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Studies on Algal Diversity in Temple Ponds from North Goa

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ABSTRACT

Many of the Goa temples are associated with ponds. In the present communication an attempt is made to study the algal flora of two temple ponds from Ponda taluqua of North Goa. Periodic collections were made at an interval of a month from different selected sampling points. Observations were made on Planktonic, Epiphytic and Epilithic alage.

Altogether 28 genera with 41 species of Chlorophyta and 9 genera with 12 species of Cyanophyta were collected from these localities. *Ankistrodesmus, Scenedesmus, Coelastrum, Dictyosphaerium, Netrium* and *Pediastrum* were the dominant green algae whereas *Microcystis, Merismopedia, Dactylococcopsis, Oscillatoria* and *Cylindrospermum* were found to be common blue-green algae.

Introduction

Algae are conspicuous in fresh water habitats like lakes, ponds, pools, swamps, streams etc and play beneficial and detrimental role in nature. Enormous information is available on fresh water algae from various parts of the country. However no data is available from Goa region Literature survey has revealed that fresh water algal flora has received incidental attention. Only two reports are available from this region. Bongale, (1981) has enlisted algae from Panjim paddy fields. Kerkar and Madkaikar (2002) have reported in their random survey 46 species of 23 genera from taxonomic point of view. No work had been done on other groups of algae. Many of the temples of Goa are associated with permanent ponds. The present work deals with the diversity studies on algae from two temple ponds of Goa, Mangeshi and Nageshi. Observations were made on two algal groups i.e. Cyanophyta and Chlorophyta. Differences, similarities observed at two study points are discussed.

Materials and Methods

A. Study area- Goa is a state situated on the western coast of India having an area of 3,702 sq kms. It is situated between Sindhudurg district of Maharashtra on North and North Canara of Karnataka on South, Western Ghats on the east and Arabian Sea on the west. The annual rainfall is around 280 – 350 cm. Humidity is high and varies from 70 – 95 %. Temperature ranges between 35 – 38 °C high and 18 – 22° C low. The present study area is restricted to Ponda Taluca which occupies the central part of Goa (Fig. 1) and supports many

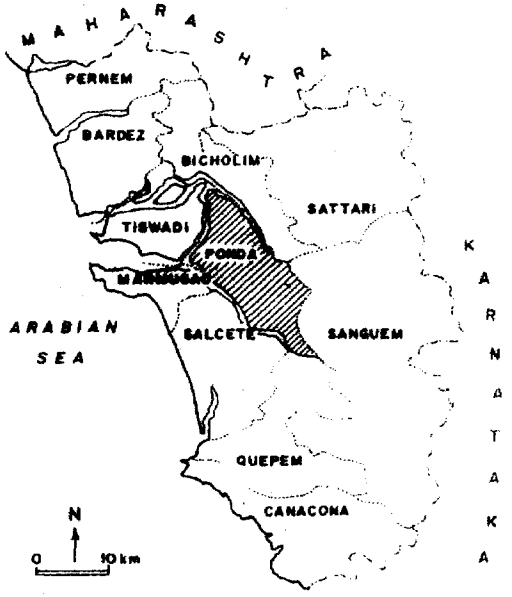

Fig. 1 Map of Goa showing station studied.

ponds associated with temples. The present work is carried out at two temple ponds Viz. Mangeshi and Nageshi.

B. Mode of collection – Periodic collections were made at an interval of a month from different sampling points of both temple ponds and observations were made on Planktonic, Epiphytic and Epilithic algae. Visual algal colonies and floating filamentous mass were stored in 4% formalin. Planktonic forms were fixed in Lugol's Solution.

C. Microscopic preparations – Samples were first studied under sterio – microscope for their morphological features like shape, size and colour of the colony. Observations were also made on the structure of chlorolplast, spores and other required structures.

D. Identification – was carried out using well known manuals and other related research articles.

Result and Discussion

The present survey is the first report discovery of 53 algal species of which 28 genera with 41 species of Chlorophyta and 9 genera with 12 species Cyanophyta. *Ankistrodesmus, Scenedesmus, Coelastrum, Dictyosphaerium, Netrium* and *Pediastrum* were the dominant green algae whereas *Microcystis, Merismopedia, Dactylococcopsis, Oscillatoria* and *Cylindrospermum* were found to be the common blue Green algae dominant in the collection. It was found that Mangeshi pond supported more number of algae than that of Nageshi. It was noticed that Mangeshi pond is more polluted than the Nageshi. It is extensively used for washing purpose. Hence phophate concentration must be more which supports more algae. It was found that the species like *Cladophora glomerata, Stigeonema informe, Oocystis gigas* and *Cylindrospermum stagnale,* were found only at Nageshi pond. Whereas *Dictyosphaerium sp., Ankistrodesmus spiralis, Oedogonium subaerolatum, Cosmarium miscellum* were restricted only at Mangeshi temple pond. This observation can not be reasoned at this stage and needs further studies. Details of algal occurrence, dominant species and distribution in both the ponds are tabulated in Table. I. The species collected from these localities are enlisted below.

Chlorophyta

1. *Pandorina morum* (Mull). Bory
2. *Chlorogonium* sp.
3. *Gloeocystis* sp.
4. *Tetraspora* sp.
5. *Characium apiculatum* Rabenh.
6. *Tetrahedron tumidulum* (Reinsch) Hansg.
7. *Pediastrum tetras* (Ehr) Ralfs
8. *Pediastrum tetras var tetraodon* (Corda) Hansg
9. *Pediastrum tetras var excisum* (Rabenh) Hansg
10. *Pediastrum duplex* Meyen var *gracillimum* West & West
11. *Oocystis gigas* Archer
12. *Ankistrodesmus spiralis* var *fasiculatus* G.M. Smith
13. *Ankistrodesmus falcatus* (Corda) Ralf
14. Nephrocytium agardhianum Naeg
15. Nephrocytium lunatum W. West
16. Kirchneriella obesa (W. West) Schmidle
17. Kirchneriella lunaris (Kirchner) Moebius
18. Scenedesmus bijugatus (Turp) Kuetz
19. *Scenedesmus armatus* var *bicaudatus* Guglietmelli
20. *Scenedesmus quadricauda* var *longispina* G.M.Smith
21. *Scenedesmus quadricauda* (Turp) var *quadrispina* G.M.Smith
22. Scenedesmus dimorphus (Turp) Kuetz
23. Coelastrum proboscideum Bohlin
24. *Coelastrum cambricum* Archer var *intermedium* (Bohlin) G.S.West
25. Crucigenia crucufera (Woole) Collins
26. Dictyosphaereum sp.
27. Spirogyra sp.
28. Netrium sp.
29. Staurastrum gracile Ralf
30. Closterium recurvum Prescott
31. *Closterium parvulum* Naeg var *angustum* W. et
32. Cosmarium miscellum skuja
33. Cosmarium lundelli Delp
34. Euastrum denticulatum (Kirchn) Gay
35. Bulbochaete sp.
36. Oedogonium subaerolatum Tiffany
37. Cylindrocapsa conferta W.West
38. Uronema gigas Vischer
39. Geminella mutabilis (Breb) Wille
40. Stigeoclonium sp
41. Cladophora glomerata (L) Kuetz

Cyanophyta

1. *Microcystis aeruginosa Kutz.*

Table : 1 Details of algal diversity at two study sites.

NAGESHI	**MANGESHI**
Temperature : Highest – 30.5 C (June)	Temperature : Highest – 31 C(June)
: Lowest – 24.5 C(December)	: Lowest – 25 C(December)
Ph – 6-6.5	Ph – 7-7.5
Dominant algae in Monsoon Season	**Dominant algae in Monsoon Season**
Cladophora glomerata	*Oedogonium subaerolatum*
Microcystis aeruginosa	*Cosmarium lundelli*
Merismopedia minima	*Cosmarium miscellium*
Oocystis gigas	*Coelastrum proboscideum*
Coelastrum proboscideum	*Netrium sp*
Dominant algae in Post monsoon Season	**Dominant algae in Post monsoon Season**
Spirogyra sp	*Oscillatoria jasorvensis*
Dactylococcopsis raphidoides	*Scenedesmus dimorphus*
	Pediastrum tetras
Dominant algae in Presonsoon Season	**Dominant algae in Permonsoon Season**
Spirogyra sp	*Dictyosphaerium sp*
Stigonema informe	*Ankistrdesmus spiralis*
Forms Restricted to Nagueshi pond	**Forms restricted to Mangueshi pond**
Cladophora glomerata	*Dictyosphaerium sp*
Spirogyra sp	*Ankistrodesmus spiralis*
Stigeonema informe	*Oedogonium subaerolatum*
Oocystis gigas	*Cosmarium miscellum*
Cylindrospermum stagnale	
Total no.of algae at Nageshi – 34	**Total no.of algae at Mangeshi – 53**
Total BGA - 11	Total BGA - 15
Total green algae - 23	Total green algae - 38

2. *M. robusta (Clark) Nygaard*
3. *Dactylococcopsis raphidoides Hansg*
4. *Aphanocapsa roeseana de Bary*
5. *Merismopedia punctata Meyen*
6. *Merismopedia elagans A Brann*
7. *Merismopedia minima Beck*
8. *Stigonema informe Kutz en Born et Flah*
9. *Oscillatoria jasorvensis Vouk*
10. *Cylindrospermum stagbnale (Kietz) Born et Flah*
11. *Anabaena volzii Lemm*
12. *Nostoc verrucosum Vaucher en Born et Flah*

Conclusion

The present preliminary work is the first report of 53 algal species of which 28 genera with 41 species of Chlorophyta and 9 genera with 12 species of Cyanophyta. Mangeshi pond supported many algae compared to that of Nageshi pond. The further systematic survey may result into the discovery of more taxa.

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Reference:

Anand, N. 1989 *Hand book of blue green algae (of rice fields of South India).* Bishen Singh Mahendra Pal Singh, Dehra Dun. Pp: 79.

Bold, H.C. & W.J. Wynne 1978. *Introduction to the algae.* Prentice Hall of India. New Delhi, Pp 686.

Bongale, U.D. 1981. On the soil algae from paddy fields of Panjim (Goa) and Chickkamanchali, (Raichur District, Karnataka India) Indian J. Bot.Soc, 326 – 329.

Desikachary, T.V. (1959). *Cyanophyta.* Indian council of Agricultural Reasearch. New Delhi, pp:68

Kerkar, V. & S. Madkaikar 2002 Fresh water Blue Green algae from Goa. In, Limnology of India. *(abstract).* Pp.8.

Singh, R.N. 1961 *Role of blue algae in the nitrogen economy of Indian Agriculture* ICAR, New Delhi.

Venkatraman, G.S. 1961 Role of Blue green algae in agriculture. *Sci and Culture.* 27: 9-13.