

Diversity of Oscillatoria in roadside ponds of Bighapur Unnao District

Hemant Kumar and Jitendra Mohan

Paryavaran Sodh Ekai, Department Of Botany, D.A.V. Collage Kanpur

ABSTRACT

Oscillatoria is one of the most important members of class myxophyuae. The distribution of Oscillatoria is cosmopolitan entire globe in all habitats. Present study deals diversity of Oscillatoria in road side ponds of Bighapur, Unnao during a season at 11 different localities. A total of 12 species of this blue green algae are reported, out of these the dominant species are Oscillatoria amoena, Oscillatoria amphigranulata, Oscillatoria chloeine, Oscillatoria formosa, Oscillatoria irrigua, Oscillatoria tenuis etc.

Key words - Cyanobacteria, Oscillatoria, Blue-green Algae, Myxophyceae.

INTRODUCTION

Cyanobacteria or blue green algae have a specific place between cryptogams. It is a group of microscopic; photosynthetic prokaryotes which play a vital role in enhancing soil fertility. They are major source of biological nitrogen fixation. Cyanobacteria comprises of about 150 genera and 1400 species. They occur in all kinds of habitats round the globe. They grow commonly in freshwater pools, ponds, lakes, ditches and rainy ditches. Moreover, they also are widely distributed in various kinds of tropical soils, tree barks, rocks and stones and plant pots. A large number of blue green algae are free floating and planktonic. Some species of blue green algae cause temporary or permanent water bloom. A blue-green algae named *Trichodesmium erytheum* is found in red sea and produces a type of red pigment which is the root cause of redness in the water of Red Sea. A number of blue green algae like nostoc and anabaena occur in paddy fields and they are a good source of biological nitrogen fertilizers. *Nostoc* and *Anabaena* grow in drains, fresh stagnant water and bathroom floor. Due to this, the bathroom floor gets slippery. They also grow as endophytic symbiotic organism in *Anthoceros*, *Blasia*, *Glasia*, *Clavicularia* (Bryophytes), *Azolla* (Pteridophytes), *Cycas* and *Zamia*

(Gymnosperms), *Trifolium alexandrium* (Angiosperms) etc. Blue green algae such as *Nostoc* and *Anabaena* are symbiotic partner with various fungal species in Lichens. A few forms such as *Anabaenolium* have been found to be as parasitic in intestinal parts of animals and human beings. *Trichodesmium erythraeum* and *Trichodesmium thiebautic* are known to be form water blooms in Indian Ocean, Bay of Bengal and Arabian Sea. *Spirulina*, a well-known blue green alga is very popular for its nutritive value. It is known as a highest protein contains source of universe. A number of drugs and antibiotics are obtained by blue green algae. A number of valuable medicins, industrial products, vitamins and minerals are obtained from various species of Blue Green Algae. Various types of blue green algae help in oxygenation of waters removal of certain toxic substances including heavy metals. The occurrence of these organisms is every part of the earth in various habitats.

Oscillatoria is a well-known member of myxophyceae or cyanphyceae. It is a cosmopolitan cyanobacteria occuring in a wide variety of habitats. Most of the species of oscillatoria are fresh water living but few are marine. It commonly occurs in damp soils, temporary fresh water reservoirs and planktonic

conditions. It is also found as an epiphytic, aquatic or terrestrial plant. *Oscillatoria tenuis* occurs in hot water springs. *Oscillatoria princeps* and *Oscillatoria formosa* widely grow in rice fields along with other nitrogen fixing blue green algae.

The vegetative body of alga is simple, unbranched and filamentous. The filaments are without sheath which is called trichomes. Each trichome has simple, undifferentiated cells which are much broader to its length. In most of the forms trichomes are unconstructed, straight, rigid and thread like without recognizable base. In some species the apical call of the trichome may be rounded, conical or dilated, some times tipped with thickened membrane. The end of trichome is some times bent on one side. The present investigation deals the diversity of *Oscillatoria* in rode side Ponds and ditches in Beghapur, District Unnao of Uttar Pradesh. It is situated between Lucknow and Kanpur and irrigated by Ganga and Sai Rivers. Rice and Wheat are main agricultural crops of Unnao District. The whole area are represents a great diversity of algae and blue green algae.

MATERIAL AND METHODS

Water samples from rode side ditches and ponds of Bighapur, Unnao were collected from January 2012 to December 2012. The Selected sites of present study are Rawatpur, Tedha, Nihalkheda, Lalkuwan, Unchgaon and Bhagwant Nagar. Sampling was done from eleven selected sides. The water samples were collected at 30 days intervals and in wide mouth glass water bottles of one liter. All the samples stored at 4° C temperature in laboratory till the analysis was completed. The sampling methods and analysis of collected water samples were same as described by Hutchinson (1974). From the presorted samples material were mountain slides and examine their systematic position with the help of standard literature and recent information's.

RESULT AND DISCUSSION

The periodicity and occurrence of collected samples studied are showed in table No-1. The diversity of *Oscillatoria* in rode side ponds represented by 12 species. *Oscillatoria amoena*, *Oscillatoria amphigranulata*, *Oscillatoria chlorine*, *Oscillatoria*

cortiana, *Oscillatoria curviceps*, *Oscillatoria formosa*, *Oscillatoria irrigu*, *Oscillatoria obscura*, *Oscillatoria sancta*, *Oscillatoria suvvevis*, *Oscillatoria subuliformis* *Oscillatoria tenuis* were recorded in most of the selected points. Most of the species occurred in both winter and autumn season, while *Oscillatoria amphigranulata* and *Oscillatoria amoena* reported throughout the year.

A large number of publication deal with ecological distribution and other valueable informations of *oscillatoria* and other of the members of myxophyceae by were reported by Fritsch (1955), Allen (1968) Singh (1961), Fogg (1973), Hirano *et al.* (1958), Rao (1955), Venkateswarlu (1969), Watanabe and Yamamota (1971), Venkatraman (1972), Gupta P. (1991), Kaushik (1994), Mohan (1989), Roy (2001), Shukla (2002), Singh *et al.* (2015) Mohan *et al.* (2007). Decreasing the area and quantities of fresh water bodies such as ponds, lakes tanks etc. created adverse effects on diversity of algae and other aquatic fauna and flora because most of the ponds are used as a dumping space of waste matter.

REFERENCES

- Hutchinson, G.E. (1974). A treatise in limnology Vol. (2) Johan Wiley and Sons Inc. Indian Standard Institution, New Delhi (1974). IS: 2490 part I.
- Mohan, N. (1989). Influence of water pollutants on algal flora. Project Report 3-33/86 (Sr-II) U.G.C. New Delhi.
- Rao, C.B. (1955). On The Distribution Of Six Small Ponds II Algae Periodicity. *J. Ecol.* 43: 291-308.
- Singh, R.N. (1961). Role Of Blue Green Algae In Nitrogen Fixing Economy Of Indian Agriculture. I.C.A.R. Publication, New Delhi.
- Venkateswarlu, V. (1969 b). An ecological study of the algae of the mossi river, Hyderabad India With Special Reference To Water Pollution Part II. *Hydrobiologia* 34: 352-362.
- Allan, M.M. (1968). Factors influencing the distribution of Algae. *J. Bact.* 96 (3): 842-852.
- Hirano, T. (1958). Studies on the blue green algae part II. Study on the formation of humus dye due to the growth of blue green algae (Japanese, English Summery) Bull. Shikoku. *Agric. Expt. Stn.* 4: 63-64.

- Roy, S.K. (2001). Cyanobacteria and rice field ecosystem. In Recent Advances in Biofertilizer Technology. Eds. A.K. Yadav, S. Ray Choudhuri, and M.R. Matsara society for promotion and utilization of resources and technology, NewDelhi. pp 272-304.
- Fogg, G.E.; Stewart, W.D.P.; Fay, P. and Walsby, A.E. (1973). The blue-green Algae, Academic Press, London.
- Kumar, Hemant (2014). Studies on biodiversity of Cyanobacteria with their biological Assessment for multifaceted utility of Unnao district. Ph.D. Thesis, C.S.J.M. University, Kanpur.
- Mohan J. Narayan S. Kumar Hemant and Mohan N. (2007). Diversity of blue green algae in Allen Forest lake, Zoological Park, Kanpur mixing with campus sewage. Indian Hydrobiology 10(1): 123-127.
- Fritsch. F.E. (1955). The Planktons Of Some English Rivers. Ann. Bot. London. 19: 163-167.
- Gupta, P. (1991). Biopollution studies on algae of Ganga Waters. Ph.D. Thesis, C.S.J.M. University, Kanpur.
- Shukla, Neeraj (2002). A study of cyanophycean toxic algae in river Pandu from Panki to Bingawan, ICPEP-2 Abst. SII/P-1,2:19p.
- Singh Rich, Singh R.P. and Singh D.V. (2015). Distribution of Cyanobacteria (Blue green algae) in rice fields of Varanasi. Int. Jour. of Adv. Res. 3(8) 1055-1060.
- Venkatraman G.S. (1972). Algal biofertilizers and rice cultivation. today and tomorrows Publishers Delhi.
- Watanabe, A. and Yamamota (1971). Algal Nitrogen Fixation In Tropics. Plant soil. Special Vol. 403-413.
- Kaushik BD (1994). Algalization Of Rice In Salt Affected Soil. Annals of Agricultural research 14: 105-106.

Table-1 : Diversity of Oscillatoria in Road Side Ponds of Bighapur, Unnao District

Sl. No.	Oscillatoria Species	Selected Sites					Bhagwant Nagar
		Rawatpur	Tedha	Nihalikheda	Lalkuwan	Unchgaon	
1	<i>Oscillatoria amoena</i>	+	+	+	+	+	+
2	<i>Oscillatoria amphigranulata</i>	+	+	+	+	+	+
3	<i>Oscillatoria chlorine</i>	-	+	+	+	+	-
4	<i>Oscillatoria cartiana</i>	+	-	+	+	+	+
5	<i>Oscillatoria curviceps</i>	+	+	-	-	-	+
6	<i>Oscillatoria formosa</i>	-	+	-	+	+	+
7	<i>Oscillatoria irrigu</i>	+	-	+	+	+	+
8	<i>Oscillatoria obscura</i>	+	+	+	+	+	-
9	<i>Oscillatoria sancta</i>	-	+	+	+	-	+
10	<i>Oscillatoria survvreis</i>	+	+	+	+	+	+
11	<i>Oscillatoria subuliformis</i>	-	-	+	+	+	+
12	<i>Oscillatoria tenius</i>	+	-	+	+	+	+
	+ = Present - = Absent						