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Original Article

Studies On Limnological Aspects In River Noyyal, Tamilnadu-India

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ABSTRACT

The water samples were collected from two selected stations of the river Noyyal for the analysis of physicochemical characteristics and planktons. The study clearly indicates that the station I was unpolluted zone where as station II was found to be highly polluted as the number of parameters exceeded the tolerable limit. In addition, the phytoplankton were available in plenty at station I but only pollutant resistant species of plankton were identified at station II. The results were tabulated and discussed.

Keywords:

Limnological Aspects , River Noyyal , physicochemical characteristics and planktons.

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Introduction

Rivers are the major freshwater aquatic ecosystem which plays a major role as natural source of water. Till the mid 1970s, most of the Indian rivers were reasonably clean. But majority of them are getting polluted thereafter as the quantum of pollutants discharged into the rivers from factories and households increased. The wastes entering in to the rivers upset the physico chemical equilibrium of the rivers, modified the biotic communities and affect the species composition and biodiversity. The dynamics of phytoplankton's and zooplanktons have been studied extensively in lentic fresh water but only little work is focused on lotic waters. This is because the survey and sampling of planktons in fresh water river put forth practical difficulties.

The hydrobiology of Indian rivers with reference to planktons has been well established by many workers (Mishra *et al.*, 2008; Jintal *et al.*,2010; Sharma and Mankodi,2011;Suresh *et al.*,2011)The phytoplankton's are the most important producers in aquatic environment and they determine the basic primary productivity of the ecosystem. The planktons are very sensitive to the environment in which they live and any alteration in the environment leads to a change in the plankton community.

In the present work, water samples from two different stations of river Noyyal were analysed for physicochemical characteristics and plankton community.

Study Area

In the present investigation, the water samples and planktons were collected from two major stations at the river Noyyal Boluvampatti which is unpolluted with rich vegetation upstreems Join at Coimbatore and Alangadu which is highly polluted downstream zone at Tiruppur 64 Km away from the first stations. The river Noyyal is tributary of river Cauvery, originating in the Vellingiri hills of Western Ghats, running through Coimbatore, Erode and Trichy districts over a distance of 180 kms covering an area of 3510 km 2 and joining the river Cauvery at kodumudi (fig. 1)

Materials And Methods

The surface water samples were collected from the selected stations of the Noyyal river in free cleared sterilized polythein containers brought to the laboratory and stored at 4^{o} C. Various physicochemicals characteristics of waters samples and planktons were analysed by following the method given by APHA(1989).

Results And Discussion

The physico chemical parameters of the water samples from two different stations of the river Noyyal were shown in Table-1. The water sample from the station I was clear and colourless where as the samples from station II was black in colour with high levels of Electrical conductivity, total dissolved solids, Biological Oxygen Demand, alkalinity, chlorides and sulphates which were above the permissible limit.

The first effect of organic pollution is and immediate increase in concentrations of various salts and the values higher than 500 mg/l are often associated with pollution (Sujata sen *et al.*, 2011). As proposed by Pramod kumar *et al.*,(2014), an increase in conductivity could indicate a heavy pollution loads in the sample from station II of the Noyyal river. The increased BOD values in the present study could be attributed to discharge of municipal and industrial waste as also absorbed by Varunprasath et al., (2010). Zahoor *et al.*,(2012) has noticed that the enhanced hardness in water is due to the increased levels of calcium and magnesium. The same is also true in the present study where the higher concentrations of calcium and magnesium could have increased the hardness of the water from stations II. In the opinion of Khama *et al.*, (2011), a high level of alkalinity in the water sample indicates a high level of pollution load. The raised level of various nutrients in the water sample of station II could become toxic to aquatic organism.

The dynamics of plankton populations is highly influenced by the climatic conditions as well as by the physicochemical characteristics of the water bodies. Shivaraju,(2011) has pointed out that the water bodies with good physicochemical conditions which support maximum number of planktons. Thus the analysis of planktons in water bodies could provide an effective mode of monitoring the water sources for water quality. Therefore, the planktons play an important role as suitable pollution indicators because they are capable of quantifying changes in water quality (Naik *et al.*, 2005; Zargar and Ghosh.,2006;veena *et al.*, 2014).

The distribution of planktons collected from two stations of river Noyyal is reported in Table 2. While only phytoplanktons were available at station I, number of Zooplankton were identified has indicated in table 2. It is evident that certain numbers of plankton which are tolerant to organic pollution and resist the stress caused by pollutants ate found abundant in polluted areas of water courses (Babu et al.,2014;Kamble et al.,2013; Annalakshmi and Amsath, 2012). This observation coincides the present investigation in which the pollutant-tolerable plankton species were identified in the water sample of station II. Daulal bohra et al.,(2014) has also found that the susceptible species of planktons completely disappear in polluted water where as the tolerant ones tend to flourish and dominate causing disruption of entire food chain.

Table-1
Physicochemical characteristics of the water samples collected at two stations of the river Noyyal

Characteristics	Stations	
	I	II
pH	7.67	7.89
Electrical Conductivity	249	1792
TDS	155	1117
DO	8.49	6.47
BOD	23	61
COD	68	176
Total hardness	24.86	94.62
Ca	6	28
Mg	2.4	6.0
Total alkalinity	100	250
Chloride	85	283
SO_4	0.05	0.03
PO_4	4.0	7.5
Nitrite	3.36	6.72

All values are in mg/l except pH and EC (mmhos).

Table-2
Planktons collected at two stations of the river Noyyal

Station-I	Station-II
1. *Euglena sp.*(Euglena phyta)	1. *Paramecium sp.*(Protozoa) 2. *Moina sp.* (Cladocera) 3. *Cyclops sp.* 4. *Naupli sp* } Copepoda 5. *Diaptomus sp* 6. *Branchionus sp* 7. Encyste eggs } Potifera 8. Larvae of mosquito

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