



Algal Diversity of River Meenachil in Kerala, India

KEYWORDS

RIVER MEENACHIL, ALGAL DIVERSITY, KERALA

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ABSTRACT *River Meenachil is one of the important river in Kottayam district which emerges from Western Ghats with a total length of 78 km and has a catchment area of 1272sq.km with a myriad of ecological, anthropological and biodiversity whereabouts. However, the algal diversity in the river is an unexplored area and hence the present study. The present study is an attempt to record the algal diversity among selected sites during the pre-monsoon and monsoon period during 2014. The specimens were preserved at the site itself and brought to the laboratory and observed under microscope for identification. A total of 16 algal genera were observed in the study. Interestingly, the phytoplankton was more abundant in the pre- monsoon when compared with the monsoon period. As the river host diverse algal species more conservation efforts with involvement of local people are the need of the hour.*

INTRODUCTION

Algae form a vital component of aquatic flora and has significant role in maintenance of proper equilibrium of abiotic and biotic components in aquatic ecosystem. Microalgae have a plethora of applications as pharmaceuticals, health foods, carotenoids, restriction endonucleases and in bioremediation of industrial effluent. Moreover, algae are used as biological indicators of water pollution in many countries. In addition, the algal flora represents a critical link in the food chain and its productivity depends on water quality at a given time (Meshram, and Dhande, 2000; Santhanam and Peruma, 2003).

Meenachil river, one of the key rivers in Kottayam district, emerges from Western Ghats, flows through the taluks of Meenachil, Vaikom and Kottayam and drains into Lake Vembanad. River Meenachil has 47 sub-watersheds and 114 micro- watersheds. The river has major and minor 38 tributaries. The river basin falls within the realm of tropical climate and the annual temperature of the area varies between 24^o and 32^o C. The annual rainfall varies from less than 100 to more than 500 cm with an average of 300 cm. It is the main source of water supply to the nearby panchayaths/townships. However, there exists a lacuna of studies about algal diversity in the river. Present attempt is to identify the phytoplanktons of the river during the pre monsoon and monsoon period of 2014.

MATERIALS AND METHODS

Water samples were collected from 15 sites from Erattupetta to Kottayam stretch of the River Meenachil during the pre-monsoon and monsoon period of 2014. Plankton net (mesh size 25 µm) was swept on surface water (Secchi's disc transparency zone) and plankton collected were transferred into separate plastic bottle/containers. Surface water was sieved through plankton net to obtain planktons. The algal samples were preserved in 4% formalin Bacillariophyceae forms were studied after cleaning by the method called "Mixgen" as described by Prasad and Singh (1996). Glycerine was used for mounting the material and observed under compound microscope. The algal genera were identified by observing various characteristics referring various monographs and literatures (Desikachary, T. V. 1959; Anand, N. 1998 and Krishnamurthy, 2000).

RESULTS AND DISCUSSION

Algae are distinct autotrophic micro community which carryout 90% of the photosynthetic activities which contribute to approximately half of the total global primary production (Graham and Wilcox 2000). Algae are pivotal to the functioning of global ecosystems as they are cosmopolitan in distribution (Patova and Dorokhova, 2008). Algae have significant role in oxygenation of the surroundings, which is unavoidable to root growth. Several studies pointed out the effectiveness of algal population in sustainable management of soil fertility. Therefore, identification of algal species in every ecosystem is much needed.

In the present study a total of 16 species of algae was identified from the collected samples across River Meenachil (Table 1). Genus *Oscillatoria* was more diverse (3 species) followed by *Cosmarium*, *Lyngbya* and *Anabaena* (2 species). It is well known that seasonal variations affect algal growth and specific terrestrial habitat conditions such as weather or water quality parameters have also commendable influences on algal population. Variations in the quantity and quality of diverse species of green algae in relation to the specific environmental conditions are evident from the results presented in Table 1. It should be noted that seasonal influence and specific soil characteristics were found to be the important factors governing algal diversity (Meshram and Dhande, 2000 and Krishnamoorthy et al., 2007).

The typical geomorphological features on the banks of the river have also impact on the algal population. Soil texture and organic carbon content are highly significant factors affecting the abundance and species diversity of algae (El-Gamal et al., 2008). Moreover, pollution and discharge of municipal sewage was also another contributing factor for algal population. It should be noted that River Meenachil is also not an exception and iextensive pollution in the river was reported by many workers (Indu et al., 2010).

CONCLUSION

The presence or absence of algal species will depend on its environmental tolerance, pollution status of the water body. In present study, basic information of the phytoplanktons distribution across River Meenachil will form a useful tool for further ecological assessment and monitoring studies.

Sl. No.	Algal species identified	Frequency of occurrence (%)	
		Pre-monsoon	Monsoon
1.	Monoraphidium elongatum	47.05	35.26
2.	Closterium granulopolaris	17.64	0
3.	Cosmarium bikopa	50	12.5
4.	Cosmarium spinoreniformis	75	50
5.	Closterium bumeranga	31.25	75
6.	Oscillatoria rubescens	93.75	43.75
7.	Oscillatoria splendida	75	56.25
8.	Oscillatoria laete-virens	75	12.5
9.	Oscillatoria laete-virens	31.25	12.5
10.	Microcystis aeruginosa	62.50	25
11.	Phormidium tenue	68.75	50
12.	Lyngbya ceylanica	81.25	93.75
13.	Lyngbya kuetzingii	93.75	56.25
14.	Nostoc commune	68.75	25
15.	Anabaena circinalis	75	31.25
16.	Anabaena circinalis	62.50	81.25
	Spirogyra violacea		

Table 1: List of algal species identified from River Meenachil

REFERENCES

- Anand, N. 1998. Indian freshwater Microalgae. Bishen Singh mahendrapal Singh, 23-A, Cannught Place, Dehra Dun, 94 pp.
- Desikachary, T. V. 1959. Cyanophyceae, Indian council of Agricultural Research, New Delhi, 1-686 pp.
- El-Gamal A.D., Nady A., Ghanem E., Eisha Y.E., I- Ayouty and Shehatha E. F. 2008. Studies on soil algal flora in Kafrel- sheikh Governnorate of Egypt. Egyptian Journal of Phycology 9: 1-23
- Graham, L.E. and Wilcox L.W. 2000. Algae of Upper Saddle River, New Jersey. Prentice Hall.
- Indu. V. N., Singh, K., Arumugam, M. and Clarson, D. 2010. Assessment of trace metal pollution in surface water of Meenachil River at Kottayam, Kerala, India. International Journal of Earth Sciences and Engineering. Vol. 03, No. 05, pp. 681-690.
- Krishnamoorthy, G., S. Rajalakshmi and D. Sakthivel. 2007. Diversity of plankton in mangrove areas of Puducherry, India. J. Aqua. Biol., 22, 45-48
- Krishnamurthy V. 2000. Algae of India and Neighbouring countries. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
- Meshram, C.B. & R.R. Dhande. 2000. Algal diversity with respect to pollution status of Wadali lake, Amaravati, Maharashtra, India. J. Aqua. Biol., 15, 1-5
- Meshram, C.B. and R.R. Dhande. 2000. Algal diversity with respect to pollution status of wadali lake, Amaravati, Maharashtra, India. J. Aqua. Biol., 15, 1-5
- Patova E.N. and Dorokhova M.F. 2008. Green algae in tundra soils affected by coal mine pollutions. Biologia 63 (6): 831-835.
- Prasad, B. N. and Singh, Y. 1996. Algal indicators of water pollution. Bishen Singh Mahendrapal Singh, 23-A, Dehra Dun.
- Santhanam, P. and Peruma. L 2003. Diversity of Zooplankton in Parangipettai coastal waters, south east coast of India. J. Mar. Biol. Ass. India, 45, 144-151.