RESEARCH ARTICLE

MICROALGAL DIVERSITY OF DAYYAM VAGU, A PERENNIAL RIVER OF ETTURNAGARAM WILDLIFE SANCTUARY, WARANGAL DISTRICT, TELANGANA, INDIA

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Abstract: In the present research an attempt has been made to assess the distribution pattern of Micro algal diversity of DayyamVagu, a perennial river of Etturnagaram Wildlife sanctuary, Warangal District, Telangana, India. Comparative study of various stations of the river is unique. This type of study is new to this perennial river. As the river is passing through the entire stretch of the sanctuary, it is quite possible that there is some difference in algal composition among the different river stations. This paper deals with the micro algal diversity of DayyamVagu which passes through the Etturnagaram wildlife sanctuary of Telangana. This study was carried out during the year 2016.The samples were taken from four fixed stations of the river during the dry season of the year. During the study period 48 species of algae were observed from various stations, during the year 2016. In the present study 12 Bascillariophyceae, 19 Chlorophyceae, and 17 Cyanophyceae members were observed.

Keywords : Wildlife sanctuary, Perennial River, Micro algae, Diversity

INTRODUCTION

Rivers are dynamic systems, in which several biotic and abiotic variables change in space and time due to different processes (Kobbia *et al.*, 1991). Phytoplankton are the primary producers in all aquatic systems and may account for a significant portion of system primary productivity (Vollenweider 1974; Townsend *et al.*, 2000; Ariyadej, *et al.*, 2004; Sridhar *et al.*, 2006; Conde *et al.*, 2007; Mathivanan *et al.*, 2007;Tas *et al.*,2007;Saravanakumar *et al.*, 2008; Sivakumar and Senthilkumar, 2008). Biomass and productivity of phytoplankton in different size ranges are important factors regulating the productivity of higher tropic-level organisms. According to Wehr and Descy (1998), phytoplankton communities are major producers of organic carbon in large rivers, a food source for planktonic consumers and may represents the primary oxygen source in many low-gradient rivers (Davies *et al.*, 2009).

Algae are a large and diverse group of simple, typically autotrophic organisms, ranging from unicellular to multicellular forms (Casamatta et al., 1999). In aquatic ecosystems phytoplankton play an important role in the ecology of water bodies through primary production. Studies on planktonic composition and physico-chemical characteristics of water are necessary to acquire basic knowledge on the biodiversity status of a water body. Algal flora varies from season to season and an important feature of freshwater algal flora is its cosmopolitanism (). Latha and Ramachandra Mohan (2010), Leela *et al.* (2010), Ramadosu and Sivakumar (2010) and Chinnaiah *et al.* (2011) studied on various fresh water bodies and described about algal population studies.

MATERIAL AND METHOD

Location

Standing atop an undulating terrain on 812 sq km of land is the oldest wildlife sanctuary in the state, the Eturnagaram Wildlife Sanctuary**.** The wildlife sanctuary is situated in Eturnagaram village of Warangal District in the state of Telangana. It boasts of verdant valleys that give way to the pristine waters of the Godavari River and provide shelter to an amazing range of biodiversity. The sanctuary is equipped with an 'all-in-one' topography comprising of plains, slopes, hills, streams and springs. The presence of embryonic species of ephemeral elements makes this sanctuary a rare eco-region. This place displays nature's beauty at its best- steep slopes to gentle slopes from west to east, hilly with many streams and springs and the Godavari River passing right through the sanctuary. In such a wonderful atmosphere wildlife is bound to thrive. DayyamVagu, a perennial water source divides Eturnagaram Wildlife Sanctuary into almost two halves and provides valuable resources for the animal and plant life within. It flows through the entire stretch of the sanctuary (Map 1).

In the present work an attempt has been made to assess the algal diversity of DayyamVagu. Comparative study of various stations of the river is unique. This type of study is new to this perennial river during the dry season of the year. As the area of the river is passing through the entire stretch of wildlife sanctuary, it is quite possible that there could be some difference in algal composition among the different river stations, even though there is a low flow of water during the research period.

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Phytoplankton collection

Phytoplankton samples were collected monthly from the four selected stations of the river for a period of six months, December 2015 to May 2016. The collections were made early in the morning by using a standard plankton net (No.25) with 30cm mouth diameter and length of 1m. 100 liter of surface water was filtered andthe filtrate was put into a clean labeled plastic containers. The volume of the concentrate wasadjusted to 25ml and it was preserved immediately with 4% formalin for further analysis.

Counting

From the collected and concentrated filtrate 1ml of the sample was taken, after shaking the concentrate in order to get an even distribution of planktonic organisms for analysis. The analysis was repeated for 10 times and computed. The average number is expressed in per cubic / meter.

Identification

The collected microalgae were identified by using standard literatures (Desikachary, 1959; Prescott,1978; Anand, 1998). An artificial key was prepared after observing the important character of all forms collected and their systematic position is given below following Fritsch (1935) classification.

RESULT AND CONCLUSION

During the study period 48 species of algae were observed from various stations, during the sampling period, 12 Bascillariophyceae, 19 Chlorophyceae and 17 Cyanophyceae members were observed (Table1).Among these algae *Navicula, Merismopedia, Oscillatoria, Scenedesmus* were economically used as feed, food, biocatalyst, biofuels and bio fertilizers.Further study is needed to find out the causes of pollution and the influences of algal flora in indicating the water quality of the river DayyamVagu. From the study it can be concluded that the river system shows some pollution indicators with a rich biodiversity of algal groups even in the dry season of the river with low flow.

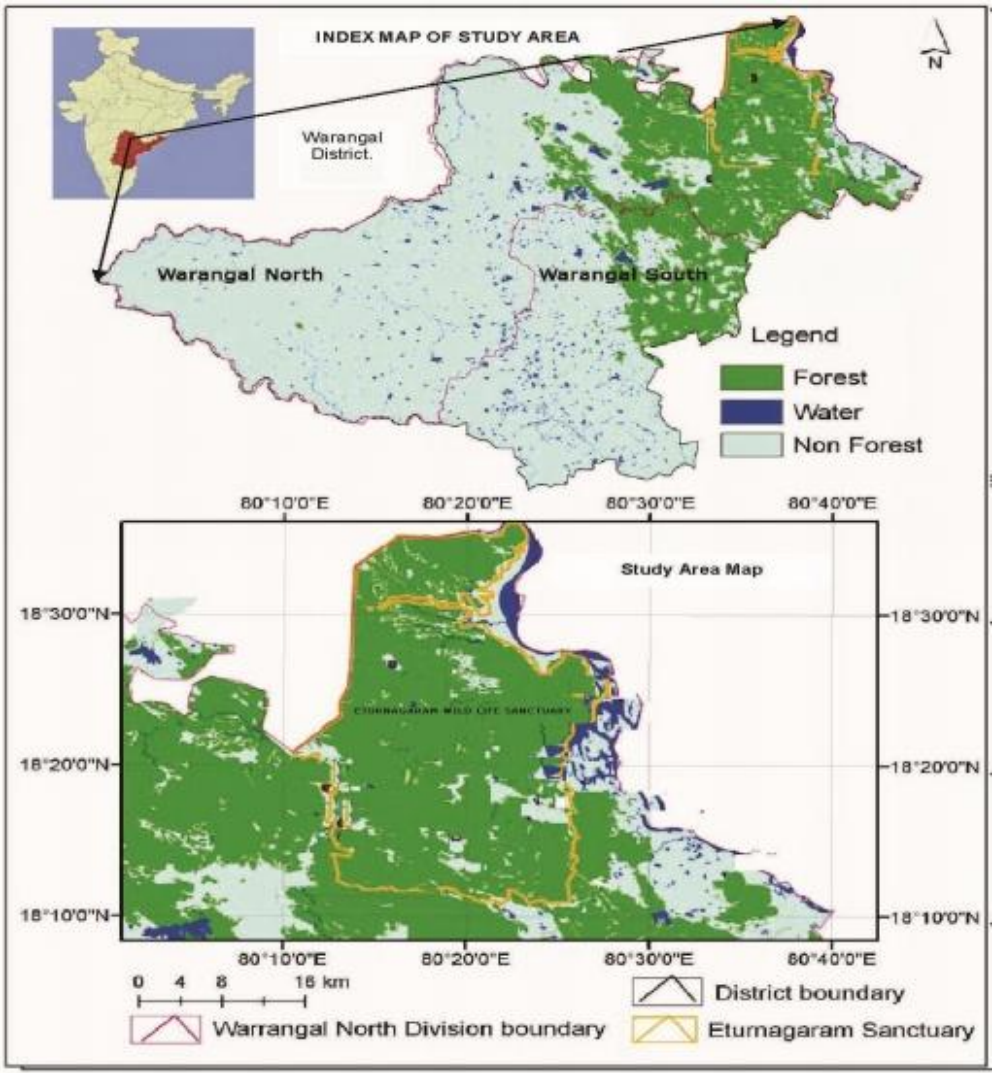
Table 1. List of micro algae found in various stations of Dayyam Vagu

Class and Name of algae	Station I	StationII	StationIII	Station IV
1. Chlorella vulgaris	+	-	+	-
2. Scenedesmusacuminatus	+	+	+	+
3. Hydrodictyonreticulatum	+	+	+	-
4. Selenastrumbibraianum	+	+	+	+
5. Closteriumacutum	-	+	-	+
6. Cosmariumcorda	-	+	-	+
7. Pandorinamorum	+	-	+	+
8. Ankistrodesmusfalcatum	+	-	+	+
9. Closteriumcalosporum	-	+	-	-
10. Characiumangustum	-	+	-	-
11. Coelastrummicrosporum	-	-	-	+
12. Crucigeniacrucifera	+	-	+	+
13. Microsporaamoena	+	+	+	-
14. Pediastrumboryanum	+	-	+	-
15. Stigeocloniumtenuae	+	+	+	+
16. Tetraedrontribobulatum	+	+	+	
17. Ulothrixzonata	+	+	+	+
18. Cosmariumcyclecum	-	+	-	-
19. Characoralina	-	-	+	-
CYANOPHYCEAE				
Chroococcusminimus	+	-	-	-
Microcystis aeruginosa	-	-	+	-
Oscillatoriaamphigranulata	-	-	-	+
Oscillatorialimnosa	+	+	+	+
Oscillatoriaproboscida	-	+	+	-
Oscillatoriaprinceps	+	+	+	+
Oscillatoria tenuis	+	+	+	+
Lyngbya major	+	+	+	-
Chroococcusturgidis	+	+	+	+
Chroococcus disperses	+	+	+	+

Merismopediatenuissima	-	-	-	+
Merismopediaelegans	-	+	-	-
Merismopediaglauca	+	+	+	+
Microcystis aeruginosa	+	+	+	+
Microcystislamelliformis	+	-	-	-
Microcystisrobusta	+	-	-	-
Arthrospira sp.	+	-	-	-
BACILLARIOPHYCEAE				
Synedra ulna	+	+	+	+
Navicula cuspidate	+	+	+	+
Pinnularisgibba	-	+	+	+
Cymbellaaffinis	-	+	+	+
Nitzschiaacicularis	-	+	-	+
Pinnulariaviroidis	+	-	+	+
Pinnulariaclasterium		-	+	+
Pinnularia tabulate.	+	+	-	+
Cymbellatumida	+	+	-	+
Nitzschiapalea	+	-	-	+
Synedra ulna	+		+	-
Synedragracilis	+	-	-	-

+ Present
- Absent

Map 1. Showing the research location



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