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A SYSTEMATIC ACCOUNT OF THE DIATOMS OF BOMBAY AND SALSETTE

PART III*

Pennales: Sub-orders—Biraphidineæ (*Contd.*)

BY ELLA A. GONZALVES
Institute of Science, Bombay
AND H. P. GANDHI
Rajaram College, Kolhapur

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IV. Sub-order BIRAPHIDINEÆ
(1) *Family* NAVICULACEÆ
Sub-family Naviculoideæ

Genus *Navicula* Bory, 1822

Section *Naviculæ orthostichæ* Cleve

104. *Navicula cuspidata* Kütz.

(Fig. 105)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by W. Baxter), 1896, p. 214, pl. 4, fig. 190; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 268, fig. 433; Skvortzow, B. W., Diatoms from Kizaki Lake, Honshu Island, Nippon, *Philip. J Sci.*, Vol 61, 1936, p. 33, pl. 6, fig. 16; Diatoms from Ikeda-Lake, Satsuma Province, Kiewsien Island, Nippon, *ibid.*, Vol. 62, 1937, p. 200, pl. 4, fig. 9.

Valves rhombic-lanceolate with acutely rounded ends. Raphe thin, straight, with hooked, unilaterally bent central pores and large terminal fissures. Axial area narrow, linear, slightly widened in the middle; central area very small. Striæ parallel, slightly convergent at the poles. Transverse striæ stronger, but less numerous than the longitudinal striæ. Craticular plates present.

Dimensions Length 112–120 μ
Breadth 26–28 μ
Transverse striæ 16–17 in 10 μ
Longitudinal striæ 24–25 in 10 μ

Habitat ... Fresh-water. Powai Lake. Rare.

105. *Navicula cuspidata* Kütz. var. *ambigua* (Ehr.) Cleve

(Fig. 106)

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* The first two papers in this series have been published in this Journal Vol. **31** : 117–151 and Vol. **32** : 239–263

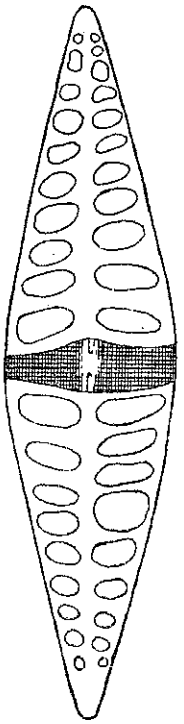

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FIG. 105

Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, P. 268, fig. 434; Skvortzow, B. W., Diatoms from Calcutta, India, *Philip. J. Sci.*, Vol. 58, 1935, p. 181, pl. 1, fig. 8; II. Fresh-water Algæ from Napier, *ibid.*, Vol. 67, 1938, p. 415, pl 1, fig. 8; Venkataraman, G, A Systematic Account of some South Indian Diatoms, *Proc. Indian Acad. Sci.*, Vol. X, No. 6, Sect. B, 1939, p. 327, fig. 94.

Valves rhombic-lanceolate with produced, rostrate ends. Raphe thin and straight with hooked, central pores and large terminal fissures. Axial area narrow; central area slightly widened in the middle. Striæ not so numerous as in the type. Transverse striæ equal to the longitudinal striæ in number.

Dimensions	Length 116–125 μ Breadth 27–28 μ Trans. and long. striæ 18–19 in 10 μ
Habitat	Fresh-water. Streams at Borivli, Kanheri Caves, Powai Lake and pools at Santa-Cruz Common.

106. *Navicula cuspidata* Kütz. var. *heribaudi* Peragallo

(Fig. 107)

Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 268, fig. 435.

Valves rhombic-lanceolate with broadly attenuated ends. Longitudinal striæ more numerous than the transverse striæ, the latter strongly radial.

Dimensions	Length 86–90 μ Breadth 19·8–20 μ Longitudinal striæ 20–22 in 10 μ Transverse striæ 14 in 10 μ
Habitat	Fresh-water. Pond at Goregaon. Rare.

107. *Navicula cuspidata* Kütz. var. *major* Meister

(Fig. 108)

Abdul-Majeed, M., Fresh-water Algæ of the Panjab, Pt. I. Bacillariophyta (Diatomeæ), *Panjab University Publications*, Lahore, 1935, p. 23, pl. 6, fig. 1.

Frustules solitary and larger than the type. Valves elongated and rhombic-lanceolate. Ends produced and rounded. Raphe somewhat thick, with hooked, unilaterally-bent central pores. Axial and central areas as in the type. Transverse striæ less numerous than the longitudinal striæ.

Dimensions	Length 192·8–205 μ Breadth 45–46·4 μ Longitudinal striæ 25–26 in 10 μ Transverse striæ 15–17 in 10 μ.
Habitat	Fresh-water. Powai Lake. Rare.

This form agrees with the description and figure given by Abdul-Majeed (1935) except that it is a larger and broader form.

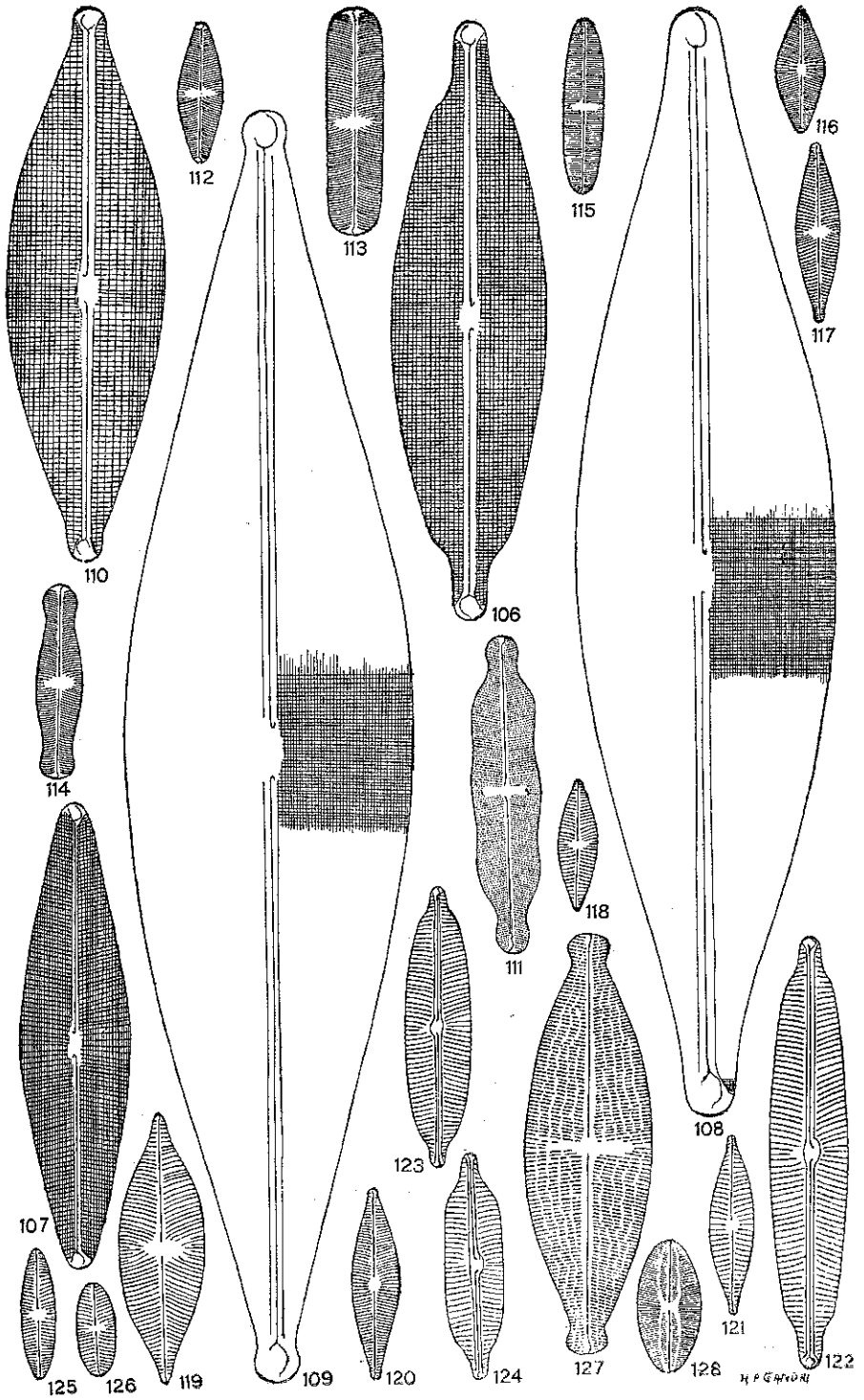
108. *Navicula cuspidata* Kütz. var. *major* Meister f. *robusta* forma nova.

(Fig. 109)

Frustula solitaria, libere natantia, amplissima atque robustissima. Valvæ rhombo-lanceolatæ, attenuatæ ad utrumque apicem, qui est constrictus atque capitatus. Raphe tenuis atque recta, ornata poris centralibus, unilateraliter inclinatis atque hamo similibus, ornata etiam fissuris terminalibus late curvatis. Area axialis angustissima, area centralis tenuiter dilatata ob interruptionem vel fractionem striarum longitudinalium in medio. Striæ longitudinales longius inter se distant quam striæ transversæ.

Frustula 225–230 μ longa, 48·6 μ lata, striæ longitudinales 18 in 10 μ, striæ transversæ 15 in 10 μ.

Frustules solitary, free-floating, very large and robust. Valves rhombic-lanceolate with attenuated, constricted, capitate ends. Raphe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FIGS. 106–128

thin and straight, with hooked, unilaterally-bent central pores and broadly curved, terminal fissures. Axial area very narrow; central area slightly widened due to interruption or breaking of the longitudinal striæ in the middle part. Longitudinal striæ more numerous than the transverse striæ.

Dimensions .. Length 225–230 μ
Breadth 48·6 μ
Longitudinal striæ 18 in 10 μ
Transverse striæ 15 in 10 μ

Habitat .. Fresh-water. Powai Lake. Rare.

The present form agrees with *N. cuspidata* Kütz. var. *major* Meister (Abdul-Majeed, *Bacillariophyta*, Pt. I, 1935, p. 23, pl. 6, fig. 1), except that the ends of this form are distinctly constricted and capitate, and not merely produced and round. Moreover, the valves are very robust and the longitudinal striæ almost equal the transverse striæ in number. In *N. cuspidata* var. *major* Meister, the longitudinal striæ are finer and more numerous than the transverse striæ. Hence, the present specimen is regarded as a new form of *N. cuspidata* Kütz. var. *major* Meister.

109. *Navicula cuspidata* Kütz. var. *conspicua* Venkataraman

(Fig. 110)

Venkataraman, G., A Systematic Account of some South Indian Diatoms, *Proc. Indian Acad Sci.*, Vol. X, No. 6, Sect. B, 1939, p. 325, figs. 83, 88.

Valves rhombic to elliptical-lanceolate with slightly constricted and rounded ends. Axial area narrow; central area slightly widened. Raphe thin and straight, with hooked central pores bent unilaterally. Transverse striæ parallel, slightly convergent at the ends. Longitudinal striæ coarse, clear and prominent, closer towards the margins and wider near the middle. Central area widened due to breaking of the longitudinal striæ in the middle.

Dimensions .. Length 91·8–123 μ
Breadth 25–27 μ
Longitudinal striæ 8–13 in 10 μ
Transverse striæ 12–14 in 10 μ

Habitat .. Fresh-water. Pond at Goregaon, Powai Lake. Common.

Section *Naviculæ mesoleiæ* Cleve

110. *Navicula mutica* Kütz. var. *linearis* var. nova.

(Fig. 111)

Valvæ lineares, marginibus triundulatis, tenuissime fastigatæ ad utrumque apicem, qui est late rotundatus atque capitatus. Raphe tenuis atque recta, poris centralibus aliquantum unilateraliter inclinatis.

Area axialis angusta, area centralis vero rectangularis vel tenuiter dilatata ad margines, uno puncto ad latus ornata. Striæ radiales, tenues, sed distincte punctatæ.

Frustula 48–56 μ longa, 9–10 8 μ lata; striæ 30 in 10 μ.

Valves linear with triundulate margins, very slightly narrowing towards the ends which are broadly rounded and capitate. Raphe thin and straight, with central pores slightly bent unilaterally. Axial area narrow; central area rectangular or very slightly widened towards the margins, with an isolated punctum on one side. Striæ radial, fine but distinctly punctate.

Dimensions	Length 48–56 μ Breadth 9–10 8 μ Striæ 30 in 10 μ
Habitat	Fresh-water. Pools and puddles at Vile-Parle (anonymous collection). Rare

This form agrees with *N. mutica* Kütz (Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 274, fig. 453 *a*) in having an isolated punctum on one side of the central area, but differs in outline. It resembles *N. mutica* var. *nivalis* (Ehr.) Hust. (Hustedt, *op. cit.*, p. 275, fig. 453 *c*) in having triundulate margins, but it is linear and not linear-elliptical like the latter. Moreover, the middle undulation is not prominent. It is also a much longer and narrower form and the punctæ of the striæ, though very fine and closely placed, are distinct. It differs from *N. mutica* var. *pulchra* McCall (McCall, D., Fossil Diatoms of Tay District, *J. Linn. Soc. Lond.*, Botany, Vol. XLIX, No. 328, 1933, p. 245, fig. 12) in having rounded, capitate ends, instead of rostrate, capitate ends, while the radial striæ have fine instead of coarse punctæ. Moreover, the striæ in this form far exceed those of *N. mutica* var. *pulchra* McCall in number. Hence, it is regarded as a new variety of *N. mutica* Kütz.

Section *Naviculæ bacillares* Cleve

111. *Navicula pupula* Kütz.

(Fig. 112)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by W. Baxter), 1896, p. 225, pl. 5, fig. 226; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 79, fig. 147; Hustedt, Fr., Pascher's *Süsswasser-Flora* Heft 10, 1930, p. 281, fig. 467 *a*; Skvortzow, B. W., Diatoms from Poyang Lake, Hunan, China, *Philip. J. Sci.*, Vol. 57, 1935, p. 469, pl. 1, figs. 30, 31; Diatoms from Kizaki Lake, Honshu Island, Nippon, *ibid.*, Vol. 61, 1936, p. 34, pl. 12, fig. 15.

Valves linear-lanceolate or subelliptical, with broadly rounded and slightly constricted ends. Raphe thin and straight. Polar areas present. Axial area very narrow, linear; central area rectangular, transversely widened. Striæ fine, radial and curved throughout.

Dimensions — Length 25–30 μ
Breadth 7·5–8 μ
Striæ 25 in 10 μ

Habitat — Fresh-water. Pond at Dahisar, Jogeswari, streams at Borivli and pools at Kanheri Caves. Very common.

112. *Navicula pupula* Kütz. var. *rectangularis* (Greg.) Grun.

(Fig. 113)

Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 79; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 281, fig. 467 *b*.

Valves linear with parallel sides and broadly rounded ends. Raphe thin and straight. Polar areas present. Axial area very narrow, linear; central area rectangular, transversely widened. Striæ fine, radial and curved throughout; in the central region short and long striæ alternate as in the type.

Dimensions — Length 30–41 μ
Breadth 8·5–10·8 μ
Striæ 20–25 in 10 μ

Habitat — Fresh-water. Powai Lake, Vihar Lake, streams at Borivli, pools and puddles at Jogeswari. Common.

113. *Navicula pupula* Kütz. var. *capitata* Hust.

(Fig. 114)

Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 281, fig. 467 *c*.

Valves linear with slightly convex walls and broadly capitate rounded ends. In all other respects like the type.

Dimensions — Length 34·2–45 μ
Breadth 9–11 μ
Striæ 22–24 in 10 μ.

Habitat — Fresh-water. Streams at Borivli, pools at Kanheri Caves and Powai Lake. Common.

Section *Naviculæ minusculæ* Cleve

114. *Navicula densestriata* Hust.

(Fig. 115)

Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 288, fig. 485.

Valves linear-elliptic with almost parallel sides and broadly rounded ends. Raphe thin and straight. Axial area very narrow, linear; central area small, linear and transversely widened. Striæ extremely fine, perpendicular to the middle line; central striæ small,

Dimensions . . Length 29-32 μ
Breadth 5·4–6 μ
Striæ 30–32 in 10 μ

Habitat . . Fresh-water. Streams at Chembur Hills. Rare.

Section *Naviculæ heterostichæ* Cleve

115. *Navicula cocconeiformis* Gregory

(Fig. 116)

Gregory, W., Notice of some new species of British Fresh-water Diatomaceæ, *Quart. J. microscop. Sci.*, O S., Vol. IV, 1856, p. 6, pl. 1, fig. 22; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 89, fig. 181; Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, pl. 228, p. 27, fig. 779; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 290, fig. 493.

Valves rhombic-elliptical with broad, somewhat rounded ends. Raphe thin, with central pores distantly placed. Axial area narrow; central area extremely small, elliptical. Striæ throughout radial, finely punctate; at the centre short and long striæ alternate with each other.

Dimensions . Length 20–27 μ
Breadth 8·5–9 μ
Striæ 23–25 in 10 μ

Habitat . . Fresh-water. Pools at Jogeswari, streams at Kanheri Caves. Common.

Section *Naviculæ lineolatæ* Cleve

116. *Navicula cryptocephala* Kütz.

(Fig. 117)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, p. 180, pl. 3, fig. 122; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 92, fig. 189; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 295, fig. 496; Skvortzow, B. W., Diatoms from Poyang Lake, Hunan, China, *Philip. J. Sci.*, Vol. 57, 1935, p. 470, pl. 1, fig. 36; Diatoms from Kizaki Lake, Honshu Island, Nippon, *ibid.*, Vol. 61, 1936, p. 36, pl. 10, fig. 5.

Valves lanceolate with more or less capitate produced ends. Raphe thin and straight. Axial area very narrow; central area extended transversely, small. Striæ radial in the middle and convergent at the poles, indistinctly punctate.

Dimensions . Length 28·8–32 μ
Breadth 7–7·2 μ
Striæ 16 in 10 μ

Habitat . . Fresh-water. Streams at Borivli, Powai Lake. Brackish water. Mahim creek, Chembur creek. Not very common.

117. *Navicula cryptocephala* Kütz. var. *veneta* (Kütz.) Grun

(Fig. 118)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, p. 181, pl. 3, fig. 123; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 92; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 295, fig. 497 *a*.

Valves linear-lanceolate, with slightly constricted ends. Raphe thin and straight. Axial area narrow; central area rectangular. Striæ radial in the middle and convergent at the ends, slightly longer striæ alternate with shorter ones in the middle.

Dimensions ... Length 23–25 μ
Breadth 6 μ
Striæ 15–17 in 10 μ

Habitat ... Brackish water. Mahim creek. Common.

118. *Navicula salinarum* Grun

(Fig. 119)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, p. 178, pl. 3, fig. 108; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 92, fig. 187; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 295, fig. 498; Skvortzow, B. W., Diatoms from Chengtu Szechwan, Western China, *Philip. J. Sci.*, Vol. 66, 1938, p. 485, pl. 4, fig. 5; Venkataraman, G., A Systematic Account of some South Indian Diatoms, *Proc. Indian Acad. Sci.*, Vol. X, No. 6, Sect. B, 1939, p. 328, fig. 95.

Frustules solitary, free-floating. Valves lanceolate-elliptical with more or less produced, acute ends. Raphe thin. Axial area very narrow; central area large and rounded. Striæ strongly radial in the middle and convergent at the ends or somewhat perpendicular to the middle line; in the centre short and long striæ alternate with each other.

Dimensions ... Length 47–50 μ
Breadth 14·4–15 μ
Striæ 14 in 10 μ

Habitat ... Brackish water. Mahim creek. Common.
Fresh-water. Powai Lake. Rare.
This form is slightly longer and broader than the type.

119. *Navicula simplex* Krasske

(Fig. 120)

Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, p. 296, fig. 500.

Valves lanceolate with subcapitate ends. Raphe straight and thin with distantly placed central pores. Axial area narrow; central area small, oval. Striæ radial in the middle strongly convergent at the ends.

Dimensions .. Length 32–33 μ
Breadth 8·6 μ
Striæ 17–18 in 10 μ

Habitat .. Brackish water. Mahim creek. Common.

This form agrees with the type in all respects except that it has subcapitate instead of rostrate ends.

120. *Navicula rostellata* Kütz.

(Fig. 121)

Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 297, fig. 502; Venkataraman, G., A Systematic Account of some South Indian Diatoms, *Proc. Indian Acad. Sci.*, Vol. X, No. 6, Sect. B, 1939, p. 329, fig. 90.

Valves lanceolate with small rostrate or produced ends. Raphe thin and straight. Axial area narrow; central area large, more or less circular. Striæ radial in the middle and slightly convergent at the poles; middle striæ shortened.

Dimensions .. Length 36–42 μ
Breadth 8–8·2 μ
Striæ 11–12 in 10 μ

Habitat .. Fresh-water. Pools at Wadala. Rare.

121. *Navicula viridula* Kütz.

(Fig. 122)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, p. 179, pl. 3, fig. 115; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 94, fig. 192; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 297, fig. 503; Rich, F., Contributions to our Knowledge of the Fresh-water Algæ of Africa, 12. Some Diatoms from Victoria-falls, *Trans. Roy. Soc. S. Afr.*, Vol. 24, 1937, p. 214, pl. 9, fig. 1; Skvortzow, B. W., Diatoms from Argun River, Hsing-An-Pei Province, Manchaukuo, *Philip. J. Sci.*, Vol. 66, 1938, p. 55, pl. 1, fig. 16; pl. 2, fig. 30.

Valves linear-lanceolate with produced and broadly rounded ends. Raphe enclosed in siliceous ribs, central pores unilaterally bent, with distinct, terminal fissures. Axial area narrow; central area wide and suborbicular. Striæ strong, radial in the middle and slightly convergent at the poles.

Dimensions .. Length 66–79 μ
Breadth 13–14·4 μ
Striæ 9–10 in 10 μ

Habitat .. Fresh-water. Powai Lake, streams at Borivli Common.

In this form, siliceous ribs enclosing the raphe as described by Skvortzow, are seen.

122 *Navicula viridula* Kütz. var. *rostellata* (Cleve) Meister

(Fig. 123)

Abdul-Majeed, M., Fresh-water Algæ of the Panjab, Bacillariophyta (Diatomeæ), pt. I, *Panjab University Publications*, Lahore, 1935, p. 24, pl. 11, fig. 18.

Valves broadly linear, somewhat lanceolate with suddenly narrowed and produced subrostrate ends. Raphe thin, enclosed between siliceous ribs, with central pores bent unilaterally. Axial area very narrow and indistinct; central area rounded. Striæ strongly radial in the middle and slightly convergent at the poles.

Dimensions	Length 45–52 μ Breadth 10–10·8 μ Striæ 12 in 10 μ
Habitat	Fresh-water. Streams at Borivli, Powai Lake. Common

This form agrees in outline with *N. viridula* var. *rostellata* as described and figured by Abdul-Majeed, except that it is slightly broader and has siliceous ribs enclosing the raphe. Skvortzow, however, describes siliceous ribs in *N. viridula* Kütz. (*Philip. J. Sci.*, Vol. 66, 1938, p. 55, pl. 1, fig. 16)

123. *Navicula viridula* Kütz. var. *rostrata* Skv.

(Fig. 124)

Skvortzow, B. W., Diatoms from Argun River, Hsing-An-Pei Province, Manchaukuo, *Philip. J. Sci.*, Vol. 66, 1938, p. 56, pl. 1, fig. 17.

Valves linear-lanceolate, with parallel margins and rostrate ends. Raphe enclosed in siliceous ribs. Axial area very narrow; central area broad, suborbicular. Striæ radial in the middle and convergent at the ends, lineate.

Dimensions	Length 37·8–40 μ Breadth 9–9·4 μ Striæ 10 in 10 μ
Habitat	Fresh-water. Streams at Borivli Powai Lake. Rare.

124. *Navicula cincta* (Ehr.) Kütz.

(Fig. 125)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, p. 178, pl. 3, fig. 105; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 92, fig. 188; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft, 10, 1930, p. 298, fig. 510; Skvortzow, B. W., Diatoms from Kenon Lake, Transbaikalia, Siberia, *Philip. J. Sci.*, Vol. 65, p. 409, pl. 1, figs. 22, 26.

Valves small, linear-lanceolate with broadly rounded ends. Raphe thin and straight. Axial area narrow; central area small and transverse. Striæ strongly radial, in the middle, convergent and delicate, at

the ends, somewhat lineate; middle striæ further apart from one another than those at the ends.

Dimensions . Length 26–32 μ
Breadth 5 4–7 μ
Striæ 14–16 in 10 μ

Habitat . Fresh-water. Streams at Borivli, Powai Lake. Brackish water. Chembur creek. Common.

125. *Navicula schönfeldii* Hust.

(Fig. 126)

Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 301, fig. 520.

Valves elliptical or somewhat elliptic-lanceolate with rounded ends. Raphe thin, straight. Axial area extremely narrow; central area rectangular. Striæ radial and strong, short and long striæ alternate in the middle.

Dimensions . Length 18–20 μ
Breadth 6·5 μ
Striæ 14–15 in 10 μ

Habitat . Fresh-water. Streams at Borivli, Powai Lake and Vihar Lake. Common.

126. *Navicula tuscula* (Ehr.) Grun.

(Fig. 127)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, p. 206, pl. 4, fig. 166; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10, 1913, p. 95, fig. 196; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p. 308, fig. 552; Skvortzow, B. W., Diatoms from Ikeda Lake, Satsuma Province, Kiewsien Island, Nippon, *Philip. J. Sci.*, Vol. 62, 1937, p. 203, pl. 1, fig. 13; Diatoms from Olhan-Gate of Baikal Lake, Siberia, *ibid*, Vol. 62, 1937, p. 332, pl. 8, fig. 3.

Valves elliptical with strongly capitate ends. Raphe thin and straight. Axial area narrow, linear; central area large, transversely extended. Striæ radial throughout, crossed by many longitudinal hyaline bands, hence irregularly interrupted.

Dimensions . Length 72–77 μ
Breadth 22·5–23 μ
Striæ 13–14 in 10 μ

Habitat . Fresh-water. Powai Lake. Fairly common.

Section *Naviculæ lyratæ* Cleve

127. *Navicula pygmæa* Kütz.

(Fig. 128)

Van Heurck, *Treatise on the Diatomaceæ* (Trans. by Baxter), 1896, p. 203, pl. 4, fig. 164; Schönfeldt, Pascher's *Süsswasser-Flora*, Heft 10,

1913, p. 98, fig. 207; Hustedt, Fr., Pascher's *Süsswasser-Flora*, Heft 10, 1930, p 312, fig. 561; Venkataraman, G., A Systematic Account of some South Indian Diatoms, *Proc. Indian Acad. Sci.*, Vol. X, No. 6, Sect. B, 1939, p. 333, fig. 97.

Valves elliptical with broadly rounded ends. Raphe thin and straight, with closely placed central pores. Axial area very narrow and somewhat indistinct; central area small; lateral H-shaped area constricted in the central nodule. Striæ very fine, delicate, somewhat radial in the middle and convergent at the ends.

Dimensions	Length 23·4–28 μ Breadth 10–11 μ Striæ 26–30 in 10 μ.
Habitat	Brackish water. Mahim creek, Chembur creek. Very common. This form is slightly broader than the type.

ACKNOWLEDGEMENT

The authors are grateful to Rev. Fr. H. Santapau, St. Xavier's College, Bombay for the Latin diagnosis of new forms described in this paper.

DESCRIPTION OF FIGURES

N B—All the figures are under a magnification of ×820 approximately.

FIG. 105. *Navicula cuspidata* Kütz.

FIGS 106–128. Fig. 106. *Navicula cuspidata* Kütz. var. *ambigua* (Ehr.) Cleve. Fig. 107. *Navicula cuspidata* Kütz. var. *heribaudi* Peragallo. Fig. 108. *Navicula cuspidata* Kütz. var. *major* Meister. Fig. 109. *Navicula cuspidata* Kütz. var. *major* Meister forma *robusta* f. nov. Fig. 110. *Navicula cuspidata* Kütz. var. *conspicua* Venkataraman. Fig. 111. *Navicula mutica* Kütz. var. *linearis* var. nov. Fig. 112. *Navicula pupula* Kütz. Fig. 113. *Navicula pupula* Kütz. var. *rectangularis* (Gregory) Grun. Fig. 114. *Navicula pupula* Kütz. var. *capitata* Hust. Fig. 115. *Navicula densestriata* Hust. Fig. 106. *Navicula cocconeiformis* Gregory. Fig. 117. *Navicula cryptocephala* Kütz. Fig. 118. *Navicula cryptocephala* Kütz. var. *veneta* (Kutz.) Grun. Fig. 119. *Navicula salinarum* Grun. Fig. 120. *Navicula simplex* Krasske. Fig. 121. *Navicula rostellata* Kütz. Fig. 122. *Navicula viridula* Kütz. Fig. 123. *Navicula viridula* Kütz. var. *rostellata* (Cleve) Meister. Fig. 124. *Navicula viridula* Kütz. var. *rostrata* Skvortzow. Fig. 125. *Navicula cincta* (Ehr.) Kütz. Fig. 126. *Navicula schönfeldii* Hust. Fig. 127. *Navicula tuscula* (Ehr.) Grun. Fig. 128. *Navicula pygmæa* Kütz.