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Diversity and distribution of aquatic entomofauna in India

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Abstract
Aquatic insects exhibit high diversity and are abundant in freshwater habitats. Different varieties of aquatic organisms colonize freshwater ecosystems, which often contribute to most regional freshwater biodiversity. The literature was reviewed from 2011 to 2021, to provide the database of the distribution and diversity of aquatic insect in different area of India. According to published literature, the majority of aquatic insects belong to 10 taxonomic orders. These orders are Order Ephemeroptera, Order Hemiptera, Order Odonata, Order Coleoptera, Order Diptera, Order Tricoptera, Order Plecoptera, Order Lepidoptera, Order Collembola, Order Megaloptera. Overall species richness revealed that insect order Coleoptera were the dominant order followed by Hemiptera, Odonata, and Ephemeroptera. The presence of pollution intolerant genera *viz*., *Petersulla, Isonychia, Isca, Clypeocaenis*, *Helicopsyche* indicates that river water is of high quality. *Cleon bimaculatum* and *Procleon regularum* are tolerant to organic pollution. Consequently, an ecological study of aquatic insects can provide information about the ecology of insects in a specific area, which can be used as baseline data for future research and conservation planning. Therefore, the present study was attempted to compile all available information on the status and diversity of aquatic entomofauna in India.

Keywords: aquatic entomofauna, biodiversity, bioindicator, ecosystem, pollution

Introduction
Biodiversity is called the variety of life forms on our planet (Gaston 2000) [19]. Biologists define biodiversity most often as the "totality of species, genes and ecosystems of a region" (Mark and Jonathan 2007) [36]. Biodiversity was not evenly distributed globally; the tropics have the most (Tittenson *et al*., 2010) [59]. Insects are the most numerous group on the planet. They constitute about 75-80% of all animal species on the earth (Ehrlich and Wilson, 1991) [17]. Various aquatic insect species are found in freshwater habitats such as puddles, rivers, lakes etc. They constitute the majority of aquatic ecosystems' benthic, limnetic, and littoral fauna, some are aquatic at certain stages of their life-cycle or spend their whole life cycle in or near bodies of water during various phases of their life span (Gullan and Cranston, 2005) [23]. Insect species found in freshwater ecosystems are around 45,000 (Balaram, 2005) [4]. In some freshwater ecosystems, only about 3% of all insect species have aquatic stages; however, insects may account for more than 95% of all individual or macro-invertebrate species. They play a significant ecological role in the proper functioning of freshwater habitat systems (Choudhary and Ahi, 2015a) [12]. Insects, which belong to different feeding groups like deposit collectors, filter feeders, and predators, shredders play a crucial role in nutrient processing and cycling. Some aquatic insects dismantle the dead leaves and other plant parts that fall into the water body from land. In aquatic environments, this material serves as the foundation of the food chain. Some scrape algae from all firm water surfaces, including rock layers, logs, leaves, and live rooted plant stems. Some aquatic insects filter fine particles suspended in water. It is advantageous because it keeps water enough clean for light to reach the bottom, where algae and other plants thrive. Other aquatic insects mix the soft sediments in the base when they burrow for food and, by infusing oxygen from the water, promote the health of the organisms on the bottom **(**Choudhary and Ahi 2015a) [12]. In the food chain base, aquatic insects like scrapers and shredders provide evidence of the ripple effects of environmental stress caused by changes in the physicochemical properties of water (Hodkinson and Jackson, 2005) [27]. Aquatic insects, which serve as an important ecological and economic function in aquatic ecology, have also been used to study ecology, population growth, genetics, evolution, and various other topics in biology. Aquatic insects are valuable as bio-indicators of both the health and quality of freshwater systems because of their diversity, high reproduction rates, short generation periods, and rapid colonization (Choudhary and Ahi, 2015a) [12]. Due to their essential ecological role, aquatic insects have been selected to predict ecological significance stress. As most aquatic insects' lives are spent near water, any change in population or composition over time and space may signal changes in water quality and act as indicators of trophic structure, water quality, and eutrophication in aquatic habitat (Varma and Pratap, 2006) [60]. Changes in physicochemical properties may also disrupt trophic levels, biological activities, migrations, feeding habits or put even the most tolerant species under physiological stress. However, there is no concrete information available on the aquatic insect fauna of India. Pertinent to above, the present study was conducted to summarize the biodiversity and distribution of aquatic insect species in India in the hope that the result would offer specific information for management and biodiversity conservation of aquatic habitats in India.

Diversity and distribution of aquatic fauna in India
Odonata is a primitive aquatic entomofauna that includes

dragonflies and damselflies (Mitra 2006) [38]. The prey of adults consists primarily of harmful insects, which has a regulatory effect on the ecosystem. They also play a significant role as prey and predator in maintaining the trophic levels of the food chain's balance. Most Odonates species are habitat-specific; however, some have adapted to urban environments and use artificial water bodies (Bishnoi and Dang, 2019) [9].

Aquatic coleopterans are highly diverse, with nearly 30 different families. The Dytiscidae family has adapted perfectly to life in the water. All adults and larvae live in the water. Dytiscidae species are predators of the aquatic ecosystem and play a vital role in mosquito control (Jaiswal, 2013) [28] Members of the Gyrinidae (Whirling beetle) family can be found in freshwater ponds, lakes, open flowing streams, etc. In rivers and streams, the Hydrophilids (water scavenger beetles) predominate. Haliplidae family lives in aquatic vegetation near ponds, lakes, streams, and creeks. Temperate regions have the greatest diversity and abundance of aquatic beetles. Aquatic beetles occur in a variety of habitats. Many of them, particularly Dytiscids and many Hydrophilids, live in small shallow water bodies or on the margins of rivers and marshes. They occupy the emergent vegetation zone or mats of plant debris.

In general, water bugs (Hemiptera) are effective predators of different variety of aquatic organisms. Their impact on nature could be both beneficial and harmful. They are useful in predating on the noxious insect's larvae such as mosquitoes, gnats, midges, and other insects that cause a variety of human diseases. However, they cause significant damage to fish and frogs (Sharma and Agarwal, 2012) [53].

Immature aquatic stages of Order Trichoptera are present in all kinds of freshwater ecosystems. Caddisflies are economically significant as pests, but they also play an essential role in trophic dynamics and energy transfer in aquatic environments (Rekha and Dinakaran 2013) [46]. In terms of biomass and diversity, stoneflies (Order Plecoptera) are an essential component of ponds. Stoneflies are eaten by various macro-vertebrates and fish, thus play a crucial role in the food chain. Plecoptera has been used in evolutionary research and as biogeographical indicators. Plecoptera is a delicate order of aquatic insects that thrives in environment with little human disturbance, pure water, and high dissolved oxygen levels. Ephemeroptera larvae are widely recognized for their sensitivity to oxygen depletion and are used as bioindicators in various monitoring programs (Choudhury and Ahi 2015a) [12]. Order Ephemeroptera, Plecoptera, and Trichoptera (EPT) are sensitive to environmental stress; their presence has been identified as a potential bioindicator for a healthy ecosystem (Kubendran and Ramesh 2016) [31]. The presence of pollution intolerant genera *viz*., *Petersulla, Isonychia, Isca, Clypeocaenis, Helicopsyche* indicates that river water is of high quality. *Cleon bimaculatum* and *Procleon regularum* are tolerant to organic pollution.

In India, status of Ephemeroptera fauna is represented by 54 species. Species richness families are Baetidae (31 species), Leptophlebiidae (8 species), Heptageniidae (7 species), Caenidae (2 species), Ephemerellidae (2 species), Ephemeridae (1 species), Isonychiidae (1 species), Siphlonuridae (1 species), Tricorythidae (1 species). 2 species of Order Plecoptera is represented by two families Perlidae (1species), Pteronarcyidae (1 species). Order Trichoptera was represented by 18 species belonging to 11 families namely Glossosomatidae (1 species), Helicopsychidae (1 species), Hydropsychidae (8 species), Hydroptilidae (1 species), Leptoceridae (1 species), Lepidostomatidae (1 species), Philopotamidae (1 species), Phyganeadae (1 species), Polycentropodidae (1 species), Psychomyiidae (1 species), Stenopsychidae (1 species).

A total of 28 species of Order Diptera belonging to 10 families namely Chironomidae (2 species), Culicidae (15 species), Dixidae (1 species), Ephydridae (2 species), Psychodidae (1 species), Simuliidae (1 species), Sciomyzidae (1 species), Stratiomyidae (1 species), Syrphidae (1 species), Tipulidae (2 species), Sepsidae (1 species) were represented.

The aquatic beetle (Order Coleoptera) fauna of India consists of 137 species belonging to 16 families. Dysticidae include maximum number of species (57 species) followed by Hydrophilidae (36 species), Gyrinidae (11 species), Curculionidae (6 species), Halipida (6 species), Carabidae (4 species), Noteridae (4 species), Dryopidae (2 species), Hydraenidae (2 species), Helodidae (2 species), Psephenidae (2 species), Chrysomelidae (1 species), Elmidae (1 species), Limnichidae (1 species), Ptilodactylidae (1 species), Scirtidae (1 species).

Order Hemiptera was represented by 126 species belonging to 13 families namely Aphididae (2 species), Aradidae (1 species), Belostomatidae (10 species), Corixidae (16 species), Gerridae (34 species), Helotrephidae (2 species), Hydrometridae (6 species), Mesoveliidae (3 species), Naucoridae (2 species), Nepidae (17 species), Notonectidae (18 species), Pleidae (7 species), Veliidae (8 species).

From different areas of India, 109 species of the Order Odonata belonging to 12 families namely Aeshnidae (7 species), Chlorocyphidae (2 species), Caloptergidae (1 species), Coenagrionidae (29 species), Corduliidae (2 species), Euphaeidae (1 species), Gomphidae (8 species), Lestidae (3 species), Libellulidae (47 species), Macromiidae (2 species), Petaluridae (1 species), Ptatycnemididae (6 species) have been reported. 2 species of Lepidoptera from the Pyralidae family, Order Collembola from Entomobryidae (1 species), Sminthuridae (1 species), Order Megaloptera having a single species from Corydalidae have been reported.

Order Hymenoptera are generally terrestrial. Several aquatic insects belonging to the Heteroptera, Odonata, a few Lepidoptera, Coleoptera, and even Diptera serve as hosts for hymenopteran parasitoids. Only single species from family Formicidae have been reported. Species wise diversity of aquatic entomofauna is summarized in table 1.

Table 1: Diversity and distribution of aquatic entomofauna in India

Oder	Family	*Genera*	Distribution	References
Ephemeroptera	Baetidae	*Beatis sp*, *Baetis acceptus*, *Baetis conservatus*, *Baetis dipsicus*, *Baetis fluitans*, *Baetis frequentus*, *Tenuibaetis frequentus*	Southern Western Ghats, Assam, Maharashtra, Andhra Pradesh, Tamil Nadu, Telangana	Kubendran and Ramesh (2016), Kubendran *et al.*, (2017), Prabhakar and Choodamani (2018), Amaravathi *et al.*,(2018),

				Ponraman *et al.*,(2016), Rao *et al.*,(2020),
		Chopralla ceylonensis, *Chopralla similis*, *Indobaetis michaelohubbardi*	Southern Western Ghats	Kubendran *et al.*, (2017)
		Cloeon bicolor, *Cloeon bimaculatum*, *Cloeon harveyi*, *Cloeon inscriptum*, *Cloeon kimminsi*, *Cloeon marginale*, *Cloeon taeniatum*, *Cloeon sp.*	Southern Western Ghats, Assam, West Bengal, Tamil Nadu	Kubendran *et al.*, (2017), Gogoi and Gupta (2017), Boruah and Gupta (2016), Bera (2019), Ponraman *et al.*, (2016)
		Labiobaetis sp., *Labiobaetis geminates*, *Labiobaetis jacobusi*, *Labiobaetis palmyrae*, *Labiobaetis pulchellum*, *Labiobaetis rubellum*, *Labiobaetis soldani*	Southern Western Ghats, Assam	Kubendran *et al.*, (2017), Barman and Gupta (2015)
		Liebebiella vera, *Nigrobaetis paramakalyani*, *Offadens sp.*, *Procloeon regularum*, *Platybaetis sp.*, *Symbiocloeon madhyasthai*	Southern Western Ghats, Assam, Central Western Ghats	Kubendran *et al.*, (2017), Barman and Gupta (2015), Balachandran *et al.*, (2012)
	Caenidae	*Caenis sp.*, *Clypocaenis bisetosa*	Southern Western Ghats, Assam, Central Western Ghats, Andhra Pradesh	Kubendran and Ramesh (2016), Borkataki *et al.*, (2018), Balachandran *et al.*, (2012), Amaravathi *et al.*, (2018), Ponraman *et al.*, (2016)
	Ephemeridae	*Ephemera sp.*	Southern Western Ghats, Maharashtra	Kubendran and Ramesh (2016), Prabhakar and Choodamani (2018),
	Ephemerellidae	*Ephemerella (Torleya) sp.*, *Ephemerella (Drunella) sp.*	Central Western Ghats, Andhra Pradesh, Telangana	Balachandran *et al.*, (2012), Amaravathi *et al.*,(2018), Rao *et al.*,(2020)
	Heptageniidae	*Afronurus sp.*, *Cinygmina sp.*, *Epeorus sp.*, *Heptagenia sp.*, *Thalerosphyrus sp.*, *Stenonema sp.*, *Rhithrogena germanica*	Central Western Ghats, Southern Western Ghats, Assam, Andhra Pradesh, Karnataka	Balachandran *et al.*, (2012),Kubendran and Ramesh (2016), Barman and Gupta (2015), Amaravathi *et al.*,(2018), Vasant Kumar and Roopa (2014)
	Isonychiidae	*Isonychia sp.*	Assam, Central Western Ghats	Borkataki *et al.*, (2018), Balachandran *et al.*, (2012)
	Leptophlebiidae	*Choroterpes sp.*, *Edmundsula sp.*, *Isca sp.*, *Leptophlebia sp.*, *Notophlebia sp.*, *Petersula sp.*, *Thraulus sp.*, *Habrophlebiodes*	Cental, Southern Western Ghats, Madhya Pradesh, Telangana	Kubendran and Ramesh (2016) Balachandran *et al.*, (2012), Ganie *et al.*, (2016), Rao *et al.*,(2020)
	Siphlonuridae	*Ameletus sp.*	Madhya Pradesh	Ganie *et al.*, (2016)
	Tricorythidae	*Tricorythodes sp.*	Southern Western Ghats	Kubendran and Ramesh (2016)
Plecoptera	Perlidae	*Neoperla sp.*	Central, Southern Western Ghats	Kubendran and Ramesh (2016), Balachandran *et al.*, (2012), Amaravathi *et al.*, (2018)
	Pteronarcyidae	*Pteronarcys sp.*	Karnataka	Vasant Kumar and Roopa (2014)
Trichoptera	Glossosomatidae	*Glossosoma sp.*,	Assam	Borkataki *et al.*, (2018)
	Helicopsychidae	*Helicopsyche sp.*	Central Western Ghats	Balachandran *et al.*, (2012)
	Hydropsychidae	*Cheumatopsyche sp.*, *Diplectrona modesta*, *Homoplectra sp.*, *Hydropsyche sp.*, *Hydropsyche bidens*,	Central Western Ghats, Assam Southern Western Ghats, Southern Eastern Ghats,	Balachandran *et al.*, (2012), Borkataki *et al.*, (2018), Kubendran and Ramesh (2016), Barman and Gupta (2015), Rekha and Dinakaran

		Leptonema sp., *Macronema sp.*, *Potamiya sp.*	Telangana	(2013), Rao *et al.*, (2020)
	Hydroptilidae	*Hydroptila sp.*	Assam	Barman and Gupta (2015)
	Leptoceridae	*Leptocerus sp.*	Telangana	Rao *et al.*, (2020)
	Lepidostomatidae	*Lepidostoma sp.*	Central Western Ghats, Southern Eastern Ghats	Balachandran *et al.*, (2012), Rekha and Dinakaran (2013)
	Philopotamidae	*Wormaldia sp.*	Central Western Ghats, Southern Eastern Ghats,	Balachandran *et al.*, (2012), Rekha and Dinakaran (2013)
	Phyganeadae	*Fabria sp.*	Assam	Boruah and Gupta (2016)
	Polycentropodidae	*Polycentropus sp.*	Southern Western Ghats, Uttar Pradesh	Kubendran and Ramesh (2016), Prakash and Verma (2020)
	Psychomyiidae	*Psychomyia sp.*	Central Western Ghats, Southern Eastern Ghats,	Balachandran *et al.*, (2012), Rekha and Dinakaran (2013)
	Stenopsychidae	*Stenopsyche sp.*	Southern Western Ghats, Assam	Kubendran and Ramesh (2016), Das and Biswas (2018), Rekha and Dinakaran (2013)
Diptera	Chironomidae	*Chironomus sp.*, *Diamesinae sp.*	Assam, Madhya Pradesh, Maharashtra, Andhra Pradesh, West Bengal, Telangana, Tripura	Borkataki *et al.*, (2018), Prabhakar and Choodamani (2018), Ganie *et al.*, (2016), Amaravathi *et al.*,(2018), Saha *et al.*, (2020), Rao *et al.*,(2020), Majumder *et al.*, (2013)
	Culicidae	*Aedes sp.*, *Aedes aegypti*, *Anopheles barbirostris, Anopheles annularis, Anopheles peditaeiatus, Anopheles sp.*, *Anopheles subpictus*, *Anopheles vagus*, *Culex fuscanus*, *Culex pipiens*, *Culex pseudovishnui, Culex sp.*, *Culex tarsalis*, *Culex tritaeniorhynchus, Culex vishnui*	Southern East Coast Of India, Assam, Maharashtra	Balakrishnan *et al.*, (2014), Hasan *et al.*,(2016), Prabhakar and Choodamani (2018), Choudhury and Gupta (2015), Ponraman *et al.*, (2016)
	Dixidae	*Nothodixa sp.*	Assam	Barman and Gupta (2015)
	Ephydridae	*Brachydeutera sp.*, *Ephydra sp.*	Madhya Pradesh	Ganie *et al.*, (2016)
	Psychodidae	*Telmatoscopus sp.*	Madhya Pradesh	Ganie *et al.*, (2016)
	Simuliidae	*Simulium sp.*	Southern Western Ghats,Assam	Kubendran and Ramesh (2016)
	Sciomyzidae	*Sepedon sp.*	Andhra Pradesh	Amaravathi *et al.*,(2018)
	Stratiomyidae	*Euparyphus sp.*	Madhya Pradesh	Ganie *et al.*, (2016)
	Syrphidae	*Eristalis sp.*	Madhya Pradesh	Ganie *et al.*, (2016)
	Tipulidae	*Hexatoma sp.*, *Pilaria sp.*	Central Western Ghats, Tripura	Balachandran *et al.*, (2012), Majumdar *et al.*,(2013)
	Sepsidae	*Parapalaeosepsis sp.*	Assam	Boruah and Gupta (2016)
Coleoptera	Carabidae	*Bembidion sp.*, *Pterostichus sp.*	Rajasthan, Assam	Rukasana and Srivastava (2017), Borkataki *et al.*, (2018)
		Chlaenius sp., Casnoidea sp.	Assam	Barman and Baruah(2018)
	Chrysomelidae	*Donacia sp.*	Assam, Manipur	Choudhury and Gupta (2015), Devi *et al.*,(2016)
	Curculionidae	*Bagous affinis*, *Bagous sp.*	Assam	Barman and Gupta (2015), Borkataki *et al.*, (2018)
		Lixus sp., *Notiodes sp.*	Rajasthan, Manipur	Srivastava (2018), Devi *et al.*, (2016)
		Sphenophorus sp., *Neochetina sp.*	Assam	Choudhury and Gupta (2015)
	Dryopidae	*Helichus sp., Elmomophes brevicornis*	Assam, Manipur	Gogoi and Gupta (2017), Devi *et al.*,(2016)
	Dysticidae	*Agabus sp.*, *Agabus amoenus sinuaticolis*	Rajasthan, Andhra Pradesh, Manipur	Rukasana and Srivastava (2017), Amaravathi *et al.*,(2018), Devi *et al.*, (2016)
		Captotomus enterrogatus, *Copelatus mysorensis, Copelatus sp.*	Rajasthan, Maharashtra, Tamil	Srivastava (2018), Kulkarni *et al.*, (2015), Ponraman *et*

			Nadu	*al.*,(2016)
		Canthydrus laetabilis, *Canthydru incosistant*, *Canthydrus morsbachi*, *Canthydrus luctuosus*, *Canthydrus ritsemae*	West Bengal, Assam, Hyderabad, Maharashtra, Jammu and Kashmir, Chhattisgarh	Pahari *et al.*, (2016), Barman and Baruah(2018), Jaiswal (2013), Kulkarni *et al.*,(2015), Tara *et al.*, (2011), Ghosh *et al.*, (2014)
		Cybister confuses, *Cybister fimbriolatus*, *Cybister limbatus*, *Cybister regulosus*, *Cybister convexus*, *Cybister pectoralis*, *Cybister sp.*, *Cybister sugillatus*, *Cybister cognatus*, *Cybister cardoni* *Cybister tripunctatus asiaticus*	Assam, Uttar Pradesh, Rajasthan, West Bengal, Hyderabad, Andhra Pradesh, Jammu and Kashmir, Telangana, Chhattisgarh, Manipur, Madhya Pradesh	Borkataki *et al.*, (2018), Sharma and Agarwal (2012), Srivastava (2018), Borkataki *et al.*, (2018), Pahari *et al.*, (2016), Jaiswal (2013), Amaravathi *et al.*,(2018), Tara e al., (2011), Ghosh *et al.*, (2014), Rao *et al.*, (2020), Devi *et al.*,(2016), Choudhary and Ahi (2015b)
		Clypeodytes sp.	Assam	Barman and Baruah (2018)
		Dytiscus verticalis, *Dytiscus marginalis*	Rajasthan, Maharashtra, Jammu and Kashmir, Tamil Nadu	Srivastava (2018), Prabhakar and Choodamani (2018), Sharma (2015), Tara *et al.*,(2011), Ponraman *et al.*, (2016)
		Eretes sticticus, *Eretes griseus*, *Guignotus flammulatus*, *Guignotus inconstans*	Hyderabad, Andhra Pradesh, Karnataka, Chhattisgarh	Jaiswal (2013), Amaravathi *et al.*,(2018), Vasant kumar and Roopa (2014), Ghosh *et al.*, (2014)
		Herophydrus musicus	Assam, Maharashtra	Borkataki *et al.*, (2018), Kulkarni *et al.*,(2015)
		Hyphydrus intermixtus, *Hyphydrus birmanicus*, *Hydroporus sp.*,	Maharashtra, Andhra Pradesh	Kulkarni *et al.*, (2015), Amaravathi *et al.*,(2018)
		Hydaticus sp., *Hydaticus fabricii*, *Hydaticus vittatus*, *Hydaticus satoi*, *Hydaticus ricinus*, *Hydroglyphus flammulatus*, *Hydroglyphus pradhani*, *Hydroglyphus inconstants*	Rajasthan, Assam, Hyderabad, Maharashtra, Himachal Pradesh, Tamil Nadu, Chhattisgarh, Manipur	Srivastava (2018), Barman and Baruah (2018), Jaiswal (2013), Kulkarni *et al.*, (2015), Ghosh and Hedge (2013), Ghosh *et al.*, (2014), Devi *et al.*, (2016), Ponraman *et al.*, (2016)
		Hydrovatus sp., *Hydrovatus bonvoluri*, *Hydrovatus confertus*	Assam, West Bengal, Hyderabad, Maharashtra, Manipur	Gogoi and Gupta (2017), Pahari *et al.*, (2016), Jaiswal (2013), Kulkarni *et al.*, (2015), Devi *et al.*, (2016)
		Hydrocoptus subvittulus	West Bengal, Hyderabad	Pahari *et al.*, (2016), Jaiswal (2013)
		Laccophilus sp., *Laccophilus anticatus*, *Laccophilus inefficiens*, *Laccophilus elegans*, *Laccophilus ellipticus*, *Laccophilus flexuosus*, *Laccophilus parvulus*, *Laccophilus purvulus*, *Laccophilus uniformis*, *Laccophilus sharpi*	Assam, Rajasthan, West Bengal Uttar Pradesh, Maharashtra, Hyderabad, Himachal Pradesh, Tamil Nadu, Jammu and Kashmir, Manipur, Tripura, Chhattisgarh	Borkataki *et al.*, (2018), Srivastava (2018), Rukasana and Srivastava (2015), Sharma and Agarwal (2012), Pahari *et al.*, (2016), Prabhakar and Choodamani (2018), Barman and Baruah (2018), Jaiswal (2013), Ghosh and Hedge (2013), Tara *et al.*, (2011), Takhelmayun and Gupta (2015), Majumder *et al.*, (2013), Ponaraman *et al.*,(2016), Ghosh *et al.*, (2014)
		Laccobius sp.	Rajasthan	Srivastava (2018)
		Potamonecteus sp. *Uvarus sp.*	Tamil Nadu, Rajasthan	Srivastava (2014), Ramar *et al.*,(2018)
	Gyrinidae	*Dineutus sp.*, *Dineutus spinosus*, *Dineutus indicus*, *Dineutus unidenttatus*	Assam, Central Western Ghats, Uttar Pradesh, Tamil Nadu, Hyderabad, Maharashtra, Himachal Pradesh, Tamil Nadu	Borkataki *et al.*, (2018), Balachandran *et al.*, (2012), Sharma and Agarwal(2012), Ramar *et al.*,(2018), Barman and Baruah (2018), Jaiswal (2013), Kulkarni *et al.*,(2015), Ghosh and Hedge (2013), Majumder *et al.*, (2013), Ghosh *et al.*, (2014)
		Gyrinus marinus, *Gyrinus convexiusculus*	Rajasthan, Hyderabad	Sharma (2015), Jaiswal (2013)

		Macrogyrus sp., Rhantaticus congestus	Maharastra, Himachal Pradesh	Prabhakar and Choodamani (2018), Ghosh and Hedge (2013)
		Orectogyrus sp., *Orectochilus semivestitus*, *Orectochilus discifer*	Assam, Hyderabad	Barman and Gupta (2015), Jaiswal (2013)
	Elmidae	*Stenelmis sp.*	Assam, Andhra Pradesh, Telangana	Gogoi and Gupta (2017), Amaravathi *et al.*,(2018), Rao *et al.*, (2020)
	Halipida	*Haliplus sp., Haliplus angustifrons, Haliplus pulchellus indicus, Haliplus manipurensis, Peltodytes sp.*	Rajasthan, Hyderabad, Maharashtra, Manipur	Srivastava (2018), Jaiswal (2013), Kulkarni *et al.*, (2015), Devi *et al.*, (2016)
	Helodidae	*Scrites Nigropunctatus*	Rajasthan	Srivastava (2018)
	Hydraenidae	*Hydraena quadricollis, Hydraena sp.*	Rajasthan, Manipur	Srivastava (2018), Devi *et al.*, (2016)
	Hydrophilidae	*Allocotocerus sp., Amphiops sp., Amphiops mirabilis, Amphiop spedestris, Cercyon sp.*	Assam, Andhra Pradesh, Maharashtra, Himachal Pradesh, West Bengal, Telangana, Manipur	Gogoi and Gupta (2017), Kulkarni *et al.*,(2015), Amaravathi *et al.*,(2018), Ghosh and Hedge (2013), Saha *et al.*,(2020), Rao *et al.*, (2020), Devi *et al.*, (2016)
		Berosus sp., Berosus indicus, Berosus pulchellus, Enochrus esuriens, Enochrus nigropiceus, Dactylosternum abdominal	Assam, Andhra Pradesh, Rajasthan, Hyderabad, Maharashtra, Himachal Pradesh, Jammu and Kashmir, Tripura, Tamil Nadu	Choudhuty and Gupta (2015), Amaravathi *et al.*, (2018), Srivastava (2018), Barman and Baruah (2018), Jaiswal (2013), Kulkarni *et al.*, (2015), Ghosh and Hedge (2013), Devi *et al.*, (2016), Tara *et al.*, (2011), Ponraman *et al.*, (2016)
		Helochares sp., Helochares crenatus, Helochares atropiceus, Helochares anchoralis, Helochares pallens, Helochare sanchoralis	West Bengal, Assam, Andhra Pradesh, Hyderabad, Manipur, Chhattisgarh, Telangana, Jammu and Kashmir	Pahari *et al.*, (2016), Barman and Baruah (2018), Amaravathi *et al.*, (2018), Jaiswal (2013), Ghosh and Hedge (2013), Ghosh *et al.*, (2014), Devi *et al.*, (2016), Rao *et al.*, (2020), Tara *et al.*, (2011)
		Hydrous sp., Hydrochus bindosus, Hydrobius fuscipes, Hydrobiomorpha sp., Hydrobiomorpha spinicollis andromorpha	Maharashtra, Hyderabad, Rajasthan, Southern Western Ghats	Prabhakar and Choodamani (2018), Jaiswal (2013), Sharma (2015), Kubendran and Ramesh (2016), Kulkarni *et al.*, (2015)
		Hydrophilus sp., Hydrophilus olivaceous, Hydrophilus piceus, Hydrophilus rufocintus, Hydrophilus triangularis, Hydrophilus aquaticus	Assam, Rajasthan Southern East Coast Of India, Hyderabad, Tamil Nadu, Chhattisgarh, Manipur, West Bengal, Tripura, Madhya Pradesh	Borkataki *et al.*, (2018), Srivastava (2018), Balakrishnan *et al.*, (2014), Jaiswal (2013), Ponraman *et al.*, (2016), Ghosh *et al.*, (2014), Takhelmayun and Gupta (2015), Saha *et al.*, (2020), Devi *et al.*, (2016), Choudhary and Ahi (2015b)
		Laccobius sp.	Assam, Central Western Ghats	Choudhuty and Gupta (2015), Balachandran *et al.*, (2012)
		Sphaeridium dimidiatum	Hyderabad	Jaiswal (2013)
		Sperchopsini sp.	Andhra Pradesh	Amaravathi *et al.*,(2018)
		Sternolophus rufipes, Sternolophus sp.	Rajasthan, West Bengal, Assam, Maharashtra, Jammu and Kashmir, Chhattisgarh	Srivastava (2014), Pahari *et al.*, (2016), Barman and Baruah (2018), Kulkarni *et al.*,(2015), Tara *et al.*, (2011), Ghosh *et al.*, (2014)
		Tropisternus lateralis	Rajasthan, Madhya Pradesh, Manipur	Srivastava (2018), Ganie *et al.*,(2016), Devi *et al.*, (2016)
		Regimbertia attenuate, Regimbertia sp.	Uttar Pradesh, Hyderabad, Himachal Pradesh, Jammu and Kashmir	Sharma and Agarwal (2012), Jaiswal (2013), Ghosh and Hedge (2013), Tara *et al.*, (2011)

	Limnichidae	*Limnichus sp.*	Andhra Pradesh	Amaravathi *et al.*,(2018)
	Noteridae	*Hydrocanthus oblongus, Neohydrocoptus subvittulus*	Assam, Manipur	Barman and Gupta (2015), Barman and Baruah (2018), Devi *et al.*, (2016)
		Noterus sp.	Central Western Ghats	Balachandran *et al.*, (2012)
		Suphisellus sp.	Assam	Gogoi and Gupta (2017)
	Ptilodactylidae	*Stenocolus sp.*	Central Western Ghats	Balachandran *et al.*, (2012)
	Psephenidae	*Ectopria sp.*	Southern Western Ghats	Kubendran and Ramesh (2016)
		Eubranax sp.	Rajasthan, Central Western Ghats	Srivastava (2018), Balachandran *et al.*, (2012)
	Scirtidae	*Scrites nigropunctatus*	Karnataka, Manipur	Vasantkumar and Roopa (2014), Devi *et al.*, (2016)
Hemiptera	Aphididae	*Rhopalosiphum Nymphaeae*	Assam	Boruah and Gupta (2016)
	Aradidae	*Notapictinus aurivilli*	Assam	Barman and Gupta (2015)
	Belostomatidae	*Abedus lutarium, Belostoma sp.*	West Bengal, Andhra Pradesh, Karnataka, Telangana	Bera (2019), Amaravathi *et al.*,(2018), Vasantkumar and Roopa (2014), Rao *et al.*, (2020)
		Diplonychus annulatum, Diplonychus rusticus, Diplonychus indicus, Diplonychus sp., Diplonyhchus molestum	Uttar Pradesh, Assam,, Madhya Pradesh, West Bengal, Tamil Nadu, Hyderabad, Maharashtra, Manipur, Tripura, Chhattisgarh	Sharma and Agarwal (2012), Borkataki *et al.*, (2018), Ganie *et al.*,(2016), Borkataki *et al.*, (2018), Pahari et all., (2016), Vassou *et al.*,(2017), Jaiswal (2013), Kulkarni *et al.*,(2015), Mitra *et al.*, (2016), Jehalmalar and Chandra (2013), Majumder *et al.*, (2013), Takhelmayun and Gupta (2015)
		Lethocerus indicus, Lethocerus sp.	Assam, Uttar Pradesh, Madhya Pradesh, West Bengal, Tamil Nadu, Hyderabad, Tripura, Chhattisgarh	Borkataki *et al.*, (2018), Sharma and Agarwal (2012), Pahari *et al.*,(2016), Vassou *et al.*,(2017), Jaiswal (2013), Jehalmalar and Chandra (2013), Majumder *et al.*, (2013)
		Spherodema sp.	Andhra Pradesh, Telangana	Amaravathi *et al.*,(2018), Rao *et al.*, (2020)
	Corixidae	*Agrataptacorixa hyalinipennis, Arctocoxica sp.*	Maharashtra, Tamil Nadu	Kulkarni *et al.*,(2015), Ponraman *et al.*, (2016)
		Corixa lima, Corixa sp., *Corixa punctata*	Rajasthan, West Bengal, Maharashtra, Tamil Nadu, Tripura, Manipur	Srivastava (2018,) Bera (2019), Prabhakar and Choodamani (2018), Vassou *et al.*,(2017), Sharma (2015), Devi *et al.*, (2016), Takhelmayun and Gupta (2015)
		Corisella sp.	Karnataka	Vasantkumar and Roopa (2014)
		Lathrobium terminatum	Southern East Coast Of India	Balakrishnan *et al.*, (2014)
		Micronecta haliploides, Micronecta siva, Micronecta sp., Micronecta scutellaris, Micronecta punctata	Assam, Central Western Ghats, West Bengal, Hyderabad, Maharashtra, Andhra Pradesh, Telangana	Choudhuty and Gupta (2015), Boruah and Gupta (2016), Balachandran *et al.*, (2012), Gogoi and Gupta (2017), Pahari *et al.*, (2016) Barman and Baruah (2018), Jaiswal (2018), Kulkarni *et al.*,(2015), Amaravathi *et al.*,(2018), Rao *et al.*, (2020)
		Sigara alternate, Sigara pectoralis, Sigara striata	Madhya Pradesh, Rajasthan, Southern East Coast Of India	Ganie *et al.*,(2016), Srivastava (2018), Balakrishnan *et al.*, (2014)
		Trichocorixa verticalis	Southern East Coast Of India	Balakrishnan *et al.*, (2014)
	Gerridae	*Aquarias adelaidis, Aquarius conformis, Aquarius remigis*	Assam, Madhya Pradesh, Tamil Nadu,	Gogoi and Gupta (2017), Ganie *et al.*, (2016), Vassou *et al.*, (2017), Barman and Deka

			Telangana, Chhattisgarh, West Bengal	(2015), Rao *et al.,* (2020), Mitra *et al.,* (2016), Jehalmalar and Chandra (2013)
		Cylindrostethus sp., *Cylindrostethus productus, Rhagadotarsus sp.*	Assam, Andhra Pradesh, Chhattisgarh	Gogoi and Gupta (2017), Amaravathi *et al.*,(2018), Jehalmalar and Chandra (2013)
		Halobates micans, Halobates germanus, Halobates flaviventris, Halobates sp.	Southeast Coast Of India, Andhra Pradesh, Telangana, West Bengal	Balakrishnan *et al.,* (2014), Amaravathi *et al.*,(2018), Mitra *et al.,* (2016), Rao *et al.,* (2020)
		Gerris adelaidis, Gerris sp., Gerris gracilicornis, Gerris gibbifer, Gerris lepcha, Gerris lacustris, Gerris marginatus, Gerris spinolae, Gerris remigis	Southern Western Ghats, Assam Rajasthan Uttar Pradesh, West Bengal, Maharashtra, Andhra Pradesh, Karnataka, Manipur, Telangana	Kubendran and Ramesh (2016), Gogoi and Gupta (2017), Rukasana and Srivastava (2017), Sharma and Agarwal(2012), Bera (2019), Hasan *et al.,* (2016), Prabhakar and Choodamani (2018), Saha and Gupta (2015), Amaravathi *et al.*,(2018), Vasantkumar and Roopa (2014), Takhelmayun and Gupta (2015)
		Limnogonus nitidus, Limnogonus sp., Limnogonus fossarum	Assam, Maharashtra, Tamil Nadu, Hyderabad, West Bengal, Chhattisgarh	Choudhuty and Gupta (2015), Prabhakar and Choodamani (2018), Vassou *et al.*,(2017), Jaiswal (2013), Jehalmalar and Chandra (2013)
		Limnometra sp., Limnometra fluviorum	Assam, Rajasthan, Hyderabad, Chhattisgarh	Gupta *et al.,* (2013) Srivastava (2018), Jaiswal (2013), Jehalmalar and Chandra (2013)
		Metrocoris nigrofascioides, Metrocoris communis, Neogerris sp., Neogerris parvula, Ovatametra gualeguay, Pleciobates expositus, Ptilomera assamensis, Ptilomera agroides	West Bengal, Chhattisgarh	Barman and Gupta (2015), Choudhuty and Gupta (2015), Saha and Gupta (2015), Mitra *et al.,* (2016), Jehalmalar and Chandra (2013)
		Trapobates sp., Rhyacobates sp.	Tamil Nadu, Maharashtra	Ramar *et al.*,(2018), Kulkarni *et al.*,(2015)
	Helotrephidae	*Nanotrephes sp., Helotrephes sp.*	Telangana	Rao *et al.,* (2020)
	Hydrometridae	*Hydrometraustralis sp., Hydrmetra buleri, Hydrometra vittata, Hydrometra martini, Hydrometra sp., Hydrometra greeni*	Uttar Pradesh, Madhya Pradesh, West Bengal, Assam, Tamil Nadu, Maharashtra, West Bengal, Tripura, Chhattisgarh	Sharma and Agarwal (2012), Ganie *et al.*,(2016), Bera (2019), Hasan *et al.*,(2016), Ramar *et al.*,(2018), Prabhakar and Choodamani (2018), Barman and Deka (2015), Jehalmalar and Chandra (2013), Majumder *et al.,* (2013), Mitra *et al.,* (2016)
	Mesoveliidae	*Mesovelia* sp., *Mesovelia mulsanti, Mesovelia vittigera*	Assam, West Bengal, Tripura	Boruah and Gupta (2016), Choudhuty and Gupta (2015), Barman and Gupta (2015)
	Naucoridae	*Naucoris sp.*	Central Western Ghats, Telangana	Balachandran *et al.,* (2012), Rao *et al.,* (2020)
		Pelocoris sp.	Madhya Pradesh	Ganie *et al.*,(2016)
	Nepidae	*Curicta sp., Cercotmetus fumosus*	Assam, Chhattisgarh	Das and Biswas (2018), Jehalmalar and Chandra (2013)
		Hesperocorixa sp., Laccotrephes sp., Laccotrephes griseus, Laccotrephes elongates, Laccotrepes maculates, Laccotrephes ruber	Assam, Uttar Pradesh, Rajasthan, West Bengal, Maharashtra, Hyderabad, Andhra Pradesh, Telangana, Tripura, Tamil Nadu, Madhya Pradesh	Borkataki *et al.,* (2018) Sharma and Agarwal(2012) Srivastava (2018), Pahari *et al.*, (2016), Prabhakar and Choodamani (2018), Jaiswal (2013), Amaravathi *et al.*,(2018), Jehalmalar and Chandra (2013), Ponraman *et al.,* (2013), Rao *et al.,* (2020), Majumder *et al.,* (2013), Choudhary and Ahi (2015b)
		Nepa cineria,	Rajasthan, Tamil	Srivastava (2018), Vassou *et*

		Nepa sp.	Nadu, Andhra Pradesh	*al.*,(2017), Amaravathi *et al.*,(2018)
		Ranatra elongate, Ranatra digitata, Ranatra filliformis, Ranatra gracilis, Ranatra longipes longipes, Ranatra varipes, Ranatra sp.	Uttar Pradesh, Assam, West Bengal, Tamil Nadu, Maharashtra, Hyderabad, Andhra Pradesh, Telangana, Tripura, Chhattisgarh, Manipur, Madhya pradesh	Sharma and Agarwal (2012), Choudhuty and Gupta (2015), Boruah and Gupta (2016), Pahari *et al.*, (2016), Ramar *et al.*, (2018), Prabhakar and Choodamani (2018), Saha and Gupta (2015), Jaiswal (2013), Amaravathi *et al.*, (2018), Rao *et al.*, (2020), Majumder *et al.*, (2013), Jehalmalar and Chandra (2013), Mitra *et al.*, (2016), Takhelmayun and Gupta (2015), Choudhary and Ahi (2015b)
	Notonectidae	*Anisops sp., Anisops bouvieri, Anisops breddini, Anisops sardea, Anisops barbatatus, Anisops cavifrons*	Assam, West Bengal, Uttar Pradesh, Tamil Nadu, Hyderabad, Maharashtra, Manipur,	Boruah and Gupta (2016) Choudhuty and Gupta (2015), Pahari *et al.*,(2016) Sharma and Agarwal(2012), Ramar *et al.*, (2018), Purkayastha and Gupta (2013), Jaiswal (2013), Kulkarni *et al.*, (2015), Jehalmalar and Chandra (2013), Takhelmayun and Gupta (2015)
		Aphelonecta sp.	Assam	Choudhuty and Gupta (2015)
		Enithares sp., Enithares fusca, Enithares mandalayensis, Enithares ciliate	Assam, Maharashtra, West Bengal	Borkataki *et al.*, (2018), Saha And Guta (2015), Purkayastha and Gupta (2012), Kulkarni *et al.*, (2015), Saha *et al.*, (2020)
		Notonecta glauca, Notonecta undulate, Notonecta irrorata, Notonecta sp.	Rajasthan, Madhya Pradesh, Tamil Nadu, Maharashtra, Karnataka, Tripura	Srivastava (2018), Rukasana and Srivastava (2015), Ganie *et al.*,(2016), Ramar *et al.*,(2018), Prabhakar and Choodamani (2018), Vasantkumar and Roopa (2014), Majumder *et al.*, (2013),
		Nychia marshalli, Nychia sappho, Walambianisops	Assam	Hasan *et al.*, (2016), Saha and Gupta (2015)
	Pleidae	*Neoplea sp., Neoplea striola, Paraplea frontalis, Paraplea liturata, Plea frontalis, Plea liturata, Plea palluta*	Assam, Uttar Pradesh, Rajasthan, West Bengal, Assam, Tamil Nadu, Maharashtra, Andhra Pradesh, Manipur, Telangana	Choudhury and Gupta (2015), Sharma and Agarwal (2012), Srivastava (2018), Pahari *et al.*,(2016), Hasan *et al.*,(2016), Vassou *et al.*,(2017), Kulkarni *et al.*,(2015), Amaravathi *et al.*,(2018), Saha *et al.*, (2020), Rao *et al.*, (2020)
	Veliidae	*Baptista sp.*, *Microvelia sp., Microvelia diluta, Microvelia austrina, Microvelia douglasi, Microvellia annandalei, Pseudovelia sp., Rhagovelia obese*	Assam, Madhya Pradesh, Rajasthan, Tamil Nadu, Maharashtra, Andhra Pradesh, West Bengal	Gogoi and Gupta (2017), Ganie *et al.*,(2016), Srivastava (2018), Ramar *et al.*,(2018), Saha and Gupta(2015), Kulkarni *et al.*,(2015), Barman and Gupta (2015), Amaravathi *et al.*,(2018), Saha *et al.*, (2020)
Odonata	Aeshnidae	*Anax imperator, Anax guttatus, Aeshna fabricius, Aeshna juncea*	West Bengal, Rajasthan, Maharashtra, Karnataka, Assam, Manipur, Tamil Nadu	Pahari *et al.*, (2016), Kohli *et al.*, (2014), Prabhakar and Choodamani (2018), Barman and Boruah (2016), Harisha and Hosetti (2017), Devi *et al.*, (2016), Ponraman *et al.*, (2016),
		Cephalaeschna sp., Gynacantha dravida, Gynacantha bayadera	Tamil Nadu Assam, Karnataka	Borkataki *et al.*, (2018), Ramar *et al.*,(2018), Harisha and Hosetti (2017)
	Chlorocyphidae	*Libellago lineate, Rhinocypha bisignata*	Rajasthan	Kohli *et al.*, (2014)
	Caloptergidae	*Neurobasis chinesis chinesis*	Manipur	Takhelmayun and Gupta (2015)

	Coenagrionidae	*Aciagrion hisopa*, *Aciagrion occidentale*	Assam, Rajasthan	Borkataki *et al.*, (2018), Kohli *et al.*, (2014)
		Agriocnemis femina, *Agriocnemis pieris*, *Agriocnemis pygmaea*	Assam, Uttar Pradesh, Rajasthan, Maharashtra, Karnataka, Tamil Nadu, Tripura	Borkataki *et al.*, (2018), Sharma and Agarwal (2012), Bishnoi and Dang (2019), Kohli *et al.*, (2014), Kulkarni *et al.*,(2015), Harisha and Hosetti (2017), Majumder *et al.*, (2013)
		Amphiallagma parvum	Rajasthan	Kohli *et al.*, (2014)
		Cercion malayanum, *Cercion sp.*	Rajasthan, Andhra Pradesh	Kohli *et al.*, (2014), Amaravathi *et al.*,(2018)
		Ceriagrion calamineum, *Ceriagrion coromandelianum, Ceriagrion olivaceum, Ceriagrion rubiae*, *Coenagrion* sp.	Assam, Southern Western Ghats, Rajasthan, Andhra Pradesh, Karnataka, Manipur	Borkataki *et al.*, (2018) Kubendran and Ramesh (2016), Bishnoi and Dang (2019), Kohli *et al.*, (2014), Amaravathi *et al.*,(2018), Harisha and Hosetti (2017), Takhelmayun and Gupta (2015)
		Enallagma sp., *Enallagma parvum*	Madhya Pradesh, West Bengal, Assam	Ganie *et al.*, (2016), Pahari *et al.*, (2016),Purkayastha and Gupta(2012)
		Ischnura aurora, *Ischnura elegans, Ischnura forcipata*, *Ischnura senegalensis*, *Ischnura verticalis*	Assam, Uttar Pradesh, Madhya Pradesh, West Bengal, Rajasthan, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Tripura, Telangana, Manipur	Borkataki *et al.*, (2018), Sharma and Agarwal(2012), Ganie *et al.*, (2016), Pahari *et al.*, (2016), Kohli *et al.*, (2014), Prabhakar and Choodamani (2018), Amaravathi *et al.*,(2018), Harisha and Hosetti (2017), Takhelmayun and Gupta (2015), Rao *et al.*, (2020), Majumder *et al.*, (2013), Ponraman *et al.*, (2016)
		Pseudagrion sp., Pseudagrion australasiae, *Pseudagrion decorum*, *Pseudagrion hypermelas*, *Pseudagrion malabaricum*, *Pseudagrion rubriceps*, *Pseudogrion microcephalum, Onychargia atrocyana*	Assam, Rajasthan, West Bengal, Karnataka, Manipur	Boruah and Gupta (2016), Bishnoi and Dang (2019), Pahari *et al.*, (2016), Kohli *et al.*, (2014), Barman and Baruah(2018), Harisha and Hosetti (2017), Takhelmayun and Gupta (2015)
		Rhodischnura nursei	Rajasthan	Kohli *et al.*, (2014)
	Corduliidae	*Somatochlora sp.*, *Epitheca sp.*	Telangana	Rao *et al.*, (2020)
	Euphaeidae	*Euphaea sp.*	Central western Ghats	Balachandran *et al.*, (2012)
	Gomphidae	*Erpetogomphus sp.*, *Heliogomphus sp.*, *Ictinogomphus rapax*, *Lamelligomphus sp.*, *Mesogomphus lineatus, Melligomphus sp. Paragomphus lineatus, Paragomphus sp.*	Assam Central western Ghats, Rajasthan Uttar Pradesh, Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka, Telangana	Barman and Gupta (2015), Balachandran *et al.*, (2012), Kohli *et al.*, (2014), Sharma and Agarwal (2012), Kulkarni *et al.*,(2015), Selvarasu *et al.*,(2019), Amaravathi *et al.*,(2018), Harisha and Hosetti (2017), Rao *et al.*, (2020)
	Lestidae	*Lestes sp.* *Lestes viridulus*, *Lestes elatus*	Rajasthan, Assam, Karnataka	Kohli *et al.*, (2014), Das and Biswas (2018), Harisha and Hosetti (2017)
	Libellulidae	*Acisoma panorpoides*, *Aethriamanta brevipennis*	Assam, Rajasthan, Maharashtra, Karnataka	Borkataki *et al.*, (2018), Bishnoi and Dang (2019), Kulkarni *et al.*,(2015), Amaravathi *et al.*,(2018), Harisha and Hosetti (2017)
		Brachydiplax chalybea, *Brachythemis contaminate*, *Brechmorphoga mendax, Bradinopyga geminate*	Assam, West Bengal, Rajasthan, Maharashtra, Karnataka,	Borkataki *et al.*, (2018), Pahari *et al.*, (2016), Bishnoi and Dang (2019), Kohli *et al.*, (2014), Kulkarni *et al.*,(2015) Amaravathi *et al.*,(2018), Harisha and Hosetti (2017),
		Crocothemis erythraea, *Crocothemis servilia servilia*,	Assam, Rajasthan, Maharashtra, Andhra	Borkataki *et al.*, (2018), Bishnoi and Dang (2019),

			Pradesh, Jammu and Kashmir, Manipur, Tamil Nadu	Kohli *et al.*, (2014), Kulkarni *et al.*,(2015), Amaravathi *et al.*,(2018), Maqbool and Kant (2015), Takhelmayun and Gupta (2015), Ponraman *et al.*, (2016)
		Diplacodes nebulosa, *Diplacodes trivialis*, *Diplocodes lefebvrii*, *Indothemis carnatica*	Assam, Rajasthan, Maharastra, Karnataka, Tripura, Tamil Nadu	Borkataki *et al.*, (2018), Bishnoi And Dang (2019), Kohli *et al.*, (2014), Kulkarni et al.(2015), Harisha and Hosetti (2017), Ponraman *et al.*, (2016)
		Hydrobasileus sp., *Leucorrhinia sp.* *Nannophya sp.*	Andhra Pradesh,Assam, Manipur, Telangana	Amaravathi *et al.*,(2018), Boruah and Gupta (2016), Takhelmayun and Gupta (2015), Rao *et al.*, (2020)
		Libellula sp., *Libellula quadrimaculata*	Assam Madhya Pradesh	Gupta *et al.*, (2013) Ganie *et al.*, (2016)
		Neurothemis fulvia, *Neurothemis tullia*	Assam, Karnataka	Borkataki *et al.*, (2018) Harisha and Hosetti (2017
		Orthetrum brunneum, *Orthetrum chrysis*, *Orthetrum glaucum*, *Orthetrum luzonicum*, *Orthetrum pruinosum*, *Orthetrum sabina*, *Orthetrum taeniolatum*	Assam, Rajasthan, Maharashtra, Tamil Nadu, Jammu and Kashmir, Karnataka, Manipur, Tripura	Borkataki *et al.*, (2018), Kohli *et al.*, (2014), Prabhakar and Choodamani (2018), Selvarasu *et al.*,(2019), Maqbool and Kant (2015), Harisha and Hosetti (2017), Takhelmayun and Gupta (2015), Majumder *et al.*, (2013)
		Pantala flavescens, *Pantala servilia*, *Pantella sp.*, *Palpopluera sexmaculata*,	Assam, Rajasthan, Maharashtra, Karnataka, Tamil Nadu, Tripura, Manipur	Borkataki *et al.*, (2018), Kohli *et al.*, (2014), Prabhakar and Choodamani (2018), Harisha and Hosetti (2017), Takhelmayun and Gupta (2015), Majumder *et al.*, (2013), Ponraman *et al.*, (2016)
		Potamarcha obscura, *Potamarcha sp.*	Uttar Pradesh, Manipur	Sharma and Agarwal (2012), Takhelmayun and Gupta (2015)
		Rhyothemis variegate	Rajasthan, Assam	Kohli *et al.*, (2014), Borkataki *et al.*, (2018)
		Rhodothemis sp. Rhodothemis rufa	Assam, Jammu and Kashmir	Maqbool and Kant (2015), Takhelmayun and Gupta (2015)
		Sympetrum sp., *Sympetrum meridionale*	Assam, Rajasthan, Manipur	Gupta *et al.*,*(2013)*, Kohli *et al.*, (2014), Takhelmayun and Gupta (2015)
		Tramea basilaris, *Tramea limbata*, *Tramea sp*	Rajasthan, Maharashtra, Karnataka, Manipur	Kohli *et al.*, (2014), Kulkarni *et al.*,(2015), Harisha and Hosetti (2017), Takhelmayun and Gupta (2015)
		Trithemis aurora, *Trithemis -festiva*, *Trithemis kirbyi*, *Trithemis pallidinervis*, *Tholymis tillarga*	Rajasthan, Maharashtra, Karnataka	Bishnoi and Dang (2019), Kohli *et al.*, (2014), Kulkarni *et al.*, (2015), Harisha and Hosetti (2017)
		Urothemis signata, *Urothemis sp.*	Assam, West Bengal, Andhra Pradesh, Telangana	Borkataki *et al.*, (2018), Pahari *et al.*, (2016), Amaravathi *et al.*,(2018), Rao *et al.*, (2020)
	Macromiidae	*Epophthalmia frontalis*, *Macromia ellisoni*	Rajasthan	Kohli *et al.*, (2014)
	Petaluridae	*Tachopteryx sp.*	Madhya Pradesh	Ganie *et al.*, (2016)
	Ptatycnemididae	*Calicnemia imitans*, *Coperam arginipes*, *Copera marginipes*, *Copera vittata*, *Disparoneura quadrimaculata*, *Prodasineura verticalis*	West Bengal, Rajasthan, Karnataka	Pahari *et al.*, (2016), Kohli *et al.*,(2014) Harisha and Hosetti (2017)
Lepidoptera	Pyralidae	*Petrophila* sp.	Southern Western Ghats	Kubendran and Ramesh (2016)
		Ostrinia sp.	Madhya Pradesh	Ganie *et al.*, (2016)
Collembola	Entomobryi-dae	*Entomobrya nivalis*	Assam	Barman and Gupta (2015)
	Sminthuridae	*Siminthurus sp.*	Assam	Boruah and Gupta (2016)

Megaloptera	Corydalidae	*Corydalus sp.*	Central Western Ghats, Andhra Pradesh, Telangana	Balachandran *et al.*, (2012), Amaravathi *et al.*,(2018), Rao *et al.*, (2020)
Hymenoptera	Formicidae	*Polyrhachis sokolova*	Assam	Hasan *et al.*, (2016)

Conclusion

Natural resource conservation and biodiversity have become critical issues in recent years to achieve an environmentally sustainable future. Zoologists reported the aquatic entomofauna diversity in their survey area which enables us to understand their significance at each trophic level of ecosystems. Consequently, an ecological study of aquatic insects can provide information about the ecology of insects in a specific area, which can be used as baseline data for future research and conservation planning. As, many taxa have historically been ruled out as possible indicators due to a lack of data thus, it is imperative to make continuous investigation, census and research activities on the taxonomy and biodiversity of aquatic ecosystem. Therefore, the present study was attempted to compile all available information on the status and diversity of aquatic entomofauna in India.

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Declaration of Interest

The authors declare that there is no conflict of interest.

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