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Seasonal Cladoceran Species counting at Tale Pimpalgaon dam near Patoda Dist –Beed (MS) India

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Abstract

Tale Pimalgaon dam is situated near Patoda Dist-Beed (MS). The study of zooplankton Cladocera and its species has been studied in the period of Jan 2012 to Dec 2012.The study shows that seasonal variation of Cladoceran species

Key Words – Cladocera,Species,zooplankton,monthly,seasonal

Introduction

The **Cladocera** are an order of small crustaceans commonly called water fleas. Around 69 species have been recognised so far, with many more undescribed. They first appeared in the Oligocene period, and have since invaded most freshwater habitats. Some have also adapted to a life in the ocean, the only members of Branchiopoda to do so, even if several anostracans live in hypersaline lakes.Most are 0.2–6.0 mm (0.01–0.24 in) long, with a down-turned head with a single median compound eye, and a carapace covering the apparently unsegmented thorax and abdomen. Most species show cyclical parthenogenesis, where asexual reproduction is occasionally supplemented by sexual reproduction, which produces resting eggs that allow the species to survive harsh conditions and disperse to distant habitats.

Materials and Methodology –

Zooplankton Collection and Identification –

Zooplankton species identification was done with the help of standard references (Alfred et al., 1973; Adoni et al., 1985). The quantitative analysis of planktonic organisms was carried out using Sedgwick Rafter plankton counting cell in accordance to Welch (1948).

Calculation:

The qualitative and quantitative analyses of zooplankton were done by using Sedgwick-Rafter cell (for standardization) and by Lackey's drop method. Six strips were counted in Sedgwick-Rafter cell with dimensions of 50mm * 20mm * 1mm. In Lackey's drop method, the covers lip was placed over a drop of water in the slide and whole of the coverslip was examined by parallel overlapping strips to count all the organisms in the drop. About 20 strips were examined in each drop. Number of subsamples to be taken was dependent on the examining 2 to 3 successive Subsamples without any addition of unencountered species when compared to the already examined subsamples in the same sample. The zooplankton were identified up to a taxonomic precision of species level in Rotifers, genus level in both Cladocera and Copepoda using self made keys given in standard identification keys (Murugan et al., 1998; Altaff, 2003; Edmondson, 1959; Battish, 1992; Dhanapathi, 2000). The species belonging to each group were noted down and number of individuals in each species was counted. The number of organisms was expressed in Total organisms per liter using the formula.

For Sedgwick – Rafter cell:

$$\text{Organisms per liter (N)} = \frac{R * 1000mm^3 * 10^3}{L * D * W * S}$$

Where R = number of organisms counted per subsample
L = length of each strip, mm
D = depth of a strip, mm
W = width of a strip, mm
S = number of strips counted.
Therefore, Total organisms per liter = N * 1/C

$$\text{Where concentration factor, } C = \frac{\text{Volume of original sample (ml)}}{\text{Volume of concentrated sample (ml)}}$$

For Lackey's drop method:

$$\text{Organisms per liter (N)} = \frac{R * A_t * 10^3}{A_s * S * V}$$

Where R = Number of organisms counted per subsample
A t = Area of coverslip, mm2
A s = Area of one strip, mm2
S = Number of strips counted, and
V = Volume of sample under the coverslip, ml

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Therefore, Total organisms per liter = N * 1 C

Where concentration factor, C = $\frac{\text{Volume of original sample (ml)}}{\text{Volume of concentrated sample (ml)}}$

Result and Discussion –

CLADOCERA (org/l) (248)
(Jan 2012-Dec 2012).

SPECIES	Jan	Feb	March	April	May	June	July	Aug	Sept	Octo	Nov	Dec
Ceriodaphania Cornulata	7	1	3	3	8	6	7	6	7	9	7	3
Alona Pulchella	4	7	8	6	5	3	5	4	6	1	4	7
Bosminopsis Ditersi	5	2	4	2	2	5	9	5	3	5	5	5
Chydorus Reticulata	2	8	5	4	6	4	5	4	6	7	6	8
Chydorous Barroisi	5	7	NIL	2	NIL	5	2	NIL	1	4	5	NIL

During year Jan 2012 to Dec 2012 the five species was found by monthly counting the species are Ceriodaphania Cornulata(67), Alona Pulchella(60), Bosminopsis Ditersi(52), Chydorus Reticulata(65), Chydorous Barroisi(31).

In ecologically, zooplankton are one of the most important biotic components influencing all the functional aspects of an aquatic ecosystem, such as food chains, food webs, energy flow and cycling of matter (Murugan et al., 1998; Dadhick and Sexena, 1999; Sinha and Islam, 2002; Park and Shin, 2007). The distribution of zooplankton community depends on a complex of factors such as, change of climatic conditions, physical and chemical parameters and vegetation cover (Rocha et al., 1999; Neves et al., 2003). Most of the species of planktonic organisms are cosmopolitan in distribution (Mukherjee, 1997).

According to Murugan et al. (1998) and Dadhich and Sexena (1999) the zooplankton plays an integral role and serves bio indicators and it is a well-suited tool for understanding water pollution status (Ahmad, 1996; Contreras et al., 2009). A number of study have been carried out on ecological condition of freshwater bodies in various parts of India (Gulati and Schultz, 1980; Rana, 1991; Sinha and Islam, 2002; Singh et al., 2002; Smitha et al., 2007), but southern part of Tamilnadu, the ecological studies of freshwater body is very scanty (Haniffa and Pandian, 1980; Smitha et al., 2007).

Fresh water (or **freshwater**) is any naturally occurring water except seawater and brackish water. Fresh water includes water in ice sheets, ice caps, glaciers, icebergs, bogs, ponds, lakes, rivers, streams, and even underground water called groundwater. Fresh water is generally characterized by having low concentrations of dissolved salts and other total dissolved solids. Though the term specifically excludes seawater and brackish water, it does include mineral-rich waters such as chalybeate springs.

Fresh water is not the same as potable water (or drinking water). Much of the earth's fresh water (on the surface and groundwater) is unsuitable for drinking without some treatment. Fresh water can easily become polluted by human activities or due to naturally occurring processes, such as erosion.

Water is critical to the survival of all living organisms. Some organisms can thrive on salt water, but the great majority of higher plants and most mammals need fresh water to live.

An estimation of the number of taxa within families, genera and local faunas of Cladocera reveals that only c. [illegible] species (17% of all known species) may be considered as sufficiently well described (valid species), and c. 146 as rather well described (fair species) but needing further study using modern methods of investigation. The status of all other species is vague. The families Chydoridae, Daphniidae and Sididae and genera *Diaphanosoma*, *Daphnia* (including *Daphniopsis*), *Megafenestra*, *Scapholeberis*, *Eurycercus*, *Chydorus*, *Ephemeroporus* and *Pleuroxus* have been comparatively studied best. The largest number of valid species is known from Europe, North America, Australia and South America, and the smallest number from Africa. Presence of large number of vague species of Cladocera negatively affects faunistic, zoogeographic, and ecological studies of continental waters. **N. M. Korovchinsky (1996)**

References –

Adoni, A., D.G. Joshi, K. Gosh, S.K. Chourasia, A.K. Vaishya, M. Yadav and H.G. Verma: A work book on limnology (Pratibha Publisher) Sagar (1985).

Ahmad, M.S.: Ecological survey of some algal flora of polluted habitats of Darbhanga. J. Environ. Pollut., 3, 147-151 (1996).

Alfred, J.R.B., S. Bricice, M.L. Issac, R.G. Michael, M. Rajendran, J.P. Royan, V. Sumitra and J. Wycliffe: A guide to the study of freshwater organisms. J. Madras Univ. Suppl., 1, 103-151 (1973).

Contreras, J.J., S.S.S. Sarma, M. Merino-Ibarra and S. Nandini: Seasonal changes in the rotifer (Rotifera) diversity from a tropical high altitude reservoir (Valle de Bravo, Mexico). J. Environ. Biol., 30, 191-195 (2009).

Dadhick, N. and M.M. Saxena: Zooplankton as indicators of trophical status of some desert waters near Bikaner. J. Environ. Pollut., 6, 251-254 (1999).

Gulati, R.D. and G.W. Schultz: Remarks on the resent status of limnology in India based mainly on Indian publications in hydrobiologia and suggestion for future approach. Hydrobiologia, 72, 211-222 (1980).

Haniffa, M.A. and T.J. Pandian: Energy flow in a tropical pond. Tropical Ecol. Dev., 12, 799-808 (1980).

Murugan, N., P. Murugavel and M.S. Koderkar: Freshwater cladocera; Indian Associ. of Aqua. Biologists (IAAB), Hyderabad. pp. 1-47 (1998). Mukherjee, B.: Environmental Biology. Tata McGraw Hill Publishing Company Limited. New Delhi (1997).

Neves, I.F., O. Recha, K.F. Roche and A.A. Pinto: Zooplankton community structure of two marginal lakes of the river Cuiaba (Mato Grosso, Brazil) with analysis of Rotifera and Cladocera diversity. Braz. J. Biol., 63, 1-20 (2003).

N. M. Korovchinsky (1996). :Hydrobilogia, March 1996, Volume 321, Issue 3, pp 191–204.

Park, K.S. and H.W. Shin: Studies on phyto-and-zooplankton composition and its relation to fish productivity in a west coast fish pond ecosystem. J. Environ. Biol., 28, 415-422 (2007).

Rana, K.S.: Impact of solar radiation and the aquatic ecosystem. A case study of soor sarowar, Agra. Nat. Environ., 8, 43-49 (1991).

Rocha, O., T. Matsumura-Tundisi, E.L.G. Espindola, K.F. Roche and A.C. Rietzler: Ecological theory applied to reswervoir zooplankton, pp. 457-476. In: Theoretical reservoir ecology and its application (Eds.: J.G. Tundisi and M.Straskraba). Internat. Inst. Ecol., Sao Carlos (1999).

Sinha, B. and M.R. Islam: Seasonal variation in zooplankton population of two lentic bodies and Assam State Zoo cum Botanical garden, Guwahati, Assam. Eco. Environ. Cons., 8, 273-278 (2002).

Smitha, P.G., K. Byrappa and S.N. Ramaswamy: Physico-chemical characteristics of water samples of bantwal Taluk, South-estern Karnataka, India. J. Environ. Biol., 28, 591-595 (2007).