

STUDY ON THE ABUNDANCE AND DISTRIBUTION OF AQUATIC MACROPHYTES IN MAHENDRA NATH POND

Ravindra Kumar Singh,¹ Manoj Kumar Pandey² and Rashmi Kumari³

1,3 Dept of Zoology, J P Univ Chapra

2 Dept. of Zoology , Ganga Singh College Chapra

ABSTRACT

The macrophytes consisted of eight genera of floating plants (apart two species of filamentous algae), nine genera of submerged plant & six genera of emerged or marginal plants. The average value of the macrophytes was found maximum during summer & minimum during monsoon . Perhaps lowering of water level during summer may help them to concentrate & increase its percentage. It showed a positive relationship with total plankton, organic matter & phosphate contents of the soil & total benthos population.

Key words ;macrophytes , submerged plant ,emerged or marginal plants

Introduction

An ecosystem mainly consists of three nutritional groups: Producer organism consisting green plants responsible for synthesizing organic feed; consumers which are mainly animals and decomposed organisms, like bacteria & fungi. The biotic factors depend on the biotic factors for their survival. The fresh water habitats though occupy a relatively small portion of the earth surface in comparison to marine or estuarine habitats, their importance to mankind is far greater as the fresh

water is the most convenient & cheapest source of water for domestic & industrial needs and also provides cheapest waste disposal systems.

The lentil systems like lakes or ponds with their various zones have characteristic organism.

The macrophytes have received very little attention (Krull, 1970, Sarkar 1989, Singh & Roy, 1991) though they form most important element of the aquatic environment manufactures & producing food for aquatic heterotrophic communities. They also provide increased surface area for shelter, site of oviposition, resting & nesting ground etc. to micro invertebrates, aquatic birds & fishes. They also act as reservoir or organic nutrient & Play an important role in nutritional dynamics & maintenance of water quality (Canfield et al 1983). The micro-invertebrates primarily annelids, arthropods & molluscs provide significant support to the aquatic food web responsible for the sustenance of cultivable fishers. At the same time, it also acts as an indicator of trophic structure, water quality and eutrophication of the aquatic system (Lang, 1985). Though considerable work has been done on ecology, taxonomy, abundance, distribution & their association with the macrophytes (Biggs, 1982; Sarkar, 1989; Singh & Roy, 1991; Ahmad, 1998), but practically almost no work has been done on the micro-invertebrate abundance in the aquatic environment of north Bihar especially for mauns.

Materials and Methods

To study the larger aquatic plants (Submerged & emerged plants), a quadrature frame of 1 sq. m. in dimension was used. The collected materials were segregated group /genera wise. The water was completely drained out from the plant materials and weighed as per their qualitative identity. The weight of individual groupings were also added to get the total weight. The transferred area of the quadrature frame was also noted. $W = w/a.o.$

Where , $W =$ Weight of large aquatic plant/sq. meter of bottom surface,

$w =$ Weight larger plants/ composite sample which contained one or more operation.

$a =$ area of quadrature frme in sq. meter

$o =$ Number of operation

Results and Discussion

The macrophytes consisted of eight genera of floating plants (apart two species of filamentous algae), nine genera of submerged plant & six genera of emerged or marginal plants. The average value of the macropohytes was found maximum durig summer & minimum during monsoon . Perhaps lowering of water level during summer may help them to concentrate & increase its percentage. It showed a positive relationship with total plankton, organic matter & phosphate contents of

the soil & total benthos population. The monthly fluctuation of aquatic macrophytes (average value of three stations) was recorded maximum in the month of June (2.17 kg/m² wet up) & minimum during January (1.22 ig/m² wet wt.). Limited presence of aquatic plants is beneficial for the growth of exotic carps.

Table – 1: OCCURANCE OF MACROPHYTES IN MAHENDRA NATH POND

	MACROPHYTES
A	Floating Plants :
	Eichhornia Sp.
	Eurys Sp.
	Hyacinth Sp.
	Pistia Sp.
	Potamogeton Sp.
	Typha Sp.
	Wolfia Sp.
B	Submerged plants
	Azolla Sp.
	Ceratophyllum Sp.
	Elodea Sp.
	Hydrila Sp.
	Lemna Sp.
	Najas Sp.
	Uricularia Sp.
	Vallisharia Sp.
	Zennichellia Sp.

C	Emergent Plants
	Cyperus Sp.
	Scirpus Sp.
	Nymphia Sp.
	Nelumbo Sp.
	Ipomea Sp.
	Jussiacea Sp.

References

Bilgrami, K.S., J.S. Datta, Munshi, R.N. Yadava and B.N. Bhowmick. 1985. Limnological studies of thermal springs of Bihar, India. Proc. Natl. Sci. Acad., 51 B(1):70-77

Chakrabarti, N.M. 1987. Macrobenthic fauna of a sewage fed fish pond. Environ. Ecol., 5(1):149-153.

Chakrabarty, R.D., P. Roy and S.B. Singh. 1959. A quantitative study of the plankton and the physico-chemical conditions of the River Jamuna at Allahabad in 1954-55. Indian J. Fish., 6(1):186-203.

Chandra Ravish. 1988. Riverine fisheries resources of the Ganga and the Brahmaputra. In: A.G. Jhingran and V.V. Sugunan (Eds.), Conservation and Management of Inland Capture Fishery Resources,

Bulletin No.57., Central Inland Capture Fisheries Research Institute (CICFRI), Barrackpore, West Bengal, India, 275 pp.

Chapman,P.M., M.A.Farrel and R.O.Brinkhurst. 1982. Relative tolerances of selected aquatic oligochetes to Individual pollutants and environmental factors. *Aquat. Toxicol.*, 2:47-67.

Chari,M.S. 1985. Aquatic pollution and its effects on the fauna and flora of a freshwater pond at Aligarh, India. *Geobios*, (Spl.vol.), 49 65.

Evans,J.H. 1961. Growth of Lake Victoria phytoplankton in enriched cultures. *Natures. Nature*, 189-417.

Eauvel,P. 1953. The fauna of India including Pakistan, Ceylon, Burma and Malaya, (Annelida,Polychaeta), Edited by R.B. Seymour sewell, The Indian Press Ltd. Allahabad, India, 507 pp.

Fernando, C.H. 1974. A guide to the freshwater fauna of Sri Lanka, (Ceylon). Supplement 3 *Bull. Fish.Res.Stn.Sri Lanka (Ceylon)*, 25:27 81.

Goel,P.K., S.D.Khatavkar, A.Y.Kulkarni and R.K.Trivedy. 1986. Limnological studies of a few freshwater bodies in south western Maharashtra with special reference to their chemistry and phytoplankton. *Polln.Res.*, 5(2):79-84.

Goldman, C.R. 1960 Primary productivity and limiting factors in three lakes of the Alaska Peninsula. *Ecol.Monor.*, 30:207-230

Hutchinson, G.E. 1944. Limnological studies in Connecticut VII. A critical examination of the supposed relationship between phytoplankton periodicity and chemical changes in lake waters. *Ecology*, 25:3-25.

Hutchinson, g.E. 1957. A treatise on Limnology. Vol.1. Geography Physics, and Chemistry. John Wiley, New York, 1015 pp.

Hutchinson, g.E. 1967. A Treatise on Limnology: Vol. II. Introduction to Lake biology and the limnoplankton. John Wiley and Sons, New York, 1115 pp.

Khan A.A and A.G Siddiqui 1971. Primary production in a tropical fish pond at Aligarh, India Hydrobiologia, 37(3-4):447-456.

Khan,A.A. and A.Q.Siddiqui. 1974. Seasonal changes in the limnology of a perennial fish pond at Aligarh. Ind. J.Fish.,21(1):463-478.

Khan,1.A. and A.Khan. 1985. Physico-chemical conditions in Seikha Jheel at Aligarh. Environ. Ecol., 3(2):269-274.

Maciolek J.A 1966. Abundance and character of microseston in California mountain stream Verh Int Verein Theor Angew Limnol 16:639-45;49-433.

Mandal B.K and S.K Moitra 1975. Studies on the bottom fauna of a freshwater fish pond at Bardwan J. Inland Fish Soc. India 8:43-48.

Mann K.H 1978. Estimating the food consumption of fish in nature pp. 250-273. In S.D Gerking (Ed) Ecology of freshwater Fish population Blackwell oxford.

Nasar S.A.K 1973 The zooplankton fauna of Bhagalpur Rotifera J.Bh.U 6:55-62.

Nasar,S.A.K. and J.S.Datta Munshi. 1974.Seasonal variations in physico-chemical and biological properties of a tropicallow pond. Japanese J.Ecol., 24:255-259.

Nasar S.A.K and J.S Datta Mushi 1975 Studies on primary production of freshwater pond Jap.J.Ecol., 25:21-23

Southwood T.R.E. 1978. Ecological Methods with Particular Reference to the study of Insect populations 2nd edition, (Revised). The University Printing House. Cambridge, Great Britain, 524 pp.

Spence, D.H.N. 1964. The macrophytic vegetation of freshwater lakes, swamps and associated fans, p. 306-423. In J.H.Burnett(ed) the vegetation of Scotland. Oliver and Boyd, London.

Sreekumarn C., K.I.Joseph and M.Parmeswaran. 1970. Occurrence of sodium potasinm lubidium calcium and strontium in some Indian rivers. Cur.sci., 5:105-106.

Talling J.F and I.B Talling 1965. The photosynthetic activity of phytoplankton in East African Lakes Int.Rev.ges.Hydrobiol., 50:1 32.

Talling J.F. and I.B Talling 1965. The chemical composition of African lake water. Int.Revue. ges.Hydrobiol., 50(3):421-263.

Talling J.F. 1966. Comparative problems in a tropical and temperate lake. IN:Primary productivity in Aquatic Enviornments. (Ed) C.R. Goldman Univ. Calif.Press, 401-424.

Talling J.F,1973. The application of some electrochemical methods of the measurement of photosynthesis and respiration of freshwater FreshWat. Biol., 3:335-362.

Talling .J.F. 1975. Primary production of freshwater microphytes In:J.P.Cooper (Ed), Photosynthesis and productivity in Different Enviornemts Int.Biol.Progm., 3:225-247

Wetzel,R.G., P.H.Rich, M.C.Miller and H.L.Allen. 1972. Metabolism of dissolved and particulate detrital carbon in a temperate hardwater Lake. Mem. Ist.Ital. Idrobiol., 29 Suppl, 185-243.

Wetzel,R.G. 1982. Limnology. W.B.Saunders Company, Philadelphia