# Some Common Fresh-water Diatoms from Gersoppa-Falls (Jog-Falls)

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## Introduction.

Very little is known so far of the Diatom-flora of the Gersoppa, Gūrsūppa or Jog-Falls (Mysore), lying on latitude 14° 18' N and longitude 74° 55' E. The author, therefore, has an opportunity to present an account of some of the common diatoms from this area.

The material for this paper was collected by the author, from the site of the Falls, in form of encrustations on wet rocks along with some Bryophytes and Podostemonads, floating flakes of green matter and the brownish scum from pools, puddles and sheltered ditches of the area, when in January 1955 a botanical excursion was headed to this place.

The material has been found to be very rich in the Diatom-flora. It is, however, not intended here to present a full account of the same to render the paper unduly bulky. With this point in view, only some of the common diatoms some of which are probably new records for this country, have been described and illustrated. Whereas the other forms appearing frequently in collections from this area, which have already been recorded by the present and other authors from other regions of this country during the recent years, are merely listed here.

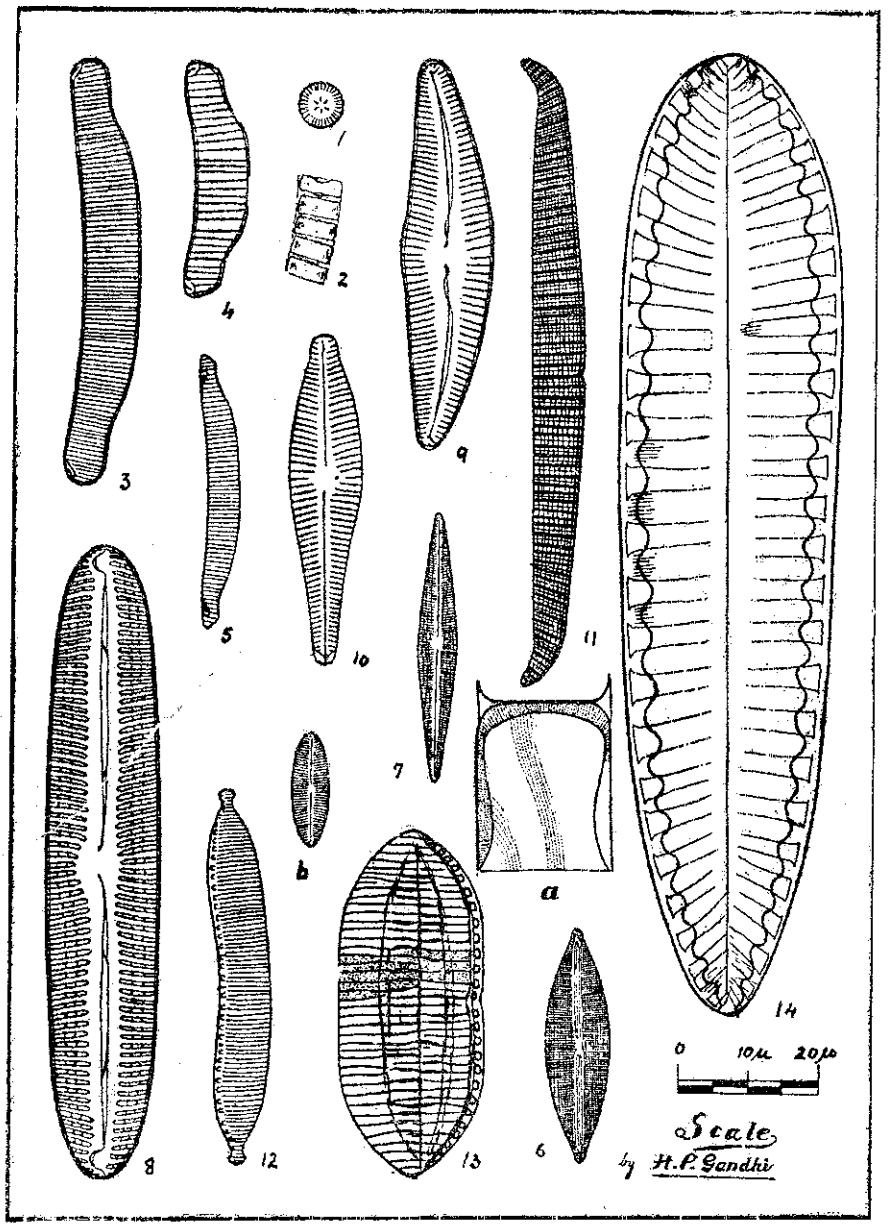
The list of such diatoms is as follows:—*Melosira juergensi* Ag, *M granulata* (Ehr) Ralfs., *Cyclotella stelligera* Cl. u. Grun, *C meneghiniana* Kütz., *Synedra ulna* (Nitz.) Ehr., *S ulna* v. *amphirhynchus* (Ehr) Grun., *S. ulna* v. *danica* (Kütz) Grun., *Cocconeis placentula* Ehr. v. *euglypta* (Ehr.) Cl., *Diploneis subovalis* Cl., *Navicula pupula* Kütz., *N fluens* Hust., *N radiosa* Kütz v. *tenella* (Brèb.) Grun., *Pinnularia acrosphaeria* Bréb., *P. acrosphaeria* v. *minor* Cl., *Amphora ovalis* Kütz v. *pediculus* Kütz, *Cymbella turgida* (Greg) Cl, *C aspera* (Ehr.) Cl., and *Epithemia sorex* Kütz

The classification followed here is that of Hustedt (1930) The dimensions given for the individual forms are those actually hitherto recorded.

### Bacillariophyta (Diatomeae).

| | | |
|---|---|---|
| A. | Order | Centrales. |
| I. | Suborder | Discineae. |
| 1. | *Family* | Coscinodiscaceae. |
| (*a*) | *Subfamily* | Coscinodiscoideae |
| | Genus | *Cyclotella* Kützing 1834. |

1957




1. **Cyclotella glomerata** Bachmann

(Figs. 1-2)

Hustedt, *Bacil*, p. 105, fig. 81; Cleve Euler, A., *Diat. von Schued. u. Finn*—I. p. 45, fig. 59; Tiffany and Britton, *Alg Illinois*, p. 220, pl. 58 fig. 656.

Frustules small in loose chains, rectangular in girdle view. Valves 6–10 $\mu$ in diameter, discoid, central field smooth or with 6–7 radial striæ in a ring. Marginal striae fine, 12–15 in 10 $\mu$.

B. Order .. PENNALES
I. Suborder .. RAPHIDINEAE
1. *Family* .. Eunotiaceae
(*a*) *Subfamily* .. Eunotioideae
Genus .. *Eunotia* Ehrenberg 1837.

**2 Eunotia pectinalis** (Kütz.) Rabh v. **minor** (Kütz.) Rabh.
(Fig. 3)

Hustedt, *Bacil.*, p. 182, fig. 238; Tiffany and Britton, *Alg. Illinois*, p. 240, pl. 64, fig. 729; Cleve-Euler, A., *Diat von Schwed u. Finn.*—II p. 84, fig. 409 f.

Valves 50–60 $\mu$ long and 8 $\mu$ broad, arcuate, linear, dorsal side straight in the middle, ventral side concave, ends constricted on the dorsal side broadly produced and rounded or feebly capitate. Striae irregularly set, 13–15 in 10 $\mu$.

**3 Eunotia pectinalis** (Kütz.) Rabh. v. **curta** V. H.
(Fig. 4)

Cleve-Euler, A., *Diat. von Schwed u Finn.*—II, p. 84, fig. 409 b-d. *E pectinalis* (Kütz.) Rabh. f. *curta* V. H.—Van Heurck, *Treat. Diat.*, p. 301, pl. 9, fig. 370.

Valves 30–40 $\mu$ long and 7·7–8 $\mu$ broad, small, arcuate, linear, ends constricted on the dorsal side, produced and obliquely truncate. Striae coarse and irregularly set 10–12 in 10 $\mu$.

**4 Eunotia grunowii** Å Berg. v. **nodulosa** (Meist.) Å. Berg.
(Fig. 5)

Cleve-Euler, A., *Diat. von Schwed u Finn.*—II, p. 96, fig. 421 i.

Valves 36–39 $\mu$ long and 4·5 $\mu$ broad, arcuate, dorsal side convex, ventral side concave and parallel in the middle ends narrowed on the dorsal side, produced and obliquely truncate. Polar nodule distinct and somewhat distant from the ends. Striae fine, 14–16 in 10 $\mu$.

II. Suborder .. BIRAPHIDINEAE.
1. *Family* .. Naviculaceae
(*a*) *Subfamily* .. Naviculoideae
Genus .. *Frustulia* (Agardh) Grunow 1865.

**5 *Frustulia saxonica** Rabh. v **typica** A. Cl.
(Fig. 6)

Cleve-Euler, A., *Diat von Schwed. u. Finn.*—V, p. 8, fig. 1327 a-b. *F rhomboides* (Ehr.) de Toni v. *saxonica* (Rabh.) de Toni—Hustedt, *Bacil.*, p. 221, fig. 325; Krishnamurthy, *Diat. S. I.*, p. 362, figs. 27–28.

Valves 34–38 $\mu$ long and 8·6–9 $\mu$ broad, lanceolate with constricted produced acutely rounded ends Raphe between the siliceous ribs. Central area some what constricted, polar areas elongated. Striae about 30–35 in 10 $\mu$, finely punctate, punctae arranged almost in straight rows. This form is smaller than the type but agrees well in all details.

Genus *Anomoeoneis* Pfitzer 1871.

**6 Anomoeoneis brachysira** ( Bréb. ) Grun. v. **lanceolata** ( Mayer ) A. Cl. ( Fig 7 )

Cleve-Euler, A., *Diat. von Schwed u. Finn*.—III, p. 199, fig. 919 e-f.

Valves 40–45 $\mu$ long and 5–5·6 $\mu$ broad, rhomboid—lanceolate with acute ends. Raphe thin and straight with central pores closely set. Axial area very narrow; central area elliptical and small. Striae 28–30 in 10 $\mu$, fine, radial and interrupted by longitudinal hyaline bands.

Genus *Pinnularia* Ehrenberg 1843.

**7 *Pinnularia viridis** ( Nitz. ) Ehr. v. **intermedia** Cl. ( Fig 8 )

Hustedt, *Bacil.*, p 335; Cleve-Euler, A , *Diat. von Schwed u. Finn* — IV, p. 75, fig. 1103 c-d; Krishnamurthy, *Diat. S. I.* p 369, fig. 44.

Valves 82–90 $\mu$ long and 15–16 $\mu$ broad, sublinear with subcuneate rounded ends Raphe thick and complex with unilaterally bent central pores. Axial area narrow, linear $\frac{1}{5}$ the breadth of the valve; central area slightly widened. Striae 7–9 in 10 $\mu$, thick, slightly radial in the middle and convergent at the ends, crossed by a narrow longitudinal band.

(*b*) *Subfamily* Gomphocymbelloideae

Genus *Cymbella* Agardh 1830.

**8 Cymbella austriaca** Grun. v. **subrhomboidea** ( Ö strup ) A. Cl. ( Fig 9 )

Cleve-Euler, A , *Diat von Schwed. u Finn* —IV, p. 154, fig 1231 h-i.

Valves 50–55 $\mu$ long and 12 5–13 $\mu$ broad, asymmetrical, subrhomboid, dorsal side convex, ventral side subconvex and inflated in the middle with narrowly rounded ends. Raphe central, thick, flexuose and complex with central pores ventrally bent and terminal fissures dorsally directed. Axial area large, lanceolate; central area slightly widened. Striae 8–9 in the middle and 9–11 in 10 $\mu$ at the ends and on the ventral side, indistinctly lineate and radial

Genus *Gomphonema* Agardh 1824.

**9 Gomphonema lanceolatum** Ehr. v **affine** ( Kütz. ) A Cl ( Fig. 10 )

Cleve-Euler, A., *Diat. von Schwed. u Finn* —IV, p. 185, fig 1280 g-p

Valves 42–50 $\mu$ long and 9–10 $\mu$ broad, lanceolate-clavate with constricted rostrate apex and narrow rounded base. Raphe thin and straight.

Axial area narrow; central area unilateral with an isolated stigma on the opposite side. Striae 9–11 in 10 $\mu$, radial.

2. *Family* Epithemiaceæ
(*a*) *Subfamily* Rhopalodioideae
Genus *Rhopalodia* O. Müller 1895

**10 *Rhopalodia ingens** (Fricke) Meist.
(Fig. 11)

Cleve-Euler, A., *Diat. von Schwed. u. Finn.*—V. p. 45, fig. 1418. **R. parallela** (Grun.) O. Mill—Hustedt, *Bacil.* p. 389, fig. 739; Krishnamurthy, *Diat. S. I.*, p. 377, fig. 65; **Epithemia gibba** Pfitz. v. **parallela** Grun.—Van Heurck *Treat Diat.*, p. 296, pl. 9, fig. 353.

Frustules 91–110 $\mu$ long and 20–21 $\mu$ broad, sublinear with truncate ends, in the middle region feebly inflated with a notch. Valves straight on the ventral side with a slight depression at the ends, dorsal side slightly convex with a slight notch in the middle, breadth 7–7·5 $\mu$, ends narrowly rounded. Costae 7–9 in 10 $\mu$, alternating 2-3 rows of fine aerioles, strongly radial at the ends, rows of aerioles 11–14 in 10 $\mu$.

This form agrees well with the type described by Cleve-Euler, and is distinguished from *R. parallela* (Grun.) O. Müll, which has strongly parallel sides, unswollen middle part with scarcely distinct notch and lesser breadth.

3. *Family* Nitzschiaceæ
(*a*) *Subfamily* Nitzschioideæ
Genus *Hantzschia* Grunow 1880

**11 *Hantzschia amphioxys** (Ehr.) Grun. f. **capitata** O. Müll.
(Fig. 12)

Hustedt, *Bacil.*, p. 394, fig. 748; Krishnamurthy *Diat. S. I.* p. 377, fig. 66.

Valves 54–70 $\mu$ long and 6·6–7·5 $\mu$ broad, slightly arcuate, linear, keel side more concave, ends narrowed and distinctly capitate. Keel excentric with keel punctae 7–9 in 10 $\mu$. Striae 16–18 in 10 $\mu$.

This form is much smaller than Krishnamurthy's forms, but agrees well in all the details.

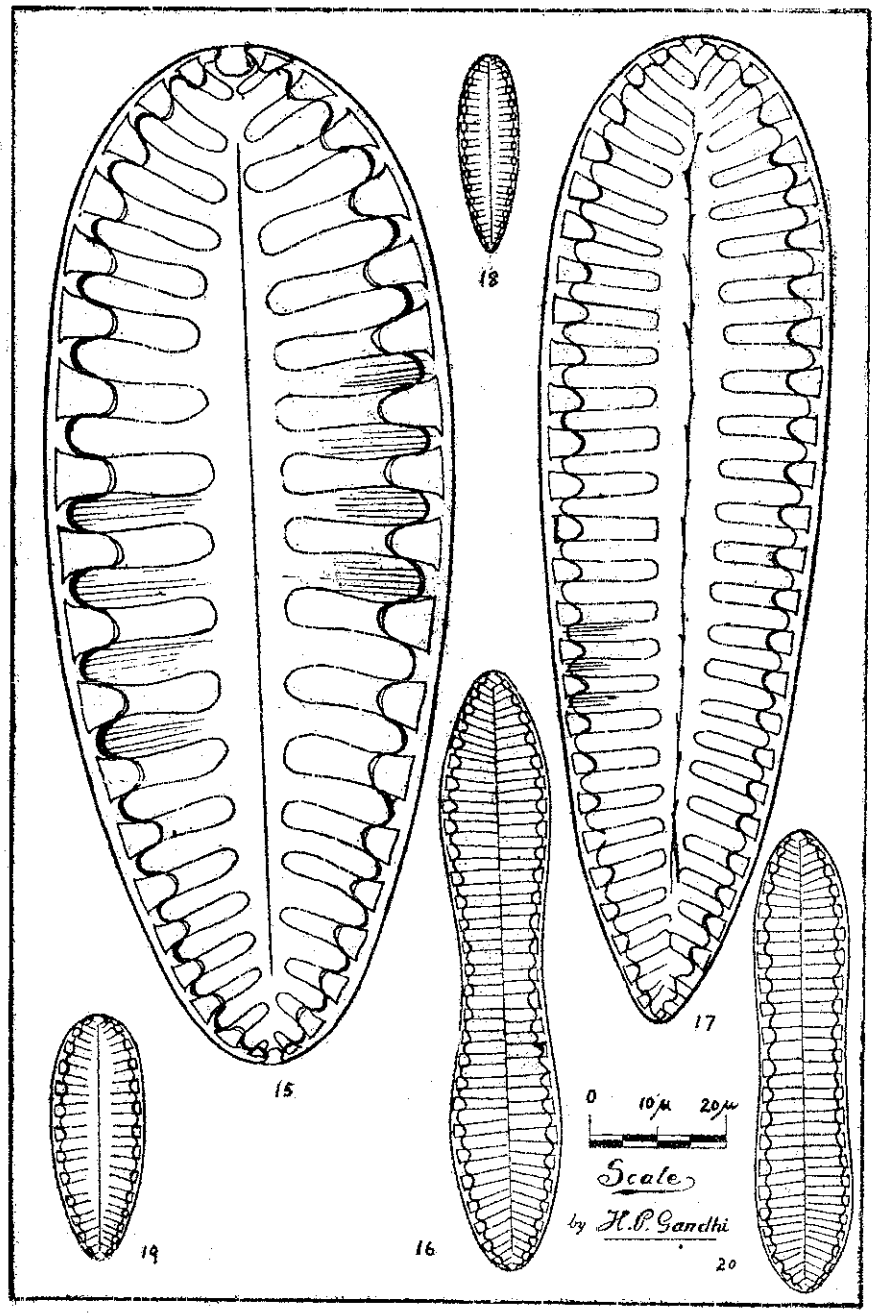
Genus *Nitzschia* Hassall 1845
Section *Tryblionellae* (W. Smith, Grunow) Hust. erw.

**12 Nitzschia tryblionella** Hantz. V. **victoriae** Grun.
(Fig. 13)

Hustedt, *Bacil.*, p. 399, fig. 758; Cleve-Euler, A., *Diat. von Schwed. u. Finn.*—V. p. 58, fig. 1430 f.

Valves 40–57 $\mu$ long and 18–22 $\mu$ broad, broadly linear or sublinear with subcuneate ends. Longitudinal folds strong and distinct. Keel excentric, with quadrate keel punctae 4–6 in 10 $\mu$. Striae very coarse and irregular 6–7 in 10 $\mu$ with fine punctae in between, punctae distinct or indistinct.

4. *Family* Surirellaceae
(*a*) *Subfamily* Surirelloideae
Genus *Surirella* Turpin 1828.



### 13 Surirella linearis W. Smith v. constricta (Ehr.) Grun.
(Figs. 16, 20)

Hustedt, *Bacil.*, 434, fig. 839; Cleve-Euler, A., *Diat. von Schwed. u. Finn.*—V, p. 109, fig. 1535 g-h; Tiffany and Britton, *Alg. Illinois*, p. 294, pl. 79, fig. 921.

Valves 65–85·6 $\mu$ long, 12–12·5 $\mu$ broad in the middle and 13–15 $\mu$ at the ends, isopolar, linear with concave sides in the middle and subcuneate rounded ends. Axial field absent, central line present. Marginal folds narrow but with clear projections. Costae 25–30 in 100 $\mu$, more or less distinct, reaching the central line and radial at the ends. Striae indistinct.

### 14 Surirella robusta Ehr.
(Fig. 15)

Van Heurck, *Treat. Diat.*, p. 371, pl. 12, fig. 577; Hustedt, *Bacil.*, p. 437, fig. 850; Tiffany and Britton, *Alg. Illinois*, p. 296, pl. 80, fig. 931; Cleve-Euler, A., *Diat. von Schwed. u. Finn.*—V, p. 102, fig. 1524 a-c (*S. robusta* v. *nobilis* (W. Sm.) A. Cl.).

Valves 143–176 $\mu$ long and 58–60·5 $\mu$ broad, heteropolar, broad to narrowly ovate with broadly rounded ends. Axial field narrowly lanceolate with a median line. Marginal folds very strongly developed with thick wavy projections. Costae 8–11 in 100 $\mu$, very strong widening towards the middle, radial at the ends, striae between the costae present sometimes indistinct.

### 15 *Surirella tenera Greg
(Fig. 14)

Hustedt, *Bacil.*, p. 438, fig. 853; Venkataraman *S. I. Diat.*, p. 356, fig. 137; Cleve-Euler, A., *Diat. von Schwed. u. Finn.*—V, p. 104, fig. 1525 a-b (*S. tenera* v. *genuina* A. Cl.)

Valves 128–140 $\mu$ long and 35–38 $\mu$ broad, heteropolar, linear-ovate or narrowly ovate with broadly rounded apex and attenuated or cuneate rounded base. Axial field narrow with a median line. Marginal folds strongly wavy with projections. Costae 20-28 in 100 $\mu$, linear and radial at the ends. Striae fine and mostly indistinct. This form presents some degree of variation in the outline.

### 16 Surirella tenera Greg v. nervosa A. S.
(Fig. 17)

Hustedt, *Bacil.*, p. 854–55; Cleve-Euler, A., *Diat. von Schwed. u. Finn.*—V, p. 104, fig. 1525 c-e.

Valves 114-140 $\mu$ long and 32–44 $\mu$ broad, heteropolar and like the above type. Axial field narrowly lanceolate, middle line beset with spiny projections throughout its length and at its ends. Costae 20-26 in 100 $\mu$, radial at the ends. Striae fine sometimes distinct.

**17 Surirella subsalsa** W. Smith
(Figs. 18-19)

Van Heurck, *Treat. Diat.*, p. 370, pl. 31, fig. 866; Cleve-Euler, A., *Diat. von Schwed u. Finn.*—V, p. 105, fig. 1526 a-d, f (= v. *smithii* A. Cl.).

Valves 29-36 $\mu$ long and 8·8-13 $\mu$ broad, heteropolar, small, subovate, with broad apex and cuneate rounded base. Axial field linear-lanceolate with a median line. Marginal folds distinct with projections. Costæ 32-40 in 100 $\mu$, distinct.

## Summary

For the first time the Diatomaceæ of the Gersoppa-Falls has been investigated, of which an illustrated account of some of the common diatoms in presented in these pages.

The forms described and illustrated in this account are those, which are either the new records for this country or some (marked with asterisks) varying in dimensions or otherwise, from already recorded ones. Whereas others, which are in conformity with the existing Indian records, are merely listed in the introduction.

Thus, in all 35 forms are included in this paper of which, probably 12 are new records for India.

## Acknowledgement

The author records his sincere thanks to all those friends who have from time to time encouraged him to investigate this interesting flora.

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