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CHECKLIST OF ZOOPLANKTONS IN DIFFERENT RIVERS OF BAJWAT AREA

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ABSTRACT

Zooplanktons are important fish and waterfowl food. Limnological studies of Marala Wetlands, a complex created by three rivers, i.e., Jammu Tawi, Chenab and Manawar Tawi, entering Bajwat area located 25 km from North of Sialkot city from state of Jammu and Kashmir, were carried out between October, 2000 to September 2001. This survey was carried out to create a checklist of zooplanktons existing in the study site which would help in future studies relating to aquatic biodiversity and ecological studies of wetlands. A minimum of 25 species of zooplanktons were present in the wetland area, which can be included into 4 major animal groups. Amoeba, Paramecium, Opalina and Euglena were the dominant species. Crustaceans were represented by Daphnia, Moina, Cyclops. Insects observed at river Jammu included mosquito larvae, water spider and dragonflies of unidentified species. The Maximum number of zooplanktons were recorded in March, April, May & then in September and October as observed throughout study period.

Keywords: Plankton, wetland, insects, protozoa, crustaceans

INTRODUCTION

Zooplanktons are important fish and waterfowl food. Every fish species and many duck species feed on zooplankton during some portion of their life cycle. Ganapati (1943) studied the ecological characteristics of a garden pond containing abundant zooplankton. Greenberg (1964) suggested that zooplankton productivity of a wetland is proportional to the age of its water and inversely proportional to its velocity. Mandal (1980) viewed that zooplanktons dominated in spring. He also reported positive correlation between the phosphate contents of the water and zooplanktons. Vertical distribution of zooplankton according to Bursey (1989) turbidity can severely affect zooplankton.

Limnological studies of Marala Wetlands, a complex created by three rivers, i.e., Jammu Tawi, Chenab and Manawar Tawi, entering Bajwat area located 25 km from North of Sialkot city from state of Jammu and Kashmir, were carried out between October, 2000 to September 2001. This survey was carried out to create a checklist of zooplanktons existing in the study site which would help in future studies relating to aquatic biodiversity and ecological studies of wetlands.

MATERIALS AND METHODS

Bajwat Game Reserve is located at a distance of some 25 km in north of Sialkot City. Three rivers, i.e., Tawi, Chenab and Manawar Tawi, coming from Jammu and Kashmir, flow into Game Reserve and meet to enter the Head Marala water storage reservoir.

Water samples were collected on monthly basis from three sampling sites, i.e.

Tawi, Chenab and Manawar Tawi, from depths of 15 cm, in one-liter plastic bottles. Different places were used and the samples were gathered using planktonic net. The samples were immediately fixed with 2ml formalin and used for the study on plankton.

The samples were preserved in 7% commercial grade formalin. Temporary slides were prepared and studied under light microscopic. The zooplanktons were identified with the help of literature.

RESULTS

The available data on the relative abundance of difference species of zooplanktons in the different streams of the wetland system during different seasons has been presented in (Table 1; Table 2). The tables suggest that there was a minimum of 25 species of zooplanktons present in the wetland area, which can be included into 4 major animal groups. The protozoa were represented by 7 species, the crustaceans by 6 and rotifers by 4 species. The insects apparently have been represented by 8 different species; but as many of the groups remain unidentified to the species level, therefore, the total number of the insects present in the wetland is expected to be more.

Among them, Amoeba, Paramecium, Opalina and Euglena were the dominant species. Crustaceans were represented by Daphnia, Moina, Cyclops. Daphnia was the dominant among crustaceans. Insects observed at river Jammu included mosquito larvae, water spider and dragonflies of unidentified species. It was also observed that the total number of zooplankton species increased during monsoon and post-monsoon.

Amongst the zooplanktons recorded at river Chenab pond area, protozoans were represented by 7 species. Among these Amoeba and Paramecium were the two dominant species. Rotifers were represented by 4 species, i.e., Brachianus, Asplanchia, Fibria and Plalyias. Insects were represented by Corina, Demsalfly nymph, mayfly nymph, culin larvae, chironomus larvae. Crustaceans were represented by Daphnia Moina, Seapholabaris, Cyclops, Diaptomus and Ostracods. From March to June there was no considerable increase in zooplankton number, but during Monsoon period a general trend of increase was observed. After Monsoon there was a decline in zooplankton abundance and variety.

At the river Chenab, among insects, Covina was observed in higher numbers during October, November, March and April, while it was absent in July and appeared again in August and September. Damselfly nymph and mayfly nymph were less in number and were observed only in December, April, July and August. Culex larvae appeared in March, April and May, while Chironomus larvae have been observed only in February and March. The maximum number of zooplanktons were recorded during monsoon in July, August.

The zooplanktons at river Manawar Tawi were represented by protozoans, rotifers, crustaceans and insects. The protozoans were represented by 9 species, among these Amoeba, Paramecium and Euglena dominated. Among Rotifers only two species, i.e., Rhilodma and Aspanclma have been observed. Daphnia dominated the crustacean population observed at river Manawar Tawi. Dragon flies, Mosquito larvae and water spiders also constituted an important part of the insect zooplanktons. The Maximum number of zooplanktons were recorded in March, April, May & then in September and October as observed throughout study period.

Table 1: Zooplanktons recorded during different seasons at different rivers (A = Jammu Tawi, B = Chenab, C = Manawar Tawi) of marala head works during October to September 2000-2001.

	Seasons											
	Winter (Nov. to Jan.)			Spring (Feb. to Apr.)			Summer (May to July)			Autumn Aug. to Oct.)		
Species	A	B	C	A	B	C	A	B	C	A	B	C
PROTOZOA												
Amoeba sp.	-	++	++	+	++	++	++	++	++	+	+	++
Paramecium sp.	++	++	+	+	++	+	++	+	+	++	++	+
Vorticella sp.	-	+	+	-	-	+	+	-	-	+	+	+
Stentor sp.	++	-	-	-	++	++	++	-	+	+++	+	++
Astria longa	-	-	-	-	+	+		-	-	+	+	+
Euglena sp.	++	+	+	+	++	+	+	+	+	+	+	++
Euploles sp.	-	-	-	-	+	-	-	-	-	-	+	+
CRUSTACEANS												
Daphnia sp.	++	+	++	++	+	+	+	+	++	++	++	++
Moina sp.	++	++	++	+	-	+	+	+	++	++	++	++
Cyclops	++	++	++	++	++	++	++	++	+	+	+	++
Diaptomus sp.	++	++	++	++	++	++	++	++	++	++	++	+

(+); Present, (++); Common, (+++); Abundance, (-); Absence

Table 2: Zooplanktons recorded during different seasons at different rivers (A=Jammu Tawi, B=Chenab, C=Manawar Tawi) of marala head works during October to September 2000-2001.

Season	Winter (Nov. to Jan.)			Spring (Feb. to Apr.)			Summer (May to July)			Autumn (Aug. to Oct.)		
Species	A	B	C	A	B	C	A	B	C	A	B	C
Seapholabaris sp.	-	+	-	-	-	-	+	-	-	-	-	-
Pstracod sp.	++	-	-	-	-	-	-	-	++	++	-	-
ROTIFERS												
Branchionus sp.	++	++	++	++	++	++	+	+	++	++	++	+

Platyias sp.		++	++	++	-	-	-	-	-	-	-	-
Asplanchna sp.	++	++	++	+	++	++	++		+	+	+	+
Rhilodma sp.	-	-	-	-	+	+	-	+	+	+	+	+
INSECTS												
Mosquito Larvae	+	+	-	-	+	+	+	+	+	+	+	+
Water spider	+	+	-	-	+	+	+	+	+	+	+	+
Dragon flies	+	+	-	-	+	+	+	+	+	+	-	+
Covina sp.	+	-	-	-	++	++	+	+	-	+	+	+
Demsalfly nymph	-	+	-	-	-	+	-	-	-	+	-	-
Mayfhy nymph	-	-	-	-	-	-	-	-	+	+	-	-
Culex larvae	-	-	-	+	+	+	+	-	-	-	-	-
Chironomus larvae	-	-	-	+	+	-	-	-	-	-	-	-

(+); Present, (++); Common, (+++); Abundance, (-); Absence

DISCUSSION

It was observed that zooplanktons had a greater population density during late spring and monsoon period. Thus, the results indicated that seasons had a direct effect on the distribution of plankton species as studied by Sameoto (1984). According to Bursey (1989) turbidity can severely effect zooplankton. Not only does it interfere with photosynthesis to inhibit food production but clogs feeding apparatus of zooplanktons causing them to accumulate silt in the digestion tract and sink. However, during this study a considerable fluctuation in zooplankton population distribution was found (Table 1; Table 2). This may be due to the reason that phytoplankton population was maximum when the turbidity started increasing. Hence, the zooplanktons distribution may be affected due to some other factors in spite of turbidity after monsoon.

After the Monsoon the zooplanktons were at average size. Phytoplanktons are an important food for zooplanktons (Bursy, 1989) and zooplankton in turn food for fish and waterfowl. Many waterfowl species feed on zooplankton during some portion of their life cycle. Hence, it is important to note the current trends of plankton population as they are a key component of the ecosystem.

CONCLUSION

Twenty-five species of zooplanktons were observed in the wetland during the study period. The zooplanktons had a greater population density during late spring and monsoon period. Thus, the results indicated that seasons had a direct effect on the distribution of the zooplanktons in the site of study.

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