

# **BIOLOGY AND BIODIVERSITY OF MICRO ALGAE**

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# Preliminary Survey on Diversity of Green Algae from the Various Habitats of Goa

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## ABSTRACT

*A preliminary survey of green algal flora from variety of habitats of Goa such as ponds, puddles, temple tanks, paddy fields has resulted into the discovery of 44 species of 26 genera belonging to 7 orders and 14 families. Observations were made on planktonic, epiphytic, epilithic and epipellic forms. Oedogonium, Spirogyra, Zygnema, Pithophora were the common filamentous forms. Various desmids like Cosmarium, Closterium, Euastrum and Staurastrum were frequent in the collection. The present paper discusses the diversity of green algae from the various places and habitats of Goa. Present observations suggests that fresh water green algal flora is qualitatively rich and supports many economically important algae. Further systematic survey will definitely result into the discovery of many more taxa.*

**Key words:** Green algae, Diversity, Goa.

## Introduction

Algae form the dominant group of plants in aquatic ecosystem. Because of their beneficial and detrimental roles they play in nature they are becoming the focussed objects of scientists. Enormous information is available on the diversity of the fresh water algae of various regions of India and other countries. However the algal flora of Goa has received incidental attention. Bongale (1981), has enlisted algae from Panjim fields for the first time from Goa. 46 species with 23 genera of Blue Green Algae have been reported from diverse habitats of Goa (Kerkar and Madkaikar, 2003). Goa is not only famous for scenic beauty but it also provides many ecologically diverse habitats which support a rich algal flora. Lakes, ponds, pools and puddles formed in the monsoon season, and temple tanks are the various habitats of algal interests. Taking into consideration this variety of habitats a preliminary survey was conducted to study the diversity of algae in such enriched habitats. Observations were made on epiphytic, epilithic and epipellic green algae in addition to the planktonic ones.

## Materials and Methods

**Study area and it's features:** Goa is geographically situated between  $73^{\circ} 40' - 74^{\circ}20'E$  and  $14^{\circ} 47' N$  with Sindhudurg district of Maharashtra state on north and North Canara district of Karnataka state on South, the Western Ghats on the east and Arabian sea on the west. The region is drained by two major rivers; the Mandovi (61.6 km long) and Zuari (62.4 Km. Long ). Along the coastal plains, cultivated fields, Khazan lands and ponds are common. **Geology** – Three types of soils are mainly observed in Goa. i) Laterite ii) Red gravelly soil along the river beds iii) Alluvial soil along the coastal belt. **Climate** – The climate of Goa can be classified into four seasons. The summer from March to May. The south west Monsoon from June to September, the post monsoon from October to

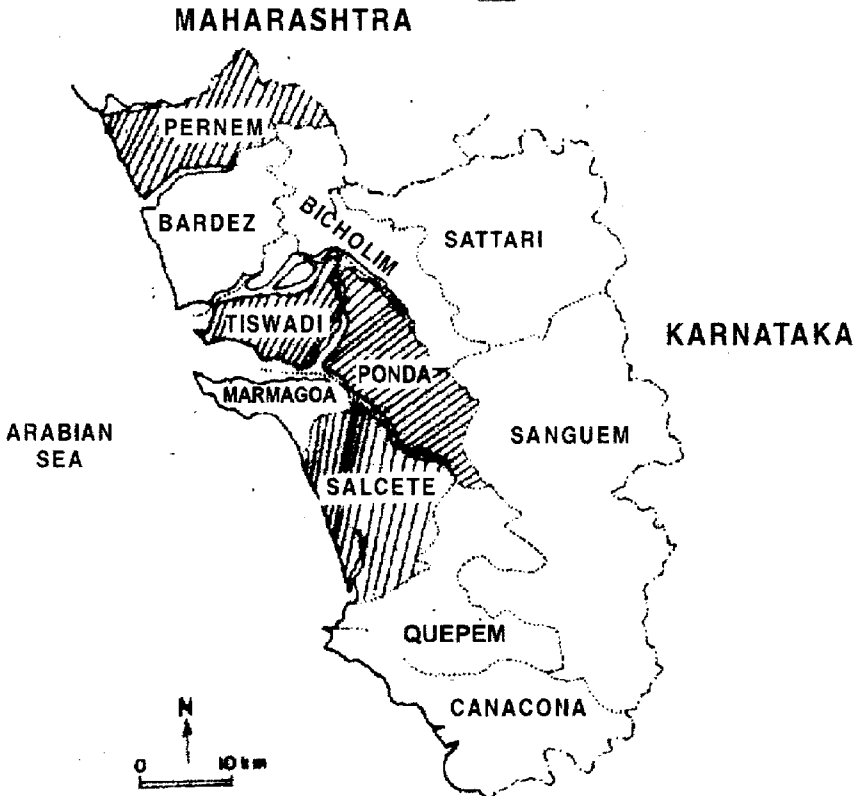


Fig 1. Map of Goa showing stations studied

November and the Winter from December to February with a distinct dry period of 6- 7 months from November to May. **Rainfall** – The area receives heavy rainfall during the south west monsoon seasons from June to September. The rains are often associated with very strong winds. The annual rainfall varies from 280 to 350 cm. **Humidity** – Due to its proximity to the coast and due to the presence of a lot of water courses and forests, the humidity is high and usually varies from 70-95 %. **Temperature** – The hot season is during March to May with maximum temperature varying from 35° to 37°C and minimum temperature from 16° to 18°C.

The Present observations were made on paddy fields from coastal talucas viz. Tiswadi, Pernem. Temple ponds from Pondataluca, permanent water bodies (lakes) from Salcete taluca of Goa were analysed for the algal diversity. (Fig.1) Planktonic, large filamentous as well as epiphyllous algae were collected from various habitats from these localities.

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

## Results and Discussion

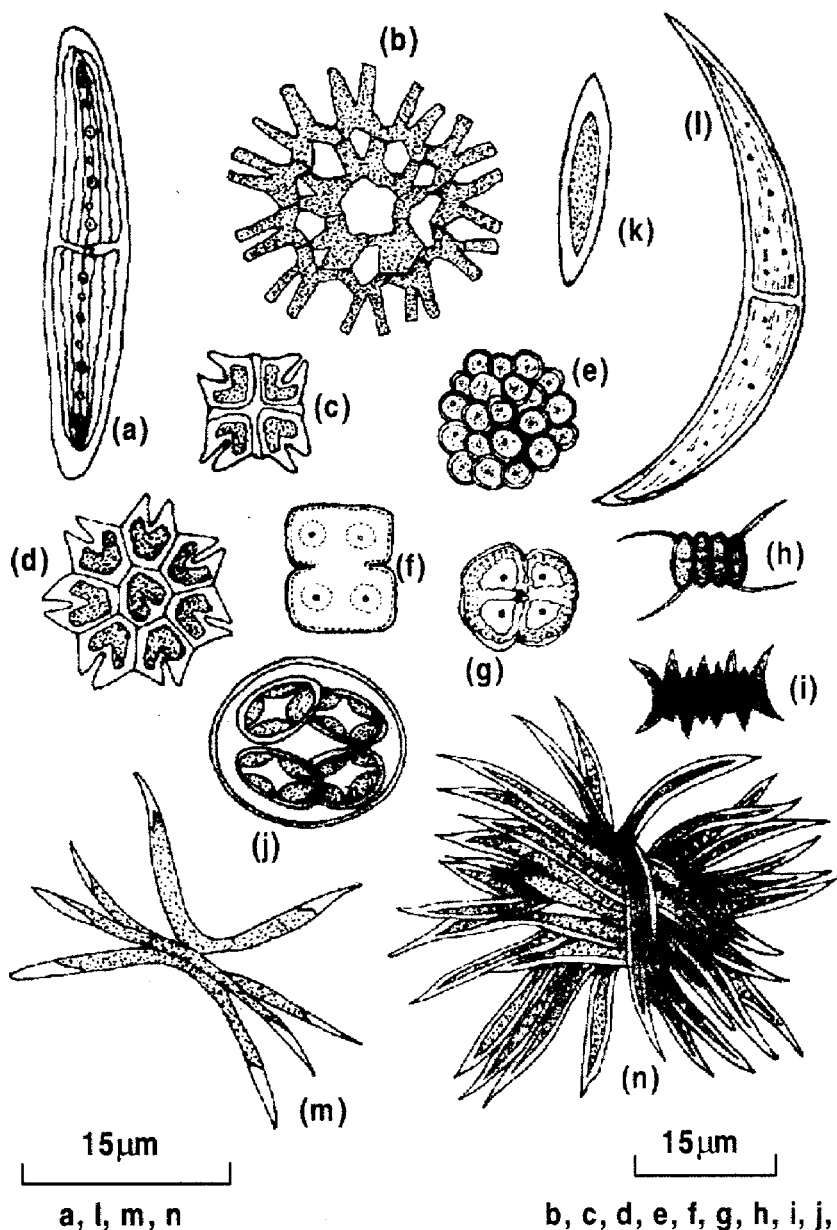
The preliminary survey carried out at various localities, representing the ecologically diverse habitats of Goa has resulted into the discovery of 44 green algal forms. Green algae formed a significantly predominant group in fresh water habitats. 26 genera with 44 species represented the green alga flora of Goa. Algal flora from ponds and permanent water bodies mainly consisted of *Scenedesmus*, *Pediastrum*, *Euastrum* and various other desmids. Filamentous forms were rare in this habitats. Forms like *Cladophora glomerata*, *Chaetophora* sp. were collected only from temple ponds and permanent water bodies. Numerous large filamentous algae like *Spirogyra*, *Mougetia*, *Rhizoclonium* and *Pithophora* were frequently observed from the paddy fields. Occurrence of filamentous algae was

very rare in the temple ponds. Epiphytic forms like *Oedogonium*, *Bulbochaetae*, *Characium* were the common forms in almost all habitats.

Green algae of common occurrence are given in Fig.2. Green algae observed in this survey are enlisted along with their details of habitat below.

1. *Chlorogonium* sp. 2. *Pandorina morum* (Muell) Borry 3. *Gloeocystis* sp. 4. *Tetraspora* sp. 5. *Sphaerocystis schroederi* Chodat 6. *Pediastrum tetras* (Ehr) Ralf 7. *P.tetras* var. *tetradron* (corda) Ralf. 8. *P.duplex* var. *gracillium* Moym 9. *Oocystis gigas* Archer 10. *Hydrodictyon reticulatum* (Len) Leguheim 11. *Kirchneriella lunaris*. 12. *K. obesa* (W.West) Schmidle 13. *Ankistrodesmus spiralis* (Turner) Lemm var. *Fasciculatus* G.M.Smith 14. *A. fulcatus* (Corda) Ralf. 15. *Scenedesmus bijugatus* (Turp) Kuetz. 16. *S. dimorphus* (Turp) Kuetz. 17. *S. denticulatus* Lagerhein var. *australis* 18. *Coelastrum microsporum* Naeg 19. *C. cambricum*. 20. *Dictyosphaerium* sp. 21. *Euastrum sinosum* var. *reductum* W. et G.S.West 22. *E. dubium* Naeg var. *tritum* W.et G.S. West 23. *E.denticulatum* (Kirchn) Gay 24. *Penium minutum* (Ralf) Cleve var. *crassum* W. West 25. *Netrium* sp. 26. *Staurastrum gracile* Ralf 27. *Closterium recurvum* Prescott 28. *C. libelilla* var. *intermediatum* 29. *C.parvulum* Naeg var. *angustum* W.t 30. *Cosmarium lundelli* Delp 31. *C. quadrum* 32. *C. abbreviatum* 33. *Spirogyra* sp. 34. *Oedogonium idioandrosporum* 35. *Oedogonium subaerolatum* 36. *Bulbochaetae* sp. 37. *Microspora floccosa* (Vaucher) Thuret 38. *Cylindrocapsa conferta* W. West 39. *Uronema gigas* Vischer 40. *Geminella mutabilis* (Breb) Wille 41. *Chaetophora* sp. 42. *Cladophora glomerata* (L) Kuetz 43. *Rhizoclonium* sp. 44. *Pithophora varia* Wille

From the foregoing account it can be concluded that the fresh water green algal flora is qualitatively rich and supports many economically important algae and will definitely lead into the discovery of many more taxa.



**Fig.2. Commonly occurring some green algae of Goa:** (a) *Closterium libellula* var. *intermedium*; (b) *Pediastrum tetras* var. *exisum*; (c) *Pediastrum tetras*; (d) *Pediastrum duplex* var. *gracillum*; (e) *Coelastrum cambricum*; (f) *Cosmarium quadrum*; (g) *Cosmarium abbreviatum*; (h) *Scenedesmus quadricauda*; (i) *Scenedesmus dimorphus*; (j) *Oocystis gigas*; (k) *Chlorogonium* species; (l) *Ankistrodesmus falcaus*; (m) *Ankistrodesmus spiralis* var. *fascicularis*

## Conclusion

The present preliminary survey has resulted into the discovery of 44 algal species of 24 genera. The further systematic survey may lead to the discovery of many more taxa.

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