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Studies on Algal Biodiversity of Tapti River in Burhanpur District of Madhya Pradesh, India

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Abstract – The present investigation was undertaken with a view to study algal biodiversity of Tapti River in Burhanpur District of Madhya Pradesh, India. The research Work was performed during June 2015 to May 2017, Altogether 26 genera were indentified and recorded from different 10 sites of Tapti River during the two year period of investigation of these 13 genera belonged to chlorophyceae 06 genera belonged to Becillariophyceae, 04 genera belonged to Cyanophyceae, 02 genera belonged to charophyceae and 01 genera belonged to Euglenophyceae. The members of chlorophyceae were dominant followed by becillariophyceae, charophyceae and euglenophyceae. Diversity of algae in terms quantity and quality were observed at all selected sites of Tapti River. Unicellular, colonial and filamentous algal forms were reported throughout the period of investigation. The algal gehera whose species recorded at all sites of study area were sjzivogyra, zygneto cosmarium, Nit3 sehia, Euglena, Chlorococcus, oscillatoria and Phormidium (see table :1 & table:2 & Plate 1,2,3A, 3B)

Key Words: Algal Biodiversity, Burhanpur, Tapti River, Madhya Pradesh, India.

I. INTRODUCTION

Algal are the most widespread and abundant photosynthetic life in aquatic as well as terrestrial ecosystem. Algae gain its importance in the modern time not only as alternative potential source of protein for the hungry man but also as the primary source of food for aquatic animals. Palmer (1969), Trivedy and goel (1980) have reported different algal forms as an indicator of water pollution. The accumulation of algae at or near source f the water is called as “**Algal Blooms**” or “**mats**” riew of literature reveals that the algal biodiversity in East Nimar is still in infacy. Therefore to fulfill this lacuna, it has been decided to work on algal biodiversity of Tapti River in Burhanpur District of Madhya Pradesh, India.

II. METERAIL AND METHODS

Fortnightly collection of water sample was done from all the 10 Sites (Before samshan ghat [S₁] to Tapti river [S₁₀])of Tapti river in Burhanpur, M.p India. (See table:1) Physiochemical parameters where analyzed wing standard methods of APHA (1998) and Khanna and Bhutiani (2008). The algal sample collection carried out with the help of trunete eone shape plankton net the plankton net is made of bolting Silk No. 25 Standard grade. This has an aperture size of 0.64 mm. The Sample Was eoncentrated by Sedimentation method, removing this Supernatant by decanting and the desired final volume was obtained. For counting, 1 ml of Concentrated sample was taken

and placed Sedgwick Rafter Counting cell following the Standard methods of APHA (1998).Trivedi And Goel (1986), hutChinson (1967), and Khanna and Bhutiani (2008), The Concentrated was preserved in 4% Formatin for study (Wetch,1952). (See Table:1 & Table:2), Given Formula is used to calculate percentage.

$$\text{Percent} = \frac{\text{No. of genera}}{\text{Total No. of genera}} \times 100$$

Total No. of genera

Table: 1

Sample Collected from 10 different Sites/location

S. No.	Source	Sample Location	Sites
01	Tapti river	Before Samshn ghat	S ₁
02	Tapti river	Shamshan ghat	S ₂
03	Tapti river	Nagzhiri ghat	S ₃
04	Tapti river	Rajghat	S ₄
05	Tapti river	Jainabad Bridge	S ₅
06	Tapti river	Satiyara ghat-1	S ₆
07	Tapti river	Satiyara ghat-2	S ₇
08	Tapti river	Big Pool Bridge	S ₈
09	Tapti river	Small Pool Bridge	8 ₉
10	Tapti river	After Small Bridge	8 ₁₀

Table:2

Algal genera common in water habitat of Tapti River in Burhanpur. District of Madhya Pradesh, India

S. No	Name of Algae / genera	Class	Total No. of genera	Percentage %
01	Chlorella, Cosmarium, oedogonium, Pediatum, scendesmus, Spirogyra, Ulothrix, Hydrodictyon, Chladophora, chlorococcus, Desmidium, zygnuma, and volvox	Chlorophyceae	13	50.0
02	Navicula, Nitzschia, Fragilaria, Pinnularia, Cymbella. And Cyclotella.	Becillariophyceae	06	23.7
03	Oscillatoria, Spirulina, Nostoc, Phormidium	Cyanophyceae	04	15.3
04	Chara, Nitella	Charophyceae	02	7.6
05	Euglena	Euglenophyceae	01	3.8
Total	26	05	26	100.4

III. RESULTS AND DISCUSSIONS

The information on algal biodiversity is essential in monitoring and management of a aquatic ecosystems.

The result & Discussions are summarized as below:-

- In present study overall 26 genera were recorded from five groups of algae i.e chlorophyceae, Bacillariophyceae, eynophyceae, charophyceae and eliglinophyceae.
- Chlorophyceae group Was dominant as it was represent by (13) genera, Becillariophyceae (06) genera, eyanophyceae (4) genera, charophyceae (2) genera and euglenophyceae (01) genera. (See table: 2 & Plate 1,2,3,)
- The composition of chlorophyceae was greater in genera composition as compared to the other group of algae.
- Class wise percentage contribution study of algal genera reveals that highest contribution was of chlorophyceae (50.0%) followed by Becillariophyceae (23.7%) eyanophyceae (15.3%), chlorophyceae (7.6%) and Euglenophyceae (3.8%).(See Fig:1 & Fig:2)
- During present investigation it is observed that algal bloom formation starts in ther month of September reaching a peak in the month of

November to January . The blooms exists up to may.

- Algal genera of 10 selected sites of Tapri river is very rich and it is found in diverse form. (See Table:1& Plate:1,2,3)

IV. CONCLUSION

- Algae Biodiversity Composition:** In present investigation algal genera such as Cosmarium, spirogyra, scendesmus, zygnuma, Ulothrix, Pediatum, Phormidium, Oscillatoria, Spirulina, Fragilaria Pinnularia, and Euglena were dominant.
- Seasonal Variation:** Winter and summer seasons are found favourable for the growth of algae.
- Pollution index:** For Pollution index study, Pollution tolerant genera of algae were recorded from all Sites of Study area. The Pollution tolerant genera which were recorded at all sites are Euglena, Oscillatoria, Scendesmus, Phormidium, spirogyra, and cosmarium.
- Algal genera of satnding and running water habitats:** Maximum algal forms were found at standing water sites as compared to running water sites.
- Algal Blooms:**Algal blooms are cladophora, zygnuma, Oscillataria, phormidium and hydrodictyon
- Epiphytic Algal:** Algae epiphytic on aquatic angiosperms like cyperus sp. , Ipomoea sp. And Typha sp. Were collected and observed. i.e. Ulothrix, Oedogonium pinnularia.

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Fig. 4 - Floating Algae



Fig.1 - Tapti River Showing Selected Sites (Before Shamshan Ghat S1 to After Small Bridge S10)

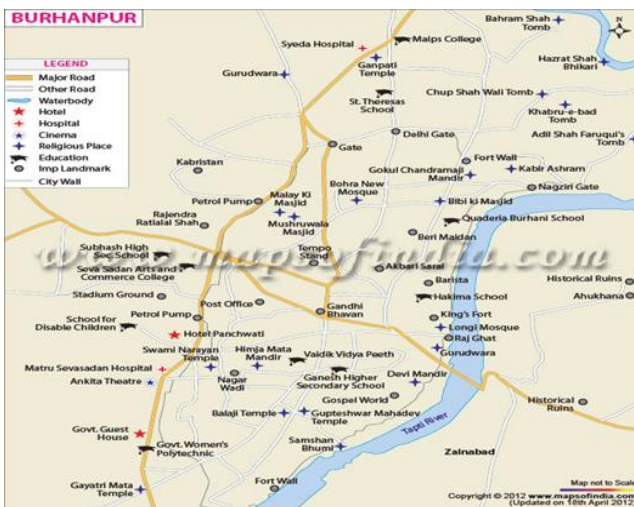


Fig. 2 - Map of District Burhanpur Showing Sampling Sites (S1 to S10) In Tapti River

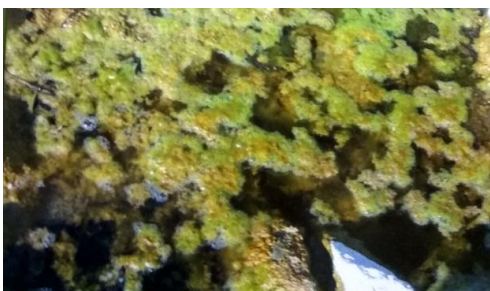


Fig. 3 - Algal Blooms



Fig. 5 - Epiphytic Algae

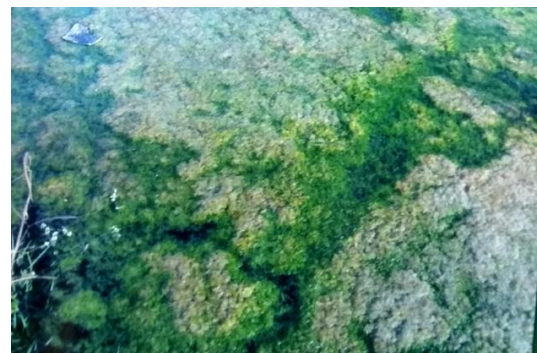
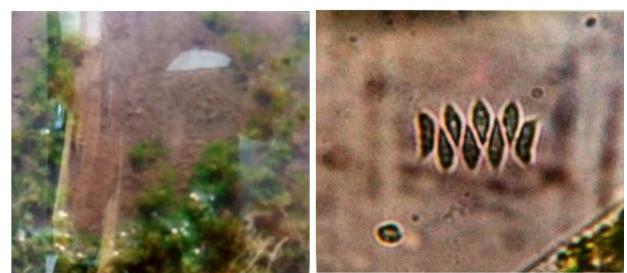
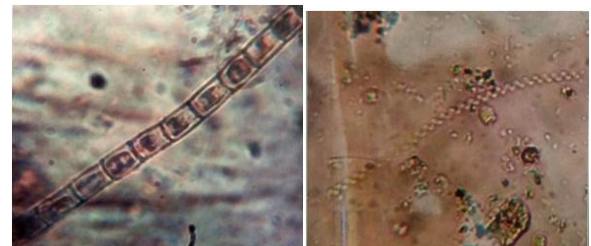


Fig. 6 - Algal Pollution



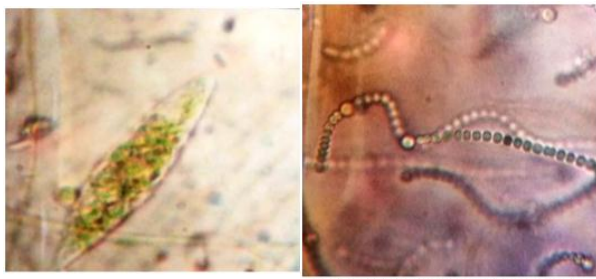
NITELLA TENUISSIMA (DES.) KUETZING

SCENEDESMUS DIMORPHUS (TRUPIN) KUETZING



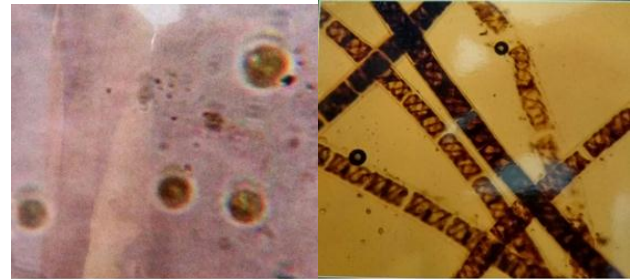
ULOTHRIX SUBTILISSIMA RADENHORTS

SPIRULINA MAJOR KUETZ EX GOMONT



EUGLENA ELONGATA SCHEWIAKOFF

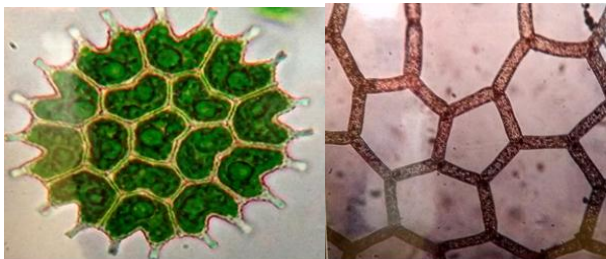
NOSTOC MICROSCOPICUM CARM EX BORN. ET FLAH



CHOLOROELLA VULGARIS BEYERINK

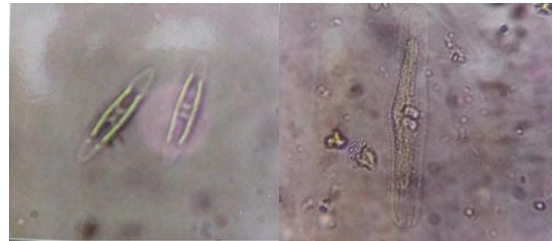
SPIROGYRA AEQUINOCTIALIS G.S. WEST

Fig. 7 - Plate: 01



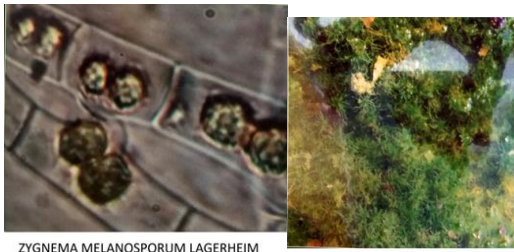
PEDIATRUM BORYANUM (TRUP.) MEHEGHINI

HYDRODICTYON RETICULATUM L. LAGERHEIM



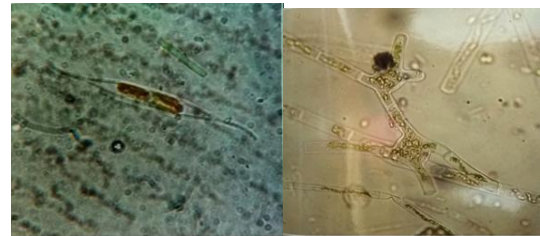
CYMBELLA ASPERA (EHR.) CLEVE

PINNULARIA DOLDOSA GANDHI



ZYGNEMA MELANOSPORUM LAGERHEIM

CHARA GROVSI PAL- HABIT

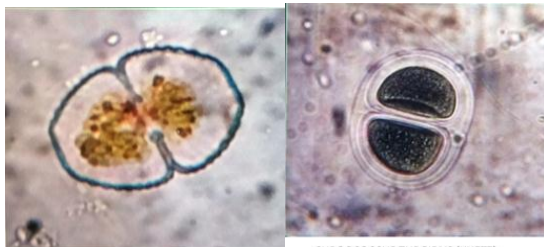


NITZSCHIC CLOSTERIUM W.SMITH

MOUGEOTIA VAIRANS (WITTER) CZURDA

Fig. 10 - Plate: 3B

Fig. 8 - Plate: 2



COSMARIUM SUBLALLATERANDATUM

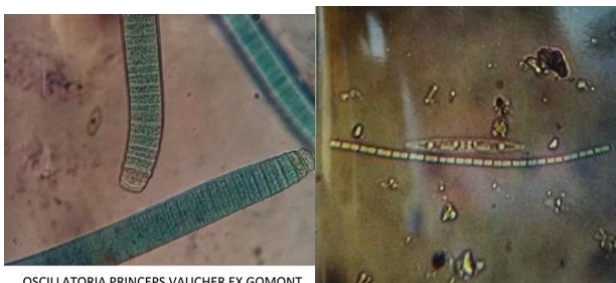
CHROOCOCCUS TURGIDUS (KUETZ)

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OSCILLATORIA PRINCEPS VAUCHER EX GOMONT

PHORMIDIUM MOLLE (KUETZ.) GOMONT

Fig. 9 - Plate: 3A