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Fresh Water Algea from Chontra, District Karak

By Shahida Naveed, Farrukh Hussain, Inayat Khattak & Niaz Ali.

Botany department, university of peshawar

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GJSFR-C Classification : *FOR Code: 060204*

FRESH WATER ALGEA FROM CHONTRA, DISTRICT KARAK

Strictly as per the compliance and regulations of :

Fresh Water Algea from Chontra, District Karak

Shahida Naveed[α], Farrukh Hussain[σ], Inayat Khattak[ρ] & Niaz Ali[α]

Abstract - Thirty-six species of fresh water algae were taxonomically identified. The samples were collected from rain-fed streams (Algaadha) in Shamshoki, District Karak during March to May, 2011. Algae was collected, identified and described from this area for the first time. These specimens belongs to 36 species, 25 genera, 17families, 15orders, 7classes and 5 divisions of *Cyanophyta, Chlorophyta, Chrysophyta, Bacillariophyta* and *Ochrophyta* including *Oscillitoria* (1 spp), *Lyngbya* (1 spp), *Chroococcus* (2 spp), *Synechocystis* (1 spp) *Spirogyra* (3spp), *Ulothrics (2 spp)Cosmarium* (2 spp) *Oedeogonium* (1 spp) *Rhizoclonium* (1 spp) *Fragilria* (1 spp), *Synedra* (1 spp), *Diatoma* (1 spp), *Pinnularia* (2 spp), *Amphora* (1 spp), *Cymbella* (2 spp), *Surirella* (1 spp), *Cocconeis* (1 spp), *Achnanthes* (1 spp), *Nitzchia* (2 spp), *Navicula*(2 sp) had one *Stauroneis* (3 spp) and *Vaucharia*, *Epithamia*, *Mastogloia*, *Frustulia*.

I. Introduction

Algae is present in all biologically active ecosystems (John et al., 2002).There is approximately 19 divisions with 26,900 species of algae which has been described till today in the world (Wilson, 1988). It has been studied world widely and in Pakistan phycologist has reported algae from various habitats. Hussain et al. (1984), Anjum & Hussain (1984), Leghari et al. (2002) Sarim (2005), Zaman and Hussain (2005), Ali et al. (2008) reported algae from various fresh water habitat of Pakistan. Freshwater diatoms of Sindh (Leghari, 2001; Leghari et al., 2001, 2002, 2004), Punjab, KPK and Azad-Kashmir (Leghari et al., 2003, 2004; Tariq et al., 2005, 2006a, b, c, d, 2007, 2008; Lashari et al. 2008; Sarim et al., 2008; Ghazala et al., 2009; Ali et al., 2010; Ghazala & Habib, 2011) have al been worked out. Diatoms from coastal waters of Pakistan were reported by Ghazala (2006, 2007). Aliya et al. (2009) demonstrated fresh water algae of Karachi.

In this continuation the present study is an attempt to report some fresh water and soil algea from the hilly area, Shamshoki of District Karak.

II. Materials and Methods

Collection was made from rain fed fresh water stream and moist soil by hand picking, squeezing the algal masses and scraping stones and other submerged objects. The collected specimens were kept in glass bottles and preserved by adding 3% formalin solution. The preserved specimens were then examined under microscope and identified with help of key used after Tiffany and Britton 1952, Prescott, 1962, Cleve (1893), Ramanathan (1964), Desikachary (1959) and Transeau (1951).

Author α : Botany department, university of peshawar.
Author σ : Centers of plants and biodiversity, university of peshawar.
Author ρ : Nrm coordinator, srsp, district karak.

III. Result and Discussion

The present study revealed that the 36 algal specimens belong to 5 Divisions. Out of it 5 species belongs to 4 genera, 3families, 2order, and 2classes of division *Cyanophytaphyta.* 9 species belongs to 5genera, 5families, 4order, and 2classes of division *Chlorophyta*.18 species belongs to 12genera, 7 families, 7order, and 1class of division *Bacillariophyta.* 1species belongs to 1 genus, 1families, 1order, 1class of division *Chrysophytophyta*.3 species belongs to 3 genera, 1 family, 1order, 1 class of Division *Ochrophyta.*

PHYLUM *CYANOPHYTA*
CLASS *CYANOPHYCEAE*
ORDER *OSCILLATORIALES*
FAMILY *OSCILLATORIACEA*

1. *Oscillitoria laetevirens:* (Crowan) Gomonl.

References: P 212 plate39, fig 2 Desikachary.
General Charecters: Cells nearly as long as broad 2.5-5 micrometer long sometimes granulated at the cross walls: end cells not capitates more or less obtuse or less obtuse or conical without calyptras.
Locality: Village Hakim Khel, March 2011.
Remarks: The species was collected in vegetative form. Fig .26.

2. *Lyngbya spirali*, Geitler.

References: p 288 plate 48, fig 1, Desikachary.
General Characters: cells mostly 1/3 seldom up to ½ as long as broad, 1.2-2.5 micrometer long; end cell broadly rounded without a thickened outer wall, calyptras absent.
Locality: Dubb Khakim khel village, March, 2011.
Remarks: it was collected in vegetative form, Fig.27.
ORDER *CHROOCOCCALES*
FAMILY *CHROOCOCCACEAE*

3. *Chroococcus turgidus* (Kuetz.) Naegeli 1849.

References: P 129 plate 26, fig 6 Desikachary
General Characters: Cells bright blue green, contents sometimes coarsely granular, enclosed by individual sheath, 8-32 u in diameter without sheath, 15-50 micrometer wide including sheath.
Locality: Village Hakim Khel, April 2011.
Remarks: the species was collected in vegetative form. Fig.24.

4. *Chr.minutus* (Kuetz.)Naegeli.1849

Reference: p 122 plate 4 Desikacharry.
General Characters: Cells contents blue green either homogenous or finely granular, cells 5-7-(10) micrometer in diameter without sheaths.
Locality: Village Hakim Khel , April 2011.
Remarks: the species was collected in vegetative form. Fig.23.
Key to species
1 Cells 2-2.5μm in diameter----------*C. turgidus.*
1 Cells 5-7μm in diameter ----------*C. minutes.*

5. *Synechocystis aquatilis* Sauv

References: p 126, plate 25, fig 9, Desikachary.
General Characters: Cells spherical, single or in tows, 5-6u broad, pale blue green. Planktonic in stagnant waters.
Locality: Collected from the green colored material deposited inside the water hose.
Remarks: it was collected in vegetative form Fig.25.
Phylum *Chlorophyceae*
Class *Zygnematophyceae*
Order *Zegnematales*
Family *Zegnemataceae*

6. *Spirogyra tetrapla* Transeaue

References: Pg 159, plate 49, fig 517, Tiffany.
General Characters: Vegetative cells 30- 40 X 100-250 u, with replicate end walls; 1 or 2 Chromatophores making 2 to 8 turns in the cell; conjugation scalariform; tubes formed by both gametangia; fertile cells inflated to 66 u; zygote ellipsoid, 48-58 X 68-88 u; median spore-wallof two layers, yellow, made up of 2 layers, of which the outer is thin and irregularly corrugate and the inner finely reticulate.
Locality: Collected from a stream in Shamshoki.
Remarks: The specie was collected in reproductive form, Fig.31.

7. *Spirogyra corrugata* Transeau

References:P 157,Plate 47, Fig 500,Tiffany.
General Characters: Vegetative cells (30-) 32-36 (-40) X 140-280 (-400) u , with plane end walls and (1-) 2-3 chromatophores making 2-4 turns in the cell; conjugation sclariform; zygospores ovoid 42-60 X 88-120u , median spore wall of two layers: of which the thin outer layer is coarsely and irregularly corrugate; the inner finely reticulate.
Locality:from Shamshoki stream.
Remarks:Collected in vegetative form, Fig.29.

8. *Spirogyra puncticulata* Jao 1935. Trans.

References: P: 304 Pl. XXX, Fig. 11, the Zygnemataceae
General Characters: Vegetative cells 1 6-22/1 x 48-240 ft, with plane end walls; filaments attached by rhizoids; chromatophores 2, rarely 1, making 1.5 to 5 turns in the cell; conjugation scalariform; tubes formed by both gametangia; fertile cells fusiform or cylindrically inflated to 29-36 / t; zygospores Ovoid, 25-32/1 x 41-58/1; median wall densely punctate, yellow.
Locality: Shamshoki, April, 2011.
Remarks: Vegetative form. Fig.28.
Key to the species
1 Vegetative cells 30-40μm in diameter ----------*S. tetralpa.*
1 otherwise----------2.
2 chromatophores making 4-5 turns----------*S. corrugate.*
2 chromatophores making 1.5-5 turns----------*S. puncticulata.*

Family: Desmidiceae

9. *Cosmarium nitidulum* De Notaris.

References: Pg 174, plate 53, fig572, Tiffany.
General Characters: Cells 23-33X 30-41u and 16.0-22.5u thick (isthmus 8-10u wide), a little longer than wide, deeply constricted, sinus narrowly linear ,the apex slightly dialated; semicells truncate - subsemicircular, basal angles broadly rounded, sides convex and converging upward, upper angles slightly rounded, apex small, truncate- convex, straight or slightly retuse; cell-wall minutely and often obscurely punctuate; chromatophore axial ,1 in each semicell; pyrenoid single, central.
Locality: VILLAGE Khakim khel, April 2011.
Remarks: The specimen collected in vegetative form, Fig.33.

10. *C. pachydermum* Lundell var. aethiopian W. and G. S. West

References: pg 174, plate 53, fig 581,Tiffany.
General Characters: Cells 61-80X 69-107u and 40-45 u thick (isthmus 28-33u wide), longer than wide, broadly elliptic, deeply constricted, lower part of sides somewhat straight, basal angles broadely rounded, apices broad; cell wall thin, finely scrobiculate and minutely punctuate between the scrobiculations; chromatophore axial, 1 in each chromatophore.
Locality: Village KHakim khel, April 2011.
Remarks: Collected in vegetative form, Fig. 34.
Key to species
Vegetative cells 23-33μm in diameter --------*C. nitidulum*
Vegetative cells 61-80μm in diameter ------*C. pachydermum.*

Order *Ulotrichales*
Class *Chlorophyceae*
Order *Odeogoniales*
Family *Oedeogoniaceae.*

11. *Oedeogonium bohemicus* Hirn

Reference: p.84 169 Pl. 22, Fig.204, Tiffony.
General Characters: monoecious; oogonium one, globose, operculate, division superior; oospore globose,

filling oogonium, spore walls smooth; Vegetative cells capitellate,10-16X 21-66u;oogonium 42-45X46-49u; oospore 40-43X40-43 u; antheradium 9-19X 5-7 u.
Locality: Shamshoki stream,April 2011.
Remarks: The species was collected in reproductive form. Fig.19.
Family *Ulotrichaceae.*

12. *Ulothrics subtilissima* (Rabenhorst 1868).

References: p: 672 plate6, fig 3 Prescott.
General Characters: Cells very slightly inflated and constricted at the cross walls. Chloroplast extending the entire length of the cell, with one pyrenoid. Cells 4-5 micrometer in diameter, 11-14.8 micrometer long.
Locality: Shamshoki Stream, April, 2011.
Remarks: Collected in vegetative form.Fig.20.

13. *U. variabilis*. Kuetzing 1849

References: p: 672 plate 6, fig13, Prescott.
General Characters: Cell cylindrical, without constrictions at the cross walls. Chloroplast a folded, parietal plate, 1/2 to 2/3 the length of the cell with one pyrenoid. Cells 4.5- 6 micrometer in diameter and up to 15 micrometer long.
Locality: Shamshoki stream, April, 2011.
Remarks: The specimen was collected in vegetative form.Fig.21.
Key to the species
Cells 5-6 μm in diameter ---------- *U. viribilis*
Cells 4-5μm in diameter---------- *U. subtilissima*
Order *Chladophorales*
Family *Chladophoraceae*

14. *Rhizoclonium hieroglyphicum* (Agardh)Kuetzing

References: P46, plate.13, fig. 91 Tiffony.
General Characters: vegetative cells 10-35 x 10- 115 u, with thin walls, cylindrically or slightly constricted at cross wall; filamentous straight, without rhizoidal cells.
Locality: Shamshoki Stream, April 2011.
Remarks: Vegetative form. Fig.22.
PHYLUM *OCHROPHYTA*
CLASS *COSCINODISCOPHYCEAE*
ORDER: *FRAGILARIALES*
FAMILY *FRAGLARIACEAE*

15. *Fragilria capucina* Desmazieren

References: p 232 plate-62, fig- 698, Tiffany
General Characters. Cells 2-5X 25-100 u, united into long chain; valves linear with pseudoraphe and rectangular to elliptical central area; transverse striation fine, about 15 in 10u.
Locality: Shamshoki Stream, April, 2011.
Remarks: Specimen collected in Vegetative form. Fig.2.

16. *Synedra acus* Kutezing

References: P 234, Plate 63, fig 720, Tiffany.
General Characters: Cells 5-6 x100-300 u , solitary; valves linear- lanceolate, becoming needle- like toward the scarcely rounded poles,about 1.5 u in diameter ; transverce striations 12-14 in 10u , pseudoraphe narrow, linear with central area usually present, rectangular .

17. *Diatoma hiemale* (Lyngbye) Hleiberg

References: P. 228.Plate-61, Fig-684, Tiffany.
General Characters: Cells 7-13x 30-100u, united into closed chains, with numerous intercalary bands; valves linear – lanceolate only slightly narrowed toward the rounded poles; costae prominent, 2-4 in 10 u. Transverse striations 18-20 in 10 u.
Locality: Shamshoki Stream, April, 2011 .Fig.7.
CLASS *BASCILARIOPHYCEAE*
ORDER *NAVICULALES*
FAMILY *NAVICULACEAE*
SUB FAMILY: *Tabellarieae*

18. *Pinnularia gibba* (Van Heurck) Boyer

References: p 259, plate 69, fig 801, Tiffany.
General Characters: Cells 7-13x50-140 u ;valves Linear-lanceolate with lightly convex sides diminishing towards broad capitates to cuneate poles, with varying wide axial area and an elliptically banded central area; transverse striations radial in the middle, parallel toward the poles and convergent at the poles,9-11 in 10 u.
Locality: Shamshoki Stream.
Remarks: It was collected in vegetative form. Fig.05.

19. *P. nobilis*. Ehrenberg

References: p. 258, plate 69, fig 806, Tiffany.
General Characters: Cells 34-50x200-350 u; valves linear, a little wider at the rounded poles; axial area about a third of the cell diameter, with rounded central area; raphe complex, undulate; transeverse striation, medianly radial , polarly convergent , 4-5 in 10u, crossed by a wide longitudinal band.
Locality: Shamshoki Stream, April 2011.
Remarks: The species was collected in vegetative form. Fig.6.
Key to species
1 Cells with subcapitate end---------- *P. gibba*
1 Cells with rounded ends---------- *P. nobillis*

20. *Navicula cuspidate* Kuetzing

References: P 252, plate68, fig 789, Tiffany.
General Characters: Cells 17-37x50-170 u, Valves rhombo-lanceolate, tapering sharply to rounded ends , transvers striations, evidently punctate,11-19 in 10 u; longitudinal striations about 25 in 10u and parallel to narrow axial area.
Locality: Shamshoki Stream, April, 2011.
Remarks: The specimen was collected in vegetative form, Fig.10.

21. Navicula oblonga Kuetzing

Reference: p 251.plate.67, fig.787, Tiffany.
Cells 13-24x70-220 u; valves linear-lanceolate with broadly rounded ends; transverse striations in polar and subpolar area bent, generally radial, 6-8 in 10u; central area large, round.

22. *Frustulia viridula.* (Brebisson)De Toni

References: P. 247, Plate 66, fig.755, Tiffany.
General Characters: Cells 13-20x100-110u, in gelatinous tubes; valves elliptic-lanceolate, with transverse striations 28-30 in 10u.
Locality: Shamshoki Stream, April 2011.
Remarks: It was collected in vegetative form. Fig.16.

23. *Mastogloia smithii* Thwaites

References: P. 252, Plate 68, fig. 793, Tiffany.
General Characters: Cells 8-16x20-65u; valves elliptic lanceolate, with transverse striations fine, 18-20 in 10u, slightly radial, axial area narrow and linear, raphe straight; rectangular to quadrate chambers of internal septa 6-8 in 10u.
Locality: Collected from Shamshoki Stream, April 2011, Fig.11.
ORDER *CYMBELLALES*
FAMILY *CYMBELLAACEAE*

24. *Amphora desipiens* .Cl. N. Sp.

References: Plate IV, Fig.16, Diatom Part II.
General Characters. Frustule nearly rectangular about 3 times as long as broad.L.0,055,B.0,02 mm; zone with distant rows(6 in 0,01 mm) of puctae (about 11 in 0,01mm).V. gibbous in the middle of the ventral margin.L.0,035 to 0,06, B.0,02 mm. Ends obtuse, axial area distinct on the dorsal and ventral side, somewhat dialated at the middle. Crest or longitudinal line distinct on the dorsal side, at some distance from the median line, Ventral side striate, striae 12 in 0, 01 mm, not distinctly punctuate. Striae crossed by an obtuse longitudinal band.
Locality: Shamshoki Stream,A pril,2011 .Fig.30.

25. *Cymbella cuspidate*. Kuetzing

Reference: p. 277 plate 74, fig.863 Tiffany.
General Characters: Cells 14-28X 40-100u; Valves broad, somewhat asymmetrically linear lanceolate, with slight constriction below the somewhat capitates poles; Raphe extrentric, nearly straight; axial area narrow; central area large and circular; transverse striation radiate 9-14 in 10u indistinctly cross-tired.
Locality: Shamshoki Stream, April 2011.

26. *C. prostrate*. (Berkeley) Cleve.

References: p 276 plate 74, fig 859, Tiffany.
General Characters: Cells 10-30x20-100u, valves quite asymmetric, semi-elliptic, dorsally convex, ventrally straight with median expansion, poles broadly rounded, raphe straight with polar deviation, axial like area narrow; content area small ,round without isolated dots; transversely striations 7-10in 10u ,radiate to parallel, with cross lines-about 20 in 10u.
Locality: Shamshoki Stream, April 2011.
Remarks: Collected in vegetative form. Fig.3.
Key to species of *Cymbella*
1 Stria 9-14 in 10µm---------- *cymbella cuspidate*.Kutz.
1 Stria 7-10in 10µm---------- *C.prostrata*
ORDER *SURIRELLA LALES*
FAMILY *SURIRELLACEA*

27. *Surirella linearis* Wm.Smith

References: P 292, Plate.79, fig.920, Tiffany.
General Characters: Cells isopolar, 9-25x20-125, valves linear with parallel or slightly convex sides and bluntly rounded nearly cuneate poles, costae 2-5 in 10 u.
Locality: Shamshoki Stream, April 2011, Fig.15.
ORDER: *ACHNANTHALALES*
FAMILY: *ACHNANTHACEAE*

28. *Cocconeis placentula* EHRENBERG

References: P 239, Plate. 64, fig.736, Tiffany.
General Characters: Cells 8-40X 11-70 u, flat or slightly curved; valves elliptic, striae in both longitudinal and transverse series, with isolated punctae and hyaline areas appearing towards margins;
Locality: Shamshoki Stream,April 2011. Fig. 8.

29. *Achnanthes lanceolata* (Brebisson) Grunow.

Reference*:* p.239, plate 64, fig.724, Tiffany.
General Characters: Cells 4-10 x 8-40 u; valves elliptic-lanceolate, with transverse striations 13-17 in 10 u; hypo-valve with prounced thread like raphe, with central broad, somewhat rectangular ,hypo-valve with slender pseudoraphe, and with a u.shaped spot on one side.
Locality: Shamshoki Stream, April 2011, Fig.36.
ORDER *NITZCHIALALES*
FAMILY *NITZCHIACEAE*

30. *Nitzchia sigmoidea*. (Nitzsch)wWm.Smith.

References: P 284, plate 76, fig 895, Tiffany.
General Characters. Cells 8-14 x160-500 u, somewhat sigmoid in girdle view, almost linear with parallel sides. Valves naviculoid with cuneate, acute somewhat recurved poles. Keel slightly excentric with punctae 5-7 in 10 u, striations 23-26 in 10u.
Locality: Shamshoki Stream, April, 2011, Fig.4.

31. *N. linearis*. (Agardh)Wm. Smith

References: P 284, plate 76, fig.892, Tiffany
General Characters: Cells 5-6 x70-80 u, rectangular, linear, valve linear and generally with parallel sides and smaller capitates poles. Striastions 28-30 in 10u, keel punctea 8-13 bin 10u.

Locality: Shamshoki Stream, April 2011, Fig.32

Key to species

1 Valve naviculoid, with some what recurved poles----------*N. sigmoidea*

1 Valve linear, with capitate poles----------*N. linearis*

ORDER *RHOPALODIALES*

FAMILY *RHOPALODIACEAE*

32. *Epithamia zebra.* (Ehrenberg) Kuetzing

References: P 283 Plate-76, Fig-882, Tiffany.

General Characters: Cells 7-14x30-150u; valves lanceolate, gently curved with nearly parallel sides, gradually attenuated to rounded poles; costae radial, 2-4 in 10u, alternating with 4-8 rows of striations, 12-14 in 10u.

Locality: Shamshoki Stream, April 2011, Fig.14.

ORDER *NAVICULALES*

FAMILY *STAURONEIDACEAE*

33. *Stauroneis acuta.* Wm. Smith

Referenecs: p.267, plate 72 fig 829, Tiffany

General Chararecters:cells 15-100x 80-166 u , joined all their valves into short filamentous ,valves rhombo-lanceolate, sometimes with a slight median inflation, rounded poles, raphe straight moderately wide, axial area linear, broad stauros wider at the margins, polar septum extending inward a considerable distance, transverse striation, radial ,12-16 in 10 micrometer, evidently punctuate.

Locality: Shamshoki Stream, April, 2011, Fig.17

34. *S. phyllode* Ehrenberg

References: p.265, plate-71, fig-821, Tiffany

General Characters: Cells 25-50 X100 -250 u, solitary; valves broadly lanceolate, with rostrate ends; raphe straight, wide; axial area linear, broad; stauros generally an elliptically elongate band; transverse striation radial throughout,10-14 in 10 u, evidently punctuate.

Locality: Shamshoki Stream,April ,2011,Fig.13

Key

Cells 15-100μm in diameter----------*S. acuta*

Cells 25-50μm in diameter----------*S. phyllode*

PHYLUM *CHRYSOPHYTA*

CLASS *XANTHOPHYCEAE*

ORDER *HETEROSIPHONALES*

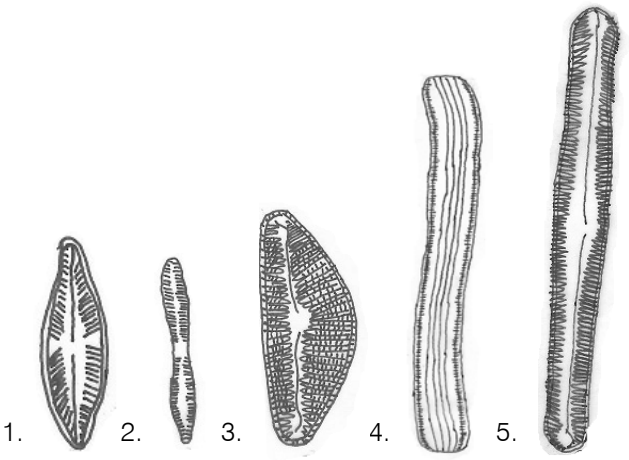
FAMILY *VAUCHARIACEAE*

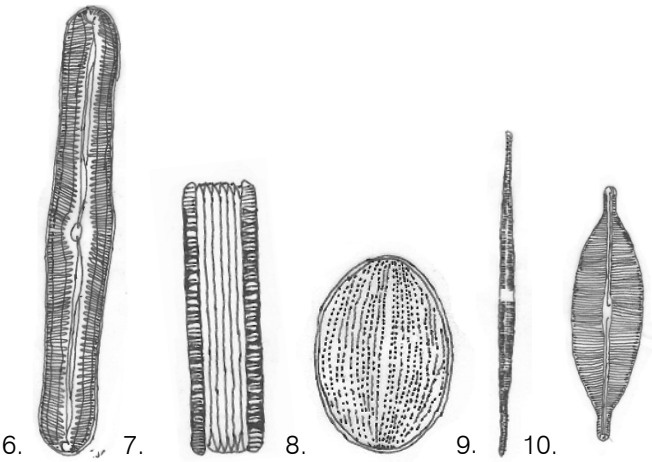
35. *Vaucharia sisselis* (Vaucher) De Candolle.

References: p 110, plate-36, fig.378, Tiffany.

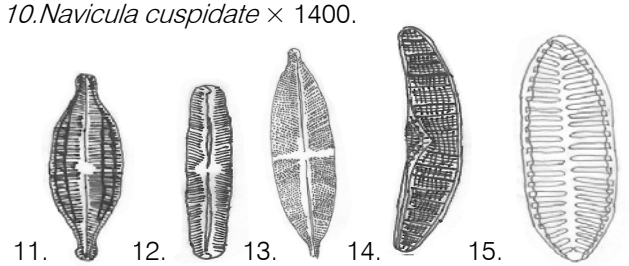
General Characters: Fillaments 50-130u in diameter; oogonia usually 2, sometimes single, sessisile or on very short stalks ,ovoid or oblong-ovoid,70-85 x 75-100 u,more or less oblique, with short beak, anthridium between the two oogonia or besides the single oogonium, on a short pedicel, straight, hooked or circinate; mature oospore dark-spotted, with triple membrane, filling oogonium ;zoosporangium ovoid-clavate , terminal ,producing a single zoospore,77-154 x 82-176 u.

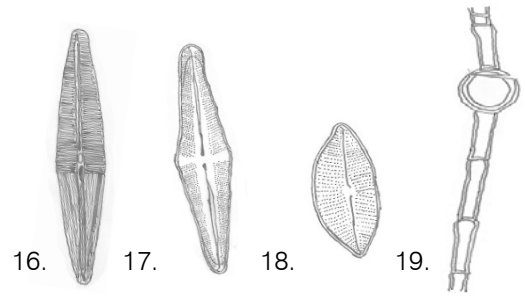
Remarks: Collected from moist soil in Chountra, December, 2011.





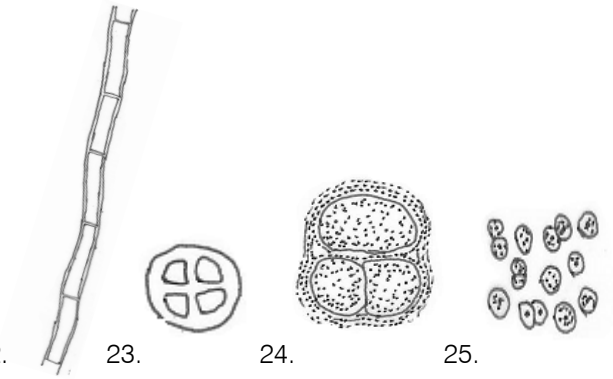
1. Stauroneis ancep × 1600 *2.Fragilaria capucina* × 1600 *3.cymbella prostrate* × 1400 *4.Natzschia sigmoidea* × 1400 *5.Pinnularia gibba* × 1400 *6.P.nobilis* × 1400 *7.Diatoma hiemale* × 1400 *8.Coconeis placentula* × 1400 *9.Synedra acus* × 1600 *10.Navicula cuspidate* × 1400.



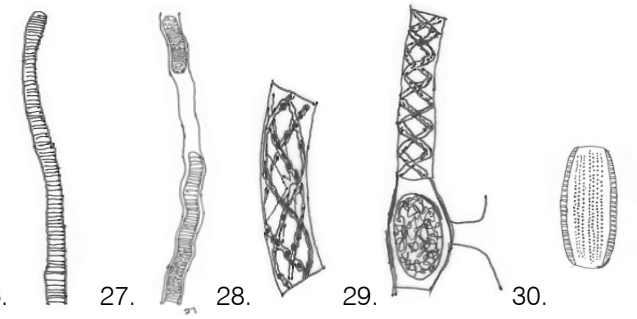


21.

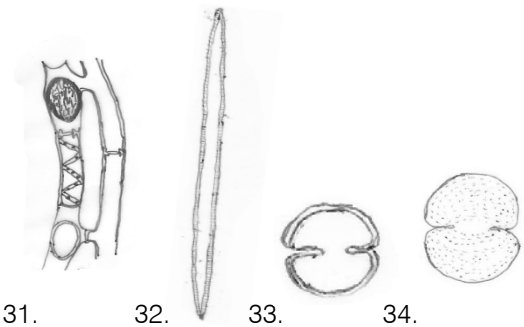
11.Mastogloia smithii × 1400 *12.Navicula oblonga* × 1400 *13.Stauroneia phylloda* × 1400 *14.Epithema zebra* × 1600 *15.Surirella linearis* × 1400 *16.Frustulia viridula* × 1400 *17.Stauroneis acuta* × 1400 *18.Cymbella cuspidate* × 1400 *19.Oedeogonium bohemicus* × 640 *20.Ulothrics subtilissima* × 160 *21.U. variabilis* × 720



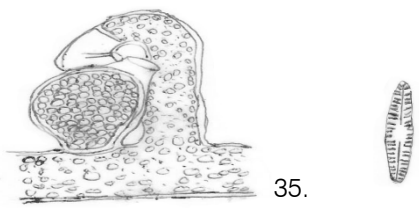
22. 23. 24. 25.



26. 27. 28. 29. 30.



31. 32. 33. 34.



35. 36.

22. Rhizoclonium heiroglyphicum × 640 *23.Chrocco - cus minutes* × 1600 *24.Chr. turgidus* × 1600 *25. Synechocystis aquatilis* × 1400 26. *Oscillitoria leatevirens* × 720 *27.Lyngbya spiralis* × 1400 *28.Spirogyra punctulata* × 160 *29.S. corrugate* × 160 *30.Amphora decipiens* × 1400 *31. Spirogyra tetrapla* × 160 *32.Natzschia linearis* × 1400 *33.Cosmarium pachydermum* × 720 *34.C.nitidulum* × 720 *35.V aucharia sessilis* × 160 *36.Achnanthes lanceolate* × 1400.

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