

## CHLOROPHYCEAN MICRO ALGAL FLORA OF KEOLA DEO NATIONAL PARK, BHARATPUR (RAJASTHAN), INDIA

ARVIND PAREEK, ABHISHEK VASHISHTHA and PREETI SHARMA

Mahatma Gandhi Institute of Applied Sciences, Shri Ram ki Nangal, Via Vatika, Tonk Road, Jaipur- 303 905, India.

Lakes are constantly enriched with organic matter from decomposing plant and animal remains, providing nutrition for algae. It is a well known fact that physico-chemical factors of the water determine the status of aquatic ecosystem. Seasonal variations have a direct impact upon the occurrence and growth of algal species in an aquatic ecosystem. During the study, different blocks of Keoladeo National Park were analysed. It was observed that Keoladeo lake was very conducive to the growth of algal population but it showed frequent algal blooms which stands a testimony to the fact that water is highly rich in nutrients. Number of members of chlorophytes were slightly more as compared to other algal classes.

**Keywords :** Algal flora; Chlorophyceae; Keola Deo National Park.

Keoladeo National Park (popularly known as Ghana, meaning dense forest) is located in the indo-gangetic plains at the joint of the North Western Indian peninsula with a wide diversity of habitats ranging from marshes, woodlands, grasslands to denuded saline patches. The park supports an amazing variety of plants and animal species. The park is situated in Bharatpur district of Rajasthan in the low lying area (77°2.9'5" E and 22°7'6" N – 27°12'2" N). The park is spread over an area of 29 sq km. It is totally flat area having gentle slope towards the centre thereby forming a depression in about 6-8 sq km area, which is flooded annually to become play-field for aquatic birds. The main source of water for the lake in the park is Ajan Dam located about one km away. The entire submersible area has been divided among various unequal compartments and dykes have been made all along the periphery. Each compartment is connected with the other through sluice gates. Level of water can thus be regulated in each compartment as per the need.

Fortnightly algal collections and their identifications lasted from the month July 2004 to Dec. 2004. Different blocks of Keoledeo Lake were selected as the study sites.

The phytoplankton and other surface living aquatic forms were collected with the help of plankton net of fine boating silk of 25 mesh. The benthic forms were detached from the substratum with the help of a scalpel and giant pipettes. The large sized thalli were directly picked up from the surface of the water.

**Algal Investigation :** In the laboratory, the collected samples of phytoplankton were studied with the help of a monocular Ajay optics research microscope. Isolation and mounting of algae was carried out under a dissecting microscope.

As far as possible, the collected samples were

studied in living state and for this no stain was employed. Preserved material was studied after proper staining. Lugol's iodine and safranine were the stains employed.

Different morphological features adopted were colour, structure and dimensions of the thalli, colonies, cells, filaments and trichomes. The reproductive stage was taken as additional parameter for identification of genera and species. Diagrams were drawn with the help of a camera lucida.

For identification of forms at generic and species level, the schemes and characters suggested by Philipose<sup>1</sup> were adopted. Similarly, works like Charophytes by Pal *et al.*<sup>2</sup>, Ulotrionales by Ramanathan<sup>3</sup>, Oedogoniales by Gonzalves<sup>4</sup> and Volvocales by Iyengar and Desikachary<sup>5</sup> were found to be of immense help.

The present studies were aimed at investigating the algal flora of three selected sites of Keoledeo National Park and the relevance of physico-chemical factors operating upon them at these sites.

Division Chlorophyta  
Class Chlorophyceae  
Order : Volvocales

Family : Chlamydomonadaceae  
*Chlamydomonas globosa* Snow  
Iyengar & Desikachary 1981<sup>5</sup>, p. 263,  
fig. 147: 1-3

Month of collection August

Family : Volvocaceae  
*Pandorina morum* (Mull.) Bory  
Iyengar & Desikachary, 1981<sup>5</sup>, p. 417, fig. 243  
Month of collection August

Order : Chlorococcales

Family : Chlorococcaceae  
*Chlorococcum humicola* (Naeg.) Raben.

- Philiphose, 1967<sup>1</sup>, p. 73, figs. 3b,c  
 Month of collection July - September  
 Family : Coelastraceae  
*Coelastrum microsporium* Naeg.  
 Smith, 1920<sup>6</sup>, p. 160, pl. 41, fig. 12-13  
 Month of collection October to December  
 Family : Scenedesmaceae  
*Crucigenia crucifera* (Wolle) Collins  
 Philipose, 1967<sup>1</sup>, p. 240, fig. 149  
 Month of collection March, April  
*Scenedesmus* Meyen  
*Scenedesmus abundans* (Kirch.) Chodat  
 Smith, 1920<sup>6</sup>, p. 272, fig. 191 G  
 Pl. - 1, fig. - 1  
 Month of collection February, March  
*S. acuminatus* (Lagerh.) Chodat.  
 Bruhl & Biswas, 1986<sup>7</sup>, p. 266, Plate I, fig. 11.  
 Month of collection February to April  
*S. denticulatus* Lagerheim  
 Philipose, 1967<sup>1</sup>, p. 268, fig. 176  
 Pl. - 1, fig. - 2  
 Month of collection March, April  
*S. longus* var. *naegelii* (Brebs) G.M. Smith  
 Philipose, 1967<sup>1</sup>, p. 274, figs. 180b,c,g,i  
 Pl. - 1, fig. - 3  
 Month of collection March, April
- Order : Ulotrichales  
 Family : Ulotrichaceae  
*Ulothrix fimbriata* Bold  
 Ramanathan, 1954<sup>3</sup>, p. 31, plate 8 A-L  
 Month of collection August  
*U. variabilis* (Kuetz.) Kuetzing  
 Ramanathan, 1954<sup>3</sup>, p. 39, plate 10D-F  
 Month of collection February  
*U. zonata* (Weber et Mohr) Kuetzing  
 Ramanathan, 1954<sup>3</sup>, p. 30, plate 1. AB; 3A, G-I;  
 4 A-H; 5 A-N; 6 A-J  
 Month of collection February  
*Geminella* sp.  
 Month of collection April  
 Family : Microsporaceae  
*Microspora pachyderma* (Wille.) Lagerh  
 Ramanathan, 1964, p. 128, plate 36 E-K  
 Month of collection March
- Order : Chaetophorales  
 Family : Coleochaetaceae  
*Coleochaete scutata* De Brebisson  
 Prescott, 1951<sup>8</sup>, p. 130, pl. 18, fig. 19  
 Month of collection April  
 Family : Chaetophoraceae  
*Stigeoclonium aestivale* (Hasen) Collins  
 Iyengar & Desikachari, 1981<sup>5</sup>
- Month of collection February  
 Order : Oedogoniales  
 Family : Oedogoniaceae  
*Oedogonium* Link  
*O. americanum* Trans.  
 Gonzalves, 1981<sup>4</sup>, p. 318 fig. 9.197  
 Pl.-2, figs.-3a,b,c  
 Month of collection April  
*O. Khannae* f. *Khannae* Skuja  
 Gonzalves, 1981<sup>4</sup>, p. 246, fig. 9.127A  
 Pl. - 3, figs. - 6a,b  
 Month of collection November  
*O. lautumniarum* f. *gracilis* (Venk.) nom. nov.  
 Gonzalves, 1981<sup>4</sup>, p. 281, fig. 9. 158C  
 Pl. - 3, figs. - 3a,b  
 Month of collection November  
*O. multisporum* var. *multisporum* Wood  
 Gonzalves, 1981<sup>4</sup>, p. 408, fig. 9.302A  
 Pl. - 2, figs. - 1a,b  
 Month of collection November  
*O. prescottii* f. *dispar* Gonz. & Jain  
 Gonzalves, 1981<sup>4</sup>, p. 300, fig. 9.180 B  
 Pl. - 3, fig. - 5a,b  
 Month of collection December  
*O. rivulare* [(Le Cl) Al. Br.] Hirn.  
 Gonzalves, 1981<sup>4</sup>, p. 289 fig. 9.168 A  
 Pl. - 2, figs. - 2 a,b  
 Month of collection February  
*O. santapau* Kam.  
 Gonzalves, 1981<sup>4</sup>, p. 293, fig. 9.17 O  
 Pl. - 5, figs. - 9a,b  
 Month of collection April  
*O. smithii* Presc.  
 Gonzalves, 1981<sup>4</sup>, p. 521, fig. 9.424  
 Pl. - 3, fig. - 2  
 Month of collection April  
*O. sociale* f. *minor* Singh  
 Gonzalves, 1981<sup>4</sup>, p. 296, fig. 9.173 c  
 Month of collection November  
*O. sociale* f. *kanwaense* Singh  
 Gonzalves, 1981<sup>4</sup>, p. 296, fig. 9.173b  
 Month of collection November  
*O. varians* var. *Varians* (Wittr. Lund) Hirn.  
 Gonzalves, 1981<sup>4</sup>, p. 186, fig. 9.55 A,A'  
 Pl. - 3, figs. - 4a, b  
 Month of collection November  
*Spirogyra* Link  
*S. aequinoctialis* G.S. West  
 Randhawa, 1958<sup>9</sup>, p. 387, fig. 439  
 Pl. - 4, figs. - 3a,b  
 Month of collection January, February  
*S. arta* Jao

Randhawa, 1958<sup>9</sup>, p. 354, fig. 369  
 Pl. - 4, fig. - 1a,b  
 Month of collection           October, November  
*S. brunnea* Czurda  
 Randhawa, 1958<sup>9</sup>, p. 337, figs. 333a,b  
 Pl. - 4, figs. - 2a,b  
 Month of collection           February, March  
*Zygnema* Agardh  
*Zygnema calosporum* Jao  
 Randhawa, 1959<sup>10</sup>, p. 235, fig. 179  
 Pl.-4, figs.-4a,b  
 Month of collection           March  
*Z. cyaneum* Czurda  
 Randhawa, 1959<sup>10</sup>, p. 246, fig. 205  
 Pl.-4, figs.-6a,b  
 Month of collection           December  
*Z. gangeticum* Rao  
 Randhawa, 1959<sup>10</sup>, p. 216, fig. 142  
 Pl.-4, figs.-7a,b  
 Month of collection           September  
*Z. insigne* (Hassall) Kuetz.  
 Randhawa, 1959<sup>10</sup>, p. 234, fig. 176  
 Pl.-4, fig.-5  
 Month of collection           February  
*Cosmariium pseudocoronatum* Turner  
 Bruhl and Biswas, 1986<sup>7</sup>, p. 298, Plate XI,  
 fig. 112  
 Month of collection           November  
 Division Xanthophyta  
 Class    Xanthophyceae  
           *Vaucheria*  
           *Vaucheria amphibia* Randhawa  
 Venkataraman, 1961<sup>11</sup>, p. 73, fig. 49  
 Pl.-1, fig.-5  
 Month of collection           February  
*V. hamata* Walz.

Venkataraman, 1961<sup>11</sup>, p. 85, fig. 62  
 Pl. - 1, figs. - 5a,b  
 Month of collection           February  
*V. sessilis f. genuina* Hansg.  
 Venkataraman, 1961<sup>11</sup>, p. 70, fig. 46c  
 Pl.-1, fig.-7  
 Month of collection           February

**Acknowledgements**

Authors are grateful to Department of Forest, Government of Rajasthan and Dy. Chief wild life warden, KNP, Bharatpur to provide all required facilities during the tenure of work.

**References**

1. Philipose M T 1967, *Chlorococcales*. ICAR, New Delhi.
2. Pal B P, Kundu B C, Sundralingam and Venkataraman G S 1962, *Charophytes*. ICAR, New Delhi.
3. Ramanathan K P 1954, *Ulotrichales*. ICAR, New Delhi.
4. Gonzalves E A 1981, *Oedogoniales*. ICAR, New Delhi.
5. Iyengar M O P and Desikachary T V, 1981, *Volvocales*. ICAR, New Delhi.
6. Smith G M 1920, Phytoplankton of inland lakes of Wisconsin. Part I. *Bull. Wis. Geol. Nat. Hist. Surv. Bull.* 57 243.
7. Bruhl P and Biswas K 1986, *Algae of the Loktak Lake*. Memoirs of the Asiatic Society of Bengal.
8. Prescott G W 1951, *Algae of the Western Great Lake area*, Gran. Brook Inst. Sci. Michigan.
9. Randhawa M S 1958, Notes on some new and interesting algae from India. *Bot. Gaz.* 120 25-31.
10. Randhawa M S 1959, *Zygnemaceae*. ICAR, New Delhi.
11. Venkataraman G S 1961, *Vaucheriaceae*. ICAR, New Delhi.