

RECENT FRESH-WATER DIATOMS OF KANKAWATI RIVER, VINJHAN, SOUTHWESTERN KUTCH, GUJARAT

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ABSTRACT

Nine species of the fresh-water diatoms are recorded from bottom samples of the river 'Kankawati' and out of nine species two species are described as new. Only one species belongs to order Centrales while the remaining eight species represent the order Pennales.

INTRODUCTION

This is the first record of fresh-water diatoms from the Kutch region as a whole. The fresh-water diatoms were collected by the senior author from bottom sediments of the river 'Kankawati' flowing in the vicinity of Vinjhan village (Fig. 1) situated in the southwestern part of Kutch in the month of March, 1969. In the summer season, the mainstream of the river 'Kankawati' gets dried and only small ponds having fresh-water within the river channel are formed. The sea coast lies at a distance of 13 km. south of the Vinjhan village.

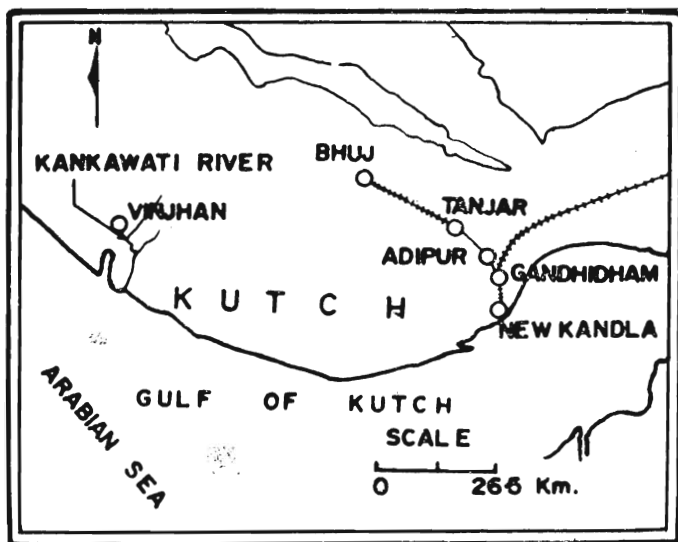


Fig. 1. Showing locality of the area.

Kutch has a semi-arid climate. The maximum and minimum mean temperatures of the year recorded at Bhuj are 110.6°F and 42.1°F respectively. The mean annual rainfall recorded at Bhuj is 34.2 cm. The mean wind speed of the year recorded at Bhuj is 15.77 km per hour.

The diatoms from the other parts of India have been described by Skvortzow (1935), Biswas (1936), Venkataraman (1939, 1956), Iyenger and Subrahmanyam (1943), Gonzalves and Gandhi (1952, 1953, 1954), Krishnamurthy (1954), Gandhi (1955, 1956, 1958a, b, 1959a, b), Desikachary (1956, 1962), Misra (1955), Subrahmanyam (1958), Singh (1960), Singh (1961, 1962, 1963), Desikachary and Rao (1973) and Singh, Nautiyal, and Vimal (1973). Marathe and Anantani (1972) studied the algae contents of the soil samples collected from the localities-Anjar, Bhuj, Dhunai, Kandla, Khavda and Mandvi and reported that the soil samples did not contain any diatoms.

The classification given by Smith (1950) for diatoms has been followed in the present paper.

SYSTEMATIC DESCRIPTION

| | |
|----------|---------------------------------|
| Division | Chrosyphyta |
| Class | Bacillariophyceae |
| Order | Centrales |
| Genus | <i>Cyclotella</i> Kützing, 1834 |

Cyclotella meneghiniana Kützing

(Pl. 1—11)

Cyclotella meneghiniana Kützing, Desikachary and Rao, 1973, pp. 78-88 Pls. 3-7.

Material : A complete valve, Slide no. D/L.U./K./1, Museum, Department of Geology, University of Lucknow, Lucknow.

Remarks : The present form is identical to *Cyclotella meneghiniana* Kützing described by Desikachary and Rao (*op. cit.*). It grows in less number in the river 'Kankawati'. Diameter 0.0165 mm.

Habitat : Fresh-water and brackish-water.

Distribution : Madras (Venkataraman, 1939), Kashmir (Iyenger and Subrahmanyam, *op. cit.*), Bombay (Gonzalves and Gandhi, 1952), Pratabgarh in Rajasthan (Gandhi, 1955).

Order Pennales
Suborder Naviculineae
Family Naviculaceae
Genus *Navicula* Bory, 1822

Navicula sp. indet.
 (Pl. 1—1)

Material : A complete valve, Slide no. D./L.U./K./2, Museum, Department of Geology, University of Lucknow, Lucknow.

Description : Valve symmetrical, lanceolate, inflated in the middle, lateral margins smooth, attenuated towards the poles with slightly capitate ends, Raphe distinct, axial, and straight. Axial field narrow and expanding in the middle region of the valve. Central nodule indistinct, and polar nodules distinct. Striae prominent, infinite in number, closely packed and slightly converging towards the middle part of the valve. Length 0.1515 mm, width 0.0420 mm.

Remarks : Only a single valve has been found. This species grows rarely in the river 'Kankawati'.

Habitat : Fresh-water.

Genus *Caloneis* Cleve, 1894
Caloneis vinjhanensis sp. nov.
 (Pl. 1—2-4.)

Holotype : A complete valve, Slide no. D./L.U./K./2 (pl. 1, fig. 3), Museum, Department of Geology, University of Lucknow, Lucknow.

Paratypes : Seven complete valves, Slide no. D./L.U./K./1 (pl. 1, fig. 2, fig. 4), Museum, Department of Geology, University of Lucknow, Lucknow.

Description : Valve lanceolate, inflated in the middle, lateral margins smooth, with capitate ends. Raphe distinct, axial and straight. Axial field prominent, straight and broad. Central and polar nodules prominent. Transverse striae prominent, indefinite in number, parallel to each other and converging slightly towards the axial area. Longitudinal lines prominent, occurring on the lateral part of the valves and varying in number from 1 to 2. Holotype—Length 0.0480 mm, width 0.0180 mm ; Paratype—Length 0.0330 mm—0.0630 mm, width 0.0120 mm—0.0165 mm.

Remarks : The species is named after the type locality—Vinjhan village. It grows abundantly and shows variation in the degree of inflation of the middle region of the valve. Some valves are slightly less inflated in comparison to others.

It differs from *Caloneis permagna* (Bailey) Cleve recorded by Gandhi (1955) in having less inflated middle region of the valve. It can be easily distinguished from *Caloneis pulchra* Messikommer forma *partabgarhensis* Gandhi and from *Caloneis clevei* (Lagerstedt) Cleve by its lanceolate shape of the valve. It differs from *Caloneis bacillum* (Grunow) Mereschkowsky in having slightly produced ends.

Habitat : Fresh-water.

Type locality : Vinjhan village, river 'Kankawati'.

Caloneis gandhii sp. nov.
 (Pl. 1—6-8)

Holotype : A complete valve, Slide no. D./L.U./K./4 (pl. 1, fig. 6), Museum, Department of Geology, University of Lucknow, Lucknow.

Paratype : Two complete valves, Slide no. D./L.U./K./1 (pl. 1, fig. 7), Slide no. D./L.U./K./4 (pl. 1, fig. 8), Museum, Department of Geology, University of Lucknow, Lucknow.

Description : Valve lanceolate, highly inflated in the middle, lateral margin dentate with capitate ends. Raphe prominent, thick, axial and straight. Axial area broad and bounded laterally by a prominent longitudinal lines. Central and polar nodules prominent. Transverse striae distinct, indefinite in number, parallel to each other, converging slightly towards the axial area and meeting the prominent longitudinal line which bounds the axial area. Longitudinal lines prominent, 2 to 4 in number, and occupying the lateral area of the valve. Holotype—Length 0.0615 mm, width 0.0195 mm; Paratype—Length 0.0300 mm—0.0405 mm, width 0.0150 mm—0.0180 mm.

Remarks : It grows less abundantly in comparison to its new associated species *Caloneis vinjhanensis* and resembles *Caloneis vinjhanensis* in outline but differs from it in having highly inflated middle part of the valve. It differs from *Caloneis pulchra* Messikommer forma *partabgarhensis* Gandhi and from *Caloneis clevei* (Lagerstedt) Cleve in having lanceolate shape of the valve. It can be demarcated from *Caloneis bacillum* (Grunow) Mereschkowsky by its produced ends. *Caloneis permagna* (Bailey) Cleve has got more inflated middle part of the valve in comparison to the present species.

Habitat : Fresh-water.

Type Locality : Vinjhan village, river 'Kankawati'.

Etymology : The species is named after Dr. H. P. Gandhi, Biological Department, M. N. College, Visnagar (N. Gujarat), in recognition of his outstanding contribution to the diatoms of India.

Genus *Anomoeoneis* Pfitzer, 1871
Anomoeoneis sp.
 (Pl. 1—5)

Material : A complete frustule, Slide no. D./L.U./K./2, Museum, Department of Geology, University of Lucknow, Lucknow.

Description : Valve rhombic-lanceolate, inflated in the middle, lateral margin entire, ends produced and rostrate. Raphe distinct, straight and thin. Axial area prominent, straight and narrow. Central and polar nodules well-developed. Delicate transverse striae poorly visible. Length 0.0645 mm, width 0.0165 mm.

Remarks : This species grows scantily in the present area.

Habitat : Fresh-water.

Genus *Diploneis* Ehrenberg, 1844

Diploneis puella (Schum.) Cleve

(Pl. 1—10)

Diploneis puella (Schum.) Cleve, Skvortzow, 1936a,

p. 31, pl. 2, fig. 2.

Material : A complete valve, Slide no. D./L.U./K./3 (pl. 1, fig. 10), Museum, Department of Geology, University of Lucknow, Lucknow.

Remarks : It grows fairly in the area of study. Length 0.0345 mm, width 0.0195 mm.

Habitat : Fresh-water and brackish-water.

Distribution : Kizaki lake in Honshu Island, Nippon (Skvortzow, 1936a), Ikeda lake in Kiusiu Island, Nippon (Skvortzow, 1937a), Khingan, North Manchuria, China (Skvortzow, 1928).

Diploneis sp.

(Pl. 1—9)

Material : A complete frustule, Slide no. D./L.U./K./2, Museum, Department of Geology, University of Lucknow, Lucknow.

Description : Valve oval, margin dentate with rounded ends. Raphe distinct, straight and thin. Axial area distinct, straight with irregular breadth—inflated in the middle and narrow at the ends. Central nodule rounded to subquadrate in shape and distinct; polar nodules indistinct. Transverse costae well-developed, distinct, converging towards the axial area and varying in number from 32 to 35. Length 0.0255 mm, width 0.0135 mm.

Remarks : It grows in less number in the present area.

Habitat : Fresh-water.

Family Cymbellaceae

Genus *Rhopalodia* O. Muller, 1895

Rhopalodia sp.

(Pl. 1—13)

Material : Three complete frustules, Slide nos. D./L.U./K./1, 4, Museum, Department of Geology, University of Lucknow, Lucknow.

Description : Valve reniform, inflated, convex margins, with acute ends. Axial field broad and distinct. Central and polar nodules indistinct. Transverse costae prominent and varying in number from 13 to 17. Length 0.0255 mm—0.0315 mm, width 0.0060 mm.

Remarks : It grows luxuriantly in the river 'Kankawati'.

Habitat : Fresh-water.

Suborder Surirellineae

Family Surirellaceae

Genus *Campylodiscus* Ehrenberg, 1841

Campylodiscus sp.

(Pl. 1—12)

Material : A complete valve, Slide no. D./L.U./K./3, Museum, Department of Geology, University of Lucknow, Lucknow.

Description : Valve circular, with undulating periphery. Costae distinct, developed around the periphery and converging towards the centre. Punctae poorly seen. Diameter 0.0405 mm.

Remarks : This form has scantily growth in the present region.

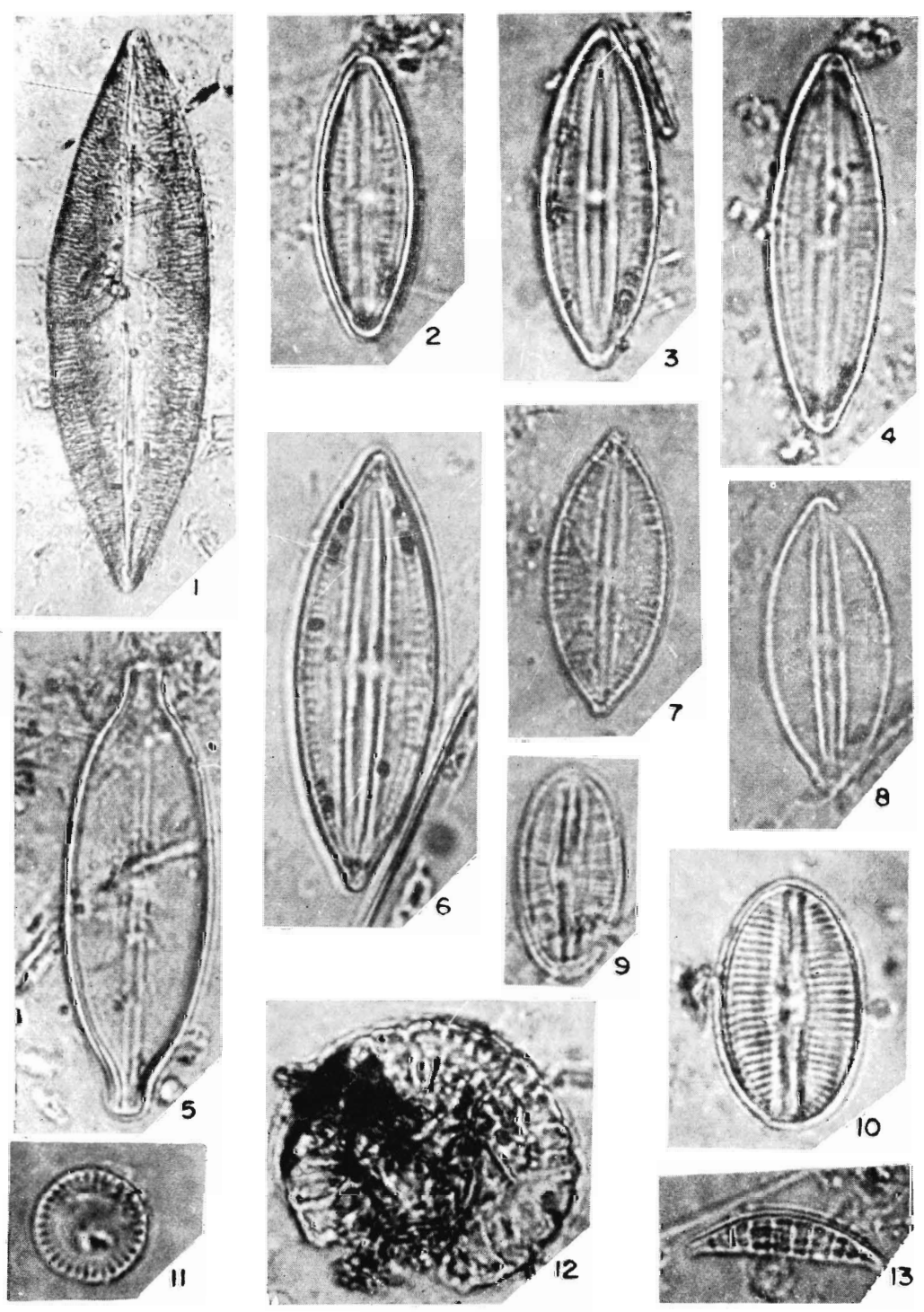
Habitat : Fresh-water.

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EXPLANATION OF PLATES

PLATE I

1. *Navicula* sp. indet., valve view, X 568.
- 2-4. *Caloneis vinjhanensis* sp. nov., Figs. 2, 4, valve views of paratype ; Fig. 3, valve view of holotype, X 1100.
5. *Anomoeoneis* sp., valve view, X 1100.
- 6-8. *Caloneis gandhii* sp. nov., Fig., 6, valve view of holotype ; Figs. 7-8, valve views of paratypes, X 1100.
9. *Diploneis* sp., valve view, X1100.
10. *Diploneis puella* (Schum.) Cleve, valve view, X 1100.
11. *Cyclotella meneghiniana* kutzing, valve view, X 1100.
12. *Campylodiscus* sp., valve view, X 1100.
13. *Rhopalodia* sp., valve view, X 1100.