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A survey of Entomofauna in Some Village Pond Ecosystems in Indian Desert Region

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Abstract - The present study was undertaken on five village ponds namely Sagar, Devikundsagar, Harsolao, Gajner and Kolayat situated in Bikaner district in the western arid region of Rajasthan to place on record an exhaustive checklist of insect fauna of these ecosystems. Insects make the largest group in the animal kingdom. These form an important component of natural food web in aquatic ecosystem. Insects perhaps the hardiest organisms and with their occurance and diversity dominate fresh water ecosystems. The faunal composition of aquatic insects was rich in all the studied village ponds and represented by 27 genera. The adult insects were represented by two orders namely Coleoptera (beetles) and Hemiptera (bugs). Orders Diptera, Odonata, Plecoptera, Ephemeroptera and Trichoptera were represented only by larval forms.

Keywords - ***Entomofauna, Ecosystem, Diversity, Village ponds, Indian desert***

I. Introduction

The Rajasthan state is located in North-West of part of India. It has typical topographic characteristics. The village pond ecosystems of Indian desert offer typical physical-chemical conditions including shallow, turbid, well oxygenated waters which are mostly alkaline, hard and a little saline. Under harsh and hostile environmental conditions a variety of biotic communities is found in village pond ecosystems.

Insects make the largest group in the animal kingdom. These form an important component of natural food web in aquatic ecosystem. Insects perhaps the hardiest organisms and with their occurrence and diversity dominate fresh water ecosystems.

The present study was undertaken to place on record an exhaustive checklist of insect fauna of some village ponds in Indian desert region.

II. Study Area

The study was carried out on five village ponds namely Sagar, Devikundsagar, Harsolao, Gajner and Kolayat situated in Bikaner district (28^{o} 01'00" North, 73^{o} 18'43" East) in the western arid region of Rajasthan.

III. Materials and Methods

The study was undertaken monthly in each pond for a period of 15 months from July 2016 to September 2017.

Both water and sediment samples were collected from three study stations on each pond. The insect fauna from water was collected with plankton net. A quadrate was used to collect the sediment samples. Benthic forms were collected by sieving the mud samples. Insect fauna was identified following Borrer and Delong (1957), Edmondson (1966), Vazirani (1970), Needham and Needham (1978), Tonapi (1980) and Mc Cafferty (1981).

IV. Results and Discussion

The faunal composition of aquatic insects was rich in all the studied village ponds and represented by two orders namely Colepotera and Hemiptera. Colepotera was represented by 17 genera belonging to seven familes : Hydrophilidae (5 genera), Dytiscidae (6 genera), Psephenidae (1 genera), Helodidae (1 genera), Hydraenidae (1 genera), Curculionidae (1 genera) and Halipidae (2 genera). Dytiscidae was the most dominant family with maximum diversity in all the ponds. Along with adult genera, larvae of *Agabus* sp., *Lacobius* sp., *Peltodytes* sp. and *Berosus* sp. were also found. Bugs displayed a variety of seven families with 10 genera. Hemipterans were represented by Corixidae (2 genera), Gerridae (2 genera), Nepedae (2 genera), Notonectidae (1 genera), Pleidae (1 genera), Velidae (1 genera) and Belostomatidae (1 genera). Corixidae, Gerridae and Nepedae showed maximum diversity. Orders Diptera, Odonata, Plecoptera, Ephemeroptera and Trichoptera were represented only by larval forms. Diptera was represented by larvae of midges (Chironomidae and Ceratopoganidae) and mosquitoes (Culicidae). Nymphs of dragonflies (order Odonata), larvae of stoneflies (order Plecoptera), larvae of mayflies (order Ephemeroptera) and larvae of caddis flies (order Trichoptera) were also recorded (Table).

The most intensively studied insect groups are the Isoptera (or termites) by Roonwal (1982) and the water beetles (Dytiscidae : Coleoptera) by Vazirani (1970). Tak & Sewak (1987) and Tak (1996) recorded 27 species of aquatic beetles from Rajasthan. Kazmi & Ramamurthy (2004) reported 32 aquatic colecopteran species from the region. Thirumalai & Ramakrishnan (2002) have recorded 25 species belonging to 16 genera and 8 families of Hemiptera from Rajasthan. Lately, Saxena (2008) recorded seven, Srivastava (2009) four and Tak (2015) ten genera of aquatic bugs from Rajasthan.

V. Conclusion

Conclusively the present study provides a comprehensive analysis of entomofaunal diversity of village pond ecosystems. The insects are the hardly enough to withstand stressful conditions of desert region and studied water bodies offer suitable biotopes for aquatic insects.

VI. Acknowledgement

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Table: Entomofauna at five ponds, Bikaner during July 2016 to September 2017.

S. No.	Order	Genus	Species	Family	Common Name	Spot
1.	Coleoptera	*Hydrophilus*	*olivaceous*	Hydrophilidae	Water scavenger beetles	All the ponds
2.	Coleoptera	*Tropisternus*	*lateralis*	Hydrophilidae	Water scavenger beetles	Sagar, Harsolao, Kolayat
3.	Coleoptera	*Sternolophus*	*rufipes*	Hydrophilidae	Water scavenger beetles	Devikundsagar, Gajner
4.	Coleoptera	*Berosus*	*indicus*	Hydrophilidae	Water scavenger beetles	Gajner, Kolayat
5.	Coleoptera	*Enochrus*	*esuriens*	Hydrophilidae	Water scavenger beetles	Kolayat
6.	Coleoptera	*Cybister*	*regulosus*	Dytiscidae	Predaceous diving beetles	Devikundsagar, Gajner, Kolayat
7.	Coleoptera	*Captotomus*	*enterrogatus*	Dytiscidae	Predaceous diving beetles	Devikundsagar, Gajner, Kolayat
8.	Coleoptera	*Dytiscus*	*verticalis*	Dytiscidae	Predaceous diving beetles	Sagar, Devikundsagar, Kolayat
9.	Coleoptera	*Hydaticus*	*fabricii*	Dytiscidae	Predaceous diving beetles	All the ponds
10.	Coleoptera	*Laccophilus*	*anticatus*	Dytiscidae	Predaceous diving beetles	Sagar, Gajner, Kolayat
11.	Coleoptera	*Laccobius*	species	Dytiscidae	Predaceous diving beetles	All the ponds
12.	Coleoptera	*Eubranax*	species	Psephenidae	Riffle beetles	All the ponds
13.	Coleoptera	*Scirtes*	*nigropunctatus*	Helodidae	Marsh beetles	Devikundsagar, Kolayat
14.	Coleoptera	*Hydraena*	*quadricollis*	Hydraenidae	Minute moss beetles	Sagar, Devikundsagar, Gajner, Kolayat
15.	Coleoptera	*Lixus*	species	Curculionidae	Snout beetles	Sagar
16.	Coleoptera	*Haliplus*	species	Halipidae	Crawling water beetles	Gajner, Kolayat

17.	Coleoptera	*Peltodytes*	species	Halipidae	Crawling water beetles	Kolayat
18.	Hemiptera	*Corixa*	*lima*	Corixidae	Water boatman	All the ponds
19.	Hemiptera	*Sigara*	*pectoralis*	Corixidae	Water boatman	All the ponds
20.	Hemiptera	*Gerris*	*marginatus*	Gerridae	Water striders	Gajner, Kolayat
21.	Hemiptera	*Limnometra*	*fluviorum*	Gerridae	Water striders	Kolayat
22.	Hemiptera	*Laccotrepes*	*maculatus*	Nepidae	Water striders	All the ponds
23.	Hemiptera	*Nepa*	*cineria*	Nepidae	Water striders	Gajner, Kolayat
24.	Hemiptera	*Microvelia*	*diluta*	Veliidae	Riffle bugs	Sagar, Devikundsagar, Kolayat
25.	Hemiptera	*Notonecta*	*glauca*	Notonectidae	Backswimmers	Devikundsagar, Gajner, Kolayat
26.	Hemiptera	*Plea*	*palluta*	Pleidae	Pygmy backswimmers	Harsolao, Kolayat
27.	Hemiptera	*Lithocerus*	*indicus*	Belostomatidae	Giant water bugs	Harsalao, Gajner, Kolayat