

ALGAL BIO-DIVERSITY OF PEDHI RIVER OF AMRAVATI DISTRICT, MAHARASHTRA, INDIA

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ABSTRACT

Freshwater algae belong to numerous evolutionary lineages and the flora of any aquatic system has many species from some or all of these lineages. These algae have a range in morphology from single cells, flagellates, colonies and unbranched or branched filaments. This study was undertaken to know the algal diversity and population in Pedhi river of tahsil Bhatkuli belongs to Amravati district. The samples were collected during the year 2018-2019 for three consecutive months. 71 algal taxa were recorded from this site. Of these, 9 belonging to cyanophyceae, 36 belong to chlorophyceae, 24 belong to Bacillariophyceae, 1 belongs to Xanthophyceae and 1 belongs to Euglenophyceae.

Keywords: Algae, Pedhi river, Cyanophyceae, Chlorophyceae, Bacillariophyceae, Xanthophyceae, Euglenophyceae.

I. INTRODUCTION

Some 3.5 billion years ago prokaryotic life began on the planet in the absence of oxygen. The cyanobacteria (blue-green algae) arose and began releasing oxygen into the atmosphere as the waste product of chlorophyll a-mediated photosynthesis. Algae in the oceans, rivers, and lakes of the world are thought to produce about half of all the oxygen produced on the planet (Strateg, 2013). They play a crucial role in the aquatic ecosystem to absorb nutrients, toxic material, heavy metals and convert it into simplest form. There is no easy definition of an alga. Algae are generally single celled to multicellular microscopic organism, are usually thought of simple aquatic plants which do not have roots, stems, or leaves and have primitive methods of reproduction. They fix the carbon dioxide from air and release valuable oxygen for the living organism.

Algae live in a wide range of aquatic environments and are a natural component of the most aquatic ecosystems. They occur in the lentic (standing water) as well as lotic water (running water). And many of them terrestrial which is living in soil and snow or in association with other organisms, especially fungi (as lichens) and animals, Aquatic algae are found in both fresh and marine waters, they range in large size (kelp) to those visible only under a microscope. Some algae have an economic importance because they are a source of carotene, glycerol, and alginates and can be converted into a food source for aquaculture. Algae vary considerably in size, shape, and growth form. They can be single celled either colonial or as filamentous cells.

Algae have been intimately connected directly or indirectly with human beings as a source of food, fodder and manure. Other countries of the world are actively engaged in exploring ways to exploit algae as a potent source of food to combat the problem of rapidly growing world population and also as a possible source in space flight.

In our area, there is a water body namely Pedhi river which is utilized by peoples living there for various purposes. Pedhi river situated at Bhatkuli region come under district Amravati. If we explore algal flora from denoted river we can able to know the algal variations from this reservoir and that can be useful for future generation. It is a need of hours and today world to know the each and every thing of this plant world. For this, we have taken this investigation for research study. Through this study the people will come to know about the flora of their district and flora of this river in particular. It may be the boon for school students, Colleges students, Researchers, Teachers, Scientist etc. and can be benefited. From this study the data can be available for all the readers who came to know about this type of study.

Different authors reported the freshwater algae from different regions of India, (Dwivedi and Pandey,2002); (Jena M *et al.*,2006); (Kalwale and Savale,2012); (Dalal *et al.*,2012); (Sarode and Kamat,1983); (Tarar *et al.*,1998) and (Agrawal, 2018).

II. MATERIAL AND METHOD

The research was conducted in the year 2018-2019 for three consecutive months. The study was under taken on Pedhi river of Amravati District, Maharashtra, India. The analysis of samples was carried out at Dept. of Botany, M.J.F. Comm., Sci. and V.R. Arts College, Bhatkuli. Pedhi river rises in hills near Rithpur in Morshi tahsil. The Pedhi flows in easterly direction, after crossing the district it turns westwards and north-westwards to join the Purna river, Rithpur,Walgaon and Bhatkuli are few important villages at banks of the river. It is one of the water-supply sources to the city of Amravati.

The water samples was collected at a depth of more than one feet with the help of sterilized forceps & employing new unused polythene bags/cans of two liter capacity. The samples were washed with 2-3% Acetic acid in order to clear the algal material from organic matter, sand and silt particles. Then it was preserved in the 3-4% formalin at the spot in glass bottles and flasks. A common method of obtaining pure culture is serial dilution. To identify the algal material, it was stained with 1% iodine solution and examined under research microscope. The photography was made with the help of micro image projection system (MIPS) and identification of different taxa was done with the help of standard keys given by Cyanophyta (Desikachary,1959) and also with the help of available literature like textbook on algae (Kamat,1975), Handbook of algae (Forest,1954). The freshwater algae (Prescott, 1954) and Different Journals, Research papers. Identified algal floras of three months during the period July 2018 to October 2018 are listed in the following table belonging to algal groups Cyanophyceae, Chlorophyceae, Bacillariophyceae, Xanthophyceae and Euglenophyceae.

III. RESULT AND DISCUSSION

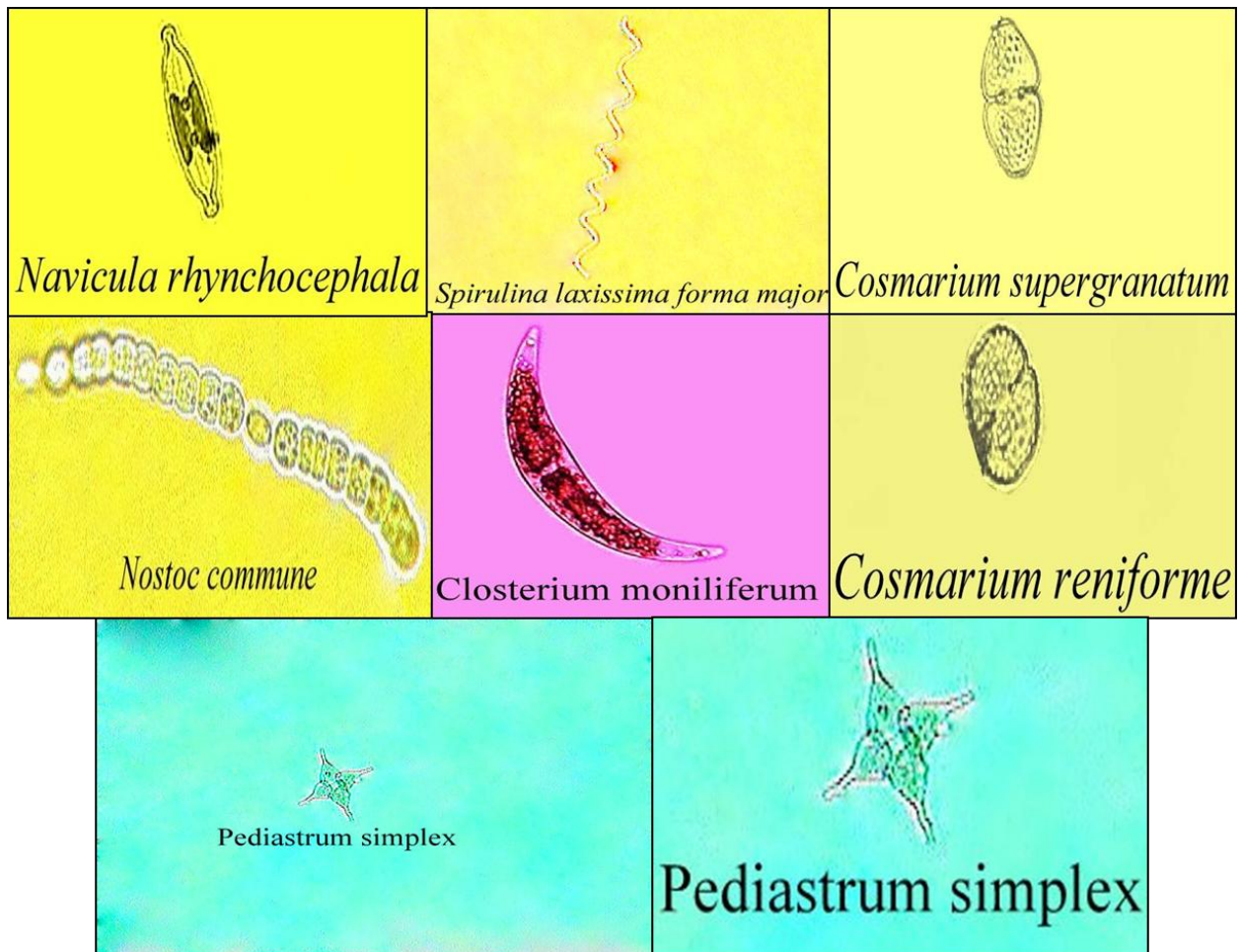
Table-1: Algal Bio-diversity during the period July 2018 to October 2018

| Algal group (Family) | Name of the algae | Total number of species |
|----------------------|--|-------------------------|
| Cyanophyceae | <i>Gloeocapsa punctata</i> <i>Gloeothece samoensis</i> <i>Anabaena cylindrica</i> <i>Spirulina subtilissima</i> <i>Spirulina laxissima</i> <i>Nostoc commune</i> <i>Phormidium sp.</i> <i>Merismopedia punctata</i> <i>Scytonema sp.</i> | 9 |
| Chlorophyceae | <i>Chlorella regularis</i> <i>Mougeotia sp.</i> <i>Cosmarium reniforme</i> <i>Cosmarium contractum</i> <i>Cosmarium depressum</i> <i>Cosmarium supergranatum</i> <i>Cosmarium turpinii</i> <i>Cosmarium subcucumis</i> <i>Cosmarium botrytis</i> | 36 |

| | | |
|--------------------------|--|-----------|
| | <p><i>Oedogonium sp.</i> <i>Closterium moniliforme</i> <i>Closterium galeria</i> <i>Closterium acutum</i> <i>Closterium pronum</i> <i>Hydrodictyon reticulatum</i> <i>Pediastrum biradiatum</i> <i>Pediastrum boryanum</i> <i>Pediastrum simplex</i> <i>Pithophora sp.</i> <i>Scenedesmus obliquus</i> <i>Scenedesmus bijuga</i> <i>Scenedesmus acuminata</i> <i>Scenedesmus quadricauda</i> <i>Scenedesmus dimorphus</i> <i>Scenedesmus opoliensis</i> <i>Volvox sp.</i> <i>Eudorina sp.</i> <i>Spirogyra sp.</i> <i>Staurastrum natator</i> <i>Staurastrum gracile</i> <i>Staurastrum orbiculare</i> <i>Pseudostaurastrum lobulatum</i> <i>Planktosphaeria gelatinosa</i> <i>Quadrigula closterioides</i> <i>Crucigenia tetrapedia</i> <i>Euastrum ampullaceum</i></p> | |
| <p>Bacillariophyceae</p> | <p><i>Navicula radiosa</i> <i>Navicula gregaria</i> <i>Navicula cryptocephala</i> <i>Navicula rhyncocephala</i> <i>Pinnularia nobilis</i> <i>Pinnularia major</i> <i>Pinnularia acrosphaeri</i> <i>Pinnularia interrupta</i> <i>Pinnularia trevelyana</i> <i>Pinnularia actinosphaerium</i> <i>Actinosphaerium sp.</i> <i>Amphiplura pellucida</i> <i>Stauroneis anceps</i></p> | <p>24</p> |

| | | |
|----------------|--|---|
| | <i>Epithemia zebra</i> <i>Hantzschia amphioxys</i> <i>Gyrosigma sp.</i> <i>Tabellariafenestrata sp.</i> <i>Melosira variance</i> <i>Amphora ovalis</i> <i>Fragilaria construens</i> <i>Gomphonema affine</i> <i>Coconeis</i> <i>Cyclotella meneghiniana</i> <i>Synedra sp.</i> | |
| Xanthophyceae | <i>Chlorobotrys regularis</i> | 1 |
| Euglenophyceae | <i>Euglena</i> | 1 |

From the above table, it was observed that this river has a collection of so many algal genera of different classes. 71 algal taxa were recorded from this site. Of these, 9 belonging to cyanophyceae, 36 belong to chlorophyceae, 24 belong to Bacillariophyceae, 1 belongs to Xanthophyceae and 1 belongs to Euglenophyceae. Photographs of some collected algae are as follows:



This river shows the presence of various algal forms. These results were in conformity with (Anilkumar, 2000); (Rai and Kumar, 1979) and (Zafar, 1967).

IV. CONCLUSION

From the above results, it was concluded that this river had a diversified algal flora in which 36-chlorophycean members was more dominant in water area followed by 24-members of Bacillariophyceae and 9-members of Cyanophyceae i.e. chlorophyceae group was dominated algal group. On the basis of total number of algal species recorded during investigation *Cosmarium sp.* followed by *Scenedesmus*, *Pinnularia*, *Closterium*, *Navicula etc.* were found to be the most dominant algae in this reservoir.

V. REFERENCES

- [1] Strateg, M. A. (2013). Algae: The world's most important "plants"—an introduction. Russell Leonard Chapman, 18: 5-12.
- [2] Dwivedi, B. K. and Pandey, G. C. (2002). Physico-chemical factors and algal diversity of two ponds in Faizabad, India. *Poll.Res*, 21(3): 361-370.
- [3] Jena, M.; Ratha, S. K. and Adhikari, S. P. (2006). Diatoms (Bacillariophyceae) from Orissa state and neighbouring regions, India, 377-392.
- [4] Kalwale, A. M. and Savale, P. A. (2012). Determination of Physico-Chemical Parameters of Deoli Bhorus Dam Water. *Adv. Appl. Sci. Res*, 3(1): 273-279.
- [5] Dalal, L. P.; Nisal, R. S. and Dhabarde, P. F. (2012). Biodiversity of fresh water algae of mahakali water reservoir of Wardha district of Maharashtra State, India. *Bionano Frontier*, 5(2-II).
- [6] Sarode, P. T. and Kamat, N. D. (1983). Diatom flora of Marathawada, Maharashtra III. *Phycos*, 24: 132-139.
- [7] Tarar, J. L.; Bodhke, S. S. and Charjan, V. Y. (1998). Ecological studies on fresh water and polluted water euglenoids of Nagpur. *Int.J.Mendel*, 15 (3 and 4): 127-128.
- [8] Agrawal, T. (2018). Evaluation of the algal biodiversity of the rupaer area of the Alwar district of Rajasthan. *Biodiversity Int J*. 2(3):306–308.
- [9] Desikachary, T. V. (1959). *Cyanophyta*. I.C.A.R., New Delhi.
- [10] Kamat, N. D. (1975). Algae of Vidarbha, Maharashtra. *J.Bomb.Nat.Hist.Soc*, 72: 450-476.
- [11] Forest, H.S. (1954). *Handbook of algae*. The University of Tennessee, press, Knoxville.
- [12] Prescott, G. W. (1954). *The freshwater algae*. Wm.C.Brown.Co.Publ.Iowa., pp.348.
- [13] Anilkumar, S. (2000). "Fresh water Algae of Hassan District, Karnataka state", India, *Ph.D. Thesis*.
- [14] Rai, L. C. and Kumar, H. D. (1979). Studies on some algae of polluted habitats. In: *Recent Researches in Plant Sciences* (Ed). Bir,S.S., pp. 11-18.
- [15] Zafar, A. R. (1967). On ecology of algae in certain fish ponds of Hyderabad, India-III. The periodicity. *Hydrobiol*, 30: 96-112.