

Diatom-flora of Allahabad (India)—I

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The paper deals with the taxonomic considerations of 33 taxa of freshwater diatoms belonging to 15 genera described from the Allahabad district of UP (India). Of these, three taxa belong to Centrales and the remaining thirty belong to Pennales. The following genera of the diatoms were represented (The numbers in parenthesis indicate the number of taxa of each genus) *Melosira* (1), *Cyclotella* (2), *Synedra* (4), *Cocconeis* (3), *Gyrosigma* (2), *Diploneis* (1), *Caloneis* (1), *Stauroneis* (1), *Navicula* (6), *Gomphonema* (3), *Cymbella* (3), *Rhopalodia* (2), *Nitzschia* (2), *Epithemia* (1) and *Surirella* (1).

Key Words: Diatoms, Taxonomy, Centrales, Pennales

Introduction

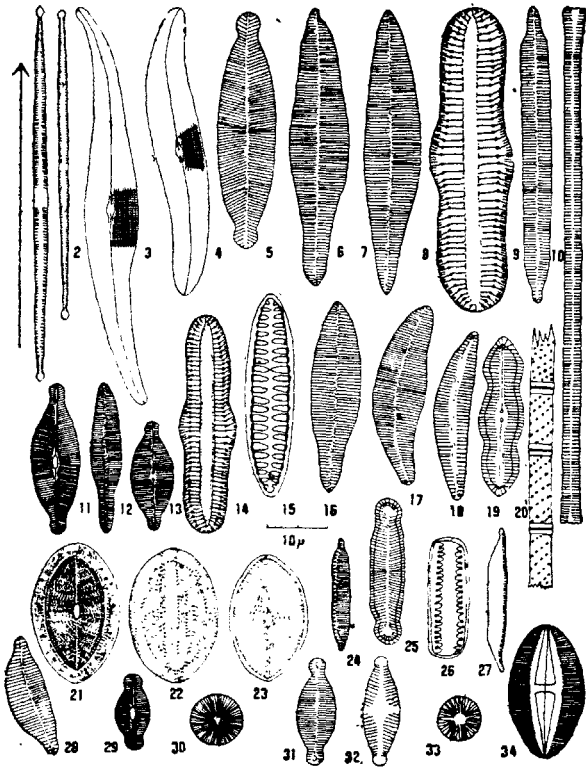
Allahabad is situated 25° 26' N latitude and 81° 52' E longitude at the southern edge of the extensive plains of the Ganga and Yamuna rivers at their confluence. The climate is characterised by striking periodicity. Temperature ranges from 59°F to 120°F. Although a good deal of work has been done on the systematics of blue-green and green algae of Allahabad (Mitra 1951, Gupta A B 1956 and Verma 1969) Only a few workers viz., Mitra (1951) and Gupta M (1976) reported some diatoms from the soils of Allahabad and Mauaima respectively. The present communication deals with the freshwater Diatom-flora of Baghla and

McPherson lakes of Allahabad district. Baghla lake is situated about 50 km southwest to the city of Allahabad. It is situated in a rocky locality and the lake receives water from a rivulet throughout the year. McPherson lake is situated in the suburb of the city at a distance of about 6 km towards west. Diatoms were collected from Baghla and McPherson lakes at a regular interval of a fortnight starting from the month of October, 1977 and ending in June, 1978. The descriptions of the forms are based on preserved material collected from nature. The genera described below are mainly arranged and identified accord-

ing to Hustedt's (1930) monograph with the additional help of Cleve-Euler's monograph (1951-55).

1. *Melosira granulata* (Ehr.) Ralfs. (figure 20)
Frustules 6μ in diameter and $10-18\mu$ high, united in chains; striations parallel and straight, about $7-9$ in 10μ .
Habitat: Planktonic. More abundant from December to January and frequent from February to November.
2. *Cyclotella operculata* (Agardh) Kütz. (figure 33)
Frustules 8μ in diameter, central area smooth; striae 13 in 10μ .
Habitat: Planktonic. Abundant in December and less frequent from January to November.
3. *Cyclotella meneghiniana* Kütz (figure 30)
Frustules $10-20\mu$ in diameter; central area smooth; striae $8-9$ in 10μ .
Habitat: Planktonic. More abundant from November to March and common from April to October.
4. *Synedra ulna* (Nitz.) Ehr. (figure 9)
Valves 77μ long and 7.5μ broad; striae $10-11$ in 10μ .
Habitat: Planktonic. Common during November to March.
5. *Synedra ulna* (Nitz.) Ehr. var. *amphirhynchus* (Ehr.) Grün. (figure 10)
Valves 170μ long and 5.2μ broad; striae, distinct, 10 in 10μ .
Habitat: Planktonic. In immense abundance during October to February, otherwise less common.
6. *Synedra ulna* var. *danica* (Kütz.) Grün. (figure 2)
Valves 270μ long and 5μ broad, striae $8-10$ in 10μ .
Habitat: Planktonic. Frequent from October to February and common during March to September.
7. *Synedra acus* Kütz. (figure 1)
Valves $100-270\mu$ long and $5-6\mu$ broad; striae, distinct, $8-9$ in 10μ .
Habitat: Planktonic. Common during November and December.
8. *Cocconeis pediculus* Ehr. (figure 22)
Valves 32μ long and 18μ broad, punctae fine; striae 23 in 10μ .
Habitat: Sticking to pebbles and stones and epiphytic on *Cladophora* sp. and sometimes it entirely covers the whole of the filament. Very common during October.
9. *Cocconeis placentula* Ehr. (figure 21)
Valves $16-34\mu$ long and $10-20\mu$ broad striae 18 in 10μ .
Habitat: Epiphytically growing on *Sirogonium* sp. and other dead twigs submerged in water. Common during November-January.
10. *Cocconeis placentula* var. *lineata* (Ehr.) Cl. (figure 23)
Valves 35μ long and 20μ broad; striae $18-20$ in 10μ . This form resembles the type except the cell is larger in size.
Habitat: Epiphytic on some old filaments of *Cladophora* sp., not common. Frequent in December.

11. *Gyrosigma acuminatum* (Kütz.) Cl. (figure 3)
Valves 100 μ long and 18 μ broad in the middle and 4 μ at the ends; transverse striations 14–16 in 10 μ ; longitudinal striation 10–12 in 10 μ .
Habitat: Planktonic. Common during October to February.
12. *Gyrosigma scalproides* (Rabh.) Cl. (figure 4)
Valves 76 μ long and 10–12 μ broad; transverse striations usually perpendicular to the middle line, sometimes medianly radial, 23–24 in 10 μ ; longitudinal striations; 28–30 in 10 μ .
Habitat: Planktonic. Frequent during October to January.
13. *Diploneis elliptica* (Kütz.) Cl. (figure 34)
Valves 20–65 μ long and 10–30 μ broad; transverse costae somewhat radial, 9 in 10 μ .
Habitat: Planktonic. Abundant during November–February, otherwise not common.
14. *Caloneis silicula* (Ehr.) Cl. (figure 19)
Valves 78 μ long and 18 μ broad; transverse striations somewhat radial, 16–20 in 10 μ .
Habitat: Epiphytic on the filaments of *Cladophora* sp., more frequent during November to February and uncommon during March to October.
15. *Staureneis anceps* Ehr. var. *anceps*. Ehr. (figure 32)
Valves 28 μ long and 9 μ broad; transverse striations 25 in 10 μ clearly punctate and radial.
Habitat: Planktonic. Common during December and January.
16. *Navicula anglica* Ralfs. (figure 29)
Valves 10.5 μ long and 8 μ broad; striae 11–12 in 10 μ , radial, central, area round.
Habitat: In brownish filmy layer covering some water plants. Frequent from January to April.
17. *Navicula decussis* Ostrup (figure 13)
Valves 25 μ long and 8.5 μ broad; striae linear and radial, 15–16 in 10 μ .
Habitat: Planktonic. In abundance from November to June, otherwise common.
18. *Navicula exigua* (Gregory) Mueller (figure 31)
Valves 25 μ long and 8 μ broad. Central area transversely widened, irregular. Striae 12–14 in 10 μ .
Habitat: In whitish slimy mass attached to some water plants. Common in December, otherwise rare.
19. *Navicula rhynchocephala* Kütz. var. *rhynchocephala* Kütz. (figure 11)
Valves 47.5 μ long and 10 μ broad; transverse striations medianly radial, polarly convergent, 11–12 in central part and 8–9 in 10 μ at the ends.
Habitat: Epiphytic on leaves of *Hydrilla* plant. Common in December.
20. *Navicula tuscula* (Ehr.) Grün. (figure 5)
Valves 57 μ long and 12.5 μ broad; transverse striations, radial throughout, 10–11 in 10 μ .
Habitat: In brownish filmy layer covering some water plants frequent during December to March.



Figures 1-34 1, *Synedra acus* Kütz.; 2, *Synedra ulna* var. *danica* (Kütz.) Grün; 3, *Gyrosigma acuminatum* (Kütz.) Cleve; 4, *G. scalproides* (Rabh.) Cleve; 5, *Navicula tuscula* (Ehr.) Grün; 6 & 7, *Gomphonema subapicatum* Fritsch & Rich; 8, *Rhopalodia gibba* (Ehr.) Müll; 10, *Synedra ulna* var. *amphirhynchus* (Ehr.) Grün; 11, *Navicula rhynchocephala* var. *rhynchocephala* Kütz.; 12, *Gomphonema montanum* var. *subclavatum* Grün.; 13, *Navicula decussis* Ostrup; 14, *Rhopalodia ventricosa* (Kütz.) Müll; 15, *Surirella linearis* Smith; 16, *Gomphonema subapicatum* f. *curta* Fritsch & Rich; 17, *Cymbella prostrata* (Ber.) Cleve; 18, *C. helvetica* var. *curta* Cleve; 19, *Caloneis silicula* (Ehr.) Cleve; 20, *Melosira granulata* (Ehr.) Ralfs; 21, *Cocconeis placentula* Ehr.; 22, *C. pediculus* Ehr.; 23, *C. placentula* Ehr. var. *lineata* (Ehr.) Cleve; 24, *Nitzschia palea* (Kütz.) Smith; 25, *Navicula dicephala* (Ehr.) Kütz.; 26, *Epithemia argus* Kütz.; 27, *Nitzschia angustata* var. *genuina* Meister; 28, *Cymbella ventricosa* Kütz.; 29, *Navicula anglica* Ralfs; 30, *Cyclotella meneghiniana* Kütz.; 31, *Navicula exigua* (Gregory) Müll; 32, *Stauroneis anceps* var. *anceps* Ehr.; 33, *Cyclotella operculata* Kütz. 34, *Diploneis elliptica* (Kütz.) Cleve

21. *Navicula dicephala* (Ehr.) Smith (figure 25)

Valves 20-33 μ long and 8-9 μ broad; transverse striations radial, 9-11 in 10 μ . Central area rectangular.

Habitat: Planktonic. Common in December.

22. *Gomphonema montanum* Schumann var. *subclavatum* Grün. (figure 12)

Valves 38 μ long and 6 μ broad. Axial area narrow. Transverse striations slightly radial 9-10 in 10 μ .

Habitat: Planktonic and epiphytic on *Cladophora* sp., frequent from January-March, otherwise common.

23. *Gomphonema subapicatum* Fritsch and Rich (figures 6,7)

Valves 66 μ long and 14 μ broad; transverse striations punctate, farther apart in the middle, 12 in 10 μ .

Habitat: In greyish fascicles attached to the leaves of *Hydrilla* plant. Common in January to February.

24. *Gomphonema subapicatum* f. *curta* Fritsch and Rich (figure 16)

Valves 40-46 μ long and 10-11 μ broad; transverse striations 12 in 10 μ .

Habitat: In brownish filmy layer covering some water plants. In immense abundance during January to May, otherwise rare.

25. *Cymbella helvetica* var. *curta* Cl. (figure 18)

Valves 42 μ long and 10 μ broad; striae radial, fine, 11-12 in 10 μ .

Habitat: Planktonic. Common from October to February.

26. *Cymbella prostrata* (Berkeley) Cl. (figure 17)
Valves 46–50 μ long and 12.5–14 μ broad; striae 7–10 in 10 μ , radial.
Habitat: Among greenish filaments of *Spirogyra* sp., common in December.
27. *Cymbella ventricosa* Kütz. (figure 28)
Valves 32 μ long and 11 μ broad; striae punctate, radiate, 13 in 10 μ .
Habitat: Epiphytic on the filaments of *Cladophora* sp., very common during October to February.
28. *Rhopalodia gibba* (Kütz.) Müll. (figure 8)
Valves 105 μ long and 25 μ broad; costae transverse, 6–8 in 10 μ .
Habitat: Sticking to the filaments of *Sirogonium* sp., frequent from November to April.
29. *Rhopalodia ventricosa* (Kütz.) Müll. (figure 14)
Valves 90 μ long and 22 μ broad; costae parallel, 6–7 in 10 μ .
Habitat: In a brownish filmy layer on some aquatic plants. Very common in December and January.
30. *Nitzschia angustata* var. *genuina* Meister (figure 27)
Valves 70 μ long and 10 μ broad; striae lineate parallel, 11–12 in 10 μ .
Habitat: Planktonic. Common from October to November.
31. *Nitzschia palea* (Kütz.) Smith (figure 24)
Valves 29 μ long and 5 μ broad; striae obscure but carinal dots in the keel quite conspicuous; keel punctate 10 in 10 μ ; striae 32 in 10 μ .
Habitat: Planktonic. Frequent during October to January.
32. *Epithemia argus* (Ehr.) Kütz. (figure 26)
Valves 60 μ long and 15 μ broad; costae somewhat radial, 1-2 in 10 μ ; striae 10 in 10 μ .
Habitat: Attached to and covering brownish filaments of *Sirogonium* sp., very common from December–January.
33. *Surirella linearis* Smith (figure 15)
Valves 72–118 μ long and 25 μ broad; costae 2–5 in 10 μ .
Habitat: Planktonic. Common from December to April and rather rare from May to November.

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