

Qualitative abundance of phytoplankton of Bishleri stream of Banihal, Doda (Jammu & Kashmir state)

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ABSTRACT

The main drainage of the Distt. Doda is the river Chenab formed by the confluence of Chandra and Bhaga streams. The other tributaries of the river Chenab are Neeru stream, Kalnei streams, Chatroo stream, Bishleri stream with a number of their tributaries. The present study was carried for a period of two year from January, 2003 to December, 2004 on Bishleri stream by dividing the stream into different stations. A total of 19 genera of phytoplankton were recorded from the stream, out of them, 07 belong to chlorophyceae, 07 to bacillorophyceae, 04 to cynophyceae and 01 to euglenophyceae. Among the phytoplankton, Bacillariophyceae emerged as the largest group

Key words: Phytoplankton, Bishleri, Banihal.

INTRODUCTION

The knowledge of plankton, available in an ecosystem, is of fundamental importance. Phytoplankton are the chlorophyll bearing suspended microscopic organisms consisting of algae with representatives from all major taxonomic phyla; majority of the members belong to chlorophyceae, cyanophyceae and bacillariophyceae. The quality and quantity of phytoplankton and their seasonal succession patterns have been utilized to assess the quality of water. Phytoplankton encountered in a water body reflects the average ecological condition of water and hence may be used as indicator of water quality. (Sharma and Sharma, 1992). Several Indian scientist (Vyas and Kumar, 1968; Munawar, 1970; Jackson, 1971; Rai and Kumar, 1977; Mathew, 1978; Singh and Swarup, 1979; Jindal and Vasisht, 1981; Ramaswamy *et al.*, 1982; Rishi and Kachroo, 1984; Pandey *et al.*, 1993 and Adesalu and Nwanko, 2005 have worked on phytoplankton of different water bodies in relation to various physico – chemical parameters. The role of phytoplankton in

aquatic productivity has been discussed by Kant and Anand, 1979; Joshi, 1996 and Nautiyal, 1986; who have recorded the fluctuations to the population of phytoplankton during different seasons of the year. Species composition of phytoplankton in any water body is important because different taxa of planktonic algae present different diet values in various development stages of fish and prawns (Nagarajaiah and Gupta, 1985; Nautiyal, 1985 and Gomathi, 1990). Despite of all this, the available literature revealed that the information on the phytoplankton of Bishleri stream are lacking. Therefore, the present study is an endeavour to elucidate the qualitative abundance of phytoplankton of Bishleri stream

MATERIAL AND METHODS

The present study was carried on Bishleri stream by dividing the stream into different stations. For the purpose of estimation of phytoplankton, monthly sampling was made between 9.00 to 11.00 hours at each station for the period of two years. One litre of water sample was collected by filtering

100 litres of water through plankton net of bolting silk No 25. (0.06 mm mesh size). Lugol's solution was added to this water for preserving the phytoplankton. The sample was then brought to the laboratory for qualitative analyses. It was kept for sedimentation in one litre measuring capacity cylinder for 24 hours after adding Lugol's solution and identification was carried out with the help of guidelines given by Needham and Needham (1962) and APHA (1995).

RESULTS AND DISCUSSION

In all, 19 genera of phytoplankton were identified during the period of two year's investigation. Out of 19 genera recorded, 7 belonged to Bacillariophyceae; 7 to Chlorophyceae; 4 to Cynophyceae and 1 to Euglenophyceae. Among the phytoplankton, Bacillariophyceae emerged as the largest group and was represented by *Achnanthes*, *Asterionella*, *Amphora*, *Cyclotella*, *Cymbella*, *Gomphonema* and *Navicula* genera. The Chlorophyceae and Cynophyceae ranked 2nd and 3rd respectively. The genera recorded from Chlorophyceae were *Closterium*, *Closteridium*, *Cosmarium*, *Gonium*, *Microspora*, *Spirogyra* and *Uronema*. The Cynophyceae was represented by *Anabaena*, *Choococcus*, *Gloeotrichia* and *Oscillatoria*, where as the Euglenophyceae is represented by only one genus i.e *Phacus*, which

remained absent at all the sampling stations of the stream except station 2nd, where it appeared occasionally in May and August, 2003 and April, May, June and September, 2004.

The maximum abundance phytoplankton was recorded during May, 2003 and June, 2004, where as minimum was recorded during the month of November in both the years of investigation. The phytoplankton population was found to increase slightly during the month of February which decline during March. From March onward, it started to increase again and reached its maximum in May, 2003 and June, 2004 and thereafter it got declined again. Khan *et al.* (1998) worked on the phytoplankton of river Ganga at Narora and reported phytoplankton population increased from spring onward, reached its maximum in summer and then declined again. The reason for the decline in phytoplankton population in March, as observed during present investigation, may be assigned to the increase in water level of the stream because of melting of snow and rains. This finding confirms with the observations recorded by Koford (1903), Chakraborty *et al.* (1959), Dad (1981) and Gupta *et al.* (1985).

The overall low density of phytoplankton plankton was probably due to occasional floods and fast current of the stream water.

REFERENCES

1. Adesalu, T.A and Nwanko, D.I. Studies on phytoplankton of Olerocreek and parts of Benin river, Nigeria. *The Ekol.* **1-2**: 21-23 (2005).
2. APHA, "Standard methods for the examination of water and wastewater." *Published jointly by American public health association, American water works association and water pollution control federation*, New York, 16th ed. 1268 (1995).
3. Chakraborty, R. D; Ray, P. and Singh, S.B. "A Quantitative study of the plankton and physico – chemical conditions of the river Yamuna at Allahabad in 1954 – 55." *India. J. Fish.* **6**: 186-203 (1959).
4. Dad, N. K. "Limnological studies on Chambal river with special reference to pollution." *Ph. D. thesis*; Vikram university (1981).
5. Gomathi. "Studies on the hydrology and the abundance of phytoplankton in fish culture ponds." *M.Sc Dissertation Cochin Univ. Sci. and Technol.* 96 (1990).
6. Gupta, S. K; Grover, S. P. and Saxena, R. M. "Limnological studies on the river Paisuni at Chitrakoot Dham (Banda. U.P.) Part-1: Physico – chemical complex and the biota." *Intl. J. Acad. Ichthy.* **2** (Proc.V.AISI) **6**: 73-83 (1985).
7. Jackson, D. F. "Comparative studies on phytoplankton photosynthesis in relation to

- total alkalinity" *ver. Int. ver. Limno.* **14**: 125-133 (1971).
8. Jindal, R. and Vasisht, H.S. "Hydro biological studies of a tributary Sirhind Canal at Sangur (Punjab, India)." *In: Proc. Syrn. Ecol. Anim. Pop. Zool. Surv. India.* **2**: 1-17 (1981).
 9. Joshi, C. B. "Hydrobiological studies on the river Kallayi in Kerella". *Indian J. Fish.* **23**(1&2); 72-73 (1996).
 10. Kant, S. and Anand, V.K. "Interrelationship of phytoplankton and physical factors in Mansar Lake, Jammu(J&K)". *Indian Ecol.* **5**(2): 134-140 (1979).
 11. Khan Asif, A.; Aftabalam and Rajeev, K.Gaur "Seasonal variations in the abundance & composition of phytoplankton in river Ganga at Nabra, U.P". *Inland. Fish. Soc. India*, **30**(1): 79-86 (1998).
 12. Kofoild, C. A. "The planktons of the Illinois river, 1994-1899, with introductory notes upon the hydrography of the Illinois river & its basin, part-I, Qualitative investigations and general results." *Bull. Ill. Lab. Nat.Hist.*, **6**; 95-629 (1903).
 13. Mathew, P. M. "Limnological investigation on the Plankton of Govindgarh lake and correlation with physico – chemical factors." *Proc. Sem. Ecol. Fish. Freshwater Reservior*: 37-46 (1978)..
 14. Munawar, M. "Limnological studies on Fresh water Ponds of Hyderabad. India". *Hydrobiol.* **36**(1): 105-128 (1970).
 15. Nagarajaiah, C.S. and Gupta, T.R.C. "seasonal fluctuation of Plankton in brackish water ponds of Nethravathi estuary. Mangalore.1. phytoplanktons." *Mysore J.Agri. Sci*, **19**: 115-120 (1985).
 16. Nautiyal, P. "Studies on the riverine ecology of torrential waters in the Indian uplands of the Garhwal region-III; floristic & faunistic survey." *Trop. Ecol.* **27**: 157-165 (1986).
 17. Nautiyal, P. "Studies on the river ecology of torrential waters in the Indian uplands 1. Seasonal variations in percentage occurrence of planktonic algae." *U.P. J. Zool.* **5**(1); 14-19 (1985).
 18. Needham, J.G. and Needham, P.R. "Fresh water Biology." *Holden Day Inc, San Francisco* (1962).
 19. Pandey, B. N; Jha, A. K. and Das, P.K.L."Hydrobioloical study of a swamp at Purnia, Bihar in relation to its Phytoplankton fauna". *J. Ecobiol.* **6**(1): 13-16 (1994).
 20. Pandey, B.N; Kumar, K; Lal, A.K and Dass, P.K.L."The Preliminary study on the Physico – chemical quality of water of the river Koshi at Purnia". *J.Ecobiol*, **5**(3). 237-239 (1993).
 21. Rai, L. C. and Kumar, H.D. "Studies on the seasonal variation in the algal communities of a pond polluted with fertilizers of actor effluent". *Ind. J.Ecol*, **4**: 124-131 (1977).
 22. Ramaswamy, S. N; Somashekar, P. K and Arekal, G.D. "Ecological studies on algae in waste water from rubber tyre factory". *Indian.J. Environ. Heth.* **24**: 1-7 (1982).
 23. Rishi, V. and Kachroo, P. "Euglenophyceae of Dood Hanga stream Kashmir". *Phykos.* **23**: 65-70 (1984).
 24. Singh, S. R and Swarup, K. "Limnological studies on surhan lake (Ballia) 2nd. The periodicity of Phytoplanktons". *J.Ind. Bot. Soc.* **58**(4): 319-329 (1979).
 25. Vyas, L. N. and Kumar, H. D. "Studies on phytoplankton and other algae of India sagar Tank, Udaipur, India." *Hydrobiol.* **31**: 421-434 (1968).