



Study On Diversity And Abundance Of Aquatic Insects In Chorkund Lake Of Ghatanji Tahsil, Yavatmal District (M.S) India

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Abstract:

Aquatic insects are those which live a part of their life cycle in water. In addition to their significant ecosystem function aquatic insects are also a primary source of food for fishes and amphibians. Aquatic insects are found abundantly and exhibits high diversity in fresh water aquatic ecosystems. They serve as food item for the vertebrate and invertebrate predators and thus play a significant role in aquatic ecosystem. Insects responded well to a wide range of environmental disturbances and thus often are employed as proxies for water quality. The present study was carried out in Chorkund Lake situated in Ghatanji Tahsil of Yavatmal District Maharashtra. The present study was carried out to evaluate the diversity of aquatic insects for a period of one year from June-2023 to May-2024. aquatic insects are shown with their taxa, order, family and scientific name and common name. two sites were selected for the study i.e. vegetation site, agricultural site. A total 10 species of aquatic insects from 5 orders and 8 families were recorded during this study.

Keywords: Diversity, Aquatic Insects, Environment, Chorkund Lake, Ghatanji, Yavatmal District.

Introduction:

Aquatic insects are essential for improving the understanding of the roles of insects in water quality and biodiversity, as well as community structure and ecosystem functioning. Lakes, ponds and reservoirs, are crucial for maintaining the biological balance of flora and fauna. Aquatic insects have a high capacity for tolerance to environmental changes (Merritt et al., 2008). As a result, they can accurately predict any changes in water quality. Aquatic insects are a crucial component of many food cycles (Sharma et al., 2010).

Due to their contribution to energy and nutrient processing through food chains as well as their role in water purification, aquatic insects serve as a connecting link between aquatic and terrestrial ecosystems.

Aquatic Insect Communities:

As the most diverse and frequently the most abundant group of macro invertebrates that live on aquatic habitats, insects have effectively invaded almost all aquatic environments. Even though there are various habitats, the majority of aquatic insects are located in either lotic or lentic habitats. Lentic habitats, such as reservoirs, lakes, ponds, and different kinds of wetlands, provide a wide range of aquatic habitats that have been utilised by a variety of insects. Compared to profoundly sediments, littoral sections of reservoirs, ponds, and lakes are often better oxygenated, physically more complex, and provide more abundant and diverse Food supplies.

India is one of the mega diverse countries, with a notable diversity of aquatic

habitats of about 3,166,414 Km² with significant variations in rainfall, altitude topography and latitude. 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, of this about 5,000 species are estimated to inhabit inland wetlands of India (Amaravathi et al., 2018; Rao et al., 2020). Aquatic insects of inland wetlands comprise some well-known groups like mayflies (Ephemeroptera), dragonflies (Odonata) and caddiesflies (Trichoptera). Aquatic insects such as dragonflies and damselflies (Odonata) are very colourful and prominent insects of the wetlands. Different functional feeding groups of aquatic insects such as shredders, scrapers, filter feeders and predators are important links in nutrient recycling (Subramanian and Sivaramakrishnan, 2007; Collins, 2012). Aquatic insects primarily process wood and leaf litter reaching the wetland from the surrounding landscape. Nutrients processed by aquatic insects are further degraded into absorbable form by fungal and bacterial action. Plants in the riparian zone absorb this nutrient soup transported through the wetlands. In addition to this significant ecosystem function, aquatic insects are also a primary source of food for fishes and amphibians.

They are a major source of food for fish and other aquatic animals. They also help to break down organic matter and recycle nutrients in the water. Insects are the most diverse group of organisms in freshwater. Aquatic insects are those which live a part of their life cycle in water. They play important ecological roles in keeping freshwater ecosystems functioning properly (Choudhary and Janak, 2015). The origin of aquatic insects has been controversial and doubts still exist as to whether or not insects are primarily or secondarily adopted to aquatic environment. Widely accepted view

is that the ancestor of Myriapod-insect group (millipedes, centipedes and insects) lived in leaf litter areas along margins of pond like environment Primitive insects of this moist environment were ancestors of aquatic insects.

Evolution of Aquatic Insects:

The origin of aquatic insects has been controversial and doubts still exist as to whether or not insects are primarily or secondarily adapted to aquatic environments. The widely accepted view is that the ancestor of myriapod-insect group (millipedes, centipedes, and insects) lived in leaf litter areas along margins of pond like environment. Primitive insects of this moist environment were ancestors of aquatic insects (Sharma et al., 2020). Their fossil record extends to Devonian in the Paleozoic era. Among extend aquatic insects, dragonflies (Odonata) and mayflies (Ephemeroptera) are the most primitive and only insects with aquatic juveniles. The understanding of aquatic insect evolution and phylogeny has been hampered by poor fossil record of freshwater animals. Living aquatic insects represent 12 insect orders (Figure 1). Of this, larvae of species of mayflies (Ephemeroptera), dragonflies and damselflies (Odonata), stoneflies (Plecoptera), alderflies (Megaloptera), lacewings (Neuroptera), flies (Diptera), caddiesflies (Trichoptera), moths (Lepidoptera) and wasps (Hymenoptera) are aquatic with terrestrial adults Larval or nymphal and adult stages of aquatic beetles (Coleoptera) and bugs (Hemiptera) are fully aquatic (Subramanian and Sivaramakrishnan, 2007).

Material and Method:

Chorkund Reservoir situated in Ghatanji Tahsil of Yavatmal District Maharashtra. This Lake is built on and impounds a local Nallah. The study was conducted during the early hours of the day

from June-2023 to May-2024. Two sites were selected for the study i.e. vegetation site, agricultural site. A length of 100m reach was considered as a unit and the aquatic entomofauna were sampled using kick net which are of 500µm mesh size. The dip net was placed in between every site for collection. One meter above stream bottom substrates was kicked to dislodge invertebrates clinging to debris and stones

into the kick net. The contents were emptied into the tray and invertebrates were collected. The kick net was employed to trap specimens clinging to vegetation, root mats etc., along the boundary (Merit and Cummins, 1988). The collected specimens were preserved in jars containing formalin and identified with the help of identification keys.



Fig. 1: Chorkund Lake

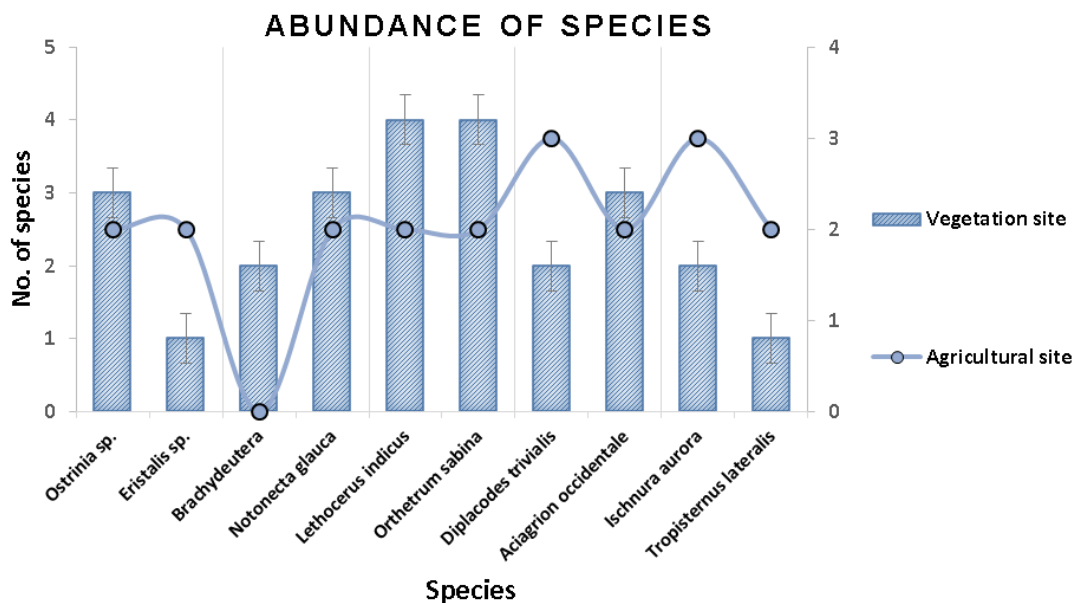
Observation and Result:

Table. 1 list of aquatic insects recorded from study area during study period.

Sr. No	Order	Family	Scientific Name	Common Name
1	Lepidoptera	Pyrilidae	<i>Ostrinia</i>	Aquatic moth
2	Diptera	Syrphidae	<i>Eristalis</i>	Rat tailed maggots
3		Ephidridae	<i>Brachydeutera</i>	Shore flies
4		Notonectidae	<i>Notonecta glauca</i>	Back swimmer
5	Hemiptera	Belostomidae	<i>Lethocerus indicus</i>	Giant water bug
6	Odonata	Libellulidae	<i>Orthetrum sabina</i>	Slender Skimmer
7			<i>Diplacodes trivialis</i>	Ground Skimmer
8		Coenagrionidae	<i>Aciagrion occidentale</i>	Green striped slender dartlet
9			<i>Ischnura aurora</i>	Golden Dartlet
10	Coleoptera	Hydrophilidae	<i>Tropisternus lateralis</i>	Hydrophilid beetle

Table.2 Abundance of recorded species at at different selected sites of Chorkund Reservoir.

Sr. No.	Scientific Name	Vegetation rich site	Agricultural site
1	<i>Ostrinia sp.</i>	3	2
2	<i>Eristalis sp.</i>	1	2
3	<i>Brachydeutera</i>	2	0
4	<i>Notonecta glauca</i>	3	2
5	<i>Lethocerus indicus</i>	4	2
6	<i>Orthetrum sabina</i>	4	2
7	<i>Diplacodes trivialis</i>	2	3
8	<i>Aciagrion occidentale</i>	3	2
9	<i>Ischnura aurora</i>	2	3
10	<i>Tropisternus lateralis</i>	1	2
Total Abundance		25	20



Overall study reveals that the vegetation site is more favourable habitat for aquatic insect rather than the agriculture site. A total 10 species of aquatic insects from 5 orders and 8 families were recorded during this study. Above graph indicates that the *Lethocerus indicus* and *Orthetrum sabina* species is most abundant and *Brachydeutera* species is least abundant and other species shows moderate abundance.

Discussion and Conclusion:

In aquatic eco-systems, insects play a key role in the energy transfer from microbial to vertebrate populations as well

as between aquatic and terrestrial eco-systems. Many aquatic insect species are extremely vulnerable to pollution and other environmental hazards. Aquatic environments, which contain a number of biotic and abiotic elements, are associated to insect abundance and diversity. The freshwater biome is enriched with a variety of animals, and plants can flourish there. The total of 10 species from the five orders and 8 families of aquatic insects found during this study.

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