*	24
		Heptageniidae	*Rhithrogena*	8

UK-4	4.11.2015	Family	Species	Abundancy
		Ephemerellidae	*Ephemerella sp.*	1
		Caenidae	*Caenis*	3
		Chironomidae	*Orthocladiinae*	1
		Hydroptilidae	*Oxyethira*	1
		Glossosomatidae	*Glossosoma case with pupa*	10
		Dugesiidae	*Dugesia japonica*	4
		Protoneuridae	*Prodesineura autumnalis*	1
		Gomphidae	*Heliogomphus*	2
			Total number	180

UK-5	25.6.2014	Family	Genus	Abundancy
		Heptageniidae	*Rhithrogena*	12
		Neoephemeridae	*Neoephemeropsis*	2
		Hydropsychidae	*Cheumatopsyche*	4
		Heptageniidae	*Cynigmina*	1
		Leptophlebidae	*Choroterpedes*	5
		Physidae	*Physa (Haitia) mexicana*	1
		Tipulidae	*Antocha*	2
		Perlidae	*Tetropina*	2
		Psephenidae	*Psephenoidinae*	1
		Salifidae	*Barbronia weberi*	1
			Total number	31

UK-5	18.11. 2015	Family	Genus	Abundancy
		Hydropsychidae	*Cheumatopsyche*	108
		Perlidae	*Flavoperla*	2
		Neoephemeridae	*Neoephemeropsis*	24
		Heptageniidae	*Afronurus*	2
		Ephemerellidae	*Ephemerella Eurylophella*	10
		Siphlonuridae	*Ameletus*	203

UK-5	18.11. 2015	Family	Genus	Abundancy
		Heptageniidae	*Cynigmina*	23
		Caenidae	*Caenis*	2
		Baetidae	*Platybaetis*	4
		Dugesiidae	*Dugesia japonica*	6
		Ecnomidae	*Ecnomus*	3
		Philopotamidae	*Chimarra*	1
		Tipulidae	*Antocha*	2
		Simulidae	*Simulium*	1
		Chironomidae	*Tanypodinae*	4
		Chironomidae	*Chironominae*	3
		Chironomidae	*Orthocladiinae*	45
			Total number	443

UK-6	20.6. 2014	Family	Genus	Abundancy
		Belostomatidae	*Lethocerus (=Belostoma)*	1
		Naucoridae	*Ilyocoris*	17
		Aphelocheiridae	*Aphelocheirus*	1
		Dytiscidae	*Hyphydrus*	6
		Palaemonidae	*Macrobrachium lanatum*	1
		Atyidae	*Caridina peninsularis*	2
		Protoneuridae	*Prodesineura autumnalis*	1
		Siphlonuridae	*Ameletus*	3
		Elmidae	*Stenelmis*	1
		Elmidae	*Stenelmis larva*	1
			Total number	34

UK-6	3.11.2015	Family	Genus	Abundancy
		Heptageniidae	*Afronurus*	4
		Heptageniidae	*Cynigmina*	65
		Neoephemeridae	*Neoephemeropsis*	15
		Ephemerellidae	*Ephemerelle Eurylophella*	3

UK-6	3.11.2015	Family	Genus	Abundancy
		Siphlonuridae	*Ameletus*	57
		Hydroptilidae	*Oxyethira*	1
		Pseudoneuroclipsis	*Incertae sedis*	1
		Heptageniidae	*Rhithrogena*	5
		Caenidae	*Caenis*	1
		Baetidae	*Baetis*	1
		Leptophlebidae	*Choroterpes*	1
		Psephenidae	*Mataeopsephus sp./ Psepheninae*	4
		Psephenidae	*Psephenoides magnioculus adult*	1
			Unidentified larva of coleoptera	1
		Naucoridae	*Heleocoris*	4
		Corixidae	*Sigara*	2
		Gomphidae	*Heliogomphus*	6
		Libellulidae	*Acisoma*	1
		Tipulidae	*Antocha*	4
		Ecnomidae	*Ecnomus*	19
		Hydropsychidae	*Cheumatopsyche*	24
		Calopterygidae	*Matrona sp.*	2
			Tichoptera pupa	12
		Planorbidae	*Indoplanorbis*	3
		Hydrophilidae	*Helophorus*	2
		Tabanidae	*Tabanus/Atylotus sp. sp.*	2
		Chironomidae	*Tanypodinae*	5
		Chironomidae	*Chironominae*	35
		Dryopidae	*Dryopidae larva*	1
		Ceratopogonidae	*Bezzia sp. pupa*	1
		Salifidae	*Barbronia weberi*	1
			Unidentified oligochaete	1
		Lumbricidae	*Eiseniella tetraedra tetraedra*	1
			Total number	286

UK-7	21.6. 2014	Family	Genus	Abundancy
		Aphelocheiridae	*Aphelocheirus*	18
		Gyrinidae	*Orectochilus*	1
		Perlidae	*Tetropina*	1
			Total number	20

UK -7	28.10.2015	Family	Genus	Abundancy
		Hydropsychidae	*Hydropsyche*	1
		Hydropsychidae	*Cheumatopsyche*	12
		Heptageniidae	*Rhithrogena*	62
		Chironomidae	*Orthocladiinae*	3
		Baetidae	*Platybaetis*	90
		Aphelocheiridae	*Aphelocheirus*	3
		Siphlonuridae	*Ameletus*	77
		Simulidae	*Simulium*	3
		Leptophlebidae	*Choroterpedes*	1
		Chironomidae	*Tanypodinae*	3
			Total number	255

UK-8, U/S JSTP	27.10.2015	Family	Genus	Abundancy
		Heptageniidae	*Rhithrogena*	8
		Hydropsychidae	*Hydropsyche*	1
			Adult insect	1
			Total number	10

UK-8b D/S JSTP	27.10.2015	Family	Genus	Abundancy
		Siphonuridae	*Ameletus*	1
		Tabanidae	*Tabanus/Atylotus sp. sp./Atylotus sp.*	1
		Dytiscidae	*Eretes*	1
		Ceratopogonidae	*Bezzia sp.*	6

UK-8b D/S JSTP	27.10.2015	Family	Genus	Abundancy
		Ephydridae	*Ephydra sp.*	1
		Muscidae	*Musca domestica larva*	1
		Tipulidae	*Antocha*	31
		Hydropsychidae	*Cheumatopsyche*	10
		Aphelocheiridae	*Aphelocheirus*	2
		Ceratopogonidae	*Bezzia sp.,biting midge larva*	1
		Culicidae	*Anopheles larva*	2
		Chironomidae	*Orthocladiinae*	12
		Salifidae	*Barbronia weberi*	2
		Glossiphoniidae	*Alboglossiphonia weberi*	2
		Tipulidae	*Hexatoma*	1
		Hydropsychidae	*Hydropsyche*	8
		Psychomyiidae	*Psychoda/ Psychomyiidae*	11
		Heptageniidae	*Rhithrogena*	19
		Baetidae	*Platybaetis*	1
		Heptageniidae	*Cynigmina*	1
		Psychomyiidae	*Lype*	1
			Adult insect	1
		Syrphidae	*Eristalis sp.*	1
		Chironomidae	*Chironominae*	1
			Total number	118

14.2 List of species in UttarPradesh

UP -1	1.2.2014	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	12
		Dytiscidae	*Oreodytes larvae*	3
		Chironomidae	*Chironominae*	17
		Dytiscidae	*Hyphydrus*	3
			Total number	35

UP-1	**26.4. 2016**	**Family**	**Genus**	**Abundancy**
		Lymnaeidae	*Lymnaea accuminata*	3
		Physidae	*Physa (Haitia) mexicana*	6
		Corbiculidae	*Corbicula bensoni*	1
		Gomphidae	*Sinictinogomphus*	5
		Dytiscidae	*Hydrovatus*	17
		Corixidae	*Micronecta*	1
		Corixidae	*Agraptocorixa*	3
		Chironomidae	*Chironominae*	1
			Total number	37

UP -2	**December, 2014**	**Family**	**Genus**	**Abundancy**
		Chironomidae	*Chironominae*	3
		Chironomidae	*Tanypodinae*	23
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Planorbidae	*Indoplanorbis*	4
		Muscidae	*Musca domestica*	1
		Lymnaeidae	*Lymnaea accuminata*	2
		Physidae	*Physa (Haitia) mexicana*	92
		Planorbidae	*Gyraulus convexiusculus*	13
		Haliplidae	*Haliplus*	1
		Hydrophilidae	*Berosus larva*	1
		Sphaerlidae	*Sphaerlidae (semiaquatic)*	1
		Atyidae	*Caridina bruneiana*	3
		Corixidae	*Agraptocorixa*	9
		Hydrophilidae	*Helophorus*	3
		Bithynidae	*Gabbia orcula*	1
			Total number	158

UP- 2	26.4. 2016	Family	Genus	Abundancy
		Planorbidae	*Indoplanorbis*	3
		Dytiscidae	*Hydrovatus*	2
		Dytiscidae	*Hydaticus*	1
		Noteridae	*Canthydrus*	6
		Hydrophilidae	*Halochares larva*	1
		Physidae	*Physa (Haitia) mexicana*	1
		Baetidae	*Baetis*	1
		Coenagrionidae	*Agriocnemis lacteola*	3
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	3
		Pyrulidae	*Nymphula*	2
		Atyidae	*Caridina thambipilaii*	7
		Chironomidae	*Chironominae*	1
		Hydrophilidae	*Berosus*	1
		Lymnaeidae	*Lymnaea accuminata*	1
		Glossiphoniidae	*Alboglossiphonia weberi*	2
		Planorbidae	*Hippeutis umbilicalis*	4
		Planorbidae	*Ameriana*	1
		Chironomidae	*Chironominae*	10
			Total number	50

UP -3	5.12.2014	Family	Genus	Abundancy
		Hydrophilidae	*Helophorus*	1
		Dytiscidae	*Hyphydrus*	3
		Dytiscidae	*Nipponhydrus*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Corixidae	*Agraptocorixa*	6
		Noteridae	*Neohydrocoptus*	1
		Gomphidae	*Heliogomphus*	1

UP -3	5.12.2014	Family	Genus	Abundancy
		Libellulidae	*Orthetrum albistylum speciosum*	1
		Protoneuridae	*Prodasineura autumnalis*	2
		Libellulidae	*Acisoma*	1
		Hydrophilidae	*Berosus*	1
		Chironomidae	*Chironominae*	4
		Chironomidae	*Orthocladiinae*	2
		Lumbricidae	*Dendrodrillus rubidus*	1
		Tubificidae	*Branchiura sowerbyi*	1
		Viviparidae	*Bellamya bengalensis*	7
		Thiaridae	*Thiara (Thiara)scabra*	1
		Thiaridae	*Melanoides pyramis*	2
		Planorbidae	*Indoplanorbis*	4
		Lymnaeidae	*Lymnaea accuminata*	4
		Unionidae	*Lamellidens lamellatus*	1
		Unionidae	*Lamellidens rhadineus*	4
		Amblemidae	*Radiatula occata(juvenile)*	6
		Palaemonidae	*Macrobrachium lopopodus*	10
		Atyidae	*Caridina bruneiana*	23
		Corixidae	*Agriocnemis*	1
		Potamidae	*Johora*	2
			Total number	93

UP-3	3.5.2016	Family	Genus	Abundancy
		Chironomidae	*Tanypodinae*	3
		Tubificidae	*Ilyodrilus templetoni*	2
		Gomphidae	*Stylurus*	1
		Gomphidae	*Orientogomphus*	1
		Libellulidae	*Orthetrum albistylum speciosum*	2
		Atyidae	*Caridina bakoensis*	28
		Dytiscidae	*Hydrovatus*	1

UP-3	3.5.2016	Family	Genus	Abundancy
		Dytiscidae	*Nannophya pygmea*	1
		Libellulidae	*Acisoma*	2
		Gomphidae	*Sieboldius*	1
		Pyrulidae	*Paraponyx diminutalis*	1
		Pyrulidae	*Nymphula*	2
		Histeridae	*Hister*	1
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Stratiomyidae	*Oxycera*	1
		Lumbricidae	*Eiseniella tetraedra tetraedra*	1
		Hydrophilidae	*Halochares*	1
		Noteridae	*Canthydrus*	2
		Baetidae	*Baetis*	2
		Planorbidae	*Ameriana*	7
		Tubificidae	*Branchiodrilus semperi*	3
		Tubificidae	*Branchiodrilus hortensis*	7
		Chironomidae	*Chironominae*	1
		Glossiphoniidae	*Halobdella stagnalis*	1
		Tubificidae	*Aulodrilus piqueti*	1
		Protoneuridae	*Prodasineura autumnalis*	9
		Leptoceridae	*Oecetis*	10
		Palaemonidae	*Macrobrachium lopopodus*	9
		Libellulidae	*Acisoma*	1
		Thiaridae	*Melanoides tuberculatus*	43
		Bithyniidae	*Gabbia orcula*	4
		Lymnaeidae	*Lymnaea accuminata*	7
		Physidae	*Physa (Haitia) mexicana*	9
		Planorbidae	*Gyraulus labiatus*	3
		Planorbidae	*Gyraulus convexiusculus*	7
		Planorbidae	*Indoplanorbis exustus*	4

UP-3	3.5.2016	Family	Genus	Abundancy
		Thiaridae	*Thiara (Thiara)scabra*	6
		Amblemidae	*Parreysia corrugata laevirostris juvenile*	1
		Amblemidae	*Radiatula caerulea juvenile*	6
		Amblemidae	*Radiatula occata juvenile*	16
		Amblemidae	*Parreysia favidens juvenile*	1
		Unionidae	*Lamellidens sp. juvenile*	1
		Sphaeriidae	*Pissidium (Odhneripisidium) prasongi*	3
		Sphaeriidae	*Pisidium (Afropisidium) clarkeanum*	39
		Corbiculidae	*Corbicula assamensis*	3
		Viviparidae	*Bellamya bengalensis*	47
		Bithyniidae	*Digoniostoma cerameopoma*	6
		Amblemidae	*Parreysia favidens chrysis*	1
		Amblemidae	*Parreysia favidens favidens*	6
		Amblemidae	*Radiatula caerulea juvenile*	6
		Unionidae	*lamellidens mainwaringi*	1
			Total number	323

UP -4	December, 2015	Family	Genus	Abundancy
		Dytiscidae	*Rhantus*	1
		Ranatrinidae	*Ranatra brevecolis*	1
		Chironomidae	*Chironominae*	20
		Lymnaeidae	*Lymnaea accuminata*	18
		Planorbidae	*Indoplanorbis*	3
		Planorbidae	*Gyraulus convexiusculus*	5

UP -4	December, 2015	Family	Genus	Abundancy
		Amblemidae	*Radiatula occata(juvenile)*	1
		Hydrophilidae	*Berosus*	10
		Hebridae	*Hebrus*	5
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Gomphidae	*Sinictinogomphus*	2
		Dytiscidae	*Hyphydrus*	4
		Dytiscidae	*Nipponhydrus*	3
		Hydrophilidae	*Helophorus*	4
		Corixidae	*Agraptocorixa*	2
		Velidae	*Rhagodotarsus kraepelini*	1
		Baetidae	*Baetis*	3
		Coenagrionidae	*Agriocnemis lacteola*	4
		Protoneuridae	*Prodasineura autumnalis*	1
		Culicidae	*Mansonia*	2
		Culicidae	*Culex pupa*	2
		Palaemonidae	*Macrobrachium lopopodus*	14
		Palaemonidae	*Macrobrachium horstii*	3
		Atyidae	*Caridina peninsularis*	7
		Gerridae	*Metrocoris*	1
		Noteridae	*Hydrocoptus*	1
			Total number	119

UP-4	28.4. 2016	Family	Genus	Abundancy
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	10
		Palaemonidae	*Macrobrachium callirrhoe*	5
		Atyidae	*Caridina bakoensis*	13
		Atyidae	*Caridina peninsularis*	1

UP-4	28.4. 2016	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	33
		Gomphidae	*Heliogomphus*	1
		Libellulidae	*Orthetrum*	1
		Protoneuridae	*Prodasineura autumnalis*	1
		Tabanidae	*Tabanus/Atylotus sp.*	1
		Libellulidae	*Nannophya pygmea*	2
		Libellulidae	*Orthetrum albistylum speciosum*	1
		Dytiscidae	*Cybister larva*	1
		Ranatrinidae	*Ranatra brevecolis*	2
		Nepidae	*Nepa*	2
		Noteridae	*Canthydrus*	1
		Hydrophilidae	*Berosus*	3
		Dytiscidae	*Hydrovatus*	8
		Nepidae	*Nepa*	2
		Corixidae	*Agraptocorixa*	4
		Corixidae	*Corixa*	11
		Physidae	*Physa (Haitia) mexicana*	36
		Bithyniidae	*Gabbia orcula*	1
		Corbiculidae	*Corbicula striatella*	4
		Lymnaeidae	*Lymnaea accuminata*	1
		Thiaridae	*Melanoides tuberculatus*	2
		Amblemidae	*Radiatula olivaria*	9
		Planorbidae	*Gyraulus convexiusculus*	1
		Planorbidae	*Indoplanorbis*	1
			Total number	158

UP 6	December, 2014	Family	Genus	Abundancy
		Ranatrinidae	*Ranatra brevicollis*	1
		Palaemonidae	*Macrobrachium horstii*	14

UP 6	**December, 2014**	**Family**	**Genus**	**Abundancy**
		Atyidae	*Caridina peninsularis*	12
		Tabanidae	*Tabanus/Atylotus sp.*	1
		Lumbricidae	*Dendrodrilus rubidus*	1
		Dytiscidae	*Rhantus*	1
		Dytiscidae	*Hyphydrus*	2
		Haliplidae	*Haliplus*	1
		Macromiidae	*Macromidia*	1
		Gomphidae	*Sinictinogomphus*	18
		Chironomidae	*Chironominae*	3
			Total number	55

UP 6A/ ZBGP	**16.5.2016**	**Family**	**Genus**	**Abundancy**
		Planorbidae	*Indoplanorbis*	8
		Corbiculidae	*Corbicula assamensis*	2
		Corbiculidae	*Corbicula striatella*	7
		Physidae	*Physa (Haitia) mexicana*	21
		Lymnaeidae	*Lymnaea accuminata*	9
		Succinidae	*Quickia sp/Succineidae*	2
		Dytiscidae	*Hydrovatus*	10
		Tabanidae	*Tabanus Atylotus sp.*	4
		Dytiscidae	*Hydaticus*	1
		Hydrophilidae	*Halochares*	1
		Hydrophilidae	*Berosus*	1
		Pleidae	*Paraplea*	2
		Thiaridae	*Melanoides pyramis*	29
		Planorbidae	*Gyraulus convexiusculus*	11
		Histeridae	*Hister*	1
		Nepidae	*Nepa,nymph*	13
		Palaemonidae	*Macrobrachium clymene*	4

UP 6A/ ZBGP	16.5.2016	Family	Genus	Abundancy
		Atyidae	*Caridina temasek*	16
		Palaemonidae	*Macrobrachium idae*	4
		Gomphidae	*Sinictinogomphus*	3
		Libellulidae	*Sympetrum*	1
		Libellulidae	*Lyriothemis*	18
		Libellulidae	*Acisoma*	2
		Libellulidae	*Orthetrum*	2
		Varunidae	*Varuna*	1
		Dytiscidae	*Nannophya pygmea*	1
		Libellulidae	*Diplacodes*	1
		Libellulidae	*Rhyothemis*	1
		Dytiscidae	*Nannophya pygmea*	1
		Nepidae	*Nepa,nymph*	1
		Hydrophilidae	*Halochares larva*	3
		Protoneuridae	*Prodasineura autumnalis*	6
		Coenagrionidae	*Agriocnemis*	1
		Chironomidae	*Chironominae*	25
		Corixidae	*Agraptocorixa*	1
		Lumbricidae	*Eiseniella tetraedra tetraedra*	2
			Total number	216

UP-6	10.5.2016	Family	Genus	Abundancy
		Lymnaeidae	*Lymnaea accuminata*	9
		Planorbidae	*Indoplanorbis*	2
		Planorbidae	*Gyraulus convexiusculus*	4
		Corbiculidae	*Corbicula assamensis*	6
		Corbiculidae	*Corbicula striatella*	21
		Physidae	*Physa (Haitia) mexicana*	26

UP-6	10.5.2016	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	9
		Palaemonidae	*Macrobrachium lopopodus juvenile*	59
		Atyidae	*Caridina elongapoda*	59
		Gomphidae	*Sinictinogomphus*	2
		Libellulidae	*Trithemis*	1
		Libellulidae	*Lyriothemis*	3
		Tabanidae	*Tabanus/Atylotus sp.*	3
		Aphelocheiridae	*Aphelocheirus*	1
		Protoneuridae	*Prodasineura autumnalis*	13
		Coenagrionidae	*Agriocnemis*	1
		Ranatrinidae	*Ranatra*	5
		Nepidae	*Laccotrephes pfeiferiae*	1
		Nepidae	*Nepa*	1
		Dytiscidae	*Hydrovatus*	17
		Dytiscidae	*Nipponhydrus*	1
		Hydrophilidae	*Hydrophilus*	5
		Hydrophilidae	*Halochares*	4
		Corixidae	*Corixa,male,female*	2
		Corixidae	*Micronecta*	1
			Total Number	256

NA-Narora	4.6.2016	Family	Genus	Abundancy
		Lumbriculidae	*Lumbriculus variegatus*	1
		Lymnaeidae	*Lymnaea accuminata*	11
		Hydropsychidae	*Diplectrona*	1
			Adult Trichoptera	1
		Corixidae	*Micronecta*	1
		Viviparidae	*Bellamya bengalensis*	1
		Physidae	*Physa (Haitia) mexicana*	10

		Bithyniidae	*Digoniostoma pulchella foot*	2
			empty case of trichoptera	
		Palaemonidae	*Macrobrachium lopopodus*	1
		Atyidae	*Caridina bakoensis, 2male, 1female*	3
		Atyidae	*Caridina thambipilaii*	1
			Total number	33

NL Anupshahar d/s, near mastram murdaghat	**4.6.2016**	**Family**	**Genus**	**Abundancy**
		Bithyniidae	*Digoniostoma pulchella*	5
		Aphelocheiridae	*Aphelocheirus*	1
		Palaemonidae	*Palaemonidae*	8
		Atyidae	*Atyidae*	1
		Thiaridae	*Melanoides pyramis*	57
		Corbiculidae	*Corbicula assamensis*	5
		Corbiculidae	*Corbicula striatella*	28
		Planorbidae	*Indoplanorbis*	8
		Unionidae	*Lamellidens sp. Juvenile*	4
		Chironomidae	*Chironominae*	14
		Aphelocheiridae	*Aphelocheirus*	1
		Dytiscidae	*Hydrovatus*	1
		Ranatrinidae	*Ranatra brevicollis*	1
		Physidae	*Physa (Haitia) mexicana*	24
		Lymnaeidae	*Lymnaea accuminata*	17
		Pleidae	*Paraplea or Plea fontalis*	1
		Thiaridae	*Melanoides tuberculatus*	25

NL Anupshahar d/s, near mastram murdaghat	4.6.2016	Family	Genus	Abundancy
		Libellulidae	*Lyriothemis*	5
		Libellulidae	*Sympetrum*	1
		Atyidae	*Atyidae*	5
		Gomphidae	*Sinictinogomphus*	13
		Protoneuridae	*Prodasineura autumnalis*	6
			Total number	231

rw, confluence of River Ganga to Choiya drain	4.6.2016	Family	Genus	Abundancy
		Palaemonidae	*Palaemonidae*	8
		Dytiscidae	*Hydrovatus*	2
		Hydrophilidae	*Halochares*	2
		Gomphidae	*Sinictinogomphus*	3
			Total number	15

jf, downstream of confluence of River Ganga to Choiya drain at Panjabi dera	4.6.2016	Family	Genus	Abundancy
		Ranatrinidae	*Ranatra brevicollis*	2
		Nepidae	*Nepa*	1
		Physidae	*Physa (Haitia) mexicana*	5
		Corixidae	*Agraptocorixa*	3
		Coenagrionidae	*Agriocnemis lacteola*	1
		Dytiscidae	*Hydrovatus*	19

jf, downstream of confluence of River Ganga to Choiya drain at Panjabi dera	**4.6.2016**	**Family**	**Genus**	**Abundancy**
		Dytiscidae	*Nipponhydrus*	1
		Belostomatidae	*Sphaerodema*	1
		Histetridae	*Hister*	1
		Planorbidae	*Gyraulus convexiusculus*	1
		Lymnaeidae	*Radix luteola*	14
			Total number	49

UP-7	**December, 2014**	**Family**	**Genus**	**Abundancy**
		Palaemonidae	*Macrobrachium callirrhoe*	10
		Atyidae	*Caridina peninsularis*	14
		Gomphidae	*Sinictinogomphus*	32
		Macromiidae	*Macromidia*	1
		Caenidae	*Caenis*	1
		Corixidae	*Agraptocorixa*	8
		Dytiscidae	*Rhantus*	2
		Chironomidae	*Chironominae*	3
		Chironomidae	*Tanypodinae*	7
		Tubificidae	*Limnodrilus udekemianus*	3
		Physidae	*Physa (Haitia) mexicana*	2
		Lymnaeidae	*Lymnaea accuminata*	1
		Thiaridae	*Melanoides pyramis*	9
		Planorbidae	*Indoplanorbis*	9
		Amblemidae	*Radiatula occata*	1
		Sphaeriidae	*Pisidium annandalei*	1
		Corbiculidae	*Corbicula striatella*	1

UP-7	December, 2014	Family	Genus	Abundancy
		Corbiculidae	*Corbicula assamensis*	1
		Corbiculidae	*Corbicula bensoni*	1
		Bithyniidae	*Digoniostoma pulchella*	2
			Total number	109

UP-7	11.5. 2016	Family	Genus	Abundancy
		Lymnaeidae	*Lymnaea accuminata*	58
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	32
		Bithyniidae	*Gabbia stenothyroides*	3
		Gomphidae	*Sinictinogomphus*	1
		Libellulidae	*Nannophya pygmea*	8
		Libellulidae	*Sympetrum*	3
		Aeshnidae	*Planaeschna*	1
		Ephemeridae	*Eatongenia*	3
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	3
		Nepidae	*Nepa*	1
		Ranatrinidae	*Ranatra brevecolis*	9
		Pyrulidae	*Paraponyx*	14
		Dytiscidae	*Cybister larva*	2
		Dytiscidae	*Hydrovatus*	1
		Hydrophilidae	*Helophorus*	2
		Glossiphoniidae	*Alboglossiphonia weberi*	4
		Hydrophilidae	*Berosus*	1
		Libellulidae	*Rhyothemis*	1
		Corixidae	*Corixa*	8
		Coenagrionidae	*Agriocnemis lacteola*	16
		Protoneuridae	*Prodasineura autumnalis*	9
		Physidae	*Physa (Haitia) mexicana*	44

UP-7	11.5. 2016	Family	Genus	Abundancy
		Planorbidae	*Indoplanorbis*	5
		Planorbidae	*Gyraulus labiatus*	1
		Planorbidae	*Gyraulus convexiusculus*	6
		Thiaridae	*Melanoides pyramis*	5
		Corbiculidae	*Corbicula striatella*	1
		Viviparidae	*Bellamya bengalensis*	9
			Total number	251

UP-8	December, 2014	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium idae*	12
		Atyidae	*Caridina peninsularis*	18
		Libellulidae	*Sympetrum purvulum*	2
		Gomphidae	*Sinictinogomphus*	2
		Libellulidae	*Orthetrum albistylum speciosum*	13
		Libellulidae	*Acisoma*	12
		Physidae	*Physa (Haitia) mexicana*	41
		Lymnaeidae	*Lymnaea accuminata*	8
		Viviparidae	*Bellamya bengalensis*	16
		Planorbidae	*Indoplanorbis*	3
		Planorbidae	*Gyraulus covexiusculus*	14
		Corbiculidae	*Corbicula striatella*	2
		Corbiculidae	*Corbicula assamensis*	1
		Thiaridae	*Melanoides pyramis*	2
		Dytiscidae	*Hyphydrus*	21
		Dytiscidae	*Hydrovatus*	3
		Hydrophilidae	*Halochares*	1
		Hydrophilidae	*Helophorus*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Libellulidae	*Brachythemis*	1

UP-8	December, 2014	Family	Genus	Abundancy
		Ranatrinidae	*Ranatra brevicollis*	1
		Hydrophilidae	*Berosus*	4
		Glossiphoniidae	*Hemiclapsis japonica*	1
		Dytiscidae	*Deronectes larva*	26
		Baetidae	*Baetis*	1
		Muscidae	*Musca domestica larva*	2
		Tubificidae	*Branchiodrilus semperi*	2
		Tubificidae	*Branchiodrilus sowerbyi*	1
		Corixidae	*Agraptocorixa*	6
		Chironomidae	*Chironominae*	1
		Naididae	*Aulophorus hymanae*	3
		Haemadipsidae	*Haemadipsa zeylanica*	1
			Total Number	223

UP 8	11.5. 2016	Family	Genus	Abundancy
		Libellulidae	*Hydrobasileus*	3
		Libellulidae	*Nannophya pygmea*	26
		Libellulidae	*Sympetrum speciosum speciosum*	4
		Libellulidae	*Rhyothemis*	2
		Gomphidae	*Heliogomphus*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	10
		Ranatrinidae	*Ranatra brevecolis*	3
		Noteridae	*Noterus*	1
		Palaemonidae	*Macrobrachium lopopodus*	10
		Atyidae	*Caridina bakoensis*	11
		Atyidae	*Caridina thambipilaii*	30
		Dytiscidae	*Hydrovatus*	3
		Planorbidae	*Gyraulus labiatus*	8
		Corbiculidae	*Corbicula striatella*	1

UP 8	11.5. 2016	Family	Genus	Abundancy
		Chironomidae	*Chironominae*	1
		Tubificidae	*Aulodrilus pluriseta*	1
		Tubificidae	*Branchiodrilus semperi*	2
		Corixidae	*Corixa*	5
		Coenagronidae	*Agriocnemis*	6
		Protoneuridae	*Prodasineura autumnalis*	6
		Hirudinidae	*Hirudinaria maniilensis*	1
		Viviparidae	*Bellamya bengalensis*	28
		Lymnaeidae	*Lymnaea accuminata*	22
		Planorbidae	*Indoplanorbis*	8
		Thiaridae	*Melanoides tuberculatus*	8
		Physidae	*Physa (Haitia) mexicana*	4
		Bithyniidae	*Digoniostoma cerameopoma*	2
		Bithyniidae	*Digoniostoma pulchella*	3
		Bithyniidae	*Gabbia stenothyroides*	16
			Total number	226

UP-9	18.12. 2014	Family	Genus	Abundancy
		Corixidae	*Sigara*	1
		Palaemonidae	*Macrobrachium callirrhae*	22
		Atyidae	*Caridina peninsularis*	2
		Macromiidae	*Macromidia*	1
		Libellulidae	*Brachythemis*	3
		Gomphidae	*Sinictinogomphus*	23
		Amblemidae	*Radiatulla occata(1Juvenile)*	24
		Corbiculidae	*Corbicula bensoni*	7
		Corbiculidae	*Corbicula assamensis*	1
		Planorbidae	*Indoplanorbis*	1
		Bithyniidae	*Digoniostoma pulchella*	1

UP-9	18.12. 2014	Family	Genus	Abundancy
		Libellulidae	*Orthetrum albistylum speciosum*	1
		Hydropsychidae	*Cheumatopsyche*	4
		Hydrophilidae	*Berosus*	1
		Chironomidae	*Chironominae*	4
			Total number	96

UP-9 JBUP-9	17.5.2016	Family	Genus	Abundancy
		Gomphidae	*Macrogomphus*	1
		Macromiidae	*Macromia*	1
		Libellulidae	*Lyriothemis*	20
		Gomphidae	*Sinictinogomphus*	9
		Libellulidae	*Acisoma*	1
		Amblemidae	*Parreysia viridula*	2
		Corbiculidae	*Corbicula striatella*	9
		Corbiculidae	*Corbicula bensoni*	3
		Corbiculidae	*Corbicula assamensis*	10
		Bithyniidae	*Gabbia stenothyroides*	1
		Viviparidae	*Bellamya bengalensis*	2
		Planorbidae	*Indoplanorbis exustus*	2
		Bithyniidae	*Digoniostoma pulchella*	3
		Lymnaeidae	*Lymnaea accuminata*	8
		Physidae	*Physa (Haitia) mexicana*	9
		Amblemidae	*Radiatula caerulea juvenile*	2
		Thiaridae	*Melanoides tuberculatus*	1
			Total number	84

UP -10	December, 2014	Family	Genus	Abundancy
		Dytiscidae	*Hyphydrus*	1

UP -10	December, 2014	Family	Genus	Abundancy
		Hydrophilidae	*Helophorus*	1
		Hydrophilidae	*Halochares*	1
		Dytiscidae	*Nipponhydrus*	1
		Tubificidae	*Limnodrilus hoffmeisteri*	16
		Chironomidae	*Chironominae*	12
			Total number	32

UP -10/ UP -11	19.5.2015	Family	Genus	Abundancy
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	3
		Nepidae	*Nepa*	31
		Hydrophilidae	*Hydrophilus*	23
		Chironomidae	*Chironominae*	1
		Hydrophilidae	*Hydrophilus larva*	9
		Dytiscidae	*Laccophilus*	1
		Noteridae	*Hydrocoptus*	1
		Dytiscidae	*Hydrovatus*	1
		Culicidae	*Anopheles pupa*	3
		Hydrophilidae	*Berosus larva*	9
		Notonectidae	*Anisops*	4
		Corixidae	*Agraptocorixa*	2
		Corixidae	*Corixa*	2
		Coenagrionidae	*Agriocnemis lacteola*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Dytiscidae	*Cybister larva*	2
		Physidae	*Physa (Haitia) mexicana*	5
		Chironomidae	*Chironominae*	276
		Libellulidae	*Lyriothemis*	1
			Total number	376

UP-11	December, 2014	Family	Genus	Abundancy
		Corydellidae	*Terrestrial reidentified on 15.9.2015*	1
		Libellulidae	*Orthetrum albistylum speciosum*	14
		Libellulidae	*Brachythemis*	4
		Libellulidae	*Acisoma*	14
		Libellulidae	*Sympetrum*	3
		Libellulidae	*Tramea*	1
		Tabanidae	*Tabanus/Atylotus sp.*	5
		Physidae	*Physa (Haitia) mexicana*	8
		Planorbidae	*Gyraulus convexiusculus*	1
		Stratiomyidae	*Nemotelus*	1
		Notonectidae	*Anisops*	1
		Corixidae	*Agraptocorixa*	18
		Corixidae	*Sigara*	4
		Palaemonidae	*Macrobrachium idae*	9
		Dytiscidae	*Hyphydrus*	9
		Hydrophilidae	*Halochares*	3
		Dytiscidae	*Rhantus*	1
		Dytiscidae	*Deronectes larva*	5
		Tubificidae	*Limnodrilus udekemianus*	13
		Chironomidae	*Chironominae*	10
		Hydrophilidae	*Berosus larva*	1
		Nymphomyiidae	*Nymphomyia*	2
			Total Number	128

UP -II	14.01.2015	Family	Genus	Abundancy
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	2
		Gomphidae	*Sinictinogomphus*	13
		Corbiculidae	*Corbicula striatella*	2
		Dytiscidae	*Nipponhydrus*	9

UP -II	14.01.2015	Family	Genus	Abundancy
		Hydrophilidae	*Halochares*	1
		Corixidae	*Agraptocorixa*	8
		Hydrophilidae	*Hydrophilus*	5
		Dytiscidae	*Hyphydrus*	1
		Hydrophilidae	*Helophorus*	1
			Total Number	42

UP -12	January, 2015	Family	Genus	Abundancy
		Lymnaeidae	*Lymnaea accuminata*	1
		Physidae	*Physa (Haitia) mexicana*	11
		Chironomidae	*Chironominae*	5
		Chironomidae	*Tanypodinae*	7
		Naididae	*Aulophorus flabelliger larva with case*	1
		Tubificidae	*Branchiura sowerbyi*	4
		Amblemidae	*Radiatula pachysoma*	1
		Amblemidae	*Radiatula occata juvenile*	1
		Dytiscidae	*Deronetes larva*	1
		Dytiscidae	*Hyphydrus*	3
		Corixidae	*Agraptocorixa*	37
		Macromiidae	*Macromidia*	1
		Gomphidae	*Sinictinogomphus*	2
		Libellulidae	*Brachythemis*	6
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	2
		Tabanidae	*Tabanus/Atylotus sp.*	2
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Corbiculidae	*Corbicula striatella*	1
		Palaemonidae	*Macrobrachium idae*	2
		Atyidae	*Caridina peninsularis*	9

UP -12	**January, 2015**	**Family**	**Genus**	**Abundancy**
		Viviparidae	*Bellamya bengalensis*	1
		Viviparidae	*Mekongia crassa*	20
		Tubificidae	*Limnodrilus hoffmeisteri*	1
			Total number	120

UP-12	**8.6.2016**	**Family**	**Genus**	**Abundancy**
		Ranatrinidae	*Ranatra brevecolis*	5
		Baetidae	*Baetis*	6
		Nepidae	*Nepa*	11
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Pleidae	*Paraplea*	1
		Hydrophilidae	*Hydrophilus*	1
		Libellulidae	*Nannopphya*	5
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	11
		Hydrophilidae	*Hydrophilus larva*	7
		Chironomidae	*Chironominae*	4
		Plaeamonidae	*Macrobrachium lopopodus*	1
		Atyidae	*Caridina bakoensis*	2
		Viviparidae	*Mekomgia crassa*	26
		Amblemidae	*Parreysia viridula*	3
		Amblemidae	*Radiatula gaudichaudi*	1
		Unionidae	*lamellidens lamellatus*	2
		Viviparidae	*Bellamya bengalensis*	9
		Thiaridae	*Melanoides tuberculatus*	3
		Thiaridae	*Thiara (Thiara)scabra*	2
		Corbiculidae	*Corbiculla striatella*	1
		Physidae	*Physa (Haitia) mexicana*	8
		Planorbidae	*Indoplanorbis*	4

UP-12	8.6.2016	Family	Genus	Abundancy
		Planorbidae	*Gyraulus convexiusculus*	3
		Lymnaeidae	*Lymnaea accuminata*	4
		Succineidae	*Quickia sp.*	1
		Protoneuridae	*Prodasineura autumnalis*	15
			Total number	137

UP -13	15.01.2015	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium idae*	31
		Atyidae	*Caridina peninsularis*	1
		Ranatrinidae	*Ranatra brevicollis*	10
		Corixidae	*Agraptocorixa*	1
		Dydiscidae	*Hyphydrus*	1
		Dytiscidae	*Nipponhydrus*	1
		Corbiculidae	*Corbicula assamensis*	1
		Coenagrionidae	*Agrocnemis lacteola*	1
		Protoneuridae	*Prodasineura autumnalis*	1
		Hydrophilidae	*Hydrophilus*	1
		Dytiscidae	*Nipponhydrus*	1
		Tubificidae	*Branchiodrilus sowerbyi*	4
			Total Number	54

UP-13	7.6.2016	Family	Genus	Abundancy
		Ranatrinidae	*Ranatra brevecolis*	9
		Palaemonidae	*Macrobrachium lopopodus*	14
		Hydrophilidae	*Hydrophilus*	3
		Stratiomyidae	*Stratiomys sp.*	1
		Hydrophilidae	*Barosus*	1
		Chironomidae	*Chironominae*	7
		Hydropsychidae	*Amphipsyche*	1

UP-13	7.6.2016	Family	Genus	Abundancy
		Protoneuridae	*Prodasineura autumnalis*	1
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Nepidae	*Nepa*	5
		Gomphidae	*Heliogomphus*	1
		Gomphidae	*Sinictinogomphus*	1
		Gomphidae	*Macrogomphus*	2
		Gomphidae	*Lamelligomphus*	1
		Libellulidae	*Lyriothemis*	1
		Neoephemeridae	*Neoephemeropsis*	1
		Notonectidae	*Anisops*	1
		Atyidae	*Caridina temasek*	13
		Physidae	*Physa (Haitia) mexicana*	5
		Planorbidae	*Gyraulus convexiusculus*	1
			Total number	70

UP-14	13.01.2015	Family	Genus	Abundancy
		Ranatrinidae	*Ranatra brevecolis*	2
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	6
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Dytiscidae	*Hyphydrus*	8
		Hydrophilidae	*Berosus*	1
		Dytiscidae	*Rhantus*	3
		Planorbidae	*Indoplanorbis*	1
		Corbiculidae	*Corbicula assamensis*	1
		Lymnaeidae	*Lymnaea accuminata*	1
		Dytiscidae	*Rhantus*	5
		Hydrophilidae	*Halochares*	8
		Notonectidae	*Anisops*	1

UP-14	13.01.2015	Family	Genus	Abundancy
		Corixidae	*Agraptocorixa*	7
		Dytiscidae	*Nipponhydrus*	3
		Culicidae	*Culex larva*	1
		Palaemonidae	*Macrobrachium idae*	7
			Total Number	56

UP-14	7.6.2016	Family	Genus	Abundancy
		Syrphidae	*Eristalis sp.*	2
		Ranatrinidae	*Ranatra brevecolis*	2
		Dytiscidae	*Hydrovatus*	4
		Dytiscidae	*Cybister larva*	1
		Chironomidae	*Orthocladiinae*	1
		Hydrophilidae	*Hydrophilus*	2
		Libellulidae	*Nannophya pygmea*	5
		Libellulidae	*Sympetrum*	2
		Libellulidae	*Lyriothemis*	1
		Libellulidae	*Nannophya pygmea*	6
		Hydrophilidae	*Helophorus*	1
		Baetidae	*Baetis*	1
		Nepidae	*Nepa*	3
		Palaemonidae	*Macrobrachium lopopodus*	9
		Atyidae	*Caridina bakoensis*	1
		Corixidae	*Micronecta*	4
		Protoneuridae	*Prodesineurs autumnalis*	5
		Coenagrionidae	*Agriocnemis lacteola*	3
		Lymnaeidae	*Lymnaea accuminata*	3
		planorbidae	*Indoplanorbis*	5
		Planorbidae	*Gyraulus labiatus*	1
		Planorbidae	*Gyruaulus convexiusculus*	1
		Succineidae	*Quickia sp.*	15

UP-14	**7.6.2016**	**Family**	**Genus**	**Abundancy**
		Physidae	*Physa (Haitia) mexicana*	44
		Bithyniidae	*Digoniostoma pulchella*	99
			Total number	221

UP -I	**13.01.2015**	**Family**	**Genus**	**Abundancy**
		Viviparidae	*Bellamyia bengalensis*	1
		Amblemidae	*Radiatulla occata*	20
		Gomphidae	*Sinictinogomphus*	2
		Palaemonidae	*Macrobrachium idae*	11
		Atyidae	*Caridina peninsularis*	1
		Dytiscidae	*Hyphydrus*	3
		Tubificidae	*Limnodrilus hoffmienseri*	1
		Chironomidae	*Chironominae*	8
		Thiaridae	*Melanoides tuberculatus (dead)*	1
			Total Number	48

UP-I (UP-17)	**8.6.2016**	**Family**	**Genus**	**Abundancy**
		Libellulidae	*Lyriothemis*	1
		Chironomidae	*Chironominae*	6
		Tubificidae	*Aulodrilus pigueti*	1
		Hydrophilidae	*Helophorus*	1
		Corixidae	*Micronecta*	1
		Tubificidae	*Branchiura sowerbyi*	1
		Nepidae	*Nepa*	4
		Atyidae	*Caridina temasek*	8
		Palaemonidae	*Macrobrachium lopopodus*	3
		Amblemidae	*Parreysia favidens favidens*	18
		Amblemidae	*Radiatula pachysoma*	7

UP-I (UP-17)	8.6.2016	Family	Genus	Abundancy
		Amblemidae	*Radiatula shurtleffiana*	1
		Bithyniidae	*Digoniostoma pulchella*	4
			Total number	56

UP -18	15.1.2015	Family	Genus	Abundancy
		Unionidae	*Lamellidens phenchooganjensis*	2
		Viviparidae	*Mekongia crassa*	1
		Corbiculidae	*Corbicula assamensis*	5
		Corbiculidae	*Corbicula striatella*	10
		Corbiculidae	*Corbicula bensoni*	6
		Amblemidae	*Parreysia favidens juvenile*	2
		Macromiidae	*Macromia*	1
		Gomphidae	*Sinictinogomphus*	13
		Libellulidae	*Sympetrum*	1
		Hydropsychidae	*Cheumatopsyche*	23
		Physidae	*Physa (Haitia) mexicana*	1
		Ephemeridae	*Eatongenia*	3
		Chironomidae	*Chironominae*	5
		Leptoceridae	*Triaenodes*	1
			Total number	74

UP -18	8.6.2016	Family	Genus	Abundancy
		Dytiscidae	*Hydrovatus*	6
		Hydrophilidae	*Halochares*	2
		Atyidae	*Caridina thambipilaii*	3
		Atyidae	*Caridina bakoensis*	1
		Palaemonidae	*Macrobrachium lopopodus*	2
		Libellulidae	*Lyriothemis*	1

UP -18	8.6.2016	Family	Genus	Abundancy
		Corbiculidae	*Corbicula bensoni*	2
		Corbiculidae	*Corbicula assamensis*	10
		Corbiculidae	*Corbicula striatella*	9
		Physidae	*Physa (Haitia) mexicana*	22
		Unionidae	*Lamellidens sp. juvenile*	1
		Lymnaeidae	*Lymnaea accuminata*	1
		Bithyniidae	*Digoniostoma lithoglyphoides*	3
		Viviparidae	*Bellamya bengalensis*	42
		Amblemidae	*Radiatula occata*	5
			Total number	110

UP -19	14.01.2015	Family	Genus	Abundancy
		Corbiculidae	*Corbicula assamensis*	1
		Macromiidae	*Macromia*	3
		Gomphidae	*Sinictinogomphus*	14
		Palaemonidae	*Macrobrachium idae*	22
		Dytiscidae	*Hyphydrus*	10
		Chironomidae	*Chironominae*	13
		Bithyniidae	*Digoniostoma pulchella*	1
		Corixidae	*Sigara*	1
		Hydrophilidae	*Halochares*	1
			Total Number	66

UP-19	9.6. 2016	Family	Genus	Abundancy
		Protoneuridae	*Prodasineura autumnalis*	1
		Chironomidae	*Chironominae*	2
		Chironomidae	*Orthocladiinae*	3
		Ranatrinidae	*Ranatra brevecolis*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	2

UP-19	**9.6. 2016**	**Family**	**Genus**	**Abundancy**
		Libellulidae	*Lyriothemis*	1
		Nepidae	*Nepa*	9
		Dytiscidae	*Hydrovatus*	16
		Baetidae	*Baetis*	1
			Springtail/Collumbola	1
		Atyidae	*Caridina thambipilaii*	7
		Palaemonidae	*Macrobrachium lopopodus*	14
		Atyidae	*Caridina temasek*	12
		Physidae	*Physa (Haitia) mexicana*	1
		Corbiculidae	*Corbicula assamensis*	3
		Corbiculidae	*Corbicula striatella*	2
		Planorbidae	*Gyraulus convexiusculus*	1
		Lymnaeidae	*Lymnaea accuminata*	1
		Viviparidae	*Bellamya bengalensis*	9
		Amblemidae	*Parreysia favidens favidens*	1
		Amblemidae	*Parreysia favidens juvenile*	2
		Amblemidae	*Parreysia favidens chrysis*	2
			Total number	92

UP -29	**16.01.2015**	**Family**	Genus	**Abundancy**
		Libellulidae	*Brachythemis*	4
		Libellulidae	*Orthetrum albistylum speciosum*	1
		Chironomidae	*Chironominae*	26
		Tubificidae	*Brachiodrillus semperi*	2
		Palaemonidae	*Macrobrachium idae*	4
		Atyidae	*Caridina peninsularis*	1
		Physidae	*Physa (Haitia) mexicana*	29
		Lymnaeidae	*Indoplanorbis*	1

UP -29	16.01.2015	Family	*Genus*	Abundancy
		Dytiscidae	*Hyphydrus*	1
		Corixidae	*Agraptocorixa*	7
		Culicidae	*Anopheles larva*	6
			Total number	82

UP -29	9.6. 2016	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	5
		Hydrophilidae	*Berosus*	1
		Nepidae	*Nepa*	1
		Syrphidae	*Eristalis sp.*	1
		Coenagrionidae	*Agriocnemis lacteola*	1
		Physidae	*Physa (Haitia) mexicana*	2
		Chironomidae	*Chironominae*	2
		Hydrophilidae	*Hydrophilus larva*	1
		Succineidae	*Quickia sp*	3
			Total number	17

UP- A	16.01.2015	Family	Genus	Abundancy
		Libellulidae	*Brachythemis*	2
		Chironomidae	*Chironominae*	12
		Chironomidae	*Tanypodinae*	2
		Palaemonidae	*Macrobrachium idae*	4
		Coenagrionidae	*Agriocnemis*	1
		Hydrophilidae	*Helophorus*	2
		Hydrophilidae	*Berosus larva*	1
		Dytiscidae	*Hyphydrus*	2
		Corixidae	*Agraptocorixa*	5
			Total number	31

UPDG	9.6.2016	Family	Genus	Abundancy
		Corbiculidae	*Corbicula assamensis*	1
		Hydrophilidae	*Hydrophilus larva*	10

UPDG	9.6.2016	Family	Genus	Abundancy
		Nepidae	*Nepa*	7
		Ranatrinidae	*Ranatra brevecolis*	1
		Atyidae	*Caridina temasek*	7
		Chironomidae	*Chironominae*	123
		Lymnaeidae	*Lymnaea accuminata*	2
		Hydrophilidae	*Helophorus*	2
		Hydrophilidae	*Hydrophilus larva*	3
		Culicidae	*Anopheles larva*	1
		Dytiscidae	*Laccophilus*	1
		Dytiscidae	*Hydaticus*	1
		Dytiscidae	*Prodasineura autumnalis*	1
		Baetidae	*Baetis*	1
		Culicidae	*Anopheles pupa*	1
		Culicidae	*Anopheles larva*	13
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	26
			Total number	201

UP AL-1	February, 2015	Family	Genus	Abundancy
		Physidae	*Physa (Haitia) mexicana*	1
		Chironomidae	*Chironominae*	10
		Corixidae	*Agraptocorixa*	2
		Palaemonidae	*Macrobrachium idae*	4
		Assimineidae	*Assiminea francesiae*	14
		Viviparidae	*Bellamya bengalensis*	1
		Viviparidae	*Mekongia crassa*	1
		Amblemidae	*Parreysia virudula*	12
		Corbiculidae	*Corbicula striatella*	2
			Total number	47

UP ALI	**4.10.2016**	**Family**	**Genus**	**Abundancy**
		Corbiculidae	*Corbicula striatella*	1
		Nepidae	*Nepa*	1
		Viviparidae	*Bellamya bengalensis*	1
		Nereidae	*Namalycastis indica*	1
		Sabellidae	*Manayunkia/ Brandtika*	4
		Palaemonidae	*Macrobrachium lopopodus*	29
			Total number	37

UP II	**14.01.2015**	**Family**	**Genus**	**Abundancy**
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	2
		Gomphidae	*Sinictinogomphus*	13
		Corbiculidae	*Corbicula striatella*	2
		Dytiscidae	*Nipponhydrus*	9
		Hydrophilidae	*Halochares*	1
		Corixidae	*Agraptocorixa*	8
		Hydrophilidae	*Hydrophilus*	5
		Dytiscidae	*Hyphydrus*	1
		Hydrophilidae	*Helophorus*	1
			Total Number	42

UP II	**7.6.2016**	**Family**	**Genus**	**Abundancy**
		Gomphidae	*Paragomphus*	2
		Corixidae	*Agraptocorixa*	9
		Culicidae	*Anopheles larva*	1
		Nepidae	*Nepa*	29
		Lymnaeidae	*Lymnaea accuminata*	11
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1

UP II	7.6.2016	Family	Genus	Abundancy
		Physidae	*Physa (Haitia) mexicana*	11
		Hydrophilidae	*Berosus*	1
		Hydrophilidae	*Hydrophilus*	3
		Chironomidae	*Tanypodinae*	1
		Tubificidae	*Branchiodrilus semperi*	1
		Chironomidae	*Chironominae*	20
		Histeridae	*Hister*	1
		Dytiscidae	*Hydrovatus*	3
		Arachnoida	*Water spider*	2
		Palaemonidae	*Macrobrachium lopopodus*	2
			Total number	99

UPIII	11.3. 2015	Family	Genus	Abundancy
		Dytiscidae	*Hyphydrus*	9
		Hydrophilidae	*Halochares*	3
		Ranatrinidae	*Ranatra*	1
		Corbiculidae	*Corbicula assamensis*	2
		Corbiculidae	*Corbicula striatella*	1
		Corixidae	*Corixa*	4
		Corixidae	*Agraptocorixa*	7
		Nephthydae	*Nephthys polybranchia*	22
		Gomphidae	*Sinictinogomphus*	1
		Gomphidae	*Orientogomphus*	1
		Palaemonidae	*Macrobrachium callirrhoe*	8
		Viviparidae	*Bellamya bengalensis*	8
		Viviparidae	*Mekongia crassa*	1
		Physidae	*Physa (Haitia) mexicana*	11
		Lymnaeidae	*Lymnaea accuminata*	1
		Thiaridae	*Melanoides pyramis*	2
		Assimineidae	*Assiminea francesiae*	6

UPIII	11.3. 2015	Family	Genus	Abundancy
		Diptera	*Unidentified diptera*	1
			Total Number	89

UPIII	20.10.2016	Family	Genus	Abundancy
		Gomphidae	*Stylurus*	1
		Gomphidae	*Sinictinogomphus*	11
		Macromiidae	*Macromidia*	1
		Protoneuridae	*Prodasineura autumnalis*	1
		Thiaridae	*Melanoides pyramis leopardina*	10
		Nereididae	*Namalycastis indica*	13
		Sabellidae	*Manayunkia/Brandtika*	4
		Viviparidae	*Bellamya bengalensis juvenile*	1
		Dytiscidae	*Laccophilus*	1
		Chironomidae	*Tanypodinae*	2
		Tubificidae	*Branchiodrilus semperi*	1
		Atyidae	*Caridina bakoensis*	2
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Palaemonidae	*Macrobrachium lopopodus*	49
		Viviparidae	*Mekongia crassa*	1
		Thiaridae	*Thiara (Tarebia) lineata*	25
		Thiaridae	*Melanoides tuberculatus*	2
		Amblemidae	*Parreysia favidens favidens*	5
		Viviparidae	*Bellamya bengalensis*	17
			Total number	148

UPIV	11.3. 2015	Family	Genus	Abundancy
		Dytiscidae	*Cybister larva*	3
		Viviparidae	*Bellamya bengalensis*	4

UPIV	11.3. 2015	Family	Genus	Abundancy
		Corbiculidae	*Corbicula assamensis*	4
		Palaemonidae	*Macrobrachium idae*	1
		Dytiscidae	*Hyphydrus*	6
		Lymnaeidae	*Lymnaea accuminata*	2
		Physidae	*Physa (Haitia) mexicana*	22
		Dytiscidae	*Hyphydrus*	2
		Dytiscidae	*Nipponhydrus*	1
		Noteridae	*Hydrocoptus*	1
		Ranatrinidae	*Ranatra brevicollis*	7
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	3
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae juvenile*	7
		Hydrophilidae	*Hydrophilus*	2
		Hydrophilidae	*Berosus*	2
		Hydrophilidae	*Halochares*	7
		Hebridae	*Hyrcanus*	1
		Histeridae	*Hister*	1
		Hydrophilidae	*Amphiops?*	1
		Corixidae	*Agraptocorixa*	1
		Palaemonidae	*Macrobrachium lopopodus*	4
		Atyidae	*Caridina celebensis*	18
			Total Number	100

UPIV	20.10.2016	Family	Genus	Abundancy
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Protoneuridae	*Prodasineura autumnalis*	4
		Gomphidae	*Stylurus*	1
		Gomphidae	*Sinictinogomphus*	1
		Ranatrinidae	*Ranatra brevecolis*	1
		Syrphidae	*Eristalis sp.*	1

UPIV	20.10.2016	Family	Genus	Abundancy
		Namanereidinae (Nereididae)	*Namanerieis covernicola*	1
		Sabellidae	*Manayunkia/Brandtika*	3
		Gomphidae	*Sieboldius*	3
		Hydrophilidae	*Halochares*	1
		Dytiscidae	*Hydaticus*	1
		Noteridae	*Canthydrus*	1
		Corixidae	*Agraptocorixa*	3
		Dytiscidae	*Nipponhydrus*	1
		Dytiscidae	*Hydrovatus*	1
		Atyidae	*Caridina bakoensis*	17
		Pleamonidae	*Macrobrachium lopopodus*	19
		Corbiculidae	*Corbicula assamensis*	2
		Viviparidae	*Bellamya bengalensis*	5
		Thiaridae	*Thiara (Tarebia) lineata*	42
		Thiaridae	*Melanoides tuberculatus*	1
			Total number	110

UP-G	March, 2015	Family	Genus	Abundancy
		Corbiculidae	*Corbicula striatella*	2
		Corbiculidae	*Corbicula bensoni*	1
		Unionidae	*Lamellidens phenchooganjensis*	2
		Amblemidae	*Parreysia favidens favidens*	1
		Viviparidae	*Bellamya bengalensis*	13
		Dytiscidae	*Hyphydrus*	24
		Dytiscidae	*Hydrocoptus*	1
		Syrphidae	*Eristalis sp.*	1
		Corixidae	*Corixa*	18
		Chironomidae	*Chironominae*	2
		Amblemidae	*Parreysia corrugata laevirostris juvenile*	1

UP-G	March, 2015	Family	Genus	Abundancy
		Dytiscidae	*Hydrovatus larva*	4
		Chironomidae	*Tanypodinae*	1
		Hydrophilidae	*Halochares*	8
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	3
		Tubificidae	*Limnodrilus Hoffmeisteri*	1
		Hydrophilidae	*Hydrophilus*	1
		Planorbidae	*Indoplanorbis*	1
		Corixidae	*Agraptocorixa*	1
		Hydrophilidae	*Berosus*	3
		Hydrophilidae	*Cybister larva*	1
		Dytiscidae	*Dytiscus*	2
		Gomphidae	*Paragomphus*	1
		Libellulidae	*Orthetrum albistylum speciosum*	1
		Chironomidae	*Chironominae*	39
		Ranatrinidae	*Ranatra brevicollis*	1
		Lymnaeidae	*Lymnaea accuminata*	4
		Physidae	*Physa (Haitia) mexicana*	31
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Thiaridae	*Melanoides pyramis*	3
		Nephthydae	*Nephthys polybranchia*	1
		Haliplidae	*Haliplidae larva*	1
		Elminthidae	*Stenelmis*	1
			Unidentified	
			Total number	176

UP-G	18.10.2016	Family	Genus	Abundancy
		Viviparidae	*Mekongia crassa juvenile*	1
		Sabellidae	*Manayunkia/ Brandtika*	1

UP-G	18.10.2016	Family	Genus	Abundancy
		Thiaridae	*Thiara (Tarebia) granifera*	10
		Chironomidae	*Tanypodinae*	1
		Libellulidae	*Orthetrum*	1
		Chironomidae	*Chironominae*	11
		Ceratopogonidae	*Halaninae larva*	1
		Palaemonidae	*Macrobrachium lopopodus*	4
		Amblemidae	*Parreysia favidens favidens*	13
		Amblemidae	*Radiatula occata*	2
		Amblemidae	*Radiatula shurtleffiana*	4
		Amblemidae	*Radiatula caerulea*	14
			Total number	63

UP-32	February, 2015	Family	Genus	Abundancy
		Corbiculidae	*Corbicula assamensis*	1
		Corbiculidae	*Corbicula striatella*	1
		Amblemidae	*Parreysia corrugata laevirostris juvenile*	7
		Unionidae	*Lamellidens sp. juvenile*	1
		Libellulidae	*Brachythemis*	17
		Palaemonidae	*Macrobrachium idae*	10
		Atyidae	*Caridina peninsularis*	7
		Chironomidae	*Chironominae*	20
		Dytiscidae	*Hyphydrus*	9
		Thiaridae	*Melanoides pyramis*	4
		Dytiscidae	*Deronectes larva*	7
		Viviparidae	*Mekongia crassa*	2
		Viviparidae	*Bellamiya bengalensis*	1
		Corixidae	*Agraptocorixa*	5
		Baetidae	*Baetis*	1
		Culicidae	*Anopheles larva*	3

UP-32	February, 2015	Family	Genus	Abundancy
		Physidae	*Physa (Haitia) mexicana*	1
		Planorbidae	*Indoplanorbis*	2
			Total Number	99

UP-32	6.10.2016	Family	Genus	Abundancy
		Unionidae	*Lamellidens rhadineus*	1
		Viviparidae	*Mekongia crassa*	16
		Viviparidae	*Bellamya bengalensis*	14
		Corbiculidae	*Corbicula assamensis*	1
		Gomphidae	*Sinictinogomphus*	1
		Amblemidae	*Parreysia favidens favidens*	5
		Dytiscidae	*Laccophilus*	1
		Dytiscidae	*Hydrovatus*	1
		Palaemonidae	*Macrobrachium lopopodus*	44
			Total number	84

UP- 33	February, 2015	Family	Genus	Abundancy
		Viviparidae	*Bellamya bengalensis*	3
		Noteridae	*Noterus*	1
		Assimineidae	*Assiminea francesiae*	10
		Thiaridae	*Thiara (Thiara)scabra*	1
		Thiaridae	*Melanoides pyramis*	3
		Gomphidae	*Orientogomphus*	9
		Libellulidae	*Brachythemis*	1
		Physidae	*Physa (Haitia) mexicana*	15
		Palaemonidae	*Macrobrachium idae*	16
		Atyidae	*Caridina peninsularis*	7
		Coenagrionidae	*Agrocnemis lacteola*	5
		Eulichadidae	*Eulichas (Coleoptera larva)*	1

UP- 33	February, 2015	Family	Genus	Abundancy
		Dytiscidae	*Hyphydrus*	3
		Corixidae	*Sigara*	2
		Dytiscidae	*Deronectes larva*	1
		Corbiculidae	*Corbicula striatella*	2
		Planorbidae	*Indoplanorbis*	7
			Total number	87

UP-33	6.10.2016	Family	Genus	Abundancy
		Thiaridae	*Thiara (Tarebia) lineata*	57
		Unionidae	*Lamellidens rhadineus*	6
		Amblemidae	*Parreysia favidens favidens*	14
		Corbiculidae	*Corbicula assamensis*	1
		Palaemonidae	*Macrobrachium lopopodus*	9
		Syrphidae	*Eristalis sp.*	2
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Planorbidae	*Gyraulus convexiusculus*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Hirudinidae	*Hirudinaria manillensis*	1
		Gomphidae	*Stylurus*	1
		Hydrophilidae	*Helophorus*	3
		Nipharigidae	*Neoniphargus indicus dried*	2
		Stratiomyidae	*Stratiomys sp.*	1
		Ephemeridae	*Eatongenia*	1
		Gomphidae	*Megalogomphus*	1
		Gomphidae	*Lamelligomphus*	1
		Noteridae	*Canthydrus*	1
		Dryopidae	*Helichus*	1

UP-33	6.10.2016	Family	Genus	Abundancy
		Chironomidae	*Chironominae*	1
			Total number	106

UP-38	February, 2015	Family	Genus	Abundancy
		Viviparidae	*Bellamya bengalensis*	2
		Corbiculidae	*Corbicula assamensis*	1
		Unionidae	*Lamellidens lamellatus*	3
		Assimineidae	*Assiminea francesiae*	6
		Libellulidae	*Brachythemis*	4
		Palaemonidae	*Macrobrachium idae*	6
		Physidae	*Physa (Haitia) mexicana*	34
		Chironomidae	*Chironominae*	12
		Hydrophilidae	*Halochares*	9
		Notonectidae	*Anisops*	1
		Culicidae	*Anopheles larva*	1
		Corixidae	*Agraptocorixa*	5
			Total number	84

UP-38	5.10. 2016	Family	Genus	Abundancy
		Unionidae	*Lamellidens rhadineus*	6
		Unionidae	*Lamellidens mainwaringi*	3
		Unionidae	*Lamellidens corrianus*	2
		Thiaridae	*Thiara (Tarebia) lineata*	45
		Amblemidae	*Parreysia favidens favidens*	27
		Nepidae	*Nepa*	2
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Physidae	*Physa (Haitia) mexicana*	2
		Gomphidae	*Sinictinogomphus*	1

UP-38	5.10. 2016	Family	Genus	Abundancy
		Ampullariidae	*Pila globosa juvenile*	4
		Assimineidae	*Paludinella (Schuetiella) daengswangi*	1
		Thiaridae	*Thirara lineata juvenile*	6
		Sabellidae	*Manayunkia/Brandtika*	44
			Total number	144

UP -39	February, 2015	Family	Genus	Abundancy
		Culicidae	*Anopheles larva*	3
		Chironomidae	*Chironominae*	3
		Gomphidae	*Orientogomphus*	2
		Macromiidae	*Macromidia*	1
		Dytiscidae	*Hyphydrus*	1
		Hydrophilidae	*Halochares*	1
		Corixidae	*Agraptocorixa*	5
		Corbiculidae	*Corbicula assamensis*	2
		Corbiculidae	*Corbicula striatella*	1
		Dytiscidae	*Deronectes larva*	1
		Corixidae	*Sigara*	2
		Hydrophilidae	*Berosus*	1
		Physidae	*Physa (Haitia) mexicana*	3
		Palaemonidae	*Macrobrachium idae*	4
		Unidentified	*Unidentified terrestrial*	1
			Total number	31

UP-39	4.10.2016	Family	Genus	Abundancy
		Amblemidae	*Parreysia favidens favidens*	14
		Viviparidae	*Mekongia crassa*	1
		Viviparidae	*Bellamya bengalensis*	4
		Planorbidae	*Gyraulus convexiusculus*	4

UP-39	4.10.2016	Family	Genus	Abundancy
		Planorbidae	*Indoplanorbis*	1
		Thiaridae	*Thiara (Tarebia) lineata*	4
		Chironomidae	*Chironominae*	1
		Dryopidae	*Helichus*	1
		Stenothyridae	*Gangetia miliacea*	1
		Scirtidae	*Cyphon larva*	1
		Hydrophilidae	*Halochares*	1
		Sabellidae	*Manayunkia/Brandtika*	1
		Macromiidae	*Macromidia*	1
		Macromiidae	*Macromia*	1
		Palaemonidae	*Macrobrachium lopopodus*	114
			Total number	150

UP- 40	February, 2015	Family	Genus	Abundancy
		Lymnaeidae	*Lymnaea accuminata*	1
		Dytiscidae	*Hyphydrus*	1
		Palaemonidae	*Macrobrachium idae*	20
		Gomphidae	*Orientogomphus*	8
		Libellulidae	*Orthetrum albistylum speciosum*	1
		Assaminidae	*Assamenia fraincaise*	5
		Caenidae	*Caenis*	1
		Noteridae	*Hydrocoptus*	1
		Protoneuridae	*Prodasineura autumnalis*	1
			Total number	39

UP- 40	4.10. 2016	Family	Genus	Abundancy
		Corbiculidae	*Corbicula bensoni*	1
		Planorbidae	*Indoplanorbis*	1
		Physidae	*Physa (Haitia) mexicana*	1

UP- 40	4.10. 2016	Family	Genus	Abundancy
		Planorbidae	*Gyraulus convexiusculus*	4
		Bithyniidae	*Digoniostoma pulchella*	1
		Namanereidinae (Nereididae)	*Namanerieis covernicola*	1
		Palaemonidae	*Macrobrachium lopopodus*	37
			Total number	46

UP-41	February, 2015	Family	Genus	Abundancy
		Culicidae	*Anopheles larva*	2
		Hydrophilidae	*Halochares*	1
		Palaemonidae	*Macrobrachium idae*	12
		Atyidae	*Caridina peninsularis*	8
		Gomphidae	*Sinictinogomphus*	1
		Physidae	*Physa (Haitia) mexicana*	1
		Corixidae	*Sigara*	2
		Corbiculidae	*Corbicula assamensis*	2
		Corbiculidae	*Corbicula striatella*	3
		Unionidae	*Lamellidens sp.juvenile*	1
		Dytiscidae	*Hyphydrus*	9
		Hydropsychidae	*Cheumatopsyche*	1
		Dytiscidae	*Deronectes larva*	7
		Chironomidae	*Chironominae*	19
			Total Number	69

UP-41	6.10.2016	Family	Genus	Abundancy
		Amblemidae	*Parreysia favidens favidens*	5
		Unionidae	*Lamellidens rhadineus*	3
		Thiaridae	*Thiara (Tarebia) lineata*	36

UP-41	**6.10.2016**	**Family**	**Genus**	**Abundancy**
		Thiaridae	*Melanoides tuberculatus*	2
		Corbiculidae	*Corbicula striatella*	2
		Corbiculidae	*Corbicula assamensis*	4
		Assimineidae	*Assiminea francesiae*	4
		Gomphidae	*Sinictinogomphus*	8
		Palaemonidae	*Macrobrachium lopopodus*	61
			Total number	125

UP - 44	**February, 2015**	**Family**	**Genus**	**Abundancy**
		Viviparidae	*Bellamya bengalensis*	8
		Dytiscidae	*Hyphydrus*	18
		Planorbidae	*Indoplanorbis*	6
		Thiaridae	*Melanoides pyramis*	1
		Lymnaeidae	*Lymnaea accuminata*	22
		Gomphidae	*Orientogomphus*	1
		Libellulidae	*Orthetrum albistylum speciosum*	2
		Notonectidae	*Anisops*	1
		Corixidae	*Sigara*	2
		Corixidae	*Agraptocorixa*	3
		Hydropsychidae	*Cheumatopsyche*	1
		Dytiscidae	*Deronectes larva*	2
		Hydrophilidae	*Helophorus*	2
		Elmididae	*Pseudamophilus*	1
		Chironomidae	*Chironominae*	10
		Sphaeriidae	*Musculium indicum*	1
		Culicidae	*Anopheles larva*	1
		Palaemonidae	*Macrobrachium idae*	3
		Atyidae	*Caridina peninsularis*	10
			Total number	95

UP-44	5.10.2016	Family	Genus	Abundancy
		Viviparidae	*Bellamya bengalensis*	2
		Corbiculidae	*Corbicula striatella*	2
		Ephemeridae	*Eatongenia*	1
		Gomphidae	*Sinictinogomphus*	2
		Chironomidae	*Orthocladiinae*	3
		Tubificidae	*Branchiodrilus semperi*	2
		Palaemonidae	*Macrobrachium lopopodus*	34
			Total number	46

UP-47	February, 2015	Family	Genus	Abundancy
		Corixidae	*Agraptocorixa*	22
		Palaemonidae	*Macrobrachium idae*	1
		Gomphidae	*Sinictinogomphus*	1
		Chironomidae	*Chironominae*	10
		Notonectidae	*Anisops*	1
		Dytiscidae	*Hyphydrus*	3
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
			Total number	39

UP-47	5.10.2016	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	84
		Atyidae	*Caridina temasek*	6
		Corbiculidae	*Corbicula striatella*	7
		Physidae	*Physa (Haitia) mexicana*	4
		Bithyniidae	*Digoniostoma cerameopoma*	1
		Viviparidae	*Bellamya bengalensis juvenile*	1
		Nepidae	*Nepa*	5
		Planorbidae	*Amerianna*	2

UP-47	5.10.2016	Family	Genus	Abundancy
		Assimineidae	*Paludinella*	1
		Protoneuridae	*Prodasineura autumnalis*	1
		Hydrophilidae	*Halochares*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	2
		Bithyniidae	*Digoniostoma pulchella*	1
		Dytiscidae	*Hydaticus*	1
			Total number	117

UP-49	March, 2015	Family	Genus	Abundancy
		Nephthydae	*Nephthys polybranchia*	24
		Chironomidae	*Tanypodinae*	1
		Corixidae	*Corixa*	13
		Corbiculidae	*Corbicula assamensis*	1
		Corbiculidae	*Corbicula bensoni*	4
		Corbiculidae	*Corbicula striatella*	2
		Amblemidae	*Parreysia favidens favidens juveniles*	4
		Lymnaeidae	*Lymnaea accuminata*	6
		Physidae	*Physa (Haitia) mexicana*	6
		Dytiscidae	*Hyphydrus*	9
		Dytiscidae	*Hydrovatus larva*	1
		Gomphidae	*Sinictinogomphus*	3
		Corixidae	*Agraptocorixa*	8
		Dytiscidae	*Nipponhydrus*	1
		Hydrophilidae	*Helophorus*	1
		Hydrophilidae	*Halochares*	3
		Chironomidae	*Chironominae*	5
		Atydae	*Caridina bruneiana*	4
		Viviparidae	*Bellamya bengalensis*	1

UP-49	March, 2015	Family	Genus	Abundancy
		Viviparidae	*Makongia crassa*	5
			Total Number	102

UP-49	20.10.2016	Family	Genus	Abundancy
		Unionidae	*Lamellidens rhadineus*	3
		Amblemidae	*Parreysia viridula*	3
		Amblemidae	*Parreysia corrugata laevirostris*	6
		Corbiculidae	*Corbicula assamensis*	5
		Thiaridae	*Thiara (Tarebia) granifera*	1
		Sabellidae	*Caobangia*	1
		Sabellidae	*Manayunkia/Brandtika*	1
		Gomphidae	*Sinictinogomphus*	1
		Chironomidae	*Orthocladiinae*	4
		Nepidae	*Nepa*	2
		Palaemonidae	*Macrobrachium lopopodus*	22
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
			Total number	50

UP-50	10.03.2015	Family	Genus	Abundancy
		Viviparidae	*Bellamya bengalensis*	3
		Unionidae	*Lamellidens rhadineus*	1
		Ranatrinidae	*Ranatra*	1
		Coenegrionidae	*Agriocnemis lacteola*	4
		Protoneuridae	*Prodasineura autumnalis*	1
		Baetidae	*Baetis*	1
		Lymnaeidae	*Lymnaea accuminata*	1
		Thiaridae	*Melanoides pyramis*	2
		Libellulidae	*Brachythemis*	1

UP-50	10.03.2015	Family	Genus	Abundancy
		Libellulidae	*Orthetrum albistylum speciosum*	6
		Paleamonidae	*Macrobrachium idae*	7
		Atydae	*Caridina endehensis*	2
		Hydrophilidae	*Berosus*	1
		Gyrinidae	*Orectochilus*	9
		Dytiscidae	*Hyphydrus*	2
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Corixidae	*Corixa*	7
		Coenagrionidae	*Agriocnemis*	1
		Tubificidae	*Branchiura sowerbyi*	1
		Noteridae	*Hydrocoptus*	1
			Total number	53

UP-50	18.10.2016	Family	Genus	Abundancy
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Chironomidae	*Tanypodinae*	3
		Tubificidae	*Branchiodrilus semperi*	4
		Chironomidae	*Orthocladiinae*	4
		Lumbricidae	*Eisiniella tetraedra tetraedra*	4
		Gomphidae	*Stylurus*	2
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	3
		Nepidae	*Nepa*	4
		Palaemonidae	*Macrobrachium lopopodus*	15
		Atyidae	*Caridina temasek*	11
		Palaemonidae	*Macrobachium lar*	1
		Unionidae	*Lamellidens narainporensis*	5

UP-50	18.10.2016	Family	Genus	Abundancy
		Unionidae	*Lamellidens narainporensis juvenile*	4
		Unionidae	*Lamellidens mainwaringi*	1
		Amblemidae	*Parreysia favidens pinex*	1
		Amblemidae	*Parreysia favidens favidens*	5
		Amblemidae	*Parreysia favidens juvenile*	1
		Thiaridae	*Melanoides tuberculatus*	4
		Thiaridae	*Thiara (Thiara)scabra*	1
		Amblemidae	*Radiatula caerulea*	3
		Viviparidae	*Bellamya bengalensis*	13
			Total number	90

UP -51	10.3.2015	Family	Genus	Abundancy
		Belostomatidae	*Lethocerus (=Belostoma)*	1
		Corixidae	*Corixa*	2
		Hydrophilidae	*Berosus*	1
		Chironomidae	*Chironominae*	2
		Palaemonidae	*Macrobrachium niphanae*	4
		Arachnoida	*Water spider*	3
		Nepidae	*Nepa*	3
		Hydrophilidae	*Halochares*	1
		Hydrophilidae	*Halophores*	1
		Libellulidae	*Zyxomma*	2
		Libellulidae	*Tholymis*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	2
		Ranatrinidae	*Ranatra*	4
		Lymnaeidae	*Lymnaea accuminata*	1

UP -51	**10.3.2015**	**Family**	**Genus**	**Abundancy**
		Physidae	*Physa (Haitia) mexicana*	32
		Protoneuridae	*Prodasineura autumnalis*	6
		Dytiscidae	*Laccophilus*	1
		Dytiscidae	*Nipponhydrus*	1
		Coleoptera	*Unidentified beetle*	1
		Viviparidae	*Bellamya bengalensis*	4
		Amblemidae	*Parreysia favidens favidens*	7
		Amblemidae	*Juvenile of Parreysia favidens*	2
			Total number	82

UP 51	**19.10.2016**	**Family**	**Genus**	**Abundancy**
		Unionidae	*Lamellidens marginalis*	1
		Hydrophilidae	*Berosus*	1
		Dytiscidae	*Laccophilus*	1
		Dytiscidae	*Hydaticus*	1
		Hydrophilidae	*Helophorus*	1
		Noteridae	*Canthydrus*	1
		Nereidae	*Namalycastis indica*	5
		Sabellidae	*Manayunkia/Brandtika*	1
		Chironomidae	*Chironomionae*	5
		Ceratopogonidae	*Bezzia sp. larva*	1
		Corixidae	*Agraptocorixa*	3
		Nepidae	*Nepa*	1
		Nepidae	*Leccotrephes pfeiferiae*	1
		Amblemidae	*Parreysia favidens favidens*	5
		Corbiculidae	*Corbicula assamensis*	1
		Palaemonidae	*Macrobrachium lopopodus*	37
			Total number	66

UP -53	10.3.2015	Family	Genus	Abundancy
		Libellulidae	*Zyxomma*	1
		Physidae	*Physa (Haitia) mexicana*	26
		Thiaridae	*Thiara (Tarebia) lineata*	8
		Thiaridae	*Melanoides pyramis*	2
		Corixidae	*Corixa*	1
		Chironomidae	*Chironominae*	24
		Culicidae	*Anopheles larvae*	3
		Baetidae	*Adult Baetis*	2
		Corixidae	*Agraptocorixa*	4
		Tubificidae	*Bothrioneurum vejdovskyanum*	2
			Total number	73

UP-53	19.10.2016	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	5
		Dytiscidae	*Hydaticus*	1
		Noteridae	*Canthydrus*	5
		Corixidae	*Corixa*	2
		Corixidae	*Agraptocorixa*	5
		Chironomidae	*Chironominae*	9
		Sabellidae	*Manayunkia/Brandtika*	3
		Gomphidae	*Sinictinogomphus*	1
		Arcidae	*Scaphula celox*	1
		Thiaridae	*Melanoides pyramis juvenile*	38
		Thiaridae	*Thiara (Tarebia) lineata*	49
		Physidae	*Physa (Haitia) mexicana*	1
		Bithyniidae	*Digoniostoma pulchella dead*	1
		Nereidae	*Namalycastis indica*	1
			Total number	122

UP -54	12.3. 2015	Family	Genus	Abundancy
		Unionidae	*Lamellidens sp. Juvenile*	1
		Corbiculidae	*Corbicula bensoni*	2
		Corbiculidae	*Corbicula striatella juvenile*	2
		Amblemidae	*Parreysia favidens juvenile*	11
		Gomphidae	*Orientogomphus*	1
		Physidae	*Physa (Haitia) mexicana*	19
		Macromiidae	*Macromia*	1
		Chironomidae	*Chironominae*	19
		Baetidae	*Baetis*	2
		Dytiscidae	*Hyphydrus*	2
		Corixidae	*Agraptocorixa*	2
		Corixidae	*Corixa*	1
			Total number	63

UP-54	19.10.2016	Family	Genus	Abundancy
		Corbiculidae	*Corbicula assamensis*	1
		Sabellidae	*Caobangia*	1
		Sabellidae	*Manayunkia/Brandtika*	11
		Ephemeridae	*Eatongenia*	2
		Chironomidae	*Chironominae*	1
		Gomphidae	*Sinictinogomphus*	1
		Chironomidae	*Tanypodinae*	5
		Chironomidae	*Orthocladiinae*	20
		Ceratopogonidae	*Bezzia sp. larva*	1
		Dytiscidae	*Hydaticus*	1
		Noteridae	*Canthydrus*	8
			Total number	52

Up -56 as UP-55	**10.3. 2015**	**Family**	**Genus**	**Abundancy**
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	16
		Lymnaeidae	*Lymnaea accuminata*	1
		Physidae	*Physa (Haitia) mexicana*	49
		Chlorolestidae	*Megalestes chengi*	1
		Chironomidae	*Chironominae*	1
		Hydrophilidae	*Berosus*	1
		Culicidae	*Malaya larva*	7
			Total number	76

UP- 56 corrected as UP-55	**19.10.2016**	**Family**	**Genus**	**Abundancy**
		Physidae	*Physa (Haitia) mexicana*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	2
		Ranatrinidae	*Ranatra brevecolis*	1
		Nepidae	*Nepa*	1
		Nepidae	*Laccotrephes pfeiferiae pfeiferiae*	1
		Hydrophilidae	*Halochares*	1
		Notonectidae	*Anisops*	1
		Caenidae	*Caenis*	3
		Tubificidae	*Aulodrilus pluriseta*	7
		Tubificidae	*Aulodrilus pigueti*	1
		Chironomidae	*Chironominae*	4
		Atyidae	*Caridina thambipilaii*	5
		Noteridae	*Canthydrus*	4
		Hydropsychidae	*Amphepsyche*	2
			Total number	34

UP-57	13.3. 2015	Family	Genus	Abundancy
		Corbiculidae	*Corbicula assamensis*	2
		Amblemidae	*Parreysia triembolus*	1
		Amblemidae	*Parreysia favidens favidens*	3
		Viviparidae	*Bellamya bengalensis*	2
		Assimineidae	*Assiminea francesiae*	3
		Palaemonidae	*Macrobrachium lopopodus*	1
		Atyidae	*Caridina bruneiana*	20
		Ranatrinidae	*Ranatra brevecolis*	3
		Dytiscidae	*Hyphydrus*	16
		Gomphidae	*Sinictinogomphus*	1
		Dytiscidae	*Cybister larva*	2
		Hydrophilidae	*Berosus*	2
		Hydrophilidae	*Halochares*	2
		Corixidae	*Corixa*	7
		Libellulidae	*Sympetrum*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	7
		Lymnaeidae	*Lymnaea accuminata*	1
		Protoneuridae	*Prodasineura autumnalis*	4
		Coenagrionidae	*Agriocnemis lacteola*	2
		Pyralidae	*Paraponyx diminutalis*	1
			Total Number	81

UP 57 Corrected as UP 56	18.10.2016	Family	Genus	Abundancy
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	6
		Ampullariidae	*Pila globosa*	1
		Bithyniidae	*Digoniostoma pulchella dead*	1

UP 57 Corrected as UP 56	18.10.2016	Family	Genus	Abundancy
		Chironomidae	*Orthocladiinae*	5
		Atyidae	*Macrobrachium lopopodus*	53
		Gomphidae	*Sieboldius*	3
		Amblemidae	*Radiatula caerulea*	4
		Amblemidae	*Radiatula andersoniana*	2
		Unionidae	*Lamellidens rhadineus*	2
		Amblemidae	*Parreysia favidens favidens*	1
		Viviparidae	*Bellamya bengalensis*	3
		Thiaridae	*Thiara (Tarebia) lineata*	10
		Corbiculidae	*Corbicula striatella*	2
		Thiaridae	*Melanoides tuberculatus*	3
		Planorbidae	*Gyraulus labiatus*	1
			Total number	97

14.3 List of species in Bihar

BH 1/ BH 3	24.4.2015	Family	Genus	Abundancy
		Nepidae	*Laccotrephes pfeiferiae*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	15
		Thiaridae	*Melanoides pyramis*	1
		Mysidae	*Gangemysis assimilis*	1
		Dytiscidae	*Hyphydrus*	4
		Planorbidae	*Gyraulus convexiusculus*	1
		Garridae	*Cylindrostethus scrutator*	2
		Unionidae	*Lamellidens phenchooganjensisi*	1
		Viviparidae	*Bellamiya bengalensis*	10

BH 1/ BH 3	24.4.2015	Family	Genus	Abundancy
		Physidae	*Physa (Haitia) mexicana*	2
		Corbiculidae	*Corbicula assamensis*	1
			Total Number	39

BH 3 in round 1	24.4.2016	Family	Genus	Abundancy
		Pleuroceridae	*Brotia costula costula*	1
		Viviparidae	*Bellamya bengalensis*	76
		Viviparidae	*Mekongia crassa*	2
		Planorbidae	*Indoplanorbis*	5
		Dytiscidae	*Hydrovatus*	1
		Viviparidae	*Bellamya (Falopaludina) bengalensis*	12
		Thiaridae	*Thiara (Sermila) requeti*	1
		Thiaridae	*Melanoides pyramis*	53
		Glosiphonidae	*Alboglossiphonia weberi*	2
		Unionidae	*Lamellidens sp. Juvenile*	3
		Physidae	*Physa (Haitia) mexicana*	2
		Thiaridae	*Melanoides tuberculatus*	4
		Thiaridae	*(Thiara (Tarebia) lineata*	23
		Lymnaeidae	*Lymnaea accuminata*	11
		Bithyniidae	*Digoniostoma pulchella*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	16
		Corbiculidae	*Corbicula striatella*	2
		Gomphidae	*Sinictinogomphus*	8

BH 3 in round 1	24.4.2016	Family	Genus	Abundancy
		Libellulidae	*Rhyothemis*	3
		Atyidae	*Caridina endehensis*	29
		Ecnomidae	*Ecnomus*	1
		Chironomidae	*Chironominae*	1
		Protoneuridae	*Prodesineura autumnalis*	1
		Corixidae	*Micronecta*	5
		Corixidae	*Agraptocorixa*	1
			Total Number	264

BH-3 d/s	29.12.2015	Family	Genus	Abundancy
		Thiaridae	*(Thiara (Tarebia) lineata juvenile*	45
		Amblemidae	*Radiatula caerulea*	1
		Viviparidae	*Bellamya bengalensis*	34
		Viviparidae	*Mekongia crassa*	2
		Thiaridae	*Melanoides pyramis*	1
		Thiaridae	*Thiara (Sermila) requeti*	2
		Bithyniidae	*Digoniostoma pulchella*	13
		Amblemidae	*Parreysia favidens*	1
		Lymnaeidae	*Lymnaea accuminata*	3
		Thiaridae	*Thiara(Thiara) scabra*	1
		Corbiculidae	*Corbicula assamensis*	1
		Unionidae	*Lamellidens sp. Juvenile*	1
		Libellulidae	*Orthetrum*	9
		Chironomidae	*Chironominae*	53
		Palaemonidae	*Macrobrachium lar*	1
		Palaemonidae	*Macrobrachium lopopodus*	8
		Dytiscidae	*Hydrovatus*	2
		Culicidae	*Anopheles pupa*	3

BH-3 d/s	**29.12.2015**	**Family**	**Genus**	**Abundancy**
		Notonectidae	*Anisops*	1
		Atyidae	*Caridina bakoensis*	27
		Corixidae	*Corixa female*	2
		Corixidae	*Micronecta female*	11
		Dytiscidae	*Nipponhydrus*	1
		Lumbriculidae	*Lumbriculus variegatus*	5
		Chironomidae	*Tanypodinae*	3
			Total number	231

BH-04	**29.4. 2015**	**Family**	**Genus**	**Abundancy**
		Atyidae	*Caridina brunieana*	35
		Paleamonidae	*Macrobrachium idae*	6
		Unionidae	*Lamellidens phenchooganjensis*	5
		Amblemidae	*Radiatula caerulea juvenile*	1
		Pleuroceridae	*Brotia costula costula*	1
		Gomphidae	*Sinictinogomphus*	18
		Thiaridae	*(Thiara (Tarebia) lineata*	2
		Thiaridae	*Melanoides pyramis*	12
		Viviparidae	*Makongia crassa*	6
		Viviparidae	*Bellamya bengalensis*	2
		Corixidae	*Corixa*	1
		Dytiscidae	*Hyphydrus*	12
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
			Total Numbers	102

BH-04	**29.12.2015**	**Family**	**Genus**	**Abundancy**
		Amblemidae	*Radiatula caerulea*	6
		Amblemidae	*Parreysia fevidens fevidens*	1

BH-04	29.12.2015	Family	Genus	Abundancy
		Corbiculidae	*Corbicula bensoni*	3
		Corbiculidae	*Corbicula striatella*	136
		Corbiculidae	*Corbicula assamensis*	10
		Gomphidae	*Sinictinogomphus*	160
		Amblemidae	*Parreysia fevidens juvenile*	24
		Macromiidae	*Macromia*	2
		Dytiscidae	*Hydrovatus*	9
		Polycentropodidae	*Polycentropus*	16
		Ephemeridae	*Adults of Eatongenia*	3
		Viviparidae	*Mekongia crassa*	135
		Assimineidae	*Assiminea francesiae*	46
		Thiaridae	*Thiara (Sermila) requeti*	14
		Thiaridae	*Melanoides pyramis*	125
		Pleuroceridae	*Brotia costula costula*	3
		Viviparidae	*Bellamya bengalensis*	1
		Hydropsychidae	*Cheumatopsyche*	67
		Palaemonidae	*Macrobrachium lopopodus*	1
		Nereididae	*Namalycastis indica*	1
		Thiaridae	*Melanoides tuberculatus*	1
		Gyrinidae	*Orectochilus larva*	1
		Corixidae	*Agraptocorixa*	1
		Atyidae	*Caridina endehnsis*	3
			Total number	769

BH-SK	31.12. 2015	Family	Genus	Abundancy
		Chironomidae	*Tanypodinae*	33
		Chironomidae	*Orthocladiinae*	15
		Amblemidae	*Parreysia favidens juvenile*	1
		Libellulidae	*Trithemis*	2

BH-SK	**31.12. 2015**	**Family**	**Genus**	**Abundancy**
		Hydrophilidae	*Helochares*	1
		Gomphidae	*Stylurus*	1
		Bithyniidae	*Digoniostoma pulchella*	14
		Dytiscidae	*Hydrovatus*	1
		Gomphidae	*Sinictinogomphus*	45
		Thiaridae	*Melanoides tuberculatus*	6
		Planorbidae	*Indoplanorbis*	3
		Caenidae	*Caenis*	1
		Protoneuridae	*Prodesineura autumnalis*	2
		Palaemonidae	*Macrobrachium idae*	2
		Corbiculidae	*Corbicula striatella*	12
		Libellulidae	*Lyriothemis*	5
		Naididae	*Branchiodrilus semperi*	18
		Amblemidae	*Parreysia favidens juvenile*	1
		Corixidae	*Micronecta*	8
		Corixidae	*Sigara*	1
		Physidae	*Physa (Haitia) mexicana*	5
		Thiaridae	*(Thiara (Tarebia) lineata*	5
		Atyidae	*Caridina temasek*	4
		Corbiculidae	*Corbicula assamensis*	11
		Unionidae	*Lamellidens sp.*	1
		Viviparidae	*Bellamya bengalensis*	8
		Amblemidae	*Parreysia viridula*	4
		Macromiidae	*Macromia*	5
		Libellulidae	*Lyriothemis*	1
		Nepidae	*Leccotrphes pfeiferiae*	3
		Corixidae	*Paracorixa*	1
			Total number	220

BH-05	27.4. 2015	Family	Genus	Abundancy
		Thiaridae	*Melanoides pyramis*	1
		Dytiscidae	*Hyphydrus*	1
		Mysidae	*Gangemysis assimilis*	45
		Amblemidae	*Parreysia favidens favidens*	1
		Unionidae	*Lamellidens phenchooganjensis juvenile*	2
		Viviparidae	*Makongia crassa*	7
		Viviparidae	*Bellamya bengalensis*	8
		Gomphidae	*Paragomphus*	1
		Atyidae	*Caridina brunieana*	1
			Total Number	67

BH-05	31.12.2015	Family	Genus	Abundancy
		Ampullariidae	*Pila globosa juvenile*	3
		Physidae	*Physa (Haitia) mexicana*	28
		Bithyniidae	*Digoniostoma pulchella*	9
		Amblemidae	*Radiatula occata*	2
		Viviparidae	*Bellamya bengalensis*	18
		Unionidae	*Lamellidens rhadineus*	1
		Thiaridae	*Thiara(Thiara) scabra*	1
		Planorbidae	*Segmentina calatha*	1
		Unionidae	*Lamellidens rhadineus juvenile*	1
		Conchostrucha	*Cyclestheria hislopi*	1
		Amblemidae	*Parreysia favidens*	4
		Thiaridae	*Melanoides tuberculatus*	3
		Unionidae	*Lamellidens rhadineus adult*	23
		Dytiscidae	*Rhantus*	1
		Libellulidae	*Rhyothemis*	1
		Gomphidae	*Sinictinogomphus*	10

BH-05	31.12.2015	Family	Genus	Abundancy
		Dytiscidae	*Hydrovatus*	1
		Chironomidae	*Chironominae*	2
		Chironomidae	*Tanypodinae*	2
			Total number	112

BH-08	April, 2015	Family	Genus	Abundancy
		Ephemeridae	*Ephemera/ Aethephemera*	10
		Nepidae	*Laccotrephes pfeiferiae*	3
		Gomphidae	*Sinictinogomphus*	3
		Corixidae	*Corixa*	3
		Dytiscidae	*Nipponhydrus*	10
		Lymnaeidae	*Lymnaea accuminata*	2
		Thiaridae	*(Thiara (Tarebia) lineata*	2
		Thiaridae	*Melanoides tuberculatus*	1
		Thiaridae	*Thiara (Sermila) requeti*	3
		Paleamonidae	*Macrobrachium lopopodus*	1
		Atyidae	*Caridina bruneiana*	36
			Total number	74

BH-8	28.12.2015	Family	Genus	Abundancy
		Gomphidae	*Sinictinogomphus*	37
		Chironomidae	*Chironominae*	1
		Corixidae	*Micronecta*	3
		Dytiscidae	*Hydrovatus*	1
		Noteridae	*Hydrocoptus*	1
		Thiaridae	*Thiara (Sermila) requeti*	2
		Atyidae	*Caridina temasek*	53
		Palaemonidae	*Macrobrachium callirrhoe*	13
		Atyidae	*Caridina bakoensis*	1

BH-8	**28.12.2015**	**Family**	**Genus**	**Abundancy**
		Palaemonidae	*Macrobrachium idae*	5
		Sphaeriidae	*Pisidium (Afropisidium) clarkeanum*	1
			Total number	118

BH-11	**April, 2015**	**Family**	**Genus**	**Abundancy**
		Dytiscidae	*Hyphydrus*	1
		Hydrophilidae	*Berosus larva*	1
		Thiaridae	*(Thiara (Tarebia) lineata*	2
		Nereididae	*Namalycastis fauveli*	1
		Chironomidae	*Chironominae*	16
		Physidae	*Physa (Haitia) mexicana*	2
		Tubificidae	*Bothrioneurum vejdovskyanum*	1
		Tubificidae	*Limnodrilus Hoffmiesteri*	2
		Gomphidae	*Sinictinogomphus*	1
		Libellulidae	*Zyxomma*	1
		Gomphidae	*Ictinogomphus*	1
		Pleuroceridae	*Brotia costula costula*	4
		Thiaridae	*Melanoides pyramis*	2
		Amblemidae	*Parreysia fevidens favidens*	1
			Total Number	36

BH-12 ups tream	**April, 2015**	**Family**	**Genus**	**Abundancy**
		Nereididae	*Namalycastis fauveli*	1
		Libellulidae	*Sympetrum*	1
		Tabanidae	*Tabanus /atylotus*	1
		Corixidae	*Corixa*	2
		Corixidae	*Agraptocorixa*	4

BH-12 ups tream	**April, 2015**	**Family**	**Genus**	**Abundancy**
		Noteridae	*Hydrocoptus*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	1
		Lymnaeidae	*Lymnaea accuminata*	1
		Elminthidae	*Stenelmis*	1
		Chironomidae	*Chironominae*	2
		Viviparidae	*Bellamya bengalensis*	16
		Glossiphonidae	*Alboglossiphonia weberi*	1
			Total Number	32

BH-12 Downstream	**April, 2015**	**Family**	**Genus**	**Abundancy**
		Pleuroceridae	*Brotia costula costula*	4
		Thiaridae	*Melanoides pyramis*	20
		Lumbricidae	*Dendrodrilus rubidus*	1
		Nereididae	*Namalycastis fauveli*	2
		Coenagrionidae	*Agriocnemis lacteola*	9
		Naididae	*Dero dorsalis*	1
		Dytiscidae	*Cybister larva*	1
		Viviparidae	*Bellamya bengalensis*	73
			Unidentified	
		Dytiscidae	*Hyphydrus*	4
		Chlorolestidae	*Megalestes chengi*	2
		Physidae	*Physa (Haitia) mexicana*	33
		Lymnaeidae	*Lymnaea accuminata*	3
		Noteridae	*Hydrocoptus*	1
		Elminthidae	*Stenelmis*	1
		Gomphidae	*Paragomphus*	1
		Gomphidae	*Nihonogomphus*	1
		Tabanidae	*Tabanus /atylotus*	1
		Chironomidae	*Chironominae*	1

BH-12 Downstream	April, 2015	Family	Genus	Abundancy
		Corixidae	*Corixa*	9
		Corixidae	*Agraptocorixa*	1
		Hydrophilidae	*Helochares*	1
			Unidentified Hemiptera	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	4
		Libellulidae	*Orthetrum albistylum speciosum*	1
		Pyrulidae	*Nimphula*	1
			Total number	177

BH-12 Downstream	28.12.2015	Family	Genus	Abundancy
		Sabellidae	*Caobangia*	3
		Corixidae	*Micronecta*	4
		Naididae	*Branchiodrilus semperi*	3
		Naididae	*Allonais inaequalisis*	7
		Naididae	*Aulodrilus pluriseta*	4
		Naididae	*Aulodrilus pigueti*	4
		Naididae	*Haemonais waldvogeli*	1
		Tubificidae	*Limnodrilus hoffmiesteri*	10
		Chironomidae	*Chironominae*	37
		Corbiculidae	*Corbicula bensoni*	8
		Corbiculidae	*Corbicula striatella*	5
		Gomphidae	*Sinictinogomphus*	1
		Amblemidae	*Parreysia favidens juvenile*	3
		Bithyniidae	*Digoniostoma pulchella juvenile*	1
		Sphaeriidae	*Pisidium (Aropisidium) clarkeanum*	2
		Lymnaeidae	*Lymnaea accuminata*	42

BH-12 Downstream	28.12.2015	Family	Genus	Abundancy
		Physidae	*Physa (Haitia) mexicana*	11
		Viviparidae	*Bellamyia bengalensis*	1
		Thiaridae	*Melanoides pyramis juvenile*	3
		Thiaridae	*Melanoides pyramis*	4
		Thiaridae	*Melanoides tuberculatus*	1
		Thiaridae	*(Thiara (Tarebia) lineata*	845
			Total Number	1000

BH-M	30.12.2015	Family	Genus	Abundancy
		Ephemeridae	*Eaetongenia*	55
		Leptoceridae	*Triplectide*	6
		Gomphidae	*Sinictinogomphus*	41
		Corbiculidae	*Corbicula bensoni juvenile*	11
		Corbiculidae	*Corbicula striatella*	101
		Amblemidae	*Parreysia fevidens juvenile*	10
		Solecurtidae	*Noviculana gangetica juvenile*	1
		Corbiculidae	*Corbicula assamensis*	1
		Bithyniidae	*Digoniostoma pulchella*	1
		Amblemidae	*Radiatula olivaria juvenile*	1
		Amblemidae	*Radiatula olivaria adult*	6
		Dytiscidae	*Oreodytes larva*	1
		Atyidae	*Caridina Bakoensis*	5
		Dytiscidae	*Hydrovatus*	5
		Corixidae	*Agraptocorixa*	6
			Total Number	251

BH-V	12.1.2016	Family	Genus	Abundancy
		Solecurtidae	*Novaculina gangetica*	78
		Unionidae	*Lemellidens corrianus*	1
		Amblemidae	*Radiatula occata*	1
		Viviparidae	*Bellamya bengalensis*	7
		Viviparidae	*Mekongia crassa*	13
		Corbiculidae	*Corbicula assamensis*	19
		Amblemidae	*Parreysia favidens chrysis*	7
		Amblemidae	*parreysia viridula*	1
		Corbiculidae	*Corbicula striatella*	21
		Assimineidae	*Assiminea francesiae*	71
		Unionidae	*Lamellidens sp juvenile*	3
		Amblemidae	*Radiatula occata juvenile*	6
		Thiaridae	*Melanoides pyramis juvenile*	69
		Corbiculidae	*Corbicula bensoni*	15
		Amblemidae	*Parreysia corrugata laevirostris juvenile*	5
		Amblemidae	*Parreysia favidens juvenile*	11
		Solecurtidae	*Novaculina gangetica juvenile*	2
		Thiaridae	*Melanoides tuberculatus*	4
		Sabellidae	*Manayunkia/Brandtika/ Brandtika*	3
		Nereididae	*Namalycastis indica*	1
		Gomphidae	*Sinictinogomphus*	7
		Dytiscidae	*Hydrovatus*	1
			Total Number	346

BH-VI	January, 2016	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	1
		Gomphidae	*Sinictinogomphus*	36

BH-VI	January, 2016	Family	Genus	Abundancy
		Pisionidae	*Pisione garciavaldecasai*	14
		Sabellidae	*Caobangia*	4
		Chironomidae	*Orthocladiinae*	3
		Corbiculidae	*Corbicula bensoni*	10
		Pleuroceridae	*Brotia costula costula*	1
		Thiaridae	*Melanoides tuberculatus*	19
		Amblemidae	*Radiatula caerulea juvenile*	24
		Thiaridae	*Melanoides pyramis juvenile*	1
		Amblemidae	*Parreysia corrugata laevirostris juvenile*	1
		Corbiculidae	*Corbiculla striatella*	6
		Amblemidae	*Parreysia favidens juvenile*	6
		Viviparidae	*Bellamya bengalensis*	5
		Thiaridae	*Thiara (Tarebia) granifera*	35
		Ampullariidae	*Pila globosa juvenile*	1
		Thiaridae	*(Thiara (Tarebia) lineata*	7
		Stenothyridae	*Stenothyra ornata*	1
			Total number	175

BH-S	12.1.2016	Family	Genus	Abundancy
		Amblemidae	*Parreysia fevidens*	2
		Amblemidae	*Radiatula occata*	7
		Corbiculidae	*Corbicula striatella*	1
		Corbiculidae	*Corbicula bensoni*	1
		Corixidae	*Micronecta*	1
		Dytiscidae	*Nipponhydrus*	1
		Atyidae	*Caridina bakoensis*	6
		Palaemonidae	*Macrobrachium lopopodus*	1

BH-S	12.1.2016	Family	Genus	Abundancy
		Chironomidae	*Orthocladiinae*	2
		Nephthydae	*Nephthys oligobranchia*	5
		Sabellidae	*Caobangia*	1
		Sabellidae	*Manayunkia/Brandtika/ Banditika*	5
			Total Number	33

BH-13	January, 2016	Family	Genus	Abundancy
		Solecurtidae	*Novaculina gangetica*	9
		Amblemidae	*Parreysia favidens pinax*	1
		Amblemidae	*Parreysia favidens favidens*	1
		Viviparidae	*Bellamya (Filopaludina) bengalensis*	1
		Viviparidae	*Bellamya bengalensis*	2
		Assimineidae	*Paludinella (Schuetiella) daengswangi*	6
		Ampullariidae	*Pila globosa juvenile*	50
		Thiaridae	*Thiara (Sermila) requeti*	10
		Pleuroceridae	*Brotia costula costula*	20
		Thiaridae	*(Thiara (Tarebia) lineata juvenile*	6
		Unionidae	*Lamellidens corrianus*	4
		Viviparidae	*Mekongia crassa*	8
		Palaemonidae	*Macrobrachium lopopodus*	6
		Palaemonidae	*Macrobrachium lar*	1
		Gomphidae	*Sinictinogomphus*	16
		Nereididae	*Namalycastis indica*	1
		Sabellidae	*Caobangia*	3
		Glossiphonidae	*Alboglossiphonia weberi*	5

BH-13	January, 2016	Family	Genus	Abundancy
		Mysidae	*Gangemysis assimilis*	1
		Assimineidae	*Assiminea francesiae*	37
		Thiaridae	*Thiara (Tarebia) granifera*	48
		Thiaridae	*Thiara(Thiara) scabra*	2
		Corbiculidae	*Corbicula bensoni*	1
		Corbiculidae	*Corbicula striatella*	2
		Amblemidae	*Parreysia favidens juvenile*	2
		Thiaridae	*Melanoides tuberculatus*	10
		Thiaridae	*Melanoides pyramis*	28
		Thiaridae	*Melanoides pyramis juvenile*	1
		Corbiculidae	*Corbicula assamensis*	1
		Corixidae	*Micronecta*	1
			Total Number	284

BH-K	January, 2016	Family	Genus	Abundancy
		Sabellidae	*Manayunkia/Brandtika*	32
		Nereididae	*Namalycastis indica*	9
		Gomphidae	*Sinictinogomphus*	1
		Dytiscidae	*Hydrovatus*	6
		Palaemonidae	*Macrobrachium lopopodus*	1
		Gyrinidae	*Orectochilus*	1
		Corallanidae	*Corallana sp*	1
		Viviparidae	*Bellamya bengalensis juvenile*	1
		Corbiculidae	*Corbicula assamensis*	4
		Amblemidae	*Parreysia favidens juvenile*	1
		Corbiculidae	*Corbicula striatella*	15
		Corbiculidae	*Corbicula bensoni*	94

BH-K	January, 2016	Family	Genus	Abundancy
		Thiaridae	*Thiara (Sermila) requeti*	1
		Thiaridae	*(Thiara (Tarebia) lineata juvenile*	108
		Thiaridae	*Melanoides tuberculatus*	3
		Thiaridae	*Melanoides pyramis*	11
		Solecurtidae	*Novaculina gangetica*	9
		Amblemidae	*Radiatula caerulea*	1
		Amblemidae	*Parreysia favidens favidens*	1
		Assimineidae	*Assiminea francesiae*	41
		Dytiscidae	*Hydaticus*	2
			Total number	343

14.4 List of species in Jharkhand

JH-1	14.1.2016	Family	Genus	Abundancy
		Gomphidae	*Sinictinogomphus*	5
		Hydrophilidae	*Berosus*	1
		Dytiscidae	*Hydrovatus*	4
		Planorbidae	*Indoplanorbis*	1
		Viviparidae	*Bellamya bengalensis*	2
		Thiaridae	*Melanoides pyramis*	1
		Bithyniidae	*Digoniostoma pulchella*	10
		Corbiculidae	*Corbicula bensoni*	1
		Corbiculidae	*Corbicula striatella*	2
		Thiaridae	*Thiara (Sermyla) requeti*	2
		Thiaridae	*Melanoides tuberculatus*	25
		Amblemidae	*Parreysia favidens juvenile*	1
		Corbiculidae	*Corbicula bensoni*	10
		Corbiculidae	*Corbicula striatella*	2

JH-1	14.1.2016	Family	Genus	Abundancy
		Nepidae	*Laccotrephes pfeiferiae pfepferiae*	2
		Chironomidae	*Chironominae*	37
		Viviparidae	*Makongia crassa*	21
		Baetidae	*Baetis*	1
		Unionidae	*Lamellidens lamellatus*	5
		Viviparidae	*Bellamya bengalensis*	23
		Physidae	*Physa (Haitia) mexicana*	1
		Viviparidae	*Bellamya (filopaludina) bengalensis*	5
		Palaemonidae	*Macrobrachium lopopodus*	1
			Total number	163

JH-2	14.1.2016	Family	Genus	Abundancy
		Gomphidae	*Sinictinogomphus*	10
		Dytiscidae	*Hydrovatus*	11
		Nereididae	*Namalycastis indica*	1
		Nephthydae	*Nephthys oligobranchia*	1
		Succineidae	*Succinia sp dead shell*	1
		Amblemidae	*Parreysia favidens juvenile*	2
		Unionidae	*Lamellidens marginalis*	2
		Unionidae	*Lamellidens rhadineus*	1
		Solecurtidae	*Novaculina gangetica*	5
		Unionidae	*Lamellidens sp. Juvenile*	1
		Amblemidae	*Radiatulla caerulea*	5
		Thiaridae	*Thiara tuberculatus*	11
		Thiaridae	*Melanoides pyramis juvenile, adults*	16
		Thiaridae	*Thiara (Tarebia) lineata*	180
		Thiaridae	*Thiara (Thiara) scabra*	7

JH-2	14.1.2016	Family	Genus	Abundancy
		Viviparidae	*Makongia crassa*	8
		Corbiculidae	*Corbicula bensoni*	5
		Corbiculidae	*Corbicula striatella*	1
		Bithyniidae	*Digoniostoma lithoglyphoides*	2
		Bithyniidae	*Digoniostoma pulchella*	2
		Viviparidae	*Bellamya bengalensis*	1
		Physidae	*Physa (Haitia) mexicana*	2
			Total Number	275

JH-3	14.1.2016	Family	Genus	Abundancy
		Pseudoneuroclipsis	*Incertae sedis pupa*	1
		Dytiscidae	*Oreodytes larva*	2
		Gomphidae	*Sinictinogomphus*	8
		Ranatrinidae	*Ranatra*	4
		Dytiscidae	*Hydrovatus*	8
		Thiaridae	*Thiara (Tarebia) lineata*	23
		Corbiculidae	*Corbicula striatella*	5
		Solecurtidae	*Novaculina gangetica juvenile, adult*	15
		Thiaridae	*Melanoides pyramis*	58
		Thiaridae	*Melanoides tuberculatus*	3
		Thiaridae	*Thiara (Sermyla) requeti*	1
		Lymnaeidae	*Lymnaea accuminata*	4
		Corbiculidae	*Corbicula assamensis*	1
		Physidae	*Physa (Haitia) mexicana*	4
		Corbiculidae	*Corbicula bensoni*	6
		Bithyniidae	*Digoniostoma pulchella*	6
		Amblemidae	*Radiatulla caerulea*	3

JH-3	14.1.2016	Family	Genus	Abundancy
		Viviparidae	*Makongia crassa*	91
		Nereididae	*Namalycastis fauveli*	1
		Corixidae	*Micronecta*	9
		Hebridae	*Hyrcunas*	1
		Veliidae	*Rhagovelia singaporsnsis*	1
		Chironomidae	*Tanypodinae*	2
		Chironomidae	*Chironominae*	10
		Ceratopogonidae	*Bezzia sp.*	1
		Stenasellidae	*Stenasellus*	2
		Atyidae	*Caridina bakoensis*	1
		Palaemonidae	*Macrobrachium lopopodus*	11
			Total Number	282

JH-4	14.1.2016	Family	Genus	Abundancy
		Lymnaeidae	*Lymnaea accuminata*	12
		Viviparidae	*Mekongia crassa*	11
		Viviparidae	*Bellamya bengalensis*	4
		Assimineidae	*Assiminea francesiae*	16
		Planorbidae	*Indoplanorbis*	2
		Physidae	*Physa (Haitia) mexicana*	10
		Corbiculidae	*Corbicula bensoni*	18
		Corbiculidae	*Corbicula striatella*	2
		Solecurtidae	*Noviculina gangetica*	1
		Planorbidae	*Gyraulus convexiusculus*	4
		Sphaeriidae	*Musculium indicum*	2
		Bithyniidae	*Digoniostoma pulchella*	4
		Amblemidae	*Radiatula caerulea juvenile*	4
		Gomphidae	*Sinictinogomphus*	10
		Dytiscidae	*Oreodytes larva*	26

JH-4	14.1.2016	Family	Genus	Abundancy
		Siphlonuridae	*Amelatus doubtful*	2
		Neoephemeridae	*Neoephemeropsis*	1
		Hydrophilidae	*Berosus*	1
		Hydrophilidae	*Helochares*	1
		Thiaridae	*Melanoides tuberculatus*	3
		Thiaridae	*Thiara (Tarebia) lineata*	7
		Dytiscidae	*Hydrovatus*	14
		Nereididae	*Namalycastis fauveli*	1
		Bithyniidae	*Gabbia stenothyroides*	1
		Ranatrinidae	*Ranatra*	1
		Thiaridae	*Thiara (Thiara) scabra juvenile*	2
		Chironomidae	*Chironominae*	14
		Chironomidae	*Tanypodinae*	1
		Tubificidae	*Spirosperma nagarkotensis*	1
		Protoneuridae	*Prodesineura autumnalis*	3
		Atyidae	*Caridina sumatrensis*	3
		Noteridae	*Hydrocoptus/Noteridae*	1
		Corixidae	*Corixa*	1
		Corixidae	*Agraptocorixa*	4
			Total number	188

14.5 List of species in West Bengal

WB-01	26.5.2015	Family	Genus	Abundancy
		Dytiscidae	*Hyphydrus*	12
		Ranatrinidae	*Ranatra brevecolis*	4
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus*	12
		Corixidae	*Corixa*	13
		Viviparidae	*Bellamya bengalensis*	13
		Viviparidae	*Makongia crassa*	3
		Pleuroceridae	*Brotia costula costula*	4

WB-01	26.5.2015	Family	Genus	Abundancy
		Thiaridae	*Thiara (Sermyla) requeti juvenile*	3
		Libellulidae	*Hydrobasileus*	1
		Libellulidae	*Nannophya pygmea pygmea*	2
		Libellulidae	*Brachythemis*	1
		Protoneuridae	*Prodasineura autumnalis*	16
		Coenagrionidae	*Agriocnemis lacteola*	4
		Bithyniidae	*Digoniostoma pulchella*	16
		Stenothyridae	*Stenothyra ornata*	12
		Lymnaeidae	*Lymnaea accuminata*	7
		Planorbidae	*Indoplanorbis*	1
		Assimineidae	*Assiminea francesiae*	22
		Corbiculidae	*Corbicula bensoni*	3
		Corbiculidae	*Corbicula assamensis*	1
		Thiaridae	*Thiara (Tarebia) lineata*	4
		Thiaridae	*Thiara (Thiara) scabra*	2
		Physidae	*Physa (Haitia) mexicana*	11
		Thiaridae	*Melanoides pyramis*	15
		Palaemonidae	*Macrobrachium lopopodus*	6
		Atyidae	*Caridina brunieana*	3
		Palaemonidae	*Macrobrachium lanchasteri*	1
		Cirolanidae	*Cirolana parva*	1
		Hymenosomatidae	*Neorhynchoplax nasalis juvenile*	1
		Amblemidae	*Parreysia fevidens juvenile*	10
		Amblemidae	*Radiatula olivaria juvenile*	13
		Varunidae	*Varuna yui*	4
		Arachnoida	*Water spider*	1
			Total number	222

WB-1	29.2. 2016	Family	Genus	Abundancy
		Gomphidae	*Stylurus*	2
		Gomphidae	*Sinictinogomphus*	1
		Planorbidae	*Indoplanorbis exustus*	19
		Hydrophilidae	*Hydrophilus*	1
		Physidae	*Physa (Haitia) mexicana*	63
		Dytiscidae	*Hydrovatus*	9
		Belostomatidae	*Diplonychus (= Sphaerodema) rusticus rusticus*	1
		Ranatrinidae	*Ranatra brevecolis*	3
		Bithynidae	*Digoniostoma pulchella*	1
		Hydrophilidae	*Helochares*	3
		Corixidae	*Micronecta*	1
		Assimineidae	*Assiminea francesiae*	3
		Thiaridae	*Melanoides pyramis*	7
		Palaemonidae	*Macrobrachium idae*	6
		Atyidae	*Caridina temasek*	8
		Libellulidae	*Lyriothemis*	3
		Libellulidae	*Tramea*	11
		Protoneuridae	*Prodasineura autumnalis*	23
		Coenagrionidae	*Agriocnemis*	1
		Corixidae	*Sigara*	9
		Corixidae	*Agraptocorixa*	1
		Culicidae	*Mansonia*	1
		Bithyniidae	*Digoniostoma pulchella*	38
		Corbiculidae	*Corbicula striatella*	1
		Corbiculidae	*Corbicula bensoni*	9
		Unionidae	*Lamellidens sp.*	1
		Unionidae	*Lamellidens lamellatus*	2
		Solecurtidae	*Novaculina gangetica*	2
		Thiaridae	*Melanoides pyramis*	7
		Corbiculidae	*Corbicula assamensis*	2

WB-1	**29.2. 2016**	**Family**	**Genus**	**Abundancy**
		Viviparidae	*Bellamya bengalensis*	23
		Lymnaeidae	*Lymnaea accuminata*	24
		Viviparidae	*Mekongia crassa*	7
		Thiaridae	*Thiara (Sermyla) requeti*	16
		Belostomatidae	*Diplonychus (= Sphaerodema) rusticus rusticus*	5
		Glossiphoniidae	*Alboglossiphonia weberi*	3
		Naididae	*Aulodrilus pigueti*	1
		Nepidae	*Laccotrephes ofeiferiae pfeiferiae*	1
			Total Number	319

WB- 02	**27.5. 2015**	**Family**	**Genus**	**Abundancy**
		Dytiscidae	*Nipponhydrus*	2
		Corbiculidae	*Corbicula assamensis*	1
		Arachnoida	*Water spider*	1
		Hydrophilidae	*Helochares*	4
		Physidae	*Physa (Haitia) mexicana dead shells*	4
		Tabanidae	*Tabanus /Atylotus sp.*	1
		Libellulidae	*Nannophya pygmea pygmea*	1
		Coenagrionidae	*Agriocnemis lacteola*	1
		Physidae	*Physa (Haitia) mexicana*	22
			Total Number	37

WB-2	**29.2 2016**	**Family**	**Genus**	**Abundancy**
		Thiaridae	*Thiara (Tarebia) lineata*	86
		Solecurtidae	*Novaculina gangetica*	3
		Corbiculidae	*Corbicula bensoni*	3
		Corbiculidae	*Corbicula striatella*	2

WB-2	29.2 2016	Family	Genus	Abundancy
		Protoneuridae	*Prodasineura autumnalis*	1
		Thiaridae	*Melanoides tuberculatus*	2
		Dytiscidae	*Hydrovatus*	1
		Corixidae	*Sigara*	1
			Total Number	99

WB -03	27.5. 2015	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	16
		Arcidae	*Scaphula celox*	2
		Pleuroceridae	*Brotia costula costula*	7
		Palaemonidae	*Macrobrachium idae*	43
		Atyidae	*Caridina bruneiana*	1
		Stenothyridae	*Stenothyra ornata*	15
		Bthyniidae	*Digoniostoma pulchella*	8
		Libellulidae	*Rhyothemis*	2
		Arcidae	*Scaphula deltae*	1
		Ranatrinidae	*Ranatra*	2
		Planorbidae	*Indoplanorbis*	2
		Planorbidae	*Gyraulus convexiusculus*	37
		Lymnaeidae	*Lymnaea accuminata*	8
		Gomphidae	*Orientogomphus exuvae (Dead)*	1
		Physidae	*Physa (Haitia) mexicana*	19
		Corbiculidae	*Corbicula assamensis*	1
		Spaeriidae	*Pisidiumannandalei*	3
		Corbiculidae	*Corbicula striatella*	2
		Corbiculidae	*Corbicula bensoni*	1
		Unionidae	*Lamellidens sp.*	1
			Unidentified (could be a plant material)	3

WB -03	27.5. 2015	Family	Genus	Abundancy
		Viviparidae	*Makongia crassa*	1
		Lumbricidae	*Eiseniella tetraedra tetraedra*	2
		Thiaridae	*Thiara (Sermyla) requeti*	1
		Thiaridae	*Melanoides pyramis*	22
		Arachnoida	*Water spider*	2
		Libellulidae	*Orthetrum albistylum speciosum*	4
		Libellulidae	*Nannophya pygmea pygmea*	1
		Libellulidae	*Brachythemis*	1
			Unidentified	2
		Hydrophilidae	*Helochares*	2
		Chironomidae	*Chironominae*	17
		Dytiscidae	*Hyphydrus*	7
		Corixidae	*Corixa*	1
		Corixidae	*Agraptocorixa*	4
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	2
		Hydrometridae	*Hydrometra Latreille*	1
		Curculionidae	*Echinocnemus*	1
		Varunidae	*Varuna yui*	1
		Protoneuridae	*Prodasineura autumnalis*	4
		Arachnoida	*Water spider*	1
			Adult insect	1
		Coleoptera family	*Unidentified beetle*	1
			Total number	254

WB -03	29.2. 2016	Family	Genus	Abundancy
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	1
		Solecurtidae	*Novaculina gangetica*	9

WB -03	29.2. 2016	Family	Genus	Abundancy
		Viviparidae	*Mekongia crassa*	99
		Lymnaeidae	*Lymnaea accuminata*	3
		Corbiculidae	*Corbicula bensoni*	2
		Corbiculidae	*Corbicula striatella*	2
		Thiaridae	*Thiara (Tarebia) lineata*	6
		Physidae	*Physa (Haitia) mexicana*	19
		Dytiscidae	*Hydrovatus*	7
		Hydrophilidae	*Helochares*	5
		Hydrophilidae	*Berosus*	1
		Noteridae	*Hydrocoptus*	1
		Ranatrinidae	*Ranatra brevecolis*	1
		Palaemonidae	*Macrobrachium idae*	1
		Protoneuridae	*Prodasineura autumnalis*	1
		Spaeriidae	*Pisidium (Afropisidium) clarkeanum*	1
		Planorbidae	*Indoplanorbis*	1
		Corixidae	*Paracorixa*	1
		Corixidae	*Agraptocorixa*	1
		Nereididae	*Namalycastis indica*	2
		Nereididae	*Nereis chilkaensis*	1
		Sabellidae	*Caobangia*	4
		Lumbricidae	*Eiseniella tetraedra tetraedra*	2
		Potamidae	*Johora*	1
			Total number	172

WB-4	26.2. 2016	Family	Genus	Abundancy
		Thiaridae	*Thiara (Sermyla) requeti*	16
		Thiaridae	*Parreysia favidens favidens*	1
		Amblemidae	*Mekongia crassa*	25
		Viviparidae	*Novaculina gangetica*	1
		Solecurtidae	*Lymnaea accuminata*	7

WB-4	26.2. 2016	Family	Genus	Abundancy
		Lymnaeidae	*Melanoides pyramis leopardina*	16
		Thiaridae	*Thiara (Tarebia) lineata*	1
		Thiaridae	*Melanoides pyramis*	22
		Thiaridae	*Physa (Haitia) mexicana*	12
		Physidae	*Ranatra brevecolis*	1
		Ranatrinidae	*Corbicula bensoni*	1
		Corbiculidae	*Scaphula celox*	1
		Arcidae	*Indoplanorbis*	2
		Planorbidae	*Nepa*	1
		Nepidae	*Laccophilus*	1
		Dytiscidae	*Noterus*	1
		Noteridae	*Hydrocoptus*	5
		Noteridae	*Agraptocorixa*	3
		Corixidae	*Sinictinogomphus*	1
		Gomphidae	*unidentified coleoptera*	1
			Macrobrachium lopopodus	5
		Palaemonidae	*Macrobrachium idae*	1
		Palaemonidae	*Helochares larva*	2
		Hydrophilidae	*Caridina temasek*	2
		Atyidae	*Noterus*	1
		Noteridae	*Hydrovatus*	1
		Dytiscidae	*Echinocnemus*	1
		Curcuolionidae	*Helochares*	2
		Hydrophilidae	*Berosus*	2
		Hydrophilidae	*Caobangia*	2
		Sabellidae	*Eisiniela tetraedra tetraedra*	1
		Lumbricidae	Total Number	139

WB-5	24.2. 2016	Family	Genus	Abundancy
		Potamidae	*Johora*	1
		Potamidae	*Isolapotamon*	1

WB-5	24.2. 2016	Family	Genus	Abundancy
		Gomphidae	*Stylurus*	10
		Palaemonidae	*Macrobrachium idae*	3
		Palaemonidae	*Macrobrachium lopopodus*	5
		Libellulidae	*Acisoma*	1
		Corbiculidae	*Corbicula striatella*	1
		Hydrophilidae	*Helochares*	2
		Noteridae	*Hydrocoptus*	1
		Hydrophilidae	*Berosus*	2
		Dytiscidae	*Uvarus*	1
		Histeridae	*Hister*	1
		Sabellidae	*Caobangia*	3
		Pisioneidae	*Pisionee garciavaldecasai*	1
		Protoneuridae	*Prodasineura autumnalis*	2
		Hydrophilidae	*Helochares larva*	1
		Planorbidae	*Indoplanorbis*	2
		Hydrophilidae	*Helochares*	1
		Chironomidae	*Tanypodinae*	3
		Chironomidae	*Chironominae*	1
		Viviparidae	*Mekongia crassa*	15
		Thiaridae	*Thiara (Sermyla) requeti*	12
		Pleuroceridae	*Brotia costula costula*	7
		Viviparidae	*Bellamya bengalensis*	21
		Bithyniidae	*Digoniostoma cerameopoma*	2
		Amblemidae	*Parreysia favidens juvenile*	12
		Unionidae	*Lamellidens lamellatus*	8
		Unionidae	*Lamellidens mainwaringi*	6
		Spaeriidae	*Pisidium (Afropisidium) clarkeanum*	2
		Thiaridae	*Melanoides tuberculatus*	23

WB-5	24.2. 2016	Family	Genus	Abundancy
		Assimineidae	*Assiminea francesiae*	5
		Thiaridae	*Melanoides pyramis*	35
		Tubificidae	*Branchiura sowerbyi*	5
		Aegidae	*Alitropus typus*	3
			Total Number	199

WB-6	27.2.2016	Family	Genus	Abundancy
		Gomphidae	*Sinictinogomphus*	1
		Palaemonidae	*Macrobrachium lopopodus*	1
		Palaemonidae	*Macrobrachium idae*	1
		Tubificidae	*Branchiura sowerbyi*	6
		Tubificidae	*Spirosperma nagarkotensis*	1
		Atyidae	*Caridina bakoensis*	5
		Dytiscidae	*Hydroporus*	1
		Arcidae	*Scaphula celox*	1
		Hydrophilidae	*Helochares*	1
		Nepidae	*Nepa juvenile*	3
		Nepidae	*Nepa adult*	1
		Protoneuridae	*Prodasineura autumnalis*	4
		Coenagrionidae	*Agriocnemis lacteola*	1
		Noteridae	*Canthydrus*	2
		Ceratopogonidae	*Halenine larva*	1
		Bithyniidae	*Digoniostoma cerameopoma*	43
		Bithyniidae	*Digoniostoma pulchella*	4
		Amblemidae	*Radiatulla occata juvenile*	1
		Pleuroceridae	*Brotia costula costula*	6
		Spaeriidae	*Pisidium atkinsonianum*	2
		Lymnaeidae	*Lymnaea accuminata*	1
		Corbiculidae	*Corbicula assamensis*	1

WB-6	27.2.2016	Family	Genus	Abundancy
		Corbiculidae	*Corbicula bensoni*	1
		Thiaridae	*Melanoides pyramis*	2
		Thiaridae	*Melanoides tuberculatus*	8
		Unionidae	*Lamellidens narainporensis*	1
		Unionidae	*Lamellidens corianus*	5
		Amblemidae	*Parreysia favidens pinex*	7
		Viviparidae	*Bellamya bengalensis*	15
		Unionidae	*Lamellidens sp.*	1
			Total number	128

WB -7	27.5. 2015	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium lopopodus*	18
		Nepidae	*Laccotrphes pfeiferiae*	2
		Parathelphusidae	*Perithelphusa*	2
		Hymenosomatiae	*Neorhynchoplax nasalis*	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	1
		Thiaridae	*Thiara (Thiara) scabra (Juvenile)*	1
		Viviparidae	*Makongia crassa*	63
		Pleuroceridae	*Brotia costula costula*	6
		Thiaridae	*Thiara requeti*	45
		Assimineidae	*Assiminea francesiae*	39
		Thiaridae	*Melanoides pyramis*	42
		Lymnaeidae	*Lymnaea accuminata*	14
		Viviparidae	*Bellamya bengalensis*	1
		Physidae	*Physa (Haitia) mexicana*	7
		Stenothyridae	*Stenothyra ornata*	4
		Planorbidae	*Gyraulus convexiusculus*	1
		Arachnoida	*Water spider*	2

WB -7	27.5. 2015	Family	Genus	Abundancy
		Libellulidae	*Orthetrum albistylum speciosum*	2
		Libellulidae	*Libellula*	1
		Libellulidae	*Nannophya pygmea*	1
		Hydrophilidae	*Helochares*	1
		Corixidae	*Agraptocorixa*	2
		Histeridae	*Hister*	1
		Elmninthidae	*Stenelmis*	1
		Chironomidae	*Chironominae*	2
		Nephthydae	*Nephthys oligobranchia*	1
		Lumbricidae	*Eiseniella tetraedar*	1
		Chironomidae	*Chironominae*	12
			Unidentified Diptera	1
			Total number	275

WB- 7	27.2. 2016	Family	Genus	Abundancy
		Viviparidae	*Mekongia crassa*	39
		Amblemidae	*Pearreysia favidens pinex*	1
		Corbiculidae	*Corbicula bensoni*	30
		Thiaridae	*Thiara (Sermyla) requeti*	6
		Thiaridae	*Melanoides pyramis*	42
		Assimineidae	*Assiminea francesiae*	42
		Solecurtidae	*Novaculina gangetica*	33
		Thiaridae	*Thiara (Thiara) scabra*	2
		Thiaridae	*Melanoides pyramis leopardina*	11
		Corbiculidae	*Corbicula assamensis*	4
		Ampullariidae	*Pila globosa juvenile*	5
		Gomphidae	*Sinictinogomphus*	1
		Palaemonidae	*Macrobrachium idae*	9
		Palaemonidae	*Macrobrachium lopopodus*	5
		Nereididae	*Neries chilkaensis*	1

WB- 7	27.2. 2016	Family	Genus	Abundancy
		Nereididae	*Namalycastis indica*	1
		Sabellidae	*Caobangia*	15
		Pisioneidae	*Pisionee garciavaldecasai*	16
		Atyidae	*Caridina temasek*	1
		Atyidae	*Caridina bakoensis*	1
		Ancylidae	*Ferrissia baconi juvenile*	1
		Dytiscidae	*Hydrovatus*	1
		Arcidae	*Scaphula celox*	2
		Aegidae	*Alitropus typus*	1
		Assimineidae	*Paludinella (Schuetiella) daengswangi*	1
		Thiaridae	*Thiaridae juvenile*	8
		Corbiculidae	*Corbicula striatella juvenile*	1
		Corbiculidae	*Corbicula striatella juvenile*	2
		Thiaridae	*Melanoides tuberculatus*	17
		Stenothyridae	*Stenothyra ornata*	1
		Viviparidae	*Bellamya bengalensis*	1
			Total number	301

WB -9	27.5. 2015	Family	Genus	Abundancy
			Unidentified insect	1
		Dytiscidae	*Hyphydrus*	1
		Protoneuridae	*Prodasineura autumnalis*	3
		Libellulidae	*Nannophya pygmea pygmea*	1
		Chironomidae	*Orthocladiinae*	4
		Hydrophilidae	*Hydrophilus*	1
		Corixidae	*Agraptocorixa*	5
		Arachnoida	*Water spider*	2
		Curculionidae	*Echinocnemus*	1

WB -9	27.5. 2015	Family	Genus	Abundancy
		Stenasellidae	*Stenasellus*	1
		Palaemonidae	*Macrobrachium lopopodus*	2
		Varunidae	*Varuna yui*	1
		Atyidae	*Caridina endehensis*	13
		Atyidae	*Caridina bruneiana*	34
		Pleuroceridae	*Brotia costula costula*	5
		Thiaridae	*Thiara (Sermyla) requeti*	19
		Thiaridae	*Melanoides pyramis*	14
		Stenothyridae	*Stenothyra ornata*	63
		Physidae	*Physa (Haitia) mexicana*	7
		Viviparidae	*Bellamya bengalensis*	4
		Bithynidae	*Gabbia stenothyridae*	1
			Total number	183

WB -10	26.2.2016	Family	Genus	Abundancy
		Gomphidae	*Sinictinogomphus*	10
		Sabellidae	*Caobangia*	4
		Nereididae	*Namalycastis indica*	5
		Pisioneidae	*Pisionee garciavaldecasai*	7
		Solecurtidae	*Novaculina gangetica*	2
		Ampullariidae	*Pila globosa juvenile*	6
		Thiaridae	*Thiaridae juvenile*	1
		Assimineidae	*Assiminea francesiae juvenile*	32
		Assimineidae	*Assiminea francesiae*	18
		Thiaridae	*Melanoides pyramis*	9
		Thiaridae	*Mekongia crassa*	48
		Pleuroceridae	*Brotia costula costula*	7
		Thiaridae	*Thiara (Sermyla) requeti*	27
		Thiaridae	*Thiara (Tarebia) lineata*	38

WB -10	26.2.2016	Family	Genus	Abundancy
		Corbiculidae	*Corbicula bensoni*	4
			Total number	218

WB -11	27.5. 2015	Family	Genus	Abundancy
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	2
		Nepidae	*Nepa*	1
		Noteridae	*Noterus*	1
		Protoneuridae	*Prodasineura autumnalis*	13
		Coenagrionidae	*Agriocnemis lacteola*	5
		Corixidae	*Agraptocorixa*	2
		Cirolanidae	*Annina kumari*	1
		Elminthidae	*Stenelmis*	1
			Unidentified beetle	1
		Libellulidae	*Orthetrum albistylum speciosum*	3
		Hydrophilidae	*Helochares*	1
		Hydrophilidae	*Hydrophilus*	1
		Haliplidae	*Haliplus*	1
		Stenothyridae	*Stenothyra ornata*	13
		Physidae	*Physa (Haitia) mexicana*	12
		Arachnoida	*Water spider*	8
			Unidentified insect	1
		Palaemonidae	*Macrobrachium idae*	9
		Lumbricidae	*Eiseniella tetraedra tetraedra*	1
		Naididae	*Aulophorus hymanae*	4
		Pleuroceridae	*Brotia costula costula*	22
		Lymnaeidae	*Lymnaea accuminata*	8
		Thiaridae	*Thiara (Sermyla) requeti*	20
		Arcidae	*Scaphula deltae*	1
		Thiaridae	*Thiara (Thiara) scabra*	1
		Assimineidae	*Assiminea francesiae*	28

WB -11	27.5. 2015	Family	Genus	Abundancy
		Thiaridae	*Melanoides pyramis*	24
		Bithyniidae	*Digoniostoma pulchella*	2
		Stenasellidae	*Stenasellus*	1
			Total number	188

WB 11	27.2. 2016	Family	Genus	Abundancy
		Gomphidae	*Sinictinogomphus*	4
		Sabellidae	*Caobangia*	14
		Pisioneidae	*Pisionee*	9
		Palaemonidae	*Macrobrachium idae*	1
		Nepidae	*Nepa*	1
		Varunidae	*Varuna*	1
		Pleuroceridae	*Brotia costula costula*	5
		Assimineidae	*Assiminea francesiae*	24
		Thiaridae	*Thiara (Tarebia)lineata*	44
		Corbiculidae	*Corbicula bensoni*	14
		Thiaridae	*Thiara (Sermyla) requeti*	7
		Thiaridae	*Melanoides pyramis*	2
		Thiaridae	*Melanoides tuberculatus*	6
		Solecurtidae	*Novaculina gangetica*	3
			Total number	135

WB-12	26.2.2016	Family	Genus	Abundancy
		Gomphidae	*Sinictinogomphus*	5
		Paleamonidae	*Macrobrachium idae*	1
		Sabellidae	*Caobangia*	3
		Pisioneidae	*Pisionee garciavaldecasai*	4
		Hydrophilidae	*Helochares*	2
		Dytiscidae	*Hydroporus*	1
		Chironomidae	*Orthocladiinae*	1
		Gomphidae	*Stylurus*	1
		Corixidae	*Agraptocorixa*	1

WB-12	26.2.2016	Family	Genus	Abundancy
		Lymnaeidae	*Lymnaea accuminata*	5
		Solecurtidae	*Novaculina gangetica*	1
		Physidae	*Physa (Haitia) mexicana*	9
		Planorbidae	*Gyraulus convexiusculus*	6
		Amblemidae	*parreysia favidens juvenile*	3
		Thiaridae	*Melanoides pyramis*	11
		Assimineidae	*Assiminea francesiae*	1
		Thiaridae	*Thiara (Tarebia) lineata*	28
		Thiaridae	*Melanoides tuberculatus*	13
		Planorbidae	*Indoplanorbis*	2
		Thiaridae	*Thiara (Sermyla) requeti*	1
		Viviparidae	*Bellamya bengalensis*	1
		Corbiculidae	*Corbicula bensoni*	90
		Unionidae	*Lamellidens lamellatus*	4
		Unionidae	*Lamellidens corrianus*	1
			Total number	195

WB-13	23.5. 2015	Family	Genus	Abundancy
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	2
		Nepidae	*Laccotrphes pfeiferiae*	6
		Planorbidae	*Gyraulus convexiusculus*	1
		Atyidae	*Caridina bruneiana*	10
		Chironomidae	*Chironominae*	2
		Protoneuridae	*Prodasineura autumnalis*	2
		Arachnoida	*Water spider*	1
		Palaemonidae	*Macrobrachium idae*	3
		Atyidae	*Caridina endehensis*	9
			Fish larva	1
		Dytiscidae	*Hyphydrus*	2
		Hydrophilidae	*Helochares*	1

WB-13	23.5. 2015	Family	Genus	Abundancy
		Thiaridae	*Melanoides pyramis*	17
		Viviparidae	*Bellamya bengalensis*	7
		Physidae	*Physa (Haitia) mexicana*	8
		Lymnaeidae	*Lymnaea accuminata*	1
		Planorbidae	*Indoplanorbis*	3
		Pleuroceridae	*Brotia costula costula*	19
		Thiaridae	*Thiara (Sermyla) requeti*	21
		Viviparidae	*Makongia crassa (juvenile)*	23
		Thiaridae	*Thiara (Thiara) scabra*	7
		Amblemidae	*Parreysia favidens favidens (juvenile)*	1
		Assimineidae	*Assiminea francesiae*	159
		Stenothyridae	*Stenothyra ornata*	30
			Total number	336

WB -13	25.2.2016	Family	Genus	Abundancy
		Gomphidae	*Stylurus*	6
		Gomphidae	*Sinictinogomphus*	3
		Sabellidae	*Caobangia*	6
		Pisioneidae	*Pisionee garciavaldecasai*	6
		Protoneuridae	*Prodasineura autumnalis*	4
		Coenagrionidae	*Agriocnemis lacteola*	1
		Chironomidae	*Chironominae*	8
		Thiaridae	*Thiara (Tarebia) lineata*	156
		Thiaridae	*Melanoides tuberculatus*	2
		Pleuroceridae	*Brotia costula costula*	3
		Thiaridae	*Thiara (Sermyla) requeti*	12
		Thiaridae	*Mekongia crassa*	18
		Planorbidae	*Gyraulus convexiusculus*	1
		Unionidae	*Lamellidens lamellatus*	2
		Amblemidae	*Parreysia favidens favidens*	1

WB -13	25.2.2016	Family	Genus	Abundancy
		Thiaridae	*Melanoides pyramis*	8
		Thiaridae	*Thiara (Tarebia) granifera*	9
		Thiaridae	*Thiara (Thiara) scabra*	3
		Lymnaeidae	*Lymnaea accuminata*	6
		Physidae	*Physa (Haitia) mexicana*	3
		Stenothyridae	*Stenothyra ornata*	1
		Viviparidae	*Bellamya bengalensis*	1
		Solecurtidae	*Novaculina gangetica*	4
		Planorbidae	*Gyraulus convexiusculus*	3
		Corbiculidae	*Corbicula bensoni*	2
			Total number	269

WB – 14	23.5. 2015	Family	Genus	Abundancy
		Ranatrinidae	*Ranatra brevicollis*	1
		Tabanidae	*Tabanus Atylotus sp.*	2
		Nepidae	*Laccotrephes ofeiferiae pfeiferiae*	2
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	9
		Lymnaeidae	*Lymnaea accuminata*	53
		Lymnaeidae	*Lymnaea andersoniana simulens*	9
		Bithyniidae	*Digoniostoma lithoglyphoides*	1
		Bithyniidae	*Digoniostoma pulchella*	31
		Bithyniidae	*Gabbia orcula*	6
		Palaemonidae	*Macrobrachium lopopodus*	1
		Chironomidae	*Chironominae*	15
		Atyidae	*Caridina bruneiana*	3
		Pyralidae	*Paraponyx*	1
		Coenagrionidae	*Agriocnemis lacteola*	14
		Protoneuridae	*Prodasineura autumnalis*	7

WB – 14	**23.5. 2015**	**Family**	**Genus**	**Abundancy**
		Stenothyridae	*Stenothyra ornata*	10
		Hydrophilidae	*Berosus larva*	1
		Arachnoida	*Water spider*	1
		Corixidae	*Corixa*	10
		Hydrophilidae	*Helochares*	3
		Hebridae	*Hebrus*	1
		Hydrophilidae	*Helophorus*	1
		Dytiscidae	*Nipponhydrus*	8
		Dytiscidae	*Hyphydrus*	3
		Noteridae	*Hydrocoptus*	1
		Libellulidae	*Nannophya pygmea*	15
		Libellulidae	*Orthetrum albistylum speciosum*	17
		Libellulidae	*Lyriothemis*	9
		Viviparidae	*Bellamya bengalensis*	1
		Planorbidae	*Gyraulus convexiusculus*	1
		Assimineidae	*Assiminea francesiae*	1
		Physidae	*Physa (Haitia) mexicana*	1
		Thiaridae	*Melanoides pyramis*	2
		Planorbidae	*Indoplanorbis*	1
		Libellulidae	*Acisoma*	1
		Corbiculidae	*Corbicula bensoni*	1
		Corbiculidae	*Corbicula assamensis*	1
		Spaeriidae	*Pissidiumannandalei*	1
		Amblemidae	*Parreysia favidens favidens (juvenile)*	2
		Amblemidae	*Radiatula caerulea (Juvenile)*	1
		Culicidae	*Anophelese larva*	1
		Chironomidae	*Tanypodinae*	6
		Tubificidae	*Branchiura sowerbyi*	2
			Total number	258

WB – 14	**February, 2016**	**Family**	**Genus**	**Abundancy**
		Gomphidae	*Sinictinogomphus*	17
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	16
		Atyidae	*Caridina temasek*	1
		Pisioneidae	*Pisionee garciavaldecasai*	1
		Nereididae	*Namalycastis indica*	1
		Noteridae	*Canthydrus*	1
		Noteridae	*Noterus*	1
		Ranatrinidae	*Ranatra brevecolis*	1
		Histeridae	*Hister*	2
		Nepidae	*Nepa*	1
		Culicidae	*Anopheles larva*	5
		Chironomidae	*Chironominae*	194
		Elmidae/Elmididae/ Elminthidae	*Elmidae/Elmididae/ Elminthidae larva*	1
		Corbiculidae	*Corbicula striatella*	3
		Corbiculidae	*Corbicula bensoni*	7
		Lymnaeidae	*Lymnaea accuminata*	19
		Stenothyridae	*Stenothyra ornata*	2
		Viviparidae	*Bellamya bengalensis*	3
		Planorbidae	*Gyraulus convexiusculus*	4
		Planorbidae	*Indoplanorbis*	1
		Planorbidae	*Segmentina trochoidae*	3
		Thiaridae	*Thiara (Tarebia) lineata*	4
			Total number	288

WB – 15	**21.5. 2015**	**Family**	**Genus**	**Abundancy**
		Potamidae	*Isolapotamon*	11
		Palaemonidae	*Macrobrachium lopopodus*	1
		Atyidae	*Caridina peninsularis*	2
		Curculionidae	*Echinocnemus*	1

WB – 15	21.5. 2015	Family	Genus	Abundancy
		Arachnoida	*Water spider*	2
		Stenasellidae	*Stenasellus*	4
		Ephydridae	*Ephydra pupa*	1
		Dytiscidae	*Nipponhydrus*	1
		Cirolanidae	*Annina*	51
		Cymothoidae	*Nerocilia depressa*	39
		Naididae	*Aulophorus hymanae*	1
		Viviparidae	*Idiopoma dissimilis*	76
		Assimineidae	*Assiminea francesiae*	1
		Bithyniidae	*Digoniostoma lithoglyphoides*	1
		Planorbidae	*Gyraulus convexiusculus*	1
			Total number	193

WB – 16	21.5. 2015	Family	Genus	Abundancy
		Nereididae	*Namalycastis indica*	1
		Psychodidae	*Psychoda*	3
		Stenasellidae	*Stenasellus*	39
		Cirolanidae	*Cirolana parva*	51
		Viviparidae	*Idiopoma disimilis*	113
		Belostomatidae	*Dyplonychus*	1
		Tabanidae	*Tabanus Atylotus sp.*	1
		Curculionidae	*Echinocnemus*	1
		Arcidae	*Scaphula celox*	1
		Libellulidae	*Sympetrum parvulum*	1
		Viviparidae	*Bellamya bengalensis*	11
		Assimineidae	*Assiminea francesiae*	1
		Thiaridae	*Melanoides pyramis*	1
		Planorbidae	*Indoplanorbis*	1
		Bithyniidae	*Digoniostoma pulchella*	3
		Planorbidae	*Gyraulus convexiusculus*	5
		Stenothyridae	*Stenothyra ornata*	3
		Scirtidae	*Prionocyphon*	1
		Salifidae	*Barbronia weberi*	1

WB – 16	**21.5. 2015**	**Family**	**Genus**	**Abundancy**
		Nephthydae	*Nephthys polybranchia*	1
		Protoneuridae	*Prodasineura autumnalis*	1
		Atyidae	*Caridina bruneiana*	4
			Unidentified Oligochaete	1
		Sesarmidae	*Sesarmops*	10
			Total number	256

WB -16	**23.3. 2016**	**Family**	**Genus**	**Abundancy**
		Sesarmidae	*Sesarmoides, 9adults, 16 juvenile*	25
		Sesarmidae	*Pseudoseserma*	7
		Parathelphusidae	*Perithelphusa*	1
		Hydrophilidae	*Helochares*	4
		Hydrophilidae	*Berosus*	3
		Hydrophilidae	*Hydrophilus*	1
		Syrphidae	*Eristalis sp.*	4
		Tabanidae	*Tabanus /Atylotus sp.*	2
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	3
		Sarcophagidae	*Sacrophaga*	1
		Nereididae	*Namalycastis indica*	4
		Chironomidae	*Chironominae*	7
		Dytiscidae	*Hydrovatus*	1
		Chironomidae	*Orthocladiinae*	1
		Elmidae/Elmididae/ Elminthidae	*Elmidae/Elmididae/ Elminthidae larva*	5
		Diptera	*Diptera pupa*	3
		Scirtidae larva	*Cyphon*	1
		Glossiphoniidae	*Alboglossiphonia weberi*	17
		Corixidae	*Agraptocorixa*	1
		Palaemonidae	*Macrobrachium lopopodus*	4

WB -16	23.3. 2016	Family	Genus	Abundancy
		Palaemonidae	*Macrobrachium callirrhoe*	1
		Crustacea	*Juvenile crabs*	2
		Varunidae	*Varuna juvenile*	5
		Perathelphusidae	*Perithelphusa juvenile*	13
		Amblemidae	*Parreysia favidens chrysis*	1
		Amblemidae	*Parreysia favidens favidens*	3
		Viviparidae	*Bellamya bengalensis*	17
		Pleuroceridae	*Brotia costula costula*	3
		Thiaridae	*Thiara (Sermyla) requeti*	13
		Thiaridae	*Melanoides tuberculatus*	56
		Viviparidae	*Mekongia crassa*	1
		Thiaridae	*Melanoides pyramis*	8
		Thiaridae	*Thiara (Tarebia) granifera*	1
		Thiaridae	*Thiara (Tarebia) lineata*	70
		Viviparidae	*Idiopoma disimilis*	2
		Planorbidae	*Hippeutis umbilicalis*	9
		Planorbidae	*Indoplanorbis*	2
		Physidae	*Physa (Haitia) mexicana*	5
		Amblemidae	*Parreysia favidens juvenile*	1
		Thiaridae	*Thiara (Thiara) scabra*	3
		Assamineidae	*Assamenia fraincaise*	12
			Total Number	323

WB -17	21.5.2015	Family	Genus	Abundancy
		Septariidae	*Septaria tesselata*	2
		Septariidae	*Septaria sp.*	1
		Nereididae	*Nereis chilkaensis*	2
		Nereididae	*Dendronereides heteropoda*	3
		Nereididae	*Namalycastis fauveli*	5

WB -17	21.5.2015	Family	Genus	Abundancy
		Varunidae	*Varuna yui*	7
		Stenasellidae	*Stenasellus*	8
		Parathelphusidae	*Perithelphusa*	11
		Hymenosomatidae	*Neorhynchoplax nasalis*	2
		Libellulidae	*Sympetrum speciosum speciosum*	1
			Unidentified Oligochete	1
		Belostomatidae	*Diplonychus (=Sphaerodema) rusticus rusticus*	1
		Stenothyridae	*Stenothyra ornata*	1
		Pleuroceridae	*Brotia costula costula*	21
		Thiaridae	*Thiara (Sermyla) requeti*	6
		Assimineidae	*Assiminea francesiae*	26
		Thiaridae	*Melanoides pyramis*	14
		Viviparidae	*Idiopoma dissimilis*	17
			Total mumber	129

WB – 17	3.3. 2015	Family	Genus	Abundancy
		Sabellidae	*Manayunkia/Brandtika*	29
		Nerillidae	*Hesionides/ Troglochaetus beranecki*	2
			unidentified	1
		Sabellidae	*Caobangia*	2
		Salifidae	*Barbronia weberi*	1
		Glossiphoniidae	*Alboglossiphonia weberi*	1
		Corixidae	*Agraptocorixa*	1
			unidentified	1
		Sesamidae	*Sesarmoides*	21
		Potamidae	*Isolapotamon*	7
		Viviparidae	*Idiopoma dissimilis*	110
		Thiaridae	*Thiara (Tarebia) lineata*	33
			Total number	209

WB -19	18.5. 2015	Family	Genus	Abundancy
		Gecarcinucidae	*Lepidothelphusa*	6
		Hymenosomatidae	*Neorhynchoplax nasalis*	1
		Arachnoida	*Water spider*	1
		Stenasellidae	*Stenasellus*	7
		Thiaridae	*Melanoides pyramis (dead shells)*	4
		Planorbidae	*Indoplanorbis*	1
		Crambidae	*Elophila*	1
		Nereididae	*Dendronereides heteropoda*	3
			Total number	24

WB - 19	27.2.2016	Family	Genus	Abundancy
		Varunidae	*Varuna juvenile*	4
		Solecurtidae	*Novaculina gangetica*	1
		Ephydridae	*Ephydra pupa*	9
		Viviparidae	*Idiopoma dissimilis*	1
		Stratiomyidae	*Beris larva*	1
		Hymenosomatidae	*Neorhynchoplax nasalis juvenile*	1
		Thiaridae	*Thiara (Tarebia) granifera*	102
		Planorbidae	*Indoplanorbis exustus*	1
		Viviparidae	*Bellamya bengalensis*	2
		Thiaridae	*Melanoides pyramis*	10
		Thiaridae	*Melanoides tuberculatus*	36
		Thiaridae	*Thiara (Thiara) scabra*	3
		Thiaridae	*Thiara (Sermyla) requeti*	14
		Corbiculidae	*Corbicula bensoni*	10
		Syrphidae	*Eristalis sp.*	2
		Psychodidae	*Psychoda*	1
		Psychodidae	*Peripsychoda*	1
		Stratiomyidae	*Stratiomys sp.*	1
		Culicidae	*Topomyia*	1

WB - 19	**27.2.2016**	**Family**	**Genus**	**Abundancy**
		Planorbidae	*Hippeutis umbelicalis*	2
		Polychaeta	*Dried polychaete*	1
		Nmanereidinae (Nereididae)	*Namanerieis covernicola*	1
		Sabellidae	*Manayunkia/Brandtika*	21
		Sabellidae	*Caobangia*	2
			Total number	228

WB -21	**22.5. 2015**	**Family**	**Genus**	**Abundancy**
		Assimineidae	*Assiminea francesiae 20 juvenile+6 adults*	26
		Stenasellidae	*Stenasellus*	3
		Cirolanidae	*Cirolana parva*	13
		Corrallanidae (Isopoda)	*Corallana grandiventra*	1
		Nereididae	*Namalycastis indica*	3
		Atyidae	*Caridina bruneiana*	1
		Libellulidae	*Hydrobasileus croceus*	1
		Nereididae	*Dendronereides heteropoda*	10
		Sesermidae	*Geosesarma*	1
		Sesarmidae	*Sesarmoides*	1
		Varunidae	*Varuna yui*	1
		Potamidae	*Johora*	17
		Gecarcinucidae	*Lepidothelphusa*	7
		Hymenosomatidae	*Neorhynchoplax nasalis*	2
			Juvenile crabs unidentified	2
			Total number	89

W - 23	**18.5. 2015**	**Family**	**Genus**	**Abundancy**
		Neritidae	*Neritina (Dostia) violacea*	5
		Sesarmidae	*Geosesarma*	1
			Total number	6

WB – 25	23.2.2016	Family	Genus	Abundancy
		Varunidae	*Varuna*	27
		Parathelphusidae	*Perithelphusa*	6
		Sesarmidae	*Sesarmoides*	60
		Sesarmidae	*Sesarmops*	10
		Nereididae	*Dendronereides heteropoda*	9
		Sabellidae	*Manayunkia/Brandtika*	8
		Nmanereidinae (Nereididae)	*Neamaneries covernicola*	1
		Nereididae	*Namalycastia indica*	4
		Thiaridae	*Thiara (Tarebia) granifera*	1
		Aegidae	*Alitropus typus*	9
		Sesarmidae	*Sesermops juvenile*	2
		Solecurtidae	*Novaculina gangetica juvenile*	1
		Viviparidae	*Idiopoma dissimilis*	10
		Mesoveliidae	*Mesovalia*	1
		Planorbidae	*Indoplanorbis*	1
		Protoneuridae	*Prodasineura autumnalis*	1
		Planorbidae	*Hippeutis umbilicalis*	2
		Nmanereidinae (Nereididae)	*Neamaneries covernicola*	2
		Tubificidae	*Aulodrilus pigueti*	1
		Tubificidae	*Aulodrilus limnobius*	2
		Naididae	*Nais bretscheri*	3
		Naididae	*Nais alpina*	1
		Sabellidae	*Manayunkia/Brandtika*	1
		Ephydridae	*Ephydra pupa*	2
		Atyidae	*Caridina endehensis*	1
		Atyidae	*Caridina bakoensis*	3
			Total number	169

WB -27.	25.3.2016	Family	Genus	Abundancy
		Varunidae	*Varuna*	3
		Sesarmidae	*Sesarmoides*	7
		Hymenosomatidae	*Neorhynchoplax nasalis*	1
		Thiaridae	*Thiara (Tarebia) lineata*	1
		Sesarmidae	*Sesarmops juvenile*	1
		Nmanereidinae (Nereididae)	*Namanerieis covernicola*	2
		Nereididae	*Dendronereidus heteropoda*	2
		Sabellidae	*Caobangia*	7
		Sabellidae	*Manayunkia/ Brandtika*	5
		Pisioneidae	*Pisionee garciavaldecasai*	21
			Total number	50

WB -28	23.2.2016	Family	Genus	Abundancy
		Pisioneidae	*Pisionee garciavaldecasai*	2
		Thiaridae	*Thiara (Tarebia) lineata*	2
		Viviparidae	*Idiopoma dissimilis*	1
		Thiaridae	*Thiara (Thiara) scabra*	1
		Sesarmidae	*Sesermops juvenile*	1
		Palaemonidae	*Macrobrachium lopopodus*	5
			Total number	12

WB-31	27.2.2016	Family	Genus	Abundancy
		Varunidae	*Varuna*	49
		Sesarmidae	*Sesarmops*	1
		Syrphidae	*Eristalis sp.*	1
		Sarcophagidae	*Sarcophaga*	1
		Muscidae	*Musca domestica pupa*	10
		Stratiomyidae	*Beris larva*	1
		Lymnaeidae	*Lymnaea accuminata*	2

WB-31	**27.2.2016**	**Family**	**Genus**	**Abundancy**
		Hydrophilidae	*Halophores*	1
		Pisioneidae	*Pisionee graciavaldecasai*	2
		Physidae	*Physa (Haitia) mexicana*	6
		Viviparidae	*Idiopoma dissimilis*	1
		Planorbidae	*Hippeutis umbilicalis*	1
		Assimineidae	*Paludinella (Schuetiella) daengswangi*	1
		Nepidae	*Nepa*	1
		Tubificidae	*Limnodrilus hoffmeisteri*	7
		Psychodidae	*Psychoda*	9
		Noteridae	*Canthydrus*	1
		Sesarmidae	*Sesarmops juvenile*	4
		Scirtidae	*Cyphon larva*	1
			Total number	100

WB -32	**25.2.2016**	**Family**	**Genus**	**Abundancy**
		Neritidae	*Neritina (Vittina) smithi*	2
		Neritidae	*Naritina (Dostia) violacea*	1
		Varunidae	*Varuna*	19
		Sesarmidae	*Sesarmoides*	3
		Sesarmidae	*Sesarmops Juvenile*	6
			Total number	31

WB -34F	**26.2.2016**	**Family**	**Genus**	**Abundancy**
		Onchidiidae	*Onchidium typhae*	4
		Onchidiidae	*Onchidium sp.*	2
		Sesarmidae	*Sesarmoides*	9
		Sesarmidae	*Sesarmops*	2
		Pisioneidae	*Pisionee garciavaldecasai*	1
		Viviparidae	*Idiopoma dissimilis*	1

WB -34F	26.2.2016	Family	Genus	Abundancy
		Sesarmidae	*Sesarmops juvenile*	2
		Atyidae	*Caridina endehensis*	32
		Palaemonidae	*Macrobrachium lopopodus*	1
		Talitridae	*Platorchestia platensis*	1
			Total number	55

WB -34	29.5. 2015	Family	Genus	Abundancy
		Neritidae	*Neritina (Vittina) smithi*	3
		Neritidae	*Neritina (Dostia) violacea*	5
		Dugesiidae?	*Dugesia sp.*	9
		Parathelphusidae	*Perithelphusa*	12
		Sesarmidae	*Sesarmoides*	17
		Nereididae	*Namalycastis fauveli*	2
		Gecarcinucidae	*Salangathelphusa juvenile*	12
		Stenasellidae	*Stenasellus*	4
		Cirolanidae	*Cirolana parva*	3
		Gerridae	*Halobates*	1
		Potamidae	*Sesarmidae*	1
		Sesarmidae	*Pseudosesarma*	1
		Sesarmidae	*Sesarmops*	7
		Viviparidae	*Idiopoma dissimilis*	3
		Varunidae	*Varuna yui*	2
			Juvenile crabs	4
		Palaemonidae	*Macrobrachium mirabile*	9
		Palaemonidae	*Macrobrachium idae*	64
		Atyidae	*Caridina endehensis*	22
		Palaemonidae	*Macrobrachium lopopodus*	11
			Total number	192

WB - 34	**26.2.2016**	**Family**	**Genus**	**Abundancy**
Jelly fishes were collected from this location		Dugessidae	*Dugessia*	21
		Varundae	*Varuna*	4
		Sesarmidae	*Sesarmoides*	4
		Sesarmidae	*Sesarmops juvenile*	1
		Mysidae	*Gangemysis assimilis*	53
		Nmanereidinae (Nereididae)	*Namanerieis covernicola*	3
		Anthuridae	*Stygocyathura*	2
		Niphargidae	*Neoniphargus*	6
		Stenothyridae	*Stenothyra deltae*	1
		Viviparidae	*Idiopoma dissimilis*	1
		Namanereidinae (Nereididae)	*Namalycastis abiuma*	2
			Total number	98

WB 35	**24.2.2016**	**Family**	**Genus**	**Abundancy**
		Neritidae	*Neritina (Dostia) violacea*	10
		Potamidae	*Isolapotamon*	9
		Parathelphusidae	*Perithelphusa*	7
		Namanereidinae (Nereididae)	*Namalycastis abiuma*	26
		Niphargidae	*Neoniphargus*	1
		Viviparidae	*Idiopoma dissimilis*	18
		Potamidae	*Johora*	1
		Planorbidae	*Hippeutis umbilicalis*	1
		Stenothyridae	*Stenothyra daltae*	3
		Sesarmidae	*Sesarmops juvenile*	2
		Viviparidae	*Bellamya bengalensis juvenile*	1
		Histriobdellidae	*Stratiodrilus*	4
		Nereididae	*Namalycastis sp.*	2

WB 35	24.2.2016	Family	Genus	Abundancy
		Viviparidae	*Bellamya (Flopaludina) bengalensis*	9
		Sesarmidae	*Sesarmops juvenile*	3
		Sesarmidae	*Sesarmops female with eggs*	1
		Niphargidae	*Neoniphargus*	10
		Talitridae	*Platorchetia platensis*	2
		Atyidae	*Caridina endehensis*	1
			Total number	111

15

INDEX 2

Genus	Family	Abundancy	Location code	Date
Acisoma	Libellulidae	1	UK 6	3.11.2015
Acisoma	Libellulidae	1	UP 3	5.12.2014
Acisoma	Libellulidae	2	UP 3	3.5. 2016
Acisoma	Libellulidae	1	UP 3	3.5. 2016
Acisoma	Libellulidae	2	UP 6A/ZBGP	16.5.2016
Acisoma	Libellulidae	12	UP 8	December, 2014
Acisoma	Libellulidae	1	UP 9/JBUP 9	17.5.2016
Acisoma	Libellulidae	14	UP 11	December, 2014
Acisoma	Libellulidae	1	WB 5	24.2. 2016
Acisoma	Libellulidae	1	WB 14	23.5. 2015
Adult Baetis	Baetidae	2	UP 53	10.3.2015
Adult insect		2	UK B	25.4.2016
Adult insect		1	UK 8, U/S JSTP	27.10.2015
Adult insect		1	UK 8b D/S JSTP	27.10.2015
Adult insect		1	WB 03	27.5. 2015
Adult Trichoptera		1	NA Narora	4.6.2016
Adults of Eatongenia	Ephemeridae	3	BH 04	29.12.2015
Afronurus	Heptageniidae	1	UK 1	24.11.2015
Afronurus	Heptageniidae	2	UK 5	18.11. 2015
Afronurus	Heptageniidae	4	UK 6	3.11.2015
Agapetus	Glossosomatidae	4	UK B	25.4.2016
Agapetus pupa in case	Hydroptilidae	2	UK B	25.4.2016
Agraptocorixa	Corixidae	1	BH 3 in round 1	24.4.2016

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Agraptocorixa	Corixidae	1	BH 04	29.12.2015
Agraptocorixa	Corixidae	4	BH 12 upstream	April, 2015
Agraptocorixa	Corixidae	1	BH 12 Downstream	April, 2015
Agraptocorixa	Corixidae	6	BH M	30.12.2015
Agraptocorixa	Corixidae	4	JH 4	14.1.2016
Agraptocorixa	Corixidae	3	UP 1	26.4. 2016
Agraptocorixa	Corixidae	9	UP 2	December, 2014
Agraptocorixa	Corixidae	6	UP 3	5.12.2014
Agraptocorixa	Corixidae	2	UP 4	December, 2015
Agraptocorixa	Corixidae	4	UP 4	28.4. 2016
Agraptocorixa	Corixidae	1	UP 6A/ZBGP	16.5.2016
Agraptocorixa	Corixidae	3	jf	4.6.2016
Agraptocorixa	Corixidae	8	UP 7	December, 2014
Agraptocorixa	Corixidae	6	UP 8	December, 2014
Agraptocorixa	Corixidae	2	UP 10/UP 11	19.5.2015
Agraptocorixa	Corixidae	18	UP 11	December, 2014
Agraptocorixa	Corixidae	8	UP II	14.01.2015
Agraptocorixa	Corixidae	37	UP 12	January, 2015
Agraptocorixa	Corixidae	1	UP 13	15.01.2015
Agraptocorixa	Corixidae	7	UP 14	13.01.2015
Agraptocorixa	Corixidae	7	UP 19	9.6. 2016
Agraptocorixa	Corixidae	22	UP 44	5.10.2016
Agraptocorixa	Corixidae	8	UP 49	March, 2015
Agraptocorixa	Corixidae	3	UP 51	19.10.2016
Agraptocorixa	Corixidae	4	UP 53	10.3.2015

Genus	Family	Abundancy	Location code	Date
Agraptocorixa	Corixidae	5	UP 53	19.10.2016
Agraptocorixa	Corixidae	2	UP 54	12.3. 2015
Agraptocorixa	Corixidae	1	WB 1	29.2. 2016
Agraptocorixa	Corixidae	4	WB 03	27.5. 2015
Agraptocorixa	Corixidae	1	WB 03	29.2. 2016
Agraptocorixa	Corixidae	3	WB 4	26.2. 2016
Agraptocorixa	Corixidae	2	WB 7	27.5. 2015
Agraptocorixa	Corixidae	5	WB 9	27.5. 2015
Agraptocorixa	Corixidae	2	WB 11	27.5. 2015
Agraptocorixa	Corixidae	1	WB 12	26.2.2016
Agraptocorixa	Corixidae	1	WB 16	23.3. 2016
Agraptocorixa	Corixidae	1	WB 17	3.3. 2015
Agriocnemis	Corixidae	1	UP 3	5.12.2014
Agriocnemis	Coenagrionidae	1	UP 6A/ZBGP	16.5.2016
Agriocnemis	Coenagrionidae	1	UP 6	10.5.2016
Agriocnemis	Coenagronidae	6	UP 8	11.5. 2016
Agriocnemis	Coenagrionidae	1	UP A	16.01.2015
Agriocnemis	Coenagrionidae	1	UP 50	10.3. 2015
Agriocnemis	Coenagrionidae	1	WB 1	29.2. 2016
Agriocnemis lacteola	Coenagrionidae	9	BH 12 Downstream	April, 2015
Agriocnemis lacteola	Coenagrionidae	3	UP 2	26.4. 2016
Agriocnemis lacteola	Coenagrionidae	4	UP 4	December, 2015
Agriocnemis lacteola	Coenagrionidae	1	jf	4.6.2016
Agriocnemis lacteola	Coenagrionidae	16	UP 7	11.5. 2016
Agriocnemis lacteola	Coenagrionidae	1	UP 10/UP 11	19.5.2015
Agriocnemis lacteola	Coenagrionidae	3	UP 14	7.6.2016
Agriocnemis lacteola	Coenagrionidae	1	UP 29	9.6. 2016
Agriocnemis lacteola	Coenegrionidae	4	UP 50	10.3. 2015

Genus	Family	Abundancy	Location code	Date
Agriocnemis lacteola	Coenagrionidae	2	UP 57	13.3. 2015
Agriocnemis lacteola	Coenagrionidae	4	WB 01	26.5. 2015
Agriocnemis lacteola	Coenagrionidae	1	WB 02	27.5. 2015
Agriocnemis lacteola	Coenagrionidae	1	WB 6	27.2.2016
Agriocnemis lacteola	Coenagrionidae	5	WB 11	27.5. 2015
Agriocnemis lacteola	Coenagrionidae	1	WB 13	25.2.2016
Agriocnemis lacteola	Coenagrionidae	14	WB 14	23.5. 2015
Agrocnemis lacteola	Coenagrionidae	1	UP 13	15.01.2015
Agrocnemis lacteola	Coenagrionidae	5	UP 33	February, 2015
Alboglossiphonia weberi	Glosiphonidae	2	BH 3 in round 1	24.4.2016
Alboglossiphonia weberi	Glossiphonidae	1	BH 12 upstream	April, 2015
Alboglossiphonia weberi	Glossiphonidae	5	BH 13	January, 2016
Alboglossiphonia weberi	Glossiphoniidae	2	UK 8b D/S JSTP	27.10.2015
Alboglossiphonia weberi	Glossiphoniidae	2	UP 2	26.4. 2016
Alboglossiphonia weberi	Glossiphoniidae	4	UP 7	11.5. 2016
Alboglossiphonia weberi	Glossiphoniidae	3	WB 1	29.2. 2016
Alboglossiphonia weberi	Glossiphoniidae	17	WB 16	23.3. 2016
Alboglossiphonia weberi	Glossiphoniidae	1	WB 17	3.3. 2015
Alitropus typus	Aegidae	3	WB 5	24.2. 2016
Alitropus typus	Aegidae	1	WB 7	27.2. 2016
Alitropus typus	Aegidae	9	WB 25	23.2.2016
Allonais inaequalisis	Naididae	7	BH 12 Downstream	28.12.2015

Genus	Family	Abundancy	Location code	Date
Amelatus doubtful	Siphlonuridae	2	JH 4	14.1.2016
Ameletus	Siphlonuridae	11	UK 1	01.07.2014
Ameletus	Siphlonuridae	10	UK 1	24.11.2015
Ameletus	Siphlonuridae	20	UK B	25.4.2016
Ameletus	Siphlonuridae	15	UK 4	4.11.2015
Ameletus	Siphlonuridae	203	UK 5	18.11. 2015
Ameletus	Siphlonuridae	3	UK 6	20.6. 2014
Ameletus	Siphlonuridae	57	UK 6	3.11.2015
Ameletus	Siphlonuridae	77	UK 7	28.10.2015
Ameletus	Siphonuridae	1	UK 8b D/S JSTP	27.10.2015
Ameriana	Planorbidae	1	UP 2	26.4. 2016
Ameriana	Planorbidae	7	UP 3	3.5. 2016
Amerianna	Planorbidae	2	UP 47	5.10.2016
Amphepsyche	Hydropsychidae	2	UP 56 corrected as UP 55	19.10.2016
Amphiops?	Hydrophilidae	1	UP IV	11.3. 2015
Amphipsyche	Hydropsychidae	1	UP 13	7.6.2016
Anisops	Notonectidae	1	BH 3 downstream	29.12.2015
Anisops	Notonectidae	4	UP 10/UP 11	19.5.2015
Anisops	Notonectidae	1	UP 11	December, 2014
Anisops	Notonectidae	1	UP 13	7.6.2016
Anisops	Notonectidae	1	UP 14	13.01.2015
Anisops	Notonectidae	1	UP 38	February, 2015
Anisops	Notonectidae	1	UP 44	February, 2015
Anisops	Notonectidae	1	UP 44	5.10.2016

Genus	Family	Abundancy	Location code	Date
Anisops	Notonectidae	1	UP 56 corrected as UP 55	19.10.2016
Annina	Cirolanidae	51	WB 15	21.5. 2015
Annina kumari	Cirolanidae	1	WB 11	27.5. 2015
Anopheles larva	Culicidae	2	UK 8b D/S JSTP	27.10.2015
Anopheles larva	Culicidae	6	UP 19	9.6. 2016
Anopheles larva	Culicidae	6	UP 29	16.01.2015
Anopheles larva	Culicidae	1	UPDG	9.6.2016
Anopheles larva	Culicidae	13	UPDG	9.6.2016
Anopheles larva	Culicidae	1	UP II	7.6.2016
Anopheles larva	Culicidae	3	UP 32	February, 2015
Anopheles larva	Culicidae	1	UP 38	February, 2015
Anopheles larva	Culicidae	3	UP 39	February, 2015
Anopheles larva	Culicidae	2	UP 41	February, 2015
Anopheles larva	Culicidae	1	UP 44	February, 2015
Anopheles larva	Culicidae	5	WB 14	28.2. 2016
Anopheles larvae	Culicidae	3	UP 53	10.3.2015
Anopheles pupa	Culicidae	3	BH 3 downstream	29.12.2015
Anopheles pupa	Culicidae	3	UP 10/UP 11	19.5.2015
Anopheles pupa	Culicidae	1	UPDG	9.6.2016
Anophelese larva	Culicidae	1	WB 14	23.5. 2015
Antocha	Tipulidae	3	UK 1	24.11.2015
Antocha	Tipulidae	19	UK B	25.4.2016
Antocha	Tipulidae	1	UK 4	24.7.2014
Antocha	Tipulidae	24	UK 4	4.11.2015

Genus	Family	Abundancy	Location code	Date
Antocha	Tipulidae	2	UK 5	25.6.2014
Antocha	Tipulidae	2	UK 5	18.11. 2015
Antocha	Tipulidae	4	UK 6	3.11.2015
Antocha	Tipulidae	31	UK 8b D/S JSTP	27.10.2015
Aphelocheirus	Aphelocheiridae	1	UK 6	20.6. 2014
Aphelocheirus	Aphelocheiridae	18	UK 7	21.6. 2014
Aphelocheirus	Aphelocheiridae	3	UK 7	28.10.2015
Aphelocheirus	Aphelocheiridae	2	UK 8b D/S JSTP	27.10.2015
Aphelocheirus	Aphelocheiridae	1	UP 6	10.5.2016
Aphelocheirus	Aphelocheirus	1	NL	4.6.2016
Aphelocheirus	Aphelocheirus	1	NL	4.6.2016
Assamenia fraincaise	Assaminidae	5	UP 40	February, 2015
Assamenia fraincaise	Assamineidae	12	WB 16	23.3. 2016
Assiminea francesiae	Assimineidae	46	BH 04	29.12.2015
Assiminea francesiae	Assimineidae	71	BH V	12.1.2016
Assiminea francesiae	Assimineidae	37	BH 13	January, 2016
Assiminea francesiae	Assimineidae	41	BH K	January, 2016
Assiminea francesiae	Assimineidae	16	JH 4	14.1.2016
Assiminea francesiae	Assimineidae	14	UP AL1	February, 2015
Assiminea francesiae	Assimineidae	6	UP III	11.3. 2015
Assiminea francesiae	Assimineidae	10	UP 33	February, 2015
Assiminea francesiae	Assimineidae	6	UP 38	February, 2015
Assiminea francesiae	Assimineidae	4	UP 41	6.10.2016
Assiminea francesiae	Assimineidae	3	UP 57	13.3. 2015
Assiminea francesiae	Assimineidae	22	WB 01	26.5. 2015
Assiminea francesiae	Assimineidae	3	WB 1	29.2. 2016

Genus	Family	Abundancy	Location code	Date
Assiminea francesiae	Assimineidae	5	WB 5	24.2. 2016
Assiminea francesiae	Assimineidae	39	WB 7	27.5. 2015
Assiminea francesiae	Assimineidae	42	WB 7	27.2. 2016
Assiminea francesiae	Assimineidae	18	WB 10	26.2.2016
Assiminea francesiae	Assimineidae	28	WB 11	27.5. 2015
Assiminea francesiae	Assimineidae	24	WB 11	27.2. 2016
Assiminea francesiae	Assimineidae	1	WB 12	26.2.2016
Assiminea francesiae	Assimineidae	159	WB 13	23.5. 2015
Assiminea francesiae	Assimineidae	1	WB 14	23.5. 2015
Assiminea francesiae	Assimineidae	1	WB 15	21.5. 2015
Assiminea francesiae	Assimineidae	1	WB 16	21.5. 2015
Assiminea francesiae	Assimineidae	26	WB 17	21.5.2015
Assiminea francesiae 20 juvenile+6 adults	Assimineidae	26	WB 21	22.5. 2015
Assiminea francesiae juvenile	Assimineidae	32	WB 10	26.2.2016
Atyidae	Atyidae	1	NL	4.6.2016
Atyidae	Atyidae	5	NL	4.6.2016
Aulodrilus limnobius	Tubificidae	2	WB 25	23.2.2016
Aulodrilus pigueti	Naididae	4	BH 12 Downstream	28.12.2015
Aulodrilus pigueti	Tubificidae	1	UP I (UP17)	8.6.2016
Aulodrilus pigueti	Tubificidae	1	UP 56 corrected as UP 55	19.10.2016
Aulodrilus pigueti	Naididae	1	WB 1	29.2. 2016
Aulodrilus pigueti	Tubificidae	1	WB 25	23.2.2016
Aulodrilus piqueti	Tubificidae	1	UP 3	3.5. 2016
Aulodrilus pluriseta	Naididae	4	BH 12 Downstream	28.12.2015
Aulodrilus pluriseta	Tubificidae	1	UP 8	11.5. 2016

Genus	Family	Abundancy	Location code	Date
Aulodrilus pluriseta	Tubificidae	7	UP 56 corrected as UP 55	19.10.2016
Aulophorus flabelliger larva with case	Naididae	1	UP 12	January, 2015
Aulophorus hymanae	Naididae	3	UP 8	December, 2014
Aulophorus hymanae	Naididae	4	WB 11	27.5. 2015
Aulophorus hymanae	Naididae	1	WB 15	21.5. 2015
Baetis	Baetidae	1	JH 1	14.1.2016
Baetis	Baetidae	1	UK 1	24.11.2015
Baetis	Baetidae	1	UK 6	3.11.2015
Baetis	Baetidae	1	UP 2	26.4. 2016
Baetis	Baetidae	2	UP 3	3.5. 2016
Baetis	Baetidae	3	UP 4	December, 2015
Baetis	Baetidae	1	UP 8	December, 2014
Baetis	Baetidae	6	UP 12	8.6.2016
Baetis	Baetidae	1	UP 14	7.6.2016
Baetis	Baetidae	1	UP 19	9.6. 2016
Baetis	Baetidae	1	UPDG	9.6.2016
Baetis	Baetidae	1	UP 32	February, 2015
Baetis	Baetidae	1	UP 50	10.3. 2015
Baetis	Baetidae	2	UP 54	12.3. 2015
Barbronia weberi	Salifidae	1	UK 5	25.6.2014
Barbronia weberi	Salifidae	1	UK 6	3.11.2015
Barbronia weberi	Salifidae	2	UK 8b D/S JSTP	27.10.2015
Barbronia weberi	Salifidae	1	WB 16	21.5. 2015
Barbronia weberi	Salifidae	1	WB 17	3.3. 2015

Genus	Family	Abundancy	Location code	Date
Barosus	Hydrophilidae	1	UP 13	7.6.2016
Bellamiya bengalensis	Viviparidae	10	BH 1/BH3	24.4.2015
Bellamiya bengalensis	Viviparidae	1	UP 32	February, 2015
Bellamya (Falopaludina) bengalensis	Viviparidae	12	BH 3 in round 1	24.4.2016
Bellamya (Filopaludina) bengalensis	Viviparidae	1	BH 13	January, 2016
Bellamya (filopaludina) bengalensis	Viviparidae	5	JH 1	14.1.2016
Bellamya (Flopaludina) bengalensis	Viviparidae	9	WB 35	24.2.2016
Bellamya bengalensis	Viviparidae	76	BH 3 in round 1	24.4.2016
Bellamya bengalensis	Viviparidae	34	BH 3 downstream	29.12.2015
Bellamya bengalensis	Viviparidae	2	BH 04	29.4. 2015
Bellamya bengalensis	Viviparidae	1	BH 04	29.12.2015
Bellamya bengalensis	Viviparidae	8	BH SK	31.12. 2015
Bellamya bengalensis	Viviparidae	8	BH 05	27.4. 2015
Bellamya bengalensis	Viviparidae	18	BH 05	31.12.2015
Bellamya bengalensis	Viviparidae	16	BH 12 upstream	April, 2015
Bellamya bengalensis	Viviparidae	73	BH 12 Downstream	April, 2015
Bellamya bengalensis	Viviparidae	7	BH V	12.1.2016
Bellamya bengalensis	Viviparidae	5	BH VI	January,2016
Bellamya bengalensis	Viviparidae	2	BH 13	January,2016
Bellamya bengalensis	Viviparidae	2	JH 1	14.1.2016
Bellamya bengalensis	Viviparidae	23	JH 1	14.1.2016

Genus	Family	Abundancy	Location code	Date
Bellamya bengalensis	Viviparidae	1	JH 2	14.1.2016
Bellamya bengalensis	Viviparidae	4	JH 4	14.1.2016
Bellamya bengalensis	Viviparidae	7	UP 3	5.12.2014
Bellamya bengalensis	Viviparidae	47	UP 3	3.5. 2016
Bellamya bengalensis	Viviparidae	1	NA Narora	4.6.2016
Bellamya bengalensis	Viviparidae	9	UP 7	11.5. 2016
Bellamya bengalensis	Viviparidae	16	UP 8	December, 2014
Bellamya bengalensis	Viviparidae	28	UP 8	11.5. 2016
Bellamya bengalensis	Viviparidae	2	UP 9/JBUP 9	17.5.2016
Bellamya bengalensis	Viviparidae	1	UP 12	January, 2015
Bellamya bengalensis	Viviparidae	9	UP 12	8.6.2016
Bellamya bengalensis	Viviparidae	42	UP 18	8.6.2016
Bellamya bengalensis	Viviparidae	9	UP 19	9.6. 2016
Bellamya bengalensis	Viviparidae	1	UP AL1	February, 2015
Bellamya bengalensis	Viviparidae	1	UP AL1	4.10.2016
Bellamya bengalensis	Viviparidae	8	UP III	11.3. 2015
Bellamya bengalensis	Viviparidae	17	UP III	20.10.2016
Bellamya bengalensis	Viviparidae	4	UP IV	11.3. 2015
Bellamya bengalensis	Viviparidae	5	UP IV	20.10.2016
Bellamya bengalensis	Viviparidae	13	UP G	March, 2015
Bellamya bengalensis	Viviparidae	14	UP 32	6.10.2016
Bellamya bengalensis	Viviparidae	3	UP 33	February, 2015
Bellamya bengalensis	Viviparidae	2	UP 38	February, 2015
Bellamya bengalensis	Viviparidae	4	UP 39	4. 10. 2016
Bellamya bengalensis	Viviparidae	8	UP 44	February, 2015
Bellamya bengalensis	Viviparidae	1	UP 49	March, 2015

Genus	Family	Abundancy	Location code	Date
Bellamya bengalensis	Viviparidae	3	UP 50	10.3. 2015
Bellamya bengalensis	Viviparidae	13	UP 50	18.10.2016
Bellamya bengalensis	Viviparidae	4	UP 51	10.3.2015
Bellamya bengalensis	Viviparidae	2	UP 57	13.3. 2015
Bellamya bengalensis	Viviparidae	3	UP 57 Corrected as UP 56	18.10.2016
Bellamya bengalensis	Viviparidae	13	WB 01	26.5. 2015
Bellamya bengalensis	Viviparidae	23	WB 1	29.2. 2016
Bellamya bengalensis	Viviparidae	21	WB 5	24.2. 2016
Bellamya bengalensis	Viviparidae	15	WB 6	27.2.2016
Bellamya bengalensis	Viviparidae	1	WB 7	27.5. 2015
Bellamya bengalensis	Viviparidae	1	WB 7	27.2. 2016
Bellamya bengalensis	Viviparidae	4	WB 9	27.5. 2015
Bellamya bengalensis	Viviparidae	1	WB 12	26.2.2016
Bellamya bengalensis	Viviparidae	7	WB 13	23.5. 2015
Bellamya bengalensis	Viviparidae	1	WB 13	25.2.2016
Bellamya bengalensis	Viviparidae	1	WB 14	23.5. 2015
Bellamya bengalensis	Viviparidae	3	WB 14	28.2. 2016
Bellamya bengalensis	Viviparidae	11	WB 16	21.5. 2015
Bellamya bengalensis	Viviparidae	17	WB 16	23.3. 2016
Bellamya bengalensis	Viviparidae	2	WB 19	18.5. 2015
Bellamya bengalensis juvenile	Viviparidae	1	BH K	January, 2016
Bellamya bengalensis juvenile	Viviparidae	1	UP III	20.10.2016
Bellamya bengalensis juvenile	Viviparidae	1	UP 47	5.10.2016
Bellamya bengalensis juvenile	Viviparidae	1	WB 35	24.2.2016
Bellamyia bengalensis	Viviparidae	1	BH 12 Downstream	28.12.2015

Genus	Family	Abundancy	Location code	Date
Bellamyia bengalensis	Viviparidae	1	UP I	13.01.2015
Beris larva	Stratiomyidae	1	WB 19	18.5. 2015
Beris larva	Stratiomyidae	1	WB 31	27.2.2016
Berosus	Hydrophilidae	1	JH 1	14.1.2016
Berosus	Hydrophilidae	1	JH 4	14.1.2016
Berosus	Hydrophilidae	1	UP 2	26.4. 2016
Berosus	Hydrophilidae	1	UP 3	5.12.2014
Berosus	Hydrophilidae	10	UP 4	December, 2015
Berosus	Hydrophilidae	3	UP 4	28.4. 2016
Berosus	Hydrophilidae	1	UP 6A/ZBGP	16.5.2016
Berosus	Hydrophilidae	1	UP 7	11.5. 2016
Berosus	Hydrophilidae	4	UP 8	December, 2014
Berosus	Hydrophilidae	1	UP 9	18.12. 2014
Berosus	Hydrophilidae	1	UP 14	13.01.2015
Berosus	Hydrophilidae	1	UP 29	9.6. 2016
Berosus	Hydrophilidae	1	UP II	7.6.2016
Berosus	Hydrophilidae	2	UP IV	11.3. 2015
Berosus	Hydrophilidae	1	UP 39	February, 2015
Berosus	Hydrophilidae	1	UP 50	10.3. 2015
Berosus	Hydrophilidae	1	UP 51	10.3.2015
Berosus	Hydrophilidae	1	UP 51	19.10.2016
Berosus	Hydrophilidae	1	Up 56 as UP 55	10.3. 2015
Berosus	Hydrophilidae	2	UP 57	13.3. 2015
Berosus	Hydrophilidae	1	WB 03	29.2. 2016
Berosus	Hydrophilidae	2	WB 4	26.2. 2016
Berosus	Hydrophilidae	2	WB 5	24.2. 2016

Genus	Family	Abundancy	Location code	Date
Berosus	Hydrophilidae	3	WB 16	23.3. 2016
Berosus	Hydrophilidae	3	UP G	March, 2015
Berosus larva	Hydrophilidae	1	BH 11	April, 2015
Berosus larva	Hydrophilidae	1	UP 2	December, 2014
Berosus larva	Hydrophilidae	9	UP 10/UP 11	19.5.2015
Berosus larva	Hydrophilidae	1	UP 11	December, 2014
Berosus larva	Hydrophilidae	1	UP A	16.01.2015
Berosus larva	Hydrophilidae	1	WB 14	23.5. 2015
Bezzia sp.	Ceratopogonidae	1	JH 3	14.1.2016
Bezzia sp.	Ceratopogonidae	6	UK 8b D/S JSTP	27.10.2015
Bezzia sp. larva	Ceratopogonidae	1	UP 51	19.10.2016
Bezzia sp. larva	Ceratopogonidae	1	UP 54	19.10.2016
Bezzia sp. pupa	Ceratopogonidae	1	UK 6	3.11.2015
Bezzia sp., pupa	Ceratopogonidae	1	UK 1	24.11.2015
Bezzia sp., pupa	Ceratopogonidae	13	UK B	25.4.2016
Bezzia sp.,biting midge	Ceratopogonidae	14	UK 4	4.11.2015
Bezzia sp.,biting midge larva	Ceratopogonidae	1	UK 8b D/S JSTP	27.10.2015
Bothrioneurum vejdovskyanum	Tubificidae	1	BH 11	April, 2015
Bothrioneurum vejdovskyanum	Tubificidae	2	UP 53	10.3.2015
Brachiodrillus semperi	Tubificidae	2	UP 19	9.6. 2016
Brachiodrillus semperi	Tubificidae	2	UP 29	16.01.2015
Brachycentrus	Brachycentridae	1	UK 1	24.11.2015
Brachythemis	Libellulidae	1	UP 8	December, 2014

Genus	Family	Abundancy	Location code	Date
Brachythemis	Libellulidae	3	UP 9	18.12. 2014
Brachythemis	Libellulidae	4	UP 11	December, 2014
Brachythemis	Libellulidae	6	UP 12	January, 2015
Brachythemis	Libellulidae	4	UP 19	9.6. 2016
Brachythemis	Libellulidae	4	UP 29	16.01.2015
Brachythemis	Libellulidae	2	UP A	16.01.2015
Brachythemis	Libellulidae	17	UP 32	February, 2015
Brachythemis	Libellulidae	1	UP 33	February, 2015
Brachythemis	Libellulidae	4	UP 38	February, 2015
Brachythemis	Libellulidae	1	UP 50	10.3. 2015
Brachythemis	Libellulidae	1	WB 01	26.5. 2015
Brachythemis	Libellulidae	1	WB 03	27.5. 2015
Branchiodrilus hortensis	Tubificidae	7	UP 3	3.5. 2016
Branchiodrilus semperi	Naididae	18	BH SK	31.12. 2015
Branchiodrilus semperi	Naididae	3	BH 12 Downstream	28.12.2015
Branchiodrilus semperi	Tubificidae	3	UP 3	3.5. 2016
Branchiodrilus semperi	Tubificidae	2	UP 8	December, 2014
Branchiodrilus semperi	Tubificidae	2	UP 8	11.5. 2016
Branchiodrilus semperi	Tubificidae	1	UP II	7.6.2016
Branchiodrilus semperi	Tubificidae	1	UP III	20.10.2016
Branchiodrilus semperi	Tubificidae	4	UP 50	18.10.2016

Genus	Family	Abundancy	Location code	Date
Branchiodrilus sowerbyi	Tubificidae	1	UP 8	December, 2014
Branchiodrilus sowerbyi	Tubificidae	4	UP 13	15.01.2015
Branchiura sowerbyi	Tubificidae	1	UP 3	5.12.2014
Branchiura sowerbyi	Tubificidae	4	UP 12	January, 2015
Branchiura sowerbyi	Tubificidae	1	UP I (UP17)	8.6.2016
Branchiura sowerbyi	Tubificidae	1	UP 50	10.3. 2015
Branchiura sowerbyi	Tubificidae	5	WB 5	24.2. 2016
Branchiura sowerbyi	Tubificidae	6	WB 6	27.2.2016
Branchiura sowerbyi	Tubificidae	2	WB 14	23.5. 2015
Brotia costula costula	Pleuroceridae	1	BH 3 in round 1	24.4.2016
Brotia costula costula	Pleuroceridae	1	BH 04	29.4. 2015
Brotia costula costula	Pleuroceridae	3	BH 04	29.12.2015
Brotia costula costula	Pleuroceridae	4	BH 11	April, 2015
Brotia costula costula	Pleuroceridae	4	BH 12 Downstream	April, 2015
Brotia costula costula	Pleuroceridae	1	BH VI	January, 2016
Brotia costula costula	Pleuroceridae	20	BH 13	January, 2016
Brotia costula costula	Pleuroceridae	4	WB 01	26.5. 2015
Brotia costula costula	Pleuroceridae	7	WB 03	27.5. 2015
Brotia costula costula	Pleuroceridae	7	WB 5	24.2. 2016
Brotia costula costula	Pleuroceridae	6	WB 6	27.2.2016
Brotia costula costula	Pleuroceridae	6	WB 7	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Brotia costula costula	Pleuroceridae	5	WB 9	27.5. 2015
Brotia costula costula	Pleuroceridae	7	WB 10	26.2.2016
Brotia costula costula	Pleuroceridae	22	WB 11	27.5. 2015
Brotia costula costula	Pleuroceridae	5	WB 11	27.2. 2016
Brotia costula costula	Pleuroceridae	19	WB 13	23.5. 2015
Brotia costula costula	Pleuroceridae	3	WB 13	25.2.2016
Brotia costula costula	Pleuroceridae	3	WB 16	23.3. 2016
Brotia costula costula	Pleuroceridae	21	WB 17	21.5.2015
Caenis	Caenidae	1	BH SK	31.12. 2015
Caenis	Caenidae	2	UK B	25.4.2016
Caenis	Caenidae	3	UK 4	4.11.2015
Caenis	Caenidae	2	UK 5	18.11. 2015
Caenis	Caenidae	1	UK 6	3.11.2015
Caenis	Caenidae	1	UP 7	December, 2014
Caenis	Caenidae	1	UP 40	February, 2015
Caenis	Caenidae	3	UP 56 corrected as UP 55	19.10.2016
Canthydrus	Noteridae	6	UP 2	26.4. 2016
Canthydrus	Noteridae	2	UP 3	3.5. 2016
Canthydrus	Noteridae	1	UP 4	28.4. 2016
Canthydrus	Noteridae	1	UP IV	20.10.2016
Canthydrus	Noteridae	1	UP 33	6.10.2016
Canthydrus	Noteridae	1	UP 51	19.10.2016

Genus	Family	Abundancy	Location code	Date
Canthydrus	Noteridae	5	UP 53	19.10.2016
Canthydrus	Noteridae	8	UP 54	19.10.2016
Canthydrus	Noteridae	4	UP 56 corrected as UP 55	19.10.2016
Canthydrus	Noteridae	2	WB 6	27.2.2016
Canthydrus	Noteridae	1	WB 14	28.2. 2016
Canthydrus	Noteridae	1	WB 31	27.2.2016
Caobangia	Sabellidae	3	BH 12 Downstream	28.12.2015
Caobangia	Sabellidae	4	BH VI	January, 2016
Caobangia	Sabellidae	1	BH S	12.1.2016
Caobangia	Sabellidae	3	BH 13	January, 2016
Caobangia	Sabellidae	1	UP 49	20.10.2016
Caobangia	Sabellidae	1	UP 54	19.10.2016
Caobangia	Sabellidae	4	WB 03	29.2. 2016
Caobangia	Sabellidae	2	WB 4	26.2. 2016
Caobangia	Sabellidae	15	WB 7	27.2. 2016
Caobangia	Sabellidae	4	WB 10	26.2.2016
Caobangia	Sabellidae	14	WB 11	27.2. 2016
Caobangia	Sabellidae	3	WB 12	26.2.2016
Caobangia	Sabellidae	6	WB 13	25.2.2016
Caobangia	Sabellidae	2	WB 17	3.3. 2015
Caobangia	Sabellidae	2	WB 19	18.5. 2015
Caobangia	Sabellidae	7	WB 27	25.3.2016
Caobangia	Sabellidae	3	WB 5	24.2. 2016
Caridina bakoensis	Atyidae	27	BH 3 downstream	29.12.2015
Caridina bakoensis	Atyidae	1	BH 8	28.12.2015
Caridina Bakoensis	Atyidae	5	BH M	30.12.2015
Caridina bakoensis	Atyidae	6	BH S	12.1.2016

Genus	Family	Abundancy	Location code	Date
Caridina bakoensis	Atyidae	1	JH 3	14.1.2016
Caridina bakoensis	Atyidae	28	UP 3	3.5. 2016
Caridina bakoensis	Atyidae	13	UP 4	28.4. 2016
Caridina bakoensis	Atyidae	11	UP 8	11.5. 2016
Caridina bakoensis	Atyidae	2	UP 12	8.6.2016
Caridina bakoensis	Atyidae	1	UP 14	7.6.2016
Caridina bakoensis	Atyidae	1	UP 18	8.6.2016
Caridina bakoensis	Atyidae	2	UP III	20.10.2016
Caridina bakoensis	Atyidae	17	UP IV	20.10.2016
Caridina bakoensis	Atyidae	5	WB 6	27.2.2016
Caridina bakoensis	Atyidae	1	WB 7	27.2. 2016
Caridina bakoensis	Atyidae	3	WB 25	23.2.2016
Caridina bakoensis, 2 male, 1 female	Atyidae	3	NA Narora	4.6.2016
Caridina bruneiana	Atyidae	36	BH 08	April, 2015
Caridina bruneiana	Atyidae	3	UP 2	December, 2014
Caridina bruneiana	Atyidae	23	UP 3	5.12.2014
Caridina bruneiana	Atydae	4	UP 49	March, 2015
Caridina bruneiana	Atyidae	20	UP 57	13.3. 2015
Caridina bruneiana	Atyidae	1	WB 03	27.5. 2015
Caridina bruneiana	Atyidae	34	WB 9	27.5. 2015
Caridina bruneiana	Atyidae	10	WB 13	23.5. 2015
Caridina bruneiana	Atyidae	3	WB 14	23.5. 2015
Caridina bruneiana	Atyidae	4	WB 16	21.5. 2015
Caridina bruneiana	Atyidae	1	WB 21	22.5. 2015
Caridina brunieana	Atyidae	35	BH 04	29.4. 2015
Caridina brunieana	Atyidae	1	BH 05	27.4. 2015
Caridina brunieana	Atyidae	3	WB 01	26.5. 2015
Caridina celebensis	Atyidae	18	UP IV	11.3. 2015

Genus	Family	Abundancy	Location code	Date
Caridina elongapoda	Atyidae	59	UP 6	10.5.2016
Caridina endehensis	Atyidae	29	BH 3 in round 1	24.4.2016
Caridina endehensis	Atydae	2	UP 50	10.3. 2015
Caridina endehensis	Atyidae	13	WB 9	27.5. 2015
Caridina endehensis	Atyidae	9	WB 13	23.5. 2015
Caridina endehensis	Atyidae	1	WB 25	23.2.2016
Caridina endehensis	Atyidae	32	WB 34F	26.2.2016
Caridina endehensis	Atyidae	22	WB 34	29.5. 2015
Caridina endehensis	Atyidae	1	WB 35	24.2.2016
Caridina endehnsis	Atyidae	3	BH 04	29.12.2015
Caridina peninsularis	Atyidae	2	UK 6	20.6. 2014
Caridina peninsularis	Atyidae	7	UP 4	December, 2015
Caridina peninsularis	Atyidae	1	UP 4	28.4. 2016
Caridina peninsularis	Atyidae	12	UP 6	December, 2014
Caridina peninsularis	Atyidae	14	UP 7	December, 2014
Caridina peninsularis	Atyidae	18	UP 8	December, 2014
Caridina peninsularis	Atyidae	2	UP 9	18.12. 2014
Caridina peninsularis	Atyidae	9	UP 12	January, 2015
Caridina peninsularis	Atyidae	1	UP 13	15.01.2015
Caridina peninsularis	Atyidae	1	UP I	13.01.2015
Caridina peninsularis	Atyidae	1	UP 19	9.6. 2016

Genus	Family	Abundancy	Location code	Date
Caridina peninsularis	Atyidae	1	UP 29	16.01.2015
Caridina peninsularis	Atyidae	7	UP 32	February, 2015
Caridina peninsularis	Atyidae	7	UP 33	February, 2015
Caridina peninsularis	Atyidae	8	UP 41	February, 2015
Caridina peninsularis	Atyidae	10	UP 44	February, 2015
Caridina peninsularis	Atyidae	2	WB 15	21.5. 2015
Caridina sumatrensis	Atyidae	3	JH 4	14.1.2016
Caridina temasek	Atyidae	4	BH SK	31.12. 2015
Caridina temasek	Atyidae	53	BH 8	28.12.2015
Caridina temasek	Atyidae	16	UP 6A/ZBGP	16.5.2016
Caridina temasek	Atyidae	13	UP 13	7.6.2016
Caridina temasek	Atyidae	8	UP I (UP17)	8.6.2016
Caridina temasek	Atyidae	12	UP 19	9.6. 2016
Caridina temasek	Atyidae	7	UPDG	9.6.2016
Caridina temasek	Atyidae	6	UP 47	5.10.2016
Caridina temasek	Atyidae	11	UP 50	18.10.2016
Caridina temasek	Atyidae	8	WB 1	29.2. 2016
Caridina temasek	Atyidae	2	WB 4	26.2. 2016
Caridina temasek	Atyidae	1	WB 7	27.2. 2016
Caridina temasek	Atyidae	1	WB 14	28.2. 2016
Caridina thambipilaii	Atyidae	7	UP 2	26.4. 2016
Caridina thambipilaii	Atyidae	1	NA Narora	4.6.2016
Caridina thambipilaii	Atyidae	30	UP 8	11.5. 2016
Caridina thambipilaii	Atyidae	3	UP 18	8.6.2016
Caridina thambipilaii	Atyidae	7	UP 19	9.6. 2016

Genus	Family	Abundancy	Location code	Date
Caridina thambipilaii	Atyidae	5	UP 56 corrected as UP 55	19.10.2016
Cheumatopsyche	Hydropsychidae	67	BH 04	29.12.2015
Cheumatopsyche	Hydropsychidae	12	UK B	25.4.2016
Cheumatopsyche	Hydropsychidae	4	UK 5	25.6.2014
Cheumatopsyche	Hydropsychidae	108	UK 5	18.11. 2015
Cheumatopsyche	Hydropsychidae	24	UK 6	3.11.2015
Cheumatopsyche	Hydropsychidae	12	UK 7	28.10.2015
Cheumatopsyche	Hydropsychidae	10	UK 8b D/S JSTP	27.10.2015
Cheumatopsyche	Hydropsychidae	4	UP 9	18.12. 2014
Cheumatopsyche	Hydropsychidae	23	UP 18	15.1.2015
Cheumatopsyche	Hydropsychidae	1	UP 41	February, 2015
Cheumatopsyche	Hydropsychidae	1	UP 44	February, 2015
Cheumatopsyche	Hydropsychidae	22	UK 1	01.07.2014
Chimarra	Philopotamidae	1	UK B	25.4.2016
Chimarra	Philopotamidae	1	UK 5	18.11. 2015
Chironominae	Chironomidae	1	BH 3 in round 1	24.4.2016
Chironominae	Chironomidae	53	BH 3 downstream	29.12.2015
Chironominae	Chironomidae	2	BH 05	31.12.2015
Chironominae	Chironomidae	1	BH 8	28.12.2015
Chironominae	Chironomidae	16	BH 11	April, 2015
Chironominae	Chironomidae	2	BH 12 upstream	April, 2015
Chironominae	Chironomidae	1	BH 12 Downstream	April, 2015
Chironominae	Chironomidae	37	BH 12 Downstream	28.12.2015

Genus	Family	Abundancy	Location code	Date
Chironominae	Chironomidae	37	JH 1	14.1.2016
Chironominae	Chironomidae	10	JH 3	14.1.2016
Chironominae	Chironomidae	14	JH 4	14.1.2016
Chironominae	Chironomidae	1	UK B	25.4.2016
Chironominae	Chironomidae	4	UK 4	4.11.2015
Chironominae	Chironomidae	3	UK 5	18.11. 2015
Chironominae	Chironomidae	35	UK 6	3.11.2015
Chironominae	Chironomidae	1	UK 8b D/S JSTP	27.10.2015
Chironominae	Chironomidae	17	UP 1	1.2.2014
Chironominae	Chironomidae	1	UP 1	26.4. 2016
Chironominae	Chironomidae	3	UP 2	December, 2014
Chironominae	Chironomidae	1	UP 2	26.4. 2016
Chironominae	Chironomidae	10	UP 2	26.4. 2016
Chironominae	Chironomidae	4	UP 3	5.12.2014
Chironominae	Chironomidae	1	UP 3	3.5. 2016
Chironominae	Chironomidae	20	UP 4	December, 2015
Chironominae	Chironomidae	3	UP 6	December, 2014
Chironominae	Chironomidae	25	UP 6A/ZBGP	16.5.2016
Chironominae	Chironominae	14	NL	4.6.2016
Chironominae	Chironomidae	3	UP 7	December, 2014
Chironominae	Chironomidae	1	UP 8	December, 2014
Chironominae	Chironomidae	1	UP 8	11.5. 2016
Chironominae	Chironomidae	4	UP 9	18.12. 2014
Chironominae	Chironomidae	12	UP 10	December, 2014
Chironominae	Chironomidae	1	UP 10/UP 11	19.5.2015

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Chironominae	Chironomidae	276	UP 10/UP 11	19.5.2015
Chironominae	Chironomidae	10	UP 11	December, 2014
Chironominae	Chironomidae	5	UP 12	January, 2015
Chironominae	Chironomidae	4	UP 12	8.6.2016
Chironominae	Chironomidae	7	UP 13	7.6.2016
Chironominae	Chironomidae	8	UP I	13.01.2015
Chironominae	Chironomidae	6	UP I (UP17)	8.6.2016
Chironominae	Chironomidae	5	UP 18	15.1.2015
Chironominae	Chironomidae	13	UP 19	14.01.2015
Chironominae	Chironomidae	2	UP 19	9.6. 2016
Chironominae	Chironomidae	26	UP 19	9.6. 2016
Chironominae	Chironomidae	2	UP 29	9.6. 2016
Chironominae	Chironomidae	26	UP 29	16.01.2015
Chironominae	Chironomidae	12	UP A	16.01.2015
Chironominae	Chironomidae	123	UPDG	9.6.2016
Chironominae	Chironomidae	10	UP AL1	February, 2015
Chironominae	Chironomidae	20	UP II	7.6.2016
Chironominae	Chironomidae	2	UP G	March, 2015
Chironominae	Chironomidae	39	UP G	March, 2015
Chironominae	Chironomidae	11	UP G	18.10.2016
Chironominae	Chironomidae	20	UP 32	February, 2015
Chironominae	Chironomidae	1	UP 33	6.10.2016
Chironominae	Chironomidae	12	UP 38	February, 2015
Chironominae	Chironomidae	3	UP 39	February, 2015
Chironominae	Chironomidae	1	UP 39	4. 10. 2016
Chironominae	Chironomidae	19	UP 41	February, 2015

Genus	Family	Abundancy	Location code	Date
Chironominae	Chironomidae	10	UP 44	February, 2015
Chironominae	Chironomidae	10	UP 44	5.10.2016
Chironominae	Chironomidae	5	UP 49	March, 2015
Chironominae	Chironomidae	2	UP 51	10.3.2015
Chironominae	Chironomidae	24	UP 53	10.3.2015
Chironominae	Chironomidae	9	UP 53	19.10.2016
Chironominae	Chironomidae	19	UP 54	12.3. 2015
Chironominae	Chironomidae	1	UP 54	19.10.2016
Chironominae	Chironomidae	1	Up 56 as UP 55	10.3. 2015
Chironominae	Chironomidae	4	UP 56 corrected as UP 55	19.10.2016
Chironominae	Chironomidae	17	WB 03	27.5. 2015
Chironominae	Chironomidae	1	WB 5	24.2. 2016
Chironominae	Chironomidae	2	WB 7	27.5. 2015
Chironominae	Chironomidae	12	WB 7	27.5. 2015
Chironominae	Chironomidae	2	WB 13	23.5. 2015
Chironominae	Chironomidae	8	WB 13	25.2.2016
Chironominae	Chironomidae	15	WB 14	23.5. 2015
Chironominae	Chironomidae	194	WB 14	28.2. 2016
Chironominae	Chironomidae	7	WB 16	23.3. 2016
Chironomionae	Chironomidae	5	UP 51	19.10.2016
Choroterpedes	Leptophlebidae	5	UK 5	25.6.2014
Choroterpedes	Leptophlebidae	1	UK 7	28.10.2015
Choroterpes	Leptophlebidae	1	UK 6	3.11.2015
Cirolana parva	Cirolanidae	1	WB 01	26.5. 2015
Cirolana parva	Cirolanidae	51	WB 16	21.5. 2015
Cirolana parva	Cirolanidae	13	WB 21	22.5. 2015
Cirolana parva	Cirolanidae	3	WB 34	29.5. 2015

Genus	Family	Abundancy	Location code	Date
Corallana grandiventra	Corrallanidae (Isopoda)	1	WB 21	22.5. 2015
Corallana sp	Corallanidae	1	BH K	January, 2016
Corbicula assamensis	Corbiculidae	1	BH 1/BH3	24.4.2015
Corbicula assamensis	Corbiculidae	1	BH 3 downstream	29.12.2015
Corbicula assamensis	Corbiculidae	10	BH 04	29.12.2015
Corbicula assamensis	Corbiculidae	11	BH SK	31.12. 2015
Corbicula assamensis	Corbiculidae	1	BH M	30.12.2015
Corbicula assamensis	Corbiculidae	19	BH V	12.1.2016
Corbicula assamensis	Corbiculidae	1	BH 13	January, 2016
Corbicula assamensis	Corbiculidae	4	BH K	January, 2016
Corbicula assamensis	Corbiculidae	1	JH 3	14.1.2016
Corbicula assamensis	Corbiculidae	3	UP 3	3.5. 2016
Corbicula assamensis	Corbiculidae	2	UP 6A/ZBGP	16.5.2016
Corbicula assamensis	Corbiculidae	6	UP 6	10.5.2016
Corbicula assamensis	Corbicula assamensis	5	NL Anupshahar d/s, near mastram murdaghat	4.6.2016
Corbicula assamensis	Corbiculidae	1	UP 7	December, 2014
Corbicula assamensis	Corbiculidae	1	UP 8	December, 2014

Genus	Family	Abundancy	Location code	Date
Corbicula assamensis	Corbiculidae	1	UP 9	18.12. 2014
Corbicula assamensis	Corbiculidae	10	UP 9/JBUP 9	17.5.2016
Corbicula assamensis	Corbiculidae	1	UP 13	15.01.2015
Corbicula assamensis	Corbiculidae	1	UP 14	13.01.2015
Corbicula assamensis	Corbiculidae	5	UP 18	15.1.2015
Corbicula assamensis	Corbiculidae	10	UP 18	8.6.2016
Corbicula assamensis	Corbiculidae	1	UP 19	14.01.2015
Corbicula assamensis	Corbiculidae	3	UP 19	9.6. 2016
Corbicula assamensis	Corbiculidae	1	UPDG	9.6.2016
Corbicula assamensis	Corbiculidae	2	UP III	11.3. 2015
Corbicula assamensis	Corbiculidae	4	UP IV	11.3. 2015
Corbicula assamensis	Corbiculidae	2	UP IV	20.10.2016
Corbicula assamensis	Corbiculidae	1	UP 32	February, 2015
Corbicula assamensis	Corbiculidae	1	UP 32	6.10.2016
Corbicula assamensis	Corbiculidae	1	UP 33	6.10.2016
Corbicula assamensis	Corbiculidae	1	UP 38	February, 2015
Corbicula assamensis	Corbiculidae	2	UP 39	February, 2015
Corbicula assamensis	Corbiculidae	2	UP 41	February, 2015

Genus	Family	Abundancy	Location code	Date
Corbicula assamensis	Corbiculidae	4	UP 41	6.10.2016
Corbicula assamensis	Corbiculidae	1	UP 49	March, 2015
Corbicula assamensis	Corbiculidae	5	UP 49	20.10.2016
Corbicula assamensis	Corbiculidae	1	UP 51	19.10.2016
Corbicula assamensis	Corbiculidae	1	UP 54	19.10.2016
Corbicula assamensis	Corbiculidae	2	UP 57	13.3. 2015
Corbicula assamensis	Corbiculidae	1	WB 01	26.5. 2015
Corbicula assamensis	Corbiculidae	2	WB 1	29.2. 2016
Corbicula assamensis	Corbiculidae	1	WB 02	27.5. 2015
Corbicula assamensis	Corbiculidae	1	WB 03	27.5. 2015
Corbicula assamensis	Corbiculidae	1	WB 6	27.2.2016
Corbicula assamensis	Corbiculidae	4	WB 7	27.2. 2016
Corbicula assamensis	Corbiculidae	1	WB 14	23.5. 2015
Corbicula bensoni	Corbiculidae	3	BH 04	29.12.2015
Corbicula bensoni	Corbiculidae	8	BH 12 Downstream	28.12.2015
Corbicula bensoni	Corbiculidae	15	BH V	12.1.2016
Corbicula bensoni	Corbiculidae	10	BH VI	January,2016
Corbicula bensoni	Corbiculidae	1	BH S	12.1.2016
Corbicula bensoni	Corbiculidae	1	BH 13	January, 2016
Corbicula bensoni	Corbiculidae	94	BH K	January, 2016

Genus	Family	Abundancy	Location code	Date
Corbicula bensoni	Corbiculidae	1	JH 1	14.1.2016
Corbicula bensoni	Corbiculidae	10	JH 1	14.1.2016
Corbicula bensoni	Corbiculidae	5	JH 2	14.1.2016
Corbicula bensoni	Corbiculidae	6	JH 3	14.1.2016
Corbicula bensoni	Corbiculidae	18	JH 4	14.1.2016
Corbicula bensoni	Corbiculidae	1	UP 7	December, 2014
Corbicula bensoni	Corbiculidae	7	UP 9	18.12. 2014
Corbicula bensoni	Corbiculidae	3	UP 9/JBUP 9	17.5.2016
Corbicula bensoni	Corbiculidae	6	UP 18	15.1.2015
Corbicula bensoni	Corbiculidae	2	UP 18	8.6.2016
Corbicula bensoni	Corbiculidae	1	UP G	March, 2015
Corbicula bensoni	Corbiculidae	1	UP 40	4.10. 2016
Corbicula bensoni	Corbiculidae	4	UP 49	March, 2015
Corbicula bensoni	Corbiculidae	2	UP 54	12.3. 2015
Corbicula bensoni	Corbiculidae	3	WB 01	26.5. 2015
Corbicula bensoni	Corbiculidae	9	WB 1	29.2. 2016
Corbicula bensoni	Corbiculidae	3	WB 2	29.2 2016
Corbicula bensoni	Corbiculidae	1	WB 03	27.5. 2015
Corbicula bensoni	Corbiculidae	2	WB 03	29.2. 2016
Corbicula bensoni	Corbiculidae	1	WB 4	26.2. 2016
Corbicula bensoni	Corbiculidae	1	WB 6	27.2.2016
Corbicula bensoni	Corbiculidae	30	WB 7	27.2. 2016
Corbicula bensoni	Corbiculidae	14	WB 11	27.2. 2016
Corbicula bensoni	Corbiculidae	90	WB 12	26.2.2016
Corbicula bensoni	Corbiculidae	2	WB 13	25.2.2016
Corbicula bensoni	Corbiculidae	1	WB 14	23.5. 2015
Corbicula bensoni	Corbiculidae	7	WB 14	28.2. 2016
Corbicula bensoni	Corbiculidae	10	WB 19	18.5. 2015
Corbicula bensoni	Corbiculidae	1	UP 1	26.4. 2016

Genus	Family	Abundancy	Location code	Date
Corbicula bensoni	Corbiculidae	4	WB 10	26.2.2016
Corbicula bensoni juvenile	Corbiculidae	11	BH M	30.12.2015
Corbicula striatella	Corbiculidae	2	BH 3 in round 1	24.4.2016
Corbicula striatella	Corbiculidae	136	BH 04	29.12.2015
Corbicula striatella	Corbiculidae	12	BH SK	31.12. 2015
Corbicula striatella	Corbiculidae	5	BH 12 Downstream	28.12.2015
Corbicula striatella	Corbiculidae	101	BH M	30.12.2015
Corbicula striatella	Corbiculidae	21	BH V	12.1.2016
Corbicula striatella	Corbiculidae	1	BH S	12.1.2016
Corbicula striatella	Corbiculidae	2	BH 13	January, 2016
Corbicula striatella	Corbiculidae	15	BH K	January, 2016
Corbicula striatella	Corbiculidae	2	JH 1	14.1.2016
Corbicula striatella	Corbiculidae	2	JH 1	14.1.2016
Corbicula striatella	Corbiculidae	1	JH 2	14.1.2016
Corbicula striatella	Corbiculidae	5	JH 3	14.1.2016
Corbicula striatella	Corbiculidae	2	JH 4	14.1.2016
Corbicula striatella	Corbiculidae	4	UP 4	28.4. 2016
Corbicula striatella	Corbiculidae	7	UP 6A/ZBGP	16.5.2016
Corbicula striatella	Corbiculidae	21	UP 6	10.5.2016
Corbicula striatella	Corbicula striatella	28	NL	4.6.2016
Corbicula striatella	Corbiculidae	1	UP 7	December, 2014
Corbicula striatella	Corbiculidae	1	UP 7	11.5. 2016
Corbicula striatella	Corbiculidae	2	UP 8	December, 2014
Corbicula striatella	Corbiculidae	1	UP 8	11.5. 2016
Corbicula striatella	Corbiculidae	9	UP 9/JBUP 9	17.5.2016
Corbicula striatella	Corbiculidae	2	UP II	14.01.2015

Genus	Family	Abundancy	Location code	Date
Corbicula striatella	Corbiculidae	1	UP 12	January, 2015
Corbicula striatella	Corbiculidae	10	UP 18	15.1.2015
Corbicula striatella	Corbiculidae	9	UP 18	8.6.2016
Corbicula striatella	Corbiculidae	2	UP 19	9.6. 2016
Corbicula striatella	Corbiculidae	2	UP AL1	February, 2015
Corbicula striatella	Corbiculidae	1	UP AL1	4.10.2016
Corbicula striatella	Corbiculidae	2	UP II	14.01.2015
Corbicula striatella	Corbiculidae	1	UP III	11.3. 2015
Corbicula striatella	Corbiculidae	2	UP G	March, 2015
Corbicula striatella	Corbiculidae	1	UP 32	February, 2015
Corbicula striatella	Corbiculidae	2	UP 33	February, 2015
Corbicula striatella	Corbiculidae	1	UP 39	February, 2015
Corbicula striatella	Corbiculidae	3	UP 41	February, 2015
Corbicula striatella	Corbiculidae	2	UP 41	6.10.2016
Corbicula striatella	Corbiculidae	7	UP 47	5.10.2016
Corbicula striatella	Corbiculidae	2	UP 49	March, 2015
Corbicula striatella	Corbiculidae	2	UP 57 Corrected as UP 56	18.10.2016
Corbicula striatella	Corbiculidae	1	WB 1	29.2. 2016
Corbicula striatella	Corbiculidae	2	WB 2	29.2 2016
Corbicula striatella	Corbiculidae	2	WB 03	27.5. 2015
Corbicula striatella	Corbiculidae	2	WB 03	29.2. 2016
Corbicula striatella	Corbiculidae	1	WB 5	24.2. 2016
Corbicula striatella	Corbiculidae	3	WB 14	28.2. 2016
Corbicula striatella juvenile	Corbiculidae	2	UP 54	12.3. 2015

Genus	Family	Abundancy	Location code	Date
Corbicula striatella juvenile	Corbiculidae	1	WB 7	27.2. 2016
Corbicula striatella juvenile	Corbiculidae	2	WB 7	27.2. 2016
Corbiculla striatella	Corbiculidae	6	BH VI	January, 2016
Corbiculla striatella	Corbiculidae	1	UP 12	8.6.2016
Corixa	Corixidae	1	BH 04	29.4. 2015
Corixa	Corixidae	3	BH 08	April, 2015
Corixa	Corixidae	2	BH 12 upstream	April, 2015
Corixa	Corixidae	9	BH 12 Downstream	April, 2015
Corixa	Corixidae	1	JH 4	14.1.2016
Corixa	Corixidae	11	UP 4	28.4. 2016
Corixa	Corixidae	8	UP 7	11.5. 2016
Corixa	Corixidae	5	UP 8	11.5. 2016
Corixa	Corixidae	2	UP 10/UP 11	19.5.2015
Corixa	Corixidae	18	UP G	March, 2015
Corixa	Corixidae	13	UP 49	March, 2015
Corixa	Corixidae	7	UP 50	10.3. 2015
Corixa	Corixidae	2	UP 51	10.3.2015
Corixa	Corixidae	1	UP 53	10.3.2015
Corixa	Corixidae	2	UP 53	19.10.2016
Corixa	Corixidae	1	UP 54	12.3. 2015
Corixa	Corixidae	7	UP 57	13.3. 2015
Corixa	Corixidae	1	WB 03	27.5. 2015
Corixa	Corixidae	10	WB 14	23.5. 2015
Corixa	Corixidae	4	UP III	11.3. 2015
Corixa	Corixidae	13	WB 01	26.5. 2015
Corixa female	Corixidae	2	BH 3 downstream	29.12.2015

Genus	Family	Abundancy	Location code	Date
Corixa, male,female	Corixidae	2	UP 6	10.5.2016
Culex larva	Culicidae	1	UP 14	13.01.2015
Culex pupa	Culicidae	2	UP 4	December, 2015
Cybister larva	Dytiscidae	1	BH 12 Downstream	April, 2015
Cybister larva	Dytiscidae	1	UP 4	28.4. 2016
Cybister larva	Dytiscidae	2	UP 7	11.5. 2016
Cybister larva	Dytiscidae	2	UP 10/UP 11	19.5.2015
Cybister larva	Dytiscidae	1	UP 14	7.6.2016
Cybister larva	Dytiscidae	3	UP IV	11.3. 2015
Cybister larva	Hydrophilidae	1	UP G	March, 2015
Cybister larva	Dytiscidae	2	UP 57	13.3. 2015
Cyclestheria hislopi	Conchostrucha	1	BH 05	31.12.2015
Cylindrostethus scrutator	Garridae	2	BH 1/BH3	24.4.2015
Cynigmina	Heptageniidae	1	UK 1	01.07.2014
Cynigmina	Hepatgeniidae	8	UK 1	24.11.2015
Cynigmina	Heptageniidae	8	UK B	25.4.2016
Cynigmina	Heptageniidae	47	UK 4	4.11.2015
Cynigmina	Heptageniidae	1	UK 5	25.6.2014
Cynigmina	Heptageniidae	23	UK 5	18.11. 2015
Cynigmina	Heptageniidae	65	UK 6	3.11.2015
Cynigmina	Heptageniidae	1	UK 8b D/S JSTP	27.10.2015
Cyphon	Scirtidae larva	1	WB 16	23.3. 2016
Cyphon larva	Scritidae	1	UK 1	01.07.2014
Cyphon larva	Scirtidae	1	UP 39	4. 10. 2016
Cyphon larva	Scirtidae	1	WB 31	27.2.2016
Dendrodrillus rubidus	Lumbricidae	1	UP 3	5.12.2014

Genus	Family	Abundancy	Location code	Date
Dendrodrilus rubidus	Lumbricidae	1	BH 12 Downstream	April, 2015
Dendrodrilus rubidus	Lumbricidae	1	UP 6	December, 2014
Dendronereides heteropoda	Nereididae	3	WB 17	21.5.2015
Dendronereides heteropoda	Nereididae	10	WB 21	22.5. 2015
Dendronereides heteropoda	Nereididae	9	WB 25	23.2.2016
Dendronereidus heteropoda	Nereididae	2	WB 27	25.3.2016
Dero dorsalis	Naididae	1	BH 12 Downstream	April, 2015
Deronectes larva	Dytiscidae	26	UP 8	December, 2014
Caridina temasek	Atyidae	1	WB 7	27.2. 2016
Caridina temasek	Atyidae	1	WB 14	28.2. 2016
Caridina thambipilaii	Atyidae	7	UP 2	26.4. 2016
Caridina thambipilaii	Atyidae	1	NA Narora	4.6.2016
Caridina thambipilaii	Atyidae	30	UP 8	11.5. 2016
Caridina thambipilaii	Atyidae	3	UP 18	8.6.2016
Caridina thambipilaii	Atyidae	7	UP 19	9.6. 2016
Caridina thambipilaii	Atyidae	5	UP 56 corrected as UP 55	19.10.2016
Cheumatopsyche	Hydropsychidae	67	BH 04	29.12.2015
Cheumatopsyche	Hydropsychidae	12	UK B	25.4.2016
Cheumatopsyche	Hydropsychidae	4	UK 5	25.6.2014
Cheumatopsyche	Hydropsychidae	108	UK 5	18.11. 2015
Cheumatopsyche	Hydropsychidae	24	UK 6	3.11.2015
Cheumatopsyche	Hydropsychidae	12	UK 7	28.10.2015
Cheumatopsyche	Hydropsychidae	10	UK 8b D/S JSTP	27.10.2015

Genus	Family	Abundancy	Location code	Date
Cheumatopsyche	Hydropsychidae	4	UP 9	18.12. 2014
Cheumatopsyche	Hydropsychidae	23	UP 18	15.1.2015
Cheumatopsyche	Hydropsychidae	1	UP 41	February, 2015
Cheumatopsyche	Hydropsychidae	1	UP 44	February, 2015
Cheumatopsyche	Hydropsychidae	22	UK 1	01.07.2014
Chimarra	Philopotamidae	1	UK B	25.4.2016
Chimarra	Philopotamidae	1	UK 5	18.11. 2015
Chironominae	Chironomidae	1	BH 3 in round 1	24.4.2016
Chironominae	Chironomidae	53	BH 3 downstream	29.12.2015
Chironominae	Chironomidae	2	BH 05	31.12.2015
Chironominae	Chironomidae	1	BH 8	28.12.2015
Chironominae	Chironomidae	16	BH 11	April, 2015
Chironominae	Chironomidae	2	BH 12 upstream	April, 2015
Chironominae	Chironomidae	1	BH 12 Downstream	April, 2015
Chironominae	Chironomidae	37	BH 12 Downstream	28.12.2015
Chironominae	Chironomidae	37	JH 1	14.1.2016
Chironominae	Chironomidae	10	JH 3	14.1.2016
Chironominae	Chironomidae	14	JH 4	14.1.2016
Chironominae	Chironomidae	1	UK B	25.4.2016
Chironominae	Chironomidae	4	UK 4	4.11.2015
Chironominae	Chironomidae	3	UK 5	18.11. 2015
Chironominae	Chironomidae	35	UK 6	3.11.2015
Chironominae	Chironomidae	1	UK 8b D/S JSTP	27.10.2015
Chironominae	Chironomidae	17	UP 1	1.2.2014

Genus	Family	Abundancy	Location code	Date
Chironominae	Chironomidae	1	UP 1	26.4. 2016
Chironominae	Chironomidae	3	UP 2	December, 2014
Chironominae	Chironomidae	1	UP 2	26.4. 2016
Chironominae	Chironomidae	10	UP 2	26.4. 2016
Chironominae	Chironomidae	4	UP 3	5.12.2014
Chironominae	Chironomidae	1	UP 3	3.5. 2016
Chironominae	Chironomidae	20	UP 4	December, 2015
Chironominae	Chironomidae	3	UP 6	December, 2014
Chironominae	Chironomidae	25	UP 6A/ZBGP	16.5.2016
Chironominae	Chironominae	14	NL	4.6.2016
Chironominae	Chironomidae	3	UP 7	December, 2014
Chironominae	Chironomidae	1	UP 8	December, 2014
Chironominae	Chironomidae	1	UP 8	11.5. 2016
Chironominae	Chironomidae	4	UP 9	18.12. 2014
Chironominae	Chironomidae	12	UP 10	December, 2014
Chironominae	Chironomidae	1	UP 10/UP 11	19.5.2015
Chironominae	Chironomidae	276	UP 10/UP 11	19.5.2015
Chironominae	Chironomidae	10	UP 11	December, 2014
Chironominae	Chironomidae	5	UP 12	January, 2015
Chironominae	Chironomidae	4	UP 12	8.6.2016
Chironominae	Chironomidae	7	UP 13	7.6.2016
Chironominae	Chironomidae	8	UP I	13.01.2015
Chironominae	Chironomidae	6	UP I (UP17)	8.6.2016
Chironominae	Chironomidae	5	UP 18	15.1.2015
Chironominae	Chironomidae	13	UP 19	14.01.2015

Genus	Family	Abundancy	Location code	Date
Chironominae	Chironomidae	2	UP 19	9.6. 2016
Chironominae	Chironomidae	26	UP 19	9.6. 2016
Chironominae	Chironomidae	2	UP 29	9.6. 2016
Chironominae	Chironomidae	26	UP 29	16.01.2015
Chironominae	Chironomidae	12	UP A	16.01.2015
Chironominae	Chironomidae	123	UPDG	9.6.2016
Chironominae	Chironomidae	10	UP AL1	February, 2015
Chironominae	Chironomidae	20	UP II	7.6.2016
Chironominae	Chironomidae	2	UP G	March, 2015
Chironominae	Chironomidae	39	UP G	March, 2015
Chironominae	Chironomidae	11	UP G	18.10.2016
Chironominae	Chironomidae	20	UP 32	February, 2015
Chironominae	Chironomidae	1	UP 33	6.10.2016
Chironominae	Chironomidae	12	UP 38	February, 2015
Chironominae	Chironomidae	3	UP 39	February, 2015
Chironominae	Chironomidae	1	UP 39	4. 10. 2016
Chironominae	Chironomidae	19	UP 41	February, 2015
Chironominae	Chironomidae	10	UP 44	February, 2015
Chironominae	Chironomidae	10	UP 44	5.10.2016
Chironominae	Chironomidae	5	UP 49	March, 2015
Chironominae	Chironomidae	2	UP 51	10.3.2015
Chironominae	Chironomidae	24	UP 53	10.3.2015
Chironominae	Chironomidae	9	UP 53	19.10.2016
Chironominae	Chironomidae	19	UP 54	12.3. 2015
Chironominae	Chironomidae	1	UP 54	19.10.2016

Genus	Family	Abundancy	Location code	Date
Chironominae	Chironomidae	1	Up 56 as UP 55	10.3. 2015
Chironominae	Chironomidae	4	UP 56 corrected as UP 55	19.10.2016
Chironominae	Chironomidae	17	WB 03	27.5. 2015
Chironominae	Chironomidae	1	WB 5	24.2. 2016
Chironominae	Chironomidae	2	WB 7	27.5. 2015
Chironominae	Chironomidae	12	WB 7	27.5. 2015
Chironominae	Chironomidae	2	WB 13	23.5. 2015
Chironominae	Chironomidae	8	WB 13	25.2.2016
Chironominae	Chironomidae	15	WB 14	23.5. 2015
Chironominae	Chironomidae	194	WB 14	28.2. 2016
Chironominae	Chironomidae	7	WB 16	23.3. 2016
Chironomionae	Chironomidae	5	UP 51	19.10.2016
Choroterpedes	Leptophlebidae	5	UK 5	25.6.2014
Choroterpedes	Leptophlebidae	1	UK 7	28.10.2015
Choroterpes	Leptophlebidae	1	UK 6	3.11.2015
Cirolana parva	Cirolanidae	1	WB 01	26.5. 2015
Cirolana parva	Cirolanidae	51	WB 16	21.5. 2015
Cirolana parva	Cirolanidae	13	WB 21	22.5. 2015
Cirolana parva	Cirolanidae	3	WB 34	29.5. 2015
Corallana grandiventra	Corrallanidae (Isopoda)	1	WB 21	22.5. 2015
Corallana sp	Corallanidae	1	BH K	January, 2016
Corbicula assamensis	Corbiculidae	1	BH 1/BH3	24.4.2015
Corbicula assamensis	Corbiculidae	1	BH 3 downstream	29.12.2015
Corbicula assamensis	Corbiculidae	10	BH 04	29.12.2015

Genus	Family	Abundancy	Location code	Date
Corbicula assamensis	Corbiculidae	11	BH SK	31.12. 2015
Corbicula assamensis	Corbiculidae	1	BH M	30.12.2015
Corbicula assamensis	Corbiculidae	19	BH V	12.1.2016
Corbicula assamensis	Corbiculidae	1	BH 13	January, 2016
Corbicula assamensis	Corbiculidae	4	BH K	January, 2016
Corbicula assamensis	Corbiculidae	1	JH 3	14.1.2016
Corbicula assamensis	Corbiculidae	3	UP 3	3.5. 2016
Corbicula assamensis	Corbiculidae	2	UP 6A/ZBGP	16.5.2016
Corbicula assamensis	Corbiculidae	6	UP 6	10.5.2016
Corbicula assamensis	Corbiculidae	5	NL	4.6.2016
Corbicula assamensis	Corbiculidae	1	UP 7	December, 2014
Corbicula assamensis	Corbiculidae	1	UP 8	December, 2014
Corbicula assamensis	Corbiculidae	1	UP 9	18.12. 2014
Corbicula assamensis	Corbiculidae	10	UP 9/JBUP 9	17.5.2016
Corbicula assamensis	Corbiculidae	1	UP 13	15.01.2015
Corbicula assamensis	Corbiculidae	1	UP 14	13.01.2015
Corbicula assamensis	Corbiculidae	5	UP 18	15.1.2015
Corbicula assamensis	Corbiculidae	10	UP 18	8.6.2016

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Corbicula assamensis	Corbiculidae	1	UP 19	14.01.2015
Corbicula assamensis	Corbiculidae	3	UP 19	9.6. 2016
Corbicula assamensis	Corbiculidae	1	UPDG	9.6.2016
Corbicula assamensis	Corbiculidae	2	UP III	11.3. 2015
Corbicula assamensis	Corbiculidae	4	UP IV	11.3. 2015
Corbicula assamensis	Corbiculidae	2	UP IV	20.10.2016
Corbicula assamensis	Corbiculidae	1	UP 32	February, 2015
Corbicula assamensis	Corbiculidae	1	UP 32	6.10.2016
Corbicula assamensis	Corbiculidae	1	UP 33	6.10.2016
Corbicula assamensis	Corbiculidae	1	UP 38	February, 2015
Corbicula assamensis	Corbiculidae	2	UP 39	February, 2015
Corbicula assamensis	Corbiculidae	2	UP 41	February, 2015
Corbicula assamensis	Corbiculidae	4	UP 41	6.10.2016
Corbicula assamensis	Corbiculidae	1	UP 49	March, 2015
Corbicula assamensis	Corbiculidae	5	UP 49	20.10.2016
Corbicula assamensis	Corbiculidae	1	UP 51	19.10.2016
Corbicula assamensis	Corbiculidae	1	UP 54	19.10.2016
Corbicula assamensis	Corbiculidae	2	UP 57	13.3. 2015

Genus	Family	Abundancy	Location code	Date
Corbicula assamensis	Corbiculidae	1	WB 01	26.5. 2015
Corbicula assamensis	Corbiculidae	2	WB 1	29.2. 2016
Corbicula assamensis	Corbiculidae	1	WB 02	27.5. 2015
Corbicula assamensis	Corbiculidae	1	WB 03	27.5. 2015
Corbicula assamensis	Corbiculidae	1	WB 6	27.2.2016
Corbicula assamensis	Corbiculidae	4	WB 7	27.2. 2016
Corbicula assamensis	Corbiculidae	1	WB 14	23.5. 2015
Corbicula bensoni	Corbiculidae	3	BH 04	29.12.2015
Corbicula bensoni	Corbiculidae	8	BH 12 Downstream	28.12.2015
Corbicula bensoni	Corbiculidae	15	BH V	12.1.2016
Corbicula bensoni	Corbiculidae	10	BH VI	January,2016
Corbicula bensoni	Corbiculidae	1	BH S	12.1.2016
Corbicula bensoni	Corbiculidae	1	BH 13	January, 2016
Corbicula bensoni	Corbiculidae	94	BH K	January, 2016
Corbicula bensoni	Corbiculidae	1	JH 1	14.1.2016
Corbicula bensoni	Corbiculidae	10	JH 1	14.1.2016
Corbicula bensoni	Corbiculidae	5	JH 2	14.1.2016
Corbicula bensoni	Corbiculidae	6	JH 3	14.1.2016
Corbicula bensoni	Corbiculidae	18	JH 4	14.1.2016
Corbicula bensoni	Corbiculidae	1	UP 7	December, 2014
Corbicula bensoni	Corbiculidae	7	UP 9	18.12. 2014
Corbicula bensoni	Corbiculidae	3	UP 9/JBUP 9	17.5.2016
Corbicula bensoni	Corbiculidae	6	UP 18	15.1.2015
Corbicula bensoni	Corbiculidae	2	UP 18	8.6.2016

Genus	Family	Abundancy	Location code	Date
Corbicula bensoni	Corbiculidae	1	UP G	March, 2015
Corbicula bensoni	Corbiculidae	1	UP 40	4.10. 2016
Corbicula bensoni	Corbiculidae	4	UP 49	March, 2015
Corbicula bensoni	Corbiculidae	2	UP 54	12.3. 2015
Corbicula bensoni	Corbiculidae	3	WB 01	26.5. 2015
Corbicula bensoni	Corbiculidae	9	WB 1	29.2. 2016
Corbicula bensoni	Corbiculidae	3	WB 2	29.2 2016
Corbicula bensoni	Corbiculidae	1	WB 03	27.5. 2015
Corbicula bensoni	Corbiculidae	2	WB 03	29.2. 2016
Corbicula bensoni	Corbiculidae	1	WB 4	26.2. 2016
Corbicula bensoni	Corbiculidae	1	WB 6	27.2.2016
Corbicula bensoni	Corbiculidae	30	WB 7	27.2. 2016
Corbicula bensoni	Corbiculidae	14	WB 11	27.2. 2016
Corbicula bensoni	Corbiculidae	90	WB 12	26.2.2016
Corbicula bensoni	Corbiculidae	2	WB 13	25.2.2016
Corbicula bensoni	Corbiculidae	1	WB 14	23.5. 2015
Corbicula bensoni	Corbiculidae	7	WB 14	28.2. 2016
Corbicula bensoni	Corbiculidae	10	WB 19	18.5. 2015
Corbicula bensoni	Corbiculidae	1	UP 1	26.4. 2016
Corbicula bensoni	Corbiculidae	4	WB 10	26.2.2016
Corbicula bensoni juvenile	Corbiculidae	11	BH M	30.12.2015
Corbicula striatella	Corbiculidae	2	BH 3 in round 1	24.4.2016
Corbicula striatella	Corbiculidae	136	BH 04	29.12.2015
Corbicula striatella	Corbiculidae	12	BH SK	31.12. 2015
Corbicula striatella	Corbiculidae	5	BH 12 Downstream	28.12.2015
Corbicula striatella	Corbiculidae	101	BH M	30.12.2015
Corbicula striatella	Corbiculidae	21	BH V	12.1.2016

Genus	Family	Abundancy	Location code	Date
Corbicula striatella	Corbiculidae	1	BH S	12.1.2016
Corbicula striatella	Corbiculidae	2	BH 13	January, 2016
Corbicula striatella	Corbiculidae	15	BH K	January, 2016
Corbicula striatella	Corbiculidae	2	JH 1	14.1.2016
Corbicula striatella	Corbiculidae	2	JH 1	14.1.2016
Corbicula striatella	Corbiculidae	1	JH 2	14.1.2016
Corbicula striatella	Corbiculidae	5	JH 3	14.1.2016
Corbicula striatella	Corbiculidae	2	JH 4	14.1.2016
Corbicula striatella	Corbiculidae	4	UP 4	28.4. 2016
Corbicula striatella	Corbiculidae	7	UP 6A/ZBGP	16.5.2016
Corbicula striatella	Corbiculidae	21	UP 6	10.5.2016
Corbicula striatella	Corbicula striatella	28	NL	4.6.2016
Corbicula striatella	Corbiculidae	1	UP 7	December, 2014
Corbicula striatella	Corbiculidae	1	UP 7	11.5. 2016
Corbicula striatella	Corbiculidae	2	UP 8	December, 2014
Corbicula striatella	Corbiculidae	1	UP 8	11.5. 2016
Corbicula striatella	Corbiculidae	9	UP 9/JBUP 9	17.5.2016
Corbicula striatella	Corbiculidae	2	UP II	14.01.2015
Corbicula striatella	Corbiculidae	1	UP 12	January, 2015
Corbicula striatella	Corbiculidae	10	UP 18	15.1.2015
Corbicula striatella	Corbiculidae	9	UP 18	8.6.2016
Corbicula striatella	Corbiculidae	2	UP 19	9.6. 2016
Corbicula striatella	Corbiculidae	2	UP AL1	February, 2015
Corbicula striatella	Corbiculidae	1	UP AL1	4.10.2016
Corbicula striatella	Corbiculidae	2	UP II	14.01.2015
Corbicula striatella	Corbiculidae	1	UP III	11.3. 2015
Corbicula striatella	Corbiculidae	2	UP G	March, 2015

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Corbicula striatella	Corbiculidae	1	UP 32	February, 2015
Corbicula striatella	Corbiculidae	2	UP 33	February, 2015
Corbicula striatella	Corbiculidae	1	UP 39	February, 2015
Corbicula striatella	Corbiculidae	3	UP 41	February, 2015
Corbicula striatella	Corbiculidae	2	UP 41	6.10.2016
Corbicula striatella	Corbiculidae	7	UP 47	5.10.2016
Corbicula striatella	Corbiculidae	2	UP 49	March, 2015
Corbicula striatella	Corbiculidae	2	UP 57 Corrected as UP 56	18.10.2016
Corbicula striatella	Corbiculidae	1	WB 1	29.2. 2016
Corbicula striatella	Corbiculidae	2	WB 2	29.2 2016
Corbicula striatella	Corbiculidae	2	WB 03	27.5. 2015
Corbicula striatella	Corbiculidae	2	WB 03	29.2. 2016
Corbicula striatella	Corbiculidae	1	WB 5	24.2. 2016
Corbicula striatella	Corbiculidae	3	WB 14	28.2. 2016
Corbicula striatella juvenile	Corbiculidae	2	UP 54	12.3. 2015
Corbicula striatella juvenile	Corbiculidae	1	WB 7	27.2. 2016
Corbicula striatella juvenile	Corbiculidae	2	WB 7	27.2. 2016
Corbiculla striatella	Corbiculidae	6	BH VI	January,2016
Corbiculla striatella	Corbiculidae	1	UP 12	8.6.2016
Corixa	Corixidae	1	BH 04	29.4. 2015
Corixa	Corixidae	3	BH 08	April, 2015
Corixa	Corixidae	2	BH 12 upstream	April, 2015
Corixa	Corixidae	9	BH 12 Downstream	April, 2015

Genus	Family	Abundancy	Location code	Date
Corixa	Corixidae	1	JH 4	14.1.2016
Corixa	Corixidae	11	UP 4	28.4. 2016
Corixa	Corixidae	8	UP 7	11.5. 2016
Corixa	Corixidae	5	UP 8	11.5. 2016
Corixa	Corixidae	2	UP 10/UP 11	19.5.2015
Corixa	Corixidae	18	UP G	March, 2015
Corixa	Corixidae	13	UP 49	March, 2015
Corixa	Corixidae	7	UP 50	10.3. 2015
Corixa	Corixidae	2	UP 51	10.3.2015
Corixa	Corixidae	1	UP 53	10.3.2015
Corixa	Corixidae	2	UP 53	19.10.2016
Corixa	Corixidae	1	UP 54	12.3. 2015
Corixa	Corixidae	7	UP 57	13.3. 2015
Corixa	Corixidae	1	WB 03	27.5. 2015
Corixa	Corixidae	10	WB 14	23.5. 2015
Corixa	Corixidae	4	UP III	11.3. 2015
Corixa	Corixidae	13	WB 01	26.5. 2015
Corixa female	Corixidae	2	BH 3 downstream	29.12.2015
Corixa,male,female	Corixidae	2	UP 6	10.5.2016
Culex larva	Culicidae	1	UP 14	13.01.2015
Culex pupa	Culicidae	2	UP 4	December, 2015
Cybister larva	Dytiscidae	1	BH 12 Downstream	April, 2015
Cybister larva	Dytiscidae	1	UP 4	28.4. 2016
Cybister larva	Dytiscidae	2	UP 7	11.5. 2016
Cybister larva	Dytiscidae	2	UP 10/UP 11	19.5.2015
Cybister larva	Dytiscidae	1	UP 14	7.6.2016
Cybister larva	Dytiscidae	3	UP IV	11.3. 2015
Cybister larva	Hydrophilidae	1	UP G	March, 2015

Genus	Family	Abundancy	Location code	Date
Cybister larva	Dytiscidae	2	UP 57	13.3. 2015
Cyclestheria hislopi	Conchostrucha	1	BH 05	31.12.2015
Cylindrostethus scrutator	Garridae	2	BH 1/BH3	24.4.2015
Cynigmina	Heptageniidae	1	UK 1	01.07.2014
Cynigmina	Hepatgeniidae	8	UK 1	24.11.2015
Cynigmina	Heptageniidae	8	UK B	25.4.2016
Cynigmina	Heptageniidae	47	UK 4	4.11.2015
Cynigmina	Heptageniidae	1	UK 5	25.6.2014
Cynigmina	Heptageniidae	23	UK 5	18.11. 2015
Cynigmina	Heptageniidae	65	UK 6	3.11.2015
Cynigmina	Heptageniidae	1	UK 8b D/S JSTP	27.10.2015
Cyphon	Scirtidae larva	1	WB 16	23.3. 2016
Cyphon larva	Scritidae	1	UK 1	01.07.2014
Cyphon larva	Scirtidae	1	UP 39	4. 10. 2016
Cyphon larva	Scirtidae	1	WB 31	27.2.2016
Dendrodrillus rubidus	Lumbricidae	1	UP 3	5.12.2014
Dendrodrilus rubidus	Lumbricidae	1	BH 12 Downstream	April, 2015
Dendrodrilus rubidus	Lumbricidae	1	UP 6	December, 2014
Dendronereides heteropoda	Nereididae	3	WB 17	21.5.2015
Dendronereides heteropoda	Nereididae	10	WB 21	22.5. 2015
Dendronereides heteropoda	Nereididae	9	WB 25	23.2.2016
Dendronereidus heteropoda	Nereididae	2	WB 27	25.3.2016
Dero dorsalis	Naididae	1	BH 12 Downstream	April, 2015

Genus	Family	Abundancy	Location code	Date
Deronectes larva	Dytiscidae	26	UP 8	December, 2014
Deronectes larva	Dytiscidae	5	UP 11	December, 2014
Deronectes larva	Dytiscidae	7	UP 32	February, 2015
Deronectes larva	Dytiscidae	1	UP 33	February, 2015
Deronectes larva	Dytiscidae	1	UP 39	February, 2015
Deronectes larva	Dytiscidae	7	UP 41	February, 2015
Deronectes larva	Dytiscidae	2	UP 44	February, 2015
Deronetes larva	Dytiscidae	1	UP 12	January, 2015
Digoniostoma cerameopoma	Bithyniidae	6	UP 3	3.5. 2016
Digoniostoma cerameopoma	Bithyniidae	2	UP 8	11.5. 2016
Digoniostoma cerameopoma	Bithyniidae	1	UP 47	5.10.2016
Digoniostoma cerameopoma	Bithyniidae	2	WB 5	24.2. 2016
Digoniostoma cerameopoma	Bithyniidae	43	WB 6	27.2.2016
Digoniostoma lithoglyphoides	Bithyniidae	2	JH 2	14.1.2016
Digoniostoma lithoglyphoides	Bithyniidae	3	UP 18	8.6.2016
Digoniostoma lithoglyphoides	Bithyniidae	1	WB 14	23.5. 2015
Digoniostoma lithoglyphoides	Bithyniidae	1	WB 15	21.5. 2015
Digoniostoma pulchella	Bithyniidae	1	BH 3 in round 1	24.4.2016

Genus	Family	Abundancy	Location code	Date
Digoniostoma pulchella	Bithyniidae	13	BH 3 downstream	29.12.2015
Digoniostoma pulchella	Bithyniidae	14	BH SK	31.12. 2015
Digoniostoma pulchella	Bithyniidae	9	BH 05	31.12.2015
Digoniostoma pulchella	Bithyniidae	1	BH M	30.12.2015
Digoniostoma pulchella	Bithyniidae	10	JH 1	14.1.2016
Digoniostoma pulchella	Bithyniidae	2	JH 2	14.1.2016
Digoniostoma pulchella	Bithyniidae	6	JH 3	14.1.2016
Digoniostoma pulchella	Bithyniidae	4	JH 4	14.1.2016
Digoniostoma pulchella	Digoniostoma pulchella	5	NL	4.6.2016
Digoniostoma pulchella	Bithyniidae	2	UP 7	December, 2014
Digoniostoma pulchella	Bithyniidae	3	UP 8	11.5. 2016
Digoniostoma pulchella	Bithyniidae	1	UP 9	18.12. 2014
Digoniostoma pulchella	Bithyniidae	3	UP 9/JBUP 9	17.5.2016
Digoniostoma pulchella	Bithyniidae	99	UP 14	7.6.2016
Digoniostoma pulchella	Bithyniidae	4	UP I (UP17)	8.6.2016
Digoniostoma pulchella	Bithyniidae	1	UP 19	14.01.2015
Digoniostoma pulchella	Bithyniidae	1	UP 40	4.10. 2016
Digoniostoma pulchella	Bithyniidae	1	UP 47	5.10.2016

Genus	Family	Abundancy	Location code	Date
Digoniostoma pulchella	Bithyniidae	16	WB 01	26.5. 2015
Digoniostoma pulchella	Bithynidae	1	WB 1	29.2. 2016
Digoniostoma pulchella	Bithyniidae	38	WB 1	29.2. 2016
Digoniostoma pulchella	Bthyniidae	8	WB 03	27.5. 2015
Digoniostoma pulchella	Bithyniidae	4	WB 6	27.2.2016
Digoniostoma pulchella	Bithyniidae	2	WB 11	27.5. 2015
Digoniostoma pulchella	Bithyniidae	31	WB 14	23.5. 2015
Digoniostoma pulchella	Bithyniidae	3	WB 16	21.5. 2015
Digoniostoma pulchella dead	Bithyniidae	1	UP 53	19.10.2016
Digoniostoma pulchella dead	Bithyniidae	1	UP 57 Corrected as UP 56	18.10.2016
Digoniostoma pulchella foot	Bithyniidae	2	NA Narora	4.6.2016
Digoniostoma pulchella juvenile	Bithyniidae	1	BH 12 Downstream	28.12.2015
Diplacodes	Libellulidae	1	UP 6A/ZBGP	16.5.2016
Diplectrona	Hydropsychidae	2	UK 1	24.11.2015
Diplectrona	Hydropsychidae	1	NA Narora	4.6.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	12	WB 01	26.5. 2015
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	1	WB 1	29.2. 2016
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	5	WB 1	29.2. 2016

Genus	Family	Abundancy	Location code	Date
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	2	WB 03	27.5. 2015
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	1	WB 03	29.2. 2016
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	1	WB 7	27.5. 2015
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	2	WB 11	27.5. 2015
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	2	WB 13	23.5. 2015
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	9	WB 14	23.5. 2015
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	16	WB 14	28.2. 2016
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	3	WB 16	23.3. 2016
Diplonychus (=Sphaerodema) rusticus rusticus	Belostomatidae	1	WB 17	21.5.2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	15	BH 1/BH3	24.4.2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	16	BH 3 in round 1	24.4.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	BH 04	29.4. 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	BH 12 upstream	April, 2015

Genus	Family	Abundancy	Location code	Date
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	4	BH 12 Downstream	April, 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	3	UP 2	26.4. 2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 3	5.12.2014
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 4	December, 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	10	UP 4	28.4. 2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	32	UP 7	11.5. 2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 8	December, 2014
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	10	UP 8	11.5. 2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 10/UP 11	19.5.2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	2	UP 12	January, 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	11	UP 12	8.6.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 14	13.01.2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	2	UP 19	9.6. 2016

Genus	Family	Abundancy	Location code	Date
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	26	UPDG	9.6.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP II	7.6.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	3	UP G	March, 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 33	6.10.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	2	UP 47	5.10.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 50	10.3. 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	1	UP 50	18.10.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	2	UP 51	10.3.2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	16	Up 56 as UP 55	10.3. 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	2	UP 56 corrected as UP 55	19.10.2016
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	7	UP 57	13.3. 2015
Diplonychus (=Sphaerodema) rusticus	Belostomatidae	6	UP 57 Corrected as UP 56	18.10.2016
Diptera pupa	Diptera	3	WB 16	23.3. 2016
Dried polychaete	Polychaeta	1	WB 19	18.5. 2015

Genus	Family	Abundancy	Location code	Date
Drunella	Ephemerellidae	5	UK 1	24.11.2015
Dryopidae larva	Dryopidae	1	UK 6	3.11.2015
Dugesia japonica	Dugesiidae	4	UK 4	4.11.2015
Dugesia japonica	Dugesiidae	6	UK 5	18.11. 2015
Dugesia sp.	Dugesiidae?	9	WB 34	29.5. 2015
Dugessia	Dugessidae	21	WB 34	26.2.2016
Dyplonychus	Belostomatidae	1	WB 16	21.5. 2015
Dytiscus	Dytiscidae	2	UP G	March, 2015
Eaetongenia	Ephemeridae	55	BH M	30.12.2015
Eatongenia	Ephemeridae	3	UP 7	11.5. 2016
Eatongenia	Ephemeridae	3	UP 18	15.1.2015
Eatongenia	Ephemeridae	1	UP 33	6.10.2016
Eatongenia	Ephemeridae	2	UP 54	19.10.2016
Echinocnemus	Curculionidae	1	WB 03	27.5. 2015
Echinocnemus	Curcuolionidae	1	WB 4	26.2. 2016
Echinocnemus	Curculionidae	1	WB 9	27.5. 2015
Echinocnemus	Curculionidae	1	WB 15	21.5. 2015
Echinocnemus	Curculionidae	1	WB 16	21.5. 2015
Ecnomus	Ecnomidae	1	BH 3 in round 1	24.4.2016
Ecnomus	Ecnomidae	1	UK 1	24.11.2015
Ecnomus	Ecnomidae	5	UK B	25.4.2016
Ecnomus	Ecnomidae	3	UK 5	18.11. 2015
Ecnomus	Ecnomidae	19	UK 6	3.11.2015
Eiseniella tetraedar	Lumbricidae	1	WB 7	27.5. 2015
Eiseniella tetraedra tetraedra	Lumbricidae	1	UK 6	3.11.2015
Eiseniella tetraedra tetraedra	Lumbricidae	1	UP 3	3.5. 2016
Eiseniella tetraedra tetraedra	Lumbricidae	2	UP 6A/ZBGP	16.5.2016

Genus	Family	Abundancy	Location code	Date
Eiseniella tetraedra tetraedra	Lumbricidae	2	WB 03	27.5. 2015
Eiseniella tetraedra tetraedra	Lumbricidae	2	WB 03	29.2. 2016
Eiseniella tetraedra tetraedra	Lumbricidae	1	WB 11	27.5. 2015
Eisiniela tetraedra tetraedra	Lumbricidae	1	WB 4	26.2. 2016
Eisiniella tetraedra tetraedra	Lumbricidae	4	UP 50	18.10.2016
Elmidae/Elmididae/ Elminthidae larva	Elmidae/ Elmididae/ Elminthidae	1	WB 14	28.2. 2016
Elmidae/Elmididae/ Elminthidae larva	Elmidae/ Elmididae/ Elminthidae	5	WB 16	23.3. 2016
Empty case barrel-shaped of Stactobia	Hydroptilidae	1	UK B	25.4.2016
Empty case of Hydroptilidae larva		1	UK B	25.4.2016
Empty case of trichoptera			NA Narora	4.6.2016
Empty shells of Trichoptera			UK B	25.4.2016
Epeorus	Heptageniidae	1	UK 1	24.11.2015
Epeorus Epeorus	Heptageniidae	2	UK 1	24.11.2015
Ephemera/ Aethephemera	Ephemeridae	10	BH 08	April, 2015
Ephemerella Eurylophella	Ephemerellidae	1	UK 1	24.11.2015
Ephemerella Eurylophella	Ephemerellidae	10	UK 5	18.11. 2015
Ephemerella Eurylophephella	Ephemerellidae	2	UK B	25.4.2016
Ephemerella sp.	Ephemerellidae	1	UK 4	4.11.2015

Genus	Family	Abundancy	Location code	Date
Ephemerelle Eurylophella	Ephemerellidae	3	UK 6	3.11.2015
Ephydra pupa	Ephydridae	1	WB 15	21.5. 2015
Ephydra pupa	Ephydridae	9	WB 19	18.5. 2015
Ephydra pupa	Ephydridae	2	WB 25	23.2.2016
Ephydra sp.	Ephydridae	1	UK 8b D/S JSTP	27.10.2015
Eretes	Dytiscidae	1	UK 8b D/S JSTP	27.10.2015
Eristalis sp.	Syrphidae	1	UK 8b D/S JSTP	27.10.2015
Eristalis sp.	Syrphidae	2	UP 14	7.6.2016
Eristalis sp.	Syrphidae	1	UP 29	9.6. 2016
Eristalis sp.	Syrphidae	1	UP IV	20.10.2016
Eristalis sp.	Syrphidae	1	UP G	March, 2015
Eristalis sp.	Syrphidae	2	UP 33	6.10.2016
Eristalis sp.	Syrphidae	4	WB 16	23.3. 2016
Eristalis sp.	Syrphidae	2	WB 19	18.5. 2015
Eristalis sp.	Syrphidae	1	WB 31	27.2.2016
Eulichas(Coleoptera larva)	Eulichadidae	1	UP 33	February, 2015
Euphaea decorata	Euphaeidae	1	UK 1	01.07.2014
Ferrissia baconi juvenile	Ancylidae	1	WB 7	27.2. 2016
Fish larva		1	WB 13	23.5. 2015
Flavoperla	Perlidae	2	UK 5	18.11. 2015
Gabbia orcula	Bithynidae	1	UP 2	December, 2014
Gabbia orcula	Bithyniidae	4	UP 3	3.5. 2016
Gabbia orcula	Bithyniidae	1	UP 4	28.4. 2016
Gabbia orcula	Bithyniidae	6	WB 14	23.5. 2015
Gabbia stenothyridae	Bithynidae	1	WB 9	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Gabbia stenothyroides	Bithyniidae	1	JH 4	14.1.2016
Gabbia stenothyroides	Bithyniidae	3	UP 7	11.5. 2016
Gabbia stenothyroides	Bithyniidae	16	UP 8	11.5. 2016
Gabbia stenothyroides	Bithyniidae	1	UP 9/JBUP 9	17.5.2016
Gangemysis assimilis	Mysidae	1	BH 1/BH3	24.4.2015
Gangemysis assimilis	Mysidae	45	BH 05	27.4. 2015
Gangemysis assimilis	Mysidae	1	BH 13	January, 2016
Gangemysis assimilis	Mysidae	53	WB 34	26.2.2016
Gangetia miliacea	Stenothyridae	1	UP 39	4. 10. 2016
Geosesarma	Sesermidae	1	WB 21	22.5. 2015
Geosesarma	Sesarmidae	1	WB 23	18.5. 2015
Glossosoma case with pupa	Glossosomatidae	10	UK 4	4.11.2015
Gyraulus convexiusculus	Planorbidae	1	BH 1/BH3	24.4.2015
Gyraulus convexiusculus	Planorbidae	4	JH 4	14.1.2016
Gyraulus convexiusculus	Planorbidae	13	UP 2	December, 2014
Gyraulus convexiusculus	Planorbidae	7	UP 3	3.5. 2016
Gyraulus convexiusculus	Planorbidae	5	UP 4	December, 2015
Gyraulus convexiusculus	Planorbidae	1	UP 4	28.4. 2016
Gyraulus convexiusculus	Planorbidae	11	UP 6A/ZBGP	16.5.2016
Gyraulus convexiusculus	Planorbidae	4	UP 6	10.5.2016
Gyraulus convexiusculus	Planorbidae	1	jf	4.6.2016

Genus	Family	Abundancy	Location code	Date
Gyraulus convexiusculus	Planorbidae	6	UP 7	11.5. 2016
Gyraulus convexiusculus	Planorbidae	1	UP 11	December, 2014
Gyraulus convexiusculus	Planorbidae	3	UP 12	8.6.2016
Gyraulus convexiusculus	Planorbidae	1	UP 13	7.6.2016
Gyraulus convexiusculus	Planorbidae	1	UP 19	9.6. 2016
Gyraulus convexiusculus	Planorbidae	1	UP 33	6.10.2016
Gyraulus convexiusculus	Planorbidae	4	UP 39	4. 10. 2016
Gyraulus convexiusculus	Planorbidae	4	UP 40	4.10. 2016
Gyraulus convexiusculus	Planorbidae	37	WB 03	27.5. 2015
Gyraulus convexiusculus	Planorbidae	1	WB 7	27.5. 2015
Gyraulus convexiusculus	Planorbidae	6	WB 12	26.2.2016
Gyraulus convexiusculus	Planorbidae	1	WB 13	23.5. 2015
Gyraulus convexiusculus	Planorbidae	1	WB 13	25.2.2016
Gyraulus convexiusculus	Planorbidae	3	WB 13	25.2.2016
Gyraulus convexiusculus	Planorbidae	1	WB 14	23.5. 2015
Gyraulus convexiusculus	Planorbidae	4	WB 14	28.2. 2016
Gyraulus convexiusculus	Planorbidae	1	WB 15	21.5. 2015
Gyraulus convexiusculus	Planorbidae	5	WB 16	21.5. 2015

Genus	Family	Abundancy	Location code	Date
Gyraulus covexiusculus	Planorbidae	14	UP 8	December, 2014
Gyraulus labiatus	Planorbidae	3	UP 3	3.5. 2016
Gyraulus labiatus	Planorbidae	1	UP 7	11.5. 2016
Gyraulus labiatus	Planorbidae	8	UP 8	11.5. 2016
Gyraulus labiatus	Planorbidae	1	UP 14	7.6.2016
Gyraulus labiatus	Planorbidae	1	UP 57 Corrected as UP 56	18.10.2016
Gyruaulus convexiusculus	Planorbidae	1	UP 14	7.6.2016
Haemadipsa zeylanica	Haemadipsidae	1	UP 8	December, 2014
Haemonais waldvogeli	Naididae	1	BH 12 Downstream	28.12.2015
Halaninae larva	Ceratopogonidae	1	UP G	18.10.2016
Halenine larva	Ceratopogonidae	1	WB 6	27.2.2016
Haliplidae larva	Haliplidae	1	UP G	March, 2015
Haliplus	Haliplidae	1	UP 2	December, 2014
Haliplus	Haliplidae	1	UP 6	December, 2014
Haliplus	Haliplidae	1	WB 11	27.5. 2015
Halobates	Gerridae	1	WB 34	29.5. 2015
Halobdella stagnalis	Glossiphoniidae	1	UP 3	3.5. 2016
Halochares	Hydrophilidae	1	UP 3	3.5. 2016
Halochares	Hydrophilidae	1	UP 6A/ZBGP	16.5.2016
Halochares	Hydrophilidae	4	UP 6	10.5.2016
Halochares	Hydrophilidae	2	rw, confluence of River Ganga to Choiya drain	4.6.2016

Genus	Family	Abundancy	Location code	Date
Halochares	Hydrophilidae	1	UP 8	December, 2014
Halochares	Hydrophilidae	1	UP 10	December, 2014
Halochares	Hydrophilidae	3	UP 11	December, 2014
Halochares	Hydrophilidae	1	UP II	14.01.2015
Halochares	Hydrophilidae	8	UP 14	13.01.2015
Halochares	Hydrophilidae	2	UP 18	8.6.2016
Halochares	Hydrophilidae	1	UP 19	14.01.2015
Halochares	Hydrophilidae	1	UP II	14.01.2015
Halochares	Hydrophilidae	3	UP III	11.3. 2015
Halochares	Hydrophilidae	7	UP IV	11.3. 2015
Halochares	Hydrophilidae	1	UP IV	20.10.2016
Halochares	Hydrophilidae	8	UP G	March, 2015
Halochares	Hydrophilidae	9	UP 38	February, 2015
Halochares	Hydrophilidae	1	UP 39	February, 2015
Halochares	Hydrophilidae	1	UP 39	4. 10. 2016
Halochares	Hydrophilidae	1	UP 41	February, 2015
Halochares	Hydrophilidae	1	UP 47	5.10.2016
Halochares	Hydrophilidae	3	UP 49	March, 2015
Halochares	Hydrophilidae	1	UP 51	10.3.2015
Halochares	Hydrophilidae	1	UP 56 corrected as UP 55	19.10.2016
Halochares	Hydrophilidae	2	UP 57	13.3. 2015
Halochares larva	Hydrophilidae	3	UP 6A/ZBGP	16.5.2016
Halochares larva	Hydrophilidae	1	UP 2	26.4. 2016
Halophores	Hydrophilidae	1	UP 51	10.3.2015

Genus	Family	Abundancy	Location code	Date
Halophores	Hydrophilidae	1	WB 31	27.2.2016
Hebrus	Hebridae	5	UP 4	December, 2015
Hebrus	Hebridae	1	WB 14	23.5. 2015
Heleocoris	Naucoridae	4	UK 6	3.11.2015
Helichus	Dryopidae	1	UP 33	6.10.2016
Helichus	Dryopidae	1	UP 39	4. 10. 2016
Heliogomphus	Gomphidae	2	UK 4	4.11.2015
Heliogomphus	Gomphidae	6	UK 6	3.11.2015
Heliogomphus	Gomphidae	1	UP 3	5.12.2014
Heliogomphus	Gomphidae	1	UP 4	28.4. 2016
Heliogomphus	Gomphidae	1	UP 8	11.5. 2016
Heliogomphus	Gomphidae	1	UP 13	7.6.2016
Helochares	Hydrophilidae	1	BH SK	31.12. 2015
Helochares	Hydrophilidae	1	BH 12 Downstream	April, 2015
Helochares	Hydrophilidae	1	JH 4	14.1.2016
Helochares	Hydrophilidae	3	WB 1	29.2. 2016
Helochares	Hydrophilidae	4	WB 02	27.5. 2015
Helochares	Hydrophilidae	2	WB 03	27.5. 2015
Helochares	Hydrophilidae	5	WB 03	29.2. 2016
Helochares	Hydrophilidae	2	WB 4	26.2. 2016
Helochares	Hydrophilidae	2	WB 5	24.2. 2016
Helochares	Hydrophilidae	1	WB 5	24.2. 2016
Helochares	Hydrophilidae	1	WB 6	27.2.2016
Helochares	Hydrophilidae	1	WB 7	27.5. 2015
Helochares	Hydrophilidae	1	WB 11	27.5. 2015
Helochares	Hydrophilidae	2	WB 12	26.2.2016
Helochares	Hydrophilidae	1	WB 13	23.5. 2015
Helochares	Hydrophilidae	3	WB 14	23.5. 2015

Genus	Family	Abundancy	Location code	Date
Helochares	Hydrophilidae	4	WB 16	23.3. 2016
Helochares larva	Hydrophilidae	2	WB 4	26.2. 2016
Helochares larva	Hydrophilidae	1	WB 5	24.2. 2016
Helophorus	Hydrophilidae	2	UK 6	3.11.2015
Helophorus	Hydrophilidae	3	UP 2	December, 2014
Helophorus	Hydrophilidae	1	UP 3	5.12.2014
Helophorus	Hydrophilidae	4	UP 4	December, 2015
Helophorus	Hydrophilidae	2	UP 7	11.5. 2016
Helophorus	Hydrophilidae	1	UP 8	December, 2014
Helophorus	Hydrophilidae	1	UP 10	December, 2014
Helophorus	Hydrophilidae	1	UP II	14.01.2015
Helophorus	Hydrophilidae	1	UP 14	7.6.2016
Helophorus	Hydrophilidae	1	UP I (UP17)	8.6.2016
Helophorus	Hydrophilidae	2	UP A	16.01.2015
Helophorus	Hydrophilidae	2	UPDG	9.6.2016
Helophorus	Hydrophilidae	1	UP II	14.01.2015
Helophorus	Hydrophilidae	3	UP 33	6.10.2016
Helophorus	Hydrophilidae	2	UP 44	February, 2015
Helophorus	Hydrophilidae	1	UP 49	March, 2015
Helophorus	Hydrophilidae	1	UP 51	19.10.2016
Helophorus	Hydrophilidae	1	WB 14	23.5. 2015
Hemiclapsis japonica	Glossiphoniidae	1	UP 8	December, 2014
Hesionides/ Troglochaetus beranecki	Nerillidae	2	WB 17	3.3. 2015
Hexatoma	Tipulidae	1	UK 8b D/S JSTP	27.10.2015

Genus	Family	Abundancy	Location code	Date
Hippeutis umbelicalis	Planorbidae	2	WB 19	18.5. 2015
Hippeutis umbilicalis	Planorbidae	4	UP 2	26.4. 2016
Hippeutis umbilicalis	Planorbidae	9	WB 16	23.3. 2016
Hippeutis umbilicalis	Planorbidae	2	WB 25	23.2.2016
Hippeutis umbilicalis	Planorbidae	1	WB 31	27.2.2016
Hippeutis umbilicalis	Planorbidae	1	WB 35	24.2.2016
Hirudinaria maniilensis	Hirudinidae	1	UP 8	11.5. 2016
Hirudinaria manillensis	Hirudinidae	1	UP 33	6.10.2016
Hister	Histeridae	1	UP 3	3.5. 2016
Hister	Histeridae	1	UP 6A/ZBGP	16.5.2016
Hister	Histetridae	1	jf	4.6.2016
Hister	Histeridae	1	UP II	7.6.2016
Hister	Histeridae	1	UP IV	11.3. 2015
Hister	Histeridae	1	WB 5	24.2. 2016
Hister	Histeridae	1	WB 7	27.5. 2015
Hister	Histeridae	2	WB 14	28.2. 2016
Hydaticus	Dytiscidae	2	BH K	January, 2016
Hydaticus	Dytiscidae	1	UP 2	26.4. 2016
Hydaticus	Dytiscidae	1	UP 6A/ZBGP	16.5.2016
Hydaticus	Dytiscidae	1	UPDG	9.6.2016
Hydaticus	Dytiscidae	1	UP IV	20.10.2016
Hydaticus	Dytiscidae	1	UP 47	5.10.2016
Hydaticus	Dytiscidae	1	UP 51	19.10.2016
Hydaticus	Dytiscidae	1	UP 53	19.10.2016
Hydaticus	Dytiscidae	1	UP 54	19.10.2016
Hydrobasileus	Libellulidae	3	UP 8	11.5. 2016
Hydrobasileus	Libellulidae	1	WB 01	26.5. 2015
Hydrobasileus croceus	Libellulidae	1	WB 21	22.5. 2015

Genus	Family	Abundancy	Location code	Date
Hydrocoptus	Noteridae	1	BH 8	28.12.2015
Hydrocoptus	Noteridae	1	BH 12 upstream	April, 2015
Hydrocoptus	Noteridae	1	BH 12 Downstream	April, 2015
Hydrocoptus	Noteridae	1	UP 4	December, 2015
Hydrocoptus	Noteridae	1	UP 10/UP 11	19.5.2015
Hydrocoptus	Noteridae	1	UP IV	11.3. 2015
Hydrocoptus	Dytiscidae	1	UP G	March, 2015
Hydrocoptus	Noteridae	1	UP 40	February, 2015
Hydrocoptus	Noteridae	1	UP 50	10.3. 2015
Hydrocoptus	Noteridae	1	WB 03	29.2. 2016
Hydrocoptus	Noteridae	5	WB 4	26.2. 2016
Hydrocoptus	Noteridae	1	WB 5	24.2. 2016
Hydrocoptus	Noteridae	1	WB 14	23.5. 2015
Hydrocoptus/ Noteridae	Noteridae	1	JH 4	14.1.2016
Hydrometra Latreille	Hydrometridae	1	WB 03	27.5. 2015
Hydrophilus	Hydrophilidae	5	UP 6	10.5.2016
Hydrophilus	Hydrophilidae	23	UP 10/UP 11	19.5.2015
Hydrophilus	Hydrophilidae	5	UP II	14.01.2015
Hydrophilus	Hydrophilidae	1	UP 12	8.6.2016
Hydrophilus	Hydrophilidae	1	UP 13	15.01.2015
Hydrophilus	Hydrophilidae	3	UP 13	7.6.2016
Hydrophilus	Hydrophilidae	2	UP 14	7.6.2016
Hydrophilus	Hydrophilidae	5	UP II	14.01.2015
Hydrophilus	Hydrophilidae	3	UP II	7.6.2016
Hydrophilus	Hydrophilidae	2	UP IV	11.3. 2015
Hydrophilus	Hydrophilidae	1	UP G	March, 2015

Genus	Family	Abundancy	Location code	Date
Hydrophilus	Hydrophilidae	1	WB 1	29.2. 2016
Hydrophilus	Hydrophilidae	1	WB 9	27.5. 2015
Hydrophilus	Hydrophilidae	1	WB 11	27.5. 2015
Hydrophilus	Hydrophilidae	1	WB 16	23.3. 2016
Hydrophilus larva	Hydrophilidae	9	UP 10/UP 11	19.5.2015
Hydrophilus larva	Hydrophilidae	7	UP 12	8.6.2016
Hydrophilus larva	Hydrophilidae	1	UP 29	9.6. 2016
Hydrophilus larva	Hydrophilidae	10	UPDG	9.6.2016
Hydrophilus larva	Hydrophilidae	3	UPDG	9.6.2016
Hydroporus	Dytiscidae	1	WB 6	27.2.2016
Hydroporus	Dytiscidae	1	WB 12	26.2.2016
Hydropsyche	Hydropsychidae	1	UK 1	24.11.2015
Hydropsyche	Hydropsychidae	1	UK 7	28.10.2015
Hydropsyche	Hydropsychidae	1	UK 8, U/S JSTP	27.10.2015
Hydropsyche	Hydropsychidae	8	UK 8b D/S JSTP	27.10.2015
Hydroptilidae pupa	Hydroptilidae		UK B	25.4.2016
Hydrovatus	Dytiscidae	1	BH 3 in round 1	24.4.2016
Hydrovatus	Dytiscidae	2	BH 3 downstream	29.12.2015
Hydrovatus	Dytiscidae	9	BH 04	29.12.2015
Hydrovatus	Dytiscidae	1	BH SK	31.12. 2015
Hydrovatus	Dytiscidae	1	BH 05	31.12.2015
Hydrovatus	Dytiscidae	1	BH 8	28.12.2015
Hydrovatus	Dytiscidae	5	BH M	30.12.2015
Hydrovatus	Dytiscidae	1	BH V	12.1.2016
Hydrovatus	Dytiscidae	6	BH K	January, 2016
Hydrovatus	Dytiscidae	4	JH 1	14.1.2016
Hydrovatus	Dytiscidae	11	JH 2	14.1.2016

Genus	Family	Abundancy	Location code	Date
Hydrovatus	Dytiscidae	8	JH 3	14.1.2016
Hydrovatus	Dytiscidae	14	JH 4	14.1.2016
Hydrovatus	Dytiscidae	17	UP 1	26.4. 2016
Hydrovatus	Dytiscidae	2	UP 2	26.4. 2016
Hydrovatus	Dytiscidae	1	UP 3	3.5. 2016
Hydrovatus	Dytiscidae	8	UP 4	28.4. 2016
Hydrovatus	Dytiscidae	10	UP 6A/ZBGP	16.5.2016
Hydrovatus	Dytiscidae	17	UP 6	10.5.2016
Hydrovatus	Hydrovatus	1	NL	4.6.2016
Hydrovatus	Dytiscidae	2	rw	4.6.2016
Hydrovatus	Dytiscidae	19	jf	4.6.2016
Hydrovatus	Dytiscidae	1	UP 7	11.5. 2016
Hydrovatus	Dytiscidae	3	UP 8	December, 2014
Hydrovatus	Dytiscidae	3	UP 8	11.5. 2016
Hydrovatus	Dytiscidae	1	UP 10/UP 11	19.5.2015
Hydrovatus	Dytiscidae	4	UP 14	7.6.2016
Hydrovatus	Dytiscidae	6	UP 18	8.6.2016
Hydrovatus	Dytiscidae	16	UP 19	9.6. 2016
Hydrovatus	Dytiscidae	3	UP II	7.6.2016
Hydrovatus	Dytiscidae	1	UP IV	20.10.2016
Hydrovatus	Dytiscidae	1	UP 32	6.10.2016
Hydrovatus	Dytiscidae	9	WB 1	29.2. 2016
Hydrovatus	Dytiscidae	1	WB 2	29.2 2016
Hydrovatus	Dytiscidae	7	WB 03	29.2. 2016
Hydrovatus	Dytiscidae	1	WB 4	26.2. 2016
Hydrovatus	Dytiscidae	1	WB 7	27.2. 2016
Hydrovatus	Dytiscidae	1	WB 16	23.3. 2016
Hydrovatus larva	Dytiscidae	1	UP 49	March, 2015
Hydrovatus larva	Dytiscidae	4	UP G	March, 2015

Genus	Family	Abundancy	Location code	Date
Hyphydrus	Dytiscidae	4	BH 1/BH3	24.4.2015
Hyphydrus	Dytiscidae	12	BH 04	29.4. 2015
Hyphydrus	Dytiscidae	1	BH 05	27.4. 2015
Hyphydrus	Dytiscidae	1	BH 11	April, 2015
Hyphydrus	Dytiscidae	4	BH 12 Downstream	April, 2015
Hyphydrus	Dytiscidae	1	UK 4	24.7.2014
Hyphydrus	Dytiscidae	6	UK 6	20.6. 2014
Hyphydrus	Dytiscidae	3	UP 1	1.2.2014
Hyphydrus	Dytiscidae	3	UP 3	5.12.2014
Hyphydrus	Dytiscidae	4	UP 4	December, 2015
Hyphydrus	Dytiscidae	2	UP 6	December, 2014
Hyphydrus	Dytiscidae	21	UP 8	December, 2014
Hyphydrus	Dytiscidae	1	UP 10	December, 2014
Hyphydrus	Dytiscidae	9	UP 11	December, 2014
Hyphydrus	Dytiscidae	1	UP II	14.01.2015
Hyphydrus	Dytiscidae	3	UP 12	January, 2015
Hyphydrus	Dydiscidae	1	UP 13	15.01.2015
Hyphydrus	Dytiscidae	8	UP 14	13.01.2015
Hyphydrus	Dytiscidae	3	UP I	13.01.2015
Hyphydrus	Dytiscidae	10	UP 19	14.01.2015
Hyphydrus	Dytiscidae	1	UP 19	9.6. 2016
Hyphydrus	Dytiscidae	1	UP 29	16.01.2015
Hyphydrus	Dytiscidae	2	UP A	16.01.2015
Hyphydrus	Dytiscidae	1	UP II	14.01.2015
Hyphydrus	Dytiscidae	9	UP III	11.3. 2015
Hyphydrus	Dytiscidae	6	UP IV	11.3. 2015

Genus	Family	Abundancy	Location code	Date
Hyphydrus	Dytiscidae	2	UP IV	11.3. 2015
Hyphydrus	Dytiscidae	24	UP G	March, 2015
Hyphydrus	Dytiscidae	9	UP 32	February, 2015
Hyphydrus	Dytiscidae	3	UP 33	February, 2015
Hyphydrus	Dytiscidae	1	UP 39	February, 2015
Hyphydrus	Dytiscidae	1	UP 40	February, 2015
Hyphydrus	Dytiscidae	9	UP 41	February, 2015
Hyphydrus	Dytiscidae	18	UP 44	February, 2015
Hyphydrus	Dytiscidae	3	UP 44	5.10.2016
Hyphydrus	Dytiscidae	9	UP 49	March, 2015
Hyphydrus	Dytiscidae	2	UP 50	10.3. 2015
Hyphydrus	Dytiscidae	2	UP 54	12.3. 2015
Hyphydrus	Dytiscidae	16	UP 57	13.3. 2015
Hyphydrus	Dytiscidae	12	WB 01	26.5. 2015
Hyphydrus	Dytiscidae	7	WB 03	27.5. 2015
Hyphydrus	Dytiscidae	1	WB 9	27.5. 2015
Hyphydrus	Dytiscidae	2	WB 13	23.5. 2015
Hyphydrus	Dytiscidae	3	WB 14	23.5. 2015
Hyrcanus	Hebridae	1	UP IV	11.3. 2015
Hyrcunas	Hebridae	1	JH 3	14.1.2016
Ictinogomphus	Gomphidae	1	BH 11	April, 2015
Idiopoma disimilis	Viviparidae	113	WB 16	21.5. 2015
Idiopoma disimilis	Viviparidae	2	WB 16	23.3. 2016
Idiopoma dissimilis	Viviparidae	76	WB 15	21.5. 2015
Idiopoma dissimilis	Viviparidae	17	WB 17	21.5.2015
Idiopoma dissimilis	Viviparidae	110	WB 17	3.3. 2015

Genus	Family	Abundancy	Location code	Date
Idiopoma dissimilis	Viviparidae	1	WB 19	18.5. 2015
Idiopoma dissimilis	Viviparidae	10	WB 25	23.2.2016
Idiopoma dissimilis	Viviparidae	1	WB 28	23.2.2016
Idiopoma dissimilis	Viviparidae	1	WB 31	27.2.2016
Idiopoma dissimilis	Viviparidae	1	WB 34F	26.2.2016
Idiopoma dissimilis	Viviparidae	3	WB 34	29.5. 2015
Idiopoma dissimilis	Viviparidae	1	WB 34	26.2.2016
Idiopoma dissimilis	Viviparidae	18	WB 35	24.2.2016
Ilyocoris	Naucoridae	17	UK 6	20.6. 2014
Ilyodrilus templetoni	Tubificidae	2	UP 3	3.5. 2016
Incertae sedis	Pseudoneu-roclipsis	1	UK 6	3.11.2015
Incertae sedis pupa	Pseudoneu-roclipsis	1	JH 3	14.1.2016
Indoplanorbis	Planorbidae	5	BH 3 in round 1	24.4.2016
Indoplanorbis	Planorbidae	3	BH SK	31.12. 2015
Indoplanorbis	Planorbidae	1	JH 1	14.1.2016
Indoplanorbis	Planorbidae	2	JH 4	14.1.2016
Indoplanorbis	Planorbidae	3	UK 6	3.11.2015
Indoplanorbis	Planorbidae	4	UP 2	December, 2014
Indoplanorbis	Planorbidae	3	UP 2	26.4. 2016
Indoplanorbis	Planorbidae	4	UP 3	5.12.2014
Indoplanorbis	Planorbidae	3	UP 4	December, 2015
Indoplanorbis	Planorbidae	1	UP 4	28.4. 2016
Indoplanorbis	Planorbidae	8	UP 6A/ZBGP	16.5.2016
Indoplanorbis	Planorbidae	2	UP 6	10.5.2016
Indoplanorbis	Indoplanorbis	8	NL	4.6.2016
Indoplanorbis	Planorbidae	9	UP 7	December, 2014

Genus	Family	Abundancy	Location code	Date
Indoplanorbis	Planorbidae	5	UP 7	11.5. 2016
Indoplanorbis	Planorbidae	3	UP 8	December, 2014
Indoplanorbis	Planorbidae	8	UP 8	11.5. 2016
Indoplanorbis	Planorbidae	1	UP 9	18.12. 2014
Indoplanorbis	Planorbidae	4	UP 12	8.6.2016
Indoplanorbis	Planorbidae	1	UP 14	13.01.2015
Indoplanorbis	planorbidae	5	UP 14	7.6.2016
Indoplanorbis	Lymnaeidae	1	UP 19	9.6. 2016
Indoplanorbis	Lymnaeidae	1	UP 29	16.01.2015
Indoplanorbis	Planorbidae	1	UP G	March, 2015
Indoplanorbis	Planorbidae	2	UP 32	February, 2015
Indoplanorbis	Planorbidae	7	UP 33	February, 2015
Indoplanorbis	Planorbidae	1	UP 39	4. 10. 2016
Indoplanorbis	Planorbidae	1	UP 40	4.10. 2016
Indoplanorbis	Planorbidae	6	UP 44	February, 2015
Indoplanorbis	Planorbidae	1	WB 01	26.5. 2015
Indoplanorbis	Planorbidae	2	WB 03	27.5. 2015
Indoplanorbis	Planorbidae	1	WB 03	29.2. 2016
Indoplanorbis	Planorbidae	2	WB 4	26.2. 2016
Indoplanorbis	Planorbidae	2	WB 5	24.2. 2016
Indoplanorbis	Planorbidae	2	WB 12	26.2.2016
Indoplanorbis	Planorbidae	3	WB 13	23.5. 2015
Indoplanorbis	Planorbidae	1	WB 14	23.5. 2015
Indoplanorbis	Planorbidae	1	WB 14	28.2. 2016
Indoplanorbis	Planorbidae	1	WB 16	21.5. 2015
Indoplanorbis	Planorbidae	2	WB 16	23.3. 2016
Indoplanorbis	Planorbidae	1	WB 25	23.2.2016

Genus	Family	Abundancy	Location code	Date
Indoplanorbis exustus	Planorbidae	4	UP 3	3.5. 2016
Indoplanorbis exustus	Planorbidae	2	UP 9/JBUP 9	17.5.2016
Indoplanorbis exustus	Planorbidae	19	WB 1	29.2. 2016
Indoplanorbis exustus	Planorbidae	1	WB 19	18.5. 2015
Insect larva			UK B	25.4.2016
Ironodes	Heptageniidae	1	UK 1	24.11.2015
Ironodes	Heptageniidae	5	UK 1	24.11.2015
Isolapotamon	Potamidae	1	WB 5	24.2. 2016
Isolapotamon	Potamidae	11	WB 15	21.5. 2015
Isolapotamon	Potamidae	7	WB 17	3.3. 2015
Isolapotamon	Potamidae	9	WB 35	24.2.2016
Johora	Potamidae	2	UP 3	5.12.2014
Johora	Potamidae	1	WB 03	29.2. 2016
Johora	Potamidae	1	WB 5	24.2. 2016
Johora	Potamidae	17	WB 21	22.5. 2015
Johora	Potamidae	1	WB 35	24.2.2016
Juvenile crabs	Crustacea	2	WB 16	23.3. 2016
Juvenile crabs		4	WB 34	29.5. 2015
Juvenile crabs unidentified		2	WB 21	22.5. 2015
Juvenile of Parreysia favidens	Amblemidae	2	UP 51	10.3.2015
Laccophilus	Dytiscidae	1	UP 10/UP 11	19.5.2015
Laccophilus	Dytiscidae	1	UPDG	9.6.2016
Laccophilus	Dytiscidae	1	UP III	20.10.2016
Laccophilus	Dytiscidae	1	UP 32	6.10.2016
Laccophilus	Dytiscidae	1	UP 51	10.3.2015
Laccophilus	Dytiscidae	1	UP 51	19.10.2016

Genus	Family	Abundancy	Location code	Date
Laccophilus	Dytiscidae	1	WB 4	26.2. 2016
Laccotrephes ofeiferiae pfeiferiae	Nepidae	1	WB 1	29.2. 2016
Laccotrephes ofeiferiae pfeiferiae	Nepidae	2	WB 14	23.5. 2015
Laccotrephes pfeiferiae	Nepidae	1	BH 1/BH3	24.4.2015
Laccotrephes pfeiferiae	Nepidae	3	BH 08	April, 2015
Laccotrephes pfeiferiae	Nepidae	1	UP 6	10.5.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 2	December, 2014
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 3	5.12.2014
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 3	3.5. 2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	3	UP 7	11.5. 2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	3	UP 10/UP 11	19.5.2015
Laccotrephes pfeiferiae pfeiferiae	Nepidae	2	UP II	14.01.2015
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 12	January, 2015
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 12	8.6.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 13	7.6.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	6	UP 14	13.01.2015
Laccotrephes pfeiferiae pfeiferiae	Nepidae	2	UP II	14.01.2015
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP II	7.6.2016

Genus	Family	Abundancy	Location code	Date
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP III	20.10.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	3	UP IV	11.3. 2015
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP IV	20.10.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP G	March, 2015
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 33	6.10.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 44	5.10.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 49	20.10.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	3	UP 50	18.10.2016
Laccotrephes pfeiferiae pfeiferiae	Nepidae	1	UP 56 corrected as UP 55	19.10.2016
Laccotrephes pfeiferiae pfeiferiae juvenile	Nepidae	7	UP IV	11.3. 2015
Laccotrephes pfeiferiae pfepferiae	Nepidae	2	JH 1	14.1.2016
Laccotrphes pfeiferiae	Nepidae	2	WB 7	27.5. 2015
Laccotrphes pfeiferiae	Nepidae	6	WB 13	23.5. 2015
Lamellidens corianus	Unionidae	5	WB 6	27.2.2016
Lamellidens corrianus	Unionidae	4	BH 13	January, 2016
Lamellidens corrianus	Unionidae	1	WB 12	26.2.2016
Lamellidens lamellatus	Unionidae	5	JH 1	14.1.2016

Genus	Family	Abundancy	Location code	Date
Lamellidens lamellatus	Unionidae	1	UP 3	5.12.2014
lamellidens lamellatus	Unionidae	2	UP 12	8.6.2016
Lamellidens lamellatus	Unionidae	3	UP 38	February, 2015
Lamellidens lamellatus	Unionidae	2	WB 1	29.2. 2016
Lamellidens lamellatus	Unionidae	8	WB 5	24.2. 2016
Lamellidens lamellatus	Unionidae	4	WB 12	26.2.2016
Lamellidens lamellatus	Unionidae	2	WB 13	25.2.2016
Lamellidens mainwaringi	Unionidae	1	UP 3	3.5. 2016
Lamellidens mainwaringi	Unionidae	1	UP 50	18.10.2016
Lamellidens mainwaringi	Unionidae	6	WB 5	24.2. 2016
Lamellidens marginalis	Unionidae	2	JH 2	14.1.2016
Lamellidens marginalis	Unionidae	1	UP 51	19.10.2016
Lamellidens narainporensis	Unionidae	5	UP 50	18.10.2016
Lamellidens narainporensis	Unionidae	1	WB 6	27.2.2016
Lamellidens narainporensis juvenile	Unionidae	4	UP 50	18.10.2016
Lamellidens phenchooganjensis	Unionidae	5	BH 04	29.4. 2015
Lamellidens phenchooganjensis	Unionidae	2	UP 18	15.1.2015

Genus	Family	Abundancy	Location code	Date
Lamellidens phenchooganjensis	Unionidae	2	UP G	March, 2015
Lamellidens phenchooganjensis juvenile	Unionidae	2	BH 05	27.4. 2015
Lamellidens phenchooganjensisi	Unionidae	1	BH 1/BH3	24.4.2015
Lamellidens rhadineus	Unionidae	1	BH 05	31.12.2015
Lamellidens rhadineus	Unionidae	1	JH 2	14.1.2016
Lamellidens rhadineus	Unionidae	4	UP 3	5.12.2014
Lamellidens rhadineus	Unionidae	1	UP 32	6.10.2016
Lamellidens rhadineus	Unionidae	6	UP 33	6.10.2016
Lamellidens rhadineus	Unionidae	3	UP 41	6.10.2016
Lamellidens rhadineus	Unionidae	3	UP 49	20.10.2016
Lamellidens rhadineus	Unionidae	1	UP 50	10.3. 2015
Lamellidens rhadineus	Unionidae	2	UP 57 Corrected as UP 56	18.10.2016
Lamellidens rhadineus adult	Unionidae	23	BH 05	31.12.2015
Lamellidens rhadineus juvenile	Unionidae	1	BH 05	31.12.2015
Lamellidens sp juvenile	Unionidae	3	BH V	12.1.2016
Lamellidens sp.	Unionidae	1	BH SK	31.12. 2015
Lamellidens sp.	Unionidae	1	WB 1	29.2. 2016
Lamellidens sp.	Unionidae	1	WB 03	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Lamellidens sp.	Unionidae	1	WB 6	27.2.2016
Lamellidens sp. Juvenile	Unionidae	3	BH 3 in round 1	24.4.2016
Lamellidens sp. Juvenile	Unionidae	1	BH 3 downstream	29.12.2015
Lamellidens sp. Juvenile	Unionidae	1	JH 2	14.1.2016
Lamellidens sp. juvenile	Unionidae	1	UP 3	3.5. 2016
Lamellidens sp. Juvenile	Lamellidens sp. Juvenile	4	NL	4.6.2016
Lamellidens sp. juvenile	Unionidae	1	UP 18	8.6.2016
Lamellidens sp. juvenile	Unionidae	1	UP 32	February, 2015
Lamellidens sp. Juvenile	Unionidae	1	UP 54	12.3. 2015
Lamellidens sp.juvenile	Unionidae	1	UP 41	February, 2015
Lamelligomphus	Gomphidae	1	UP 13	7.6.2016
Lamelligomphus	Gomphidae	1	UP 33	6.10.2016
Larva with case	Hydroptilidae	1	UK B	25.4.2016
Leccotrephes pfeiferiae	Nepidae	1	UP 51	19.10.2016
Leccotrphes pfeiferiae	Nepidae	3	BH SK	31.12. 2015
Lemellidens corrianus	Unionidae	1	BH V	12.1.2016
Lepidothelphusa	Gecarcinucidae	7	WB 21	22.5. 2015
Lethocerus (=Belostoma)	Belostomatidae	1	UK 6	20.6. 2014
Lethocerus (=Belostoma)	Belostomatidae	1	UP 51	10.3.2015
Libellula	Libellulidae	1	WB 7	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Limnodrilus hoffmeisteri	Tubificidae	16	UP 10	December, 2014
Limnodrilus hoffmeisteri	Tubificidae	1	UP 12	January, 2015
Limnodrilus Hoffmeisteri	Tubificidae	1	UP G	March, 2015
Limnodrilus hoffmeisteri	Tubificidae	7	WB 31	27.2.2016
Limnodrilus hoffmienseri	Tubificidae	1	UP I	13.01.2015
Limnodrilus Hoffmiesteri	Tubificidae	2	BH 11	April, 2015
Limnodrilus hoffmiesteri	Tubificidae	10	BH 12 Downstream	28.12.2015
Limnodrilus udekemianus	Tubificidae	3	UP 7	December, 2014
Limnodrilus udekemianus	Tubificidae	13	UP 11	December, 2014
Lumbriculus variegatus	Lumbriculidae	5	BH 3 downstream	29.12.2015
Lumbriculus variegatus	Lumbriculidae	1	NA Narora	4.6.2016
Lymnaea accuminata	Lymnaeidae	11	BH 3 in round 1	24.4.2016
Lymnaea accuminata	Lymnaeidae	3	BH 3 downstream	29.12.2015
Lymnaea accuminata	Lymnaeidae	2	BH 08	April, 2015
Lymnaea accuminata	Lymnaeidae	1	BH 12 upstream	April, 2015
Lymnaea accuminata	Lymnaeidae	3	BH 12 Downstream	April, 2015
Lymnaea accuminata	Lymnaeidae	42	BH 12 Downstream	28.12.2015
Lymnaea accuminata	Lymnaeidae	4	JH 3	14.1.2016
Lymnaea accuminata	Lymnaeidae	12	JH 4	14.1.2016

Genus	Family	Abundancy	Location code	Date
Lymnaea accuminata	Lymnaeidae	3	UP 1	26.4. 2016
Lymnaea accuminata	Lymnaeidae	2	UP 2	December, 2014
Lymnaea accuminata	Lymnaeidae	1	UP 2	26.4. 2016
Lymnaea accuminata	Lymnaeidae	4	UP 3	5.12.2014
Lymnaea accuminata	Lymnaeidae	7	UP 3	3.5. 2016
Lymnaea accuminata	Lymnaeidae	18	UP 4	December, 2015
Lymnaea accuminata	Lymnaeidae	1	UP 4	28.4. 2016
Lymnaea accuminata	Lymnaeidae	9	UP 6A/ZBGP	16.5.2016
Lymnaea accuminata	Lymnaeidae	9	UP 6	10.5.2016
Lymnaea accuminata	Lymnaeidae	11	NA Narora	4.6.2016
Lymnaea accuminata	Lymnaea accuminata	17	NL	4.6.2016
Lymnaea accuminata	Lymnaeidae	1	UP 7	December, 2014
Lymnaea accuminata	Lymnaeidae	58	UP 7	11.5. 2016
Lymnaea accuminata	Lymnaeidae	8	UP 8	December, 2014
Lymnaea accuminata	Lymnaeidae	22	UP 8	11.5. 2016
Lymnaea accuminata	Lymnaeidae	8	UP 9/JBUP 9	17.5.2016
Lymnaea accuminata	Lymnaeidae	1	UP 12	January, 2015
Lymnaea accuminata	Lymnaeidae	4	UP 12	8.6.2016
Lymnaea accuminata	Lymnaeidae	1	UP 14	13.01.2015
Lymnaea accuminata	Lymnaeidae	3	UP 14	7.6.2016
Lymnaea accuminata	Lymnaeidae	1	UP 18	8.6.2016
Lymnaea accuminata	Lymnaeidae	1	UP 19	9.6. 2016
Lymnaea accuminata	Lymnaeidae	2	UPDG	9.6.2016
Lymnaea accuminata	Lymnaeidae	11	UP II	7.6.2016
Lymnaea accuminata	Lymnaeidae	1	UP III	11.3. 2015
Lymnaea accuminata	Lymnaeidae	2	UP IV	11.3. 2015

Genus	Family	Abundancy	Location code	Date
Lymnaea accuminata	Lymnaeidae	4	UP G	March, 2015
Lymnaea accuminata	Lymnaeidae	1	UP 40	February, 2015
Lymnaea accuminata	Lymnaeidae	22	UP 44	February, 2015
Lymnaea accuminata	Lymnaeidae	6	UP 49	March, 2015
Lymnaea accuminata	Lymnaeidae	1	UP 50	10.3. 2015
Lymnaea accuminata	Lymnaeidae	1	UP 51	10.3.2015
Lymnaea accuminata	Lymnaeidae	1	Up 56 as UP 55	10.3. 2015
Lymnaea accuminata	Lymnaeidae	1	UP 57	13.3. 2015
Lymnaea accuminata	Lymnaeidae	7	WB 01	26.5. 2015
Lymnaea accuminata	Lymnaeidae	24	WB 1	29.2. 2016
Lymnaea accuminata	Lymnaeidae	8	WB 03	27.5. 2015
Lymnaea accuminata	Lymnaeidae	3	WB 03	29.2. 2016
Lymnaea accuminata	Lymnaeidae	7	WB 4	26.2. 2016
Lymnaea accuminata	Lymnaeidae	1	WB 6	27.2.2016
Lymnaea accuminata	Lymnaeidae	14	WB 7	27.5. 2015
Lymnaea accuminata	Lymnaeidae	8	WB 11	27.5. 2015
Lymnaea accuminata	Lymnaeidae	5	WB 12	26.2.2016
Lymnaea accuminata	Lymnaeidae	1	WB 13	23.5. 2015
Lymnaea accuminata	Lymnaeidae	6	WB 13	25.2.2016
Lymnaea accuminata	Lymnaeidae	53	WB 14	23.5. 2015
Lymnaea accuminata	Lymnaeidae	19	WB 14	28.2. 2016
Lymnaea accuminata	Lymnaeidae	2	WB 31	27.2.2016
Lymnaea andersoniana simulens	Lymnaeidae	9	WB 14	23.5. 2015
Lype	Psychomyiidae	1	UK 8b D/S JSTP	27.10.2015
Lyriothemis	Libellulidae	5	BH SK	31.12. 2015
Lyriothemis	Libellulidae	1	BH SK	31.12. 2015

Genus	Family	Abundancy	Location code	Date
Lyriothemis	Libellulidae	18	UP 6A/ZBGP	16.5.2016
Lyriothemis	Libellulidae	3	UP 6	10.5.2016
Lyriothemis	Lyriothemis	5	NL	4.6.2016
Lyriothemis	Libellulidae	20	UP 9/JBUP 9	17.5.2016
Lyriothemis	Libellulidae	1	UP 10/UP 11	19.5.2015
Lyriothemis	Libellulidae	1	UP 13	7.6.2016
Lyriothemis	Libellulidae	1	UP 14	7.6.2016
Lyriothemis	Libellulidae	1	UP I (UP17)	8.6.2016
Lyriothemis	Libellulidae	1	UP 18	8.6.2016
Lyriothemis	Libellulidae	1	UP 19	9.6. 2016
Lyriothemis	Libellulidae	3	WB 1	29.2. 2016
Lyriothemis	Libellulidae	9	WB 14	23.5. 2015
Macrobrachium callirrhae	Palaemonidae	22	UP 9	18.12. 2014
Macrobrachium callirrhoe	Palaemonidae	13	BH 8	28.12.2015
Macrobrachium callirrhoe	Palaemonidae	5	UP 4	28.4. 2016
Macrobrachium callirrhoe	Palaemonidae	10	UP 7	December, 2014
Macrobrachium callirrhoe	Palaemonidae	8	UP III	11.3. 2015
Macrobrachium callirrhoe	Palaemonidae	1	WB 16	23.3. 2016
Macrobrachium clymene	Palaemonidae	4	UP 6A/ZBGP	16.5.2016
Macrobrachium horstii	Palaemonidae	3	UP 4	December, 2015
Macrobrachium horstii	Palaemonidae	14	UP 6	December, 2014
Macrobrachium idae	Paleamonidae	6	BH 04	29.4. 2015
Macrobrachium idae	Palaemonidae	2	BH SK	31.12. 2015
Macrobrachium idae	Palaemonidae	5	BH 8	28.12.2015

Genus	Family	Abundancy	Location code	Date
Macrobrachium idae	Palaemonidae	4	UP 6A/ZBGP	16.5.2016
Macrobrachium idae	Palaemonidae	12	UP 8	December, 2014
Macrobrachium idae	Palaemonidae	9	UP 11	December, 2014
Macrobrachium idae	Palaemonidae	2	UP 12	January, 2015
Macrobrachium idae	Palaemonidae	31	UP 13	15.01.2015
Macrobrachium idae	Palaemonidae	7	UP 14	13.01.2015
Macrobrachium idae	Palaemonidae	11	UP I	13.01.2015
Macrobrachium idae	Palaemonidae	22	UP 19	14.01.2015
Macrobrachium idae	Palaemonidae	4	UP 19	9.6. 2016
Macrobrachium idae	Palaemonidae	4	UP 29	16.01.2015
Macrobrachium idae	Palaemonidae	4	UP A	16.01.2015
Macrobrachium idae	Palaemonidae	4	UP AL1	February, 2015
Macrobrachium idae	Palaemonidae	1	UP IV	11.3. 2015
Macrobrachium idae	Palaemonidae	10	UP 32	February, 2015
Macrobrachium idae	Palaemonidae	16	UP 33	February, 2015
Macrobrachium idae	Palaemonidae	6	UP 38	February, 2015
Macrobrachium idae	Palaemonidae	4	UP 39	February, 2015
Macrobrachium idae	Palaemonidae	20	UP 40	February, 2015
Macrobrachium idae	Palaemonidae	12	UP 41	February, 2015
Macrobrachium idae	Palaemonidae	3	UP 44	February, 2015
Macrobrachium idae	Palaemonidae	1	UP 44	5.10.2016
Macrobrachium idae	Paleamonidae	7	UP 50	10.3. 2015
Macrobrachium idae	Palaemonidae	6	WB 1	29.2. 2016

Genus	Family	Abundancy	Location code	Date
Macrobrachium idae	Palaemonidae	43	WB 03	27.5. 2015
Macrobrachium idae	Palaemonidae	1	WB 03	29.2. 2016
Macrobrachium idae	Palaemonidae	1	WB 4	26.2. 2016
Macrobrachium idae	Palaemonidae	3	WB 5	24.2. 2016
Macrobrachium idae	Palaemonidae	1	WB 6	27.2.2016
Macrobrachium idae	Palaemonidae	9	WB 7	27.2. 2016
Macrobrachium idae	Palaemonidae	9	WB 11	27.5. 2015
Macrobrachium idae	Palaemonidae	1	WB 11	27.2. 2016
Macrobrachium idae	Paleamonidae	1	WB 12	26.2.2016
Macrobrachium idae	Palaemonidae	3	WB 13	23.5. 2015
Macrobrachium idae	Palaemonidae	64	WB 34	29.5. 2015
Macrobrachium lanatum	Palaemonidae	1	UK 6	20.6. 2014
Macrobrachium lanchasteri	Palaemonidae	1	WB 01	26.5. 2015
Macrobrachium lar	Palaemonidae	1	BH 3 downstream	29.12.2015
Macrobrachium lar	Palaemonidae	1	BH 13	January, 2016
Macrobrachium lar	Palaemonidae	1	UP 50	18.10.2016
Macrobrachium lopopodus	Palaemonidae	8	BH 3 downstream	29.12.2015
Macrobrachium lopopodus	Palaemonidae	1	BH 04	29.12.2015
Macrobrachium lopopodus	Paleamonidae	1	BH 08	April, 2015
Macrobrachium lopopodus	Palaemonidae	1	BH VI	January,2016
Macrobrachium lopopodus	Palaemonidae	1	BH S	12.1.2016
Macrobrachium lopopodus	Palaemonidae	6	BH 13	January, 2016
Macrobrachium lopopodus	Palaemonidae	1	BH K	January, 2016

Genus	Family	Abundancy	Location code	Date
Macrobrachium lopopodus	Palaemonidae	1	JH 1	14.1.2016
Macrobrachium lopopodus	Palaemonidae	11	JH 3	14.1.2016
Macrobrachium lopopodus	Palaemonidae	12	UP 1	1.2.2014
Macrobrachium lopopodus	Palaemonidae	10	UP 3	5.12.2014
Macrobrachium lopopodus	Palaemonidae	9	UP 3	3.5. 2016
Macrobrachium lopopodus	Palaemonidae	14	UP 4	December, 2015
Macrobrachium lopopodus	Palaemonidae	33	UP 4	28.4. 2016
Macrobrachium lopopodus	Palaemonidae	9	UP 6	10.5.2016
Macrobrachium lopopodus	Palaemonidae	1	NA Narora	4.6.2016
Macrobrachium lopopodus	Palaemonidae	10	UP 8	11.5. 2016
Macrobrachium lopopodus	Plaeamonidae	1	UP 12	8.6.2016
Macrobrachium lopopodus	Palaemonidae	14	UP 13	7.6.2016
Macrobrachium lopopodus	Palaemonidae	9	UP 14	7.6.2016
Macrobrachium lopopodus	Palaemonidae	3	UP I (UP17)	8.6.2016
Macrobrachium lopopodus	Palaemonidae	2	UP 18	8.6.2016
Macrobrachium lopopodus	Palaemonidae	14	UP 19	9.6. 2016
Macrobrachium lopopodus	Palaemonidae	5	UP 29	9.6. 2016
Macrobrachium lopopodus	Palaemonidae	29	UP AL1	4.10.2016

Genus	Family	Abundancy	Location code	Date
Macrobrachium lopopodus	Palaemonidae	2	UP II	7.6.2016
Macrobrachium lopopodus	Palaemonidae	49	UP III	20.10.2016
Macrobrachium lopopodus	Palaemonidae	4	UP IV	11.3. 2015
Macrobrachium lopopodus	Pleamonidae	19	UP IV	20.10.2016
Macrobrachium lopopodus	Palaemonidae	4	UP G	18.10.2016
Macrobrachium lopopodus	Palaemonidae	44	UP 32	6.10.2016
Macrobrachium lopopodus	Palaemonidae	9	UP 33	6.10.2016
Macrobrachium lopopodus	Palaemonidae	114	UP 39	4. 10. 2016
Macrobrachium lopopodus	Palaemonidae	37	UP 40	4.10. 2016
Macrobrachium lopopodus	Palaemonidae	61	UP 41	6.10.2016
Macrobrachium lopopodus	Palaemonidae	84	UP 47	5.10.2016
Macrobrachium lopopodus	Palaemonidae	22	UP 49	20.10.2016
Macrobrachium lopopodus	Palaemonidae	15	UP 50	18.10.2016
Macrobrachium lopopodus	Palaemonidae	37	UP 51	19.10.2016
Macrobrachium lopopodus	Palaemonidae	5	UP 53	19.10.2016
Macrobrachium lopopodus	Palaemonidae	1	UP 57	13.3. 2015
Macrobrachium lopopodus	Atyidae	53	UP 57 Corrected as UP 56	18.10.2016
Macrobrachium lopopodus	Palaemonidae	6	WB 01	26.5. 2015

Genus	Family	Abundancy	Location code	Date
Macrobrachium lopopodus	Palaemonidae	16	WB 03	27.5. 2015
Macrobrachium lopopodus	Palaemonidae	5	WB 4	26.2. 2016
Macrobrachium lopopodus	Palaemonidae	5	WB 5	24.2. 2016
Macrobrachium lopopodus	Palaemonidae	1	WB 6	27.2.2016
Macrobrachium lopopodus	Palaemonidae	18	WB 7	27.5. 2015
Macrobrachium lopopodus	Palaemonidae	5	WB 7	27.2. 2016
Macrobrachium lopopodus	Palaemonidae	2	WB 9	27.5. 2015
Macrobrachium lopopodus	Palaemonidae	1	WB 14	23.5. 2015
Macrobrachium lopopodus	Palaemonidae	1	WB 15	21.5. 2015
Macrobrachium lopopodus	Palaemonidae	4	WB 16	23.3. 2016
Macrobrachium lopopodus	Palaemonidae	5	WB 28	23.2.2016
Macrobrachium lopopodus	Palaemonidae	1	WB 34F	26.2.2016
Macrobrachium lopopodus	Palaemonidae	11	WB 34	29.5. 2015
Macrobrachium lopopodus juvenile	Palaemonidae	59	UP 6	10.5.2016
Macrobrachium mirabile	Palaemonidae	9	WB 34	29.5. 2015
Macrobrachium niphanae	Palaemonidae	4	UP 51	10.3.2015
Macrogomphus	Gomphidae	1	UP 9/JBUP 9	17.5.2016
Macrogomphus	Gomphidae	2	UP 13	7.6.2016
Macromia	Macromiidae	2	BH 04	29.12.2015

Genus	Family	Abundancy	Location code	Date
Macromia	Macromiidae	5	BH SK	31.12. 2015
Macromia	Macromiidae	1	UP 9/JBUP 9	17.5.2016
Macromia	Macromiidae	1	UP 18	15.1.2015
Macromia	Macromiidae	3	UP 19	14.01.2015
Macromia	Macromiidae	1	UP 39	4. 10. 2016
Macromia	Macromiidae	1	UP 54	12.3. 2015
Macromidia	Macromiidae	1	UP 6	December, 2014
Macromidia	Macromiidae	1	UP 7	December, 2014
Macromidia	Macromiidae	1	UP 9	18.12. 2014
Macromidia	Macromiidae	1	UP 12	January, 2015
Macromidia	Macromiidae	1	UP III	20.10.2016
Macromidia	Macromiidae	1	UP 39	February, 2015
Macromidia	Macromiidae	1	UP 39	4. 10. 2016
Makongia crassa	Viviparidae	6	BH 04	29.4. 2015
Makongia crassa	Viviparidae	7	BH 05	27.4. 2015
Makongia crassa	Viviparidae	21	JH 1	14.1.2016
Makongia crassa	Viviparidae	8	JH 2	14.1.2016
Makongia crassa	Viviparidae	91	JH 3	14.1.2016
Makongia crassa	Viviparidae	5	UP 49	March, 2015
Makongia crassa	Viviparidae	3	WB 01	26.5. 2015
Makongia crassa	Viviparidae	1	WB 03	27.5. 2015
Makongia crassa	Viviparidae	63	WB 7	27.5. 2015
Makongia crassa(juvenile)	Viviparidae	23	WB 13	23.5. 2015
Malaya larva	Culicidae	7	Up 56 as UP 55	10.3. 2015
Manayunkia/ Brandtika	Sabellidae	4	UP AL1	4.10.2016

Genus	Family	Abundancy	Location code	Date
Manayunkia/ Brandtika	Sabellidae	1	UP G	18.10.2016
Manayunkia/ Brandtika	Sabellidae	5	WB 27	25.3.2016
Manayunkia/ Brandtika	Sabellidae	32	BH K	January, 2016
Manayunkia/ Brandtika	Sabellidae	4	UP III	20.10.2016
Manayunkia/ Brandtika	Sabellidae	3	UP IV	20.10.2016
Manayunkia/ Brandtika	Sabellidae	1	UP 39	4. 10. 2016
Manayunkia/ Brandtika	Sabellidae	1	UP 49	20.10.2016
Manayunkia/ Brandtika	Sabellidae	1	UP 51	19.10.2016
Manayunkia/ Brandtika	Sabellidae	3	UP 53	19.10.2016
Manayunkia/ Brandtika	Sabellidae	11	UP 54	19.10.2016
Manayunkia/ Brandtika	Sabellidae	29	WB 17	3.3. 2015
Manayunkia/ Brandtika	Sabellidae	21	WB 19	18.5. 2015
Manayunkia/ Brandtika	Sabellidae	8	WB 25	23.2.2016
Manayunkia/ Brandtika	Sabellidae	1	WB 25	23.2.2016
Manayunkia/ Brandtika/Banditika	Sabellidae	5	BH S	12.1.2016
Manayunkia/ Brandtika/Brandtika	Sabellidae	3	BH V	12.1.2016
Mansonia	Culicidae	2	UP 4	December, 2015
Mansonia	Culicidae	1	WB 1	29.2. 2016

Genus	Family	Abundancy	Location code	Date
Mataeopsephus sp./ Psepheninae	Psephenidae	4	UK 6	3.11.2015
Matrona sp.	Calopterygidae	2	UK 6	3.11.2015
Megalestes chengi	Chlorolestidae	2	BH 12 Downstream	April, 2015
Megalestes chengi	Chlorolestidae	1	Up 56 as UP 55	10.3. 2015
Megalogomphus	Gomphidae	1	UP 33	6.10.2016
Mekomgia crassa	Viviparidae	26	UP 12	8.6.2016
Mekongia crassa	Viviparidae	2	BH 3 in round 1	24.4.2016
Mekongia crassa	Viviparidae	2	BH 3 downstream	29.12.2015
Mekongia crassa	Viviparidae	135	BH 04	29.12.2015
Mekongia crassa	Viviparidae	13	BH V	12.1.2016
Mekongia crassa	Viviparidae	8	BH 13	January, 2016
Mekongia crassa	Viviparidae	11	JH 4	14.1.2016
Mekongia crassa	Viviparidae	20	UP 12	January, 2015
Mekongia crassa	Viviparidae	1	UP 18	15.1.2015
Mekongia crassa	Viviparidae	1	UP AL1	February, 2015
Mekongia crassa	Viviparidae	1	UP III	11.3. 2015
Mekongia crassa	Viviparidae	1	UP III	20.10.2016
Mekongia crassa	Viviparidae	2	UP 32	February, 2015
Mekongia crassa	Viviparidae	16	UP 32	6.10.2016
Mekongia crassa	Viviparidae	1	UP 39	4. 10. 2016
Mekongia crassa	Viviparidae	7	WB 1	29.2. 2016
Mekongia crassa	Viviparidae	99	WB 03	29.2. 2016
Mekongia crassa	Viviparidae	25	WB 4	26.2. 2016
Mekongia crassa	Viviparidae	15	WB 5	24.2. 2016
Mekongia crassa	Viviparidae	39	WB 7	27.2. 2016

Genus	Family	Abundancy	Location code	Date
Mekongia crassa	Thiaridae	48	WB 10	26.2.2016
Mekongia crassa	Thiaridae	18	WB 13	25.2.2016
Mekongia crassa	Viviparidae	1	WB 16	23.3. 2016
Mekongia crassa juvenile	Viviparidae	1	UP G	18.10.2016
Melanoides pyramis	Thiaridae	1	WB 16	21.5. 2015
Melanoides pyramis	Thiaridae	1	BH 1/BH3	24.4.2015
Melanoides pyramis	Thiaridae	53	BH 3 in round 1	24.4.2016
Melanoides pyramis	Thiaridae	1	BH 3 downstream	29.12.2015
Melanoides pyramis	Thiaridae	12	BH 04	29.4. 2015
Melanoides pyramis	Thiaridae	125	BH 04	29.12.2015
Melanoides pyramis	Thiaridae	1	BH 05	27.4. 2015
Melanoides pyramis	Thiaridae	2	BH 11	April, 2015
Melanoides pyramis	Thiaridae	20	BH 12 Downstream	April, 2015
Melanoides pyramis	Thiaridae	28	BH 13	January, 2016
Melanoides pyramis	Thiaridae	11	BH K	January, 2016
Melanoides pyramis	Thiaridae	1	JH 1	14.1.2016
Melanoides pyramis	Thiaridae	58	JH 3	14.1.2016
Melanoides pyramis	Thiaridae	2	UP 3	5.12.2014
Melanoides pyramis	Thiaridae	29	UP 6A/ZBGP	16.5.2016
Melanoides pyramis	Melanoides pyramis	57	NL	4.6.2016
Melanoides pyramis	Thiaridae	9	UP 7	December, 2014
Melanoides pyramis	Thiaridae	5	UP 7	11.5. 2016
Melanoides pyramis	Thiaridae	2	UP 8	December, 2014
Melanoides pyramis	Thiaridae	2	UP III	11.3. 2015
Melanoides pyramis	Thiaridae	3	UP G	March, 2015

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Melanoides pyramis	Thiaridae	4	UP 32	February, 2015
Melanoides pyramis	Thiaridae	3	UP 33	February, 2015
Melanoides pyramis	Thiaridae	1	UP 44	February, 2015
Melanoides pyramis	Thiaridae	2	UP 50	10.3. 2015
Melanoides pyramis	Thiaridae	2	UP 53	10.3.2015
Melanoides pyramis	Thiaridae	15	WB 01	26.5. 2015
Melanoides pyramis	Thiaridae	7	WB 1	29.2. 2016
Melanoides pyramis	Thiaridae	7	WB 1	29.2. 2016
Melanoides pyramis	Thiaridae	22	WB 03	27.5. 2015
Melanoides pyramis	Thiaridae	35	WB 5	24.2. 2016
Melanoides pyramis	Thiaridae	2	WB 6	27.2.2016
Melanoides pyramis	Thiaridae	42	WB 7	27.5. 2015
Melanoides pyramis	Thiaridae	42	WB 7	27.2. 2016
Melanoides pyramis	Thiaridae	14	WB 9	27.5. 2015
Melanoides pyramis	Thiaridae	9	WB 10	26.2.2016
Melanoides pyramis	Thiaridae	24	WB 11	27.5. 2015
Melanoides pyramis	Thiaridae	2	WB 11	27.2. 2016
Melanoides pyramis	Thiaridae	11	WB 12	26.2.2016
Melanoides pyramis	Thiaridae	17	WB 13	23.5. 2015
Melanoides pyramis	Thiaridae	8	WB 13	25.2.2016
Melanoides pyramis	Thiaridae	2	WB 14	23.5. 2015
Melanoides pyramis	Thiaridae	8	WB 16	23.3. 2016
Melanoides pyramis	Thiaridae	14	WB 17	21.5.2015
Melanoides pyramis	Thiaridae	10	WB 19	18.5. 2015
Melanoides pyramis	Thiaridae	4	BH 12 Downstream	28.12.2015
Melanoides pyramis	Thiaridae	22	WB 4	26.2. 2016

Genus	Family	Abundancy	Location code	Date
Melanoides pyramis juvenile	Thiaridae	3	BH 12 Downstream	28.12.2015
Melanoides pyramis juvenile	Thiaridae	69	BH V	12.1.2016
Melanoides pyramis juvenile	Thiaridae	1	BH VI	January,2016
Melanoides pyramis juvenile	Thiaridae	1	BH 13	January, 2016
Melanoides pyramis juvenile	Thiaridae	38	UP 53	19.10.2016
Melanoides pyramis juvenile, adults	Thiaridae	16	JH 2	14.1.2016
Melanoides pyramis leopardina	Thiaridae	10	UP III	20.10.2016
Melanoides pyramis leopardina	Thiaridae	16	WB 4	26.2. 2016
Melanoides pyramis leopardina	Thiaridae	11	WB 7	27.2. 2016
Melanoides tuberculatus	Thiaridae	4	BH 3 in round 1	24.4.2016
Melanoides tuberculatus	Thiaridae	1	BH 04	29.12.2015
Melanoides tuberculatus	Thiaridae	6	BH SK	31.12. 2015
Melanoides tuberculatus	Thiaridae	3	BH 05	31.12.2015
Melanoides tuberculatus	Thiaridae	1	BH 08	April, 2015
Melanoides tuberculatus	Thiaridae	1	BH 12 Downstream	28.12.2015
Melanoides tuberculatus	Thiaridae	4	BH V	12.1.2016
Melanoides tuberculatus	Thiaridae	19	BH VI	January,2016
Melanoides tuberculatus	Thiaridae	10	BH 13	January, 2016

Genus	Family	Abundancy	Location code	Date
Melanoides tuberculatus	Thiaridae	3	BH K	January, 2016
Melanoides tuberculatus	Thiaridae	25	JH 1	14.1.2016
Melanoides tuberculatus	Thiaridae	3	JH 3	14.1.2016
Melanoides tuberculatus	Thiaridae	3	JH 4	14.1.2016
Melanoides tuberculatus	Thiaridae	43	UP 3	3.5. 2016
Melanoides tuberculatus	Thiaridae	2	UP 4	28.4. 2016
Melanoides tuberculatus	Melanoides tuberculatus	25	NL	4.6.2016
Melanoides tuberculatus	Thiaridae	8	UP 8	11.5. 2016
Melanoides tuberculatus	Thiaridae	1	UP 9/JBUP 9	17.5.2016
Melanoides tuberculatus	Thiaridae	3	UP 12	8.6.2016
Melanoides tuberculatus	Thiaridae	2	UP III	20.10.2016
Melanoides tuberculatus	Thiaridae	1	UP IV	20.10.2016
Melanoides tuberculatus	Thiaridae	2	UP 41	6.10.2016
Melanoides tuberculatus	Thiaridae	4	UP 50	18.10.2016
Melanoides tuberculatus	Thiaridae	3	UP 57 Corrected as UP 56	18.10.2016
Melanoides tuberculatus	Thiaridae	2	WB 2	29.2 2016
Melanoides tuberculatus	Thiaridae	23	WB 5	24.2. 2016

Genus	Family	Abundancy	Location code	Date
Melanoides tuberculatus	Thiaridae	8	WB 6	27.2.2016
Melanoides tuberculatus	Thiaridae	17	WB 7	27.2. 2016
Melanoides tuberculatus	Thiaridae	6	WB 11	27.2. 2016
Melanoides tuberculatus	Thiaridae	13	WB 12	26.2.2016
Melanoides tuberculatus	Thiaridae	2	WB 13	25.2.2016
Melanoides tuberculatus	Thiaridae	56	WB 16	23.3. 2016
Melanoides tuberculatus	Thiaridae	36	WB 19	18.5. 2015
Melanoides tuberculatus (dead)	Thiaridae	1	UP I	13.01.2015
Mesovalia	Mesoveliidae	1	WB 25	23.2.2016
Metrocoris	Gerridae	1	UP 4	December, 2015
Micronecta	Corixidae	5	BH 3 in round 1	24.4.2016
Micronecta	Corixidae	8	BH SK	31.12. 2015
Micronecta	Corixidae	3	BH 8	28.12.2015
Micronecta	Corixidae	4	BH 12 Downstream	28.12.2015
Micronecta	Corixidae	1	BH S	12.1.2016
Micronecta	Corixidae	1	BH 13	January, 2016
Micronecta	Corixidae	9	JH 3	14.1.2016
Micronecta	Corixidae	1	UP 1	26.4. 2016
Micronecta	Corixidae	1	UP 6	10.5.2016
Micronecta	Corixidae	1	NA Narora	4.6.2016
Micronecta	Corixidae	4	UP 14	7.6.2016
Micronecta	Corixidae	1	UP I (UP17)	8.6.2016

Genus	Family	Abundancy	Location code	Date
Micronecta	Corixidae	1	WB 1	29.2. 2016
Micronecta female	Corixidae	11	BH 3 downstream	29.12.2015
Musca domestica	Muscidae	1	UP 2	December, 2014
Musca domestica larva	Muscidae	1	UK 8b D/S JSTP	27.10.2015
Musca domestica larva	Muscidae	2	UP 8	December, 2014
Musca domestica pupa	Muscidae	10	WB 31	27.2.2016
Musculium indicum	Sphaeriidae	2	JH 4	14.1.2016
Musculium indicum	Sphaeriidae	1	UP 44	February, 2015
Nais alpina	Naididae	1	WB 25	23.2.2016
Nais bretscheri	Naididae	3	WB 25	23.2.2016
Namalycastia indica	Nereididae	4	WB 25	23.2.2016
Namalycastis abiuma	Namanereidinae (Nereididae)	2	WB 34	26.2.2016
Namalycastis abiuma	Namanereidinae (Nereididae)	26	WB 35	24.2.2016
Namalycastis fauveli	Nereididae	1	BH 11	April, 2015
Namalycastis fauveli	Nereididae	1	BH 12 upstream	April, 2015
Namalycastis fauveli	Nereididae	2	BH 12 Downstream	April, 2015
Namalycastis fauveli	Nereididae	1	JH 3	14.1.2016
Namalycastis fauveli	Nereididae	1	JH 4	14.1.2016
Namalycastis fauveli	Nereididae	5	WB 17	21.5.2015
Namalycastis fauveli	Nereididae	2	WB 34	29.5. 2015
Namalycastis indica	Nereididae	1	BH 04	29.12.2015
Namalycastis indica	Nereididae	1	BH V	12.1.2016
Namalycastis indica	Nereididae	1	BH 13	January, 2016

Genus	Family	Abundancy	Location code	Date
Namalycastis indica	Nereididae	9	BH K	January, 2016
Namalycastis indica	Nereididae	1	JH 2	14.1.2016
Namalycastis indica	Nereidae	1	UP AL1	4.10.2016
Namalycastis indica	Nereididae	13	UP III	20.10.2016
Namalycastis indica	Nereidae	5	UP 51	19.10.2016
Namalycastis indica	Nereidae	1	UP 53	19.10.2016
Namalycastis indica	Nereididae	2	WB 03	29.2. 2016
Namalycastis indica	Nereididae	1	WB 7	27.2. 2016
Namalycastis indica	Nereididae	5	WB 10	26.2.2016
Namalycastis indica	Nereididae	1	WB 14	28.2. 2016
Namalycastis indica	Nereididae	1	WB 16	21.5. 2015
Namalycastis indica	Nereididae	4	WB 16	23.3. 2016
Namalycastis indica	Nereididae	3	WB 21	22.5. 2015
Namalycastis sp.	Nereididae	2	WB 35	24.2.2016
Namanerieis covernicola	Namanereidinae (Nereididae)	1	UP IV	20.10.2016
Namanerieis covernicola	Namanereidinae (Nereididae)	1	UP 40	4.10. 2016
Namanerieis covernicola	Nmanereidinae (Nereididae)	1	WB 19	18.5. 2015
Namanerieis covernicola	Nmanereidinae (Nereididae)	2	WB 27	25.3.2016
Namanerieis covernicola	Nmanereidinae (Nereididae)	3	WB 34	26.2.2016
Nannophya pygmea	Dytiscidae	1	UP 3	3.5. 2016
Nannophya pygmea	Libellulidae	2	UP 4	28.4. 2016
Nannophya pygmea	Dytiscidae	1	UP 6A/ZBGP	16.5.2016
Nannophya pygmea	Dytiscidae	1	UP 6A/ZBGP	16.5.2016
Nannophya pygmea	Libellulidae	8	UP 7	11.5. 2016
Nannophya pygmea	Libellulidae	26	UP 8	11.5. 2016
Nannophya pygmea	Libellulidae	5	UP 14	7.6.2016

Genus	Family	Abundancy	Location code	Date
Nannophya pygmea	Libellulidae	6	UP 14	7.6.2016
Nannophya pygmea	Libellulidae	1	WB 7	27.5. 2015
Nannophya pygmea	Libellulidae	15	WB 14	23.5. 2015
Nannophya pygmea pygmea	Libellulidae	2	WB 01	26.5. 2015
Nannophya pygmea pygmea	Libellulidae	1	WB 02	27.5. 2015
Nannophya pygmea pygmea	Libellulidae	1	WB 03	27.5. 2015
Nannophya pygmea pygmea	Libellulidae	1	WB 9	27.5. 2015
Nannopphya	Libellulidae	5	UP 12	8.6.2016
Naritina (Dostia) violacea	Neritidae	1	WB 32	25.2.2016
Neamaneries covernicola	Nmanereidinae (Nereididae)	1	WB 25	23.2.2016
Neamaneries covernicola	Nmanereidinae (Nereididae)	2	WB 25	23.2.2016
Nemotelus	Stratiomyidae	1	UP 11	December, 2014
Neoephemeropsis	Neoephemeridae	1	JH 4	14.1.2016
Neoephemeropsis	Neoephemeridae	3	UK 1	01.07.2014
Neoephemeropsis	Neoephemeridae	4	UK B	25.4.2016
Neoephemeropsis	Neoephemeridae	2	UK 5	25.6.2014
Neoephemeropsis	Neoephemeridae	24	UK 5	18.11. 2015
Neoephemeropsis	Neoephemeridae	15	UK 6	3.11.2015
Neoephemeropsis	Neoephemeridae	1	UP 13	7.6.2016
Neohydrocoptus	Noteridae	1	UP 3	5.12.2014
Neoniphargus	Niphargidae	6	WB 34	26.2.2016
Neoniphargus	Niphargidae	1	WB 35	24.2.2016
Neoniphargus	Niphargidae	10	WB 35	24.2.2016
Neoniphargus indicus dried	Nipharigidae	2	UP 33	6.10.2016

Genus	Family	Abundancy	Location code	Date
Neorhynchoplax nasalis	Hymenosomatiae	1	WB 7	27.5. 2015
Neorhynchoplax nasalis	Hymenosomatidae	2	WB 17	21.5.2015
Neorhynchoplax nasalis	Hymenosomatidae	2	WB 21	22.5. 2015
Neorhynchoplax nasalis	Hymenosomatidae	1	WB 27	25.3.2016
Neorhynchoplax nasalis juvenile	Hymenosomatidae	1	WB 01	26.5. 2015
Neorhynchoplax nasalis juvenile	Hymenosomatidae	1	WB 19	18.5. 2015
Nepa	Nepidae	2	UP 4	28.4. 2016
Nepa	Nepidae	2	UP 4	28.4. 2016
Nepa	Nepidae	1	UP 6	10.5.2016
Nepa	Nepidae	1	jf	4.6.2016
Nepa	Nepidae	1	UP 7	11.5. 2016
Nepa	Nepidae	31	UP 10/UP 11	19.5.2015
Nepa	Nepidae	11	UP 12	8.6.2016
Nepa	Nepidae	5	UP 13	7.6.2016
Nepa	Nepidae	3	UP 14	7.6.2016
Nepa	Nepidae	4	UP I (UP17)	8.6.2016
Nepa	Nepidae	9	UP 19	9.6. 2016
Nepa	Nepidae	1	UP 29	9.6. 2016
Nepa	Nepidae	7	UPDG	9.6.2016
Nepa	Nepidae	1	UP AL1	4.10.2016
Nepa	Nepidae	29	UP II	7.6.2016
Nepa	Nepidae	5	UP 47	5.10.2016
Nepa	Nepidae	2	UP 49	20.10.2016
Nepa	Nepidae	4	UP 50	18.10.2016
Nepa	Nepidae	3	UP 51	10.3.2015

Genus	Family	Abundancy	Location code	Date
Nepa	Nepidae	1	UP 51	19.10.2016
Nepa	Nepidae	1	UP 56 corrected as UP 55	19.10.2016
Nepa	Nepidae	1	WB 4	26.2. 2016
Nepa	Nepidae	1	WB 11	27.5. 2015
Nepa	Nepidae	1	WB 11	27.2. 2016
Nepa	Nepidae	1	WB 14	28.2. 2016
Nepa	Nepidae	1	WB 31	27.2.2016
Nepa adult	Nepidae	1	WB 6	27.2.2016
Nepa juvenile	Nepidae	3	WB 6	27.2.2016
Nepa,nymph	Nepidae	13	UP 6A/ZBGP	16.5.2016
Nepa,nymph	Nepidae	1	UP 6A/ZBGP	16.5.2016
Nephthys oligobranchia	Nephthydae	5	BH S	12.1.2016
Nephthys oligobranchia	Nephthydae	1	JH 2	14.1.2016
Nephthys oligobranchia	Nephthydae	1	WB 7	27.5. 2015
Nephthys polybranchia	Nephthydae	22	UP III	11.3. 2015
Nephthys polybranchia	Nephthydae	1	UP G	March, 2015
Nephthys polybranchia	Nephthydae	24	UP 49	March, 2015
Nephthys polybranchia	Nephthydae	1	WB 16	21.5. 2015
Nereis chilkaensis	Nereididae	1	WB 03	29.2. 2016
Nereis chilkaensis	Nereididae	2	WB 17	21.5.2015
Neries chilkaensis	Nereididae	1	WB 7	27.2. 2016
Neritina (Dostia) violacea	Neritidae	5	WB 34	29.5. 2015
Neritina (Dostia) violacea	Neritidae	10	WB 35	24.2.2016

Genus	Family	Abundancy	Location code	Date
Neritina (Dostia) violacea	Neritidae	5	WB 23	18.5. 2015
Neritina (Vittina) smithi	Neritidae	2	WB 32	25.2.2016
Neritina (Vittina) smithi	Neritidae	3	WB 34	29.5. 2015
Nerocilia depressa	Cymothoidae	39	WB 15	21.5. 2015
Nihonogomphus	Gomphidae	1	BH 12 Downstream	April, 2015
Nimphula	Pyrulidae	1	BH 12 Downstream	April, 2015
Nipponhydrus	Dytiscidae	1	BH 3 downstream	29.12.2015
Nipponhydrus	Dytiscidae	10	BH 08	April, 2015
Nipponhydrus	Dytiscidae	1	BH S	12.1.2016
Nipponhydrus	Dytiscidae	1	UP 3	5.12.2014
Nipponhydrus	Dytiscidae	3	UP 4	December, 2015
Nipponhydrus	Dytiscidae	1	UP 6	10.5.2016
Nipponhydrus	Dytiscidae	1	jf,	4.6.2016
Nipponhydrus	Dytiscidae	1	UP 10	December, 2014
Nipponhydrus	Dytiscidae	9	UP II	14.01.2015
Nipponhydrus	Dytiscidae	1	UP 13	15.01.2015
Nipponhydrus	Dytiscidae	1	UP 13	15.01.2015
Nipponhydrus	Dytiscidae	3	UP 14	13.01.2015
Nipponhydrus	Dytiscidae	9	UP II	14.01.2015
Nipponhydrus	Dytiscidae	1	UP IV	11.3. 2015
Nipponhydrus	Dytiscidae	1	UP IV	20.10.2016
Nipponhydrus	Dytiscidae	1	UP 49	March, 2015
Nipponhydrus	Dytiscidae	1	UP 51	10.3.2015
Nipponhydrus	Dytiscidae	2	WB 02	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Nipponhydrus	Dytiscidae	8	WB 14	23.5. 2015
Nipponhydrus	Dytiscidae	1	WB 15	21.5. 2015
Noterus	Noteridae	1	UP 8	11.5. 2016
Noterus	Noteridae	1	UP 33	February, 2015
Noterus	Noteridae	1	WB 4	26.2. 2016
Noterus	Noteridae	1	WB 4	26.2. 2016
Noterus	Noteridae	1	WB 11	27.5. 2015
Noterus	Noteridae	1	WB 14	28.2. 2016
Novaculina gangetica	Solecurtidae	78	BH V	12.1.2016
Novaculina gangetica	Solecurtidae	9	BH 13	January, 2016
Novaculina gangetica	Solecurtidae	9	BH K	January, 2016
Novaculina gangetica	Solecurtidae	5	JH 2	14.1.2016
Novaculina gangetica	Solecurtidae	2	WB 1	29.2. 2016
Novaculina gangetica	Solecurtidae	3	WB 2	29.2 2016
Novaculina gangetica	Solecurtidae	9	WB 03	29.2. 2016
Novaculina gangetica	Solecurtidae	1	WB 4	26.2. 2016
Novaculina gangetica	Solecurtidae	33	WB 7	27.2. 2016
Novaculina gangetica	Solecurtidae	2	WB 10	26.2.2016
Novaculina gangetica	Solecurtidae	3	WB 11	27.2. 2016
Novaculina gangetica	Solecurtidae	1	WB 12	26.2.2016
Novaculina gangetica	Solecurtidae	4	WB 13	25.2.2016

Genus	Family	Abundancy	Location code	Date
Novaculina gangetica	Solecurtidae	1	WB 19	18.5. 2015
Novaculina gangetica juvenile	Solecurtidae	2	BH V	12.1.2016
Novaculina gangetica juvenile	Solecurtidae	1	WB 25	23.2.2016
Novaculina gangetica juvenile, adult	Solecurtidae	15	JH 3	14.1.2016
Noviculana gangetica juvenile	Solecurtidae	1	BH M	30.12.2015
Noviculina gangetica	Solecurtidae	1	JH 4	14.1.2016
Nymphomyia	Nymphomyiidae	2	UP 11	December, 2014
Nymphula	Pyrulidae	2	UP 2	26.4. 2016
Nymphula	Pyrulidae	2	UP 3	3.5. 2016
Oecetis	Leptoceridae	10	UP 3	3.5. 2016
Onchidium sp.	Onchidiidae	2	WB 34F	26.2.2016
Onchidium typhae	Onchidiidae	4	WB 34F	26.2.2016
Orectochilus	Gyrinidae	1	BH K	January, 2016
Orectochilus	Gyrinidae	1	UK 7	21.6. 2014
Orectochilus	Gyrinidae	9	UP 50	10.3. 2015
Orectochilus larva	Gyrinidae	1	BH 04	29.12.2015
Oreodytes larva	Dytiscidae	1	BH M	30.12.2015
Oreodytes larva	Dytiscidae	2	JH 3	14.1.2016
Oreodytes larva	Dytiscidae	26	JH 4	14.1.2016
Oreodytes larvae	Dytiscidae	3	UP 1	1.2.2014
Orientogomphus	Gomphidae	1	UP 3	3.5. 2016
Orientogomphus	Gomphidae	1	UP III	11.3. 2015
Orientogomphus	Gomphidae	9	UP 33	February, 2015

Genus	Family	Abundancy	Location code	Date
Orientogomphus	Gomphidae	2	UP 39	February, 2015
Orientogomphus	Gomphidae	8	UP 40	February, 2015
Orientogomphus	Gomphidae	1	UP 44	February, 2015
Orientogomphus	Gomphidae	1	UP 54	12.3. 2015
Orientogomphus exuvae(Dead)	Gomphidae	1	WB 03	27.5. 2015
Orthetrum	Libellulidae	9	BH 3 downstream	29.12.2015
Orthetrum	Libellulidae	1	UP 4	28.4. 2016
Orthetrum	Libellulidae	2	UP 6A/ZBGP	16.5.2016
Orthetrum	Libellulidae	1	UP G	18.10.2016
Orthetrum albistylum speciosum	Libellulidae	1	BH 12 Downstream	April, 2015
Orthetrum albistylum speciosum	Libellulidae	1	UP 3	5.12.2014
Orthetrum albistylum speciosum	Libellulidae	2	UP 3	3.5. 2016
Orthetrum albistylum speciosum	Libellulidae	1	UP 4	28.4. 2016
Orthetrum albistylum speciosum	Libellulidae	13	UP 8	December, 2014
Orthetrum albistylum speciosum	Libellulidae	1	UP 9	18.12. 2014
Orthetrum albistylum speciosum	Libellulidae	14	UP 11	December, 2014
Orthetrum albistylum speciosum	Libellulidae	1	UP 19	9.6. 2016
Orthetrum albistylum speciosum	Libellulidae	1	UP 29	16.01.2015
Orthetrum albistylum speciosum	Libellulidae	1	UP G	March, 2015

Genus	Family	Abundancy	Location code	Date
Orthetrum albistylum speciosum	Libellulidae	1	UP 40	February, 2015
Orthetrum albistylum speciosum	Libellulidae	2	UP 44	February, 2015
Orthetrum albistylum speciosum	Libellulidae	6	UP 50	10.3. 2015
Orthetrum albistylum speciosum	Libellulidae	4	WB 03	27.5. 2015
Orthetrum albistylum speciosum	Libellulidae	2	WB 7	27.5. 2015
Orthetrum albistylum speciosum	Libellulidae	3	WB 11	27.5. 2015
Orthetrum albistylum speciosum	Libellulidae	17	WB 14	23.5. 2015
Orthocladiinae	Chironomidae	15	BH SK	31.12. 2015
Orthocladiinae	Chironomidae	3	BH VI	January,2016
Orthocladiinae	Chironomidae	2	BH S	12.1.2016
Orthocladiinae	Chironomidae	18	UK 1	24.11.2015
Orthocladiinae	Chironomidae	3	UK B	25.4.2016
Orthocladiinae	Chironomidae	1	UK 4	4.11.2015
Orthocladiinae	Chironomidae	45	UK 5	18.11. 2015
Orthocladiinae	Chironomidae	3	UK 7	28.10.2015
Orthocladiinae	Chironomidae	12	UK 8b D/S JSTP	27.10.2015
Orthocladiinae	Chironomidae	2	UP 3	5.12.2014
Orthocladiinae	Chironomidae	1	UP 14	7.6.2016
Orthocladiinae	Chironomidae	3	UP 19	9.6. 2016
Orthocladiinae	Chironomidae	4	UP 49	20.10.2016
Orthocladiinae	Chironomidae	4	UP 50	18.10.2016
Orthocladiinae	Chironomidae	20	UP 54	19.10.2016
Orthocladiinae	Chironomidae	5	UP 57 Corrected as UP 56	18.10.2016

Genus	Family	Abundancy	Location code	Date
Orthocladiinae	Chironomidae	4	WB 9	27.5. 2015
Orthocladiinae	Chironomidae	1	WB 12	26.2.2016
Orthocladiinae	Chironomidae	1	WB 16	23.3. 2016
Orthotrichia	Hydroptilidae	2	UK B	25.4.2016
Oxycera	Stratiomyidae	1	UP 3	3.5. 2016
Oxyethira	Hydroptilidae	1	UK 4	4.11.2015
Oxyethira	Hydroptilidae	1	UK 6	3.11.2015
Palaemonidae	Palaemonidae	8	NL	4.6.2016
Palaemonidae	Palaemonidae	8	rw	4.6.2016
Paludinella	Assimineidae	1	UP 47	5.10.2016
Paludinella (Schuetiella) daengswangi	Assimineidae	6	BH 13	January, 2016
Paludinella (Schuetiella) daengswangi	Assimineidae	1	WB 7	27.2. 2016
Paludinella (Schuetiella) daengswangi	Assimineidae	1	WB 31	27.2.2016
Paracorixa	Corixidae	1	BH SK	31.12. 2015
Paracorixa	Corixidae	1	WB 03	29.2. 2016
Paragomphus	Gomphidae	1	BH 05	27.4. 2015
Paragomphus	Gomphidae	1	BH 12 Downstream	April, 2015
Paragomphus	Gomphidae	2	UP II	7.6.2016
Paragomphus	Gomphidae	1	UP G	March, 2015
Paraplea	Pleidae	2	UP 6A/ZBGP	16.5.2016
Paraplea	Pleidae	1	UP 12	8.6.2016
Paraplea or Plea fontalis	Paraplea or Plea fontalis	1	NL	4.6.2016
Paraponyx	Pyrulidae	14	UP 7	11.5. 2016
Paraponyx	Pyralidae	1	WB 14	23.5. 2015

Genus	Family	Abundancy	Location code	Date
Paraponyx diminutalis	Pyrulidae	1	UP 3	3.5. 2016
Paraponyx diminutalis	Pyralidae	1	UP 57	13.3. 2015
Parreysia corrugata laevirostris	Amblemidae	6	UP 49	20.10.2016
Parreysia corrugata laevirostris juvenile	Amblemidae	5	BH V	12.1.2016
Parreysia corrugata laevirostris juvenile	Amblemidae	1	BH VI	January,2016
Parreysia corrugata laevirostris juvenile	Amblemidae	1	UP 3	3.5. 2016
Parreysia corrugata laevirostris juvenile	Amblemidae	1	UP G	March, 2015
Parreysia corrugata laevirostris juvenile	Amblemidae	7	UP 32	February, 2015
Parreysia favidens	Amblemidae	1	BH 3 downstream	29.12.2015
Parreysia favidens	Amblemidae	4	BH 05	31.12.2015
Parreysia favidens juvenile	Amblemidae	11	BH V	12.1.2016
Parreysia favidens chrysis	Amblemidae	7	BH V	12.1.2016
Parreysia favidens chrysis	Amblemidae	1	UP 3	3.5. 2016
Parreysia favidens chrysis	Amblemidae	2	UP 19	9.6. 2016
Parreysia favidens chrysis	Amblemidae	1	WB 16	23.3. 2016
Parreysia favidens favidens	Amblemidae	1	BH 05	27.4. 2015
Parreysia favidens favidens	Amblemidae	1	BH 13	January, 2016
Parreysia favidens favidens	Amblemidae	1	BH K	January, 2016

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Parreysia favidens favidens	Amblemidae	6	UP 3	3.5. 2016
Parreysia favidens favidens	Amblemidae	18	UP I (UP17)	8.6.2016
Parreysia favidens favidens	Amblemidae	1	UP 19	9.6. 2016
Parreysia favidens favidens	Amblemidae	5	UP III	20.10.2016
Parreysia favidens favidens	Amblemidae	1	UP G	March, 2015
Parreysia favidens favidens	Amblemidae	13	UP G	18.10.2016
Parreysia favidens favidens	Amblemidae	5	UP 32	6.10.2016
Parreysia favidens favidens	Amblemidae	14	UP 33	6.10.2016
Parreysia favidens favidens	Amblemidae	14	UP 39	4. 10. 2016
Parreysia favidens favidens	Amblemidae	5	UP 41	6.10.2016
Parreysia favidens favidens	Amblemidae	5	UP 50	18.10.2016
Parreysia favidens favidens	Amblemidae	7	UP 51	10.3.2015
Parreysia favidens favidens	Amblemidae	5	UP 51	19.10.2016
Parreysia favidens favidens	Amblemidae	3	UP 57	13.3. 2015
Parreysia favidens favidens	Amblemidae	1	UP 57 Corrected as UP 56	18.10.2016
Parreysia favidens favidens	Amblemidae	1	WB 4	26.2. 2016
Parreysia favidens favidens	Amblemidae	1	WB 13	25.2.2016

Genus	Family	Abundancy	Location code	Date
Parreysia favidens favidens	Amblemidae	3	WB 16	23.3. 2016
Parreysia favidens favidens (juvenile)	Amblemidae	2	WB 14	23.5. 2015
Parreysia favidens favidens juveniles	Amblemidae	4	UP 49	March, 2015
Parreysia favidens favidens(juvenile)	Amblemidae	1	WB 13	23.5. 2015
Parreysia favidens juvenile	Amblemidae	1	BH SK	31.12. 2015
Parreysia favidens juvenile	Amblemidae	1	BH SK	31.12. 2015
Parreysia favidens juvenile	Amblemidae	3	BH 12 Downstream	28.12.2015
Parreysia favidens juvenile	Amblemidae	6	BH VI	January,2016
Parreysia favidens juvenile	Amblemidae	2	BH 13	January, 2016
Parreysia favidens juvenile	Amblemidae	1	BH K	January, 2016
Parreysia favidens juvenile	Amblemidae	1	JH 1	14.1.2016
Parreysia favidens juvenile	Amblemidae	2	JH 2	14.1.2016
Parreysia favidens juvenile	Amblemidae	1	UP 3	3.5. 2016
Parreysia favidens juvenile	Amblemidae	2	UP 18	15.1.2015
Parreysia favidens juvenile	Amblemidae	2	UP 19	9.6. 2016
Parreysia favidens juvenile	Amblemidae	1	UP 50	18.10.2016
Parreysia favidens juvenile	Amblemidae	11	UP 54	12.3. 2015
Parreysia favidens juvenile	Amblemidae	12	WB 5	24.2. 2016

Genus	Family	Abundancy	Location code	Date
parreysia favidens juvenile	Amblemidae	3	WB 12	26.2.2016
Parreysia favidens juvenile	Amblemidae	1	WB 16	23.3. 2016
Parreysia favidens pinax	Amblemidae	1	BH 13	January, 2016
Parreysia favidens pinex	Amblemidae	1	UP 50	18.10.2016
Parreysia favidens pinex	Amblemidae	7	WB 6	27.2.2016
Parreysia fevidens	Amblemidae	2	BH S	12.1.2016
Parreysia fevidens favidens	Amblemidae	1	BH 11	April, 2015
Parreysia fevidens fevidens	Amblemidae	1	BH 04	29.12.2015
Parreysia fevidens juvenile	Amblemidae	24	BH 04	29.12.2015
Parreysia fevidens juvenile	Amblemidae	10	BH M	30.12.2015
Parreysia fevidens juvenile	Amblemidae	10	WB 01	26.5. 2015
Parreysia triembolus	Amblemidae	1	UP 57	13.3. 2015
Parreysia viridula	Amblemidae	4	BH SK	31.12. 2015
parreysia viridula	Amblemidae	1	BH V	12.1.2016
Parreysia viridula	Amblemidae	2	UP 9/JBUP 9	17.5.2016
Parreysia viridula	Amblemidae	3	UP 12	8.6.2016
Parreysia viridula	Amblemidae	3	UP 49	20.10.2016
Parreysia virudula	Amblemidae	12	UP AL1	February, 2015
Pearreysia favidens pinex	Amblemidae	1	WB 7	27.2. 2016
Peripsychoda	Psychodidae	1	WB 19	18.5. 2015
Perithelphusa	Parathelphusidae	2	WB 7	27.5. 2015
Perithelphusa	Parathelphusidae	1	WB 16	23.3. 2016

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Perithelphusa	Parathelphusidae	11	WB 17	21.5.2015
Perithelphusa	Parathelphusidae	6	WB 25	23.2.2016
Perithelphusa	Parathelphusidae	12	WB 34	29.5. 2015
Perithelphusa	Parathelphusidae	7	WB 35	24.2.2016
Perithelphusa juvenile	Perathelphusidae	13	WB 16	23.3. 2016
Physa (Haitia) mexicana	Physidae	1	UK 5	25.6.2014
Physa (Haitia) mexicana	Physidae	2	BH 1/BH3	24.4.2015
Physa (Haitia) mexicana	Physidae	2	BH 3 in round 1	24.4.2016
Physa (Haitia) mexicana	Physidae	5	BH SK	31.12. 2015
Physa (Haitia) mexicana	Physidae	28	BH 05	31.12.2015
Physa (Haitia) mexicana	Physidae	2	BH 11	April, 2015
Physa (Haitia) mexicana	Physidae	33	BH 12 Downstream	April, 2015
Physa (Haitia) mexicana	Physidae	11	BH 12 Downstream	28.12.2015
Physa (Haitia) mexicana	Physidae	1	JH 1	14.1.2016
Physa (Haitia) mexicana	Physidae	2	JH 2	14.1.2016
Physa (Haitia) mexicana	Physidae	4	JH 3	14.1.2016
Physa (Haitia) mexicana	Physidae	10	JH 4	14.1.2016
Physa (Haitia) mexicana	Physidae	6	UP 1	26.4. 2016
Physa (Haitia) mexicana	Physidae	92	UP 2	December, 2014

Genus	Family	Abundancy	Location code	Date
Physa (Haitia) mexicana	Physidae	1	UP 2	26.4. 2016
Physa (Haitia) mexicana	Physidae	9	UP 3	3.5. 2016
Physa (Haitia) mexicana	Physidae	36	UP 4	28.4. 2016
Physa (Haitia) mexicana	Physidae	21	UP 6A/ZBGP	16.5.2016
Physa (Haitia) mexicana	Physidae	26	UP 6	10.5.2016
Physa (Haitia) mexicana	Physidae	10	NA Narora	4.6.2016
Physa (Haitia) mexicana	Physa (Haitia) mexicana	24	NL	4.6.2016
Physa (Haitia) mexicana	Physidae	5	jf	4.6.2016
Physa (Haitia) mexicana	Physidae	2	UP 7	December, 2014
Physa (Haitia) mexicana	Physidae	44	UP 7	11.5. 2016
Physa (Haitia) mexicana	Physidae	41	UP 8	December, 2014
Physa (Haitia) mexicana	Physidae	4	UP 8	11.5. 2016
Physa (Haitia) mexicana	Physidae	9	UP 9/JBUP 9	17.5.2016
Physa (Haitia) mexicana	Physidae	5	UP 10/UP 11	19.5.2015
Physa (Haitia) mexicana	Physidae	8	UP 11	December, 2014
Physa (Haitia) mexicana	Physidae	11	UP 12	January, 2015
Physa (Haitia) mexicana	Physidae	8	UP 12	8.6.2016
Physa (Haitia) mexicana	Physidae	5	UP 13	7.6.2016

Genus	Family	Abundancy	Location code	Date
Physa (Haitia) mexicana	Physidae	44	UP 14	7.6.2016
Physa (Haitia) mexicana	Physidae	1	UP 18	15.1.2015
Physa (Haitia) mexicana	Physidae	22	UP 18	8.6.2016
Physa (Haitia) mexicana	Physidae	1	UP 19	9.6. 2016
Physa (Haitia) mexicana	Physidae	29	UP 19	9.6. 2016
Physa (Haitia) mexicana	Physidae	2	UP 29	9.6. 2016
Physa (Haitia) mexicana	Physidae	29	UP 29	16.01.2015
Physa (Haitia) mexicana	Physidae	1	UP AL1	February, 2015
Physa (Haitia) mexicana	Physidae	11	UP II	7.6.2016
Physa (Haitia) mexicana	Physidae	11	UP III	11.3. 2015
Physa (Haitia) mexicana	Physidae	22	UP IV	11.3. 2015
Physa (Haitia) mexicana	Physidae	31	UP G	March, 2015
Physa (Haitia) mexicana	Physidae	1	UP 32	February, 2015
Physa (Haitia) mexicana	Physidae	15	UP 33	February, 2015
Physa (Haitia) mexicana	Physidae	34	UP 38	February, 2015
Physa (Haitia) mexicana	Physidae	3	UP 39	February, 2015
Physa (Haitia) mexicana	Physidae	1	UP 40	4.10. 2016
Physa (Haitia) mexicana	Physidae	1	UP 41	February, 2015

Genus	Family	Abundancy	Location code	Date
Physa (Haitia) mexicana	Physidae	4	UP 47	5.10.2016
Physa (Haitia) mexicana	Physidae	6	UP 49	March, 2015
Physa (Haitia) mexicana	Physidae	32	UP 51	10.3.2015
Physa (Haitia) mexicana	Physidae	26	UP 53	10.3.2015
Physa (Haitia) mexicana	Physidae	1	UP 53	19.10.2016
Physa (Haitia) mexicana	Physidae	19	UP 54	12.3. 2015
Physa (Haitia) mexicana	Physidae	49	Up 56 as UP 55	10.3. 2015
Physa (Haitia) mexicana	Physidae	1	UP 56 corrected as UP 55	19.10.2016
Physa (Haitia) mexicana	Physidae	11	WB 01	26.5. 2015
Physa (Haitia) mexicana	Physidae	63	WB 1	29.2. 2016
Physa (Haitia) mexicana	Physidae	22	WB 02	27.5. 2015
Physa (Haitia) mexicana	Physidae	19	WB 03	27.5. 2015
Physa (Haitia) mexicana	Physidae	19	WB 03	29.2. 2016
Physa (Haitia) mexicana	Physidae	12	WB 4	26.2. 2016
Physa (Haitia) mexicana	Physidae	7	WB 7	27.5. 2015
Physa (Haitia) mexicana	Physidae	7	WB 9	27.5. 2015
Physa (Haitia) mexicana	Physidae	12	WB 11	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Physa (Haitia) mexicana	Physidae	9	WB 12	26.2.2016
Physa (Haitia) mexicana	Physidae	8	WB 13	23.5. 2015
Physa (Haitia) mexicana	Physidae	3	WB 13	25.2.2016
Physa (Haitia) mexicana	Physidae	1	WB 14	23.5. 2015
Physa (Haitia) mexicana	Physidae	5	WB 16	23.3. 2016
Physa (Haitia) mexicana	Physidae	6	WB 31	27.2.2016
Physa (Haitia) mexicana dead shells	Physidae	4	WB 02	27.5. 2015
Pila globosa	Ampullariidae	1	UP 57 Corrected as UP 56	18.10.2016
Pila globosa juvenile	Ampullariidae	3	BH 05	31.12.2015
Pila globosa juvenile	Ampullariidae	1	BH VI	January,2016
Pila globosa juvenile	Ampullariidae	50	BH 13	January, 2016
Pila globosa juvenile	Ampullariidae	5	WB 7	27.2. 2016
Pila globosa juvenile	Ampullariidae	6	WB 10	26.2.2016
Pisidium (Afropisidium) clarkeanum	Sphaeriidae	39	UP 3	3.5. 2016
Pisidium (Afropisidium) clarkeanum	Spaeriidae	1	WB 03	29.2. 2016
Pisidium (Afropisidium) clarkeanum	Spaeriidae	2	WB 5	24.2. 2016
Pisidium (Afropisidium) clarkeanum	Sphaeriidae	1	BH 8	28.12.2015

Genus	Family	Abundancy	Location code	Date
Pisidium (Aropisidium) clarkeanum	Sphaeriidae	2	BH 12 Downstream	28.12.2015
Pisidium annandalei	Sphaeriidae	1	UP 7	December, 2014
Pisidium atkinsonianum	Spaeriidae	2	WB 6	27.2.2016
Pisidiumannandalei	Spaeriidae	3	WB 03	27.5. 2015
Pisione garciavaldecasai	Pisionidae	14	BH VI	January,2016
Pisionee	Pisioneidae	9	WB 11	27.2. 2016
Pisionee garciavaldecasai	Pisioneidae	1	WB 5	24.2. 2016
Pisionee garciavaldecasai	Pisioneidae	16	WB 7	27.2. 2016
Pisionee garciavaldecasai	Pisioneidae	7	WB 10	26.2.2016
Pisionee garciavaldecasai	Pisioneidae	4	WB 12	26.2.2016
Pisionee garciavaldecasai	Pisioneidae	6	WB 13	25.2.2016
Pisionee garciavaldecasai	Pisioneidae	1	WB 14	28.2. 2016
Pisionee garciavaldecasai	Pisioneidae	21	WB 27	25.3.2016
Pisionee garciavaldecasai	Pisioneidae	2	WB 28	23.2.2016
Pisionee garciavaldecasai	Pisioneidae	1	WB 34F	26.2.2016
Pisionee graciavaldecasai	Pisioneidae	2	WB 31	27.2.2016
Pissidium (Odhneripisidium) prasongi	Sphaeriidae	3	UP 3	3.5. 2016
Pissidiumannandalei	Spaeriidae	1	WB 14	23.5. 2015
Planaeschna	Aeshnidae	1	UP 7	11.5. 2016

Genus	Family	Abundancy	Location code	Date
Platorchestia platensis	Talitridae	1	WB 34F	26.2.2016
Platorchetia platensis	Talitridae	2	WB 35	24.2.2016
Platybaetis	Baetidae	43	UK 1	24.11.2015
Platybaetis	Baetidae	4	UK 5	18.11. 2015
Platybaetis	Baetidae	90	UK 7	28.10.2015
Platybaetis	Baetidae	1	UK 8b D/S JSTP	27.10.2015
Polycentropus	Polycentropodidae	16	BH 04	29.12.2015
Potamiya	Hydropsychidae	30	UK 1	24.11.2015
Potamiya	Hydropsychidae	45	UK 4	4.11.2015
Prionocyphon	Scirtidae	1	WB 16	21.5. 2015
Prodasineura autumnalis	Protoneuridae	2	UP 3	5.12.2014
Prodasineura autumnalis	Protoneuridae	9	UP 3	3.5. 2016
Prodasineura autumnalis	Protoneuridae	1	UP 4	December, 2015
Prodasineura autumnalis	Protoneuridae	1	UP 4	28.4. 2016
Prodasineura autumnalis	Protoneuridae	6	UP 6A/ZBGP	16.5.2016
Prodasineura autumnalis	Protoneuridae	13	UP 6	10.5.2016
Prodasineura autumnalis	Protoneuridae	6	NL	4.6.2016
Prodasineura autumnalis	Protoneuridae	9	UP 7	11.5. 2016
Prodasineura autumnalis	Protoneuridae	6	UP 8	11.5. 2016
Prodasineura autumnalis	Protoneuridae	15	UP 12	8.6.2016
Prodasineura autumnalis	Protoneuridae	1	UP 13	15.01.2015

Genus	Family	Abundancy	Location code	Date
Prodasineura autumnalis	Protoneuridae	1	UP 13	7.6.2016
Prodasineura autumnalis	Protoneuridae	1	UP 19	9.6. 2016
Prodasineura autumnalis	Dytiscidae	1	UPDG	9.6.2016
Prodasineura autumnalis	Protoneuridae	1	UP III	20.10.2016
Prodasineura autumnalis	Protoneuridae	4	UP IV	20.10.2016
Prodasineura autumnalis	Protoneuridae	1	UP 40	February, 2015
Prodasineura autumnalis	Protoneuridae	1	UP 47	5.10.2016
Prodasineura autumnalis	Protoneuridae	1	UP 50	10.3. 2015
Prodasineura autumnalis	Protoneuridae	6	UP 51	10.3.2015
Prodasineura autumnalis	Protoneuridae	4	UP 57	13.3. 2015
Prodasineura autumnalis	Protoneuridae	16	WB 01	26.5. 2015
Prodasineura autumnalis	Protoneuridae	23	WB 1	29.2. 2016
Prodasineura autumnalis	Protoneuridae	1	WB 2	29.2 2016
Prodasineura autumnalis	Protoneuridae	4	WB 03	27.5. 2015
Prodasineura autumnalis	Protoneuridae	1	WB 03	29.2. 2016
Prodasineura autumnalis	Protoneuridae	2	WB 5	24.2. 2016
Prodasineura autumnalis	Protoneuridae	4	WB 6	27.2.2016
Prodasineura autumnalis	Protoneuridae	3	WB 9	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Prodasineura autumnalis	Protoneuridae	13	WB 11	27.5. 2015
Prodasineura autumnalis	Protoneuridae	2	WB 13	23.5. 2015
Prodasineura autumnalis	Protoneuridae	4	WB 13	25.2.2016
Prodasineura autumnalis	Protoneuridae	7	WB 14	23.5. 2015
Prodasineura autumnalis	Protoneuridae	1	WB 16	21.5. 2015
Prodasineura autumnalis	Protoneuridae	1	WB 25	23.2.2016
Prodesineura autumnalis	Protoneuridae	1	BH 3 in round 1	24.4.2016
Prodesineura autumnalis	Protoneuridae	2	BH SK	31.12. 2015
Prodesineura autumnalis	Protoneuridae	3	JH 4	14.1.2016
Prodesineura autumnalis	Protoneuridae	1	UK 4	4.11.2015
Prodesineura autumnalis	Protoneuridae	1	UK 6	20.6. 2014
Prodesineurs autumnalis	Protoneuridae	5	UP 14	7.6.2016
Psephenoides magnioculus adult	Psephenidae	1	UK 6	3.11.2015
Psephenoidinae	Psephenidae	1	UK 5	25.6.2014
Pseudamophilus	Elmididae	1	UP 44	February, 2015
Pseudocloeon	Baetidae	3	UK 1	01.07.2014
Pseudosesarma	Sesarmidae	1	WB 34	29.5. 2015
Pseudoseserma	Sesarmidae	7	WB 16	23.3. 2016
Psychoda	Psychodidae	3	WB 16	21.5. 2015
Psychoda	Psychodidae	1	WB 19	18.5. 2015

Genus	Family	Abundancy	Location code	Date
Psychoda	Psychodidae	9	WB 31	27.2.2016
Psychoda/ Psychomyiidae	Psychomyiidae	11	UK 8b D/S JSTP	27.10.2015
Pupa in trichoptera case		1	UK B	25.4.2016
Pupa of Agapetus	Glossosomatidae	1	UK B	25.4.2016
Pupa of Stactobiella in case	Hydroptilidae	2	UK B	25.4.2016
Pupa of Trichoptera in empty case		4	UK B	25.4.2016
Quickia sp	Succineidae	3	UP 29	9.6. 2016
Quickia sp.	Succineidae	1	UP 12	8.6.2016
Quickia sp.	Succineidae	15	UP 14	7.6.2016
Quickia sp/ Succineidae	Succinidae	2	UP 6A/ZBGP	16.5.2016
Radiatula andersoniana	Amblemidae	2	UP 57 Corrected as UP 56	18.10.2016
Radiatula caerulea	Amblemidae	1	BH 3 downstream	29.12.2015
Radiatula caerulea	Amblemidae	6	BH 04	29.12.2015
Radiatula caerulea	Amblemidae	1	BH K	January, 2016
Radiatula caerulea	Amblemidae	14	UP G	18.10.2016
Radiatula caerulea	Amblemidae	3	UP 50	18.10.2016
Radiatula caerulea	Amblemidae	4	UP 57 Corrected as UP 56	18.10.2016
Radiatula caerulea juvenile	Amblemidae	1	BH 04	29.4. 2015
Radiatula caerulea juvenile	Amblemidae	24	BH VI	January,2016
Radiatula caerulea juvenile	Amblemidae	4	JH 4	14.1.2016

Genus	Family	Abundancy	Location code	Date
Radiatula caerulea juvenile	Amblemidae	6	UP 3	3.5. 2016
Radiatula caerulea juvenile	Amblemidae	6	UP 3	3.5. 2016
Radiatula caerulea juvenile	Amblemidae	2	UP 9/JBUP 9	17.5.2016
Radiatula caerulea(Juvenile)	Amblemidae	1	WB 14	23.5. 2015
Radiatula gaudichaudi	Amblemidae	1	UP 12	8.6.2016
Radiatula occata	Amblemidae	2	BH 05	31.12.2015
Radiatula occata	Amblemidae	1	BH V	12.1.2016
Radiatula occata	Amblemidae	7	BH S	12.1.2016
Radiatula occata	Amblemidae	1	UP 7	December, 2014
Radiatula occata	Amblemidae	5	UP 18	8.6.2016
Radiatula occata	Amblemidae	2	UP G	18.10.2016
Radiatula occata juvenile	Amblemidae	6	BH V	12.1.2016
Radiatula occata juvenile	Amblemidae	16	UP 3	3.5. 2016
Radiatula occata juvenile	Amblemidae	1	UP 12	January, 2015
Radiatula occata(juvenile)	Amblemidae	6	UP 3	5.12.2014
Radiatula occata(juvenile)	Amblemidae	1	UP 4	December, 2015
Radiatula olivaria	Amblemidae	9	UP 4	28.4. 2016
Radiatula olivaria adult	Amblemidae	6	BH M	30.12.2015
Radiatula olivaria juvenile	Amblemidae	1	BH M	30.12.2015
Radiatula olivaria juvenile	Amblemidae	13	WB 01	26.5. 2015

Genus	Family	Abundancy	Location code	Date
Radiatula pachysoma	Amblemidae	1	UP 12	January, 2015
Radiatula pachysoma	Amblemidae	7	UP I (UP17)	8.6.2016
Radiatula shurtleffiana	Amblemidae	1	UP I (UP17)	8.6.2016
Radiatula shurtleffiana	Amblemidae	4	UP G	18.10.2016
Radiatulla caerulea	Amblemidae	5	JH 2	14.1.2016
Radiatulla caerulea	Amblemidae	3	JH 3	14.1.2016
Radiatulla occata	Amblemidae	20	UP I	13.01.2015
Radiatulla occata juvenile	Amblemidae	1	WB 6	27.2.2016
Radiatulla occata(1Juvenile)	Amblemidae	24	UP 9	18.12. 2014
Radix luteola	Lymnaeidae	14	jf,	4.6.2016
Ranatra	Ranatrinidae	4	JH 3	14.1.2016
Ranatra	Ranatrinidae	1	JH 4	14.1.2016
Ranatra	Ranatrinidae	5	UP 6	10.5.2016
Ranatra	Ranatrinidae	1	UP III	11.3. 2015
Ranatra	Ranatrinidae	1	UP 50	10.3. 2015
Ranatra	Ranatrinidae	4	UP 51	10.3.2015
Ranatra	Ranatrinidae	2	WB 03	27.5. 2015
Ranatra brevecolis	Ranatrinidae	1	UP 4	December, 2015
Ranatra brevecolis	Ranatrinidae	2	UP 4	28.4. 2016
Ranatra brevecolis	Ranatrinidae	9	UP 7	11.5. 2016
Ranatra brevecolis	Ranatrinidae	3	UP 8	11.5. 2016
Ranatra brevecolis	Ranatrinidae	5	UP 12	8.6.2016
Ranatra brevecolis	Ranatrinidae	9	UP 13	7.6.2016
Ranatra brevecolis	Ranatrinidae	2	UP 14	13.01.2015
Ranatra brevecolis	Ranatrinidae	2	UP 14	7.6.2016
Ranatra brevecolis	Ranatrinidae	1	UP 19	9.6. 2016

Genus	Family	Abundancy	Location code	Date
Ranatra brevecolis	Ranatrinidae	1	UPDG	9.6.2016
Ranatra brevecolis	Ranatrinidae	1	UP IV	20.10.2016
Ranatra brevecolis	Ranatrinidae	1	UP 56 corrected as UP 55	19.10.2016
Ranatra brevecolis	Ranatrinidae	3	UP 57	13.3. 2015
Ranatra brevecolis	Ranatrinidae	3	WB 1	29.2. 2016
Ranatra brevecolis	Ranatrinidae	1	WB 03	29.2. 2016
Ranatra brevecolis	Ranatrinidae	1	WB 14	28.2. 2016
Ranatra brevecolis	Ranatrinidae	4	WB 01	26.5. 2015
Ranatra brevicollis	Ranatrinidae	1	UP 6	December, 2014
Ranatra brevicollis	Ranatra brevicollis	1	NL	4.6.2016
Ranatra brevicollis	Ranatrinidae	2	jf,	4.6.2016
Ranatra brevicollis	Ranatrinidae	1	UP 8	December, 2014
Ranatra brevicollis	Ranatrinidae	10	UP 13	15.01.2015
Ranatra brevicollis	Ranatrinidae	7	UP IV	11.3. 2015
Ranatra brevicollis	Ranatrinidae	1	UP G	March, 2015
Ranatra brevicollis	Ranatrinidae	1	WB 14	23.5. 2015
Rhagodotarsus kraepelini	Velidae	1	UP 4	December, 2015
Rhagovelia singaporsnsis	Veliidae	1	JH 3	14.1.2016
Rhantus	Dytiscidae	1	BH 05	31.12.2015
Rhantus	Dytiscidae	1	UP 4	December, 2015
Rhantus	Dytiscidae	1	UP 6	December, 2014
Rhantus	Dytiscidae	2	UP 7	December, 2014

Genus	Family	Abundancy	Location code	Date
Rhantus	Dytiscidae	1	UP 11	December, 2014
Rhantus	Dytiscidae	3	UP 14	13.01.2015
Rhantus	Dytiscidae	5	UP 14	13.01.2015
Rhithrogena	Heptageniidae	1	UK 1	01.07.2014
Rhithrogena	Heptageniidae	77	UK 1	24.11.2015
Rhithrogena	Heptageniidae	13	UK B	25.4.2016
Rhithrogena	Heptageniidae	8	UK 4	4.11.2015
Rhithrogena	Heptageniidae	12	UK 5	25.6.2014
Rhithrogena	Heptageniidae	5	UK 6	3.11.2015
Rhithrogena	Heptageniidae	62	UK 7	28.10.2015
Rhithrogena	Heptageniidae	8	UK 8, U/S JSTP	27.10.2015
Rhithrogena	Heptageniidae	19	UK 8b D/S JSTP	27.10.2015
Rhyothemis	Libellulidae	3	BH 3 in round 1	24.4.2016
Rhyothemis	Libellulidae	1	BH 05	31.12.2015
Rhyothemis	Libellulidae	1	UP 6A/ZBGP	16.5.2016
Rhyothemis	Libellulidae	1	UP 7	11.5. 2016
Rhyothemis	Libellulidae	2	UP 8	11.5. 2016
Rhyothemis	Libellulidae	2	WB 03	27.5. 2015
Sacrophaga	Sarcophagidae	1	WB 16	23.3. 2016
Salangathelphusa juvenile	Gecarcinucidae	12	WB 34	29.5. 2015
Sarcophaga	Sarcophagidae	1	WB 31	27.2.2016
Scaphula celox	Arcidae	1	UP 53	19.10.2016
Scaphula celox	Arcidae	2	WB 03	27.5. 2015
Scaphula celox	Arcidae	1	WB 4	26.2. 2016
Scaphula celox	Arcidae	1	WB 6	27.2.2016
Scaphula celox	Arcidae	2	WB 7	27.2. 2016

Genus	Family	Abundancy	Location code	Date
Scaphula celox	Arcidae	1	WB 16	21.5. 2015
Scaphula deltae	Arcidae	1	WB 03	27.5. 2015
Scaphula deltae	Arcidae	1	WB 11	27.5. 2015
Segmentina calatha	Planorbidae	1	BH 05	31.12.2015
Segmentina trochoidae	Planorbidae	3	WB 14	28.2. 2016
Septaria sp.	Septariidae	1	WB 17	21.5.2015
Septaria tesselata	Septariidae	2	WB 17	21.5.2015
Sesarmidae	Potamidae	1	WB 34	29.5. 2015
Sesarmoides	Sesamidae	21	WB 17	3.3. 2015
Sesarmoides	Sesarmidae	1	WB 21	22.5. 2015
Sesarmoides	Sesarmidae	60	WB 25	23.2.2016
Sesarmoides	Sesarmidae	7	WB 27	25.3.2016
Sesarmoides	Sesarmidae	3	WB 32	25.2.2016
Sesarmoides	Sesarmidae	9	WB 34F	26.2.2016
Sesarmoides	Sesarmidae	17	WB 34	29.5. 2015
Sesarmoides	Sesarmidae	4	WB 34	26.2.2016
Sesarmoides, 9adults, 16 juvenile	Sesarmidae	25	WB 16	23.3. 2016
Sesarmops	Sesarmidae	10	WB 16	21.5. 2015
Sesarmops	Sesarmidae	10	WB 25	23.2.2016
Sesarmops	Sesarmidae	1	WB 31	27.2.2016
Sesarmops	Sesarmidae	2	WB 34F	26.2.2016
Sesarmops	Sesarmidae	7	WB 34	29.5. 2015
Sesarmops female with eggs	Sesarmidae	1	WB 35	24.2.2016
Sesarmops juvenile	Sesarmidae	1	WB 27	25.3.2016
Sesarmops juvenile	Sesarmidae	4	WB 31	27.2.2016
Sesarmops Juvenile	Sesarmidae	6	WB 32	25.2.2016
Sesarmops juvenile	Sesarmidae	2	WB 34F	26.2.2016

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Sesarmops juvenile	Sesarmidae	1	WB 34	26.2.2016
Sesarmops juvenile	Sesarmidae	2	WB 35	24.2.2016
Sesarmops juvenile	Sesarmidae	3	WB 35	24.2.2016
Sesermops juvenile	Sesarmidae	2	WB 25	23.2.2016
Sesermops juvenile	Sesarmidae	1	WB 28	23.2.2016
Sieboldius	Gomphidae	1	UP 3	3.5. 2016
Sieboldius	Gomphidae	3	UP IV	20.10.2016
Sieboldius	Gomphidae	3	UP 57 Corrected as UP 56	18.10.2016
Sigara	Corixidae	1	BH SK	31.12. 2015
Sigara	Corixidae	2	UK 6	3.11.2015
Sigara	Corixidae	1	UP 9	18.12. 2014
Sigara	Corixidae	4	UP 11	December, 2014
Sigara	Corixidae	1	UP 19	14.01.2015
Sigara	Corixidae	2	UP 33	February, 2015
Sigara	Corixidae	2	UP 39	February, 2015
Sigara	Corixidae	2	UP 41	February, 2015
Sigara	Corixidae	2	UP 44	February, 2015
Sigara	Corixidae	9	WB 1	29.2. 2016
Sigara	Corixidae	1	WB 2	29.2 2016
Simulium	Simulidae	1	UK 1	01.07.2014
Simulium	Simulidae	3	UK B	25.4.2016
Simulium	Simulidae	1	UK 5	18.11. 2015
Simulium	Simulidae	3	UK 7	28.10.2015
Sinictinogomphus	Gomphidae	8	BH 3 in round 1	24.4.2016

Genus	Family	Abundancy	Location code	Date
Sinictinogomphus	Gomphidae	18	BH 04	29.4. 2015
Sinictinogomphus	Gomphidae	160	BH 04	29.12.2015
Sinictinogomphus	Gomphidae	45	BH SK	31.12. 2015
Sinictinogomphus	Gomphidae	10	BH 05	31.12.2015
Sinictinogomphus	Gomphidae	3	BH 08	April, 2015
Sinictinogomphus	Gomphidae	37	BH 8	28.12.2015
Sinictinogomphus	Gomphidae	1	BH 11	April, 2015
Sinictinogomphus	Gomphidae	1	BH 12 Downstream	28.12.2015
Sinictinogomphus	Gomphidae	41	BH M	30.12.2015
Sinictinogomphus	Gomphidae	7	BH V	12.1.2016
Sinictinogomphus	Gomphidae	36	BH VI	January,2016
Sinictinogomphus	Gomphidae	16	BH 13	January, 2016
Sinictinogomphus	Gomphidae	1	BH K	January, 2016
Sinictinogomphus	Gomphidae	10	JH 2	14.1.2016
Sinictinogomphus	Gomphidae	8	JH 3	14.1.2016
Sinictinogomphus	Gomphidae	10	JH 4	14.1.2016
Sinictinogomphus	Gomphidae	5	UP 1	26.4. 2016
Sinictinogomphus	Gomphidae	2	UP 4	December, 2015
Sinictinogomphus	Gomphidae	18	UP 6	December, 2014
Sinictinogomphus	Gomphidae	3	UP 6A/ZBGP	16.5.2016
Sinictinogomphus	Gomphidae	2	UP 6	10.5.2016
Sinictinogomphus	Sinictinogomphus	13	NL	4.6.2016
Sinictinogomphus	Gomphidae	3	rw	4.6.2016
Sinictinogomphus	Gomphidae	32	UP 7	December, 2014
Sinictinogomphus	Gomphidae	1	UP 7	11.5. 2016
Sinictinogomphus	Gomphidae	2	UP 8	December, 2014

Genus	Family	Abundancy	Location code	Date
Sinictinogomphus	Gomphidae	23	UP 9	18.12. 2014
Sinictinogomphus	Gomphidae	9	UP 9/JBUP 9	17.5.2016
Sinictinogomphus	Gomphidae	13	UP II	14.01.2015
Sinictinogomphus	Gomphidae	2	UP 12	January, 2015
Sinictinogomphus	Gomphidae	1	UP 13	7.6.2016
Sinictinogomphus	Gomphidae	2	UP I	13.01.2015
Sinictinogomphus	Gomphidae	13	UP 18	15.1.2015
Sinictinogomphus	Gomphidae	14	UP 19	14.01.2015
Sinictinogomphus	Gomphidae	13	UP II	14.01.2015
Sinictinogomphus	Gomphidae	1	UP III	11.3. 2015
Sinictinogomphus	Gomphidae	11	UP III	20.10.2016
Sinictinogomphus	Gomphidae	1	UP IV	20.10.2016
Sinictinogomphus	Gomphidae	1	UP 32	6.10.2016
Sinictinogomphus	Gomphidae	1	UP 41	February, 2015
Sinictinogomphus	Gomphidae	8	UP 41	6.10.2016
Sinictinogomphus	Gomphidae	1	UP 44	5.10.2016
Sinictinogomphus	Gomphidae	3	UP 49	March, 2015
Sinictinogomphus	Gomphidae	1	UP 49	20.10.2016
Sinictinogomphus	Gomphidae	1	UP 53	19.10.2016
Sinictinogomphus	Gomphidae	1	UP 54	19.10.2016
Sinictinogomphus	Gomphidae	1	UP 57	13.3. 2015
Sinictinogomphus	Gomphidae	1	WB 1	29.2. 2016
Sinictinogomphus	Gomphidae	1	WB 4	26.2. 2016
Sinictinogomphus	Gomphidae	1	WB 6	27.2.2016
Sinictinogomphus	Gomphidae	1	WB 7	27.2. 2016
Sinictinogomphus	Gomphidae	10	WB 10	26.2.2016
Sinictinogomphus	Gomphidae	4	WB 11	27.2. 2016
Sinictinogomphus	Gomphidae	5	WB 12	26.2.2016
Sinictinogomphus	Gomphidae	3	WB 13	25.2.2016

Genus	Family	Abundancy	Location code	Date
Sinictinogomphus	Gomphidae	17	WB 14	28.2. 2016
Sinictinogomphus	Gomphidae	5	JH 1	14.1.2016
Sphaerlidae (semiaquatic)	Sphaerlidae	1	UP 2	December, 2014
Sphaerodema	Belostomatidae	1	jf,	4.6.2016
Spirosperma nagarkotensis	Tubificidae	1	JH 4	14.1.2016
Spirosperma nagarkotensis	Tubificidae	1	WB 6	27.2.2016
Springtail/ Collumbola		1	UP 19	9.6. 2016
Stenasellus	Stenasellidae	2	JH 3	14.1.2016
Stenasellus	Stenasellidae	1	WB 9	27.5. 2015
Stenasellus	Stenasellidae	1	WB 11	27.5. 2015
Stenasellus	Stenasellidae	4	WB 15	21.5. 2015
Stenasellus	Stenasellidae	39	WB 16	21.5. 2015
Stenasellus	Stenasellidae	8	WB 17	21.5.2015
Stenasellus	Stenasellidae	3	WB 21	22.5. 2015
Stenasellus	Stenasellidae	4	WB 34	29.5. 2015
Stenelmis	Elminthidae	1	BH 12 upstream	April, 2015
Stenelmis	Elminthidae	1	BH 12 Downstream	April, 2015
Stenelmis	Elmidae	1	UK 6	20.6. 2014
Stenelmis	Elminthidae	1	UP G	March, 2015
Stenelmis	Elmninthidae	1	WB 7	27.5. 2015
Stenelmis	Elminthidae	1	WB 11	27.5. 2015
Stenelmis larva	Elmidae	1	UK 1	01.07.2014
Stenelmis larva	Elmidae	1	UK 6	20.6. 2014
Stenopsyche	Stenopsychidae	1	UK 1	24.11.2015
Stenopsyche	Stenopsychidae	6	UK B	25.4.2016

Genus	Family	Abundancy	Location code	Date
Stenothyra ornata	Stenothyridae	4	WB 7	27.5. 2015
Stenothyra daltae	Stenothyridae	3	WB 35	24.2.2016
Stenothyra deltae	Stenothyridae	1	WB 34	26.2.2016
Stenothyra ornata	Stenothyridae	1	BH VI	January,2016
Stenothyra ornata	Stenothyridae	12	WB 01	26.5. 2015
Stenothyra ornata	Stenothyridae	15	WB 03	27.5. 2015
Stenothyra ornata	Stenothyridae	1	WB 7	27.2. 2016
Stenothyra ornata	Stenothyridae	63	WB 9	27.5. 2015
Stenothyra ornata	Stenothyridae	13	WB 11	27.5. 2015
Stenothyra ornata	Stenothyridae	30	WB 13	23.5. 2015
Stenothyra ornata	Stenothyridae	1	WB 13	25.2.2016
Stenothyra ornata	Stenothyridae	10	WB 14	23.5. 2015
Stenothyra ornata	Stenothyridae	2	WB 14	28.2. 2016
Stenothyra ornata	Stenothyridae	3	WB 16	21.5. 2015
Stenothyra ornata	Stenothyridae	1	WB 17	21.5.2015
Stratiodrilus	Histriobdellidae	4	WB 35	24.2.2016
Stratiomys sp.	Stratiomyidae	1	UP 13	7.6.2016
Stratiomys sp.	Stratiomyidae	1	UP 33	6.10.2016
Stratiomys sp.	Stratiomyidae	1	WB 19	18.5. 2015
Stygocyathura	Anthuridae	2	WB 34	26.2.2016
Stylurus	Gomphidae	1	BH SK	31.12. 2015
Stylurus	Gomphidae	1	UP 3	3.5. 2016
Stylurus	Gomphidae	1	UP III	20.10.2016
Stylurus	Gomphidae	1	UP IV	20.10.2016
Stylurus	Gomphidae	1	UP 33	6.10.2016
Stylurus	Gomphidae	2	UP 50	18.10.2016
Stylurus	Gomphidae	2	WB 1	29.2. 2016
Stylurus	Gomphidae	10	WB 5	24.2. 2016
Stylurus	Gomphidae	1	WB 12	26.2.2016

Genus	Family	Abundancy	Location code	Date
Stylurus	Gomphidae	6	WB 13	25.2.2016
Succinia sp dead shell	Succineidae	1	JH 2	14.1.2016
Sympetrum	Libellulidae	1	BH 12 upstream	April, 2015
Sympetrum	Libellulidae	1	UP 6A/ZBGP	16.5.2016
Sympetrum	Sympetrum	1	NL	4.6.2016
Sympetrum	Libellulidae	3	UP 7	11.5. 2016
Sympetrum	Libellulidae	3	UP 11	December, 2014
Sympetrum	Libellulidae	2	UP 14	7.6.2016
Sympetrum	Libellulidae	1	UP 18	15.1.2015
Sympetrum	Libellulidae	1	UP 57	13.3. 2015
Sympetrum parvulum	Libellulidae	1	WB 16	21.5. 2015
Sympetrum purvulum	Libellulidae	2	UP 8	December, 2014
Sympetrum speciosum speciosum	Libellulidae	4	UP 8	11.5. 2016
Sympetrum speciosum speciosum	Libellulidae	1	WB 17	21.5.2015
Tabanus /atylotus	Tabanidae	1	BH 12 upstream	April, 2015
Tabanus /atylotus	Tabanidae	1	BH 12 Downstream	April, 2015
Tabanus /Atylotus sp.	Tabanidae	1	WB 02	27.5. 2015
Tabanus /Atylotus sp.	Tabanidae	2	WB 16	23.3. 2016
Tabanus Atylotus sp.	Tabanidae	4	UP 6A/ZBGP	16.5.2016
Tabanus Atylotus sp.	Tabanidae	2	WB 14	23.5. 2015
Tabanus Atylotus sp.	Tabanidae	1	WB 16	21.5. 2015
Tabanus/Atylotus sp.	Tabanidae	1	UP 4	28.4. 2016
Tabanus/Atylotus sp.	Tabanidae	1	UP 6	December, 2014

Genus	**Family**	**Abundancy**	**Location code**	**Date**
Tabanus/Atylotus sp.	Tabanidae	3	UP 6	10.5.2016
Tabanus/Atylotus sp.	Tabanidae	5	UP 11	December, 2014
Tabanus/Atylotus sp.	Tabanidae	2	UP 12	January, 2015
Tabanus/Atylotus sp. /Atylotus sp.	Tabanidae	1	UK 8b D/S JSTP	27.10.2015
Tabanus/Atylotus sp. sp.	Tabanidae	2	UK 6	3.11.2015
Tanypodinae	Chironomidae	3	BH 3 downstream	29.12.2015
Tanypodinae	Chironomidae	33	BH SK	31.12. 2015
Tanypodinae	Chironomidae	2	BH 05	31.12.2015
Tanypodinae	Chironomidae	2	JH 3	14.1.2016
Tanypodinae	Chironomidae	1	JH 4	14.1.2016
Tanypodinae	Chironomidae	2	UK 1	24.11.2015
Tanypodinae	Chironomidae	1	UK 1	24.11.2015
Tanypodinae	Chironomidae	1	UK B	25.4.2016
Tanypodinae	Chironomidae	4	UK 5	18.11. 2015
Tanypodinae	Chironomidae	5	UK 6	3.11.2015
Tanypodinae	Chironomidae	3	UK 7	28.10.2015
Tanypodinae	Chironomidae	23	UP 2	December, 2014
Tanypodinae	Chironomidae	3	UP 3	3.5. 2016
Tanypodinae	Chironomidae	7	UP 7	December, 2014
Tanypodinae	Chironomidae	7	UP 12	January, 2015
Tanypodinae	Chironomidae	2	UP A	16.01.2015
Tanypodinae	Chironomidae	1	UP II	7.6.2016
Tanypodinae	Chironomidae	2	UP III	20.10.2016
Tanypodinae	Chironomidae	1	UP G	March, 2015
Tanypodinae	Chironomidae	1	UP G	18.10.2016

Genus	Family	Abundancy	Location code	Date
Tanypodinae	Chironomidae	1	UP 49	March, 2015
Tanypodinae	Chironomidae	3	UP 50	18.10.2016
Tanypodinae	Chironomidae	5	UP 54	19.10.2016
Tanypodinae	Chironomidae	3	WB 5	24.2. 2016
Tanypodinae	Chironomidae	6	WB 14	23.5. 2015
Terrestrial reidentified on 15.9.2015	Corydellidae	1	UP 11	December, 2014
Tetropina	Perlidae	1	UK 1	01.07.2014
Tetropina	Perlidae	1	UK B	25.4.2016
Tetropina	Perlidae	2	UK 5	25.6.2014
Tetropina	Perlidae	1	UK 7	21.6. 2014
Thiara requeti	Thiaridae	45	WB 7	27.5. 2015
Thiara (Sermila) requeti	Thiaridae	1	BH 3 in round 1	24.4.2016
Thiara (Sermila) requeti	Thiaridae	2	BH 3 downstream	29.12.2015
Thiara (Sermila) requeti	Thiaridae	14	BH 04	29.12.2015
Thiara (Sermila) requeti	Thiaridae	3	BH 08	April, 2015
Thiara (Sermila) requeti	Thiaridae	2	BH 8	28.12.2015
Thiara (Sermila) requeti	Thiaridae	10	BH 13	January, 2016
Thiara (Sermila) requeti	Thiaridae	1	BH K	January, 2016
Thiara (Sermyla) requeti	Thiaridae	2	JH 1	14.1.2016
Thiara (Sermyla) requeti	Thiaridae	1	JH 3	14.1.2016
Thiara (Sermyla) requeti	Thiaridae	16	WB 1	29.2. 2016

Genus	Family	Abundancy	Location code	Date
Thiara (Sermyla) requeti	Thiaridae	1	WB 03	27.5. 2015
Thiara (Sermyla) requeti	Thiaridae	16	WB 4	26.2. 2016
Thiara (Sermyla) requeti	Thiaridae	12	WB 5	24.2. 2016
Thiara (Sermyla) requeti	Thiaridae	6	WB 7	27.2. 2016
Thiara (Sermyla) requeti	Thiaridae	19	WB 9	27.5. 2015
Thiara (Sermyla) requeti	Thiaridae	27	WB 10	26.2.2016
Thiara (Sermyla) requeti	Thiaridae	20	WB 11	27.5. 2015
Thiara (Sermyla) requeti	Thiaridae	1	WB 12	26.2.2016
Thiara (Sermyla) requeti	Thiaridae	21	WB 13	23.5. 2015
Thiara (Sermyla) requeti	Thiaridae	12	WB 13	25.2.2016
Thiara (Sermyla) requeti	Thiaridae	13	WB 16	23.3. 2016
Thiara (Sermyla) requeti	Thiaridae	6	WB 17	21.5.2015
Thiara (Sermyla) requeti	Thiaridae	14	WB 19	18.5. 2015
Thiara (Sermyla) requeti juvenile	Thiaridae	3	WB 01	26.5. 2015
Thiara (Tarebia) granifera	Thiaridae	35	BH VI	January,2016
Thiara (Tarebia) granifera	Thiaridae	48	BH 13	January, 2016
Thiara (Tarebia) granifera	Thiaridae	9	WB 13	25.2.2016
Thiara (Tarebia) granifera	Thiaridae	1	WB 16	23.3. 2016

Genus	Family	Abundancy	Location code	Date
Thiara (Tarebia) granifera	Thiaridae	102	WB 19	18.5. 2015
Thiara (Tarebia) granifera	Thiaridae	1	WB 25	23.2.2016
Thiara (Tarebia) lineata	Thiaridae	23	BH 3 in round 1	24.4.2016
Thiara (Tarebia) lineata	Thiaridae	2	BH 04	29.4. 2015
Thiara (Tarebia) lineata	Thiaridae	5	BH SK	31.12. 2015
Thiara (Tarebia) lineata	Thiaridae	2	BH 08	April, 2015
Thiara (Tarebia) lineata	Thiaridae	2	BH 11	April, 2015
Thiara (Tarebia) lineata	Thiaridae	845	BH 12 Downstream	28.12.2015
Thiara (Tarebia) lineata	Thiaridae	7	BH VI	January,2016
Thiara (Tarebia) lineata	Thiaridae	180	JH 2	14.1.2016
Thiara (Tarebia) lineata	Thiaridae	23	JH 3	14.1.2016
Thiara (Tarebia) lineata	Thiaridae	7	JH 4	14.1.2016
Thiara (Tarebia) lineata	Thiaridae	25	UP III	20.10.2016
Thiara (Tarebia) lineata	Thiaridae	42	UP IV	20.10.2016
Thiara (Tarebia) lineata	Thiaridae	57	UP 33	6.10.2016
Thiara (Tarebia) lineata	Thiaridae	4	UP 39	4. 10. 2016
Thiara (Tarebia) lineata	Thiaridae	36	UP 41	6.10.2016
Thiara (Tarebia) lineata	Thiaridae	8	UP 53	10.3.2015

Genus	Family	Abundancy	Location code	Date
Thiara (Tarebia) lineata	Thiaridae	49	UP 53	19.10.2016
Thiara (Tarebia) lineata	Thiaridae	10	UP 57 Corrected as UP 56	18.10.2016
Thiara (Tarebia) lineata	Thiaridae	4	WB 01	26.5. 2015
Thiara (Tarebia) lineata	Thiaridae	86	WB 2	29.2 2016
Thiara (Tarebia) lineata	Thiaridae	6	WB 03	29.2. 2016
Thiara (Tarebia) lineata	Thiaridae	1	WB 4	26.2. 2016
Thiara (Tarebia) lineata	Thiaridae	38	WB 10	26.2.2016
Thiara (Tarebia) lineata	Thiaridae	28	WB 12	26.2.2016
Thiara (Tarebia) lineata	Thiaridae	156	WB 13	25.2.2016
Thiara (Tarebia) lineata	Thiaridae	4	WB 14	28.2. 2016
Thiara (Tarebia) lineata	Thiaridae	70	WB 16	23.3. 2016
Thiara (Tarebia) lineata	Thiaridae	33	WB 17	3.3. 2015
Thiara (Tarebia) lineata	Thiaridae	1	WB 27	25.3.2016
Thiara (Tarebia) lineata	Thiaridae	2	WB 28	23.2.2016
Thiara (Tarebia) lineata juvenile	Thiaridae	45	BH 3 downstream	29.12.2015
Thiara (Tarebia) lineata juvenile	Thiaridae	6	BH 13	January, 2016
Thiara (Tarebia) lineata juvenile	Thiaridae	108	BH K	January, 2016

Genus	Family	Abundancy	Location code	Date
Thiara (Tarebia) granifera	Thiaridae	10	UP G	18.10.2016
Thiara (Tarebia) granifera	Thiaridae	1	UP 49	20.10.2016
Thiara (Tarebia) lineata	Thiaridae	44	WB 11	27.2. 2016
Thiara (Thiara) scabra	Thiaridae	7	JH 2	14.1.2016
Thiara (Thiara) scabra	Thiaridae	2	WB 01	26.5. 2015
Thiara (Thiara) scabra	Thiaridae	2	WB 7	27.2. 2016
Thiara (Thiara) scabra	Thiaridae	1	WB 11	27.5. 2015
Thiara (Thiara) scabra	Thiaridae	7	WB 13	23.5. 2015
Thiara (Thiara) scabra	Thiaridae	3	WB 13	25.2.2016
Thiara (Thiara) scabra	Thiaridae	3	WB 16	23.3. 2016
Thiara (Thiara) scabra	Thiaridae	3	WB 19	18.5. 2015
Thiara (Thiara) scabra	Thiaridae	1	WB 28	23.2.2016
Thiara (Thiara) scabra (Juvenile)	Thiaridae	1	WB 7	27.5. 2015
Thiara (Thiara) scabra juvenile	Thiaridae	2	JH 4	14.1.2016
Thiara (Thiara) scabra	Thiaridae	1	UP 3	5.12.2014
Thiara (Thiara) scabra	Thiaridae	6	UP 3	3.5. 2016
Thiara (Thiara) scabra	Thiaridae	2	UP 12	8.6.2016
Thiara (Thiara) scabra	Thiaridae	1	UP 33	February, 2015

Genus	Family	Abundancy	Location code	Date
Thiara (Thiara) scabra	Thiaridae	1	UP 50	18.10.2016
Thiara tuberculatus	Thiaridae	11	JH 2	14.1.2016
Thiara(Sermyla) requeti	Thiaridae	7	WB 11	27.2. 2016
Thiara(Thiara) scabra	Thiaridae	1	BH 3 downstream	29.12.2015
Thiara(Thiara) scabra	Thiaridae	1	BH 05	31.12.2015
Thiara(Thiara) scabra	Thiaridae	2	BH 13	January, 2016
Thiaridae juvenile	Thiaridae	8	WB 7	27.2. 2016
Thiaridae juvenile	Thiaridae	1	WB 10	26.2.2016
Tholymis	Libellulidae	1	UP 51	10.3.2015
Tichoptera pupa		12	UK 6	3.11.2015
Topomyia	Culicidae	1	WB 19	18.5. 2015
Torleya	Ephemerellidae	1	UK 1	01.07.2014
Tramea	Libellulidae	1	UP 11	December, 2014
Tramea	Libellulidae	11	WB 1	29.2. 2016
Triaenodes	Leptoceridae	1	UP 18	15.1.2015
Triplectide	Leptoceridae	6	BH M	30.12.2015
Triplectides	Leptoceridae	1	UK B	25.4.2016
Trithemis	Libellulidae	2	BH SK	31.12. 2015
Trithemis	Libellulidae	1	UP 6	10.5.2016
Unidentified			BH 12 Downstream	April, 2015
Unidentified		2	WB 03	27.5. 2015
unidentified		1	WB 17	3.3. 2015
unidentified		1	WB 17	3.3. 2015
Unidentified beetle	Coleoptera	1	UP 51	10.3.2015
Unidentified beetle	Coleoptera family	1	WB 03	27.5. 2015

Genus	Family	Abundancy	Location code	Date
Unidentified beetle		1	WB 11	27.5. 2015
unidentified coleoptera		1	WB 4	26.2. 2016
Unidentified Diptera		1	WB 7	27.5. 2015
Unidentified Hemiptera		1	BH 12 Downstream	April, 2015
Unidentified insect		1	WB 9	27.5. 2015
Unidentified insect		1	WB 11	27.5. 2015
Unidentified larva of coleoptera		1	UK 6	3.11.2015
Unidentified oligochaete		1	UK 6	3.11.2015
Unidentified Oligochaete		1	WB 16	21.5. 2015
Unidentified Oligochete		1	WB 17	21.5.2015
Unidentified terrestrial	Unidentified	1	UP 39	February, 2015
Unidentified(could be a plant material)		3	WB 03	27.5. 2015
Unidentifies diptera	Diptera	1	UP III	11.3. 2015
Uvarus	Dytiscidae	1	WB 5	24.2. 2016
Varuna	Varunidae	1	UP 6A/ZBGP	16.5.2016
Varuna	Varunidae	1	WB 11	27.2. 2016
Varuna	Varunidae	27	WB 25	23.2.2016
Varuna	Varunidae	3	WB 27	25.3.2016
Varuna	Varunidae	49	WB 31	27.2.2016
Varuna	Varunidae	19	WB 32	25.2.2016
Varuna	Varundae	4	WB 34	26.2.2016
Varuna juvenile	Varunidae	5	WB 16	23.3. 2016
Varuna juvenile	Varunidae	4	WB 19	18.5. 2015
Varuna yui	Varunidae	4	WB 01	26.5. 2015

Genus	Family	Abundancy	Location code	Date
Varuna yui	Varunidae	1	WB 9	27.5. 2015
Varuna yui	Varunidae	7	WB 17	21.5.2015
Varuna yui	Varunidae	1	WB 21	22.5. 2015
Varuna yui	Varunidae	2	WB 34	29.5. 2015
Varuna yui	Varunidae	1	WB 03	27.5. 2015
Water spider	Arachnoida	2	UP II	7.6.2016
Water spider	Arachnoida	3	UP 51	10.3.2015
Water spider	Arachnoida	1	WB 01	26.5. 2015
Water spider	Arachnoida	1	WB 02	27.5. 2015
Water spider	Arachnoida	2	WB 03	27.5. 2015
Water spider	Arachnoida	1	WB 03	27.5. 2015
Water spider	Arachnoida	2	WB 7	27.5. 2015
Water spider	Arachnoida	2	WB 9	27.5. 2015
Water spider	Arachnoida	8	WB 11	27.5. 2015
Water spider	Arachnoida	1	WB 13	23.5. 2015
Water spider	Arachnoida	1	WB 14	23.5. 2015
Water spider	Arachnoida	2	WB 15	21.5. 2015
Zyxomma	Libellulidae	1	BH 11	April, 2015
Zyxomma	Libellulidae	2	UP 51	10.3.2015
Zyxomma	Libellulidae	1	UP 53	10.3.2015

16

Proficiency Testing on Taxonomic Identification of Benthic Macro-invertebrates of River Ganga

Table 16.1

S.No	State Pollution Control Board	Sample Code	Total Marks Obtained	Average - individual	x/sd = Z-score	Z- Score Performance
1	Haryana State Pollution Control Board	47	500	-0.8	-0.003	Super Excellent
2	Bihar State Pollution Control Board	22	390	109.2	0.468	Excellent
3	Nagaland State Pollution Control Board	41	430	69.2	0.296	Excellent
4	Telangana State Pollution Control Board	18	230	269.2	1.154	Good
5	Assam, State Pollution Control Board	2	590	-90.8	-0.389	Super Excellent
6	Maharashtra State Pollution Control Board	28	250	249.2	1.068	Good
7	Regional Directorate Central Pollution Control Board,Vadodara	30	360	139.2	0.597	Excellent
8	Punjab, State Pollution Control Board	20	250	249.2	1.068	Good
9	Central Pollution Control Board, Bio lab, Delhi	14	700	-200.8	-0.861	Super Excellent
10	Central Pollution Control Board, Bio lab, Delhi	51	700	-200.8	-0.861	Super Excellent
11	Central Pollution Control Board, Bio lab, Delhi	7	800	-300.8	-1.290	Super Excellent
12	Central Pollution Control Board, Bio lab, Delhi	46	710	-210.8	-0.904	Super Excellent

S.No	State Pollution Control Board	Sample Code	Total Marks Obtained	Average - individual	x/sd = Z-score	Z- Score Performance
13	Central Pollution Control Board, Bio lab, Delhi	12	700	-200.8	-0.861	Super Excellent
14	Central Pollution Control Board, Bio lab, Delhi	26	1060	-560.8	-2.405	Super Excellent
15	Central Pollution Control Board, Bio lab, Delhi	3	870	-370.8	-1.590	Super Excellent
16	Regional Directorate Central Pollution Control Board, Lucknow	49	750	-250.8	-1.075	Super Excellent
17	Odisha State Pollution Control Board	33	510	-10.8	-0.046	Super Excellent
18	West Bengal State Pollution Control Board	27	230	269.2	1.154	Good
19	Uttar Pradesh State Pollution Control Board	11	500	-0.8	-0.003	Super Excellent
20	Regional Directorate, Central Pollution Control Board , Bhopal	42	480	19.2	0.082	Excellent
21	Madhya Pradesh State Pollution Control Board	50	260	239.2	1.025	Good
22	Goa Pollution Control Committee	4	250	249.2	1.068	Good
23	Mizoram State Pollution Control Board	36	270	229.2	0.983	Excellent
24	Gujrat State Pollution Control Board	8	360	139.2	0.597	Excellent
25	NEERI, Nagpur	1	330	169.2	0.725	Excellent

Z-Score= - (0-2) Super Excellent, 0-1 Excellent, (1-2) Good, ≥2 Improvement Required (Training), =>2 Rejected

Central Pollution Control Board
Ministry of Environment, Forest & Climate Change
"Parivesh Bhawan", C.B.D. Cum-Office Complex,
East Arjun Nagar, Shahdara, Delhi - 110032