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Diversity in Larvae of Aquatic Insects at Chittaura Jheel of District Bahraich (U.P.), India

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Abstract

Diversity in larvae of aquatic insects at Chittaura Jheel of district Bahraich (U.P.), India was studied during January 2019 to December 2019. Fourteen genera of larvae of aquatic insects were collected. In class Insecta two order belonging to nine families having fourteen genera of larvae of aquatic insects, namely: Order - Diptera: Chironomus larvae, Anopheles larvae, Culex larvae, Dixa larvae, Psychoda larvae, Ptychoptera larvae, Eristalis larvae and Tabanus larvae, Order - Coleoptera: Coptotomus larvae, Cybister larvae, Dytiscus larvae, Hydroporus larvae, Dineutes larvae and Gyrinus larvae were identified and recorded in Chittaura Jheel .

In Chittaura Jheel Dipteran larvae of aquatic insects have been found to be dominant among larvae of aquatic insects and in water body generally present Chironomus larvae, Ptychoptera larvae and Eristalis larvae which indicate the polluted nature of Jheel water . Thus keeping in view the importance of the study steps should be necessarily taken for the conservation and maintenance of Chittaura Jheel.

Keywords: Chittaura Jheel, Freshwater body, larvae of aquatic insects and diversity.

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Introduction

All over the world about 45,000 species of insects are known to inhabit diverse freshwater ecosystem (Balram, 005). Aquatic insects constitute an important part of the aquatic ecosystem. These are involved in nutrient recycling and form an important elements of natural food web in aquatic ecosystem. Some are of medical importance as they help in biological control of mosquitoes and a number of aquatic insects are used as a food for fishes and as pollution indicator .

They are primary bio-indicator of freshwater bodies such as ponds, lakes, wetlands, streams and rivers due to their different environmental disturbances tolerant levels (Arimoro and Ikomi, 2008).

It is estimated that about 3% of total insects are aquatic spending at least a part of their life cycle in water and these comprise about 25,000 to 30,000 species (Cheng, 1976). Order -Coleoptera or beetles, family Hydrophylidae are water scanvengers beetles and generally occur in shallower regions of the wetland. With abundant macrophytes particularly emergent ones and feed mainly on detritus, algae and decaying vegetative matter (Khan and Ghosh, 2001). The ponds, lakes and other stagnant water are homes of two great groups of aquatic insects that is the surface hunters and divers. The odonate nymph uses the Anopheles larvae as food and control the mosquitoes population, which itself are responsible for spreading of the epidemic illness like malaria (Mitra, 2000). Information is also available on aquatic entomofauna studied by Tonapi (1980), Burton and Sivaramakrishnan(1993), Epler(1996), Bath and Kaur (1998), Vijay Kumar and Ramesh (2002), Thakur (2003), Jeelani et. al. (2005) Andrew et.al. (2008), Jana et.al (2009), Ganai et.al (2011). The present study was carried out with the objective to identify the diversity of larvae of aquatic insects (order - Diptera and Coleoptera) in freshwater body of chittaura Jheel of district Bahraich (U.P.), India .

Materials and Methods

Location of study area: The Chittaura Jheel of district - Bahraich is located 27.32574 latitude and 81.38628 longitude. It is an important, historical and natural Jheel in district - Bahraich of Uttar Pradesh. Chittaura Jheel is situated about 8 km from Bahraich city on Gonda road near Chittaura Village in district - Bahraich of Uttar Pradesh, India. A small river Tedhi nadi flows from this lake and total area of this Jheel is covered 1000 Acres. Many migratory birds are also found here during August-October (late monsoon period).

Chittaura Jheel is a hindu pilgrimage site, centred around a pond in Bahraich district of Uttar Pradesh, India. The site is believed to be the place where the fight between Raja Sukhdeo and Ghazi Saiyyad Salar Masud took place in June 1033. Ashtwarka Muni, the Guru of Maharaja Janak used to live here in his ashram. Every year, a fair is organized here on Basant Panchami. A temple is also situated here as well as a statue of Raja Sukhdeo (Map- 1, 2 & 3).

Sampling and Preservation: The present work was carried out for a period of one year from January 2019 to December 2019 for completion of exhaustive work and standard methods described for the purpose have been used, certain permissible modification and according to the local condition have also been incorporated. A short description of materials and method applied during the present investigation.

All the sample for larvae of aquatic insects of Chittaura Jheel were collected during the first week of each month between 8.30 AM to 11.00 AM . They were taken from different sampling station fixed up in littoral, pelagic and polluted region (Fig. 1) and were transported to the laboratory of P.G. Department of Zoology, M.L.K. P.G. College, Balrampur (U.P.), India at the earlier for qualitative and quantitative estimations.

Method:

Larvae of aquatic insects were randomly collected using Surber net with a size of 0.3 m × 0.3 m at several microhabitat at Chittaura Jheel intakes. The samples transferred in to a plastic zipper bag with 75% of ethanol as preservation and brought back to the laboratory for identification process.

Identification: Collected sample were examined under a stereo zoom microscope (Carl Zeiss, Stemi DV4) and identified using standard taxonomic literatures. Larvae of aquatic insects were identified up to the lowest taxonomic category using taxonomic keys for the particular group. Following keys are useful for identification: order-Diptera and Coleoptera (Fraser 1933-1936, Morse et. al. 1994 and Hoell et.al. , 1998).

Map 1: Location of study area in India.

Map 2: Location of study area in Uttar Pradesh

Map 3: Location of study area in District Bahraich (U.P.)

Fig 1: Chittaura Jheel

Results and Discussion

Aquatic insect plays an important role to preserve the good health of water body. They are probable indicator of aquatic ecosystem and their abundance and diversity provides information about the nature of water body. In the present investigation 14 genera of larvae of aquatic insects were collected. In class Insecta two order belonging to nine families having fourteen genera of larvae of aquatic insects, namely- Order -Diptera: Chironomus larvae (Chironomidae), Anopheles larvae(Culicidae), Culex larvae(Culicidae), Dixa larvae (Dixidae), Psychoda larvae (Psychodidae), Ptychoptera larvae (Ptychopteridae), Eristalis larvae (Syrphidae) and Tabanus larvae (Tabanidae), Order - Coleoptera: Coptotomus larvae (Dytiscidae), Cybister larvae (Dytiscidae), Dytiscus larvae (Dytiscidae), Hydroporus larvae (Dytiscidae), Dineutes larvae (Gyrinidae) and Gyrinus larvae (Gyrinidae) were identified and recorded in Chittaura Jheel. In Chittaura Jheel Dipteran larvae of aquatic insects have been found to be dominant among larvae of aquatic insects and in water body generally present Eristalis larvae, Ptychoptera larvae and Chironomus larvae which indicate the polluted nature of water body of Chittaura Jheel (Table: 1,2 & Fig:1).

Table : 1 - Larvae of aquatic insects population in freshwater body of Chittaura Jheel of district Bahraich (U.P.), India

(Data of January 2019 to December 2019)

S.No.	Genera	Order	Family	Class
1	Chironomus larvae	Diptera	Chironomidae	Insecta
2	Anopheles larvae	"	Culicidae	"
3	Culex larvae	"	Culicidae	"
4	Dixa larvae	"	Dixidae	"
5	Psychoda larvae	"	Psychodidae	"
6	Ptychoptera larvae	"	Ptychopteridae	"
7	Eristalis larvae	"	Syrphidae	"
8	Tabanus larvae	"	Tabanidae	"
9	Coptotomus larvae	Coleoptera	Dytiscidae	"
10	Cybister larvae	"	Dytiscidae	"
11	Dytiscus larvae	"	Dytiscidae	"
12	Hydroporus larvae	"	Dytiscidae	"
13	Dineutes larvae	"	Gyrinidae	"
14	Gyrinus larvae	"	Gyrinidae	"

Table: 2-Diversity in larvae of aquatic insects in freshwater body of Chittaura Jheel of district Bahraich (U.P.), India.

(Data of January 2019 to December 2019)

S.No.	Aquatic insects	Months											
	Genera	Jan	Feb.	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
	Order - Diptera												
1	Chironomus larvae	-	+	+	+	+	+	+	+	+	+	+	-
2	Anopheles larvae	-	+	+	+	+	+	+	+	-	+	+	-
3	Culex larvae	+	+	+	+	+	+	+	+	+	+	+	+
4	Dixa larvae	+	+	+	+	+	+	+	+	+	+	+	+
5	Psychoda larvae	+	+	+	+	+	+	+	+	+	+	+	+
6	Ptychoptera larvae	+	+	+	+	+	+	+	+	+	+	+	+
7	Eristalis larvae	-	+	+	+	+	+	+	+	+	+	+	+
8	Tabanus larvae	-	+	+	+	+	+	+	+	+	+	+	-
	Order - Coleoptera												
9	Coptotomus larvae	-	+	+	-	+	+	+	+	-	+	-	-
10	Cybister larvae	+	+	+	+	+	+	+	-	-	-	+	-
11	Dytiscus larvae	-	+	-	+	+	-	-	-	-	-	-	-
12	Hydroporus larvae	+	-	+	+	+	+	+	+	+	+	-	-
13	Dineutes larvae	-	+	-	+	+	-	+	+	+	+	+	-
14	Gyrinus larvae	-	+	+	-	-	-	-	-	+	-	+	-

Note : + = Present
- = Absent

Similar observations were reported by Majumder et. al. (2013) reported 31 species from urban freshwater lake of Tripura belonging to 23 genera, 15 families and 4 order, recorded the order hemiptera and odonata are dominant order. Choudhary and Gupta (2015) studied aquatic insects community of Deepor beel, Assam and reported 31 species belonging to 18 families of 5 orders and noticed that hemiptera is the dominant order representing 17 species and 8 families. Jeelani et.al. (2005) reported order-Coleoptera aquatic insects larvae in Dal lake of Kashmir, India and Ganai et.al.(2011) reported Diptera and Coleoptera aquatic insects in some derelict water bodies of Aligarh (U.P.), India. These type of findings are reported in present study. Jaiswal (2012) published a preliminary study on water beetles of Ameenpur lake, reported 26 species of aquatic beetles and distributed in 4 families represented by Gyrinidae, Dytiscidae, Hydrophilidae and Haliplidae. These type findings are reported in present study. Vass et.al. (1977) also investigated red Chironomus sp. as pollution detector in Dal lake. During present investigation Chironomus larvae is observed at water inlet site, where more amount of sewage water enters such site show water pollution. Anopheles larvae and Culex larvae noted from the small pot like holes and back water of present Chittaura Jheel. Our results are good in agreements with Vass et.al. (1977), Roy (1982), Kaushik et.al. (1990), Jaiswal (2012), Sharma and Agarwal (2012), Majumder et.al. (2013), Choudhary and Gupta (2015).

Conclusion

The present contribution is the result of the extensive and intensive studies on diversity in larvae of aquatic insects (Order-Diptera and Coleoptera) carried out during January 2019 to December 2019. During present investigation in Chittaura Jheel Dipteran larvae of aquatic insects have been found to be dominant among larvae of aquatic insects and in water body generally present Chironomus larvae, Ptychoptera larvae and Eristalis larvae which indicate the polluted nature of Jheel water. Thus keeping in view the importance of study steps should be taken for conservation and maintenance of Chittaura Jheel. It is the necessarily step which have to be followed for the safety of natural and historical water bodies .

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