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DIVERSITY OF ALGAE IN DIFFERENT WATER BODIES OF PATTHALGAON JASHPUR DISTRICT CHHATTISGARH

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ABSTRACT

Chhattisgarh state, situated in central India, is blessed with natural resources. The climatic and geographical conditions of the state are responsible for the unique assemblage of flora and fauna in this region, be it terrestrial or aquatic. Pathalgaon is a town and a nagar panchayat in Jashpur district in the Indian state of Chhattisgarh. The aquatic habitats primarily consist of fresh water forms including Dams and Pond which harbour a plethora of aquatic organisms including algae. Physico-chemical conditions as light, temperature, pH, nutrients and dissolved oxygen are required not only for the optimum growth of autotrophic organisms as algae but also influence their chemical composition. During the present investigation out of total 23 taxa Chlorophyceae belonging to 7 orders where, Chlorococales, Ulotrichales, Charales, Eaglenales, oedogoniales and Zygnematales have been found with total 8 genera and 11 species.

KEYWORD: Chhattisgarh, Pathalgaon, Physico-chemical, temperature, pH, dissolved oxygen.

INTRODUCTION

The term algae is routinely used to indicate a polyphyletic, non cohesive and artificial assemblage of oxygen evolving, photosynthetic organisms but with thalloid body. They include both prokaryotic (blue-green algae) and eukaryotic (green, brown, red algae) organisms, with profound diversity of size ranging from 0.2-2.0 µm in diameter (microalgae) to as large as 60 m in length (macroalgae). They serve as tiny biological factories which transform radiant energy into chemical energy very efficiently (Goswami, 2011) and form the food for aquatic animals directly or indirectly (Rao, 1975). They are important to aquatic habitats as they enrich the water bodies by photosynthesis. In this way they are of great ecological importance as they can be used for the

assessment of water quality and help in providing particular status to the water body. They also have the potential to revert the ill effects of anthropogenic activities to some extent.

Algae are predominantly aquatic and are found in marine as well as fresh water habitats. Fresh water forms of algae occur in Dams, lakes, streams and rivers and reservoirs growing as free floating, swimming or attached to the bottom of shallow waters. Some are also terrestrial, growing in moist conditions as damp soil, walls or even rocks. The free swimming algae form the phytoplanktons of the water bodies serving as the support to aquatic food chains providing energy to power the whole system. Blue Green Algae (BGA) are unique prokaryotic organisms with the ability to perform mutually compatible functions like nitrogen fixation and photosynthesis. Eukaryotic forms are simply photosynthetic. Thus these serve as rich source of nutrients for aquatic animals and play an important role in aquatic productivity (Misra et al., 2001).

Physico-Chemical Characteristics

To assess the status of a water-body two important indices are required: physico-chemical and biological (Bhatnagar and Bhardwaj, 2013). Various parameters are capable of causing various types of stress on the overall water quality, and these are helpful in assessing the water quality (Bharti and Katyal, 2011). Physico-chemical conditions as light, temperature, pH, nutrients and dissolved oxygen are required not only for the optimum growth of autotrophic organisms as algae but also influence their chemical composition (Rousch et al., 2003). Physiological factors regulate the productivity of fresh water bodies in terms of plankton biomass. Physico-chemical analysis are Temperature, Dissolved oxygen and Biological oxygen demand in pond and dam water of Patthalgao area.

Biodiversity

Biodiversity is the expression of the natural components of the ecosystem that were present even before the habitats got modified and exotic species were introduced either intentionally or accidentally. Biodiversity is composed of components like genetic diversity, species richness and unmodified indigenous communities (Arulmurugan et al., 2010). Physicochemical characteristics of water and biodiversity are interdependent as biodiversity on one hand is governed by the physico-chemical characteristics of water and on the other itmodifies the aquatic environment (Stevenson and Pan, 1999; Jafari and Gunale, 2005). Therefore it is essential to study both in order to thoroughly study an aquatic ecosystem. Study of algal diversity reflects the different types of species found at the given site and

simultaneously takes into account their distribution. The value of diversity index increases both when species richness increases and/or species evenness increases. Species richness is the measure of total number of species occurring in a sample. Larger the area more number of species would be expected.

Algae

The singular *alga* is the Latin word for "seaweed" and retains that meaning in English. The emtymology is obscure. Although some speculate that it is related to Latin *algēre*, "be cold", no reason is known to associate seaweed with temperature. A more likely source is *alliga*, "binding, entwining". The Ancient Greek word for seaweed was (*phycos*), which could mean either the seaweed (probably red algae) or a red dye derived from it. The Latinization, *fucus*, meant primarily the cosmetic rouge. The etymology is uncertain, but a strong candidate has long been some word related to the Biblical (*puk*), "paint" (if not that word itself), a cosmetic eye-shadow used by the ancient Egyptians and other inhabitants of the eastern Mediterranean. It could be any color: black, red, green, or blue.

MATERIAL AND METHODS

Study Area

Pathalgaon is a town and nagar panchayat in Jashpur district of Chhattisgarh. Pathalgaon is located at 22.57°N 83.47°E. It has an average elevation of 546 metres (1791 feet). as of 2001 India census, Pathalgaon had a population of 14,054. The sites of study of algal flora selected for the present investigation, methods of physico-chemical analysis of water bodies serving as habitats for algal communities, methods to study diversity and seasonal variation of algal flora have been described.

RESULT AND DISCUSSION

During the present investigation out of total 23 taxa Chlorophyceae belonging to 7 orders where, Chlorococales represent 5 genera and 7 species, Ulotrichales with 1 genera with 1species. Charales 1 genera with 2 species Eaglenales 1 genera with 1 species Oedogoniales 1 genera with 1 species Zygnematales have been found with total 8 genera and 11 species (Table 1). Seasonal fluctuation on the occurrence of algae were seen in most of streams in present investigation. Algal population were drastically reduced in advent of monsoon due to the ploughing and field preparation activities where field flooded with suspended soil particles(Gupta, 1966).

Table No. 1

Seasonal variation of algal diversity in Patthalgaon Dam and Pond of Jashpur district					
S No.	**Name of algae**	**Goghara**	**Kharktta**	**Pakargaon**	**Ghargiya**
1	*Chlorococum humicola*	+	*	*	*
2	*Chlorella vulgaris*	+	*	+	+
3	*Chlamydomonos globosa*	+	+	+	+
4	*Scenedesmus spp.*	+	+	*	*
5	*Scenedesmus obliquus*	+ +	+	+	+
6	*Scenedesmus bicaudatus*	+	*	+	+
7	*Scenedesmus accuminatus*	+	*	+	+
8	*Ulotrix flacca*	+	*	*	*
9	*Odogonium australe*	+	*	+	+
10	*Bulbocheate spp.*	*	*	+	+
11	*Mougetia austrica*	*	*	+	+
12	*Spirogyra spp.*	+	+	+	+
13	*Spirogyra lagerheimini*	+ +	*	+	+
14	*Spirogyra dubia*	+	+	+ +	+ +
15	*Zygnema stellinum*	+	*	+ +	+ +
16	*Clasterium acutum*	+	*	+	+
17	*Pleuotaenium eherenbergi*	+	*	+ +	+ +
18	*Cosmarium margaritatum*	+	*	+	+
19	*Cosmarium contractum*	+ +	*	+	+
20	*Euastrum Spinulosum*	*	+	+ +	+ +
21	*Ankistrodesmus falcatus*	*	+	+	$
22	*Chara zenelica*	+	+	&	&
23	*Euglena*	+	+	+	+

- Absent, + Sub Presents, ++Presents

CONCLUSION

Present study shows seasonal diversity richness in monsoon followed by summer and winter due to variation in temperature and high densitz. Variation of cellular organisation from prokaryotics to eukaryotics at cellularlevel in chlorophycae others classes was noticed. On the basis of motility it shows a clear character of motility to non motility. In morphology there is great organisation diversity from unicellular, colonial to coenobial from unbranched to branched thallus. Thus in in a water body how this mechanic diversity occur is a matter of further study.

Physicochemical analysis of the selected specimens revealed certain important implications regarding the economic importance of algae not only as a water purifier, a balance in aquatic ecosystem but also as a source of economically important products. Physicochemical analysis of the selected specimens revealed certain important implications regarding the economic

importance of algae not only as a water purifier, a balance in aquatic ecosystem but also as a source of economically important products.

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