

Aquatic Insect Diversity of Kinhi Lake of Chandrapur District (MS), India

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Abstract: *Aquatic insects play important roles in keeping freshwater ecosystems functioning properly. Just about anywhere you go on the planet; there is some kind of insect that will live in almost any place that stays wet for a week or so. Freshwater lakes are integral part of urban ecosystem and provide numerous benefits to human beings directly or indirectly.*

This study was aimed to study the diversity of aquatic insects of Kinhi lake near Sindewahi of Chandrapur district. The aquatic insects were collected from the lake during June 2025 to May 2026. During the study, 14 species of aquatic insect belonging to 5 orders and 14 families were found, with the highest number of aquatic insects from the order Hemiptera and Diptera, 5 each.

Keywords: Kinhi lake, Aquatic insect, Diversity, Check list.

I. INTRODUCTION

Fresh water ecosystem plays very crucial role in ecology and it maintain ecological balance of flora and fauna on the earth. Aquatic insects are among the most diverse groups of animals of especially in the fresh water ecosystem. Aquatic and terrestrial food chains both include aquatic insects as essential components. Due to their involvement in the energy and nutrient cycling through food chains and webs as well as their role in water purification, aquatic insects serve as the link between the aquatic and terrestrial ecology. Insects constitutes about 70% of all known species of animals are insects. Although they are mainly land animal, they are widespread and adapted to all types of environments. They are also the only invertebrates that can fly (Voshell, 2002). Most insects feed on plant materials, while some feed on animal tissues and wastes. Aquatic insects contribute significantly to fresh water ecosystems, one of many groups of organisms that, together, must be considered in the study of aquatic ecology. As such their study may be a significant part of understanding the ecological state of a given ecosystem and in gauging how that ecosystem will respond to stress.

Aquatic adversely affect the diversity, distribution and insects are extremely important in ecological systems for composition of aquatic insects (Foil, L.D., 1998). They serve various purposes such as food of literature review suggested that this is the first study on fishes and other invertebrates, as vectors of pathogens to the quantitative assessment of aquatic insect diversity of both humans and animals.

Aquatic insects and other bottom-dwelling organisms in freshwater systems are also monitored in order to gauge subtle and profound effects that changes in water quality have on aquatic life. Many species of aquatic insects are very susceptible to pollution or alteration of their habitat. In fact, aquatic insects are the group of living things used most commonly for monitoring the health of aquatic environments. The aquatic insects also reside in surface, column and bottom zone of fresh water lakes.

II. MATERIAL AND METHODS

The Kinhi lake is freshwater body situated in Kinhi village near Sindewahi of Chandrapur district and around 68 km from the district headquarters. The area of this lake is spread over near about 83.64 acre. It is situated at about 246 m. above mean sea level and is at 20.2634° N Latitude and 79.6529° E Longitude. The water of this lake is primary used for washing, bathing and fishing activities.



Aquatic insect organisms were seen floating on the surface which were collected with the help of forceps and net. All the organisms were preserved in 5% formalin. The identification is done using standard literature viz. Pennak, R.W. (1978), Tonapi, G.T. (1980), Vazirani, T.G. (1984) and Thirumalai, G. and Radhakrishna, C. (1998).

III. RESULT AND DISCUSSION

In the present investigation total 14 species of aquatic insect have been recorded belonging to 5 orders and 14 families. The order Hemiptera and Diptera consist of 5 species each and shows dominancy and rest orders i.e., Odonata consist of 2 species and order Ephemeroptera and Coleoptera consist of 1 species each and there are about 14 families which consist of 1 species each viz., Ephemerelloidae, Libellulidae, Coenagrionidae, Gerridae, Belostomatidae, Nepidae, Corixidae, Notonectidae, Culicidae, Tipulidae, Chironomidae, Syrphidae, Chironomidae and Dytiscidae. Presence or absence of littoral vegetation and depth found to be important factors and that is affecting in the distribution of aquatic insects in the present studied water bodies.

Some recent works are those by Thirumalai (1999), Sarmistha Jana, Priti R. Pahari, Tapan Kr. Dutta and Tanmay Bhattacharya(2009) reported 20 species of aquatic insects from a weed infested pond in Midnapore town, West Bengal, Pinki Purkayastha and Susmita Gupta (2012) recorded 8 species of aquatic insect in two ponds of Chatla Wetland, Barak Vally, Assam, Jenila, G.J. and C.R. Radhakrishnan (2013) recorded the 25 species of aquatic insect from two permanent ponds of Kanyakumari district and Vasantkumar, B. and Roopa, S. V. (2014) reported 15 species of aquatic insect belonging to 6 orders in a pond of Karwar. Anamika, Vinod Kumari, Shashi Meena, Rakesh Kumar Lata (2021) reported 54 species of aquatic entomofauna in India. Pratiksha. S. Bhandare, Sandhya M. Pawar, Suresh A. Khabade and Parashuram B. Teli (2022) recorded 16 species of aquatic insects belonging to 16 genera and 11 families distributed in 6 different orders namely Odonata, Hemiptera, Coleoptera, Orthoptera, Dermaptera and Trichoptera in Pazar Lake, Taluka-Palus, Dist. Sangli (Ms), India. S. M. Mandape and R. R. Kamdi (2022) reported 25 species of aquatic insect belonging to 5 different orders were recorded. At order level highest species of Hemiptera (7) were recorded Similarly, Coleoptera (5), Odonata (6), Diptera (4), Ephemeroptera (3) aquatic insect species was found in selected Wainganga River Basin Areas Of Pauni, District Bhandara, (M.S.). Vivek Hanmantrao Thaware (2023) recorded 11 species of aquatic insect belonging 11 families and four orders at Karadkhed Dam in Nanded, Maharashtra. Tekade, R. S. and Telkhade, P. M. (2024) reported 28 species of aquatic insects from 5 orders and 18 families in Tamasi lake, Tahsil- Bhadravati, Dist- Chandrapur (M.S) India.

It has been found that the littoral fauna is mainly associated with weeds such as *Ceratophyllum* spp., *Hydrilla* spp. and *Nelumbo* spp. and is predominated by macroinvertebrates and aquatic insects. The aquatic insects successfully occupied the various ecological niches, in the area of the most productive aquatic habitat the littoral zone. The aquatic coleopteran, predominantly, the predaceous diving beetle, Whirling beetles and aquatic hemipterans, Giant Water bug, Water scorpion were found in the littoral zone clinging to aquatic vegetation. Water scorpion and Water strider were found on floating and emergent weeds. Back swimmers are active predators acting as biological control of mosquito larvae while Water boatman feeds on decaying organic vegetation found in benthic region of lakes. Dragonfly nymph was found clinging to the aquatic vegetation.

The dipteran larvae viz. chironomous were found in lake water in the region of organic pollution created by dead and decaying vegetation of macrophytes. They can be categorized as indicator species occurring in waters, receiving rich organic wastes. The presence of *Chironomus* spp. points towards presence of organic pollution in the lake sediments.

IV. CONCLUSION

The present paper describes the aquatic insect diversity of Kinhi lake near Sindewahi of Chandrapur in which 14 species were recorded. However, it was found that studies were not made on Kinhi lake with respect to aquatic insects of Chandrapur region. This work has therefore undertaken of document and prepares the checklist of aquatic insect diversity of Kinhi lake near Chandrapur. The check list generated in the study is intended to support other research in wetlands and in particular, to assure the continuity of ongoing long term ecological programmed.



REFERENCES

1. Anamika, Vinod Kumari, Shashi Meena and Rakesh Kumar Lata (2021) Diversity and distribution of aquatic entomofauna in India. *International Journal of Entomology Research*. Vol. 6(6): 180-193
2. Bauernfeind, E. and O. Moog (2000) Mayflies (Insecta: Ephemeroptera) and the assessment of ecological integrity: A Methodological Approach. *Hydrobiol.* Vol. 135: 155-165.
3. Chae, S. J., N. Purstela, E. Johnson, E. Derock, S. P. Lawler and J.E. Madigan (2000) Infection of aquatic insects with trematode metacercariae carrying; *Ehrlichia risticii*, the case of the Potomac house fever. *J. Med. Entomol.* Vol. 37: 619-625.
4. Foil, L. D. (1998) Tabanids as vectors of disease agents. *Parasitol.* Vol. 5: 88-96.
5. Jenila, G.J. and C.R. Radhakrishnan (2013) Biodiversity of aquatic insect population in two permanent ponds of Kanyakumari District. *IJFBS*. Vol. 1 (2): 8-12.
6. Merritt, R.W., K.W. Cummins and M. B. Berg (2008) An introduction to the aquatic insect of North America. Vol.4: 11-58.
7. Pennak, R.W. (1978) Freshwater invertebrates of United states., John. Wiley and Sons, New York.
8. Pennak, R.W. (1989) Fresh-Water Invertebrates of the United States: Protozoa to Mollusca. 3rd Edn., John Wiley and Sons Inc., New York.
9. Pinki Purkayastha and Susmita Gupta (2012) Insect diversity and water quality parameters of two ponds of Chatla Wetland, Barak Valley, Assam. *Current World Environment*. Vol. 7(2): 243-250.
10. Pratiksha. S. Bhandare, Sandhya M. Pawar, Suresh A. Khabade and Parashuram B. Teli (2022) Freshwater aquatic insect diversity of Ingale Pazar Lake, Taluka-Palus, Dist. Sangli (Ms), India. *J.Bio.Innov.* Vol. 11(1): 150-156, 2022
11. S. M. Mandape and R. R. Kamdi (2022) Diversity of aquatic insect as a bioindicator with water quality parameters of selected Wainganga River basin areas of Pauni, District Bhandara, (M.S.). *JRBAT*. Vol. 2(10): 80-86
12. Sarmistha Jana, Priti R. Pahari, Tapan Kr. Dutta and Tanmay Bhattacharya (2009) Diversity and community structure of aquatic insects in a pond in Midnapore town, West Bengal, India. *J. Environ. Biol.* Vol. 30(2):283-287.
13. Tekade, R. S. and Telkhade, P. M. (2024) Studies on diversity of aquatic insects in Tamasi lake, Tahsil-Bhadravati, Dist- Chandrapur (M.S) India. *Environment Conservation Journal*. Vol. 25(1): 156-159.
14. Thirumalai, G. (1999) Aquatic and semi aquatic heteroptera of India., IAAB, Publication 7, Hyderabad (A.P.). pp 24.
15. Thirumalai, G. and Radhakrishna, C. (1998) Aquatic Hemiptera (Insecta of Kasargod District, Kerala State). *Rec. Zool. Surv. of India*. Vol. 97: 1 - 98.
16. Tonapi, G.T. (1980) Fresh water animals of India. An ecological approach, Oxford IBH. Publishing Co Ltd., New Delhi. pp 319.
17. Vasantkumar, B. and Roopa, S. V. (2014) Physico-chemical and aquatic insects diversity of pond ecosystem in Karwar, India. *Int. J. of Life Sciences* Vol. 2(2): 148-154.
18. Vazirani, T.G. (1984) Coleoptera, Family : Gyrinidae and Family -Halipidae. *Fauna of India. Z.S.I. Culcutta*. Vol.14: 01-140.
19. Vivek Hanmantrao Thaware (2023) Study of aquatic insects, their role in improving biodiversity and balancing the food web of a freshwater ecosystem at Karadkhed Dam in Nanded, Maharashtra. *JEZS*. Vol. 11(1): 173-176.
20. Voshell Jr, J.R., (2002) A Guide to Common Freshwater Invertebrates of North America. McDonald and Woodward Publishing Co., Blacksburg, Virginia. pp 442.



Table 1. Aquatic insect diversity of Kinh lake near Chandrapur during June 2025 to May 2026.

Sr. No.	Insect	Order	Family
1	Mayfly	Ephemeroptera	<i>Ephemerelloidae</i>
2	Dragonfly	Odonata	<i>Libellulidae</i>
3	Damselfly	Odonata	<i>Coenagrionidae</i>
4	Water Strider	Hemiptera	<i>Gerridae</i>
5	Giant Water Bug	Hemiptera	<i>Belostomatidae</i>
6	Water Scorpion	Hemiptera	<i>Nepidae</i>
7	Water Boatman	Hemiptera	<i>Corixidae</i>
8	Backswimmer	Hemiptera	<i>Notonectidae</i>
9	Mosquito larvae	Diptera	<i>Culicidae</i>
10	Crane fly	Diptera	<i>Tipulidae</i>
11	Midges	Diptera	<i>Chironomidae</i>
12	Maggots (Rat-tailed Maggot)	Diptera	<i>Syrphidae</i>
13	Chironomus larvae	Diptera	<i>Chironomidae</i>
14	Predaceous Diving Beetle	Coleoptera	<i>Dytiscidae</i>



Fig. Satellite image of Kinh lake

