

Faunal Diversity of Insects of Fresh Water Lake of Ajmer Rajasthan

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Abstract: Ajmer is located in the center of Rajasthan (INDIA) between 25° 38' " and 26° 58' " north Latitude and 73° 54' " and 75° 22' " east longitude covering a geographical area of about 8481sq km hemmed in all sides by Aravalli hills. About 7 miles from the city is Pushkar lake created by the touch of lord Brahma. The Dargah of khawaja Moinuddin chisti is holiest shrine next to Mecca in the world. Ajmer has hot dry summer and cold bracing winter. The winter extends from November to February and summer extends from March to June followed by rainy season till mid September. The temperature varies from 2° c in winter and 49° c in summer. The normal annual rainfall is 527.3mm. The adult insect fauna displayed diversity of more than 18 families belonging to Dytiscidae, Helonidae, Hydraenidae, Hydrophilidae, Psephenidae, Corixidae, Gerriidae, Nepidae, Notonectidae, and Validae. Besides larval forms and aquatic and terrestrial insect.

Key words : Aquatic insect faunal diversity, physiochemical parameters, Anasagar lake, Ajmer.

I. Introduction

Ajmer is located in the center of Rajasthan (INDIA) between 25° 38' " and 26° 58' " north Latitude and 73° 54' " and 75° 22' " east longitude covering a geographical area of about 8481sq km hemmed in all sides by Aravalli hills. The district is somewhat triangular in shape. It is centrally located in Rajasthan also known as heart of Rajasthan. About 7 miles from the city is Pushkar lake created by the touch of lord Brahma. The Dargah of khawaja Moinuddin chisti is holiest shrine next to Mecca in the world. Ajmer has hot dry summer and cold bracing winter. The winter extends from November to February and summer extends from March to June followed by rainy season till mid September. The temperature varies from 2° c in winter and 49° c in summer. The normal annual rainfall is 527.3mm. The total population of the district is 2180526 persons. Around 5.56 % of total area available for land utilization is covered under forest. Ajmer is abode of certain flora and fauna that are particularly endemic to semi-arid and are specially adapted to survive in the dry waterless region of the state.

Many workers have studied lentic ecosystem in India with reference to physiochemical status (Sharma and Durve,1991;Kaur et.al.,1996; Birasal 1996; Bais et.al. 1997; Jain et.al. 1997; Sharma et.al., 2000; Thomas and Abdul, 2000 ; Shukla and Pawar, 2001 ; Ranu, 2001; Meena, 2001; Chisty, 2002; Sultan et.al., 2003; Rani et.al., 2004; Umavati et.al., 2007; Vijayvergia et.al.,2007; Feresin et.al., 2010; Fatima et.al.,2011; Uveges et.al., 2011), Kar, 1986;Parvateesam and Mishra,1993; Patni et.al., 2006). Anasagar is an Ancient lake situated in the middle of the city. In the present investigation an attempt has been made to study physio-chemical parameters and aquatic insect fauna of Anasagar lake .

II. Materials and Methods

Study Area

Ajmer is located in the center of Rajasthan (INDIA) between 25° 38' " and 26° 58' " north Latitude and 73° 54' " and 75° 22' " east longitude covering a geographical area of about 8481 sq km. The investigation site Ajmer retains a primeval grandeur of Aravallis, The oldest mountain ranges. It harbours an amazing variety of life and habitats, variety of vegetation, the present study was carried out between February 2014 to December 2014. Notpad is essential to note down and sketch the species seen. The catchment area of lake includes Nagpahar hills, Taragarh hills. Capacity of lake is 2052 million liters. Average depth is 5 meter (Ranga 1995). Water samples were collected from selected station during morning first week of every month. Physiochemical parameters such as Temperature, Transparency, pH, Dissolved Oxygen (DO), Biological Oxygen Demand (BOD), Alkalinity, Chloride, Turbidity, Chloride, Turbidity, Hardness, Nitrate, Phosphate were analyzed. Using Standard methods (APHA,2005).

Insect fauna from water was collected with suitable net covering both macroscopic and microscopic forms. The fauna were identified following Daglish(1952), Borrer and Delong (1957), Edmondson (1966), Needham and Needham (1978), Tonapi (1980) and Mc. Cafferty (1981).

III. Results and Discussion

Physiochemical properties revealed

Temperature- 16-32.3⁰ C, Transpirancy-.34--.65m, pH 6.8-10.1

DO 6.6 -10.6 mg/l, BOD - 9.2-25. mg/l ,Alkalinity 176-264 mg/l, Chloride 20-30mg/l

Phosphate .14-3.2 mg/l, Nitrate 14.1-26 mg/l, Total hardness 107-135 mg/l

TDS 314-1105 mg/l .

Insect fauna

Coleoptera(Beetle)

f- Dytiscidae(Predaceous diving beetle)

Captotomus enterogatus

Dytiscus verticalis

Hydaticus fabricii

Laccophilus anticalus

F Helodidae (Marsh beetle)

Scirtes nigropunctatus

F Hydraenidae (minute moss beetle)

Hydraena quadricollis

f- Hydrophilidae(Water scavenger beetle)

Berosus sp.

Enochrus sp.

Hydrophilus olivaceous

Tropisternus lateralis

f- Psephenidae

Eubranax sp.

O Hemiptera(bug)

F Corixidae (water boatman)

Corixa lima

F Gerridae (water striders)

Geris marginatus

Limnometra fluviorum

F Notonectidae(backswimmer)

Notonecta glauca

Nepidae (water scorpion)

Laccotrepes maculatus

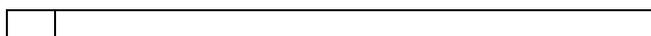
Nepa cineria

Veliidae riffle bug

Microvelia diluta

Table 1 Physiochemical variables of Anasagar lake

Variable	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Avg
Temperature	26	27	31.5	32	32	25.5	24.4	23.2	20	16	20.2	22.6	23.08
Transpiracy(m)	.5	.5	.34	.34	.65	.5	.5	.5	.5	.5	.5	.5	.485
pH	6.8	7.8	8	10.6	9	7.8	7.8	7.8	7.9	7.8	6.9	7.8	7.35
DO m/l	9.6	10.6	10	10	10.6	10.6	6.6	10.6	10.6	8.6	10.6	10.6	9.1
BOD mg/l	25	24	23	22	20	15	12	9.2	9.9	9.9	20	22	17.6
Alkalinity mg/l	170	200	264	255	200	170	176	176	176	170	160	176	191.0
Chloride mg/l	25	30	20	20	20	20	25	20	20	20	20	20	21.6
Phosphate mg/l	2.9	3.2	3.1	3.0	.14	.15	.16	.17	.14	.15	.14	.15	1.116
Nitrate mg/l	25	26	20	18	14.1	15	15	14.1	14.2	14.1	14.3	14.2	17
Total hardnessmg/l	110	120	135	110	120	107	110	110	107	107	106	107	112.4



Faunal Diversity of Insects of Fresh Water Lake Of Ajmer Rajasthan

Table 2 Population diversity of Insects at Anasagar lake Ajmer .

Insect species	Apr 2014	may	june	july	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Avg		Per.
O- Coleoptera															
F- Dytiscidae															
<i>Captotomus enterrogatus</i>	0	0	0	0	0	50	80	60	80	80	120	120	49.16		
<i>Dytiscus marginalis</i>	0	0	30	0	0	0	40	60	80	200	100	80	49.16		
<i>Laccophilus anticalus</i>	60	0	0	0	0	0	60	80	80	80	100	80	45		
Gyrinidae <i>Gyrinus marinus</i>	0	0	40	0	0	0	60	80	80	80	80	80	41.66		
F- Helodidae															
<i>Scirtes nigropunctatus</i>	0	0	0	0	0	0	0	80	80	0	0	0	13.33		
F -Hydraenidae															
<i>Hydraena quadricollis</i>	300	200	180	0	0	0	0	0	0	600	500	200	165		
F- Hydrophilidae															
<i>Hydrobius fuscipes</i>	0	0	0	0	60	80	60	40	0	0	0	0	20		
Berosus sp.	120	300	180	0	0	60	0	0	0	0	0	0	55		
<i>Hydrophilus olivaceous</i>	0	0	0	80	60	40	0	60	0	0	0	0	20		
<i>Hydrophilus piceus</i>	0	0	0	60	80	40	0	40	0	0	0	0	18.33		
<i>Tropisternus lateralis</i>	0	0	0	0	0	60	60	60	40	200	160	80	55		
F- Psephenidae															
<i>Eubranax sp.</i>	0	0	0	0	0	0	110	160	110	140	100	100	60		
Total beetles	1020	500	430	140	200	330	470	720	550	1380	1160	740	591.64		
O-Hemiptera															
F-Corixidae															
<i>Corixa lima</i>	200	80	60	60	60	40	0	60	0	0	0	0	46.66		
<i>C. punctata</i>	180	60	60	60	60	40	0	40	0	0	0	0	41.66		
F-Gerridae															
<i>Limnometra fluviorum</i>	0														
<i>Gerris marginatus</i>	80	0	60	140	140	100	100	0	0	0	0	60	56.66		
<i>G. lacustris</i>	60	0	60	120	120	100	100	0	0	0	0	60	46.66		
F- Notonectidae															
<i>Notonecta glauca</i>	0	0	0	0	0	0	0	0	0	60	40	0	8.33		
F Nepidae															
<i>Laccotrepes maculatus</i>	0	60	60	0	40	0	0	60	40	100	100	0	38.33		
<i>Nepa cinerea</i>	30	60	0	0	0	0	20	40	60	60	60	20	29.16		
F Veliidae															
<i>Microvelia diluta</i>	0	0	40	40	0	40	60	0	0	0	0	0	15		
Total bugs	550	260	340	420	420	320	280	200	100	220	200	140	282.46		
Total insects	1570	760	770	560	620	650	750	920	650	1600	1360	880	874.1		

The physio chemical limnology revealed that the lake turbid, alkaline and hard. Productive, Eutrophicated, it is influenced by agricultural runoff, industrial effluents, Sewage water and other anthropogenic activities. The Temperature is between 16-31 °C according to season. pH 6.7-10 which shows the lake is alkaline in nature. DO is 6.7-10.7 mg/l i.e. above 5mg/L through out the year. BOD 9.2-25.2 mg/l . Alkalinity 176-264 mg/l. Chloride 20-30 mg/l. Phosphate .14-3.2 mg/l, Nitrate 14.1-26 mg/l. Total hardness 107-135 mg/l, TDS 314-1105 mg/L. The lake is highly under pressure of city encroachment and urbanization. Water quality is polluted and deteriorating due to agriculture runoff, industrial effluents and sewage water. 18 species of insects belonging to

coleoptera and Hemiptera with 5 families were identified. The beetles were dominant. In order to conserve the faunal diversity of the lake it is essential - availability of safe water all round the year. Water utilization should be judicious. Social rituals have to be managed.

IV. Summary and Conclusion

In the light of above information we can conclude that the lake is turbid, alkaline, Productive, Eutrophicated, it is influenced by agricultural runoff, industrial effluents, Sewage water and other anthropogenic activities. The Temperature is between 16-31 °C according to season. pH 6.7-10 which shows the lake is alkaline in nature. DO is 6.7-10.7 mg/l i.e. above 5mg/L through out the year. BOD 9.2-25.2 mg/l. Alkalinity 176-264 mg/l. Chloride 20-30 mg/l. Phosphate .14-3.2 mg/l, Nitrate 14.1-26 mg/l. Total hardness 107-135 mg/l, TDS 314-1105 mg/L. water. Thousands of pilgrims bath in water during Urs and pushkar fair which pollute the lake. The lake is highly under pressure of city encroachment and urbanization. Water quality is polluted and deteriorating due to agriculture runoff, industrial effluents and sewage water. Thousands of pilgrims bath in water during Urs and pushkar fair which pollute the lake. 18 species of insects belonging to coleoptera and Hemiptera with 5 families were identified. The beetles were dominant. In order to conserve the faunal diversity of the lake it is essential - availability of safe water all round the year. Water utilization should be judicious. Social rituals have to be managed.

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