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Bio-diversity of fresh water algae of Rotha-I reservoir of Wardha district of Maharashtra, India.

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Abstract

A Rotha-I Reservoir, a fresh water reservoir situated within the Wardha District of Maharashtra State (India). Water from this reservoir is utilized for irrigation purpose and to certain extent for drinking purpose also. The present study can enrich our knowledge of algal flora found in the reservoir along with its physico-chemical parameters which was evaluated by standard procedures and by culture media. In order to identify the biodiversity of this reservoir, the micro image projection system were used. In all, 47 algal species were recorded, out of which 31 belongs to chlorophyceae, 10 to bacillariophyceae, 5 to cyanophyceae and 1 to Euglenophyceae. Since, the reservoir show the presence of various algal species, it should be protected as a natural wealth. It can be done by through the application of protective measures through removal of algal blooms which are of no use. The aquatic weeds of which are of succession habit and of no use and regular algicide applications, that will facilitates the growth of other algae too and helps in maintaining the reservoir.

Keywords: Bio-diversity, Fresh Water Algae, Rotha-I Reservoir, Wardha, India

Introduction

Algae are the important part in aquatic ecosystem. Algae live in a wide range of aquatic environments and are a natural component of the most aquatic ecosystems. They occurs in the lentic (standing water) as well as lotic (running water), many of them terrestrial which lives in soil and snow or in association with other organisms, plants (cycas, anthoceros), especially fungi (as lichens) and animals. Aquatic algae are found in both fresh and marine waters, their range from 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. They vary considerably in sizes, shapes and growth forms. They can be single celled, either colonial or as filamentous cells and it is thought to be 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. However, blue green algae

differ from plants and all other algae, in that they have a cellular structure and function, that is more common to bacteria called cyano-bacteria in the plant kingdom.

The antibiotics like chlorellin are extracted from chlorella. Chlorella is a crystalline substance which decomposed by heating at 120 °C. From its chemical composition, it is seem to be a mixture of fatty acids. Chlorellin is active against Staphylococcus aureus, a common organism which causes the infections to wounds and particularly useful in the purification of sewage effluent. The presence of specific nutrients, heavy metals toxic effluents on which specific type of algae grows. Plants hormone like the Auxins (IAA) have been found in the filtrate from the culture of chlorella. The fresh water body i.e. reservoir which is located 2 Km away from Wardha City. The water of reservoir is mainly used for agriculture and in some extent for drinking purposes of wild animals and human beings.

Such water body of great importance if we study the algal flora of this reservoir can be known. The algal bio-diversity can be known to the peoples and may be the heritage of future generation. Hence, it is a need of hour to know each and everything of this plant world. For this cause, the investigation is carried out for my research study.

For the research point of view, different authors reported the freshwater algae from different regions of India, (Dwivedi, B.K. and G.C. Pandey. 2002), (Jena, M., Ratha, S.K., and Adhikari, S.P.2006), (Kalwale, A. M. and Savale, P. A.2012), (L.P.Dalal, Nisal R.S. and Dhabarde P.F. 2012), (Sarode, P.T. and Kamat N.D.1983), and (Tarar, J. L, Bodhke, S. S. and Charjan, V.Y. 1998).

Materials and Methods

The experiment was conducted in the year 2007-2008. The study was under taken on Rotha-I Reservoir of Wardha District, Maharashtra, India. The analysis of samples were carried out at Deptt. Of Botany, J.B.College of Science, Wardha. Rotha-I Reservoir is comes under the dry tropical weather climate and average rainfall were 1105 mm. Max temperature were 47.5 °C and Min temperature were 10.5 °C. Present study site is belongs to Wardha District which is at an elevation of 285 meter (935 feet) and at the longitude of 78.331 East and latitude of 20.453 North (North-Eastern side of the state). Wardha District is typical seasonal mansoon, where peoples are engaged in agriculture. 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. Algal material were preserved in the 3-4% formalin at the spot in glass bottles and tubes/vials. Then the samples were washed with 2-3% Acetic acid in order to clear the algal material from organic matter, sand and silt particles. A commom 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 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 Geitler (1932), Cyanophyta (T.V.Desikachary 1959), & Anand (1959) and also with the help of available literature like textbook on algae (N.D.Kamat 1975), Handbook of algae (Forest H.S. 1954), The freshwater algae (Prescott, G.W.1954) and Different Journals, Research papers.

Observation Table

Physico-chemical parameters of water samples of Rotha-I Reservoir in Wardha District during the study period.

Parameters

pH	6.55
Temperature	22 °C

Results and Discussion

From table, it was noticed that the pH = 6.55 and Temperature = 22 C. From the above observation, it was observed that the reservoir has a collection of so many algal genera of different classes. 47 algal taxa were recorded from these sites. A list is given below:

Chroococcus turgidus (Kutz) Naeg., *C. minutus* (kutz) Nag., *Synechococcus elongates* Nag., *Synechocystis pevalekii* Ercegovic., *Lyngbya martensiana* Menegh ex. Gomont., *Nostoc verrucosum* Vaucher ex. Born. et. Flah., *Cosmarium portianum* Arch var. *orthostichum* Schmidle., *C. tetraophthalmum* Breb. Var Rich., *C. biretum* Breb., *Chlamydomonas mucicola* (Schmidle), *C. angulosa* (Dill), *Cosmarium* spp., *Chlorella vulgaris* Beij., *Coccomyxa ophiurae* Rosenv., *Closterium turgidum* Ehrenb (Lutkemuller), *Gloeocystis naegeliana* Artari (Artari), *Gonium pectorale* Mull (Hartmann), *Oocystis solitaria* Wittr., *Pandorina morum* (Mull) Bory (Iyenger), *Pediastrum boryanum* var. *granulatum* (Turp) Menegh., *P. tetras* (Ehrenb) Ralfs.,

P. ovatum (Ehr.) A. braun., *P. duplex* Meyen var. *clathratum*., *Quadrigula closteriodes* (Bohlin) Printz., *Scenedesmus acuminatus* (Lagerh). Chod., *Scherffelia phacus* (Pascher), *Selenastrum westii* Fritsch., *Sphaerella droebakensis* (Wollenweb), *Staurastrum kjelmanni* West., *Staurastrum* spp., *Tetraedron trilobulatum* (Reinsch) Hansgirg., *T. minimum* (A. Br.) Hansgirg., *Trochiscia aspera* (Reinsch) Hansg., *Ulothrix rorida* Kutz., *Xanthium brebisonii* Ralfs., *Westella botryoides* Wildem., *Amphora ovalis* (Nitzsc) Ehrenb., *Cymbella cistula* (Hempr) Grun., *Gomphonema olivaceum* (Lyngb) Kutz., *Hantzschia amphioxys* (Ehren) Grun., *Navicula mutica* Kutz , *N.seminulum* Grun., *Pinnularia viridis* (Nitzsch) Ehrenb., *Synedra ulna* (Nitzsch) Ehrenb., *Tabellaria* spp. (Naumann), *Triceratium distinctum* Janisch., *Euglena* Sp.

Of these, 31 belong to Chlorophyceae, 10 to Bacillariophyceae, 5 to Cyanophyceae and 1 to Euglenophyceae. The reservoir show the presence of various algal blooms and various algal forms. These results were in conformity with Anilkumar S.2000, "Fresh water algae of Hassan District, Karnataka State", Rai,L. C, and Kumar, H. D.1979 " Studies on some algae of polluted habitats ", Gunale, V. R.1991 " Algal communities as indicators of pollution " and Zafar A.R.1967 " On ecology of algae in certain fish ponds of Hyderabad, India".

Conclusion

From the above results, it was concluded that the reservoir had a diversified algal flora in which 31-chlorophycean members was more dominant in water area followed by 10-members of Bacillariophyceae, 5-members of Cyanophyceae and 01-member of Euglenophyceae.

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