Aquatic Insects of Lakes in and around Hyderabad (Hemiptera and Coleoptera)

DEEPA JAISWAL

ZOLOGICAL SURVEY OF INDIA
AQUATIC INSECTS OF LAKES IN AND AROUND HYDERABAD (HEMPITERA AND COLEOPTERA)

DEEPA J AISWAL
Zoological Survey of India
Freshwater Biology Regional Centre
Hyderabad-500048
Email: deepajzsi@gmail.com

Edited by
The Director, Zoological Survey of India

Zoological Survey of India
Kolkata
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INTRODUCTION

Hyderabad city in Andra Pradesh is located in the heart of Deccan plateau of the India at latitude 17°20’ N and longitude 78°30’E. It is spread over 1552 km and includes a major wetlands which constitutes lentic and lotic freshwater resources. Among lotic resources, the main river Musi passes through the city. The present study on insects was undertaken on four important man made lakes of Hyderabad which differ significantly in their nutrient status. The lakes studied were Hussain sagar, Miralam lake (eutrophic lakes), Himayat sagar, (oligotrophic lake) and Durgam cheruvu (mesotrophic lake). Hyderabad is famous for its beautiful lakes. The lakes are home for many beautiful migratory birds, which travel every year to the lakes and provide people with visual treat.

LAKES

Lakes, ponds, temporary ditches etc. form habitats for a number of aquatic insects and they to some extent indicate environmental conditions of the water bodies as well. The present account is a part of the work on the faunal diversity of the four lakes of Hyderabad viz. Hussain sagar and Mialam tank, (Eutrophic lakes), Himayat sagar (Oligotrophic lake) Durgam Cheruvu (Mesotrophic lake), being carried out by the Zoological Survey of India, Hyderabad. The study reports the presence of 14 species of Hemiptera belonging to 5 families and 8 genera, which forms the first report of this group from insects of lakes of Hyderabad. The inventory also comprises of 31 species of coleopteran accommodated under 20 genera and four families. Under each species, citation for original description and other accompanying work necessary to undertake the taxon is given. Taxonomic treatments of the taxa are dealt.

1. Hussain sagar :

The Hussain Sagar Lake in Hyderabad is an enchanting lake and is one of the largest man­made Lake in Asia. This gem of a lake is truly a masterpiece given shape by Hussain Shah Wahi on the tributary of the river named Musi in the year 1562. Hyderabad and Secunderabad are the two cities that are connected to each other by this Lake. The place where it is located is called ‘Tank Bund’. The Lake doubles up as an important landmark as well as picnic and recreation spot. The Lake is bordered by four major spans of greenery, Indira Park in the east, Sanjeevaiah Park in the north, Lumbini Park in the south and a green belt stretch squeezed in between the Raj Bhavan road and the Necklace Road. The 16 meter tall, 350-tonne monolithic gigantic sculpture Buddha Statue rises high from the calm waters of the scenic lake, being situated at a distance of approximately 1.5 kilometers from the city of Hyderabad stands out.
amongst the very limited number of man-made lakes in the country. The dam was originally fed by Balkapur river which branched off from Musi river, about 32 km from Hyderabad. The lake is located at about 51 cm above the sea level, its maximum length and breadth are reported to be 3.02 km and 2.80 km respectively with a maximum depth of 12.50 m and mean depth of 2.50 m. The total catchment area is about 240.80 Km².

2. Himayat Sagar lake:

The Himayat Sagar lake is one of the beautiful lakes dotting the Hyderabad region. Himayat Sagar lake is 20 kilometers distant from Hyderabad city. It lies parallel to another lake-Osman Sagar. Himayat Sagar is named after Himayat Ali Khan. Himayat Ali Khan was the youngest son of the 7th Nizam of Hyderabad. Constructed across the Esi, a tributary of Musi river, during the periods 1920 and 1927 AD. The reservoir is located southwest of the city at a distance of 9.66 km from the city. Its catchment area is reported to be 1315 sq. km, its maximum length and breadth area is 3.22 km and 2.80 km with maximum depth of 12.5 m and mean depth of 2.5 m. It has relatively smaller water spread area of 29.27 m² at full tank level. The origin of Himayat Sagar lake at Hyderabad is purely due to practical man made causes. The Deccan region-where the city of Hyderabad lies-receives seasonal rainfall during the monsoons. The region receives minimal rainfall during the rest of the year. Maximum rainfall occurs during the time of the Indian monsoons. This yearly precipitation occurs during the months which extend from June to September. The primary purpose of the lake is to impound and store rainwater to cover the liquid requirement for the rest of the year. It provides drinking water and meets irrigation water requirements in the region. It also serves another secondary function-the lake recharges the groundwater level in the immediate geological area.

3. ‘Durgam Cheruvu’, Secret lake of Hyderabad:

The Secret lake is situated near HITEC city in Hyderabad. Secret lake is situated close to Shilparamam Crafts Village. The vernacular name of Secret lake is ‘Durgam Cheruvu’. Secret lake in Hyderabad extends over an area comprising 63 acres. The name ‘Secret lake’ was probably due to its concealed location. The lake is picturesque and is encircled by hills of interesting rocky formations. Secret lake was constructed during the reign of the Quli Qutub Shahs. The primary purpose of Secret lake at the time of its construction was to supply potable drinking water to Golconda fort. The rainfall is stored and utilized for economic needs when and where required.

4. Mir Alam Tank:

Mir Alam Tank is a small lake in Hyderabad. It is 16 kilometers distant from Hyderabad. The nearest landmark to Mir Alam Tank is Nehru Zoological Park. The unique feature of the
tank is that the structure of the man made water body has 21 in-built small masonry dams. The complete architectural arrangement imparts a majestic look to the structure. The nomenclature of Mir Alam Tank in Hyderabad betrays its origin to Mir Alam, the builder of the tank. It was built during the early 19th Century. Mir Alam laid the foundation of the tank on July 20, 1804. It was completed in 2 years. According to historical documentary records, Mir Alam Tank was completed on June 8, 1806. It supplied potable, drinking water before more modern storage facilities came into existence. It is located about 1 km southwest of the old city of Hyderabad. The lake has comparatively reduced water spread area of 1.69 km² and catchmenet area of 15.24 km². The maximum length and breadth of the lake are 2.088 and 1.5 km² respectively with maximum depth of 31.40 m and mean depth of 4.80 m.

AQUATIC INSECTS

Insects are the most diverse group of organisms in freshwater. Estimates on the global number of aquatic insect species derived from the fauna of North America, Australia and Europe is about 45,000 sps, of this about 5,000 species are estimated to inhabit inland wetlands of India. Eventhough the insects are terrestrial in origin, a large number of species belonging to several orders have adapted to aquatic mode of life. The present study, “Studies on aquatic insects of lakes of Hyderabad” is a part of the work faunal diversity of lakes of Hyderabad. The study is based on Insect collections made from various surveys to the four different lakes of Hyderabad, during April, 2008-March, 2010. During the course of local surveys, aquatic insects were collected from water bodies. Collections were made with the help of hand operated nets of varying sizes by randomly netting different areas of wetland. Insects collected for study were preserved in 70% alcohol. The collections were identified with the aid of standard literature on the groups. This study is significant due to its maiden effort to study the entomofaunal diversity of lakes of Hyderabad, Andhra Pradesh.

HEMIPTERA

Aquatic bugs are living throughout of their life cycle inside the waterbody and they are placed under the series Hydrocorisae while semiaquatic bugs are dwelling on the surface of waterbody and belong to series Amphibicorisae. In spite of 80 genera and 275 species accommodated in 16 major families of aquatic and semi aquatic Hemiptera known from India (Thirumalai, 2002), very little information on water bugs of Andhra Pradesh is available. Limited number of studies has also been carried out on general entomofauna of some specific wetlands from taxo-ecological view points which includes the work of Roy (1988), Bhattacharya (2000), Ramakrishna (2000), Ghosh (1996), Bal and Basu (1994) and Tonapi (1959), Deepa & Rao (2010) and Deepa (2010).
COLEOPTERA

The order Coleoptera, or beetles, is represented by some 3,50,000 known species (Lawrence et al., 1982), but recent estimates suggest there are hundreds of thousands or even millions of undescribed species. Although the vast majority of beetles are terrestrial, it is estimated that about 18,000 species of aquatic Coleoptera are present on the earth at present. About 12,600 (70%) of these are already described. About 30 beetle families have aquatic representatives, and in 25 of these families at least 50% of the species are to be considered as aquatic. Six families are supposed to include 1,000 or more aquatic species: Dytiscidae (3,908 described species/5,000 estimated), Hydraenidae (1,380/12,500), Hydrophilidae (1,800/12,320), Elmidae (1,330/1,850), Scirtidae (900/1,700) and Gyrinidae (750/1,000). Scirtidae and Hydraenidae, Haliplidae, are regarded as the least explored families. (Jach and Balke, 2008).

Although aquatic coleopterans are highly diverse and distributed to nearly 30 families, but only four families namely Dytiscidae, Gyrinidae Hydrophilidae and Haliplidae are chiefly represented in the present report of lakes of Hyderabad. The members of the family Dytiscidae (Predacious diving beetles) have adapted perfectly well to aquatic life. All adults and larvae are aquatic. The members of family Gyrinidae (Whirlig beetles) are found in fresh water ponds, lakes, open flowing streams etc. When the Gyrinid beetles are swimming on the surface of the water, the dorsal portion of the eye is in air, and the ventral portion in water. The Hydrophilids (water scavenger beetles) are predominant in rivers and streams. The members of Haliplidae (crawling water beetles) live among aquatic vegetation along the edges of ponds, lakes streams or creeks.

Aquatic Coleoptera constitute an important part of the macrozoobenthos of freshwater habitats. Small and temporary water bodies have more species than large and permanent ones (Larson, 1974). Aquatic beetles have their greatest abundance and diversity in temperate regions. These insects are not selective in their choice of water bodies and occur in a wide variety of habitats. Many of them, especially dytiscids and many hydrophilids, are generally found in habitats of small shallow water bodies or on the margin of rivers and marshes, and they occupy the zone of emergent vegetation, mats of plant debris.

Water beetles can be used to control water plants that have become pests. Agasicles hygrophila, an alticine chrysomelid was, for instance, introduced into the USA from South America to control Alligatorweed (Alternanthera). Species of Dytiscidae are aquatic predators and may play an important role in controlling mosquitoes. Dytiscids cause considerable harm to fish fry but there were few actual studies on that subject, and more research would be needed to assess potential harm as well as benefits of water beetles to aquaculture (Vazirani, 1972). Adults of larger Cybister, Eretes, (Dytiscidae) and Hydrophilus, (Hydrophilidae), are still part of the diet of man in China, Thailand, and New Guinea (Jach & Easton, 1998). Ochs
(1924) believes these gyrinids to be an aphrodisiac. More than a century ago, a Riffle Beetle, *Austrelmis condimentarius* (Elmidae), was used as seasoning for food in South America. This species was reported to have considerable commercial value. In Hong Kong, *Cybister* are sold as pets for use in the aquarium (Jach & Easton, 1998).

The water beetles show wide diversity of colour, form and life pattern. (Vazirani, 1968). The earlier knowledge and scientific contribution on aquatic beetles (Vazirani, 1968, 1970, 1984, Mukhopadhyay, 2007) are noteworthy to understand the present fauna. Beside Vazirani, a number of other workers contributed greatly, among them are Jach & Balke, 2008, Balfour-Brown (1939), Wewalka, 1975. The major studies on aquatic Coleoptera also includes the works from Andhra Pradesh (Mukhopadhyaya, 2007 & Mukhopadhyaya & Ghosh, 2007), West Bengal, (Biswas & Mukhopadhyay, 1995), Sikkim (Mukhopadyaya & Ghosh, 2003). More than 223 species of aquatic coleopteran are know from India, Only 31 species of Beetles are reported from the present study. More intensive survey spread over different seasons would be required to provide a complete picture of the aquatic beetle diversity of this area.

The inventory comprises of 31 species accommodated under 20 genera and four families. Under each species, citation for original description and other accompanying work necessary to undertake the taxon is given.

**MATERIAL AND METHODS**

During the course of monthly surveys in connection with studies on the lakes of Hyderabad during 2007-2009, collections was made with the help of hand operated nets of varying sizes by randomly netting different areas of wetland. While surface floating/swimming insects were collected with small circular nets made of either coarsely meshed cotton cloths or finely meshed polyester mosquito curtain cloth. Macrophytes associated insects were collected with help of hand operated ‘D’ framed sweep net of the size of 50 cm length, 25 cm maximum breadth of the ‘D’. The frame was attached to a bag net made of fine malmal cloth with mesh size of approximately 200μ. The design and operation of the net was roughly based on those described by Junk (1977). Insects collected for study were preserved in 4% formalin or 70% alcohol. All the aquatic insect material reported here-in has been collected by the author herself.

Aquatic hemiptera in the collections was identified with the aid of standard literature on the group viz., Thirumalai (1999) and Bal and Basu (1994a & 1994b) and Aquatic coleoptera were identified by literature on group by Vazirani (1970, 1984), Biswas & Mukhopadyaya (1995). Under each species citation for the original description and other accompanying work necessary to understand the taxon or its occurrence in India is given.
SYSTEMATIC LIST

AQUATIC INSECTS: HEMIPTERA

Order HEMIPTERA
Suborder HETEROPTERA
Infraorder NEPOMORPHA Popov, 1968
Family NEPIDAE Latereille, 1802
Subfamily RANANTRINAE Latereille, 1802
Tribe RANATRINI Latereille, 1802
Genus Ranatra Fabricius, 1790
1. Ranatra elongata Fabricius, 1790
2. Ranatra filiformis Fabricius, 1790
3. Ranatra digitata Hafiz & Pradhan, 1947
   Subfamily NEPINAE Latereille, 1802
   Tribe NEPINI Latereille, 1802
   Genus Laccotrephus Stal, 1866
4. Laccotrephus griseus Guerin-Meneville, 1844
5. Laccotrephus ruber Linnaeus, 1764
6. Laccotrephus elongatus Montandon, 1907
   Family BELOSTOMATIDAE Leach, 1815
   Subfamily BELOSTOMATINAE Leach, 1833
   Genus Diplonychus (Laporte), 1833
7. Diplonychus rusticus Fabricius, 1781
8. Diplonychus annulatus Fabricius, 1781
    Subfamily LETHOCERINAEA Lauck & Menke, 1961
    Genus Lethocerus Mayr, 1853
9. Lethocerus indicus Lepeletier & Serville, 1852
    Family NOTONECTIDAE Latereille, 1802
    Subfamily ANISOPINAE Hutchinson, 1929
    Genus Anisops Spinola, 1837
10. Anisops bouvieri Kirkaldy, 1904
11. Anisops sardeus sardeus Herrich-Shaffer, 1850
Family CORIXIDAE Leach, 1815  
Subfamily MICRONECTINAE Leach, 1815  
Genus *Micronecta* Kirkaldy, 1897

12. *Micronecta scutellaris scutellaris* Stal, 1858

Infra order GERROMORPHA Popov, 1971  
Family GERRIDAE Leach, 1815  
Subfamily GERRINAE Bianchi, 1896  
Genus *Limnogonus* (Stal, 1868)

13. *Limnogonus (Limnogonus) nitidus* (Mayr, 1865)

Genus *Limnometra* Mayr, 1865

14. *Limnometra fluviorum* (Fabricius, 1798)

**SYSTEMATIC ACCOUNT**

Order HEMIPTERA  
Suborder HETEROPTERA  
Infraorder NEPOMORPHA Popov, 1968  
Family NEPIDAE Latereille, 1802

The insects belonging to this family are popularly known as “water scorpions” because of fact that forelegs somewhat resemble to the pedipalps of scorpions. The body is dorsoventrally fattened or cylindrical with long slender legs, the anterior pair being raptorial with long and stout femur used mainly for capture of prey. One jointed tarsi and absence of ocelli are the characteristic feature of family. Two long slender non retractile caudal filaments with grooves on median surface and fitted together constitute the respiratory tube. By placing its tip at the surface film, oxygen in the tracheal system is replenished.

Nepids are sluggish in nature and prefer still water. They are usually found in trash and mud or remain entangled with aquatic vegetation in the shallow littoral region of wetlands. Highly predacious insect species feed mainly on live insects and their nymph. The prey is captured with the help of raptorial forelegs. The most important cosmopolitan genus *Ranatra* occurs abundantly in this region.

Subfamily RANANTRINAE Latereille, 1802  
Tribe RANATRINI Latereille, 1802  
Genus *Ranatra* Fabricius, 1790  
1. *Ranatra elongata* Fabricius, 1790


*Diagnostic characters*: It is reported to be feeding on tadpoles, nymphs of mayflies and other aquatic Hemipterans and during dry seasons it is known to migrate in search of suitable areas. This species can be identified by the structure of the anterior femur, which is provided with a triangular tooth beyond the middle of its length, and the metasternal process, which is sub triangular.

*Distribution*: India: Andhra Pradesh, Bihar, Delhi, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.


2. *Ranatra filiformis* Fabricius, 1790


*Diagnostic characters*: This species is found in shallow parts of water, clinging to submerged vegetation and feeds on nymphs of dragon flies and mosquito pupae. This species is smaller in size than *R. elongata*. Head provided with distinct tubercle on the vertex, eyes are more prominent.

*Distribution*: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Manipur, Meghalaya, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.


*Diagnostic characters*: Body length may be 28-31 mm while abdominal appendages may be 26-28 mm in adult specimens, metasternal process broadly rounded with a slight median keel at the posterior.
**Distribution** : India: Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Manipur, Meghalaya, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.


Subfamily NEPINAE Latereille, 1802
Tribe NEPINI Latereille, 1802
Genus *Laccotrephus* Stal, 1866

4. *Laccotrephus griseus* Guerin-Meneville, 1844


*Material examined* : 02 exs., FBRC/ZSII740, Hussain sagar, 30.i.2007.

*Diagnostic characters* : A very common sluggish species, found at the bottom of slow or stagnant water. It can be identified by the presence of slightly hooked and symmetrical parameres, abdominal appendages shorter than the body, presence of an obtusely rounded tooth at the base of the anterior femora.

*Distribution* : India: Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Manipur, Meghalaya, Nagaland, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : Malaysia, Myanmar, Seychelles, Sri Lanka, Thailand.

5. *Laccotrephus ruber* Linnaeus, 1764


*Diagnostic characters* : This is a larger species with the abdominal appendages slightly longer than the body. The male parameres are curved and hook shaped. It is a common species with wide distribution in the Indo-Australian region.

*Distribution* : India: Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Manipur, Meghalaya, Nagaland, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : China, Japan, Nepal, Pakistan, Taiwan.
6. **Laccotrephus elongatus** Montandon, 1907


**Diagnostic characters**: This is a larger species with the abdominal appendices slightly longer than the body. The male parameres are curved and hook shaped. It is a common species with wide distribution in the Indo-Australian region.

**Distribution**: India: Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Manipur, Meghalaya, Nagaland, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

**Elsewhere**: China, Japan, Nepal, Pakistan, Taiwan.

*Family BELOSTOMATIDAE*, Leach, 1815

These insects are commonly known as “Giant water bugs” because of their large size (10-110 mm in length). The body is flat, oval or oblong, brown or dull greenish colour. Antennae 4 segmented and concealed in pockets beneath the head, eyes prominent. The Strong and thick front legs are raptorial and used for grasping. The middle and hind legs are broad, flat and fringed with swimming hair. The tarsi are 3 segmented, ocelli absent. The most characteristic feature in adult is presence of retractile strap like appendages at the abdominal apex, which are used to obtain air. These air straps are homologous with respiratory siphon of related family Nepidae, being derived from 8\(^{th}\) abdominal tergum, each bearing a basal spiracle. About 150 sps. of Belostomatids are so far known from the world.

*Subfamily BELOSTOMATINAE* Leach, 1833

*Genus Diplonychus* (Laporte), 1833

7. **Diplonychus rusticus** Fabricius, 1781


**Diagnostic characters**: This species is voracious feeder on fish fry, mosquito larvae. It has single segmented fore tarsus with claw, pale lateral basal margins of pronotum and its head length is shorter than the intraocular space. Body 15-17 mm long. It is a voracious feeder and has been reported to attack fish fry and fingerlings.
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**Distribution**: India: Andaman & Nicobar Island, Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, West Bengal.

*Elsewhere*: Malaysia, Myanmar, China, Indonesia, Japan, New Guinea, New Zealand, Srilanka, Thailand.

8. *Diplonychus annulatus* Fabricius, 1781


*Diagnostic characters*: Rostrum long and Segment I of rostrum twice longer than segment II, pronotum with lateral margins nearly straight, anterior tarsus two segmented and terminated by two small and equal claws which are shorter than the width of the tarsal segment.

*Distribution*: India: Tamil Nadu, Andaman & Nicobar Island, Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, West Bengal.

*Elsewhere*: Malaysia, Myanmar, China, Indonesia, Japan, New Guinea, New Zealand, Srilanka, Thailand.

Subfamily LETHOCRINAE Lauck & Menke, 1961

Genus *Lethocerus* Mayr, 1853

9. *Lethocerus indicus* (Lepeletier & Serville, 1825)


*Diagnostic characters*: This species is known as Giant Indian water-bugs. Adult insects may be 62-85 mm in body length, head between eues with parallel sides, pronotum with a transverse fasciae at the baseal end and a fine mid-longitudinal carination, hemielytra with distinct membrane which provided with prominent and thick longitudinal veins, posterior legs provided with thick sets of long swimming hairs on the ventral sides.

*Distribution*: India: Andaman & Nicobar Island, Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, West Bengal.

*Elsewhere*: Malaysia, Myanmar, China, Indonesia, Japan, New Guinea, New Zealand, Srilanka.
Family NOTONECTIDAE Latereille, 1802
Subfamily ANISOPINAE Hutchinson, 1929
Genus *Anisops* Spinola, 1837

10. *Anisops bouvieri* Kirkaldy, 1904


*Diagnostic characters*: Body length of males and females 6.0 to 6.3 mm and 5.5 to 6.0 mm respectively. General body colour perlaceous. Moderately prominent cephalic horn with frons excavate triangularly and bordered laterally by two carinae, rostral prong as long as the 3rd rostral segment, male stidulatory comb of about 12 teeth.

*Distribution*: India: Andaman & Nicobar Island, Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, West Bengal.

*Elsewhere*: Myanmar, China, Indonesia, Japan, New Guinea.

11. *Anisops sardeus sardeus*, Herrich-Shaffer, 1850


*Diagnostic characters*: Males may reach 7.5 to 8.4 mm and females 7.2 to 7.5 mm in body length, general body colour pale yellow or brownish yellow. Much prominent cephalic horn with frons excavate of its entire length and bordered laterally by two carinae, rostral prong slightly shorter than the 3rd rostral segments, stidulatory comb of male on the first tibiae of about 18 teeth.

*Distribution*: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Kerala, Tamil Nadu, West Bengal.

*Elsewhere*: Myanmar, China, Africa, Turkey, Pakistan.

Family CORIXIDAE Leach, 1815

The members of this family usually called “Water Boatmen” are medium to small insects usually 2-16 mm in length. Although the family Corixidae is the largest family of aquatic Hemiptera consisting of about 500 species, distributed widely in the world from below sea level to as high as 4575 meters in Himalaya, from arctic water beneath ice to hot springs with
temperature around 35°C (Thirumalai, 1989). In India it is represented only 35 species belonging to 4 genera (Thirumalai, 1994). During present investigation only one species was recorded. The body is somewhat flattened above and colour is dark grayish with yellow or black markings. The wing membrane is without veins. Head is triangular with short, unsegmented labium. Antennae short, concealed with 3-4 segments. Front tarsus-1-jointed, flattened and scoop like called “Pala” which is the characteristic of family. Scutellum is concealed and male abdominal segments are asymmetrical. A file like plate called “Strigil” is present in tergum VI of male. Abdominal terga III-IV of nymphs and adults have metathoracic scent glands opening near the 3rd coaxae. Dorsum of the abdomen with alternative dark and transverse band.

Subfamily MICRONECTINAE Leach, 1815

Genus Micronecta Kirkaldy, 1897

12. Micronecta scutellaris scutellaris Stal, 1858


Diagnostic characters : This species is very widely distributed in India and mostly found in stagnant pools, pond and ditches. It is the largest species (2.8 to 3.1 mm) of the genus. Pronotum grey or grayish brown, paler margins and with obscure elytral pattern.

Distribution : India : Andhra Pradesh, Himachal Pradesh, Bihar, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.
Elsewhere : Malaysia, China, Indonesia, Japan, Sri Lanka, Vietnam, Africa (Central).

Infraorder GERROMORPHA Popov, 1971

Family GERRIDAE Leach, 1815

Family GERRIDAE

These are popularly known as “Water Striders” or “Pond Skaters”. They are semiaquatic long legged hemipterans. These insects are found skating or leaping about on the surface film of wetlands. When disturbed they scatter widely in all directions. They feed upon a number of microcrustaceans and insects that are caught just below water surface. The family is represented by about 450 species in the world. The body is oval shaped and covered with a velvety hydrofuge hair pile. Both winged And nonwinged forms occur but the latter are more common (Thirumalai, 1986).
Subfamily GERRINAE Bianchi, 1896

Genus *Limnogonus* Stal, 1868

13. *Limnogonus (Limnogonus) nitidus* (Mayr, 1865)


*Diagnostic characters* : This species can be identified from all the known species of this genus by the presence of fairly, prominent connexival spines and yellow markings at the anterior pronotal lobe. It has been recorded from temporary pools, rice fields, ponds from sea level to 1000 metres and found as winged individual.

*Distribution* : India : Andhra Pradesh, Arunachal Pradesh, Bihar, Delhi, Chandigarh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Manipur, Meghalaya, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.


Genus *Limnometra* Mayr, 1865

14. *Limnometra fluviorum* (Fabricius, 1798)


*Diagnostic characters* : This species can be identified from all the known species of this genus by the presence of spine like projection on the dorsolateral rear margin of the middle coxae. It is commonly found in fresh water habitats of Southern India.

*Distribution* : India : Karnataka, Kerala, Maharashtra, Pondicherry, Tamil Nadu, West Bengal.


The aquatic and semi aquatic groups of insects are overall indicators of both recent and long term environmental conditions (Thirumalai & Raghunathan, 1988; Ramakrishna, 2000). The study reports the presence of 14 species belonging to 5 families and 8 genera, which forms the first report of this group from insects of lakes of Hyderabad.
AQUATIC INSECTS : COLEOPTERA
SYSTEMATIC LIST

Order COLEOPTERA
Family-I DYTISCIDAE
Subfamily HYDROPORINAE
Tribe-I HYDROVATINI
1. Genus *Hydrovatus*, Motschulsky, 1855
   1. *Hydrovatus confertus* Sharp, 1882

   Tribe-II BIDESSINI
   2. Genus *Guignotus* Houlbert, 1934
      2. *Guignotus flammulatus* Sharp, 1854
      3. *Guignotus inconstans* Regimbart, 1863
         Subfamily NOTORINAE
         Tribe HYDROCANTHINI
         3. Genus *Canthydrus* Sharp, 1882
            4. *Canthydrus laetabilis* Walker, 1882
            5. *Canthydrus morsbachi* Wehncke, 1876
               4. Genus *Hydrocoptus* Motschulsky, 1859
                  6. *Hydrocoptus subvittulus* Motschulsky, 1859
                     Subfamily LACCPHILINAE
                     5. Genus *Laccophilus* Leach, 1817
                        7. *Laccophilus elegans* Sharp, 1882
                        8. *Laccophilus ellipticus* Regimbart, 1899
                           Subfamily DYTISCINAE
                           Tribe-I CYBISTERINI
                           6. Genus *Cybister* Curtis, 1827
                              10. *Cybister (Melanectes) tripunctatus asciaticus* Sharp, 1899
                                  11. *Cybister (Melanectes) convexus* Sharp, 1882
                                  12. *Cybister (Melanectes) pectoralis* Sharp, 1882
Tribe-II ERETINI
7. Genus *Eretes* Castelnau, 1833
13. *Eretes sticticus* (Linnaeus, 1833)

Tribe-III HYDATICINI
8. Genus *Hydaticus*, Leach, 1817
14. *Hydaticus (Guignotites) fabricii* Macleay, 1833
15. *Hydaticus (Guignotites) vittatus* (Fabricius, 1838)

Family-II GYRINIDAE
Subfamily ENHYDRINAE
9. Genus *Dineutus Macleay*, 1825
16. *Dineutus (Protodineutus) indicus* Aube, 1838

Subfamily GYRININAE
10. Genus *Gyrinus Geoffroy*, 1762
17. *Gyrinus convexiusculus* Macleay, 1871

Subfamily ORECHTOCHILINAE
11. Genus *Orechtochilus Eschscholtz*, 1833
18. *Orectochilus (Patrus) semivestitus* Guerin, 1893
19. *Orectochilus (Patrus) discifer* (Walker, 1859)

Family-III HYDROPHILIDAE
Subfamily HYDROPHILINAE
Tribe-I HYDROPHILINAE
12. Genus *Hydrophilus Leach*, 1764
20. *Hydrophilus olivaceous* (Fabricius, 1781)

Tribe-II HYDROBINI
21. *Helochares anchoralis* Sharp, 1890
22. *Helochares pallens* Macleay, 1825

14. Genus *Enochrus* Thoms., 1859
23. *Enochrus esuriens* Walker, 1858

Tribe-III BEROSINI
15. Genus *Regimbartia Zaitz.*, 1908
24. *Regimbartia attenuate* Fabricius, 1801
16. Genus **Berosus** Leach, 1817

25. *Berosus indicus* Mot., 1861

26. *Berosus pulchellus* Macleay, 1825

Subfamily HYDROCHINAE

17. Genus **Hydrochus** Leach, 1817

27. *Hydrochus bindosus* Mot., 1860

Subfamily SPHAERIDIINAE

18. Genus **Dactylosternum** Woll., 1854

28. *Dactylosternum abdominale* Fabricius, 1792

19. Genus **Sphaeridium** F., 1775


Family-IV HALIPLIDAE

30. *Haliplus (Liaphlus) angustifrons* Regimbart, 1892

31. *Haliplus (Liaphlus) pulchellus indicus* Regimbart, 1899

Family DYTISCIDAE

The members of this family have adapted perfectly well to aquatic life. All adults and larvae are aquatic. These beetles are commonly known as “Predacious diving beetles” as they feed vigorously upon almost all invertebrates and fish eggs and fry. Both adults and larvae are predaceous, and attack a wide variety of small aquatic organisms. These beetles generally occupy clean and fresh macrophytic leaves near the bottom along littoral zone. They are active swimmers and swift divers. Adult dytiscids range from 1.4 to 3.8 mm in length. Although most species are small to medium sized, some adults can attain a length of 35 mm. The body is covered with an adherent layer of grease which holds dust particles or detritus. They are usually black or brownish colour, sometimes marked with dull yellow, orange or brown shades. The hind coxae is very large and 2nd and third legs are widely separated. Hind legs of dytiscid beetles are very important and contribute mainly to swimming movements. Antennae very long, thread like with 11 segments. Ten pairs of spiracles are present, the first two on thorax, three to nine on the abdominal segments and 10th on tip of abdomen. The spiracles open in subelytral chambers and help in oxygen supply. During submergence these beetles utilize the oxygen from tracheae and subelytral chambers. De and Sengupta (1993) have recorded 16 species from a few wetlands of Kolkata and surrounding districts. More than 3700 species are known (Pederzani 1995; Nilsson 2001), of which 223 have been recorded from India.

Family DYTISCIDAE
Subfamily HYDROPORINAE

1. **Hydrovatus confertus** Sharp, 1882


**Diagnostic characters**: Body broadly oval, about 2.2-2.5 mm long; head reddish-brown, head elongate, prothorax reddish brown, punctures irregular, elytra also reddish brown, puncturation somewhat regular, moderate and rather denser than on pronotum.

**Distribution**: India: Kerala, Tamil Nadu, West Bengal and Andhra Pradesh.

Elsewhere: Myanmar, China, Indonesia, Sri Lanka, Thailand and Vietnam.

2. **Guignotus flammulatus** Sharp, 1854


**Diagnostic characters**: Body oblong, about 2.4 mm long, Head with a basal blackish marking, vertex punctate, antennae long and slender. Elytra with black markings and with minute setiferous, dense puncturation, legs with front and middle tarsi armed with spines and hairs, hind tarsi elongate and with hairs.

**Distribution**: India: Kerala, Tamil Nadu, West Bengal, Uttar Pradesh, Gujarat, Andhra Pradesh.

Elsewhere: China, Indonesia, Thailand and Vietnam.

3. **Guignotus inconstans** (Regimbart) 1863


**Diagnostic characters**: Body oval, about 3 mm long, elytra with dense puncturations, legs with front and middle tarsi armed with spines. This species was first recorded from Andhra Pradesh by Mukhopadyay & Gosh (2007).

**Distribution**: India: Kerala, Tamil Nadu, West Bengal, Uttar Pradesh, Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu, Goa.
Elsewhere: China, Indonesia, Thailand and Vietnam.

Subfamily NOTORINAE

4. Canthydrus laetabilis (Walker), 1858


Diagnostic characters: Body oblong-oval, head brownish yellow, eyes large, antennae brownish yellow, short and slender, prothorax with its front margin darker and with dark punctures, elytra streamlined, brownish black with two basal orange yellow spots and one transverse irregular spot situated post medi ally, legs with front tibiae short and its apical spur curved, hind tarsi with swimming hairs, claws simple.

Distribution: India: Kerala, West Bengal, Andhra Pradesh, Assam, Bihar, Orissa, Punjab, Rajasthan, Uttar Pradesh.


5. Canthydrus morsbachi (Wehncke), 1876

1876. Hydrocanthus morsbachii Wehncke, Dtsch. ent. Z., 20 : 222.


Diagnostic characters: Body 3.0-3.5 mm long, head brownish black with anterior portion yellowish, curved spurs present on the apex of fore tibiae.

Distribution: India: Kerala, West Bengal, Andhra Pradesh, Orissa, Kerala, Goa.

Elsewhere: Thailand, Indonesia, Myanmar, Africa.

6. Hydrocoptus subvittulus Motschulsky, 1859


Diagnostic characters: Body oblong oval, 1.9-2.3 mm long, eyes large with fine row of punctures, antennae pale yellow, curves spurs absent on the apex of fore tibiae.

Distribution: India: Kerala, West Bengal, Andhra Pradesh, Assam, Bihar, Orissa, Punjab, Rajasthan, Uttar Pradesh.
Elsewhere: Srilanka, China.

Subfamily LACCOPHILINAE

7. Laccophilus elegans Sharp, 1882


Diagnostic characters: Body elongate, 3.7 to 4.0 mm long. Head brownish yellow, Elytra testaceous reddish with zig-zag double markings. Ventral surface with metacoaxal plate, hind tarsi with swimming hairs and has straight single claw.

Distribution: India: Kerala, West Bengal, Andhra Pradesh, Assam, Bihar, Orissa, Andaman & Nicobar islands.


8. Laccophilus ellipticus Regimbart, 1899


Diagnostic characters: Body oval in shape, length 3.25-3.75 mm. Elytra marked with regular wavy lines.

Distribution: India: Kerala, West Bengal, Andhra Pradesh, Assam, Bihar, Orissa, Punjab, Rajasthan, Uttar Pradesh.


9. Laccophilus uniformis Motschulsky, 1859


Diagnostic characters: Elytra testaceous with brown irrations, sometimes slightly distinct.

Distribution: Sikkim, Manipur, Andhra Pradesh.

Elsewhere: China, Vietnam, Thailand, Cambodia, Indonesia, Myanmar, Laos.
Subfamily DYTISCINAE

10. Cybister (Melanectes) tripunctatus ascioticus Sharp, 1899


Diagnostic characters: Body elongate-oval, about 28 mm long, head blackish, antennae long, narrow yellowish red, prothorax concolourous with head, Scutellum triangular, legs with spines and swimming hairs, ventral surface reddish brown to black. This is the largest species of Dytiscidae, prefers mainly slow flowing waters, ponds and urban lakes with sparse vegetation.

Distribution: India: Kerala, West Bengal, Andhra Pradesh, Assam, Bihar, Orissa, Rajasthan, Uttar Pradesh, Tamil Nadu.

Elsewhere: Nepal, China, Philippines, Srilanka, Afghanistan.

11. Cybister (Melanectes) convexus Sharp, 1882


Diagnostic characters: Hind margins of four basal metatarsal segments not fringed with any ciliae,tibial spurs of hind leg reaching two basal tarsal segments combined.

Distribution: India: Kerala, West Bengal, Manipur, Andhra Pradesh, Assam, Bihar, Orissa.

Elsewhere: China.

12. Cybister (Melanectes) pectoralis Sharp, 1882


Diagnostic characters: Abdominal sternites 3-6 with anterior border black.

Distribution: India: West Bengal, Bihar, Maharashtra, Madhya Pradesh, Andhra Pradesh

Elsewhere: Srilanka.
13. *Eretes sticticus* (Linnaeus), 1833


*Material examined*: 8 exs. FBRC/ZSII/590, Durgamcheruvu, 2.vii.07.

*Diagnostic characters*: Sides of pronotum rebordered, lateral borders of elytra serrated at posterior half.

*Distribution*: India: West Bengal, Bihar, Maharashtra, Madhya Pradesh, Andhra Pradesh, Karnataka, Goa, Andaman islands.

*Elsewhere*: Nepal, Pakistan, Myanmar, Thailand.

14. *Hydaticus (Guignotites) fabricii* Macleay, 1833


*Diagnostic characters*: Suture between the meta episternum and metasternal wings straight, apical spurs of the hind tibia simple pointed.

*Distribution*: India: Sikkim, Manipur, Rajasthan, Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Goa, Andaman islands.

*Elsewhere*: Indonesia, Vietnam, Philippines.

15. *Hydaticus (Guignotites) vittatus* (Fabricius, 1838)


*Diagnostic characters*: Elytra brown, head and pronotum without any band.

*Distribution*: India: Kerala, Pondicherry, Madhya Pradesh, Maharashtra, West Bengal, Manipur, Andhra Pradesh, Assam, Bihar, Orissa.

*Elsewhere*: Pakistan.

Family II GYRINIDAE

Subfamily ENHYDRINAE

16. *Dineutus (Protodineutus) indicus* Aube, 1838


Diagnostic characters: Body elongate, black, 7-8 mm in length, antennae very short, epipleural angle extended into a strong spine and apex with fine denticles, legs with front tarsi armed.

Distribution: India: Kerala, Pondicherry, Madhya Pradesh, Maharashtra, West Bengal, Manipur, Andhra Pradesh, Assam, Bihar, Orissa.

Elsewhere: Pakistan.

Subfamily GYRININAE

17. Gyrinus convexiusculus MacLeay, 1871


Diagnostic characters: 5-6 mm in length, shiny black in colour, depressed body, abdomen extending beyond elytra. The middle and hind legs are greatly flattened paddle like and fringed, the third segment of antennae is very much enlarged and the other segments are spindle shaped.

Distribution: India: Kerala, Pondicherry, Madhya Pradesh, Maharashtra, West Bengal, Manipur, Andhra Pradesh, Assam, Bihar, Orissa, Karnataka.

Elsewhere: Sri Lanka.

Subfamily ORECHTOCHILINAE

18. Orectochilus (Patrus) semivestitus Guerin, 1893


Diagnostic characters: Body elongate, black, 4-4.5 mm long, scutellum short and transverse, legs with front legs simple, middle and hind legs short, paddle like, flattened and tarsi folded.

Distribution: India: West Bengal, Bihar, Maharashtra, Madhya Pradesh, Andhra Pradesh, Kerala, Tamil Nadu.

Elsewhere: Sri Lanka.
19. **Orectochilus (Patrus) discifer** (Walker, 1859)


*Diagnostic characters* : Body elongate, brownish black, 3-5 mm long, scutellum short and transverse, front legs simple, middle and hind legs short, paddle like, flattened and tarsi folded.


Family HYDROPHILIDAE

Subfamily HYDROPHILINAE

20. **Hydrophilus olivaceous** Fabricius, 1781


*Diagnostic characters* : 7-8 mm in length, body elongate, blackish brown, convex normally. Antennae 9-segmented, prothorax transverse, tarsi strongly compressed and oar like. Claws of all tarsi dentate at base. Prostital carina is not cultriform, excavate to receive the anterior side which is widely emarginated.

*Distribution* : India : Maharashtra, West Bengal, Andhra Pradesh, and Manipur. **Elsewhere** : Nil.

21. **Helochares anchoralis** (Sharp, 1890)


*Diagnostic characters* : Body elongate, about 6 mm in length, dark brown with blackish patches, head densely punctate, Y-shaped frontal suture, 1st joint of hind tarsi very short and the 2nd joint slightly longer and claws with basal swelling and characteristic expodium.

*Distribution* : India : Maharashtra, West Bengal, Bihar, Andhra Pradesh. **Elsewhere** : Sri Lanka, China, Indonesia, Cambodia, Philippines.
22. *Helochares pallens* (Macleay, 1825)


*Diagnostic characters:* Body oblong, about 4-5 mm in length, antennae nine segmented, second segment of maxillary palpi concave or straight on anterior side and convex on posterior side.

*Distribution:* India: West Bengal, Bihar, Assam, Andhra Pradesh.

*Elsewhere:* Indonesia, Philippines, Egypt, Syria, Madagascar.

23. *Enochrus esuriens* Walker, 1858


*Diagnostic characters:* Body oval, 2.5 mm long, reddish brown, head black with a yellow spot in front of eyes, antennae nine segmented, second segment of maxillary palpi convex on anterior side and concave posteriorly, clubs darker and curved pseudobasal segment of maxillary palpi convex anteriorly.

*Distribution:* India: West Bengal, Manipur, Nicobar islands.

*Elsewhere:* Srilanka, Indonesia, Philippines, Australia.

*Remarks:* This species is recorded for the first time from Andhra Pradesh by Mukhopadhyay (2007).

24. *Regimbertia attenuata* Fabricius, 1801


*Material examined:* 16 exs. FBRC/ZSI/695, Himayatsagar, 16.i.2007.

*Diagnostic characters:* Body elongate, blackish brown, convex normally. Antennae 9-segmented, and fifth ventral segment is retractile, more or less prominent and emarginated in male, prothorax transverse, tarsi strongly compressed and oar like. Claws of all tarsi dentate at base. Elytra strongly narrowed posteriorly, mid and hind tibiae with long swimming hairs on inner side.

*Distribution:* India: Maharashatra, West Bengal, Andhra Pradesh, and Manipur.

*Elsewhere:* Srilanka, South Asia, Australia, Japan.
25. **Berosus indicus** Motschulsky, 1861


*Diagnostic characters*: Body elongate, more than 3 mm long with brown to yellow colour and punctuate, antennae seven segmented, scutellum is like triangle and punctuate, elytra highly patterned, narrowed posteriorly with about 10 rows of dark punctures, legs with long swimming hairs.

*Distribution*: India: West Bengal, Manipur, Bihar, Punjab, Rajasthan, Tripura, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh.

*Elsewhere*: Indonesia, Philippines, Nepal, China.

26. **Berosus pulchellus** Macleay, 1825


*Diagnostic characters*: 3-4 mm in length. Antennae seven segmented, eyes convex, hind legs with long swimming hairs.

*Distribution*: India: West Bengal, Meghalaya, Rajasthan, Delhi, Haryana Tripura, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh.

*Elsewhere*: Indonesia, Philippines, Nepal, China, Japan, Hongkong, Taiwan, Malaysia.

*Remarks*: This species is recorded for the first time from Andhra Pradesh by Mukhopadhyay (2007).

Subfamily HYDROCHINAE

27. **Hydrochus binodosus** Motschulsky, 1860


*Diagnostic characters*: 3-4 mm in length. Body contour is not uniformly curved and not regularly convex, proyhorax not narrower than hind body and distinctly separated.
Distribution: India: West Bengal, Assam.

Subfamily SPHAERIDIINAE

28. *Dactylosternum abdominale* Fabricius, 1792


Diagnostic characters: Antennae usually longer than maxillary palpi, pygidium not exposed, elytra normally with sutural stria and several other striae with serially arranged large puncture. Scutellum short triangular. First ventral segment well developed and usually carinated along its whole length.

Distribution: India: West Bengal, Manipur, Andhra Pradesh.
Elsewhere: North & South America.

29. *Sphaeridium dimidiatum* Gory, 1834


Diagnostic characters: Antennae eight segmented and inserted below the laminated border, concealing base of antennae from above, Pygidium exposed, elytra with sutural stria, scutellum as an elongate triangle. First ventral segment not carinated.

Distribution: India: West Bengal, Andhra Pradesh.

Family IV HALIPLIDAE

30. *Haliphus (Liaphlus) angustifrons* Regimbart, 1892

Material examined: 3 exs. FBRC/ZSI/705, Durgamcheruvu, 28.i.2009.

Diagnostic characters: Body 3-3.5 mm long, head brownish yellow, vertex sparsely puctured, antennae long, legs slender and long with fringed hairs. They have enlarged plate
like coxae on hind legs covering third to fifth ventral abdominal segments. Prontum with a notch on lateral side before posterior angle.

**Distribution**: India: West Bengal, Manipur, Bihar, Punjab, Rajasthan, Tripura, Karnataka, Kerala, Tamil Nadu and Andhra Pradesh.

**Elsewhere**: Srilanka, Indonesia, Philippines, Nepal, China.

31. *Haliplus (Liaphlus) pulchellus indicus* Regimbart, 1899


Van Vondel (1991 : 127) included *Haliplus indicus* Regimbart 1899 : 189 as a variety of *Haliplus pulchellus* Clark, but subsequently (Van Vondel 1993 : 299) considered it a distinct species.


**Material examined**: 1 exs. FBRC/ZSII706, Durgamcheruvu, 28.i.2009; 2 exs. FBRC/ZSI/713, Miralamtank, 19.xii.2007.

**Diagnostic characters**: Prosternal process canaliculated and without any distinct pit at apex, elytra with two dilations on either side.

**Distribution**: India: West Bengal, Bihar, Orissa, Rajasthan and Andhra Pradesh.

**Elsewhere**: Srilanka, Indonesia, Philippines, Nepal, China.

### CHECKLIST OF AQUATIC COLEOPTERA OF INDIA

(Dytiscidae, Gyrinidae, Hydrophilidae, Haliplidae, and Elmidae)

A check list of Gerromorpha (Hemiptera) from India (Thirumalai, 2002) and a synoptic list of Nepomorpha (Hemiptera: Heteroptera) from India (Thirumalai, 2007) are also given in ZSI website www.zsi.gov.in. An attempt has been made to update the Checklist of Aquatic coleopteran (only five families). Of the 18 families of aquatic coleoptera known from the world representative of five families namely Dytiscidae, Gyrinidae, Hydrophilidae, Haliplidae, Elmidae, Dryopidae, & Notoridae are chiefly represented in the India. The checklist of Aquatic coleopteran from India presented here, includes five families and lists a total of 396 species under five families. The earlier knowledge and scientific contribution on aquatic beetles (Vazirani, 1968, 1970, 1984) are noteworthy to understand the present fauna. The major studies on aquatic Coleoptera also includes the works of Jach & Balke (2008) Balfour-Brown (1939), Mukhopadhyaya & Ghosh (2003 & 2007), Biswas & Mukhopadhyay (1995). The members of the family **Dytiscidae (Predacious diving beetles)** feed vigorously upon almost
all invertebrates and fish eggs and fry. These beetles generally occupy clean and fresh macrophytic leaves near the bottom along littoral zone. They are active swimmers and swift divers. Adult dytiscids range from 1.4 to 3.8 mm in length. Although most species are small to medium sized, some adults can attain a length of 35 mm. The hind coxae is very large and 2nd and third legs are widely separated. Antennae very long, thread like with 11 segments. The members of family Gyrinidae (Whirlig beetles) are found in fresh water ponds, lakes, open flowing streams etc. First abdominal sternite divided by hind coxae (suborder Adephaga), Short, clubbed antennae, seemingly 2 pairs of eyes, 1 above and 1 below the water level. Forelegs long and thin; middle and hind legs short and paddle like, not extending beyond margin of abdomen (only front legs visible in dorsal view), body elongate-oval and flattened, 3 to 15 mm in length. The members of Haliplidae (Crawling water beetles) live among aquatic vegetation along the edges of ponds, lakes streams or creeks. They are best identified by the large coxal plates covering base of hind legs and abdomen. Their tarsi have two claws. They are omnivores found in the vegetation of pools. They are small beetles with their size at maturity of about 2-6 mm. Regimbart (1892) recorded the first Indian species Haliplus angustifrons from Bihar. So far 05 species recorded under the genus Haliplus from India.

The Hydrophilids (Water scavenger beetles) are predominant in rivers and streams. They are characterized by their short-clubbed antennae that generally remain concealed beneath the head and long maxillary palps resembling antennae like Dytiscidae, they also make contact with surface water film with the anterior edge of their body but unlike former, their hind legs move alternatively while swimming and are not very good swimmers. Beetles belonging to family Elmidae (Riffle beetles) live in running water. Some breathe under water using an air film trapped by hairs as a physical gill, mostly aquatic in both adult and larval stages. This is a family of small beetles 2-5mm long. They have punctured elytra and raised lines on the thorax. The riffle beetles usually have filiform antennae that are much longer that the head. Their tarsi are distinctly five segmented and have 5-6 abdominal segments. They are underwater crawlers and do not swim, therefore they have no swimming hairs on their hind legs.

Order COLEOPTERA
Suborder I ADEPHAGA
Family I DYTISCIDAE Leach, 1815
Subfamily I AGABINAE Thomson, 1867
Tribe AGABINI Thomson, 1867
Genus Agabus Leach, 1817

1. Agabus biguttatus (Olivier, 1795)
2. Agabus freudei Guéorguiev, 1975
3. *Agabus glazunovi* (Zaitzev, 1953)
4. *Agabus guttatus guttatus* (Paykull, 1798)
5. *Agabus lobonyx* Guignot, 1952
6. *Agabus longissimus* Régimbart, 1899
7. *Agabus winkleri* (Gschwendtner, 1923)
8. *Agabus conspersus* (Marsham, 1802)
9. *Agabus dichrous* Sharp, 1878
11. *Agabus bipustulatus* (Linnaeus, 1767)
12. *Agabus debilipes* Régimbart, 1899
13. *Agabus solskii* Jakovlev, 1897

Genus *Hydronebrius* Jakovlev, 1897

14. *Hydronebrius kashmirensis* (Vazirani, 1964)
15. *Hydronebrius mattheyi mattheyi* Brancucci, 1980

Genus *Platambus* Thomson, 1859

17. *Platambus biswasi* Vazirani, 1965
19. *Platambus fletcheri* Zimmermann, 1928
22. *Platambus nepalensis* (Guéorguiev, 1968)
23. *Platambus satoi* Brancucci, 1982
24. *Platambus wittmeri* Wewalka, 1975
25. *Platambus coriaceus* (Régimbart, 1899)
26. *Platambus princeps* (Régimbart, 1888)
29. *Platambus sogdianus* (Jakovlev, 1897)
30. *Platambus wewalkai* Brancucci, 1982
Genus **Platynectes** Régimbart, 1887 (3 spp.)

31. *Platynectes dissimilis* (Sharp, 1873)

32. *Platynectes kashmiranus kashmiranus* J. Balfour-Browne, 1944

Subfamily II **Colymbetinae** Erichson, 1837

Tribe **Colymbetini** Erichson, 1837

Genus **Colymbetes**

33. *Colymbetes fuscus* (Linnaeus, 1758)

34. *Colymbetes semenowi* (Jakovlev, 1896)

Genus **Rhantus** Dejean, 1833 (9 spp.)

35. *Rhantus interclusus* (Walker, 1858)

36. *Rhantus ovalis* Gschwendtner, 1936

37. *Rhantus rugulosus* Régimbart, 1899

38. *Rhantus sexualis* Zimmerman, 1919

39. *Rhantus sikkimensis* Régimbart, 1899

40. *Rhantus suturalis* (W.S. Macleay, 1825)

41. *Rhantus taprobanicus* Sharp, 1890

42. *Rhantus tigris* Balke, 1995

Subfamily **Copelatinae** Branden, 1885

Tribe **Copelatini** Branden, 1885

Genus **Copelatus** Erichson, 1832

43. *Copelatus cryptarchoides* Régimbart, 1899

44. *Copelatus mysorensis* Vazirani, 1970

45. *Copelatus wewalkai* Holmen & Vazirani, 1990

46. *Copelatus biswasi* Mukherjee & Sengupta, 1986

47. *Copelatus assamensis* Vazirani, 1970


49. *Copelatus bangalorensis* Vazirani, 1970

50. *Copelatus bengalensis* Guignot, 1955

51. *Copelatus brivioi* Rocchi, 1976

52. *Copelatus ceylonicus* Vazirani, 1969

53. *Copelatus feae* Régimbart, 1888
54. Copelatus freudei Guignot, 1955
55. Copelatus gibsoni Vazirani, 1974
56. Copelatus indicus Sharp, 1882
57. Copelatus irinus Régimbart, 1899
58. Copelatus karnatakus Holmen & Vazirani, 1990
59. Copelatus latipes Sharp, 1882
60. Copelatus malaisei Guignot, 1954
61. Copelatus minutissimus J. Balfour- Browne, 1939
62. Copelatus neelumae Vazirani, 1973
63. Copelatus oblitus Sharp, 1882
64. Copelatus schereri Wewalka, 1981
65. Copelatus spongleri Vazirani, 1974
66. Copelatus tenebrosus Régimbart, 1880
67. Copelatus filiformis Sharp, 1882
68. Copelatus schuhi Hendrich & Balke, 1998
69. Copelatus boukali Hendrich & Balke, 1998
70. Copelatus ternatensis Régimbart, 1899

Genus Lacconectus Motschulsky, 1855

71. Lacconectus arunachal Brancucci, 2006
72. Lacconectus basalis Sharp, 1882
73. Lacconectus biswasi Brancucci, 1986
74. Lacconectus fallaciosus Brancucci, 1986
75. Lacconectus fulvescens Motschulsky, 1855
76. Lacconectus gusenleinleri Brancucci, 1986
77. Lacconectus holzschuh Brancucci, 1986
78. Lacconectus nicolasi Brancucci, 1986
79. Lacconectus pederzani Brancucci, 1986
80. Lacconectus penguensis Brancucci, 1986
81. Lacconectus ritsemae Régimbart, 1883
82. Lacconectus shaverdoae Brancucci, 2005
83. Lacconectus simoni Régimbart, 1893
84. *Lacconectus strigulifer* Zimmermann, 1928
85. *Lacconectus andrewesi* Guignot, 1952
86. *Lacconectus blandulus* Brancucci, 2003
88. *Lacconectus klausnitzeri* Brancucci, 2006
89. *Lacconectus lambai* Vazirani, 1977
90. *Lacconectus munnarensis* Brancucci, 2003
91. *Lacconectus nepalensis* Brancucci, 1989
92. *Lacconectus ovalis* Gschwendtner, 1936
94. *Lacconectus regimbarti* Brancucci, 1986
95. *Lacconectus satoi* Brancucci, 2003
96. *Lacconectus scholzi* Gschwendtner, 1922
97. *Lacconectus sikkimensis* Brancucci, 1989
98. *Lacconectus spangleri* Brancucci, 1986

Subfamily DYTISCINAE

Tribe ACILIINI Thomson, 1867

Genus *Rhantaticus* Sharp, 1882

100. *Rhantaticus congestus* (Klug, 1832)

Genus *Sandracottus* Sharp

101. *Sandracottus dejeanii* (Aubé, 1838)
102. *Sandracottus festivus* (Illiger, 1801)
103. *Sandracottus maculatus* (Wehncke, 1876)
104. *Sandracottus manipurensis* Vazirani, 1969
105. *Sandracottus mixtus* (Blanchard, 1843)

Tribe CYBISTRINI Sharp, 1880

Genus *Cybister* Curtis, 1827

106. *Cybister cardoni* Severin, 1890
107. *Cybister cognatus* Sharp, 1882
108. *Cybister concessor* Guignot, 1947
109. Cybister confusus Sharp, 1882
110. Cybister dejeanii Aubé, 1838
111. Cybister extenuans (Walker, 1858)
112. Cybister gracilis Sharp, 1882
113. Cybister guerini Aubé, 1838
114. Cybister javanus Aubé, 1838
115. Cybister lateralimarginalis torquatus (Fischer von Waldheim, 1829)
116. Cybister lewisianus Sharp, 1873
117. Cybister limbatus (Fabricius, 1775)
118. Cybister pectoralis Sharp, 1882
119. Cybister rugulosus (Redtenbacher, 1844)
120. Cybister tripunctatus lateralis (Fabricius, 1798)
121. Cybister ventralis Sharp, 1882
122. Cybister wittmeri Brancucci, 1979
123. Cybister convexus Sharp, 1882
124. Cybister dehaanii Aubé, 1838
125. Cybister posticus Aubé, 1838
126. Cybister siamensis Sharp, 1882
127. Cybister sugillatus Erichson, 1834

Tribe DYTISCINI

Genus *Dytiscus* Linnaeus, 1758

128. *Dytiscus persicus* Wehncke, 1876

Tribe ERETINI Crotch, 1873

Genus *Eretes* Laporte, 1833 (2 spp.)

129. *Eretes griseus* (Fabricius, 1781)

130. *Eretes sticticus* (Linnaeus, 1767)

Tribe HYDATICINI Sharp, 1880 (1 genus)

Genus *Hydaticus* Leach, 1817 (21 spp.)

131. *Hydaticus bengalensis* Régimbart, 1899

132. *Hydaticus bipunctatus bipunctatus* Wehncke, 1876

133. *Hydaticus epipleuricus* Régimbart, 1891
134. *Hydaticus fabricii fabricii* (W.S. Macleay, 1825)
135. *Hydaticus fractifer* Walker, 1858
136. *Hydaticus histrio* Clark, 1864
137. *Hydaticus incertus* Régimbart, 1888
138. *Hydaticus litigiosus* Régimbart, 1880
139. *Hydaticus luczonicus* Aubé, 1838
140. *Hydaticus major* Régimbart, 1899
141. *Hydaticus mexaformis* Wewalka, 1979
142. *Hydaticus pacificus* Aubé, 1838
143. *Hydaticus pictus* (Sharp, 1882)
144. *Hydaticus ponticus* Sharp, 1882
145. *Hydaticus ricanus* Wewalka, 1979
146. *Hydaticus satoi satoi* Wewalka, 1975
147. *Hydaticus vaziranii* Wewalka, 1979
148. *Hydaticus vittatus vittatus* (Fabricius, 1775)

Subfamily HYDROPORINAE Aubé, 1836
Tribe BIDESSINI Sharp, 1880 (8 genera)

Genus *Clypeodytes* Régimbart, 1894

149. *Clypeodytes bufo* (Sharp, 1890)
150. *Clypeodytes jaechi* Wewalka & Biström, 1987
151. *Clypeodytes duodecimmaculatus* Régimbart, 1899
152. *Clypeodytes gestroi* (Régimbart, 1888)
153. *Clypeodytes severini* (Régimbart, 1892)
155. *Clypeodytes dilutus* (Sharp, 1882)

Genus *Geodessus* Brancucci, 1979
156. *Geodessus besucheti* Brancucci, 1979

Genus *Hydroglyphus* Motschulsky, 1853
158. *Hydroglyphus angularis* (Klug, 1834)
159. *Hydroglyphus crassifrons* (Régimbart, 1903)
160. Hydroglyphus flammulatus (Sharp, 1882)
161. Hydroglyphus geminus (Fabricius, 1792)
162. Hydroglyphus gujaratensis (Vazirani, 1973)
163. Hydroglyphus inconstans (Régimbart, 1892)
164. Hydroglyphus mysorensis (Régimbart, 1903)
165. Hydroglyphus orientalis (Clark, 1863)
166. Hydroglyphus pendjabensis (Guignot, 1954)
167. Hydroglyphus pradhani (Vazirani, 1969)
168. Hydroglyphus signatellus (Klug, 1834)

Genus **Leiodytes** Guignot, 1936 (7 spp.)
169. Leiodytes griseoguttatus (Régimbart, 1893)
170. Leiodytes horai (Vazirani, 1969)
171. Leiodytes indicus (Régimbart, 1892)
172. Leiodytes minutus (Vazirani, 1969)
173. Leiodytes nicobaricus (Redtenbacher, 1867)
174. Leiodytes orissaensis (Vazirani, 1969)

Genus **Peschetius** Guignot, 1942 (2 spp.)
175. Peschetius quadricostatus (Aubé, 1838)
176. Peschetius toxophorus Guignot, 1942

Genus **Pseuduvarus** Biström, 1988 (1 sp.)
177. Pseuduvarus vitticollis (Boheman, 1848)

Genus **Uvarus** Guignot, 1939 (2 spp.)
178. Uvarus livens (Régimbart, 1892)
179. Uvarus quadrilineatus (Zimmermann, 1923)

Genus **Yola** Gozis, 1886 (3 spp.)
180. Yola nilgirica Biström, 1983

Tribe HYDROPORINI Aubé, 1836

Genus **Boreonectes** Angus, 2010
181. Boreonectes griseostriatus (De Geer, 1774)

Genus **Deronectes** Sharp, 1882 (6 spp.)
182. Deronectes abnormicollis Semenov, 1900
183. *Deronectes afghanicus* Wewalka, 1971
185. *Deronectes vestitus* (Gebler, 1848)

Genus *Hydroporus* Clairville, 1806
186. *Hydroporus discretus discretus* Fairmaire & Brisout de
187. *Hydroporus glasunovi glasunovi* Zaitzev, 1905
188. *Hydroporus martensi* Brancucci, 1981

Genus *Nebrioporus* Régimbart, 1906
189. *Nebrioporus airumlus* (Kolenati, 1845)
190. *Nebrioporus balli* (Vazirani, 1970)
191. *Nebrioporus indicus* (Sharp, 1882)
192. *Nebrioporus insignis* (Klug, 1834)
193. *Nebrioporus melanogrammus* (Régimbart, 1899)
194. *Nebrioporus ressli* (Wewalka, 1974)
195. *Nebrioporus stearinus stearinus* (Kolenati, 1845)

Tribe HYDROVATINI Sharp, 1880

Genus *Hydrovatus* Motschulsky, 1853
196. *Hydrovatus acuminatus* Motschulsky, 1859
197. *Hydrovatus confertus* Sharp, 1882
198. *Hydrovatus obtusus* Motschulsky, 1855
199. *Hydrovatus pinguis* Régimbart, 1892
200. *Hydrovatus punctipennis* Motschulsky, 1859
201. *Hydrovatus rangoonensis* Guignot, 1954
202. *Hydrovatus sinister* Sharp, 1890
203. *Hydrovatus subtilis* Sharp, 1882
204. *Hydrovatus fractus* Sharp, 1882
205. *Hydrovatus bonvouloiri* Sharp, 1882
206. *Hydrovatus castaneus* Motschulsky, 1855
207. *Hydrovatus picipennis* Motschulsky, 1859
208. *Hydrovatus rufescens* Motschulsky, 1859
209. *Hydrovatus rufoniger rufoniger* (Clark, 1963)
210. *Hydrovatus seminarius* Motschulsky, 1859
211. *Hydrovatus pumilus* Sharp, 1882
212. *Hydrovatus cardoni* Severin, 1890
213. *Hydrovatus subrotundatus* Motschulsky, 1859

Tribe **HYGROTINI** Portevin, 1929

Genus **Herophydrus** Sharp, 1880

214. *Herophydrus musicus* (Klug, 1834)

Genus **Hygrotus** Stephens, 1828

216. *Hygrotus confluens* (Fabricius, 1787)
217. *Hygrotus flaviventris* (Motschulsky, 1860)
218. *Hygrotus impressopunctatus* (Schaller, 1783)
219. *Hygrotus lernaeus* (Schaum, 1857)
220. *Hygrotus parallelogrammus* (Ahrens, 1812)

Genus **Hyphoporus** Sharp, 1880 (18 spp.)

221. *Hyphoporus anitae* Vazirani, 1969
222. *Hyphoporus aper* Sharp, 1882
223. *Hyphoporus bengalensis* Severin, 1890
224. *Hyphoporus bertrandii* Vazirani, 1969
225. *Hyphoporus caliginosus* Régimbart, 1899
226. *Hyphoporus dehraduni* Vazirani, 1969
227. *Hyphoporus elegans* Régimbart, 1888
228. *Hyphoporus elevatus* Sharp, 1882
229. *Hyphoporus geetae* Vazirani, 1969
230. *Hyphoporus josephi* Vazirani, 1969
231. *Hyphoporus kempi* Gschwendtner, 1936
232. *Hyphoporus montanus* Régimbart, 1899
233. *Hyphoporus nilghiricus* Régimbart, 1903
234. *Hyphoporus pacistanus* Guignot, 1959
235. *Hyphoporus pugnator* Sharp, 1890
236. *Hyphoporus severini* Régimbart, 1892
Tribe HYPHYDRINI, Gistel, 1848
Genus *Hyphydrus* Illiger, 1802
237. *Hyphydrus lyratus flavicans* Régimbart, 1892
238. *Hyphydrus lyratus lyratus* Swartz, 1808
239. *Hyphydrus gschwendtneri* Guignot, 1942
240. *Hyphydrus holmeni* Biström, 1983
241. *Hyphydrus intermixtus* (Walker, 1858)
242. *Hyphydrus pulchellus* Clark, 1863
243. *Hyphydrus renardi* Severín, 1890
244. *Hyphydrus sumatrae* Régimbart, 1880

Genus *Microdytes* J. Balfour-Browne, 1946
249. *Microdytes elgae* Hendrich, Balke & Wewalka, 1995
250. *Microdytes maculatus* (Motschulsky, 1859)
254. *Microdytes svensoni* K.B. Miller & Wewalka, 2010
256. *Microdytes whitingi* K.B. Miller & Wewalka, 2010

Tribe METHLINI Branden, 1885
Genus *Methles* Sharp, 1882
257. *Methles indicus* Régimbart, 1899

Subfamily LACCOPHILINAE Gistel, 1856
Tribe LACCOPHILINI Gistel, 1856
Genus *Laccophilus* Leach, 1815
258. *Laccophilus anticatus anticatus* Sharp, 1890
259. *Laccophilus anticatus translucidus* Régimbart, 1899
260. Laccophilus auropictus Régimbart, 1899
261. Laccophilus boukali Hájek & Š. Eastný, 2005
262. Laccophilus chinensis Boheman, 1858
263. Laccophilus elegans Sharp, 1882
264. Laccophilus ellipticus Régimbart, 1899
265. Laccophilus flexuosus Aubé, 1838
266. Laccophilus guttalis Régimbart, 1893
267. Laccophilus indicus Gschwendtner, 1936
268. Laccophilus inefficiens (Walker, 1859)
269. Laccophilus kaszabi Brancucci, 1983
270. Laccophilus kempi kempi Gschwendtner, 1936
271. Laccophilus maindroni persicus Brancucci, 1983
272. Laccophilus medialis Sharp, 1882
273. Laccophilus minutus (Linnaeus, 1758)
274. Laccophilus parvulus obtusus Sharp, 1882
275. Laccophilus parvulus parvulus Aubé, 1838
276. Laccophilus poecilus Klug, 1834
277. Laccophilus punctatissimus Brancucci, 1983
278. Laccophilus ritsemae Régimbart, 1880
279. Laccophilus sharpi Régimbart, 1889
280. Laccophilus siamensis kavanaughi Brancucci, 1983
281. Laccophilus uniformis Motschulsky, 1859
282. Laccophilus wolfei Brancucci, 1983

Genus Neptosternus Sharp, 1882
283. Neptosternus annettae Hendrich & Balke, 2000
284. Neptosternus biharensis Vazirani, 1963
285. Neptosternus boukali Hendrich & Balke, 1999
286. Neptosternus circumductus Régimbart, 1899
287. Neptosternus horai Vazirani, 1953
288. Neptosternus hydaticoides (Régimbart, 1877)
289. Neptosternus kerala Hendrich & Balke, 1999
290. Neptosternus leyi Hendrich & Balke, 2000
291. Neptosternus rajasthanicus Vazirani, 1975
292. Neptosternus starmuehlneri Wewalka, 1973
293. Neptosternus taprobanicus Sharp, 1890

Family II GYRINIDAE

Subfamily ENHYDRINAE

Genus Dineutus Macleay, 1825
Subgenus Protodineutus, Ochs, 1926

294. Dineutus (Protodineutus) indicus Aube, 1838
295. Dineutus (Spinosodineutus) spinosus (Fabricius) 1781
296. Dineutus (Spinosodineutus) unidentatus (Aube) 1833

Subfamily GYRININAE

Genus Aulonogyrus Motschulsky, 1853

297. Aulonogyrus obliquus (Walker) 1858

Genus Gyrinus Geoffroy, 1762

298. Gyrinus convexiusculus Macleay 1871
299. Gyrinus smaragdinus Regimbart, 1891

Genus Metagyrinus Brinck 1955

300. Metagyrinus arrowi (Regimbart) 1907

Subfamily ORECTOCHILINAE

Genus Orectochilus Eschscholtz, 1833

Subgenus Patrus, Aube, 1836

301. Orectochilus (Patrus) andamanicus Regimbart, 1884
302. Orectochilus (Patrus) cameroni Ochs, 1925
303. Orectochilus (Patrus) cardoni Regimbart 1891
304. Orectochilus (Patrus) cribratellus metallescens Regimbart, 1907
305. Orectochilus (Patrus) cuneatus Regimbart, 1891
306. Orectochilus (Patrus) cylindricus Regimbart 1892
307. Orectochilus (Patrus) desgodinsi Regimbart, 1886
308. Orectochilus (Patrus) discifer(Walker), 1859
309. Orectochilus (Patrus)figuratus Regimbart, 1891
310. Orectochilus (Patrus) fletcheri Ochs, 1925
311. Orectochilus (Patrus) gangeticus (Wiedmann), 1930
312. Orectochilus (Patrus) haemorrhous Regimbart, 1893
313. Orectochilus (Patrus) himalayensis Vazirani, 1984
314. Orectochilus (Patrus) horni Ochs., 1933
315. Orectochilus (Patrus) marginipennis angustilimbus Ochs, 1925
316. Orectochilus (Patrus) metallicus Regimbart, 1883
317. Orectochilus (Patrus) murinus Regimbart, 1891
318. Orectochilus (Patrus) neglectus Ochs, 1925
319. Orectochilus (Patrus) oblogiusculus Regimbart, 1886
320. Orectochilus (Patrus) ribeiroi Vazirani, 1958
321. Orectochilus (Patrus) productus Regimbart, 1883
322. Orectochilus (Patrus) semivestitus Guerin, 1893
323. Orectochilus (Patrus) similis Ochs, 1929

Family III HALIPLIDAE

Genus Haliplus Latreille, 1802
Subgenus Liaphlus Guignot, 1928

324. Haliplus (Liaphlus) angustifrons Regimbart, 1892
325. Haliplus (Liaphlus) arrowi Guignot, 1936
326. Haliplus (Liaphlus) manipurensis Vazirani, 1966
327. Haliplus (Liaphlus) pruthi Vazirani, 1966
328. Haliplus (Liaphlus) pulchellus indicus Regimbart, 1899

Suborder II POLYPHAGA
Family IV HYDROPHILIDAE
Subfamily HYDRAENINAE

Genus Hydraena Kugelann, 1794

329. Hydraena bihamata Champ, 1920
330. Hydraena cirrata Champ, 1920
331. Hydraena maculicollis Champ, 1920
332. Hydraena tenjikuana Sato, 1979
333. Hydraena wittmeri Sato, 1979
Genus *Ochthebius* Leach, 1815

Subgenus *Hymenodes Mulsant*, 1844

334. *Ochthebius (Hymenodes) foveolatus* Germer, 1824
335. *Ochthebius (Hymenodes) nitidipennis* Champ, 1920
336. *Ochthebius (Hymenodes) opacipennis* Champ, 1920
337. *Ochthebius (Hymenodes) rivalis* Champ, 1920
338. *Ochthebius (Hymenodes) scintillans* Champ, 1920
339. *Ochthebius (Hymenodes) sexfoveatus* Champ, 1920
340. *Ochthebius (Hymenodes) strigosus* Champ, 1920

Subgenus *Bothochilus* Rey, 1885

341. *Ochthebius (Bothochilus) nobilis* Villa, 1835

Subfamily LIMNEBIINAE

Genus *Limnebius* Leach, 1815

342. *Limnebius almoranus* Knisch, 1924
343. *Limnebius distinctus* Knisch, 1924
344. *Limnebius singularis* Knisch, 1924

Subfamily EPIMETOPINAE

Genus *Epimetopus* lacord, 1854

345. *Epimetopus asperatus* Champ, 1919

Subfamily SPERCHEININAE

Genus *Spercheus* Kugel, 1798

346. *Spercheus gibbus* Champion, 1919

Subfamily HYDROCHINAE

Genus *Hydrochus* Leach, 1817

347. *Hydrochus annamitra* Regimbart, 1903
348. *Hydrochus bindosus* Motsch
349. *Hydrochus locustris* Nietner, 1856

Subfamily SPHAERIDINAE

Tribe SPHAERIDINI d’Orchymont

Genus *Coelostoma* Brulle, 1835

350. *Coelostoma horni* Regimbart, 1902
351. Coelostoma subditum d'Orchymont, 1936
352. Coelostoma stul

Genus **Dactylosternum** Wollaston, 1854
353. Dactylosternum abdominale F., 1792
354. Dactylosternum hydrophiloides (M’Leay), 1825

Genus **Sphaeridium** Fabricius, 1775
355. Sphaeridium cameroni d’Orchymont, 1919
356. Sphaeridium dimidiatum Gory, 1834
357. Sphaeridium quinquemaculatum Fabricius 1798
358. Sphaeridium seriatum d’Orchymont, 1919
359. Sphaeridium severini d’Orchymont, 1919

Tribe CERCYONINI

Genus **Cercyonini** Leach, 1817
360. Cercyon dilutum Regimbart, 1903
361. Cercyon pseudodilutum Sato, 1979
362. Cercyon punctigerum Knisch, 1921
363. Cercyon subditum d’Orchymont, 1919
364. Cercyon vicinalis Walker 1859

Genus **Oosternum** Sharp, 1882
365. Oosternum horni d’Orchymont, 1914

Tribe MEGASTERNINI

Genus **Pachysternum** Motsch, 1863
366. Pachysternum cardoni d’Orchymont, 1926
367. Pachysternum evanescens Sharp, 1873
368. Pachysternum nigrovittatum Motschulsky 1863
369. Pachysternum stevensi d’Orchymont, 1942
Subfamily HYDROPHILINAE

Tribe HYDROBINII

Genus *Crenetis* Bedel, 1881

370. *Crenetis orientalis* Sato

Genus *Paracymus*, Thomson, 1867

371. *Paracymus evanescens* Sharp, 1890

Genus *Laccobius* Erichson, 1837

372. *Laccobius rotundus* Regimbart, 1903

373. *Laccobius simulans* d’Orchymont, 1923

Genus *Helochares* Mulsant, 1844

374. *Helochares anchoralis* (Sharp), 1890

375. *Helochares crenatus* Regimbart, 1903

376. *Helochares densus* Sharp, 1890

377. *Helochares lentus* Sharp, 1890

378. *Helochares pallens* (Macleay), 1825

379. *Helochares taprobanicus* Sharp, 1890

Genus *Enochrus* Thomson, 1859

380. *Enochrus esuriens* Walker 1858

381. *Enochrus rubrocinctus* (Regimbart), 1903

Tribe II HYDROPHILINI

Genus *Sternolophus* Solier, 1834

382. *Sternolophus rufipes* (F.), 1792

Genus *Hydrophilus* Leach, 1764

383. *Hydrophilus bilineatus caschmiensis* Redentenbacher, 1844

384. *Hydrophilus indicus* (Bedel)1892

385. *Hydrophilus olivaceous* F.1781

386. *Hydrophilus rufocinctus* (Bedel), 1888
387. *Hydrophilus senegalensis* Percheron, 1835
388. *Hydrophilus temnopteroides* (d’Orchymont) 1890
   
   Tribe AMPHIPINI
   
   Genus *Amphiops* erichson, 1843
389. *Amphiops pedestris* Sharp, 1890
390. *Amphiops simplex* Sharp, 1890
   
   Tribe BEROSINI
   
   Genus *Berosus* Leach, 1817
391. *Berosus fairmairei* Macleay 1908
392. *Berosus indicus* Mots. 1861
393. *Berosus pulchellus* Macleay 1825
   
   Genus *Regimbartia Zaitiev*, 1908
394. *Regimbartia attenuata* Fabr. 1801
   
   Genus *Globaria Latreille*, 1829
395. *Globaria leachi* Hope, 1838
   
   Family V ELMIDAE
   
   Genus *Stenelmis Dufour*, 1835
396. *Stenelmis* sp.

**SUMMARY**

The aquatic and semi aquatic groups of insects are overall indicators of both recent and long term environmental conditions. The study reports the presence of 14 species of Aquatic Hemiptera belonging to 5 families and 8 genera, which forms the first report of this group from insects of lakes of Hyderabad. It also comprises of 31 species of aquatic coleoptera accommodated under 20 genera and four families. Aquatic coleopterans are highly diverse and distributed, only four families namely Dytiscidae, Gyrinidae and Hydrophilidae and Haliplidae are chiefly represented in the present report of lakes of Hyderabad. The diversity of insect fauna in different wetland types varied widely which was dependant on availability of macrophytes and general physico chemical conditions of water. An attempt has also been made to update the Checklist of Aquatic coleoptera, though the list includes only five families,
further studies on other aquatic families will be made. It is presumed that further intensive seasonal surveys to many more wetlands belonging to different types and detailed taxonomic studies may reveal some species which may be significant both ecologically and taxonomically. Further studies aiming to improve our knowledge on water insects should focus on collecting in little known areas, revision of the still unstudied material from additional families and filling the large gaps in our knowledge regarding the diversity of water beetles in some specific habitats.

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REFERENCES


Comparison of no. of insects belonging to Hemiptera and Coleoptera from four different lakes.
PLATE - I

Hussain sagar-Collection localities

Collection spot -1

Collection spot -2

Collection spot -3

Collection spot -4
Collection spot 1  Collection spot 2

Water pollution-Washing clothes at Durgam cheruvu  Regular Cultural fest organised at Durgam cheruvu
PLATE - III

A View of Miralam Tank

Miralam Tank collection spot - 1
Miralam Tank collection spot - 2
Miralam Tank collection spot - 4

Miralam lake water used for different purposes

Miralam lake-5
Miralam lake-6
Boating unit at Miralam lake-7
Collection spot -1

Collection spot -2

Collection spot -3

Insects collected from crevices of underlying stones at Himayat Sagar
PLATE - V

Aquatic Hemiptera

*Diplonychus rusticus*  
*Limnometra fluviorum*  
*laccotrephus griseus*

Coleoptera: Aquatic Families

*Hydrophilidae*  
*Haliplidae*  
*Gyrinidae*
Laccophilus ellipticus  
Lethocerus indicus  
Limnogonus sp.

Orectochilus semivestitus  
Sandracottus mixtus  
Sphaeridium dimidiatum