

THE ALGAL GENUS *PEDIASTRUM* MEYEN FROM NORTH MAHARASHTRA

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This communication is a morpho-taxonomic description and distribution of genus *Pediastrum*, member of algal order Chlorococcales. Nine *Pediastrum* species have been collected from Tapi river in Jalgaon district, Maharashtra. These are *Pediastrum boryanum* (Turpin) Menegh. var. *longicorne* Reinsch, *P. clathratum* (Schroeder) Lemm. var. *punctatum* Lemm., *P. duplex* Meyen var. *clathratum* A Braun., *P. ovatum* (Ehr.) A Braun., *P. muticum* Kuetz. var. *longicorne* Racib., *P. simplex* Meyen var. *duodenarium* (Bailey) Rabenh., *P. simplex* Meyen var. f. *echinulatum* f. novo. *P. tetras* (Ehr.) Ralf. var. *excisum* (Rabenh.) Hansgirg, *P. tetras* var. *tetraodon* (Corda) Hansgirg. Of these *P. clathratum* var. *punctatum* is new to India, 2 taxa *P. duplex* var. *clathratum* and *P. muticum* var. *longicorne* are additions to the algal flora of Maharashtra. One new species *P. simplex* Meyen f. *echinulatum* f. novo is proposed. An illustrated detailed account has been given for the new species and new records for India and rest of the taxa only brief taxonomic notes are given. All nine species were collected from freshwater and showed best growth in end of rainy season and early winter months. Whilst *P. clathratum* var. *punctatum* has been collected as a Tychoplankter from small pond in a river. Such pond was adulterated by domestic sewage.

Keywords : Maharashtra; *Pediastrum*; Tapi river.

Introduction

Algae are the most beautiful microflora of the microscopic world. The collection and study of algae has a charm and fascination, which is better experienced than described. They exhibit a great beauty and aesthetic value in aquatic nature, one of them genus *Pediastrum* is a beautiful flat monostromatic shaped disc colonial alga shows radial symmetry.

While studying the algae from Tapi river in Jalgaon district, Maharashtra State, we collected about 60 taxa of Chlorococcales. Out of which nine taxa of *Pediastrum* have been described in the present paper. Of these one taxon is new to India and 2 taxa are additions to the algal flora of Maharashtra and *P. simplex* f. *echinulatum* f. novo is proposed.

Our knowledge regarding the occurrence and distribution of Indian Chlorococcales have appeared closely on the heel of the publication of the monograph by Philipose¹, very few reports are available on the algae of Tapi river from Jalgaon district²⁻⁶. Keeping this in mind, the authors surveyed the algal flora of Tapi river. Present communication includes 9 taxa of *Pediastrum* are taxonomically described.

Material and Methods

Study area: Jalgaon district lies between 20° and 21° North

latitude and 74° 75' and 76° 28' East longitude. The river Tapi is one of the main and big river of Jalgaon district. This river has its origin in the Mahadeva hills of Satpura mountain near village Multai, Dist. Baitul (M.P.). It enters into Maharashtra near village Amurkheda, Tal. Raver, Dist. Jalgaon and join in Dhule district near village Padalsa, Tal. Amalner, Dist. Jalgaon. It flows east-south for about 307 kms. in Maharashtra State, of which approximately 140 kms. length in Jalgaon district with a dam over at Hatnur, Tal. Bhusawal. During the monsoon the river is flooded and in dry season however the river trickles down into minor channels.

Algal collection were made during August, 2007 to December, 2008 from both bank of Tapi river. The collected algal samples were killed, fixed and stored in 4% formalin for microscopical studies and sketched both from fresh as well as preserved material. Microphotograph are taken from using Trinocular research microscope in combination with 8 megapixel digital camera. Identifications are mostly based on the monograph of Philipose¹, Prescott⁷, Hortobogyi⁸ and other relevant literature.

Morpho -Taxonomic Description :

Genus *Pediastrum* Meyen- It is a free-floating, monostromatic disc shaped colonial green alga consisting 4

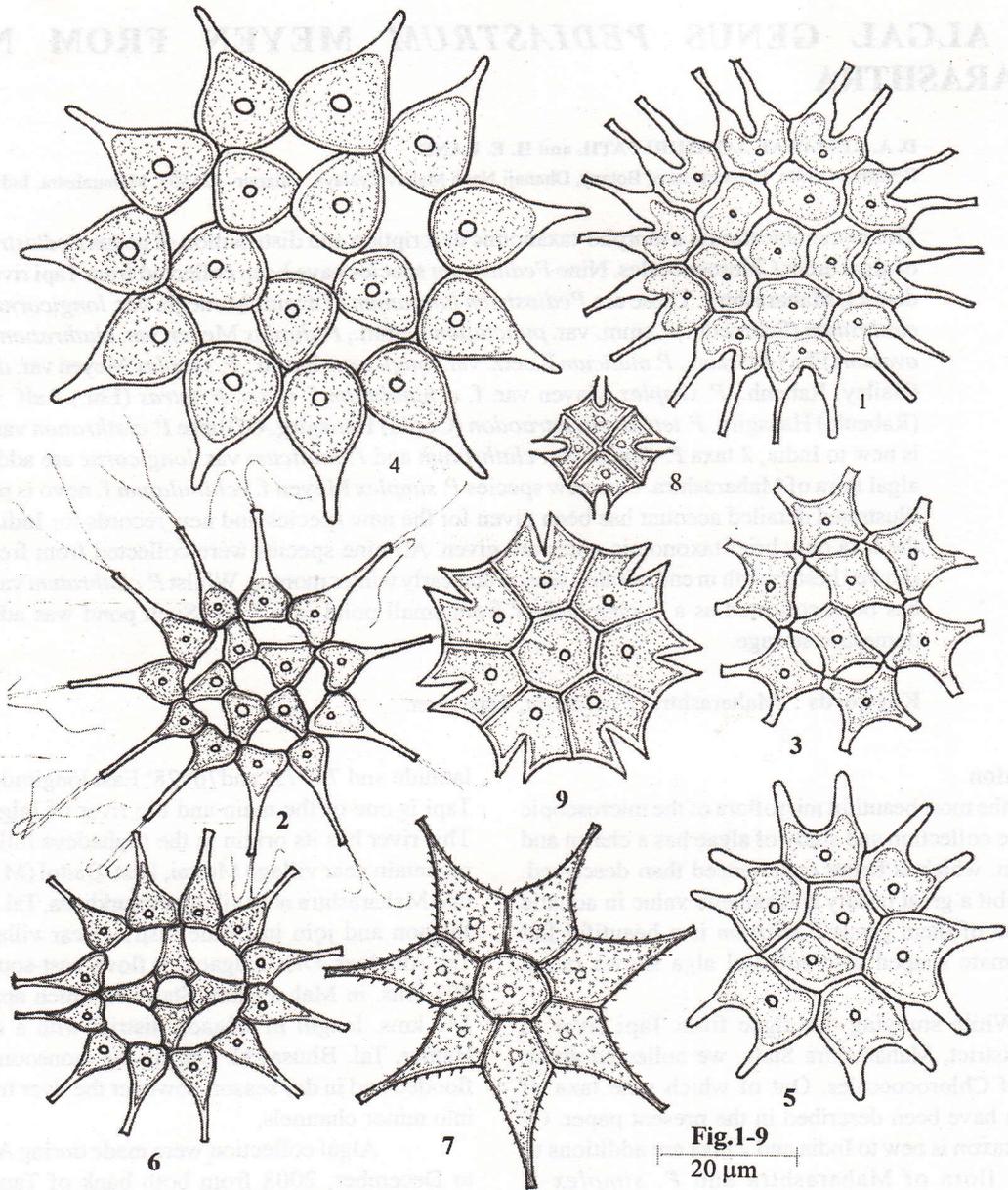


Plate 1: Genus *Pediastrum* Meyen. Fig. (1-9) : 1. *Pediastrum boryanum* (Turpin) Menegh. var. *longicornis* (Reinsch), 2. *P. clathratum* (Schroet.) Lemm. var. *punctatum* Lemm., 3. *P. duplex* Meyen var. *clathratum* (A. Braun) Legerheim), 4. *P. ovatum* (Ehr.) A Braun, 5. *P. muticum* Kuetz. var. *longicornis* Raciborski, 6. *P. simplex* Meyen var. *duodenarium* (Bailey) Rabenhorst, 7. *P. simplex* Meyen. f. *echinulatum* f. nov, 8. *P. tetras* (Ehr.) Ralfs. var. *excisum* (Rabenh.) Hansgirg, 9. *P. tetras* var. *tetraodon* (Corda) Hansgirg. to 64 or more polygonal cells arranged in radial symmetry. This genus was first described by Meyen in 1829 and belongs to class Chlorophyceae.

1. *Pediastrum boryanum* (Turpin) Menegh. var. *longicornis* (Reinsch) Pl.1 Fig.1; Pl.2 Fig.1

Philipose, 1967, p. 199-120, f. 40b.

Coenobia of 16 cells, 59.4 μm dia.; cell dimensions 9.3 – 11.2 x 19.1 -21.8 μm (Coll.No. 136).

2. *P. clathratum* (Schroet.) Lemm. var. *punctatum* Lemm. Pl.1 Fig.2; Pl.2 Fig.2

Hortobagyi, 1973, p. 77, f. 304.

We observed coenobia cells, 52.8 μm dia.

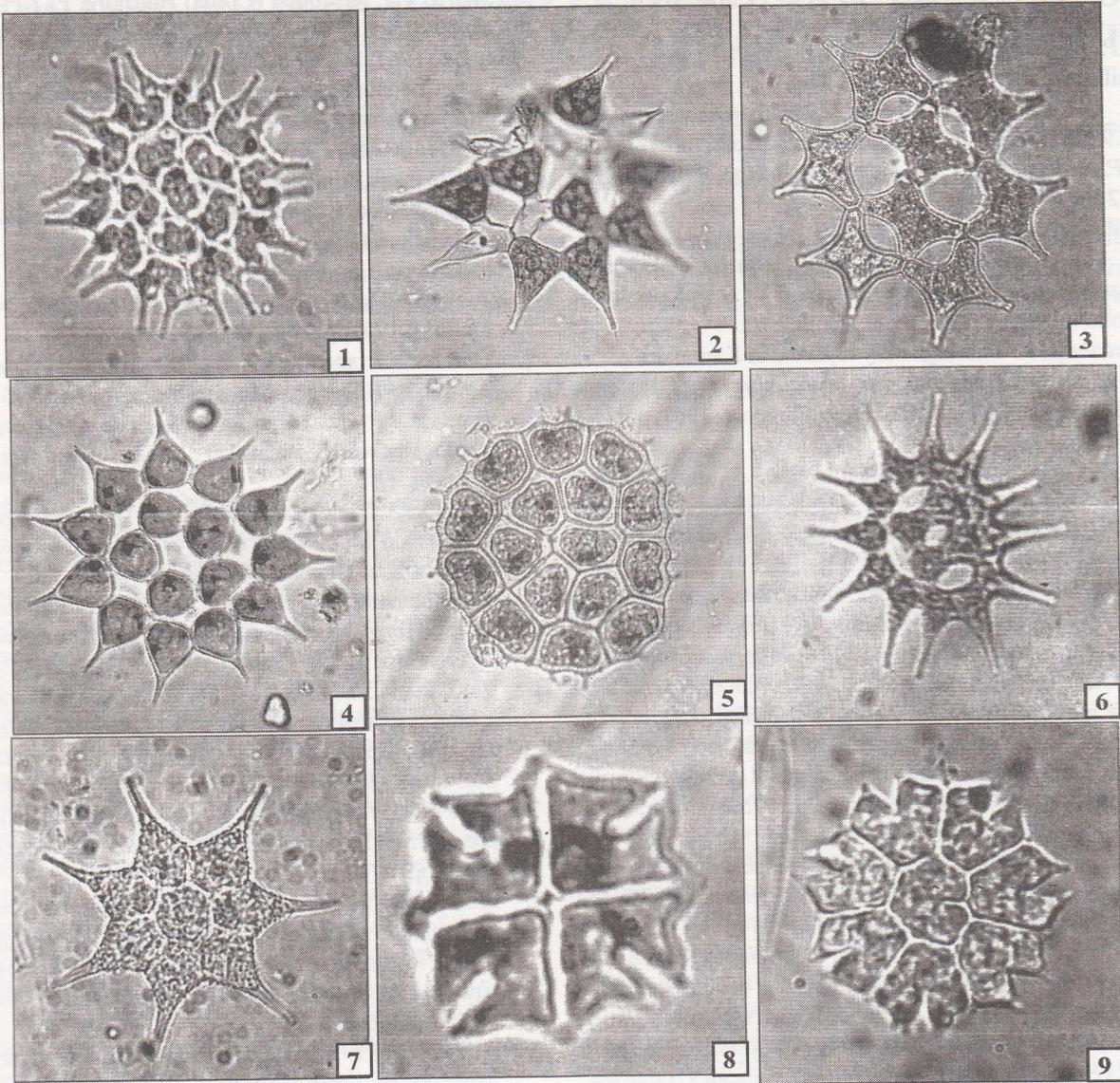


Plate 2 : Genus *Pediastrum* Meyen. **Fig. (1-9) :** 1. *Pediastrum boryanum* (Turpin) Menegh. var *longicorne* (Reinsch), 2. *P. clathratum* (Schroet.) Lemm. var. *punctatum* Lemm., 3. *P. duplex* Meyen var. *Clathratum* (A. Braun) Legerheim), 4. *P. ovatum* (Ehr.) A Braun, 5. *P. muticum* Kuetz. var. *longicorne* Raciborski, 6. *P. simplex* Meyen var. *duodenarium* (Bailey) Rabenhorst, 7. *P. simplex* Meyen. f. *echinulatum* f. nov, 8. *P. tetras* (Ehr.) Ralfs. var. *excisum* (Rabenh.) Hansgirg, 9. *P. tetras* var. *tetraodon* (Corda) Hansgirg.

circular with large intercellular spaces. Innerface of marginal cells concave, outer face prolonged into a single long delicate tapering process end bear one or two long thin flagella. Sides of marginal cells also concave. Interior cells similar to marginal cells but with shorter processes and without flagella. Cell wall smooth. Cells 6.6–7.3 μm broad and 14.4 – 15.8 μm long.

It has been collected as Plankton in standing

waters of pond adulterated with village sewage waste drain near Bhusawal during November, 2008.

The alga, which is known from America, has not been reported from the Indian region. (Coll.No.142).

3. *P. duplex* Meyen var. *clathratum* (A. Braun) Legerheim) Pl.1 Fig.3; Pl.2 Fig.3

Philipose, 1967, p. 123, f. 43 f.

Coenobia of 8 cells, 41-42.9 μm dia. cells 10.7-

11.2 μm broad and 11-13.2 μm long. (Coll.No.124)
Tamil Nadu¹, Jamnu⁹, Gujarat⁸

4. *P. ovatum* (Ehr.) A Braun Pl.1 Fig.4; Pl.2 Fig.4
Philipose, 1967, p. 115-116, f. 37 g.

Coenobia of 16 cells, 7.72-80 μm dia., cells 13-13.9 μm broad and 22-23.1 μm long. (Coll.No.147).

5. *P. muticum* Kuetz. var. *longicorne* Raciborski, Pl.1 Fig.5
Pl.2 Fig.5

Philipose 1967, p. 117, f. 38.

Coenobia of 8 cells, 47-49.5 μm dia. cells 11.2 - 12 μm broad and cells with process 17.1 - 18.5 μm long (Coll.No.69).

Distribution : This alga only reported in Karnataka¹.

6. *P. simplex* Meyen var. *duodenarium* (Bailey) Rabenhorst) Pl.1 Fig.6; Pl.2 Fig.6 Philipose, 1967, p. 115, f. 36 h.

Coenobia of 8-16 cells, 45-47.5 μm dia. cells, 5.3 - 6.6 μm broad and 14-15.2 μm long. (Coll.No.79)

7. *P. simplex* Meyen. f. *echinulatum* f. novo Pl.1 Fig.7; Pl.2 Fig.7

Coenobia with eight cells, no intercellular cavities between the cells of coenobium 58.1 μm dia. cells 9.9 - 11.2 μm broad and 22.4-25.1 μm long, Chloroplast a parietal reticulate, covering the wall, with one pyrenoid cells multinucleate. Inner side of marginal cells nearly straight, outer side produced into a gradually tapering lobes, sides concave. Inner cell polygonal surface cell wall and free outer margins furnished with numerous sharp spine but ends of process are smooth.

The alga collected in slightly acidic water frequency with decomposing vegetation near Rameshavar temple, Khedi Bhokari during November 2007 (Coll.No. 74).

This taxa is very similar to *P. simplex* Meyen but differs from the type there are no intercellular cavities between the cells of coenobium and cell membrane covered with spines but terminal ends of lobes are smooth.

8. *P. tetras* (Ehr.) Ralfs. var. *excisum* (Rabenh.) Hansgirg

Pl.1 Fig.8; Pl.2 Fig.8

Philipose, 1967, p. 129-130, f. 45 f.

Coenobia of 4 cells, 21.1 μm in dia. Diameter of the cells 10.5 - 11.2 μm . (Coll. No. 79).

9. *P. tetras* var. *tetraodon* (Corda) Hansgirg. Pl.1 Fig.9; Pl.2 Fig.9

Philipose, 1967, p. 129, f. 45 d, e, g.

Coenobia 8-16 celled, 40.9 μm dia. Cells 13.2-15.8 μm in diameter. (Coll.No. 83).

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