Meddelelser om Grønland

The subfossil diatom flora of four geographically widely separated cores in Greenland

Niels Foged

Bioscience
30 · 1989

Meddelelser om Grønland

The series *Meddelelser om Grønland* was started in 1879 and has since then published results from all fields of research in Greenland. In 1979 it was split into three separate series:

Bioscience
Geoscience
Man & Society

The series should be registered as *Meddelelser om Grønland, Bioscience (Geoscience, Man & Society)* followed by the number of the paper. Example: *Meddr Grønland, Biosci.* 1, 1979.

The new series are issued by Kommissionen for videnskabelige Undersøgelser i Grønland (The Commission for Scientific Research in Greenland).

Correspondence

All correspondence and manuscripts should be sent to:

Danish Polar Center
The Commission for Scientific Research in Greenland
Hausergade 3
DK-1128 Copenhagen K.
DENMARK

Questions concerning subscription to all three series should be directed to the agent.

Agent

Nyt Nordisk Forlag – Arnold Busck A/S, Købmagergade 49, DK-1150 Copenhagen K. Tlf. +45 33 11 03.

ISSN 0106-1054
ISBN 87-17-05959-3

Meddelelser om Grønland, Bioscience

Meddelelser om Grønland, Bioscience invites papers that contribute significantly to studies of flora and fauna in Greenland and of ecological problems pertaining to all Greenland environments. Papers primarily concerned with other areas in the Arctic or Atlantic region may be accepted, if the work actually covers Greenland or is of direct importance to the continued research in Greenland. Papers dealing with environmental problems and other borderline studies may be referred to any of the series *Bioscience, Geoscience,* or *Man & Society* according to emphasis and editorial policy.

Scientific editor – Botany

Gert Steen Mogensen, Botanical Museum, Gothersgade 130, DK-1123 Copenhagen K. Telephone +45 33 11 17 44.

Scientific editor – Zoology

G. Høpner Petersen, Zoological Museum, Universitetsparken 15, DK-2100 Copenhagen Ø. Telephone +45 31 35 41 11.

This volume edited by Gert Steen Mogensen.

Instructions to authors

See page 3 of cover.

The subfossil diatom flora of four geographically widely separated cores in Greenland

Niels Foged

MEDDELELSER OM GRØNLAND, BIOSCIENCE 30 · 1989

Contents

Accepted 1988
ISBN 87-17-05959-3
ISSN 0106-1054
Printed in Denmark by AiO Print as. Odense

The subfossil diatom flora of four geographically widely separated cores in Greenland

NIELS FOGED

Foged, N. 1989. The subfossil diatom flora of four geographically widely separated cores in Greenland. Meddr Grønland, Biosci. 30, 75 pp. Copenhagen 1990-1-10.

Diatoms in cores from four Greenland lakes are reported; one lake is situated in NE Greenland, two in NW Greenland, and one in W Greenland. All cores are of postglacial age, the earliest sample radiocarbon-dated to c. 8500 years B.P.; in each core the latest sample is taken a few cm below the lake bottom.

Previously investigated cores from Greenland showed a gradual change of environmental pH from alkaline to faintly acid lacustrine environments. This is also the case at one of the two sites in NW Greenland, and in W Greenland the pH is initially alkaline but subsequently developing towards neutral and slightly below it. At Station Nord, NE Greenland, the pH is faintly alkaline. However, the data from the fourth lake, Qeqertat, NW Greenland is rather confusing, as the alkaline environment which seems to persist is suddenly interrupted three times by higher levels of acidity.

The diatom flora consists predominantly of cosmopolitan species which are mostly recorded from the extant Greenland flora. In som aspects it represents a transition between the flora of northern Europe and North America. Most of the taxa are recorded from both regions, but some seem to be more common in Europe, whereas a few are more common, or previously only found in North America, especially Alaska.

Some species of particular interest are commented upon, and photographs of selected species are included.

Niels Foged, Aarestrupvej 20, DK-5230 Odense M, Denmark.

Introduction

The four samples from Greenland treated in this paper were received from Bent Fredskild and Niels Abrahamsen to demonstrate possible isolation levels and environmental changes by means of diatom analyses.

The samples were received over a period of years and originally analysed with no intention of publishing them in one paper. Initially, the four cores were treated somewhat differently and therefore, this paper has a somewhat heterogeneous character. This should, however, be of no significance for the purpose of this paper, i.e. the demonstration of isolation levels and environmental developments occurring at the different study sites.

NE Greenland

Previous investigation of subfossil and extant freshwater diatoms

Klaresø

One core, 82°10'N, 30°34'W. Foged 1972: 6–26, Pls A I–V. Fredskild 1969, 1973.

The core covers 0–113.5 cm below the bottom of the present lake (max. depth c. 3 m; size 100 × 300 m).

Thirty-eight diatom taxa were found (18 polyhalobous, 7 mesohalobous and 13 oligohalobous) in six samples obtained from marine clay at the bottom of the core (113.5–103.5 cm). About 120 oligohalobous taxa were recorded in 35 samples obtained from the freshwater sediment (101–0 cm).

The alkaliphilous *Fragilaria pinnata* Ehr. occurred very frequently in all the freshwater samples, and since alkaliphilous and circumneutral or pH-indifferent species were predominant, it must be assumed that sedimentation took place in a faintly alkaline environment, presumably rather poor in nutrients.

The present Klaresø has a low content of nutrients. According to C-14 dating of samples 7a and 8 from 103.5 and 101.0 cm, respectively, the lake became isolated from the sea c. 5000 years ago.

Sølejren

Profile of bog, 82°13'N, 32°40'W. Foged 1972: 27–36, Pl. B I–III. Fredskild 1973.

The core consists of a peaty layer up to 25 cm thick which covers the sandy subsoil.

A total of 115 diatom taxa were found, in 14 samples, all of them oligohalobous: 57 alkaliphilous or alkalibiontic, 33 pH-indifferent or circumneutral, and 25 acidophilous or acidobiontic.

Sedimentation must have taken place in freshwater, the pH being faintly alkaline without major variations throughout the whole period. The C-14 dating shows that the formation of the bog started c. 1500 years ago.

In general, the extant freshwater diatom flora of Peary Land is fairly rich, considering the extraordinarily natural conditions. Foged (1955) mentioned 303 taxa, predominantly widespread, partly cosmopolitan taxa. The genera *Navicula, Cymbella, Pinnularia, Nitzschia, Achnanthes, Fragilaria* and *Neidium,* each with between 13 and 64 taxa, are the most common of the 28 genera found.

Centric species are infrequent in recent material as well as in subfossil material examined up to now.

Present investigations

Vandsøen

81°36'N, 16°40'W. Tabs N 1–2, Pls N I–IV.

C. 2 km SE of Station Nord, Kronprins Christian Land, Prinsesse Ingeborg peninsula, NE Greenland; a core from a lake not previously examined for diatoms.

This lake was about 150 × 300 m, shallow, with a maximum depth of 2.65 m. The surroundings were level and sparsely covered with vegetation. The core was obtained on August 8, 1979, from a pontoon in the central northern quarter of the lake by means of a c. 1 m long and c. 10 cm wide acryl tube with a piston (see also Funder & Abrahamsen 1988).

The following layers were found:
0 – 12 cm: greyish-green, homogeneous lumpy gyttja (mud).
12 – 37 cm: brownish-grey gyttja (silty clay).
37 – 49 cm: blackish-grey silt (silty clay).
49 – 51 cm: black sand.
The interval 30 – 37 cm was radiocarbon-dated to 6430 ± 75 years before 1950.

The taxa

Most of the samples were poor in diatom valves and valves were very poor or completely lacking at the bottom.

Fragilaria pinnata Ehr., together with short or elliptic forms of it, dominated in the upper samples as shown in Tables N 1 and 2. Apart from a single valve, presumably adventive, of *Navicula digitoradiata* (Greg.) A. Schmidt in the topmost sample, all the species were freshwater diatoms. There were 30 alkaliphilous or alkalibiontic taxa, 30 pH-indifferent or circumneutral taxa, and 7 acidophilous or acidobiontic taxa. The samples are arranged according to their numbers: N 5.1–5.10 with the corresponding depths (Tab. N 1). Thus, the topmost sample is found to the left, the bottom sample to the right.

The environment remained faintly alkaline (Tab. N 1) throughout the whole sedimentation period, which lasted about 6500 years. However, in sample N 5.5 (19.5 cm), six valves (among the 100 counted) of the highly acidophilous *Achnanthes flexella* (Kütz.) Brun may indicate a faint change towards a neutral environment. This increases in sample N 5.4 at a depth of 15 cm with the occurrence of 16 valves of the same species. After this short change, the alkaline environment was reestablished at the same level as before the occurrence of *Achnanthes flexella* valves, as they were very few in number compared with their frequency in the two preceding samples.

Taxonomical remarks

Fragilaria pinnata Ehr. dominates in all the samples and is therefore not counted.

Fragilaria construens (Ehr.) Grun., however, is less frequent and therefore counted (Tab. N 1).

There were very few valves in most samples and counting 100 valves per sample within a reasonable time was practicable only in samples N 5.1–5.5 (4–19.5 cm).

At the bottom of the series N 5.12–5.8 (46–30.5 cm) only a few or no valves at all were found in each sample.

Among centric diatoms, *Cyclotella comta* (Ehr.) Kütz. and *C. kuetzingiana* (Kütz). Thwaites were mostly found as single valves in the topmost sample N 5.1 (–4 cm), and one valve of *Stephanodiscus astraea* (Ehr.) Grun. in sample N 5.2 (–7 cm), almost at the top of the core. All the other taxa were pennate.

A single valve of the mesohalobous *Navicula digitoradiata* (Greg.) A. Schmidt in N 5.1 is presumably adventive from the neighbouring coast.

Twenty-one freshwater diatom genera were represented by a total of 69 different taxa. Most numerous was the genus *Cymbella* with 17 taxa, followed by *Na-*

vicula with 14. None of the other genera had more than four taxa, and ten genera were represented by one single species each.

The genus *Cymbella* belongs to a group of freshwater diatom genera which have given rise to diverging opinions about taxonomy in recent years, caused by nomenclatural as well as diagnostic difficulties.

Previously, I mainly used the nomenclature of earlier diatomists, especially F. Hustedt, but sometimes A. Cleve-Euler and others were used as well. When I have found it appropriate, I have given the "new names" as synonyms. On rare occasions they are used as the names of the species. Many species vary so much that the same taxon is mentioned by different names from different localities, but if drawings or photos are given, it may be possible to estimate what the applied name covers, but complete agreement concerning all the identifications can hardly be reached.

Amphora ovalis Kütz. var. **affinis**(Kütz.) V. Heurck
Patrick & Reimer 1975: 69; 13: 3, 4.
Plate: N IV, Fig. 3.

According to Krammer (1980: 210), this variety should be "included with the nominate species *Amphora libyca* Ehr. together with *A. pediculus* f. *major* Grun. (Van Heurck 1880–85), *A. ovalis* var. *pediculus* (Kütz.) Cleve 1895 and *A. ovalis* var. *libyca* (Ehr.) Cleve 1895". I still think it appropriate to separate them. It should be added that *A. inariensis* Krammer 1980: 211, Figs 21–24, 36, 37, 43–45 ("no puncta are visible") and *A. parallelistriata* Manguin seem closely related to the above-mentioned group.

The debate on *Cymbella* species often concerns the presence of one or more isolated puncta (stigmata) in the central area, or none at all.

Cymbella heilprinensis Foged sensu Foged
Foged 1958: 124; 14: 10.
Plate: N IV, Fig. 9.

These specimens are somewhat smaller than the holotype (Foged 1955: 65; 10: 8) from Peary Land, but they are closer to Foged (1958: 14; 13) from W Greenland. However, they probably both belong to the same species which resembles *C. turgidula* Grun., in the shape of the valve and in the course of striae, but deviates from it by having no isolated puncta in the central area. These species are also recorded from Alaska (Foged 1981: 69).

Cymbella minuta Hilse var. **silesiaca** (Bleisch ex Rabh.) Reimer
Patrick & Reimer 1975: 49; 8: 7a–10b.
Syn.: *C. ventricosa* var. *silesiaca* (Bleisch ex Rabh.) Cleve-Euler 1955.
Plate: N IV, Fig. 10.
Previously recorded from Europe and N America.

Cymbella norvegica Grun.
Hust. 1942: Figs 55–59. Foged 1964: 131; 17: 13. 1955: 69; 13: 18. 1981: 73; 45: 12, 13. Patrick & Reimer 1975: 25; 3: 16, 17.
Plate: N IV, Fig. 7.
Previously recorded from Europe, Spitzbergen, Alaska and U.S.A.

Cymbella obtusa Greg.
Hust. 1930: 361; Fig. 667.
Foged 1955: 70; 13: 13, 14. 1964: 132; 18: 17. Krammer 1979: 4: 34, 35.
Plate: N IV, Fig. 8: 41 × 7 µm N 5.5.

Cymbella turgida (Greg.) Cleve
Hust. 1930: 358; Fig. 660. Patrick & Freese 1961: 266. Patrick & Reimer 1975: 65. Foged 1971: 943; 18: 5, 6. 1981: 75; 56: 2.
Plate: N IV, Figs 4, 5.
Seems to be closely related to *C. minuta* Hilse var. *silesiaca* (Bleisch ex Rabh.) Reimer 1975 and *C. minuta* var. *pseudogracilis* (Cholnoky) Reimer 1975.

Cymbella variabilis (Cramer) Heiberg var. **botellus** Lagerst. sensu Foged
Foged 1955: 73; 9: 1, 3.
Plate: N IV, Figs 11, 14.
Probably identical with *Cocconema cymbiforme* Kütz. 1944 (Hust. 1955: 50) which, just like the above-mentioned species has no isolated stigma in the central area. In *Cymbella cymbiformis* Ag. 1880 (Patrick & Reimer 1975: 54) there is "a single isolated stigma on the ventral side of central area". It must consequently be a different species than *C. variabilis* var. *botellus* Lagerst.

Navicula gibbula Cleve
Hust. 1930–66: III, 13, Fig. 1180.
Syn.: *N. holmenii* Foged 1955: 56; 5: 6. *N. terrestris* Petersen 1915. Lund 1945: 80, Figs 7 M–X. *N. gibbula* var. *terrestris* Petersen 1915 Dodd & Stoermer 1962, Fig. 3.
Plate: N III, Figs 1, 2.

In previous descriptions of this species, the length of the valve is stated to be less than 35 µm. However, in Foged (1964: 11; 7) a specimen with a length of 54.6 µm is depicted. It is practically the same length as in N III, Fig. 2 from the present core. N III, Fig. 1 has a length of 78 µm and is from the same sample as N III, Fig. 2. As no structural differences are seen between these two specimens of very different sizes, they presumably belong to the same species.

Navicula interglacialis Hust.
Hust. 1944: 286, Fig. 27. 1954: 453, Fig. 16. Foged 1958: 108; 6: 12. 1960: 204, Fig. 9. 1964: 99; 10: 13, 14. 1974: 74; 14: 17–19. 1981: 115; 32: 9, 10. Patrick & Freese 1961: 208: "occasionally in our collections".
Plate: N III, Fig. 6.

First recorded by Hustedt from an interglacial deposit in N Germany. Since then, it has been recorded, subfossil as well as recent, from many localities in N Europe, Spitsbergen, Greenland and Alaska. Furthermore, it is noted in a sample (No. 20/1969, Foged Collection, Copenhagen (C)) from NW Canada, collected by Holmquist (not previously published).

Navicula modica Hust.
Hust. 1945: 916; 41: 21–23. Hust. 1945–50: 351; 38: 71–75. 1930–66, III, p. 154, Fig. 1286. Foged 1977: 83.
Plate: III, Figs 12, 13.

A small species, previously rather unnoticed, probably overlooked or confused with other similar small species. Previously only recorded from Europe.

Neidium distincte-punctatum Hust.
Hust. 1930: 247, Fig. 386. Hust. 1942: 242, Fig. 2. Foged 1955: 44; 5: 6. 1971: 969; 9: 9. 1972: 29, A III: 1, 2. 1981: 132; 26: 1–4. Stoermer 1963: 3; 2: 7. 1964: 64; 2: 1.
Plates: N I, Fig. 6. N II, Figs 1, 2.

Previously often confused with *N. kozlowii* Mereschk., but it deviates from it "by its more coarsely punctate striae and the fact that the striae and the central area are never as strongly diagonal as they are in *N. kozlowii*" (Stoermer 1963: 3). In spite of this, however, it is not always easy to separate these two species with certainty.

Neidium iridis (Ehr.) Cleve var. **porsildii** Foged
Foged 1972: 63; 3: 1, 2. Foged 1973: 52; 9: 1–4.
Plate: N I, Figs 13, 15.

This characteristic variety is recorded from subfossil material from Spongilla Sø in SW Greenland (Foged 1972) and from extant material from SW Greenland (Foged 1973).

Neidium sp.
Plate: N II, Fig. 3.

This single defective valve of a form of *N. iridis* (Ehr.) Cleve has been noticed. It may represent a transition between *N. iridis* var. *ampliata* A. Mayer and var. *amphigomphus* (Ehr.) Temp. & Perag.

W Greenland

Previous investigations of the subfossil diatom flora

Johannes Iversen Sø

64°24'N, 50°12'W. Foged 1977a: 7–18, Pls I–IX treat all four localities. 100 m a.s.l. 150 × 200 m. Depth 3 m. Depth of water at the coring site 2.8 m. Core 367.5 cm. Sample near bottom of the core radiocarbon-dated to 8640 ± 130 years B.P. The diatom flora consisted of 20 polyhalobous, 13 mesohalobous and c. 200 oligohalobous species, the last group including 8 halophilous, 70 alkaliphilous, 79 pH-indifferent or circumneutral, and 44 acidophilous taxa.

As the number of alkaliphilous taxa decreased, the number of acidophilous taxa increased from the bottom sample towards the top. This indicates a gradual change from an alkaline to a faintly acid environment during the sedimentation period.

Gytjesø

64°23'N, 50°21'W. Foged 1977a: 18–30. 100 × 350 m. 57 m a.s.l. Depth of water at the coring site 2.03 m. Core 408 cm. Sample from 394–391 cm radiocarbon-dated to 7430 ± 100 years B.P. The three bottom samples from a depth of 405–393 cm contained 48 polyhalobous, 29 mesohalobous and 13 oligohalobous taxa.

These samples are marine. Due to the postglacial upheaval, an isolation of a freshwater lake took place. All samples from 393 cm up to 0 cm are deposited in freshwater from which a total of 213 oligohalobous species consisting of 79 alkaliphilous, 86 pH-indifferent or circumneutral, and 48 acidophilous species were recorded. The composition of the diatom flora indicates that the pH passed the neutral point from alkaline to acid when the layers between 200 and 150 cm below the lake bottom were deposited. In 1973 the pH was 5.2.

Sârdlup timâne taserssuaq

64°28'N, 51°35' W. Foged 1977a: 30–42. 250 × 90 m. 61 m a.s.l. Depth of water at the coring site 3.25 m. Core 139 cm. Radiocarbon-dating of sample 126–130 cm resulted in 9000 ± 140 years B.P. Two marine bottom samples with a total of 52 taxa consisting of 26 polyhalobous, 18 mesohalobous and 8 oligohalobous taxa were recorded.

The rest of the samples were deposited in freshwater from which a total of 223 taxa were recorded: 63 alkaliphilous, 107 pH-indifferent or circumneutral, and 53 acidophilous.

At this locality a sudden change from a marine to a freshwater environment was evident between marine sample M 8071 from a depth of 131.5 cm and freshwater sample M 8072 from a depth of 129 cm. During the freshwater period, the pH developed from an alkaline to a faintly acid environment. In 1973 the pH was 5.6.

Kigssaviat taserssua

64°28'N, 51°35'W. Foged 1977a. 42–57. 100 × 50 m. 51 m a.s.l. Depth of water at the deepest coring site 175 cm. Core 254 cm. A sample from 235.5–241.5 cm has been radiocarbon-dated to 8080 ± 130 years B.P.

The two bottom samples M 8362 (243.5 cm) and M 8263 (240.5 cm) were marine with 17 polyhalobous, 23 mesohalobous and 10 oligohalobous taxa. The isolation from the sea took place between the sedimentation of samples M 8263 and M 8267 from a depth of 240.5 cm and 232.5 cm, respectively. In freshwater samples, a total of 162 taxa consisting of 46 alkaliphilous, 68 pH-indifferent or circumneutral, and 48 acidophilous taxa were recorded. The development of pH is the same as in the three above-mentioned localities. In 1973 the pH was 5.8.

Galium Kær, a former pond

61°10'N, 45°31'W. Foged 1972: 37–83, Pls C I–IV. A 35 m wide depression in the bedrock was formed after the retreat of the ice 7000 years ago. 51 samples from 2 to 194 cm below the surface were studied. The diatom flora consisted of oligohalobous species. In the whole series only one single valve of each of the mesohalobous species *Navicula digito-radiata* (Greg.) Ralfs and *Synedra pulchella* Kütz. was found. Of the 136 taxa recorded, 49 were alkaliphilous, 60 pH-indifferent or circumneutral, and 27 acidophilous. Also at this locality a development from an alkaline to a neutral or faintly acid environment took place during the sedimentation period, although this gradient is less distinct here than in the four above-mentioned localities.

Spongilla Sø

59°58'N, 44°21'W. Foged 1972: 54–66, Pls D I-III. 75 × 40 m. C. 5.5 m a.s.l. Upper marine limit 30 m a.s.l. The present depth of the coring site is 125 cm. Core: 3–241 cm below the lake bottom. Nethermost a marine facies at a depth of 241–201 cm (samples 1–5), then a transition layer represented by sample 5a at a depth of 195–194 cm, followed by a limnic freshwater facies at a depth of 191 cm to the lake bottom (samples 6–24). Radiocarbon-dating of sample from 191–196 cm resulted in 9210 ± 140 years B.P.; samples from 32–38 cm resulted in 2110 ± 100 years B.P.

In the six bottom samples, 39 polyhalobous and mesohalobous taxa were recorded together with 10 oligohalobous taxa. In samples 6–24, a total of 96 oligohalobous taxa consisting of 17 alkaliphilous, 27 pH-indifferent or circumneutral, and 52 acidophilous taxa were recorded. During the sedimentation, a development from an alkaline to a faintly acid environment took place.

Present investigations

Qeqertat, Inglefield Bredning

77°30'N, 66°39'W. Tab. Q 1, Pls Q I–IV. At the head of Inglefield Bredning there is a low, hilly, mostly polished gneiss island. Only the peaks of a few hills are above the postglacial upper marine limit (c. 72 m). A shallow lake, 800 × 175 m, 22 m a.s.l., was cored by Fredskild, mid-August 1981, during the third season of the "Knud Rasmussen Memorial Expedition". The coring was impeded by big ice floes.

No vascular plants were observed in the lake, but som mosses, *Scorpidium scorpioides* and *Calliergon* cf. *stramineum* (det. J. Lewinsky) growing on the lake bottom were easily visible in the crystal-clear water.

The surrounding vegetation was *Carex stans* fens, often with frost boils, on raised, marine clay with *Eriophorum triste, E. scheuchzeri, Carex marina* ssp. *pseudolagopina, C. maritima, Juncus biglumis* and *J. triglumis.* On slightly higher ground *Cassiope* heaths were found with scattered *Salix arctica, Arctagrostis latifolia, Luzula confusa* and *L. arctica. Racomitrium* heaths occured on N-exposed bedrocks, whereas open *Carex rupestris* vegetation was found on the S-exposed sites. A summary diatom diagram was published by Fredskild (1985). The pH of the lake was 7.7, the conductivity 110 µmho. The depth at the coring site was c. 3 m. The upper part of the c. 1.3 m limnic sediment was very wet, and the exact depth of the gyttja-water interface was difficult to determine.

The following layers were found:
0 – 47 cm: below the lake bottom: bright olive, slightly laminated, upwards very loose, watery gyttja with some pea-size *Nostoc commune* balls.
47 – 51 cm: slightly reddish, more jelly-like gyttja.
51 – 130 cm: bright brown to olive, laminated gyttja. Especially below 100 cm numerous green *Nostoc* balls, in many cases still with the cell content.
130 – 133.5 cm: finely laminated, brownish gyttja.
133.5 – 135 cm: thin layers of clay alternating with dark olive gyttja.
135 – 143 cm: marine clay.

Four samples from the following depths below the lake bottom have been radiocarbon-dated:
43 – 51 cm: 3610 ± 80 B.P. (K-3740).
71 – 75 cm: 4370 ± 85 B.P. (K-3739).
103 – 107 cm: 5370 ± 95 B.P. (K-3738).
131 – 135 cm: 6800 ± 85 B.P. (K-3502).

Marine shells of *Mya truncata* and *Hiatella byssifera* from frost boils on the lake shore were dated to 7930 ± 120 B.P. (K-3503). The limnic stage of the lake started around 7000 C-14 years ago.

The taxa

This analysis covers 32 subfossil samples from the core and two recent ones taken at the drill site and on the shore, respectively, shown in Table Q 1. The bottom sample, -2, is taken 2 cm below the limit between the marine clay and gyttja. The other samples follow upwards, indicated by the figures 1, 2.5, 4, 6 and so on up to 124 cm above this limit. The pennate genera *Cymbella, Pinnularia, Navicula* and *Eunotia* are the most numerous with 18, 8, 8 and 6 taxa, respectively. The centric *Cyclotella kuetzingiana* Thwaites var. *planetophora* Fricke and var. *radiosa* Fricke, and the likewise centric *Melosira distans* (Ehr.) Kütz. var. *lirata* (Ehr.) Bethge are very infrequent.

Fragilaria pinnata is very dominant in the bottom samples, from Q +1 to 44. Hence, its occurrence varies, and apart from Q 52 and Q 72 only a few valves are found in most of the remaining samples. *Fragilaria construens* is profound in all the samples, fairly common in the nethermost ones, but from Q 32 and upwards it is decidedly predominant except in a few samples. Thus, both of these two *Fragilaria* species are dominant in Q 32, Q 44 and Q 72, whereas one of them is more frequent than the other in the rest of the samples. This might indicate a slight difference in their environmental demands, for instance with regard to pH. The samples are very poor in diatom valves with exception of the *Fragilaria* species, and therefore the counting covers only 250 valves per sample. All the samples seem to be deposited in freshwater. The occurrence of four valves of the polyhalobous *Scoliopleura tumida* (Breb.) Rabh. in Q +1 may indicate that an isolation from the sea did take place a short time before the sedimentation of Q +1, but due to the presence of a large number of *Fragilaria pinnata* in the same sample it must have been deposited in freshwater. Besides these two species, only three other taxa occur in Q +1: the acidophilous *Achnanthes flexella* (Kütz.) Brun and *Melosira distans* (Ehr.) Kütz. var. *lirata* (Ehr.) Bethge, and the alkaliphilous *Navicula vulpina* Kütz. In Q 2.5, the sample immediately above, a single valve of each of the two polyhalobous species *Achnanthes brevipes* Ag. and *Grammatophora oceanica* (Ehr.) Grun. is seen. A large number of *Fragilaria pinnata* and eight valves of *Achnanthes flexella* (of 150 counted) are also present here.

Thus, the sedimentation of all samples in freshwater must be considered quite certain.

A single valve of the mesohalobous *Diploneis didyma* (Ehr.) Cleve and one of *Mastogloia smithii* Thwaites var. *lacustris* Grun. in Q 84 must be regarded as incidental and adventive. This also applies to *Cocconeis scutellum* Ehr. and its variety *parva* Grun. in Q 80.

Taxonomical remarks

Achnanthes flexella (Kütz.) Brun.
Hust. 1930–66, II, p. 415, Figs 869, a–e. Foged 1955: 40. 1973: 24. 1981: 47, Pl. 11: 5, 6. Patrick & Reimer 1966: 260; 31, 32. Patrick & Freese 1961: 163.
Plate: Q I, Figs 15, 19.

Recorded from all the samples, the number of valves increasing from the bottom samples to a temporary maximum of 33 and 38 valves (of 250 counted) in Q 60 and Q 64, respectively. Then an intermediate stage with smaller numbers of valves is followed by an increase to the absolute maximum in the top samples Q 116 and Q 124 with 57 and 76 valves, respectively. This species as well as its variety *alpestris* Brun is very frequent in arctic and subarctic regions, subfossil as well as recent.

Achnanthes kryophila Petersen
Hust. 1930–66, II: 403, Fig. 854. Patrick & Freese 1961: 164. Foged 1955: 40; Pl. 4: 18, 19. 1973: 25. 1981: 49.

Common in the samples Q 8, Q 10, Q 12 and Q 16 with 45, 59, 41 and 20 valves, respectively. Few or no valves at all in the other samples. Like the above-mentioned taxa, widely distributed in the frigid regions of the northern hemisphere.

Cymatopleura solea (Breb.) W. Smith
Hust. 1930: 425, Fig. 823a. Patrick & Freese 1961: 282. Foged 1971: 940. 1964: 148. 1977: 10 and 22. 1981: 64, 60: 2.
Plate: Q IV, Fig. 15.

In Greenland observed previously in only two subfossil cores from Godthåbsfjord, and few in number of valves (Foged 1977a). In Spitsbergen infrequent. In Alaska rather infrequent (Patrick & Freese 1961. Foged 1971: 940, 20: 14) In the present material there are a few valves in several samples, but in Q 20 it is very common with 48 valves of 250 counted. No immediate explanation can be offered.

Cymbella
This genus is the most common with regard to number of taxa: seven are alkaliphilous and 11 pH-indifferent or circumneutral. The identification of some closely related species from this locality is doubtful, many taxa being very variable as to the shape of the valve or of the central area.

Cymbella cuspidata Kütz. sensu Foged
Foged 1981, 48: 3–7.
Plate: Q IV, Fig. 2. C. 9 striae in 10 µm.

The central area has the same shape as in Foged 1972, C IV: 17 and 1981, 48: 3–7. Also the shape and size of the valve and the number of striae correspond reasonably well. Hust. 1930, Fig. 653 deviates somewhat from other illustrations of this species. It is not observed in the 13 bottom samples of the core, but from Q 68 it occurs in varying numbers in all samples with a maximum of 30 and 24 valves in Q 80 and Q 84, respectively. A few valves were found in the recent samples from this locality.

Cymbella helvetica Kütz. var. **compacta** (Østrup) Hust.
Østrup 1910: 54, 2: 39. Foged 1977: 42; 38: 8.
Plate: Q IV, Fig. 7.

Referred to this taxon with some doubt. Only a single valve in Q 92 is recorded.

Cymbella spuria Cleve
A. Schmidt et al. 377: 11–14. Cleve 1894–95, I: 166. Foged 1964: 134, 18: 9.
Plate: Q IV, Fig. 3.

The central area is dilated. It resembles *Cymbella lata* Grun. sensu Foged 1972: 33, B III: 3, which also has a dilated central area, whereas in Hust. 1930: 355, Fig. 649 its central area is not dilated. In Patrick & Reimer 1975, 5: 4, however, it is faintly dilated, but only on the dorsal side of the valve. In many cases it seems impossible to separate *C. lata* and *C. spuria* on the basis of available descriptions and illustrations.

Cymbella semigibbosa Patrick & Freese
Patrick & Freese 1961: 265, 4: 6.
Plate: Q IV, Fig. 5.

Rather infrequent in this material as well as in Alaska. It seems to be closely related to *C. obtusa* Greg., which is recorded from many localities in Greenland and northern Europe.

Cymbella subaequalis Grun.
Patrick & Reimer 1975: 24, 3: 13, 14. Foged 1981: 75, 45: 15.
Plate: Q IV, Fig. 4.

Very rare, only found in Q 32. Closely related to *C. obtusa* Greg. and *C. aequalis* W. Smith. It is impossible to separate *C. subaequalis* and *C. obtusa* with certainty on the basis of available descriptions and illustrations.

Navicula mutica Kütz.
Hust. 1930–66, III: 583, Figs 1592a–f.
Plate: Q III, Fig. 6.

Terrestrial and aerophilous taxa occur very infrequently in the present material. *N. mutica* is found only in Q 84.

Navicula tuscula Ehr. fo. **rostrata** Hust.
Foged 1972, A IV: 4, 7, 8. Foged 1977: 89, 15: 6–8. Patrick & Reimer 1966: 539, 52: 7.
Plate: Q II, Fig. 4.

This form is very common in the two recent samples form this locality, but it was not observed as subfossil in the core.

Navicula tuscula var. **capitata** (Fontell) Cleve-Euler
Cleve-Euler 1953, III: 121, Figs 742a, b. Foged 1952, A IV: 5. 1977: 89, 25: 5.
Plate: Q II, Fig. 3.

This variety is common in samples Q 68–84, but infrequent in several of the other core samples. In Table Q 1, both forms and varieties are included in *Navicula tuscula*.

Pinnularia gentilis (Donk.) Cleve
Hust. 1930: 355, Fig. 618.
Plate: Q III, Fig. 5. 6–7 striae in 10 µm.

This species greatly resembles *P. viridis* (Nitzsch) Ehr. However, it has broadly rounded apices, whereas *P. viridis* has elliptically rounded apices. A few valves were found in the three topmost core samples. In the recent lake it occurs somewhat more frequently.

Pinnularia macilenta (Ehr.) Cleve var. **genuina** A. Cleve
Cleve-Euler 1955, IV: 40, Figs 1051a, b. Okuno 1952, 15: 10, fossil, Japan
Plate: Q III, Fig. 4.

Common, subfossil and recent, in Scandinavia.

Stauroneis anceps Ehr. var. **genuina** Mayer
Cleve-Euler 1953, III: 207, Figs 943a, b, according to Van Landingham 1978, VII: 3621.
Plate: Q II, Figs 5, 6.

Several more or less capitate forms of *Stauroneis anceps* exist. In this core, most valves seem to be identical with Cleve-Euler 1953, III, Figs 943a, b. *S. anceps* is very variable and often difficult to separate from forms of *S. phoenicenteron* (Nitzsch) Ehr.

Stauroneis anceps Ehr. fo. **triundulata** Foged *fo. nov.*
Valvis triundulatis a typo nominato differt.
Plate: Q II, Fig. 7.

Differs from the nominate type by having triundulate valves. Holotype: Sample Q 84. Foged Collection, Copenhagen (C). Type locality: Qeqertat, Inglefield Bredning, W Greenland; subfossil core.

Ecological remarks

The development of pH during the sedimentation period differs from the previous subfossil cores in W Greenland in which the environment was generally alkaline at first, passed through a neutral stage and ended as weakly acid.

In this core the diatom flora does indicate a change of the pH, but also that it has generally remained on the alkaline side of the neutral point.

The acidophilous *Achnanthes flexella* (Kütz.) Brun and *A. kryophila* Petersen indicate changes towards or even beyond the neutral point three times. In samples Q 8, Q 10 and Q 12, *Achnanthes kryophila* is relatively frequent with 45, 49 and 41 valves, (i.e. 18.0, 23.6 and

16.4%) respectively. And in samples Q 60–64 and Q 116–124, *Achnanthes flexella* indicates with 33–38 and 57–76 valves, (i.e. 13.2–15.2% and 22.8–30.4%) respectively, a change from a more or less alkaline to a neutral or even weakly acid environment.

The remaining nine acidophilous taxa recorded here are of no specific importance, all of them occurring sporadically and few in number. *Eunotia pectinalis* (Dillw.) Rabh. var. *minor* (Kütz.) Rabh. is the most common and was found in more than half of the samples, although only with a few valves; its optimum is probably near or slightly below pH 7.0.

Some other species may also indicate changes in the pH. The alkaliphilous *Navicula vulpina* Kütz. was observed in all the samples except the bottom one. Almost as numerous was *Cymbella ventricosa* Kütz., a rather markedly pH-indifferent species, which, however, now and then is stated to have an optimum at pH 7.7–7.8. These two species occur with a fairly large number of valves in the samples.

The alkalibiontic *Epithemia sorex* Kütz. was observed in all the samples except the two bottom ones, but there were fewer numbers of valves than the above-mentioned species.

Navicula radiosa Kütz., recorded as fairly common in most samples, is difficult to place as to pH. It is markedly indifferent, but it is also now and then stated to be alkaliphilous, but never (?) acidophilous. The exclusively alkaliphilous *Amphora ovalis* (Kütz.) Kütz. var. *libyca* (Ehr.) Cleve was not observed in most of the lower core samples apart from Q 20 (13 valves), but from Q 76 and upwards it occurred in all the samples, and in several of them it was fairly numerous.

Thus, on the basis of the diatom flora it is difficult to demonstrate gradual changes of pH during the sedimentation of this core. As mentioned above, it must have taken place in an alkaline environment, but with a fluctuating pH and sudden approaches to the neutral point.

Eqalunguit, Disko

69°32'N, 53°41'W. Tabs Eq 1–2, Pls Eq I–VII.
In the middle of a 5 km wide isthmus between Kangerdluarssuk and Kûanerssuit suvdluat, Disko Fjord, a 300 × 80 m lake, c. 20–25 m a.s.l. was cored in 1980 by Fredskild.

The lake was surrounded by polished gneiss outcrops with *Cetraria-Stereocaulon* heaths rich in *Betula nana, Ledum decumbens* and *Empetrum hermaphroditum*. In moist depressions and at the outlet, low *Salix glauca* copses with *Equisetum arvense* and patches of fen vegetation covered the ground.

The bottom of the lake was covered by *Drepanocladus exannulatus* and *D. revolvens* (det. J. Lewinsky) and a 1–2 m thick layer of pea-size *Nostoc commune* balls. *Callitriche hermaphroditica* was the dominant phanerogam, *C. anceps, Hippuris vulgaris* and *Ranunculus confervoides,* all fertile, were frequent, whereas sterile *Potamogeton pusillus* was rare.

The pH was 7.4, the conductivity 52 μmho. The transparency was very low, possibly due to waterfowl; many ducks were nesting on the shore. The depth of the coring site was 2.7 m.

The following layers were found:
0 – 47 cm below the lake bottom: dark olive-brownish, slightly gritty jelly-like gyttja, with tiny *Nostoc* balls.
47 – 116 cm: bright, brownish, fine gyttja with som moss.
116 – 135.5 cm: bright, slightly clayey, fine gyttja.
135.5 – 138 cm: greyish-brown, slightly clayey gyttja with mosses.
138 – 143 cm: finely laminated brown gyttja and grey clay-gyttja.
143 – 147 cm: grey clay.
147 – 151 cm: grey clay with coarse sand.
One sample, 139 – 143 cm below the lake bottom has been radiocarbon-dated to 6750 ± 105 B.P. (K-3505).

The taxa

Twenty-one samples with a fairly varied diatom content were analysed. Except in five samples from the core bottom, it was possible to count 250 valves per sample.

In Table Eq 1 all the recorded diatom taxa are presented.

In the bottom sample Eq 2561, the number of polyhalobous and mesohalobous species was so predominant that it must have been deposited in a sea-water environment. However in the next four samples, Eq 2563–2569, there were increasing numbers of freshwater diatoms and decreasing numbers of sea-water diatoms.

Sedimentation probably started in a shallow lagoon. In the final stage during land upheaval, the lagoon changed into a freshwater lake, which was exposed to intrusion or submersion by sea-water for some time. The final isolation took place shortly after sedimentation of sample Eq 2565, which, as mentioned above, has been radiocarbon-dated to 6750 ± 105 years B.P.

The core is fairly rich in diatom species as c. 230 taxa are recorded, 9 of them polyhalobous, 17 mesohalobous and 208 oligohalobous belonging to 8, 9 and 25 genera, respectively.

The oligohalobous group includes 95 alkaliphilous or alkalibiontic, 77 pH-indifferent and 36 acidophilous taxa.

The genera richest in species are *Navicula, Eunotia, Pinnularia* and *Cymbella* with 33, 26, 25 and 19 taxa, respectively.

Changes in pH of the environment

The pH-spectra given in Table Eq 2 are based on the recorded number of taxa and the percentages of valves counted. The earliest sample is at the bottom of the table.

The facts which are deducible from Table Eq 1 are summarized in the following. As to the development during the freshwater period from Eq 2573 and upwards it appears that the environment was at first alkaline but gradually became neutral. In the topmost samples the number of acidophilous taxa (but not the percentages of valves) is larger than in earlier samples, although alkaliphilous and circumneutral groups are still predominant as to the number of species as well as the percentage of valves. Therefore, it must be concluded that even at the end of sedimentation the environment had a pH hardly below 7.0.

Taxonomical remarks

Achnanthes depressa (Cleve) Hust.
Hust. 1930–66, II: 417, Fig. 870. Patrick & Freese 1961: 163. Foged 1958: 79. 1973: 24. 1977: 14, 27, 38, 48. 1981: 45.

A few valves were found in Eq 2627 and Eq 2639. Common, subfossil as well as recent, in Eurasia, Greenland and Alaska.

Achnanthes recurvata Hust.
Hust. 1945–50: 434; 36: 28–30.
Syn.: *A. altaica* (Poretzky) Cleve (Ross & Sims 1978: 153, Figs 5–9).
Foged 1971: 932. 1973: 26. 1977: 26; 13: 25a, b, c. 1981: 52.

Widely distributed, subfossil as well as recent, in northern Eurasia, Greenland and Alaska.

A small species, probably often overlooked or confused with other small *Achnanthes* species. Here observed in four of the topmost samples.

Amphora fonticola Maillard
Maillard 1967: 29; 4: 10. Stoermer and Yang 1971: 902, Figs 4a, b. Kaczmarska 1977: 52; 24: 1, 8. Foged 1982: 29; 17: 4.
Plate: Eq V, Fig. 12.

Previously recorded only a few times (in U.S.A., Poland and Denmark). A weakly defined taxon which may be confused with other *Amphora* species (see Foged 1982: 29).

Cymbella cistula (Hempr.) Kirchner
Hust. 1930: 363, Fig. 676a. Patrick & Freese 1961: 260. Patrick & Reimer 1975: 62; 11: 3, 4. Foged 1971: 941; 18: 1. 1981: 67; 47: 2, 4, 5.
Plate: Eq VI, Figs 4, 5.

Recorded in all samples from Eq 2597 to the topmost Eq 2650, but in varying, generally few numbers of valves.

Krammer (1981) finds that there are three characteristic raphe types in the genus *Cymbella* which should make it possible to separate several of the very similar species. However, this is probably still difficult with the light-microscope, especially because valves often lie in subobtimal positions on the slide.

Thus, in Foged (1981), Pl. 47, Figs 3, 6 and 7 represent *C. proxima* Reimer (Patrick & Reimer 1975: 61, 11: 1) and not *C. cistula* as stated.

Cymbella heteropleura (Ehr.) Kütz. fo. **minor** Cleve
A. Schmidt et al. 374: 12. Patrick & Freese 1961: 262. Foged 1964: 128. 1971: 941; 18: 19. 1972: 33; B III: 4. 1977: 42; 36: 1. 1981: 70.

A few valves in three samples. Previously recorded from arctic regions, subfossil as well as recent.

Cymbella heteropleura (Ehr.) Kütz. var. **subrostrata** Cleve
Patrick & Reimer 1975: 38; 6: 1. Foged 1981: 76; 49: 1.
Plate: Eq VI, Fig. 3.

A few valves in Eq 2627. Fairly common in Alaska. Seems to be closely related to *C. inaequalis* (Ehr.) Rabh. (Patrick & Reimer 1975: 36; 5: 3).

Cymbella laterostrata Pant. var. **alaskana** Patrick & Freese
Patrick & Freese 1961: 263; 4: 2. Foged 1981: 72; 49: 4; 51: 3.
Plate: Eq VI, Fig. 2.

Only a few valves in Eq 2642. Fairly common in Alaska. Closely related to *C. heteropleura* Ehr. fo. *minor* Cleve and *C. pseudocuspidata* (Tynni 1978: 38; 11: 94).

Epithemia smithii Carruthers
Patrick & Reimer 1975: 187; 27: 3a, b.
Plate: Eq VII, Fig. 6. Three costae in 10 µm.

Only a few valves in Eq 2642. Previously recorded from fresh and brackish water in eastern U.S.A.

According to Patrick & Reimer (1975: 187): "Closely related to *E. sorex* from which it differs by the more distant costae (2–4 in 10 µm)".

Eunotia major Ehr. var. **scandica** Cleve-Euler fo. **ventricosa** Cleve-Euler
Cleve-Euler 1953, II: 119, Figs 456d, e. Cleve 1895: 27; 1: 37. Foged 1973: 38; 1: 2. 1977: 56, 1: 10.
Plate: Eq I, Fig. 5.

A few valves in Eq 2589 and Eq 2650. Previously recorded from northern Scandinavia and Greenland. Always rare.

Eunotia faba (Ehr.) Grun. fo. **rhomboidea** Foged
Foged 1977b: 55; 10: 10–13. Foged 1981: 85; 9: 21.
Syn.: *E. vanheurckii* Patrick fo. *rhomboidea* Foged.

A few valves in Eq 2639, Eq 2642 and Eq 2646.

Eunotia (Ehr.) Grun. **faba** fo. **asymmetrica** Fusey
Fusey 1953: 487, Fig. 4.

A fairly rare form, usually found together with the main form. It resembles *E. rhomboidea* Hust., but is much larger.

Gomphonema acuminatum Ehr. var. **elongatum** (W. Smith) V. Heurck fo. **tenuis** A. Cleve
Cleve-Euler 1955, IV: 175, Fig. 1263f.
Plate: Eq VI, Fig. 12.
Rare in Eq 2642.

Gomphonema gracile Ehr. emend. V. Heurck sensu Patrick & Reimer
Patrick & Reimer 1975: 131; 17: 1–3.
Plate: Eq VII, Fig. 4.
Rare in Eq 2631. The usual type of *G. gracile* Ehr. (Hust. 1930: 376) is recorded from ten samples with a varying number of valves. (Also commented by Patrick & Reimer 1975: 132 and Foged 1980: 37, 19).
Many taxa in the group *Naviculae lanceolatae* Cleve are highly variable. Consequently, they may be difficult to delimit with certainty.

Navicula digito-radiata (Greg.) A. Schmidt var. **arctica** Patrick & Freese
Patrick & Freese 1961: 204. Foged 1981: 112; 32: 3.
Syn.: *N. digitoradiata* (Greg.) A. S. var. *minor* Foged 1953: 45; 5: 12.
Plate: Eq IV, Fig. 2. Nine striae in 10 µm.
A few valves found in Eq 2563 with *N. digitoradiata*, which also occurs in Eq 2561.

Navicula grudeensis Foged
Foged 1970: 182, Fig. 6.
Syn.: *Navicula cymbula* Donk. sensu Lortie 1982: 20: 9.
Plate Eq IV, Fig. 5. 9 (–10) striae in 10 µm.
Very common in three of the nethermost samples of the core (Eq 2567, Eq 2573 and Eq 2577).
Previously recorded as subfossil from southwestern Norway. It shows an affinity to rather saline environments. It may be mesohalobous or at least halophilous; probably often confused with closely related species.

Navicula peregrina (Ehr.) Kütz. var. **kefvingensis** (Ehr.) Cleve sensu Foged
Foged 1977a: 58; 5: 3.
Plate: Eq IV, Fig. 3. Nine striae in 10 µm.
Occasional and only in Eq 2581 and Eq 2639.

Navicula pseudolanceolata Lange-Bertalot
Lange-Bertalot 1980: 32; 2: 1–8.
Syn.: *N. lanceolata* (Ag.) Kütz. sensu Foged 1974: 12: 18. 1977: 28: 18. *N. lanceolata* (Ag.) Kütz. sensu Hust. 1930: 305, Fig. 540.
Plate: Eq IV, Fig. 6. Ten to eleven striae in 10 µm.
Only a few valves in Eq 2639.

Navicula radiosa Kütz. var. **tenella** (Breb. ex Kütz.) Grun. sensu Patrick & Reimer
Patrick & Reimer 1966: 510; 48: 17.
Plate: Eq IV, Fig. 12. C. 16 striae in 10 µm.
Recorded from the three topmost samples, Eq 2635, Eq 2639 and Eq 2642.

Navicula rhyncocephala Kütz.
Hust. 1930: 293, Fig. 501.
Plate: Eq IV, Fig. 7. Ten striae in 10 µm. Fig. 11. Eight to nine striae in 10 µm. Eq 2642 (sensu Foged 1980: 64; 16: 6–8).
One of the most common species in this material. Numerous in all the samples in the middle of the core, from Eq 2577 to 2597, and then in the above-lying samples, relatively few in six of them, but common in three.

Navicula rhyncocephala Kütz. var. **elongata** Mayer sensu Germain
Germain 1964: 4: 8. Foged 1981: 124; 31: 2.
Plate: Eq IV, Fig. 4. Eight striae in 10 µm.
Fairly common in Eq 2577.

Nitzschia sociabilis Greg.
Hust. 1957: 354, Figs 91–94. Lange-Bertalot & Simonsen 1978: 50; Figs 216–221.
Plate: Eq VII, Fig. 10. Nine keel puncta in 10 µm. Dense striae.
Recorded from Eq 2635 and Eq 2639.

Pinnularia aequilateralis Patrick & Freese
Patrick & Freese 1961: 228; 3: 3.
Plate: Eq V, Fig. 2. Eight striae in 10 µm.
This form, only found in Eq 2639, seems to be identical with Patrick & Freese's species from Alaska.
Many *Pinnularia* forms are also difficult to identify; many of the species, e.g. *P. viridis* (Nitzsch) Ehr., are extremely variable, and a large number of varieties and forms seem to overlap.

Pinnularia viridis (Nitzsch) Ehr. fo. **cuneata** (Østrup et Cleve) Foged
Foged 1972: 52; C III: 4.
Plate: Eq V, fig. 6. Five to six striae in 10 µm.
Only recorded from Eq 2581.

Langesø and Rundesø, Tugtuligssuaq

75°22'N, 58°36'W. Tabs T 1–2, Pls T I–VI.
Surrounded by the Greenland inland ice and the ice-filled Melville Bugt, there is a c. 20 km long, 600–800 m high gneissic peninsula, Tugtuligssuaq. Close to its western point two small lakes, c. 15 m a.s.l. and connected by a 75 m long brooklet draining in the sea, were cored by Fredskild in 1979 on the "Knud Rasmussen Memorial Expedition". The upper marine limit is c. 14 m a.s.l. The bottom of both lakes was covered by mosses and liverworts, especially *Drepanocladus exannulatus* and *Marsupella arctica* (K. Damsholt det.), and by a bright, loose carpet of algae, consisting of diatoms, *Oedogo-*

nium, Lyngbya, Microspora, Nostoc, Chroococcus, Staurastrum, Cosmarium and *Euastrum* (J. B. Hansen det.). No limnophytes were observed in the lakes.

The vegetation of the surrounding slopes was very poor, consisting mainly of snowbeds and open, snow-protected *Cassiope tetragona* heaths. Pollen and macrofossil diagrams have been produced for both lakes. A summary diatom diagram from Langesø was published by Fredskild (1985). The pH of the lake was c. 6, the conductivity 12 μmho.

Langesø is 800 × 100 m. The water depth at the coring site was 4 m; the maximum depth of the lake was undoubtedly greater, but unknown due to a big ice floe which still covered most of the lake on August 18.

The following layers were found:
0 – 88 cm below the lake bottom: bright olive, slightly clayey, fine gyttja (0 – c. 20 cm) with some or a few moss remains. Very watery, especially upwards.
88 – 98.5 cm: greyish-olive, stratified, fine gyttja with cladoceran remains. Single mosses at 92 cm.
98.5 – 100 cm: olive-brown, stratified, fine gyttja with clay and cladoceran remains.
100 – 102 cm: olive-grey, stratified clay-gyttja, firm jelly-like with cladoceran remains and single mosses.
102 – 104 cm: like 100 – 102 cm, but grey with more clay.
104 – 108 cm: sticky, violet clay.
108 – 125 cm: sand, with some grey clay.

Five samples from the following depths below the lake bottom have been radiocarbon-dated:
18 – 22 cm: 2270 ± 75 B.P. (K-3690).
38 – 42 cm: 4150 ± 90 B.P. (K-3689).
62 – 66 cm: 4990 ± 90 B.P. (K-3688).
82 – 86 cm: 6710 ± 105 B.P. (K-3300).
98.5 – 100 cm: 8540 ± 120 B.P. (K-3276).
There were no diatoms in three samples from 109, 115 and 121 cm, whereas a sample extracted from a macrofossil from 103.5 – 107 cm contained a few frustules.

The taxa

This account covers 17 subfossil samples from 103 cm of the Langesø core and one sample from Rundesø, which is situated at a lower level and connected to Langesø.

In this series none of the valves were counted; the taxa are registered in Table T 1. The *Fragilaria* species are placed at the top like in the other core series.

The samples are arranged according to their depth below the bottom of the lake, the nethermost sample L 2404 to the left, the top sample L 2392 to the right. Farthest to the right the sample L 2339 from Rundesø is given.

Eighteen genera with c. 100 taxa were recorded from this material. Since only oligohalobous species were found, the sedimentation must have taken place in a freshwater environment.

The genera *Eunotia, Cymbella* and *Pinnularia* had the largest number of taxa with 22, 11 and 11 taxa, respectively. These genera are dominated by freshwater species.

Most *Eunotia* species are found in acid or faintly neutral environments. The genus *Pinnularia* is found over a broader pH-spectrum, but the freshwater species of this genus are generally pH-indifferent or circumneutral, or faintly acidophilous. The genus *Cymbella* is more variable. In this material eight of the recorded *Cymbella* species were circumneutral, two alkaliphilous and one acidophilous.

The distribution of the entire diatom material within the three main oligohalobous groups amounts to 26 alkaliphilous and alkalibiontic, 39 pH-indifferent or circumneutral, and 38 acidophilous species.

Only three centric species were found, the acidophilous *Melosira distans* (Ehr.) Kütz. and the two varieties var. *perglabra* (Østrup) Jørgensen and var. *lirata* (Ehr.) Bethge. The most frequent was var. *perglabra* which occurred in all the samples from the upper half of the core with an increasing number of valves, starting with a few in sample L 2371. The var. *lirata* was only found in L 2377 together with var. *perglabra*. The main species *Melosira distans* likewise occurred in a single sample, the top L 2392.

From Table T 1 it appears that there is a predominance of alkaliphilous and pH-indifferent species in the lower part of the core, whereas acidophilous species are more abundant in the upper part of the series.

Changes in pH of the environment

Sample numbers are given in the left column in Table T 2. The recent sample from Rundesø, L 2339 is placed at top, and samples from the Langesø core are arranged below with the uppermost sample at the top and the nethermost, i.e. the oldest, at the bottom.

As no countings were performed during the analysis of this core the percentages are calculated on the basis of the number of taxa.

The pH-spectra show that the percentages for alkaliphilous and alkalibiontic groups are largest at the bottom of the core. Furthermore, the pH-indifferent or circumneutral groups have somewhat larger percentages in the lower samples than in the upper ones in most cases, and the acidophilous and acidobiontic groups usually clearly increase from bottom to top. On this basis it seems reasonable to conclude that an environmental change took place as reflected by the pH, from faintly alkaline to somewhat acid. Thus, the development in Langesø is the same as the six previously examined subfossil cores from W Greenland (Foged 1972 and 1977a).

Taxonomical remarks

The genus *Cymbella* is represented by 11 species, eight of which are pH-indifferent or circumneutral. They are mainly found in the mid-core samples, L 2353 to 2374, but at least one species is present in all samples except L 2389. Most frequent is *Cymbella gracilis* (Rabh. Cleve, recorded as common in L 2359 and L 2362.

Cymbella incerta Grun. var. **naviculacea** (Grun.) Cleve
Cleve-Euler 1955, IV: 140, Figs 1201a–e.
Plate: T VI, Fig. 12.
Common in N Europe, subfossil as well as recent.

Cymbella laterostrata Pant. var. **alaskana** Patrick & Freese
Patrick & Freese 1961: 263; 4: 2. Foged 1981: 72; 49: 4; 51: 3.
Plate: T VI, Fig. 8.
Previously recorded from Alaska.

Cymbella rupicola Grun. sensu Patrick & Reimer
Patrick & Reimer 1966: 26; 3: 19.
Plate: T VI, Fig. 6.
Previously recorded from Europe and eastern U.S.A.

Eunotia
With its 22 taxa, this genus is the most prominent in the series and occurs most frequently in the middle and upper part of the core. However, several of the species are only represented by a few valves in a few samples.

Eunotia monodon Ehr. is the most common, recorded in all samples except the bottom sample L 2404. In seven samples, between L 2362 and 2386, it is recorded as common or fairly common.

Eunotia lapponica Grun. is recorded from the four topmost samples and is very common in L 2389.

Eunotia arcus Ehr. and **E. praerupta** Ehr. are both recorded as fairly common in L 6362, in which sample seven different *Eunotia* species are found.

Eunotia monodon Ehr. var **major** (W. Smith) Hust. is recorded from five samples, in two of them together with *Eunotia major* (W. Smith) Rabh. var. *scandica* Cleve-Euler (Cleve-Euler 1953, II: 119, Fig. 456e).

Eunotia testudinata Å. Berg (Berg 1939: 425; 1: 10) is also found in five samples. It is previously recorded as subfossil in Spongilla Sø, Godthåbsfjord (Foged 1972: 62; D II: 2, 3) and as recent in SW Greenland (Foged 1973: 40; 5: 4, 5).

The species depicted in the following illustrations are considered as forms of *Eunotia monodon:* Pl. T I, Figs 9, 11, 12, 13 and 14, and Pl. T II, Figs 1, 2, 3 and 7. Figs 14 and 7 are closely related to *E. major* var. *scandica* fo. *ventricosa* Cleve (Cleve 1895: 27; 1: 37).

Patrick & Reimer 1966: 196–198 separate *E. major* (W. Smith) Rabh. sensu Hust. 1930–66, II, Fig. 772 from *E. monodon* Ehr., the former having "distinctly capitate ends", "set off from the main body", whereas Hust. 1930–66, II: 365, Fig. 772 includes *E. major* W. Smith in *E. monodon* Ehr. None of the specimens observed in this series have capitate apices.

Eunotia monodon and its varieties are common in northern Europe, Greenland and the eastern U.S.A., but unknown from Alaska.

Neidium affine (Ehr.) Cleve fo. **undulata** (Grun.) Hust.
Hust. 1930: 243 ("Mittlere Auftreibung starker als die übrigen"). Patrick & Freese 1961: 178. Foged 1981: 129; 27: 2.
Plate: T IV, Fig. 8.
A single valve in L 2374. Previously known from Alaska.

Neidium affine var. **amphirhynchus** (Ehr.) Cleve fo. **undulata** (Grun.) Hust.
Hust. 1930: 243 ("Unterscheidet sich von *N. affine* fo. *undulata* durch die gleichen Breite der Auftreibungen"). Foged 1981: 129; 19: 16.
Plate: T IV, Fig. 9.
A single valve in L 2368. Previously known from Alaska.

Neidium affine var. **longiceps** (Greg.) Cleve
Hust. 1930: 242, Fig. 378. Patrick & Reimer 1966: 393; 35: 4.
Plate: T V, Fig. 5.
Alkaliphilous *Neidium* species were only observed in most of the nethermost samples and not in the upper; upwards, the circumneutral *N. iridis* (Ehr.) Cleve var. *porsildii* Foged is common in L 2377 and the following five samples.

Neidium bisulcatum (Lagerst.) Cleve var. **baicalense** (Skv. & Meyer) Reimer
Patrick & Reimer 1966: 397; 36: 6. Foged 1981: 131; 24: 4. 1971: 968.
Plates: T IV, Fig. 7. T V, Fig. 6.
Found in L 2374 and L 2377. Fairly common in Alaska. Also recorded from eastern U.S.A.

Neidium rudimentarum Reimer
Patrick & Reimer 1966: 407; 37: 10.
A single valve in L 2377. Previously only recorded from a single locality in eastern U.S.A.

Neidium temperei Reimer
Patrick & Reimer 1966: 406; 37: 9. Patrick & Freese 1961: 181: "Occasionally in our collections" (Alaska). Foged 1973: 52; 8: 7–9. 1977: 59; 3: 10.
Plate: T II, Fig. 6. A small specimen.

Infrequent in L 2347. Previously known as subfossil in Greenland and as recent in Alaska and eastern U.S.A.

Pinnularia suchlandtii Hust.
Hust. 1943: 184, Figs 39–41. Foged 1971: 978; 16: 9, 10. 1981: 156; 44: 13.
Plate: T VI, Fig. 2.
A single valve in L 2404. Previously recorded from Central Europe (The Alps) and Alaska.

Stauroneis nobilis Schum. var. **minima** Foged
Foged 1981: 160; 20: 7.
Plate: T V, Fig. 8.
Previously only recorded from Alaska. The valve shown in T V: 8 resembles *S. lauenburgiana* Hust. with regard to the punctation of the striae and size of the valve, but due to the absence of pseudosepta at the apices it is most likely the small Alaskan form of *S. nobilis*.

Acknowledgements

The initiative to the present investigation came from Bent Fredskild, Greenland Botanical Survey, University of Copenhagen, who supplied me with three of the analysed cores (T, Q and Eq). The samples from Station Nord (N) were procured by Niels Abrahamsen, Geophysical Institute, Aarhus University.

I am grateful to Dr. Fredskild for the material, the descriptions of the cores, and for his suggestion of publishing the results of the analyses in one paper.

I am also grateful for the valuable material from one of the northernmost localities of all, which Dr. Abrahamsen handed over to me together with the information about the core.

In many respects this paper demanded extraordinary carefulness and effort on account of the parallel between the four investigations and their temporal dispersal. So, once more I wish to express my gratitude to my wife Anna Charlotte for our diatom collaboration throughout many years.

References

Berg, Å. 1939. Some new species and forms of the diatom genus *Eunotia* Ehr. 1837. – Bot. Not. 1939: 423–462.
– 1945. Diatomeen von der Sophia-Expedition im Jahre 1883. – Arkiv f. Botanik. K. Sv. Vet. Akad. 32 A. No. 1: 1–34. (8 plates).
Cleve, A. 1895. On Recent Freshwater Diatoms from Lule Lappmark Sweden. Bih. K. Sv. Vet. Akad. Handl. Bd. 21, III, No. 2: 1–44 (1 plate).
Cleve-Euler, A. 1951–55. Die Diatomeen von Schweden und Finnland. I–V. K. Sv. Vet. Akad. Handl. 4. Ser. 2(1), 4(1), 4(5), 5(4), 3(3).
Dodd, J. R. & Stoermer, E. F. 1962. Notes on Iowa Diatoms I. Iowa – Acad. Sci. 69: 83–87.
Foged, N. 1953. Diatoms from West Greenland. – Meddr Grønland 147(10): 1–86 (13 plates).
– 1955. Diatoms from Peary Land, North Greenland. – Meddr Grønland 128(7): 1–90 (14 plates).
– 1958. The Diatoms in the Basalt Area and Adjoining Areas of Archean Rock in West Greenland. – Meddr Grønland 156(4): 1–146 (15 plates).
– 1960. Diatoméfloraen i en interglacial kiselguraflejring ved Rands fjord i Øst Jylland. (Engl. summary). – Meddr Dansk Geol. Foren. 14: 197–211.
– 1964. Freshwater Diatoms from Spitsbergen. – Tromsø Mus. Skr. 11: 1–205 (22 plates).
– 1970. The Diatomaceous Flora in a Postglacial Kieselguhr Deposit in Southwestern Norway. – Beih. Nova Hedwigia 31: 169–201 (1 plate).
– 1971. Diatoms found in a bottom sediment sample from a small deep lake on the Northern Slope, Alaska. – Nova Hedwigia 21: 923–1034 (23 plates).
– 1972. The Diatoms in Four Postglacial Deposits in Greenland. – Meddr Grønland 194(4): 1–66 (16 plates).
– 1973. Diatoms from Southwest Greenland. – Meddr Grønland 194(5): 1–84 (29 plates).
– 1977a. The Diatoms in Four Postglacial Deposits at Godthåbsfjord, West Greenland. – Meddr Grønland 199(4): 1–64 (8 plates).
– 1977b. Freshwater Diatoms in Ireland. – Bibliotheca Phycologica 34: 1–221 (48 plates).
– 1981. Diatoms in Alaska. – Bibliotheca Phycologica 53: 1–317 (64 plates).
– 1982. Diatoms in Bornholm, Denmark. – Bibliotheca Phycologica 59: 1–175 (36 plates).
Fredskild, B. 1969. A postglacial standard pollen diagram from Peary Land, North Greenland, – Pollen et Spores, XI. Paris.
– 1973. Studies in the vegetational history of Greenland. – Meddr Grønland 198(4): 1–245 (21 plates).
– 1985. The Holocene vegetational development of Tugtuligssuaq and Qeqertat, Northwest Greenland. – Meddr Grønland, Geosci. 14: 1–20 (6 plates).
Funder, S. & Abrahamsen, N. 1988. Palynology in a polar desert, eastern North Greenland. – Boreas 17: 195–207.
Germain, H. 1964 *Navicula gottlandica* Grun. – Rev. algol. Nouv. Sèr. 7(2): 196–201 (4 plates).
Hustedt, F. 1930. Bacillariophyta. In: Pascher, A.: Die Süsswasser-Flora Mitteleuropas 10: 1–466.
– 1930–66. Die Kieselalgen Deutschlands, Österreichs und der Schweiz mit Berücksichtigung der übrigen Länder Europas sowie der angrenzendende Meeresgebiete. I, II, III. – Dr. L. Rabenhorst's Kryptogamen-Flora 7, Leipzig.
– 1942a. Diatomeen aus der Umgebung von Abisko in Schwedisch Lappland. – Arch. Hydrobiol. 39: 82–174 (Abb. 1–84 in Text).
– 1942b. Beiträge zur Algenflora von Bremen. V. – Abh. naturw. Ver. Bremen 32: 184–221.
– 1944. Neue und wenig bekannte Diatomeen. I. – Ber. Deut. Bot. Ges. 61(5): 271–290.
– 1945–50. Die Diatomeenflora norddeutscher Seen mit besonderer Berücksichtigung des holsteinischen Seengebietes. I–IV. – Arch. Hydrobiol. 41: 392–414; 43: 329–456 (Taf. 21–41).
– 1954. Die Diatomeenflora des Interglazials von Oberohe in der Lüneburger Heide. – Abh. naturw. Ver. Bremen 33(3): 431–455.
– 1955. Neue und wenig bekannte Diatomeen. 8. – Abh. naturw. Ver. Bremen 34(1): 47–68.
– 1957. Die Diatomeenflora des Flusssystems der Weser im Gebiet der Hansestadt Bremen. – Abh. naturw. Ver. Bremen 34(3): 181–440.
Kaczmarska, I. 1977. Comments on the flora of diatoms (Bacillariophyceae) from Eemian freshwater sediments at Imbramoviza near Wroclaw. – Acta Palaeobotanica 18(2): 35–58 (29 plates).
Krammer, K. 1979. Zur Morphologie der Raphe bei der Gat-

tung *Cymbella*. – Nova Hedwigia 31(4): 993–1029 (7 Tafeln).
– 1980. Morphologic and Taxonomic Investigations of Some Freshwater Species of the Diatom Genus *Amphora* Ehr. – Bacillaria 3: 197–225 (7 plates).
– 1981. Morphologic Investigations of the Valve and Girdle of the Diatom Genus *Cymbella* Agardh. – Bacillaria 4: 125–146 (5 plates).
Lange-Bertalot, H. 1980. Zur taxonomischen Revision einiger ökologisch wichtigen »*Naviculae lineolatae*« Cleve. – Cryptogamie, Algologique I(1): 29–50 (10 Tafeln).
– & Simonsen, R. 1978. Taxonomic Revision of the *Nitzschiae lanceolatae* Grunow. 2. – Bacillaria 1: 11–111 (22 plates).
Okuno, H. 1952. Atlas of Fossil Diatoms from Japanese Diatomite Deposits. Bot. Inst. Fac. Text. Fibers. Kyoto Univ. Inst. Arts & Textile Fibers, Kamikyoto, Kyoto: 1–58 (29 plates).
Patrick, R. & Freese, L. R. 1961. Diatoms (*Bacillariophyceae*) from Northern Alaska. – Proc. Acad. Nat. Sci. Philad. 112 (6): 129–292 (4 plates).
– & Reimer, C. W. 1966. The Diatoms of the United States Exclusive of Alaska and Hawaii. 1. Monographs Acad. Nat. Sci. Philad. 13: 1–688 (64 plates).
– & – 1975. The Diatoms of the United States Exclusive of Alaska and Hawaii. 2(1). Monographs Acad. Nat. Sci. Philad. 13: 1–213 (28 plates).
Petersen, J. B. 1915. Studier over danske aërofile Alger. – K. Dansk Vid. Selsk. Skr. 7. Række. Naturv. og mathem. Afd. 12(7): 271–380 (4 tavler).
Schmidt, A. et al. 1874–1958. Atlas der Diatomaceenkunde. – Aschersleben, Leipzig.
Stoermer, E. F. 1963. New Taxa and New United States Records of the Diatom Genus *Neidium* from West Lake Okoboji, Iowa. – Notulae Naturae 358: 1–9 (1 plate).
– 1964. Notes on Iowa Diatoms VII. – Iowa Acad. Sci. 71: 55–66 (5 plates).
– & Yang, J. J. 1971. Contribution to the diatom flora of the Lawrentian Great Lakes I. New and Little-known Species of *Amphora* (*Bacillariophyta, Pennatibacillariophyceae*). Phycologia 10(4): 397–409 (1 plate).
Tynni, R. 1978. Über Finnlands rezente und subfossile Diatomeen. X. Geol. Surv. Finland. Bull. 296: 1–55 (17 Tafeln).
Van Landingham, S. L. 1967–1979. Catalogue of the Fossil and Recent Genera and Species of Diatoms and their Synonyms. I–VIII.
Østrup, E. 1910. Danske Diatomeer. København: 323 pp. (5 tavler).

Tables and plates

A list of the recorded diatoms from each of the four localities is included (Tabs N 1, Q 1, Eq 1 and T 1). In Tables Q 1 and Eq 1, the species are arranged according to their halobian relation: first the polyhalobous, then the mesohalobous and finally the oligohalobous. (All the species from the two other localities were oligohalobous). The oligohalobous species are arranged according to their pH relation: first the alkaliphilous or alkalibiontic, then the pH-indifferent or circumneutral, and finally the acidophilous or acidobiontic. The species are arranged alphabetically within each group.

Finally, dominant *Fragilaria* species were not counted, a common practice among diatomologists, as it gives a more objective picture of the species composition. These *Fragilaria* species are listed at the top of each table.

The legend for these tables can be seen in Table N 1.

Three tables (N 2, Eq 2 and T 2) are included to show the pH-spectrum of the recorded taxa in relation to the depths of the samples.

Photographs of some of the species from the four localities are also included (Pls N I–IV, Q I–IV, Eq I–VII and T I–VI). The name, dimensions and sample number are given in the legends.

Table N 1. List of diatoms, Vandsøen.

Sample no. N	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.10
Depth below lake bottom (cm)	4	7	11	15	19.5	23.5	27	30.5	35	38.5
Alkaliphilous or alkalibiontic:										
Not counted:										
Fragilaria pinnata Ehr.	cc	cc	cc	cc	cc	c	dom	dom	c	+
- fo. *ventriculosa* Schum.	–	+	–	–	–	–	–	–	–	–
Amphora										
ovalis (Kütz.) Kutz.	–	–	1	–	+	2	–	–	+	–
- var. *affinis* (Kütz.) V.Heurck	–	–	–	+	–	–	–	–	–	–
- var. *libyca* (Ehr.) Cleve	14	7	7	4	+	–	–	–	–	–
- var. *pediculus* Hust.	2	+	–	1	–	–	1	–	–	–
Caloneis	–	–	–	–	+	–	–	–	–	–
bacillum (Grun.) Cleve	4	3	–	–	–	–	–	–	–	–
schumanniana (Grun.) Cleve										
silicula (Ehr.) Cleve	–	–	–	+	+	–	–	–	–	–
- var. *truncatula* Grun.	+	–	–	–	–	–	–	–	–	–
Cyclotella										
comta (Ehr.) Kütz.	1	–	–	–	–	–	–	–	–	–
Cymbella										
hebridica (Greg.) Grun.	5	19	3	7	10	–	–	–	–	–
leptoceros (Ehr.) Grun.	–	–	–	–	–	4	1	–	–	–
- var. *rostrata* Hust.	–	–	–	–	+	2	–	–	–	–
minuta Hilse var. *silesiaca* (Bleisch ex Rabh.) Reimer	–	–	–	–	+	–	–	–	–	–
obtusa Greg.	–	–	1	+	10	1	–	–	–	–
turgida (Greg.) Cleve	2	–	3	2	1	–	–	–	–	–
Denticula										
tenuis Kütz.	–	–	+	–	+	–	–	–	–	–
Diploneis										
ovalis (Hilse) Cleve	–	–	–	–	–	1	–	–	–	–
Fragilaria										
construens (Ehr.) Grun.	–	–	–	1	+	6	+	–	1	–
Gomphonema										
acuminatum Ehr. var. *coronata* (Ehr.) W. Smith	–	–	–	+	–	–	–	–	–	–
angustatum (Kütz.) Rabh.	–	–	–	1	–	–	–	–	–	–
- var. *productum* Grun.	–	–	1	–	–	–	–	–	–	–
Meridion										
circulare Ag.	–	–	4	–	–	–	–	–	–	–
Navicula										
clementioides Hust.	–	–	+	–	–	–	–	–	–	–
contenta Grun. fo. *parallela* Petersen	–	6	7	+	–	1	–	–	–	–
digito-radiata (Greg.) A. Schmidt	+	–	–	–	–	–	–	–	–	–
interglacialis Hust.	6	15	6	2	3	1	–	–	–	–
modica Hust.	–	–	–	14	12	2	–	–	–	–
Nitzschia										
perpusilla Rabh.	–	–	–	3	–	–	–	–	–	–
Stephanodiscus										
astraea (Ehr.) Grun.	–	+	–	–	–	–	–	–	–	–
pH-indifferent or circumneutral:										
Cyclotella										
kuetzingiana Thwaites	+	–	–	–	–	–	–	–	–	–
Cymbella										
brehmii Hust.	2	14	21	9	24	4	1	–	–	–
cesatii (Rabh.) Grun.	–	–	–	–	+	–	–	–	–	–
cuspidata Kütz.	+	1	1	2	2	1	–	–	–	–
heilprinensis Foged sensu Foged	–	–	–	–	+	–	–	–	–	–
naviculiformis Auerswald	–	–	–	–	+	–	–	–	–	–
norvegica Grun.	–	–	+	–	+	2	–	–	–	–
sinuata Greg.	1	–	6	4	4	–	–	–	–	–
- fo. *ovata* Hust.	+	–	4	3	3	2	–	–	–	–
variabilis (Cramer) Heiberg										
- var. *botellus* Lagerst. sensu Foged	–	–	2	5	3	–	5	–	–	–
ventricosa Kütz.	–	–	3	4	12	17	2			
Eunotia										

lunaris (Ehr.) Grun.	–	–	1	–	–	–	–	–	–	–
Hantzschia										
amphioxys (Ehr.) Grun. var.										
major Grun.	–	–	–	+	–	–	–	–	–	–
Navicula										
amphibola Cleve	–	3	+	+	+	–	–	+	–	–
bacillum Ehr.	–	–	1	–	+	–	–	–	–	–
bryophila Petersen	–	+	+	–	–	–	–	–	–	–
pseudoscutiformis Hust.	–	–	–	+	–	–	–	–	–	–
radiosa Kütz.	–	–	–	–	+	–	–	–	–	–
schoenfeldii Hust.	–	+	–	–	–	1	–	–	–	–
wittrockii (Lagerst.) Cleve-Euler	–	+	2	+	+	–	–	–	–	–
Neidium										
distincte-punctatum Hust.	15	14	1	–	–	–	–	–	–	–
iridis (Ehr.) Cleve	3	2	2	–	–	–	–	–	–	–
- var. *porsildii* Foged	20	1	–	–	–	–	–	–	–	–
sp.N II: 3.	–	–	–	–	+	–	–	–	–	–
Pinnularia										
interrupta W. Smith	–	–	–	1	–	–	–	–	–	–
mesolepta (Ehr.) W. Smith	–	1	4	16	1	1	–	–	–	–
subcapitata Greg.	–	–	–	1	–	–	–	–	–	–
Stauroneis										
anceps Ehr.	6	11	11	3	3	–	–	–	–	–
- var. *hyalina* Brun & Perag.	15	–	4	–	–	–	–	–	–	–
phoenicenteron Ehr.	–	2	1	2	6	2	–	–	–	–
Acidophilous or acidobiontic:										
Achnanthes										
flexella (Kütz.) Brun	1	1	2	14	6	–	1	–	–	–
Anomoeoneis										
serians (Bréb.) Cleve var.										
brachysira (Bréb.) Cleve	+	–	–	–	–	–	–	–	–	–
- fo. *thermalis* (Grun.) Hust.	+	–	–	–	–	–	–	–	–	–
Eunotia										
veneris (Kütz.) O. Müller	–	–	–	–	+	–	–	–	–	–
Navicula										
brekkaensis Petersen	+	–	–	–	–	–	–	–	–	–
gibbula Cleve	3	–	–	+	–	–	–	–	–	–
Tabellaria										
flocculosa (Roth) Kütz.	–	–	1	–	–	–	–	–	–	–

+: found, c: common or fairly common, cc: very common, dom: dominant.

Table N 2. pH-spectra, Vandsøen.
For legend, see Table N 1.

	Depth below lake bottom (cm)	Sample no. N	*Fragilaria pinnata* + forms	Alkaliphilous or alkalibiontic taxa	valves	pH-indifferent or circumneut. taxa	valves	Acidophilous or acidobiontic taxa	valves	Total valves taxa	counted
greyish-green gyttja	4	5.1	cc	10	34	10	62	5	4	25	100
	7	5.2	cc	7	50	12	49	1	1	20	100
	11	5.3	cc	11	33	18	64	2	3	31	100
	15	5.4	cc	15	35	17	51	2	14	34	100
brownish-grey lumpy clay	19.5	5.5	cc	13	36	18	58	1	6	32	100
	23.5	5.6	c	9	20	8	30	–	–	17	50
	27	5.7	dom	3	2	3	8	1	1	7	11
	30.5	5.8	dom	–	–	1	+	–	–	1	+
	35	5.9	c	2	1	–	–	–	–	2	1
blackish-grey silty clay	38.5	5.10	+	–	–	–	–	–	–	–	–
	42	5.11	No diatoms								
	46	5.12	No diatoms								

Plate N I. Scale 10 µm

1. *Cyclotella kuetzingiana* Thwaites. Diam. 16 µm. N 5.1.
2. *Fragilaria pinnata* Ehr. fo. *ventriculosa* Schum. 31 × 5.5 µm. N. 5.2.
3. *Fragilaria pinnata* Ehr. 13 × 4 µm. N 5.3.
4. *Fragilaria pinnata* Ehr. 8 × 4.5 µm. N 5.6.
5. *Fragilaria construens* (Ehr.) Grun. 9 × 6 µm. N 5.5.
6. *Neidium dinstincte-punctatum* Hust. 44 × 15 µm. N 5.2.
7. *Eunotia veneris* (Kütz.) O. Müller. 30 × 4 µm. N 5.5.
8. *Caloneis silicula* (Ehr.) Cleve var. *truncatula* Grun. 36 × 7 µm. N 5.1.
9. *Meridion circulare* Ag. 32 × 7 µm. N 5.3.
10. *Achnanthes flexella* (Kütz.) Brun. 43 × 15 µm. N 5.1.
11. *Caloneis bacillum* (Grun.) Cleve. 24 × 8 µm. N 5.1.
12. *Neidium iridis* (Ehr.) Cleve. 64 × 20 µm. N 5.1.
13. *Neidium iridis* var. *porsildii* Foged. 50 × 15 µm. N 5.1.
14. *Caloneis schumanniana* (Grun.) Cleve. 53 × 11 µm. N 5.5.
15. *Neidium iridis* var. *porsildii* Foged. 48 × 18 µm. N 5.1.

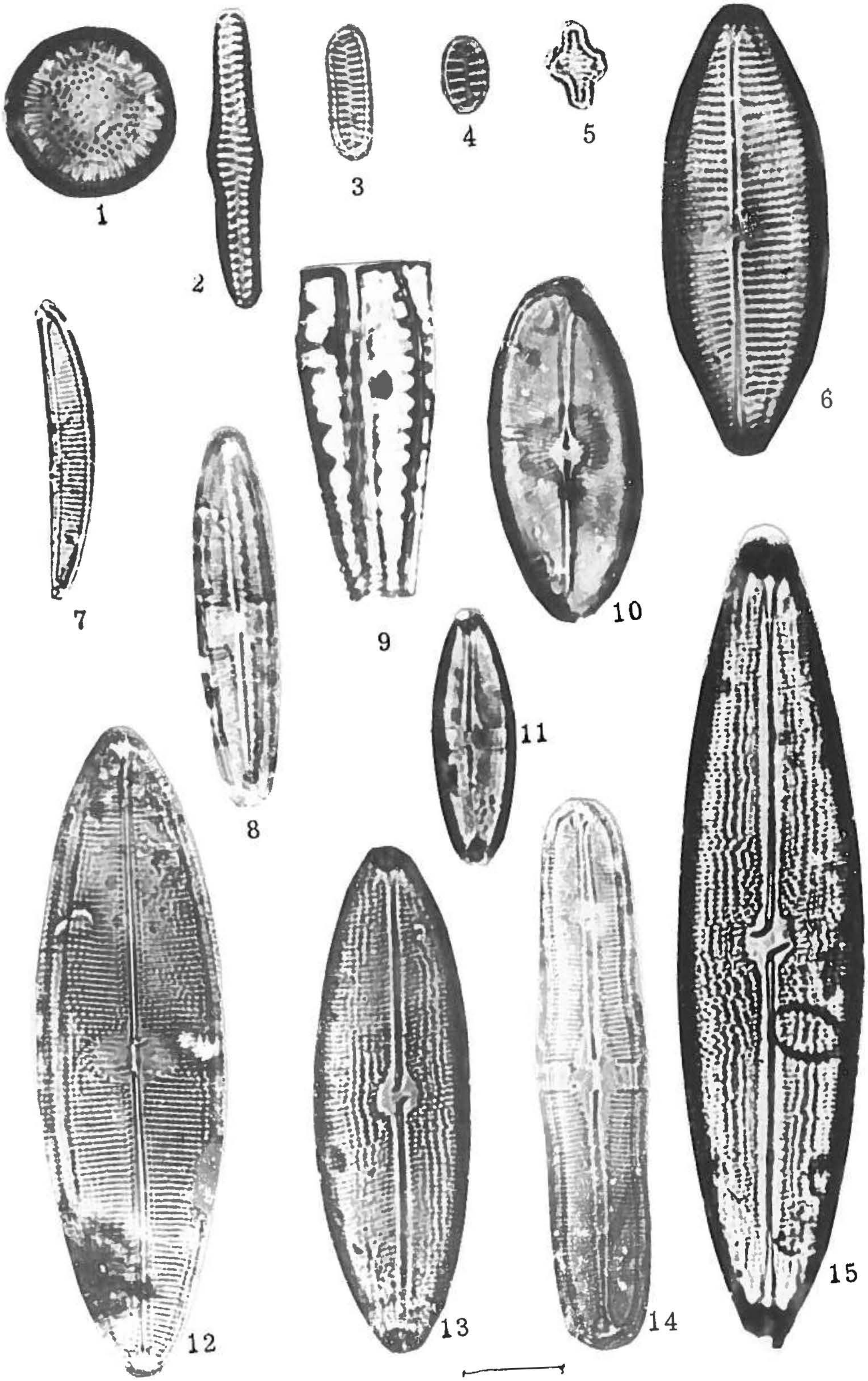

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Plate N II. Scale 10 μm

1. *Neidium distincte-punctatum* Hust. 72 × 22 μm. N 5.1.
2. *Neidium distincte-punctatum* Hust. 55 × 19 μm. N 5.1.
3. *Neidium* sp. 63 × 21 μm. N 5.5.
4. *Stauroneis anceps* Ehr. 98 × 10 μm. N 5.1.
5. *Stauroneis anceps* Ehr. 50 × 12 μm. N 5.5.
6. *Stauroneis anceps* Ehr. 50 × 10 μm. N 5.2.
7. *Stauroneis anceps* var. *hyalina* Brun & Perag. 52 × 10 μm. N 5.1.
8. *Stauroneis anceps* Ehr. 52 × 10 μm. N 5.1.
9. *Stauroneis phoenicenteron* (Nitzsch) Ehr. 106 × 24 μm. N 5.2.

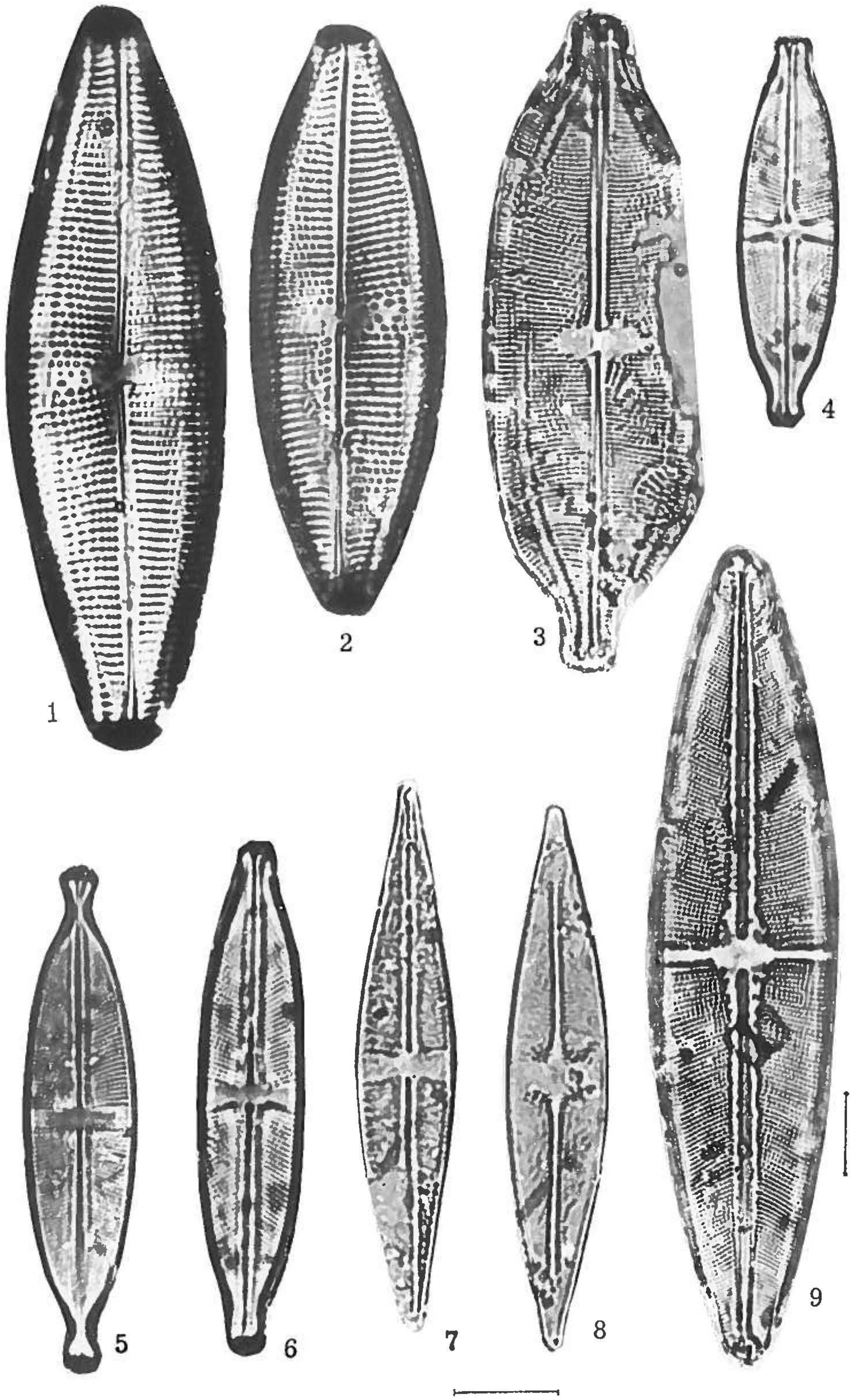
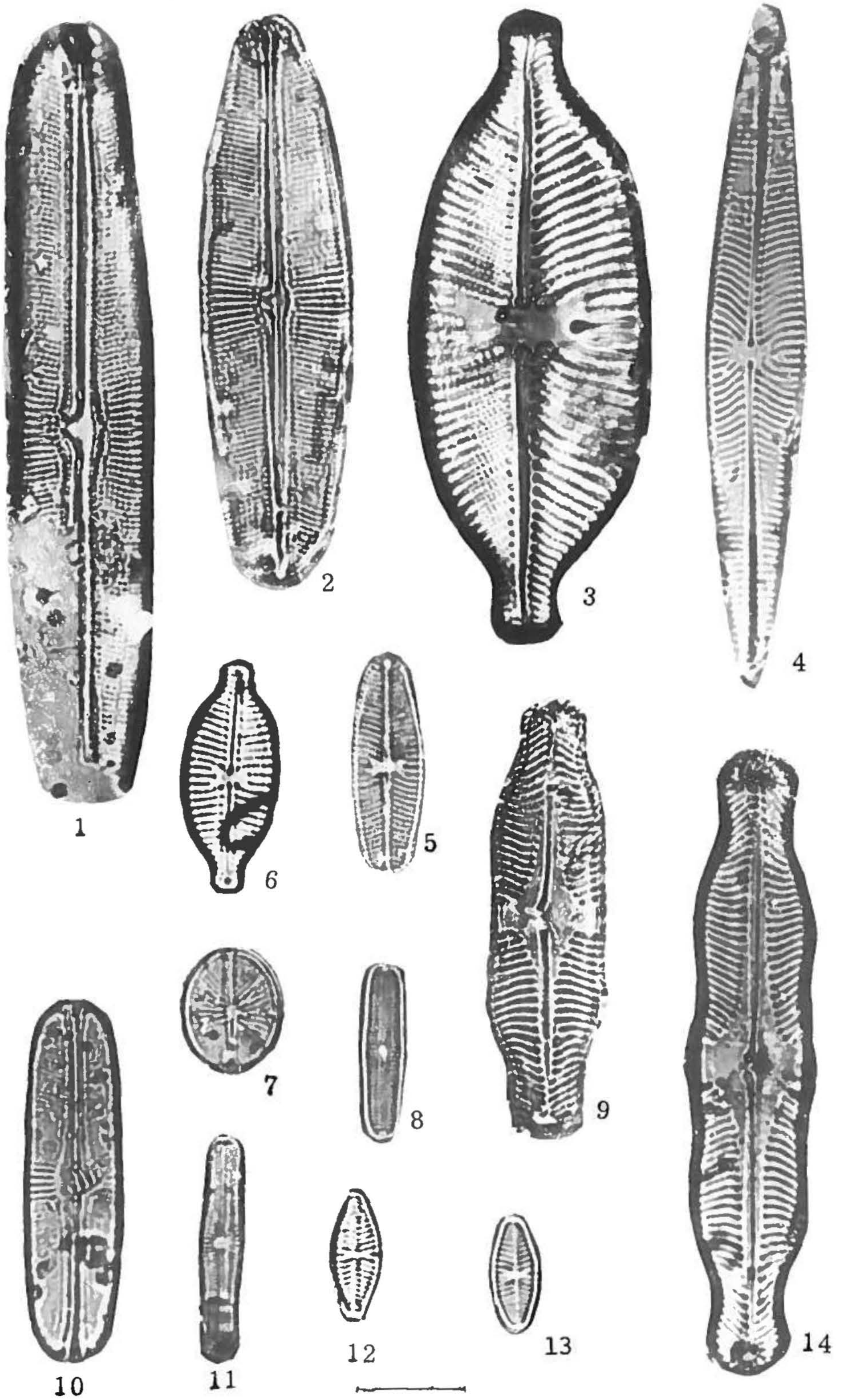

1
2
3
4
5
6
7
8
9

Plate N III. Scale 10 µm

1. *Navicula gibbula* Cleve. 78 × 14 µm. N 5.1.
2. *Navicula gibbula* Cleve. 56 × 15 µm. N 5.1.
3. *Navicula amphibola* Cleve. 62 × 23 µm. N 5.2.
4. *Navicula radiosa* Kütz. 70 × 10.5 µm. N 5.5.
5. *Navicula schoenfeldii* Hust. 22 × 7 µm. N 5.2.
6. *Navicula interglacialis* Hust. 23 × 9.3 µm. N 5.1.
7. *Navicula pseudoscutiformis* Hust. 13 × 11 µm. N 5.4.
8. *Navicula bryophila* Petersen. 17 × 4.3 µm. N 5.2.
9. *Pinnularia mesolepta* (Ehr.) W. Smith. 44 × 11(–12) µm. N 5.5.
10. *Navicula bacillum* Ehr. 36 × 10 µm. N 5.5.
11. *Navicula bryophila* Petersen. 21 × 4 µm. N 5.3.
12. *Navicula modica* Hust. 13 × 5 µm. N 5.5.
13. *Navicula modica* Hust. 11 × 5 µm. N 5.4.
14. *Pinnularia mesolepta* (Ehr.) W. Smith. 63 × 13 µm. N 5.3.



1
2
3
4
5
6
7
8
9
10
11
12
13
14

Plate N IV. Scale 10 μm

1. *Amphora ovalis* (Kütz.) Kütz. var. *libyca* (Ehr.) Cleve. 36 × 8 μm. N 5.1.
2. *Amphora ovalis* (Kütz.) Kütz. 39 × 11 μm. N 5.5.
3. *Amphora ovalis* var. *affinis* (Kütz.) V. Heurck. 28 × 12 μm. N 5.4.
4. *Cymbella turgida* (Greg.) Cleve. 36 × 12 μm. N 5.5.
5. *Cymbella turgida* (Greg.) Cleve. 32 × 9 μm. N 5.1.
6. *Cymbella cuspidata* Kütz. 38 × 14 μm. N 5.1.
7. *Cymbella norvegica* Grun. 42 × 7 μm. N 5.5.
8. *Cymbella obtusa* Greg. 41 × 7 μm. N 5.5.
9. *Cymbella heilprinensis* Foged. 29 × 10 μm. N 5.5.
10. *Cymbella minuta* Hilse var. *silesiaca* (Bleisch ex Rabh.) Reimer. 25 × 8 μm. N 5.5.
11. *Cymbella variabilis* (Cramer) Heiberg var. *botellus* Lagerst. 25 × 5 μm. N 5.3.
12. *Cymbella sinuata* Greg. var. *ovata* Hust. 17 × 5 μm. N 5.1.
13. *Denticula tenuis* Kütz. 28 × 5 μm. N 5.5.
14. *Cymbella variabilis* var. *botellus* Lagerst. 36 × 6 μm. N 5.4.
15. *Cymbella naviculiformis* Auerswald. 36 × 10 μm. N 5.5.
16. *Cymbella brehmii* Hust. 10 × 4 μm. N 5.4.
17. *Cymbella sinuata* Greg. var. *ovata* Hust. 18 × 7 μm. N 5.4.
18. *Gomphonema acuminatum* Ehr. var. *coronata* (Ehr.) W. Smith. 53 × 11.5 μm. N 5.4.
19. *Denticula tenuis* Kütz. 42 × 5 μm. N 5.3.

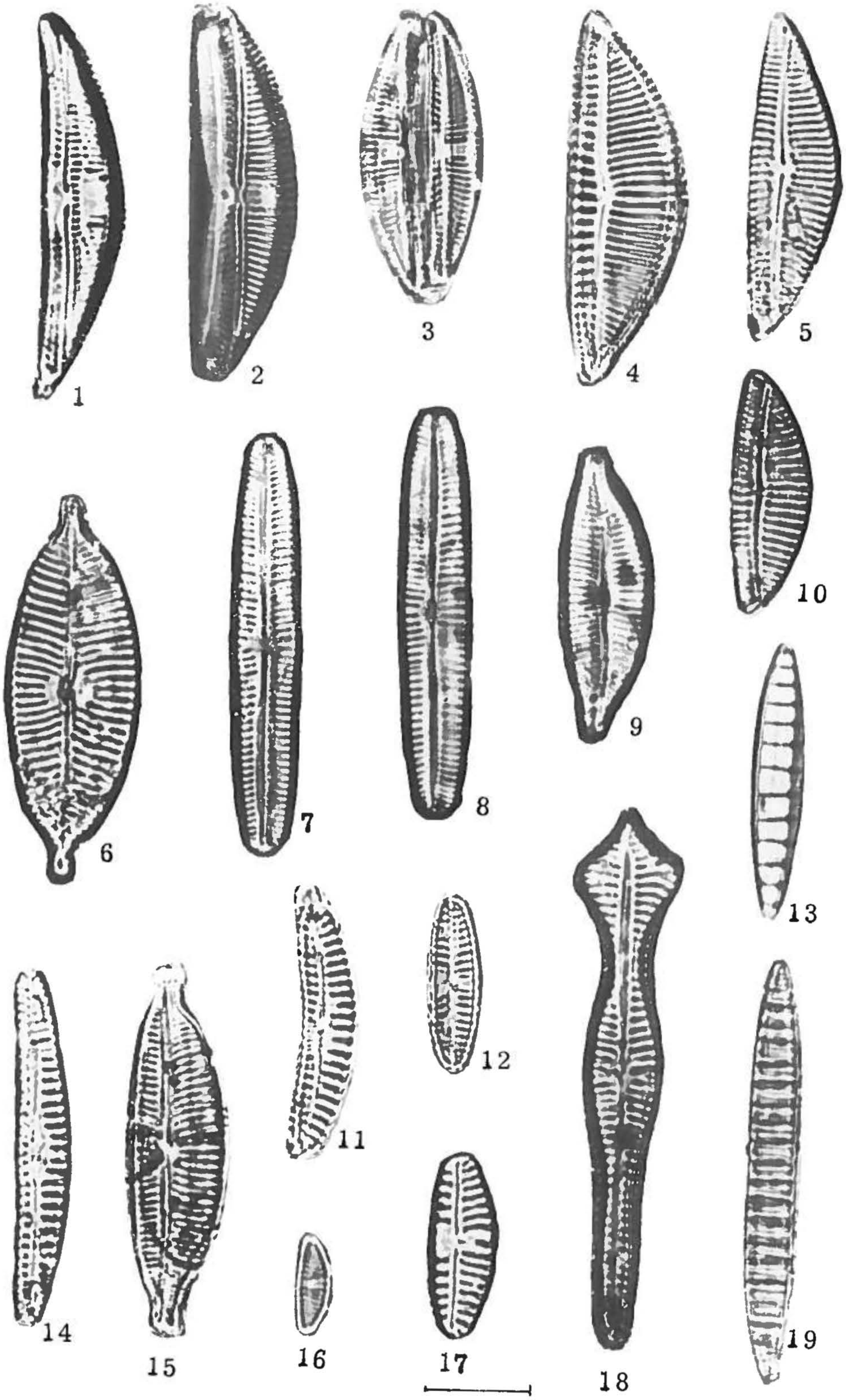

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

Table Q 1. List of diatoms, Qeqertat, Inglefield Bredning.
For legend, see Table N 1.

Sample no. Q	–2	1	2.5	4	6	8	10	12	16	20	24	28	32	36
Depth below lake bottom (cm)	137	134	132,5	131	129	127	125	123	119	115	111	107	103	99
Not counted:														
Fragilaria														
construens (Ehr.) Grun.	–	c	c	c	c	+	c	c	cc	c	cc	cc	dom	dom
- var. *binodis* (Ehr.) Grun.	–	–	–	–	–	–	–	–	–	–	+	–	–	–
intermedia Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
pinnata Ehr.	–	dom	dom	dom	dom	dom	dom	dom	dom	dom	dom	cc	dom	+
virescens Ralfs	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Polyhalobous:														
Achnanthes														
brevipes Ag.	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Cocconeis														
scutellum Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Grammatophora														
oceanica (Ehr.) Grun.	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Scoliopleura														
tumida (Bréb.) Rabh.	–	4	–	–	–	–	–	–	–	–	–	–	–	–
Mesohalobous:														
Cocconeis														
scutellum Ehr. var. *parva* Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Diploneis														
didyma (Ehr.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Mastogloia smithii Thwaites var. *lacustris* Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Oligohalobous:														
Alkaliphilous or alkalibiontic:														
Achnanthes														
minutissima Kütz.	–	–	–	–	+	–	–	–	–	–	–	–	–	–
Amphora														
ovalis (Kütz.) Kütz.	–	–	–	–	–	–	–	–	–	–	1	–	–	–
- var. *libyca* (Ehr.) Cleve	–	–	–	–	–	–	–	–	–	13	–	–	–	1
Anomoeoneis														
exilis (Kütz.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- var. *lanceolata* A. Mayer	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Caloneis														
bacillum (Grun.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–
silicula (Ehr.) Cleve	–	–	–	–	–	–	–	+	–	–	–	–	+	–
Cocconeis														
diminuta Pant.	–	–	–	–	–	–	+	+	–	–	–	–	–	–
Cymatopleura														
solea (Bréb.) W. Smith	–	–	–	–	1	+	–	+	1	48	–	–	–	–
Cymbella														
affinis Kütz.	–	–	–	–	–	–	+	–	–	–	–	–	–	1
hebridica (Greg.) Grun.	–	–	–	–	–	–	+	–	–	–	–	–	–	–
helvetica Kütz. var. *compacta* (Østrup) Hust. (?)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
lanceolata (Ehr.) V. Heurck	–	–	–	–	–	–	–	–	–	–	–	–	–	–
obtusa Greg.	–	–	–	–	–	–	–	–	1	–	1	2	2	1
subaequalis Grun.	–	–	–	–	–	–	–	–	–	–	–	–	+	–
turgida (Greg.) Cleve	–	–	–	–	+	1	1	1	8	4	3	4	3	–
Denticula														
tenuis Kütz. var. *crassula* (Naeg.) Hust.	–	–	–	–	+	3	1	–	+	+	1	2	–	–
Epithemia														
sorex Kütz.	–	–	1	1	2	4	5	11	7	17	7	18	17	28
zebra (Ehr.) Kütz. var. *saxonica* (Kütz.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Navicula														
cryptocephala Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
modica Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
tuscula (Ehr.) Grun.	–	–	1	2	–	–	–	–	–	+	–	–	–	1
vulpina Kütz.	–	4	137	246	142	42	58	64	59	77	47	29	55	52
Neidium														
temperei Reimer	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nitzschia														
angustata (W. Smith) Grun.	–	–	–	–	–	–	–	+	–	–	–	–	–	–

40	44	48	52	56	60	64	68	72	76	80	84	88	92	100	108	116	124	at	on
95	91	87	83	79	75	71	67	63	59	55	51	47	43	35	27	19	11	drill	shore
+	dom	+	dom	dom	dom	dom	+	dom	+	dom	dom	dom	dom	dom	c	+	dom	+	+
–	–	–	–	–	–	–	–	–	–	+	–	–	–	+	+	+	+	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
dom	dom	+	cc	+	+	–	+	dom	+	+	–	+	–	–	–	+	–	–	+
–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	+	+	+
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	2	–	8	2
–	–	–	–	1	3	–	2	5	10	25	13	29	14	5	12	9	3	9	1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	2	4
–	–	–	–	+	1	1	–	–	–	3	4	2	11	+	2	12	5	–	+
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	+	–	–	–	–	–	–	–	–	+	–	–	+	1	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–
–	4	1	1	5	–	–	–	–	–	–	1	–	1	–	–	–	–	4	1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3	1	9	4	3	–	5	1	–	1	–	1	3	6	–	–	4	3	1	1
–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	1	6
12	16	24	30	15	35	49	14	5	1	8	11	22	38	20	13	2	2	5	25
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	+	5
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	23	–	–
1	–	–	1	–	+	+	4	8	18	13	8	1	6	–	+	+	+	28	8
62	22	8	17	10	54	15	24	35	84	116	109	77	50	34	149	108	6	10	6
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

- var. *acuta* Grun.	–	–	–	–	–	–	1	1	3	3	–	–	–	–
denticula Grun.	–	–	–	–	+	+	2	+	1	–	+	2	1	–
fonticula Grun.	+	–	–	–	–	–	–	–	–	–	–	–	–	–
perpusilla Rabh.	–	–	–	–	–	–	+	–	–	–	–	–	–	–
pH-indifferent or circumneutral:														
Achnanthes														
linearis (W. Smith) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Caloneis														
schumanniana (Grun.) Cleve var. *biconstricta* Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cyclotella														
kuetzingiana Thwaites	–	–	–	–	–	–	1	1	+	–	–	1	–	–
- var. *planetophora* Fricke	–	–	–	–	–	–	–	–	–	–	+	–	–	–
- var. *radiosa* Fricke	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cymbella														
angustata (W. Smith) Cleve	–	–	–	–	–	–	2	3	1	1	1	4	–	–
broenlundensis Foged	+	–	–	–	–	+	+	–	–	–	–	1	–	–
cesatii (Rabh.) Grun.	–	–	–	–	–	–	+	–	–	–	–	–	–	–
cuspidata Kütz. sensu Foged	–	–	–	–	–	–	–	–	–	–	–	–	–	1
heteropleura (Ehr.) Kütz. var. *minor* Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–
naviculiformis Auerswald	–	–	–	–	–	–	–	–	–	–	–	–	–	–
norvegica Grun.	–	–	–	–	3	4	+	5	3	1	6	5	+	3
semigibbosa Patrick & Freese	–	–	–	–	–	–	–	–	–	–	–	–	–	–
sinuata Greg.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
spuria Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ventricosa Kütz.	–	–	–	–	89	130	105	80	126	61	154	151	152	140
Hantzschia														
amphioxys (Ehr.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Navicula														
bacillum Ehr.	–	–	–	–	+	–	–	–	–	–	–	–	–	–
bryophila Petersen	–	–	–	–	–	–	–	–	–	–	–	–	–	–
mutica Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
radiosa Kütz.	–	–	–	–	8	17	12	38	17	16	8	11	7	6
Neidium														
iridis (Ehr.) Cleve var. *porsildii* Foged	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Pinnularia														
gentilis (Donk.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–
gracillima Greg.	+	–	–	–	–	–	–	–	–	–	–	–	–	–
interrupta W. Smith	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- fo. *minutissima* Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
islandica Østrup	–	–	–	–	–	–	–	–	–	–	–	–	–	–
macilenta Ehr. var. *genuina* A. Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–
mesolepta (Ehr.) W. Smith	–	–	–	–	–	–	–	–	–	–	–	–	–	–
viridis (Nitzsch) Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stauroneis														
anceps Ehr.	–	–	–	–	4	3	2	5	3	3	5	3	2	1
- var. *genuina* Cleve-Euler	–	–	–	–	+	–	–	–	–	–	–	–	–	–
- fo. *triundulata* fo. nov.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
phoenicenteron (Nitzsch) Ehr.	–	–	–	–	–	–	–	–	–	+	1	1	+	1
Synedra														
ulna (Nitzsch) Ehr.	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Acidophilous or acidobiontic:														
Achnanthes														
flexella (Kütz.) Brun	–	2	8	–	1	1	+	+	+	1	3	4	11	13
kryophila Petersen	–	–	–	–	–	45	59	41	20	5	12	10	–	1
Cyclotella														
antiqua W. Smith	+	–	–	–	–	–	1	–	–	–	–	–	–	–
Eunotia														
arcus Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- var. *fallax* Hust.	+	–	–	–	–	–	–	–	–	–	–	–	–	–
monodon Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
pectinalis (Dillw.) Rabh.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- var. *minor* (Kütz.) Rabh.	–	–	–	–	–	–	+	+	+	+	+	2	–	–
praerupta Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Melosira														
distans (Ehr.) Kütz.														
- var. *lirata* (Ehr.) Bethge	–	2	–	+	–	–	–	–	–	–	–	–	–	–
Tabellaria														
flocculosa (Roth) Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–

1	–	–	+	–	–	–	–	–	–	–	–	2	4	–	–	–	–	–	–
+	–	+	1	–	–	2	2	1	–	–	–	1	+	–	–	+	1	+	3
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	5
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3
–	–	–	–	–	–	–	–	–	–	–	3	3	–	–	–	2	+	16	2
–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	+	+	10
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
–	–	–	–	+	–	–	–	–	–	–	–	–	1	–	–	+	2	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	23
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	2
–	–	–	1	1	2	–	3	11	9	30	24	8	2	5	6	15	1	2	+
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
–	–	+	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	+
4	3	1	5	5	4	3	3	7	+	3	–	1	–	–	1	2	8	2	1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
–	–	–	–	–	–	–	–	–	–	2	1	–	–	–	4	3	–	4	3
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
140	180	166	140	180	95	124	180	166	5	21	11	40	50	14	5	5	88	68	70
–	–	–	–	–	1	–	+	–	–	–	–	–	–	–	+	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
10	8	20	24	10	12	7	2	1	–	–	9	30	28	4	1	5	18	26	13
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	+
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	3	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
–	–	–	–	–	–	–	–	–	–	–	3	1	6	1	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	7	6	27	16	1	–	1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	2
–	–	–	–	–	–	–	–	–	+	–	1	–	–	–	–	–	–	1	3
2	2	–	8	3	8	3	4	5	15	8	39	11	7	4	3	6	4	9	7
+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
1	–	3	1	+	2	2	–	–	1	5	5	6	5	–	+	1	+	–	+
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
10	11	15	12	15	33	38	11	6	6	12	6	10	11	6	19	57	76	32	16
–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
–	–	–	2	1	+	–	–	–	–	–	+	2	1	1	–	–	+	5	13
–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	+	2	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
4	3	3	2	1	–	1	+	+	–	–	–	1	+	–	–	–	3	2	4
–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	3	–	7
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2

Plate Q I. Scale 10 µm

1. *Cyclotella antiqua* W. Smith. Diam. 18 µm. Q 2.
2. *Cyclotella kuetzingiana* Thwaites var. *radiosa* Fricke. Diam. 9 µm. Q 84.
3. *Fragilaria pinnata* Ehr. 7.5 × 4 µm. Q 20.
4. *Fragilaria construens* (Ehr.) Grun. fo. 16 × 5 µm. Q 124.
5. *Fragilaria construens* var. *binodis* (Ehr.) Grun. 16 × 4-4.5 µm. Q 24.
6. *Fragilaria construens* var. *binodis* (Ehr.) Grun. 18 × 4 µm. Q 100.
7. *Fragilaria virescens* Ralfs. 28 × 5.5 µm. Q 124.
8. *Fragilaria intermedia* Grun. 37 × 4 µm. Q 116.
9. *Eunotia praerupta* Ehr. 23 × 8 µm. Q 124. Anomalous forma.
10. *Eunotia arcus* Ehr. 40 × 8 µm. Q 92.
11. *Eunotia arcus* Ehr. 41 × 8 µm. Q 44.
12. *Eunotia pectinalis* (Dillw.) Rabh. var. *minor* (Kütz.) Rabh. 35 × 8 µm. Q 12.
13. *Eunotia praerupta* Ehr. fo. 26 × 9 µm. Q 124.
14. *Eunotia praerupta* Ehr. fo. 23 × 8 µm. Q 124.
15. *Achnanthes flexella* (Kütz.) Brun. 34 × 18 µm. Q 28.
16. *Mastogloia smithii* Thwaites var. *lacustris* Grun. 33 × 11 µm. Q 84.
17. *Eunotia pectinalis* (Dillw.) Rabh. 91 × 10 µm. Q 108.
18. *Cocconeis scutellum* Ehr. 22 × 18 µm. Q 80.
19. *Achnanthes flexella* (Kütz.) Brun. 39 × 19 µm. Q 36.
20. *Caloneis schumanniana* (Grun.) Cleve var. *biconstricta* Grun. 60 × 13 µm. Q 84.

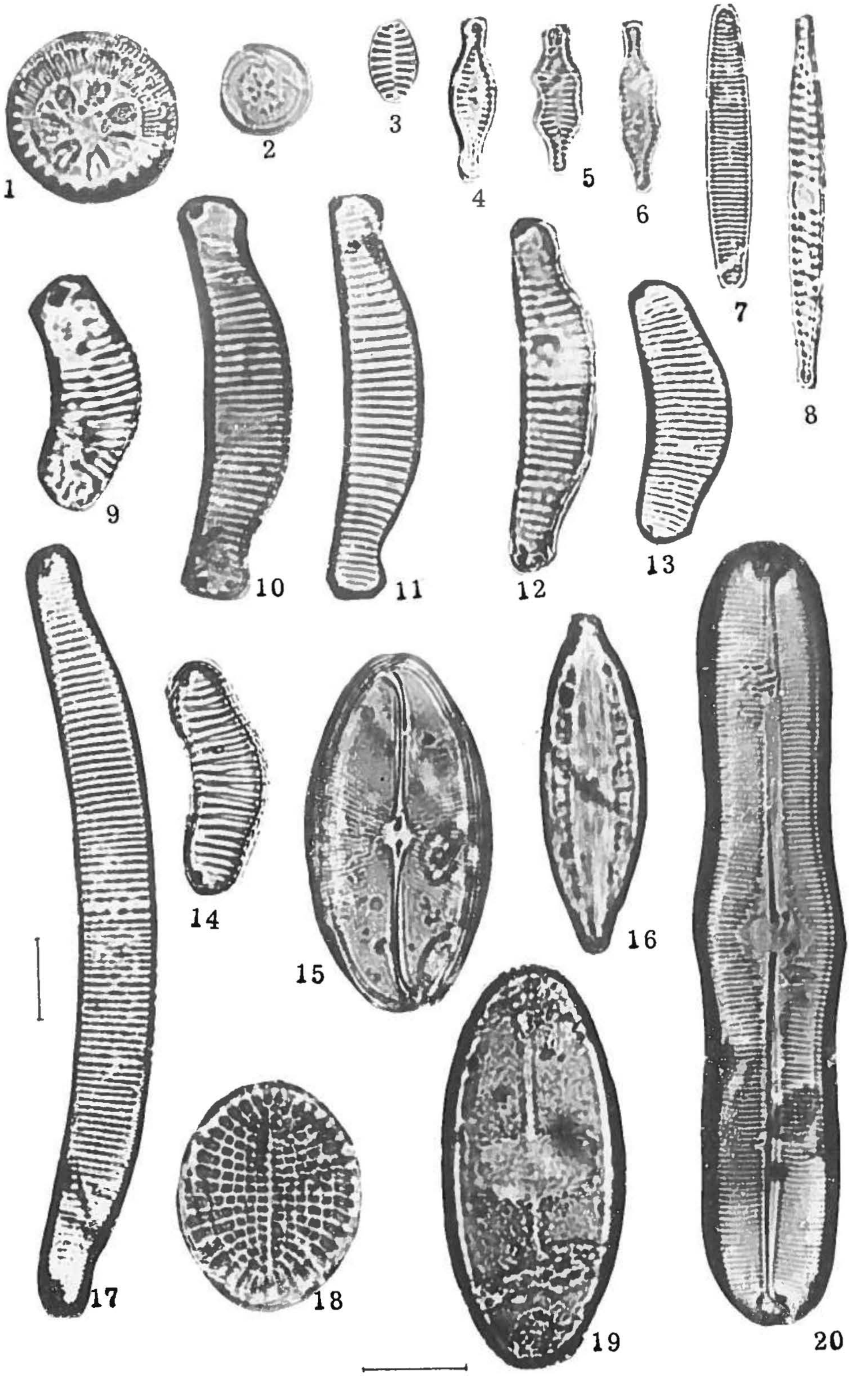
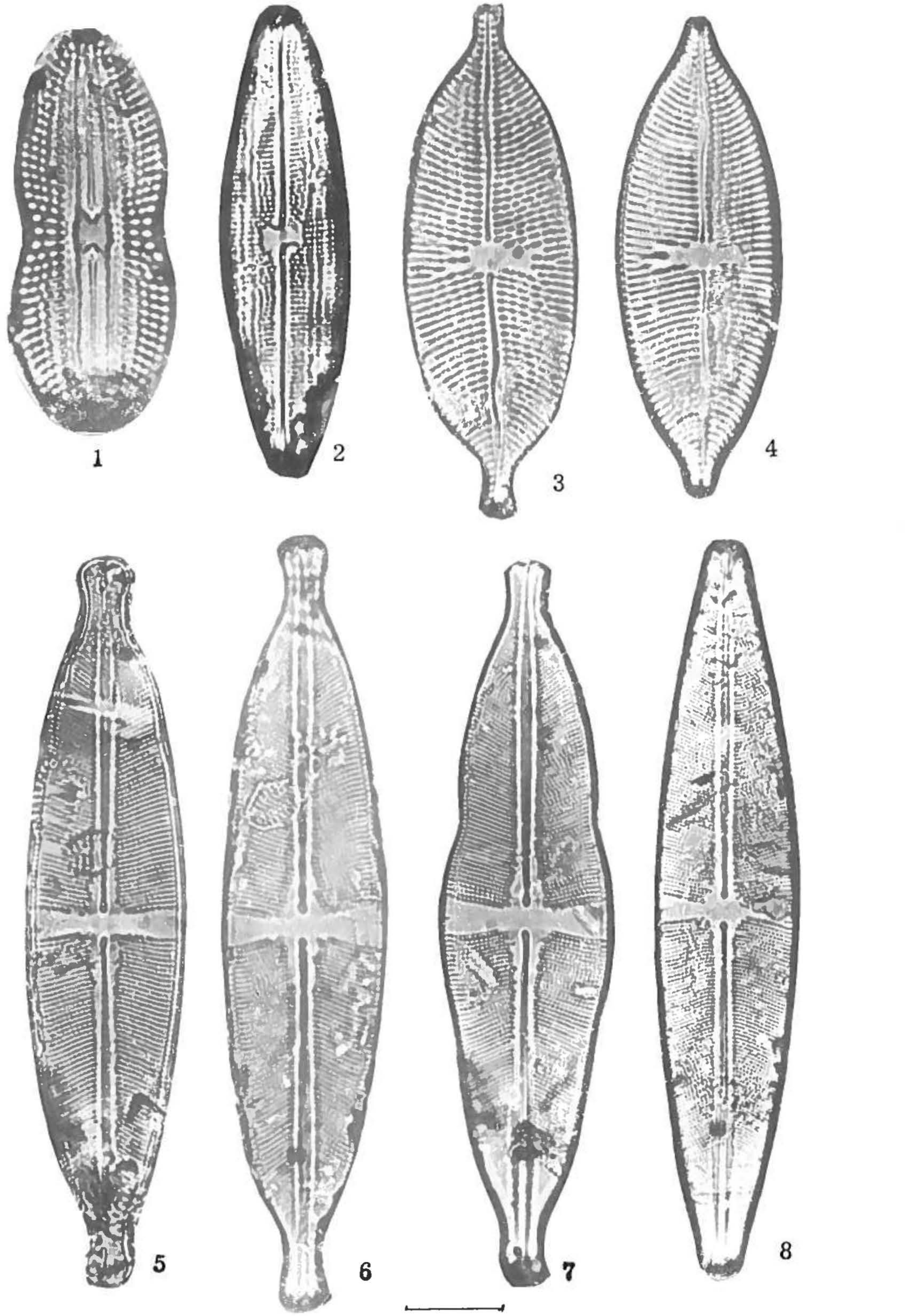

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

Plate Q II. Scale 10 µm

1. *Diploneis didyma* (Ehr.) Cleve. 42 × 14–17 µm. Q 84.
2. *Neidium iridis* (Ehr.) Cleve var. *porsildii* Foged. 47 × 14 µm. Q 108.
3. *Navicula tuscula* (Ehr.) Grun. var. *capitata* (Fontell) Cleve-Euler. 53 × 19 µm. Q 68.
4. *Navicula tuscula* (Ehr.) Grun. fo. *rostrata* Hust. 49 × 18 µm. Q recent.
5. *Stauroneis anceps* Ehr. var. *genuina* Cleve-Euler. 80 × 17 µm. Q 6.
6. *Stauroneis anceps* Ehr. var. *genuina* Cleve-Euler. 82 × 17 µm. Q 40.
7. *Stauroneis anceps* Ehr. fo. *triundulata* Foged fo. nov. 90 × 22 µm. Q 84.
8. *Stauroneis phoenicenteron* (Nitzsch) Ehr. 110 × 22 µm. Q 80.



1
2
3
4
5
6
7
8

Plate Q III. Scale 10 µm

1. *Navicula vulpina* Kütz. 85 × 16 µm. Q 20.
2. *Navicula vulpina* Kütz. 76 × 15 µm. Q 10.
3. *Navicula radiosa* Kütz. 80 × 11 µm. Q 124.
4. *Pinnularia macilenta* Ehr. var. *genuina* A. Cleve. 105 × 17 µm. Q 116.
5. *Pinnularia gentilis* (Donk.) Cleve. 120 × 19 µm. Q 108.
6. *Navicula mutica* Kütz. 22 × 6 µm. Q 84.
7. *Pinnularia gracillima* Greg. 28 × 4.5 µm. Q -2.
8. *Cymbella norvegica* Grun. 32 × 9 µm. Q 52.
9. *Cymbella turgida* (Greg.) Cleve. 52 × 13 µm. Q 44.
10. *Navicula modica* Hust. 13 × 5 µm. Q 124.
11. *Navicula modica* Hust. 15 × 5 µm. Q 124.
12. *Pinnularia interrupta* W. Smith. 45 × 9 µm. Q 84.

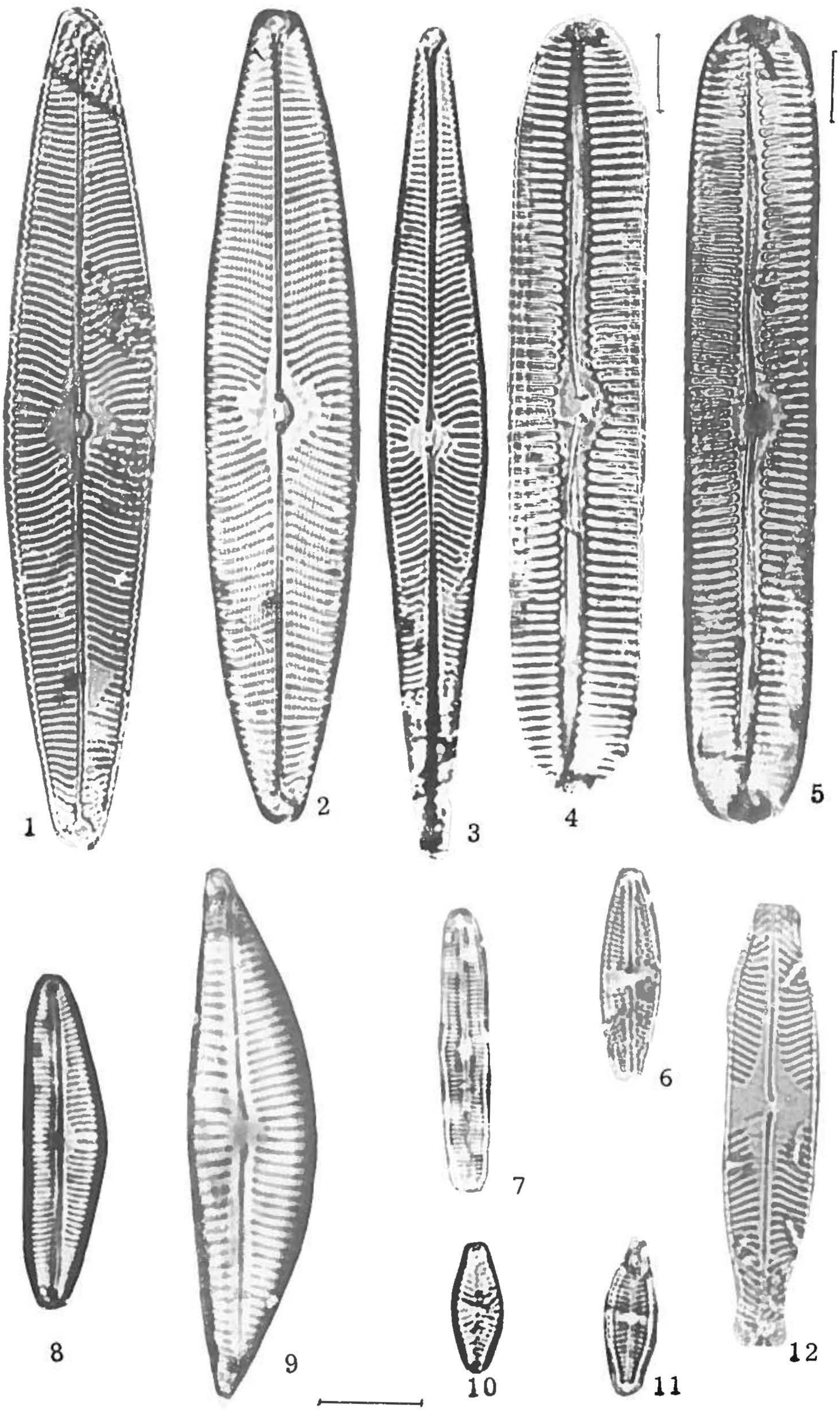

1
2
3
4
5
6
7
8
9
10
11
12

Plate Q IV. Scale 10 µm

1. *Amphora ovalis* (Kütz.) Kütz. var. *libyca* (Ehr.) Cleve. 42 × 10 µm. Q 72.
2. *Cymbella cuspidata* Kütz. 70 × 21 µm. Q 72.
3. *Cymbella spuria* Cleve. 63 × 18 µm. Q 116.
4. *Cymbella subaequalis* Grun. 49 × 8 µm. Q 32.
5. *Cymbella semigibbosa* Patrick & Freese. 45 × 8 µm. Q 124.
6. *Cymbella turgida* (Greg.) Cleve. 32 × 16 µm. Q 12.
7. *Cymbella helvetica* Kütz. var.*compacta* (Østrup) Hust. 28 × 8 µm. Q 92.
8. *Cymbella turgida* (Greg.) Cleve. 37 × 10 µm. Q 24.
9. *Cymbella ventricosa* Kütz. 17 × 7 µm. Q 20.
10. *Epithemia sorex* Kütz. 43 × 12 µm. Q 32.
11. *Epithemia sorex* Kütz. 35 × 13 µm. Q 32.
12. *Nitzschia denticula* Grun. 17 × 5 µm. Q 12.
13. *Nitzschia denticula* Grun. 29 × 6 µm. Q 12.
14. *Nitzschia angustata* (W. Smith) Grun. 51 × 6 µm. Q 12.
15. *Cymatopleura solea* (Bréb.) W. Smith. 128 ×19–22 µm. Q 12.

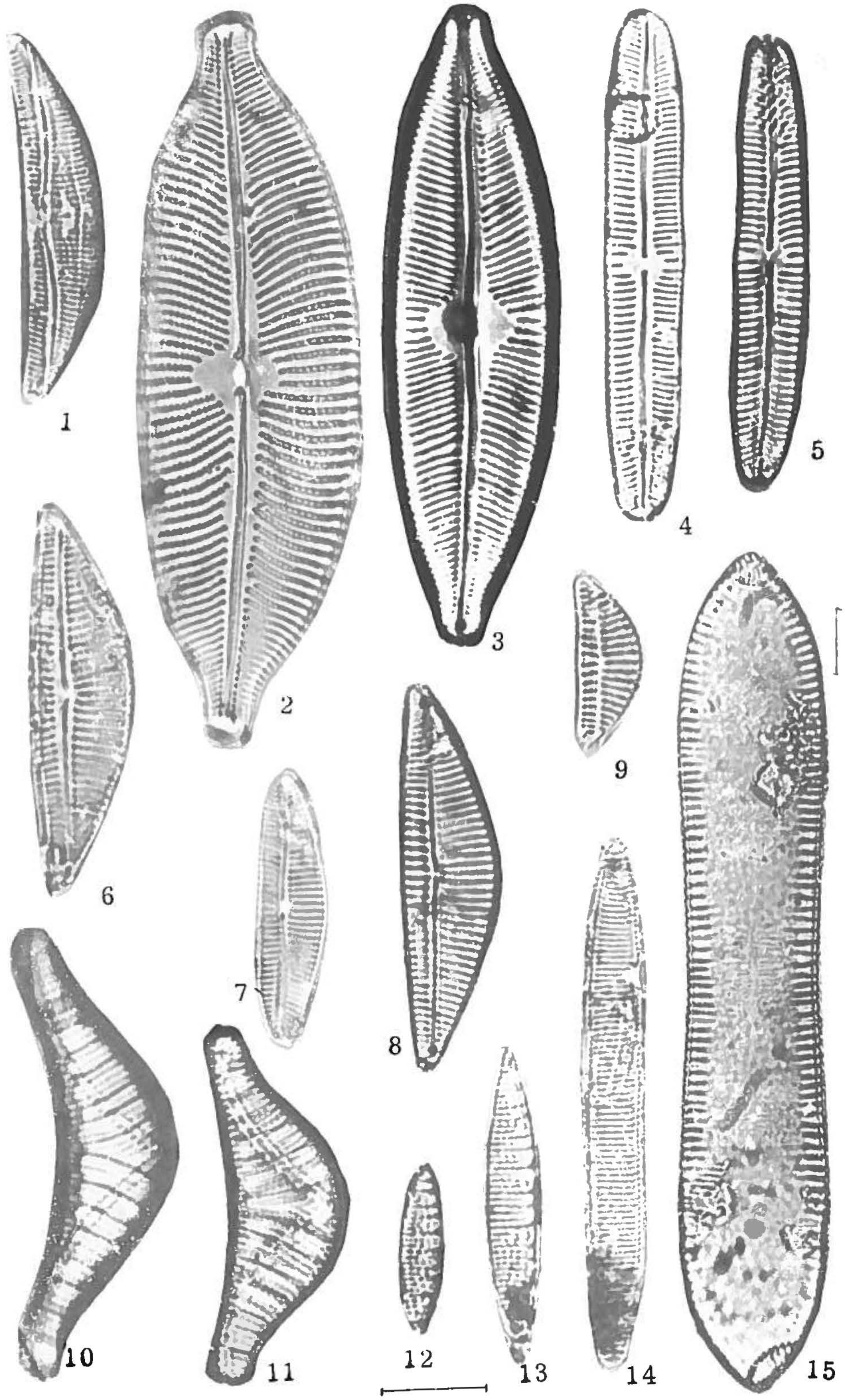

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Table Eq 1. List of diatoms, Eqalunguit, Disko.
For legend, see Table N 1.

Sample no. Eq	25–61	63	65	67	69	73	77	81	85	89	93	97	26–01	23	27	31	35	39	42	46	5(
Depth below lake bottom (cm)	148	144.5	141	137	133	125	117	109	101	93	85	77	69	60	52	44	36	28	20	12	4
Not Counted:																					
Fragilaria																					
brevistriata Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–
construens (Ehr.) Grun.	+	–	–	c	+	+	+	dom	+	–	–	–	+	dom	+	+	+	+	–	+	+
- var. *venter* (Ehr.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
intermedia Grun.	–	–	–	–	–	–	–	–	–	+	–	–	+	–	–	+	+	–	–	–	–
pinnata Ehr.	–	–	dom	c	dom	–	–	–	–	–	–	–	–	dom	+	–	+	+	+	+	+
virescens Ralfs	–	–	–	+	–	–	+	c	+	+	+	+	+	dom	–	+	+	+	+	+	–
Polyhalobous:																					
Diploneis																					
smithii (Bréb.) Cleve	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hyalodiscus																					
scoticus (Kütz.) Grun.	59	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Navicula																					
forcipata Grev.	1	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nitzschia																					
acuminata (W. Smith) Grun.	10	+	10	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
punctata (W. Smith) Grun. var. *coarctata* Grun.	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Podosira																					
stelliger (Bail.) Mann	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rhabdonema																					
arcuatum (Lyngbye) Kütz.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Scoliopleura																					
tumida (Bréb.) Rabh.	15	+	1	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Trachyneis																					
aspera (Ehr.) Cleve	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Mesohalobous:																					
Anomoeoneis																					
sphaerophora (Kütz.) Pfitzer	–	–	28	1	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Caloneis																					
westii (W. Smith) Hendey	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Diploneis																					
didyma (Ehr.) Cleve	10	+	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Mastogloia																					
elliptica (Ag.) Cleve	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
exigua Lewis	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Navicula																					
digito-radiata (Greg.) A. Schmidt	2	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- var. *arctica* Patrick & Freese	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
peregrina (Ehr.) Kütz.	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- var. *kefvingensis* (Ehr.) Cleve sensu Foged	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	+	–	–	–
- var. *meniscus* (Schum.) Grun.	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nitzschia																					
apiculata (Greg.) Grun.	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
hungarica Grun.	–	–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
sigma (Kütz.) W. Smith	25	+	–	6	27	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rhopalodia																					
musculus (Kütz.) O. Müller	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stauroneis																					
salina W. Smith	1	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Synedra																					
pulchella Kütz.	–	–	–	4	1	2	–	17	–	–	–	–	–	–	–	–	–	–	–	–	–
tabulata (Ag.) Kütz.	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Oligohalobous:																					
Alkaliphilous or alkalibiontic:																					
Achnanthes																					
lanceolata (Bréb.) Grun.	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- fo. *rostrata* (Østrup) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	1	–	–	–	–
minutissima Kütz.	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	1	–	–
Amphora																					
fonticola Maillard	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+

ovalis (Kütz.) Kütz.	1	–	+	–	4	–	–	–	4	–	2	–	3	–	3	3	+	+	+	3	+
- var. *libyca* (Ehr.) Cleve	–	–	1	14	–	4	8	4	10	22	21	8	41	38	58	52	10	6	14	21	25
Anomoeoneis																					
exilis (Kütz.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	2	+	1	–
- var. *lanceolata* A. Mayer	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
Caloneis																					
bacillaris (Greg.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
bacillum (Grun.) Cleve	–	–	–	–	–	–	–	–	1	+	1	–	+	–	+	+	–	–	–	–	1
silicula (Ehr.) Cleve	–	–	–	–	–	–	–	–	+	1	–	–	–	1	–	+	+	+	1	1	–
Cocconeis																					
pediculus Ehr.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
placentula Ehr.	–	–	–	23	–	1	30	11	5	12	5	8	6	6	21	5	1	+	1	+	1
Cymbella																					
affinis Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	2	2	+	–	–
aspera (Ehr.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	+	–	–	–	–	–
cistula (Hempr.) Kirchner	–	–	–	–	–	–	–	–	–	–	–	1	1	4	1	1	2	4	5	1	2
cymbiformis (Ag.) V. Heurck	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+
hebridica (Greg.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	1	–	–
turgida (Greg.) Cleve	–	–	–	–	–	–	–	–	–	3	–	–	+	1	–	+	–	–	–	+	–
Denticula																					
tenuis Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
- var. *crassula* (Naeg.) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	6	3	4	–	–
Diatomella																					
balfouriana Grev.	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Diploneis																					
elliptica (Kütz.) Cleve	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Epithemia																					
argus Kütz.	–	–	21	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
muelleri Fricke	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
smithii Carruthers	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
sorex Kütz.	4	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	+	–	–
turgida (Ehr.) Kütz.	–	–	–	15	2	–	4	3	–	+	1	5	2	–	–	+	+	+	+	–	2
- var. *granulata* (Ehr.) Brun	–	–	–	9	8	2	1	5	5	2	1	–	1	1	1	1	–	–	–	1	–
zebra (Ehr.) Kütz.	–	–	–	1	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- var. *porcellus* (Kütz.) Grun.	–	–	–	34	–	–	+	2	1	–	1	–	1	–	–	3	–	+	+	1	–
- var. *saxonica* (Kütz.) Grun.	–	–	19	45	3	2	+	2	+	+	+	1	3	1	5	4	–	–	1	–	7
Gomphonema																					
acuminatum Ehr.	–	–	–	–	–	–	–	–	1	4	–	+	5	2	+	1	+	–	+	–	–
- var. *brebissonii* (Kütz.) Cleve	–	–	–	1	–	–	1	3	–	–	1	+	–	–	–	+	4	2	3	+	2
- var. *coronata* (Ehr.) W. Smith	–	–	–	–	–	–	–	1	+	2	2	1	–	2	–	2	3	2	–	+	2
- var. *elongata* (W. Smith) V. Heurck fo. *tenuis* A. Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
- var. *turris* (Ehr.) Cleve	–	–	–	–	–	–	–	4	–	2	–	1	6	5	–	1	5	1	1	+	+
angustatum (Kütz.) Rabh.	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	2	–
- var. *productum* Brun	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
constrictum Ehr.	–	–	–	–	–	–	+	–	–	–	+	–	6	1	–	1	+	+	+	+	–
- var. *capitata* (Ehr.) Cleve	–	–	+	–	–	–	+	1	–	+	–	–	–	–	–	1	3	1	1	+	1
gracile Ehr.	–	–	–	–	–	–	–	1	–	+	+	+	10	–	–	1	1	1	–	2	7
- var. *lanceolata* (Kütz.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	+	–	–	–
intricatum Kütz.	–	–	–	–	–	–	–	–	–	1	+	–	–	–	–	–	–	–	+	–	–
- var. *pumila* Grun.	–	–	–	–	–	–	+	4	5	2	1	4	1	2	2	–	–	–	–	–	–
lanceolatum Ehr.	–	–	–	–	–	–	1	–	–	3	1	–	3	–	–	+	+	1	–	–	–
longiceps Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–
Melosira																					
ambigua (Grun.) O. Müller	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
Navicula																					
cincta (Ehr.) Kütz.	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
cryptocephala Kütz.	–	–	–	–	1	–	+	–	–	–	–	–	–	–	–	–	–	3	–	–	–
- var. *veneta* (Kütz.) Rabh.	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+	–	–
dicephala (Ehr.) W. Smith	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	+	+	2	–	–
exilis Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	4	–	–	–
grudeensis Foged	–	–	–	55	–	57	65	–	–	–	–	–	–	–	–	–	–	–	–	–	–
hungarica Grun. var. *capitata* (Ehr.) Cleve	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
rhyncocephala Kütz.	–	–	3	1	4	–	37	19	46	12	32	38	4	5	26	4	6	+	8	25	36
- var. *elongata* Mayer sensu Germain	–	–	–	–	–	–	13	–	–	–	–	–	–	–	–	–	–	–	–	–	–
rotundata Hust.	–	–	–	–	–	–	–	–	–	–	–	–	2	+	–	+	–	–	–	–	–
salinarum Grun.	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
scutelloides W. Smith	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
viridula Kütz.	–	–	10	–	70	1	+	–	–	1	–	–	–	–	–	–	–	–	–	–	–

vulpina Kütz.	2	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Neidium																					
affine (Ehr.) Cleve	–	–	–	–	–	–	–	–	–	+	+	–	–	–	1	–	2	2	3	2	1
- var. *amphirhynchus* (Ehr.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+	+	2	+	2	3
- var. *capitata* Möller	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
- var. *longiceps* (Greg.) Cleve	–	–	–	–	–	–	–	–	+	–	+	–	–	–	–	–	–	–	–	–	+
bisulcatum (Lagerst.) Cleve	–	–	–	–	–	–	–	–	1	3	2	+	+	+	–	–	+	+	+	–	–
temperei Reimer	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	1	–	+
Nitzschia																					
acuta Hantzsch	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–
angustata (W. Smith) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
- var. *acuta* Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	6	6	+	–
denticula Grun.	–	–	–	–	–	–	–	1	–	+	–	–	–	–	–	–	2	+	1	1	+
frustulum (Kütz.) Grun.	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	+	1	2	–	–
perpusilla Rabh.	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	1	+	–	–	+
sigmoidea (Ehr.) W. Smith	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
sociabilis Greg.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2	–	–
Opephora																					
martyi Héribaud	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rhopalodia																					
gibba (Ehr.) O. Müller	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	+	+	–	–
parallela (Grun.) O. Müller	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stauroneis																					
smithii Grun.	–	–	–	–	–	–	5	2	13	+	1	–	–	–	2	–	–	–	–	1	+
Surirella																					
biseriata Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	+	1	1	1
robusta Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
- var. *splendida* (Ehr.) V. Heurck	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	+	+	–	–
tenera Greg. var. *nervosa* A. Schmidt	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–
Synedra																					
acus Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
amphicephala Kütz.	–	–	–	–	–	–	–	–	2	6	3	3	–	–	1	+	–	–	–	–	–
parasitica (W. Smith) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–
pH-indifferent or circumneutral:																					
Achnanthes																					
laterostrata Hust.	–	–	–	–	–	–	+	–	+	1	4	5	4	2	1	5	4	+	1	4	+
linearis (W. Sm.) Grun.	–	–	–	–	–	–	–	–	–	11	6	–	8	–	–	7	4	+	+	1	2
oestrupii (A. Cleve) Hust.	–	–	–	–	–	–	+	–	–	4	1	17	23	31	5	+	1	–	–	–	–
recurvata Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	+	–	1
Caloneis																					
pulchra Messikommer	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cymbella																					
cesatii (Rabh.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	1	–	–
cuspidata Kütz.	1	–	–	–	–	–	–	–	–	–	+	–	–	1	–	+	+	1	1	+	+
gracilis (Rabh.) Cleve	–	–	–	–	–	–	–	–	–	–	+	–	–	1	–	2	14	23	12	8	4
heteropleura (Ehr.) Kütz. fo. *minor* Cleve	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	+	+	–	–
- var. *subrostrata* Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
laterostrata Pant. var. *alaskana* Patrick & Freese	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
microcephala Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
naviculiformis Auerswald	–	–	–	–	–	–	+	2	+	1	1	–	4	2	1	1	+	+	+	1	2
norvegica Grun.	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	1	+	+	–	–
sinuata Greg.	+	–	–	–	–	–	–	–	–	–	–	–	–	1	4	1	+	–	+	3	2
- var. *ovata* Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
ventricosa Kütz.	5	–	–	–	–	–	1	5	–	3	2	+	1	4	1	6	4	10	6	1	1
Diatoma																					
elongatum (Lyngb.) Ag. var. *tenuis* V. Heurck	–	–	–	1	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Diploneis																					
puella (Schum.) Cleve	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Eunotia																					
lunaris (Ehr.) Grun. sensu Patrick & Reimer	–	–	–	–	–	–	2	2	1	1	–	–	+	–	2	2	3	2	+	+	+
- var. *subarcuata* (Naeg.) Grun.	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	1	–	–	1	–	1
Gomphonema																					
parvulum (Kütz.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–
subtile Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	+	1	–	–	1	+	–	–	+
Melosira																					
italica (Ehr.) Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	–	–	–	+

- var. *valida* Grun.	–	–	–	–	–	–	–	61	11	12	10	8	13	14	19	24	+	2	+	2	7
roeseana Rabh.	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Navicula																					
paludosa Hust.	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	+	–	–
pseudolanceolata Lange-Bertalot	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
pseudoscutiformis Hust.	–	–	–	–	–	–	–	1	–	1	+	1	+	2	–	–	2	4	2	+	+
pupula Kütz.	–	–	–	–	–	–	–	–	+	–	+	–	+	–	+	2	2	+	+	1	1
- var. *rectangularis* (Greg.) Grun.	–	–	–	–	–	–	–	–	–	+	–	–	+	–	–	+	+	1	1	–	1
radiosa Kütz.	1	–	–	–	–	–	1	8	1	+	+	2	4	3	1	2	12	56	30	6	2
- var. *tenella* (Bréb. ex. Kütz.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	–	–
rotaeana (Rabh.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
seminulum Grun. var. *intermedia* Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	40	9	1	1	–
subrotundata Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–
wittrockii (Lagerst.) Cleve-Euler	+	–	–	–	–	–	5	+	3	7	3	5	4	4	5	+	3	3	2	2	4
- fo. *fusticulus* (Østrup) Cleve-Euler	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
Neidium																					
iridis (Ehr.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	1	1	3	+	1	+	1	+	6
- var. *amphigomphus* (Ehr.) V. Heurck	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	1	–	+	–
- var. *ampliata* (Ehr.) Cleve	–	–	–	–	–	–	+	–	+	2	+	–	–	–	–	–	–	–	+	–	–
Nitzschia																					
ignorata Krasske	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
Pinnularia																					
aequilateralis Patrick & Freese	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
borealis Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
braunii (Grun.) Cleve var. *amphicephala* (A. Mayer) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	3	5	11	13	28
brevicostata Cleve	–	–	–	–	–	–	–	–	1	–	1	1	–	–	–	–	1	+	–	–	–
dactylus Ehr.	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
gentilis (Donk.) Cleve	–	–	–	–	1	+	+	–	–	–	–	–	–	–	–	+	+	1	1	1	–
gibba Ehr.	–	–	–	–	–	–	–	–	1	2	+	+	4	2	2	+	5	+	4	4	4
- var. *linearis* Hust.	–	–	–	–	–	–	–	–	–	26	11	–	4	–	–	+	1	+	2	1	–
- var. *mesogongyla* (Ehr.) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
gracillima Greg.	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	+	1	1	2
interrupta W. Smith	–	–	–	14	2	18	2	+	4	+	–	–	–	–	–	1	–	+	–	–	+
- fo. *minutissima* Hust.	–	–	–	–	6	–	24	15	33	18	16	18	10	6	15	4	22	20	16	11	–
krockii (Grun.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
major (Kütz.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	+	–	–	–
mesolepta (Ehr.) W. Smith	–	–	–	–	2	2	4	+	+	1	1	–	1	–	–	+	+	1	1	2	–
microstauron (Ehr.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–	–
- var. *brebissonii* (Kütz.) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–
- - fo. *diminuta* Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
nodosa Ehr.	–	–	–	6	12	1	14	7	17	23	30	28	14	8	5	6	1	5	6	4	8
pulchra Østrup	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	5	14	21	1	1
stomatophora (Grun.) Cleve	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	+	–	–
subcapitata Greg.	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
viridis (Nitzsch) Ehr. fo. *cuneata* (Østrup et Cleve) Foged	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
viridis (Nitzsch) Ehr.	–	–	–	–	1	6	2	2	+	1	–	1	2	–	3	2	+	1	–	–	–
- var. *sudetica* (Hilse) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Stauroneis																					
acuta W. Smith	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
anceps Ehr.	2	–	–	–	1	1	1	13	17	17	32	37	34	66	26	10	16	9	28	34	22
- fo. *gracilis* Rabh.	–	–	–	–	–	–	–	–	–	–	4	8	4	4	3	3	6	8	15	15	12
- var. *hyalina* Brun & Perag.	–	–	–	–	–	–	4	1	14	6	3	3	–	–	–	–	+	–	–	–	4
phoenicenteron (Nitzsch) Ehr.	1	–	–	–	–	–	3	1	+	+	1	1	–	–	+	+	+	2	6	+	6
Surirella																					
linearis W. Smith var. *constricta* (Ehr.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
Synedra																					
tenera W. Smith	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	2	–	2
ulna (Nitzsch) Ehr.	–	–	–	+	–	1	1	3	+	1	2	1	+	+	–	–	–	–	–	–	–
- var. *aequalis* (Kütz.) Hust.	–	–	–	–	–	–	–	–	3	1	+	–	1	+	–	+	–	–	–	–	–
Acidophilous or acidobiontic:																					
Achnanthes																					
depressa (Cleve) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+	–	–	–
flexella (Kütz.) Brun	1	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
- var. *alpestris* Brun	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	+
Anomoeoneis																					

serians (Bréb.) Cleve var. *brachysira* (Bréb.) Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	2	–	–
Cymbella																					
incerta Grun.	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	+	6	5	6	1	1
Eunotia																					
alpina (Naeg.) Hust.	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
arcus Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
bigibba Kütz. var. *pumila* Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
diodon Ehr.	–	–	–	–	–	–	–	–	–	–	–	–	1	+	3	2	2	+	–	5	4
faba (Ehr.) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+
- fo. *rhomboidea* Foged	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	1	+	–
gracilis (Ehr.) Rabh.	–	–	–	–	–	–	–	+	1	4	6	1	–	1	2	5	1	+	+	2	2
lapponica Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
major Ehr. var. *scandica* Cleve-Euler fo. *ventricosa* Cleve-Euler	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	+
monodon Ehr.	–	–	–	–	–	–	+	1	1	4	1	2	1	–	2	1	+	3	2	9	5
- var. *major* (W. Smith) Hust.	–	–	–	–	–	–	–	–	–	+	+	1	+	–	+	+	+	–	+	–	–
pectinalis (Dillw.) Rabh.	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–	–	–	–	–	–	+
- var. *minor* (Kütz.) Rabh.	+	–	–	–	–	–	18	18	46	75	35	15	10	12	19	+	6	2	1	11	9
polyglyphis Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	+	1	+	–	–
praerupta Ehr.	–	–	–	–	–	–	–	+	–	–	+	1	+	–	–	15	2	8	2	12	6
- var. *bidens* (W. Smith) Grun.	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
rhomboidea Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	–
robusta Ralfs	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+	+	+	–	+	+
- var. *tetraodon* (Ehr.) Ralfs	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–
septentrionalis Østrup	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
sudetica O. Müller var. *bidens* Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
suecica A. Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
tenella (Grun.) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
valida Hust.	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	+	1	–	–	–	–
Melosira																					
distans (Ehr.) Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	+	–	–
- var. *lirata* (Ehr.) Bethge	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	3	4	–	+	–	1
Navicula																					
variostriata Krasske	–	–	–	–	–	–	–	+	–	–	–	–	–	–	+	–	+	+	+	–	–
Stauroneis																					
lapponica A. Cleve	–	–	–	–	–	–	+	15	–	–	2	16	4	14	4	3	6	1	2	13	4
Tabellaria																					
fenestrata (Lyngbye) Kütz.	–	–	–	–	–	–	–	2	1	+	–	1	–	+	1	1	+	2	–	–	1
flocculosa (Roth) Kütz.	–	–	–	–	–	–	–	1	+	+	1	+	+	–	1	+	+	2	+	4	–
quadriseptata Knudson	–	–	–	–	–	–	–	–	–	–	2	1	2	1	–	5	1	+	+	3	2

Table Eq 2. pH-spectra, Eqalunguit, Disko.
For legend, see Table N 1.

Depth below lake bottom (cm)	Sample no.	*Fragilaria* not counted		Polyhalobous		Mesohalobous		Oligohalobous Alkaliphilous + alkalibiontic		Oligohalobous pH-indifferent or circumneut.		Oligohalobous Acidophilous + acidobiontic		Total valves	
	Eq	taxa	freq.	taxa	%	taxa	%	taxa	%	taxa	%	taxa	%	taxa	counted
4	2650	2	+					23	36.4	33	49.6	15	14.0	71	250
12	2646	3	+					29	26.8	28	46.8	13	26.4	70	250
20	2642	3	+					40	23.6	44	69.6	22	6.8	106	250
28	2639	4	+			1	+	42	18.8	42	70.8	19	10.4	103	250
36	2635	5	+					34	22.4	43	66.0	19	11.6	96	250
44	2631	3	+					30	41.0	37	41.0	15	18.0	82	200
52	2627	2	+					15	48.8	20	38.4	10	12.8	45	250
60	2623	3	dom					16	27.6	21	61.2	6	11.2	43	250
69	2601	3	+					25	38.4	25	54.4	10	7.2	60	250
77	2597	1	+					15	29.2	18	54.8	12	16.0	45	250
85	2593	1	+					21	30.0	26	51.2	8	18.8	55	250
93	2589	2	+					23	25.3	28	47.0	8	27.7	59	300
101	2585	2	+					16	37.6	21	42.8	6	19.6	43	250
109	2581	2	dom			1	+	16	26.0	20	56.0	9	14.8	46	250
117	2577	2	+					20	67.2	18	25.6	3	7.2	41	250
125	2573	1	+			1	1.0	7	68.0	8	31.0	–	–	16	100
133	2569	2	dom	1	0.7	2	19.3	8	62.0	9	18.0	–	–	20	150
137	2567	3	c	1	0.8	3	6.4	15	82.4	6	10.4	–	–	25	250
141	2565	1	dom	3	13.0	5	31.0	6	55.0	1	1.0	–	–	15	100
144.5	2563	–	–	6		8		1						15	few
148	2561	1	+	7	58.0	8	28.0	7	6.7	7	6.7	2	0.6	30	150

Plate Eq I. Scale 10 µm

1. *Podosira stelliger* (Bail.) Mann. Diam. 24 µm. Eq 2563.
2. *Melosira italica* (Ehr.) Kütz. Width 11 µm. Eq 2650.
3. *Melosira distans* (Ehr.) Kütz. var. *lirata* (Ehr.) Bethge. Width 15 µm. Eq 2650.
4. *Melosira distans* (Ehr.) Kütz. Width 6 µm. Eq 2642.
5. *Eunotia major* Ehr. var. *scandica* Cleve-Euler fo. *ventricosa*. 125 × 19 µm. Eq 2589.
6. *Eunotia faba* (Ehr.) Grun. fo. *rhomboidea* Foged. 31 × 8 µm. Eq 2646.
7. *Synedra amphicephala* Kütz. 48 × 3 µm. Eq 2589.
8. *Eunotia gracilis* (Ehr.) Rabh. 102 × 7 µm. Eq 2623.
9. *Eunotia lunaris* (Ehr.) Grun. 98 × 7 µm. Eq 2639.
10. *Eunotia monodon* Ehr. 84 × 14 µm. Eq 2639.
11. *Eunotia monodon* Ehr. 105 × 15 µm. Eq 2631.
12. *Eunotia polyglyphis* Grun. 38 × 8 µm. Eq 2642.
13. *Fragilaria brevistriata* Grun. 20 × 6 µm. Eq 2639.
14. *Eunotia bigibba* Kütz. var. *pumila* Grun. 18 × 5–5.5 µm. Eq 2642.
15. *Eunotia diodon* Ehr. 21 × 5–6 µm. Eq 2650.
16. *Eunotia pectinalis* (Dillw.) Rabh. var. *minor* (Kütz.) Rabh. 19 × 5 µm. Eq 2631.
17. *Eunotia polyglyphis* Grun. 25 × 8 µm. Eq 2642.
18. *Eunotia sudetica* O. Müller var. *bidens* Hust. 31 × 5.5–6 µm. Eq 2642.
19. *Eunotia robusta* Ralfs. 43 × 13 µm. Eq 2646.

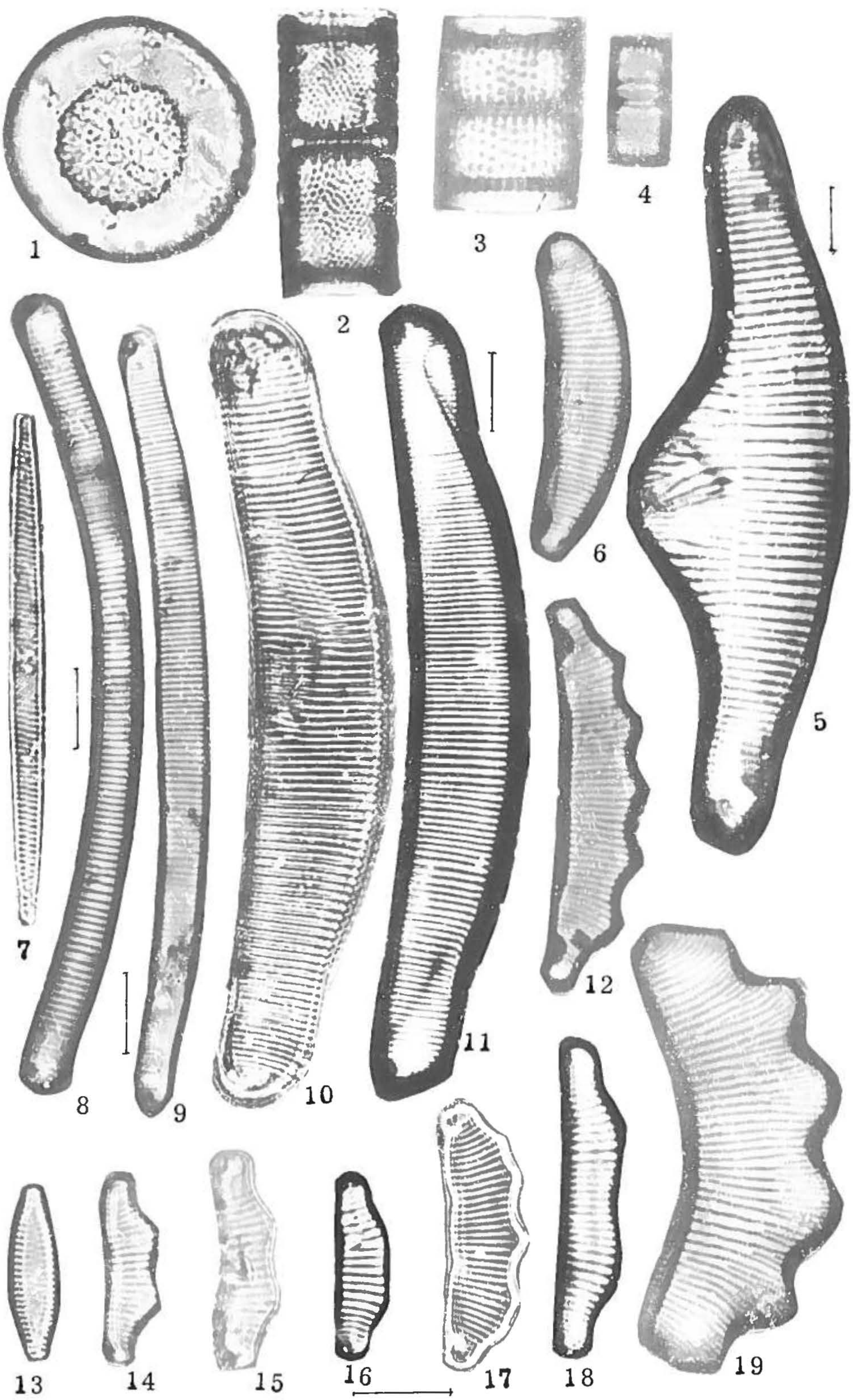
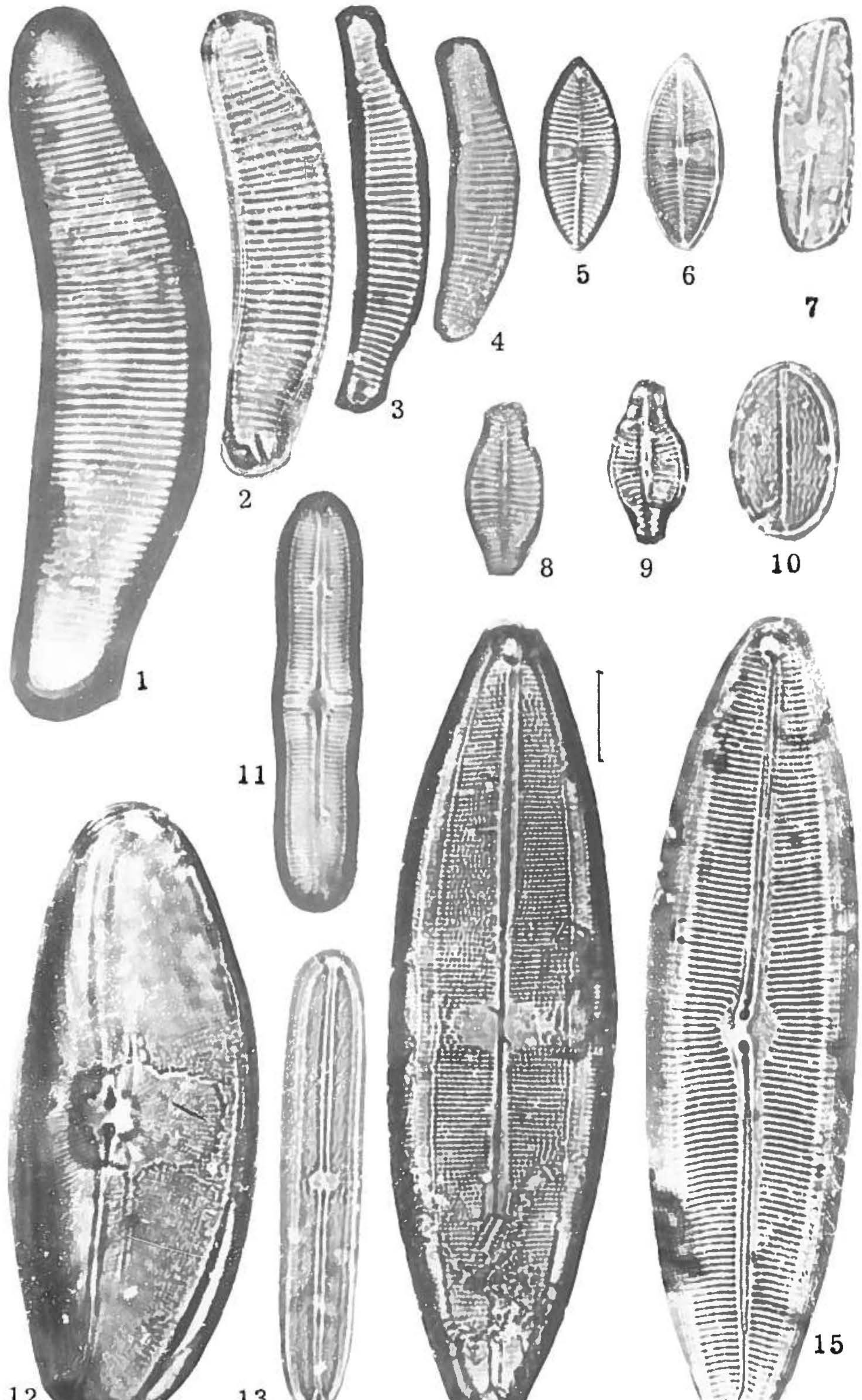

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

Plate Eq II. Scale 10 µm

1. *Eunotia monodon* Ehr. 68 × 16 µm. Eq 2650.
2. *Eunotia praerupta* Ehr. 43 × 10 µm. Eq 2642.
3. *Eunotia pectinalis* (Dillw.) Rabh. 40 × 7 µm. Eq 2650.
4. *Eunotia pectinalis* var. *minor* (Kütz.) Rabh. 29 × 7 µm. Eq 2646.
5. *Achnanthes oestrupii* (A. Cleve) Hust. 18 × 8 µm. Eq 2601.
6. *Achnanthes oestrupii* (A. Cleve) Hust. 18 × 8 µm. Eq 2601.
7. *Achnanthes flexella* (Kütz.) Brun var. *alpestris* Brun. 23 × 8 µm. Eq 2650.
8. *Achnanthes laterostrata* Hust. 16 × 8 µm. Eq 2646.
9. *Achnanthes laterostrata* Hust. 16 × 8 µm. Eq 2646.
10. *Cocconeis placentula* Ehr. 17 × 10 µm. Eq 2650.
11. *Caloneis silicula* (Ehr.) Cleve. 40 × 8 µm. Eq 2631.
12. *Achnanthes flexella* (Kütz.) Brun. 55 × 26 µm. Eq 2561.
13. *Neidium bisulcatum* (Lagerst.) Cleve. 43 × 7 µm. Eq 2639.
14. *Neidium iridis* (Ehr.) Cleve. 92 × 27 µm. Eq 2650.
15. *Caloneis westii* (W. Smith) Hendey. 81 × 20 µm. Eq 2563.



4

Plate Eq III. Scale 10 μm

1. *Neidium iridis* (Ehr.) Cleve. 68 × 25 μm. Eq 2639.
2. *Neidium iridis* (Ehr.) Cleve var. *ampliata* (Ehr.) Cleve. 67 × 23 μm. Eq 2642.
3. *Neidium iridis* (Ehr.) Cleve. 56 × 23 μm. Eq 2635.
4. *Stauroneis smithii* Grun. 28 × 9 μm. Eq 2650.
5. *Neidium temperei* Reimer. 43 × 18 μm. Eq 2650.
6. *Diploneis didyma* (Ehr.) Cleve. 47 × 15–18 μm. Eq 2563.
7. *Neidium affine* (Ehr.) Cleve. 53 × 12 μm. Eq 2650.
8. *Stauroneis lapponica* A. Cleve. 26 × 5 μm. Eq 2581.
9. *Stauroneis lapponica* A. Cleve. 21 × 5 μm. Eq 2631.
10. *Stauroneis anceps* Ehr. fo. *gracilis* Rabh. 47 × 10 μm. Eq 2639.
11. *Stauroneis lapponica* A. Cleve. 20 × 5 μm. Eq 2581.
12. *Stauroneis lapponica* A. Cleve. 16 × 5 μm. Eq 2577.
13. *Diatomella balfouriana* Grev. 18 × 6 μm. Eq 2561.
14. *Stauroneis acuta* W. Smith. 120 × 21 μm. Eq 2639.

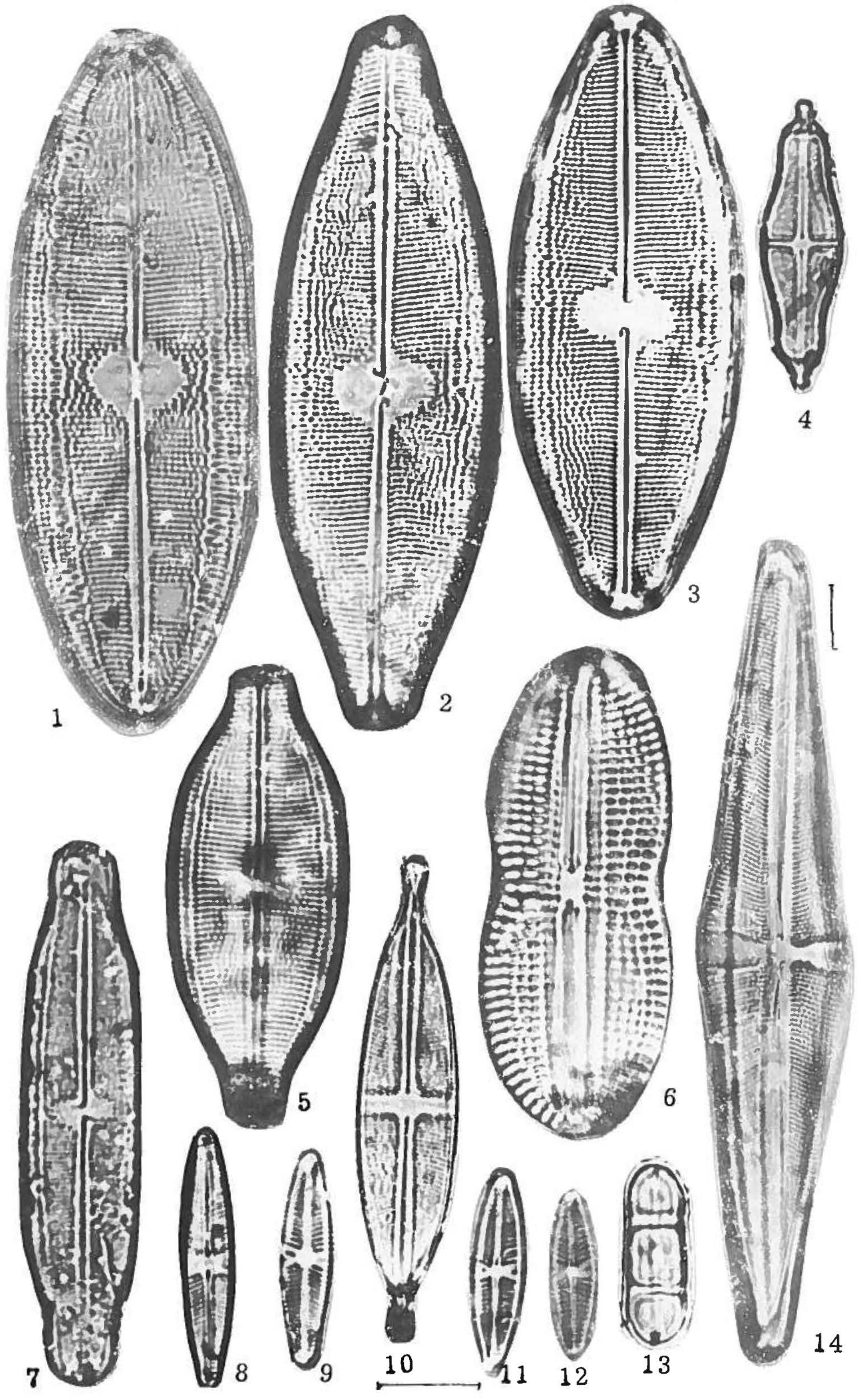

1
2
3
4
5
6
7
8
9
10
11
12
13
14

Plate Eq IV. Scale 10 µm

1. *Navicula digito-radiata* (Greg.) A. Schmidt. 56 × 15 µm. Eq 2561.
2. *Navicula digito-radiata* var. *arctica* Patrick & Freese. 55 × 12 µm. Eq 2563.
3. *Navicula peregrina* (Ehr.) Kütz. var. *kefvingensis* (Ehr.) Cleve. 63 × 12 µm. Eq 2581.
4. *Navicula rhyncocephala* Kütz. var. *elongata* Mayer. 68 × 13 µm. Eq 2577.
5. *Navicula grudeensis* Foged. 50 × 11 µm. Eq 2567.
6. *Navicula pseudolanceolata* Lange-Bertalot. 37 × 9 µm. Eq 2639.
7. *Navicula rhyncocephala* Kütz. 55 × 10 µm. Eq 2650.
8. *Navicula cryptocephala* Kütz. 38 × 8 µm. Eq 2639.
9. *Navicula dicephala* (Ehr.) W. Smith. 29 × 10 µm. Eq 2642.
10. *Navicula forcipata* Grev. 26 × 10 µm. Eq 2563.
11. *Navicula rhyncocephala* Kütz. 58 × 12 µm. Eq 2642.
12. *Navicula radiosa* Kütz. var. *tenella* (Bréb. ex Kütz.) Grun. 23 × 5 µm. Eq 2639.
13. *Navicula pseudoscutiformis* Hust. 9 × 9 µm. Eq 2642.
14. *Navicula pseudoscutiformis* Hust. 15 × 13 µm. Eq 2639.
15. *Navicula variostriata* Krasske. 22 × 7.5 µm. Eq 2642.
16. *Navicula wittrockii* (Lagerst.) Cleve-Euler var. *fusticulus* (Østrup) Cleve-Euler. 30 × 8 µm. Eq 2589.

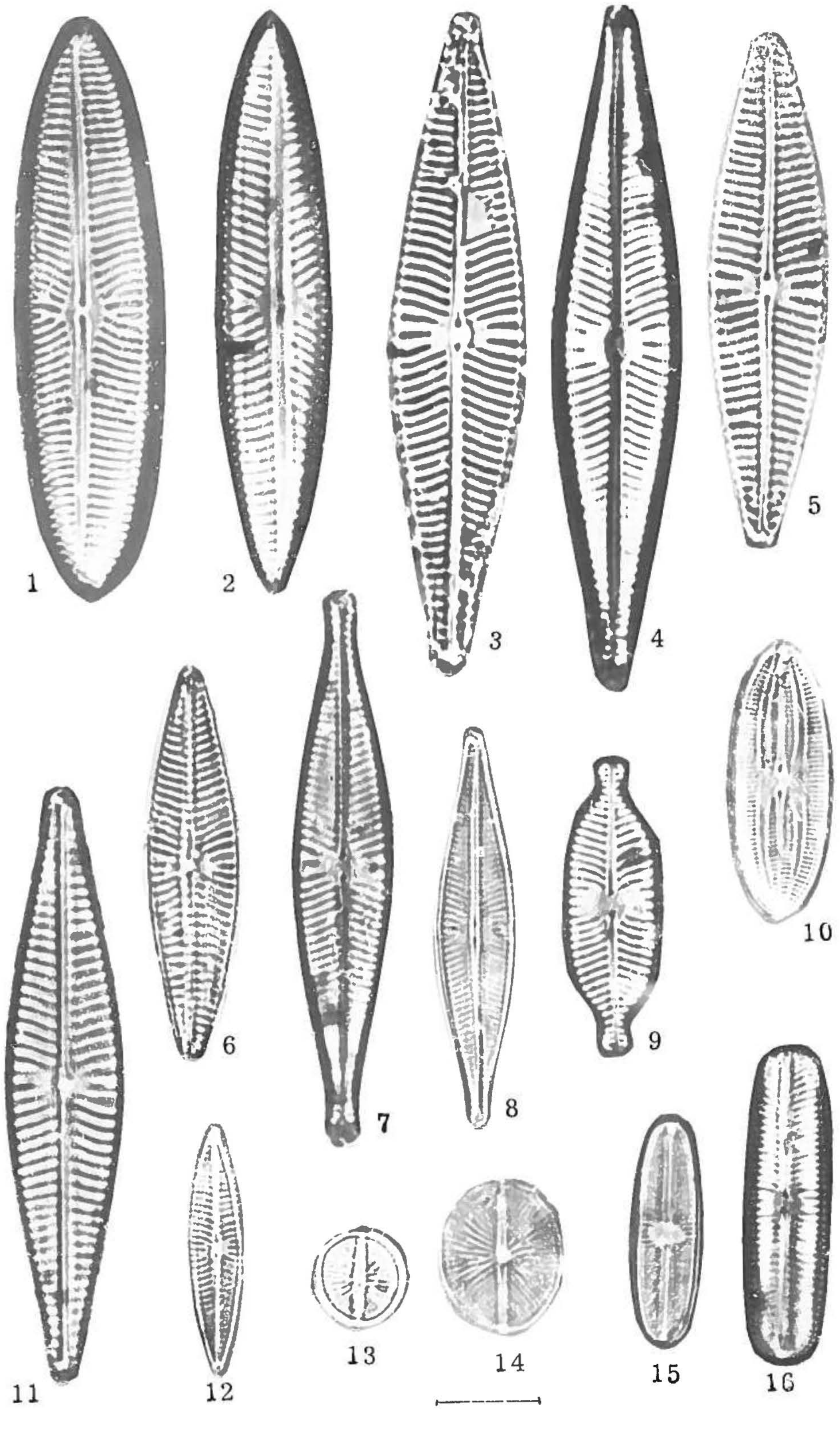

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

Plate Eq V. Scale 10 µm

1. *Pinnularia stomatophora* (Grun.) Cleve. 76 × 10 µm. Eq 2642.
2. *Pinnularia aequilateralis* Patrick & Freese. 88 × 11 µm. Eq 2639.
3. *Pinnularia viridis* (Nitzsch) Ehr. 112 × 17 µm. Eq 2573.
4. *Pinnularia gibba* Ehr. 92 × 13 µm. Eq 2639.
5. *Pinnularia gibba* var. *linearis* Hust. 70 × 12 µm. Eq 2642.
6. *Pinnularia viridis* (Nitzsch) Ehr. fo. *cuneata* (Østrup et A. Cleve) Foged. 89 × 18 µm. Eq 2581.
7. *Pinnularia nodosa* Ehr. 43 × 8 µm. Eq 2642.
8. *Pinnularia interrupta* W. Smith. 45 × 8 µm. Eq 2650.
9. *Pinnularia pulchra* Østrup. 48 × 7 µm. Eq 2631.
10. *Pinnularia microstauron* (Ehr.) Cleve var. *brebissonii* (Kütz.) Hust. fo. *diminuta* Grun. 35 × 10 µm. Eq 2642.
11. *Amphora ovalis* (Kütz.) Kütz var. *libyca* (Ehr.) Cleve. 48 × 10 µm. Eq 2631.
12. *Amphora fonticola* Maillard. 70 × 12 µm. Eq 2650.
13. *Cymbella sinuata* Greg. 31 × 7 µm. Eq 2561.
14. *Cymbella sinuata* Greg. fo. *ovata* Hust. 21 × 7 µm. Eq 2650.

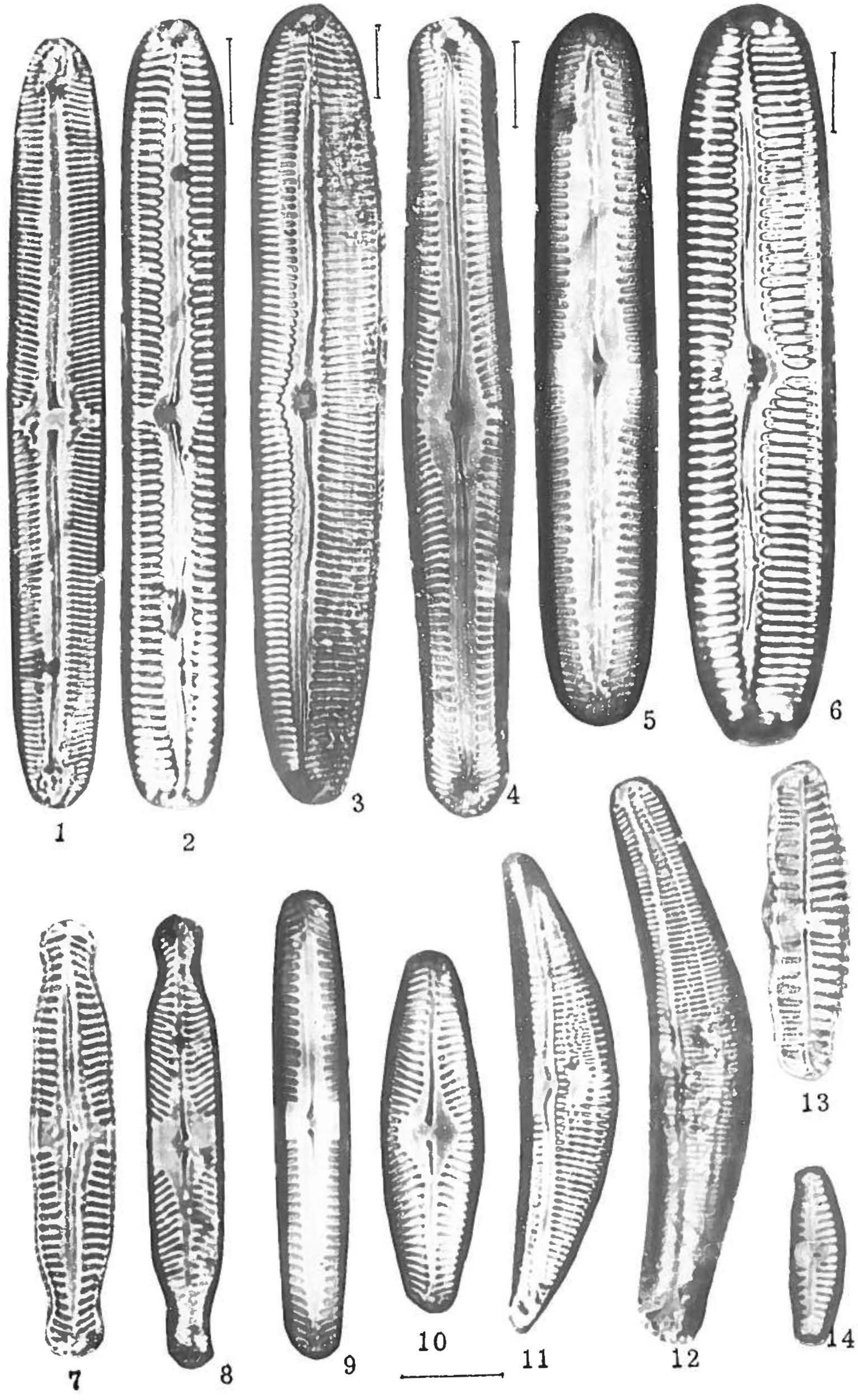

1
2
3
4
5
6
7
8
9
10
11
12
13
14

Plate Eq VI. Scale 10 µm

1. *Cymbella cuspidata* Kütz. 70 × 23 µm. Eq 2561.
2. *Cymbella laterostrata* Pant. var. *alaskana* Patrick & Freese. 62 × 16 µm. Eq 2642.
3. *Cymbella heteropleura* (Ehr.) Kütz. var. *subrostrata* Cleve. 130 × 32 µm. Eq 2627.
4. *Cymbella cistula* (Hempr.) Kirchner. 45 × 12 µm. Eq 2639.
5. *Cymbella cistula* (Hempr.) Kirchner. 40 × 10.3 µm. Eq 2639.
6. *Cymbella ventricosa* Kütz. 18 × 6 µm. Eq 2561.
7. *Cymbella incerta* Grun. 32 × 8 µm. Eq 2642.
8. *Cymbella incerta* Grun. 51 × 8 µm. Eq 2639.
9. *Cymbella gracilis* (Rabh.) Cleve. 40 × 8 µm. Eq 2642.
10. *Cymbella naviculiformis* Auerswald. 35 × 10 µm. Eq 2589.
11. *Cymbella norvegica* Grun. 33 × 7 µm. Eq 2639.
12. *Gomphonema acuminatum* Ehr. var. *elongatum* (W. Smith) V. Heurck fo. *tenuis* A. Cleve. 50 × 7 µm. Eq 2642.
13. *Gomphonema intricatum* Kütz. 62 × 8 µm. Eq 2642.
14. *Gomphonema gracile* Ehr. var. *lanceolata* (Kütz.) Cleve. 55 × 11 µm. Eq 2639.
15. *Gomphonema acuminatum* Ehr. var. *turris* (Ehr.) Cleve. 38 × 8 µm. Eq 2646.
16. *Gomphonema intricatum* Kütz. var. *pumilum* Grun. 22 × 5 µm. Eq 2589.
17. *Gomphonema acuminatum* Ehr. var. *turris* (Ehr.) Cleve. 31 × 8 µm. Eq 2581.
18. *Gomphonema constrictum* Ehr. var. *capitata* (Ehr.) Cleve. 35 × 11 µm. Eq 2565.
19. *Gomphonema constrictum* Ehr. 50 × 14 µm. Eq 2631.

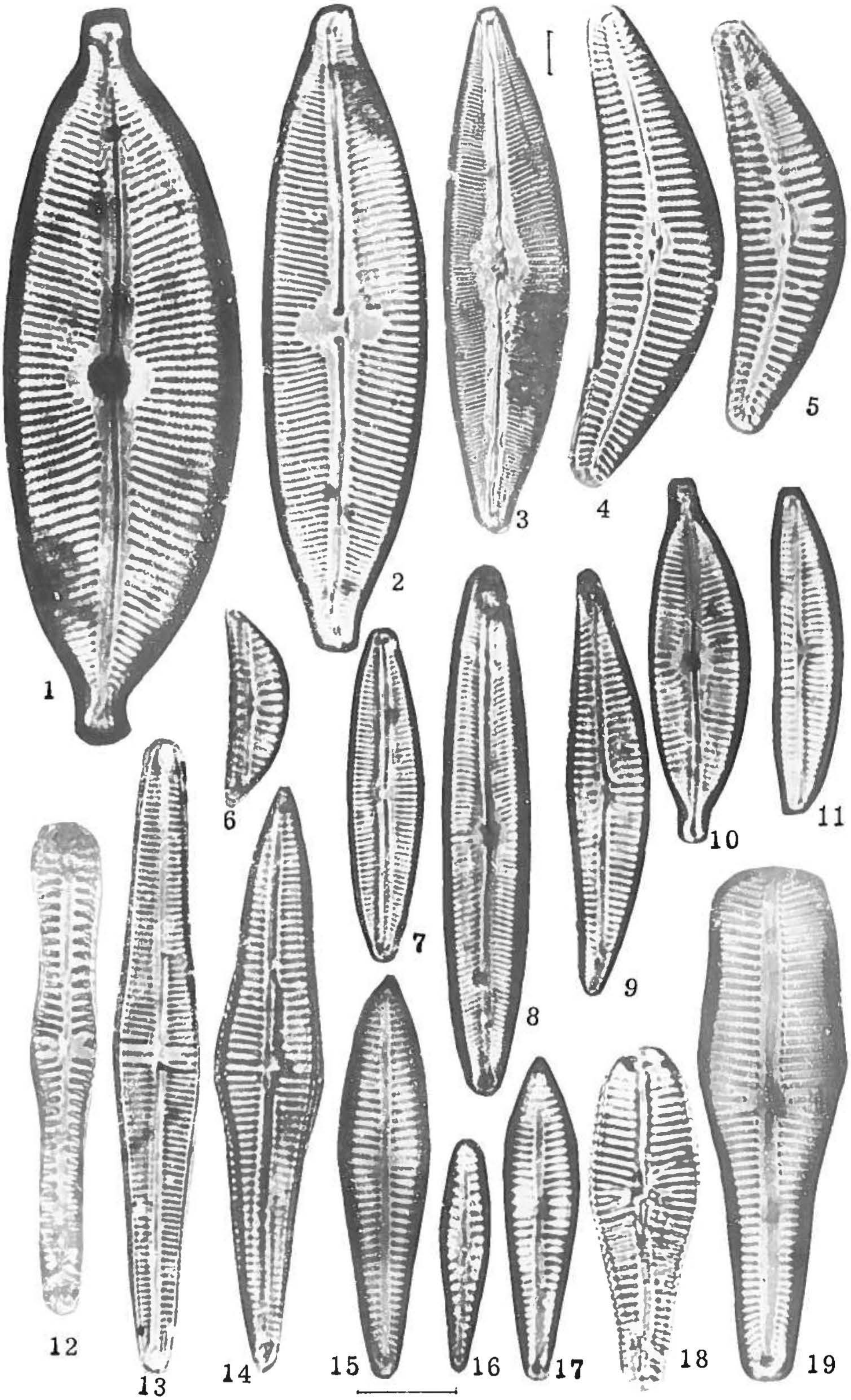

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

Plate Eq VII. Scale 10 μm

1. *Gomphonema acuminatum* Ehr. var. *brebissonii* (Kütz.) Cleve. 40 × 7 μm. Eq 2642.
2. *Gomphonema acuminatum* Ehr. var. *coronata* (Ehr.) W. Smith. 55 × 12 μm. Eq 2650.
3. *Gomphonema subtile* Ehr. 46 × 7 μm. Eq 2650.
4. *Gomphonema gracile* Ehr. 30 × 4 μm. Eq 2631.
5. *Gomphonema acuminatum* var. *brebissonii* (Kütz.) Cleve. 28 × 7 μm. Eq 2650.
6. *Epithemia smithii* Carruthers. 37 × 12 μm. Eq 2642.
7. *Epithemia zebra* (Ehr.) Kütz. var. *saxonica* (Kütz.) Grun. 43 × 10 μm. Eq 2589.
8. *Denticula tenuis* Kütz. 28 × 5 μm. Eq 2642.
9. *Nitzschia perpusilla* Rabh. 25 × 4 μm. Eq 2650.
10. *Nitzschia sociabilis* Greg. 30 × 4.5 μm. Eq 2639.
11. *Epithemia turgida* (Ehr.) Kütz. 96 × 14 μm. 2650.
12. *Nitzschia angustata* (W. Smith) Grun. var. *acuta* Grun. 34 × 6 μm. Eq 2639.
13. *Nitzschia angustata* (W. Smith) Grun. 53 × 7 μm. Eq 2639.
14. *Nitzschia apiculata* (Greg.) Grun. 49 × 9 μm. Eq 2561.
15. *Nitzschia acuminata* (W. Smith) Grun. 86 × 12 μm. Eq 2561.
16. *Surirella robusta* Ehr. var. *splendida* (Ehr.) V. Heurck. 180 × 45 μm. Eq 2642.

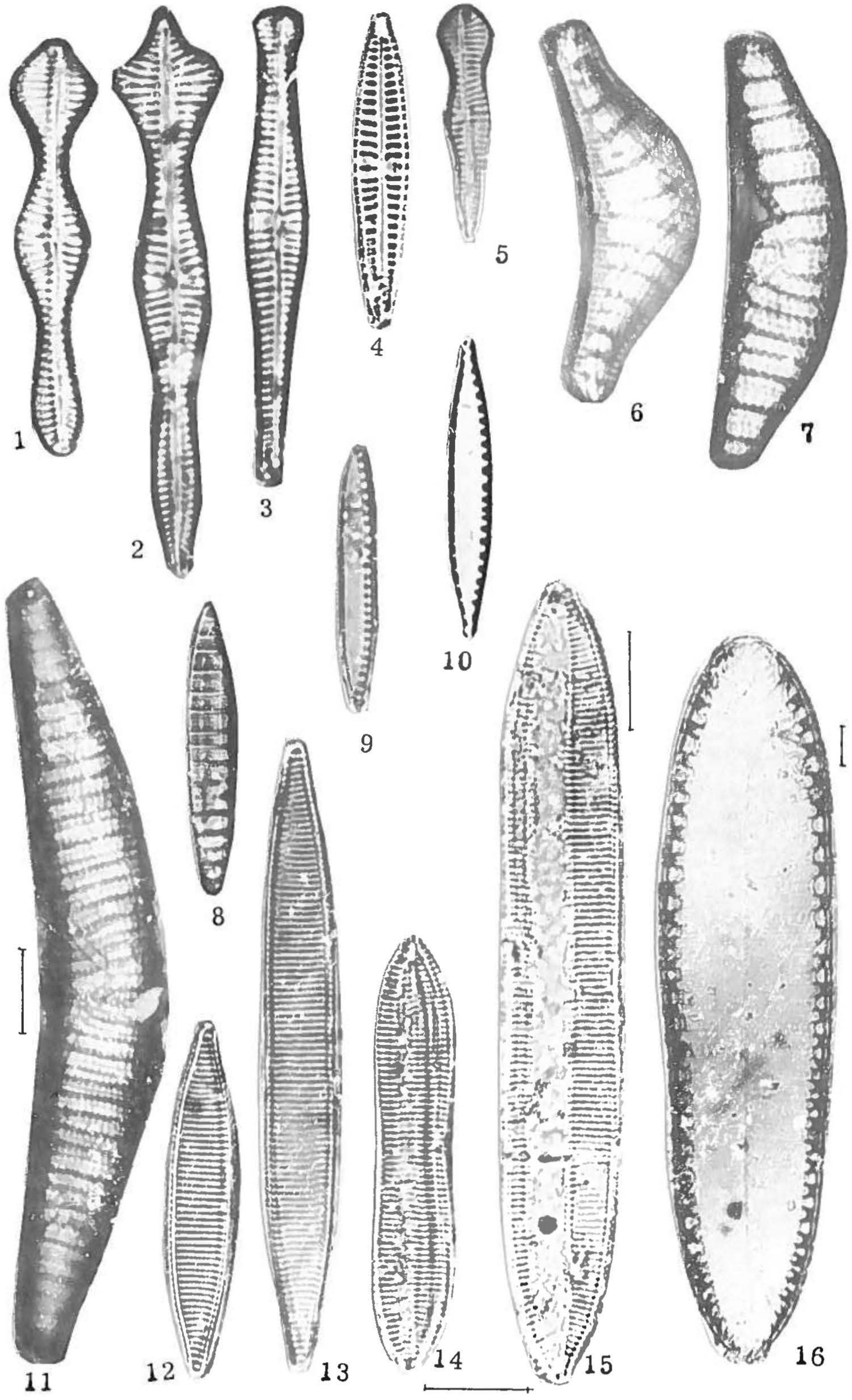

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

Table T 1. List of diatoms, Langesø and Rundesø, Tugtuligssuaq.
For legend, see Table N 1.

Sample no. L	24–04	23–47	50	53	56	59	62	65	68	71	74	77	80	83	86	89	92	23–39
Depth below lake bottom (cm)	103	97	91	85	79	73	67	61	5	49	43	37	31	25	19	13	7	2
Alkaliphilous or alkalibiontic:																		
Fragilaria																		
construens (Ehr.) Grun.	+	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
intermedia Grun.	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	+
pinnata Ehr.	–	cc	+	+	+	–	–	–	–	–	–	–	–	–	–	–	–	do
virescens Ralfs var. *subsalina* Grun.	–	cc	+	+	c	+	+	c	+	cc	cc	do	+	+	c	–	+	do
Achnanthes																		
minutissima Kütz.	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Anomeoneis																		
exilis (Kütz.) Grun.	–	+	–	+	+	+	c	cc	+	+	c	–	–	–	–	–	+	–
- var. *lanceolata* A. Mayer	–	–	–	+	+	+	c	cc	+	+	c	+	+	–	+	+	+	–
Caloneis																		
bacillaris (Greg.) Cleve	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
silicula (Ehr.) Cleve	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
- var. *truncatula* (Grun.) Cleve	–	c	+	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Cymbella																		
rupicola Grun. sensu Patrick & Reimer	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
turgida (Greg.) Cleve	–	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
Denticula																		
tenuis Kütz. var. *crassula* (Naeg.) Hust.	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
Gomphonema																		
angustatum (Kütz.) Rabh.	–	–	+	+	–	–	+	+	–	–	–	–	–	–	–	–	–	–
- var. *linearis* Hust.	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
- var. *productum* Brun.	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
gracile Ehr.	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Navicula																		
cuspidata Kütz.	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
rhyncocephala Kütz.	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Neidium																		
affine (Ehr.) Cleve fo. *undulata* (Grun.) Hust.	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–
- var. *amphirhynchus* (Ehr.) Cleve fo. *undulata* (Grun.) Hust.	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–
- var.*longiceps* (Greg.) Cleve	+	+	–	+	–	–	+	+	+	+	+	+	–	–	–	–	–	–
temperei Reimer	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Nitzschia																		
amphibia Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
frustulum (Kütz.) Grun.	–	+	–	+	+	+	+	–	+	–	–	–	–	–	–	–	–	–
perpusilla Rabh.	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
pH-indifferent or circumneutral																		
Achnanthes																		
holstii Cleve	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
Cymbella																		
angustata (W. Smith) Cleve	–	+	–	+	+	–	–	–	–	–	+	–	–	–	+	–	+	–
cuspidata Kütz.	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
gracilis (Rabh.) Cleve	–	–	–	+	–	c	c	+	+	+	+	+	–	–	+	–	+	–
heteropleura (Ehr.) Hust. fo. *minor* Cleve	–	–	–	+	+	+	–	–	+	–	+	–	–	–	–	–	–	–
javanica Hust.	–	–	–	–	+	+	+	+	+	–	+	+	+	+	+	–	–	–
laterostrata Pant. fo. *alaskana* Patrick & Freese	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–
naviculiformis Auerswald	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
ventricosa Kütz.	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Eunotia																		
lunaris (Ehr.) Grun.	–	–	–	–	–	+	+	+	+	–	+	–	–	–	–	–	–	–
Gomphonema																		
parvulum (Kütz.) Grun.	–	–	–	–	+	+	–	–	–	–	–	–	–	–	–	–	–	–
- var. *micropus* (Kütz.) Cleve	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hantzschia																		
amphioxys (Ehr.) Grun. var. *major* Grun.	+	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Navicula																		

bryophila Petersen	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–
pseudoscutiformis Hust.	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
radiosa Kütz.	c	cc	+	–	+	–	–	–	–	–	–	–	–	–	–	–	–	+
schoenfeldii Hust.	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–
Neidium																		
bisulcatum (Lagerst.) Cleve var. *baicalense* (Skv. & Meyer) Reimer	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–	–
distincte-punctatum Hust.	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
iridis (Ehr.) Cleve var. *porsildii* Foged	–	–	–	–	–	–	–	–	–	–	–	c	+	+	+	+	+	–
knuthii Foged	–	–	–	–	–	–	–	–	–	+	–	–	+	+	–	–	–	–
kozlowii Mereschk. var. *parva* Mereschk.	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
rudimentarum Reimer	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
Nitzschia																		
palea (Kütz.) W. Smith	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–
Pinnularia																		
borealis Ehr.	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
divergens W. Smith var. *elliptica* (Grun.) Cleve	–	+	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–
interrupta W. Smith	+	–	+	+	c	+	c	c	+	+	c	c	+	cc	+	c	cc	–
- fo. *minutissima* Hust.	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
lacunicola Patrick & Freese	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
mesolepta (Ehr.) W. Smith	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
microstauron (Ehr.) Cleve	–	+	+	–	–	–	–	–	–	–	–	–	cc	+	c	c	cc	+
stomatophora Grun.	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
subsolaris (Grun.) Cleve	–	–	–	–	–	+	+	–	–	–	–	–	–	–	–	–	–	–
suchlandtii Hust.	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
viridis (Nitzsch) Ehr.	–	+	–	+	c	+	+	+	–	–	–	–	–	–	–	–	–	–
Stauroneis																		
anceps Ehr.	+	+	+	–	+	–	–	+	–	–	–	+	+	+	–	–	–	+
- fo. *gracilis* Rabh.	+	+	+	+	+	+	–	–	+	–	–	–	–	–	–	–	–	+
- var. *hyalina* Brun & Perag.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
nobilis Schum. var. *minima* Foged	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
phoenicenteron (Nitzsch) Ehr.	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	+
Acidophilous or acidobiontic:																		
Achnanthes																		
flexella (Kütz.) Brun. var. *alpestris* Brun.	–	–	–	–	+	–	+	+	–	–	–	–	–	–	–	–	–	–
kryophila Petersen	–	–	–	–	–	–	–	–	–	+	+	–	+	+	+	c	–	–
Anomoeoneis																		
serians (Bréb.) Cleve var. *brachysira* (Bréb.) Cleve	–	–	–	–	–	+	c	cc	+	+	c	c	+	c	c	c	c	–
Cymbella																		
incerta Grun. var. *naviculacea* (Grun.) Cleve	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Eunotia																		
alpina (Naeg.) Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
arcus Ehr.	–	–	–	+	+	–	c	+	+	+	+	+	+	+	+	+	+	–
bigibba Kütz.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
denticulata (Bréb.) Rabh.	–	–	–	–	–	–	–	–	–	–	–	+	+	+	+	+	+	–
exigua (Bréb.) Rabh.	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–
- var. *compacta* Hust.	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	+	+	–
lapponica Grun.	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	cc	+	–
major (W. Smith) Rabh. var. *scandica* Cleve-Euler	–	–	–	–	–	–	–	+	+	–	–	–	–	–	–	–	–	–
monodon Ehr.	–	+	+	+	+	+	c	c	+	c	c	c	c	+	c	+	+	+
- var. *bidens* (Greg.) W. Smith	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
- var. *maior* (W. Smith) Hust.	–	–	–	–	–	+	–	+	+	–	+	–	+	–	–	–	–	–
papilio (Grun.) Hust.	–	+	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	+
pectinalis (Dillw.) Rabh. var. *minor* (Kütz.) Rabh.	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–
- var. *ventralis* (Ehr.) Hust.	–	–	–	–	–	–	–	–	+	–	–	+	–	–	–	+	–	–
praerupta Ehr.	–	+	+	+	+	+	c	+	+	+	+	–	+	+	+	+	–	+
- var. *bidens* (W. Smith) Grun.	–	–	–	–	–	+	–	+	+	–	–	–	–	–	–	–	–	–
- var. *inflata* Grun.	–	+	–	–	–	+	+	+	+	–	–	–	–	–	–	–	–	–
rhomboidea Hust.	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	+	–	–
tenella (Grun.) Hust.	–	–	–	–	–	–	+	–	–	–	+	+	+	+	+	+	+	–
testudinata Å. Berg.	–	–	–	–	–	–	+	+	+	–	–	–	–	–	–	+	+	–

triodon Ehr.	–	–	–	–	–	–	–	–	+	+	+	+	+	+	+	–	–	–
Frustulia																		
rhomboides (Ehr.) De Toni var. *saxonica* (Rabh.) De Toni	–	–	–	–	–	–	–	+	+	+	+	c	c	cc	cc	c	c	–
Melosira																		
distans (Ehr.) Kütz.	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	+	–
- var. *lirata* (Ehr.) Bethge	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–
- var. *perglabra* (Østrup) Jørgensen	–	–	–	–	–	–	–	–	–	+	+	+	c	c	c	+	c	–
Navicula																		
subtilissima Cleve	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	+	–	–
Tabellaria																		
flocculosa (Roth) Kütz.	–	+	+	+	+	+	+	+	+	+	+	+	+	+	c	+	+	+

Table T 2. pH-spectra, Langesø and Rundesø, Tugtuligssuaq. For legend, see Table N1.

Sample no.	*Fragilaria* not included		Alkaliphilous + alkalibiontic		pH-indifferent or circumneut.		Acidophilous + acidobiontic		Total no. of taxa
L	taxa	freq.	taxa	%	taxa	%	taxa	%	
2339	3	dom	3	16.7	8	44.4	7	38.9	18
2392	1	+	2	10.0	5	25.0	13	65.0	20
2389	–	–	1	4.8	4	19.0	16	76.2	21
2386	1	c	1	5.0	6	30.0	13	65.0	20
2383	1	+	–	–	9	39.1	14	60.9	23
2380	1	+	1	5.6	6	33.3	11	61.1	18
2377	1	dom	3	12.5	8	33.3	13	54.2	24
2374	1	cc	4	16.7	9	37.5	11	45.8	24
2371	1	cc	3	18.8	4	25.0	9	56.2	16
2368	1	+	5	20.0	7	28.0	13	52.0	25
2365	1	c	4	17.4	7	30.4	12	52.2	23
2362	1	+	6	27.3	7	31.8	9	40.9	22
2359	1	+	3	15.8	9	47.4	7	36.8	19
2356	3	c	6	27.3	11	50.0	5	22.7	22
2353	2	+	7	38.9	7	38.9	4	22.2	18
2350	3	+	5	38.5	5	38.5	3	23.0	13
2347	3	cc	9	34.6	11	42.3	6	23.1	26
2404	1	+	3	21.4	11	78.6	–	–	14

Plate T I. Scale 10 μm

1. *Melosira distans* (Ehr.) Kütz. var. *lirata* (Ehr.) Bethge. Width 17 μm. L 2380.
2. *Melosira distans* (Ehr.) Kütz. Width 9 μm. L 2392.
3. *Melosira distans* (Ehr.) Kütz. Width 17 μm. Disc. L 2374.
4. *Tabellaria flocculosa* (Roth) Kütz. 16 × 15 μm. L 2389.
5. *Eunotia exigua* (Bréb.) Rabh. var. *compacta* Hust. 32 × 4 μm. L 2389.
6. *Eunotia pectinalis* (Dillw.) Rabh. var. *minor* (Kütz.) Rabh. 35 × 6 μm. L 2368.
7. *Eunotia rhomboidea* Hust. 25 × 4 μm. L 2380.
8. *Eunotia denticulata* (Bréb.) Rabh. Anomalous. 23 × 7 μm. L 2377.
9. *Eunotia monodon* Ehr. 40 × 8–11 μm. L 2368.
10. *Eunotia lapponica* Grun. 60 × 10 μm. L 2389.
11. *Eunotia monodon* Ehr. 54 × 13 μm. L 2383.
12. *Eunotia monodon* Ehr. fo. 60 × 14 μm. L 2359.
13. *Eunotia monodon* Ehr. fo. 83 × 12 μm. L 2368.
14. *Eunotia monodon* Ehr. fo. 60 × 18 μm. L 2368.

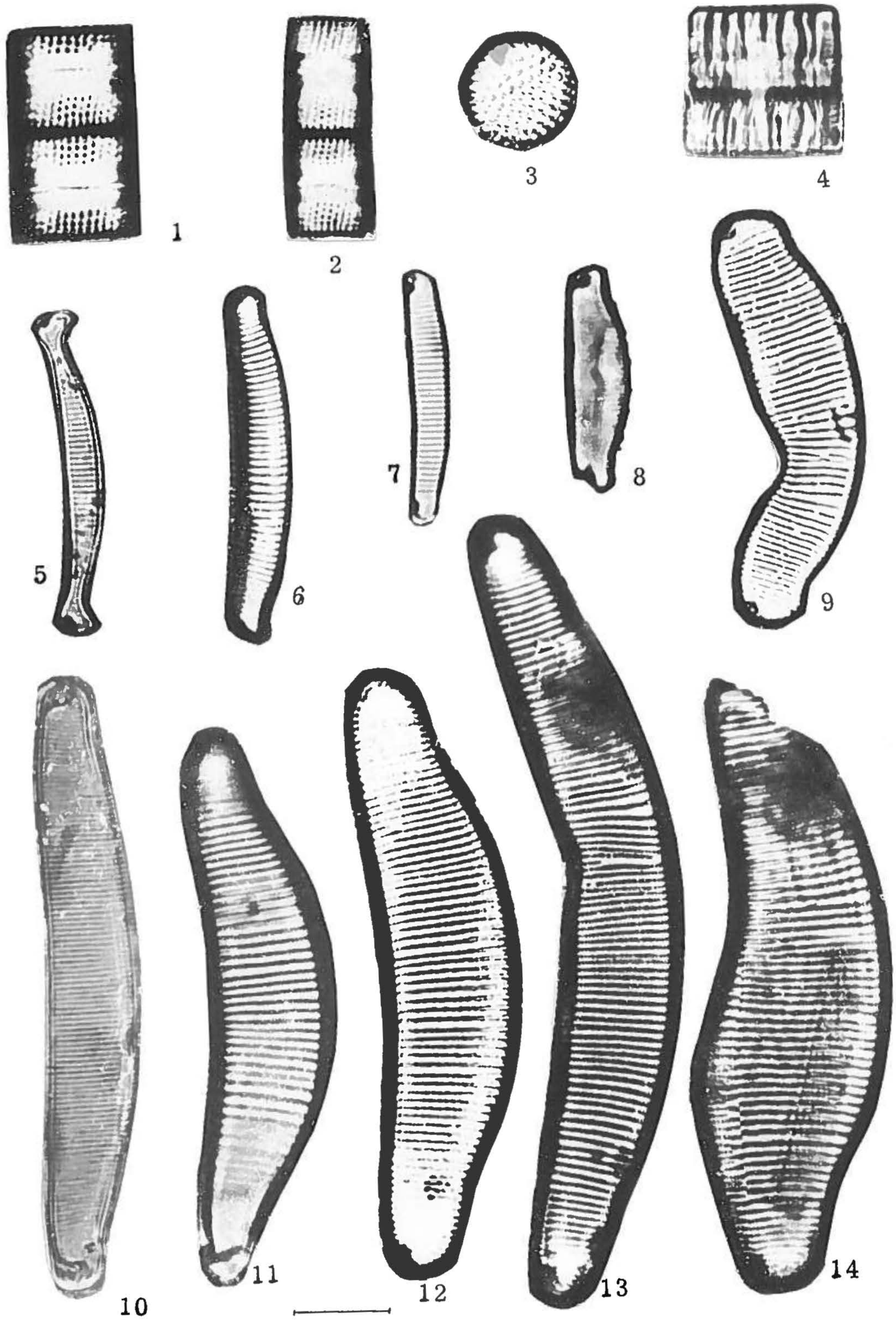

1
2
3
4
5
6
7
8
9
10
11
12
13
14

Plate T II. Scale 10 μm

1. *Eunotia monodon* Ehr. fo. 80 × 13–15 μm. L 2368.
2. *Eunotia monodon* Ehr. fo. 80 × 12–14 μm. L 2365.
3. *Eunotia monodon* Ehr. fo. 57 × 8–12 μm. L 2368.
4. *Eunotia lunaris* (Ehr.) Grun. 55 × 3 μm. L 2365.
5. *Eunotia arcus* Ehr. 56 × 5.5 μm. L 2371.
6. *Eunotia triodon* Ehr. 49 × 23 μm. L 2368.
7. *Eunotia monodon* Ehr. fo. 60 × 21 μm. L 2368.
8. *Eunotia arcus* Ehr. 59 × 9 μm. L 2353.
9. *Eunotia arcus* Ehr. 50 × 9 μm. L 2377.

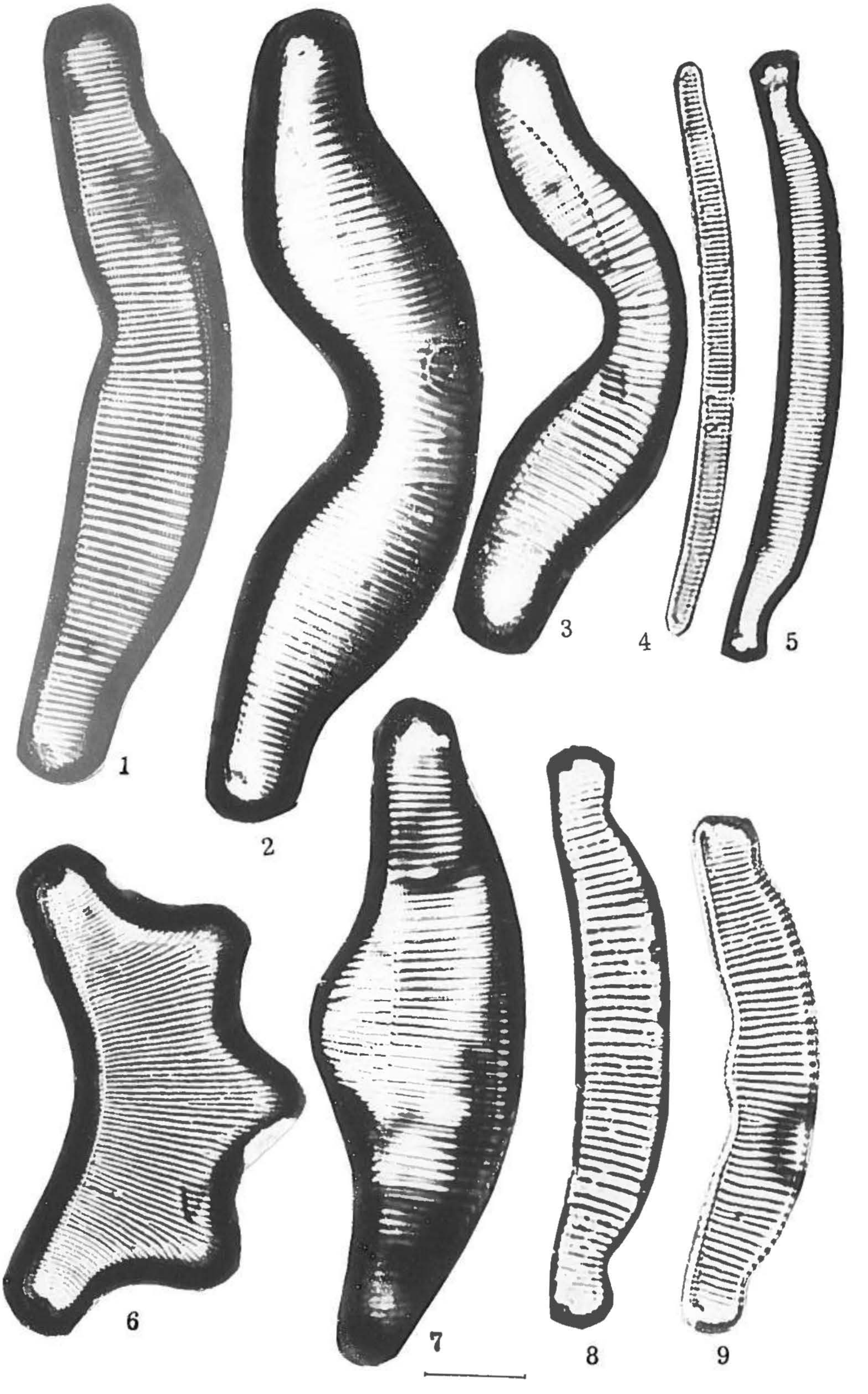

1
2
3
4
5
6
7
8
9

Plate T III. Scale 10 µm

1. *Eunotia arcus* Ehr. 50 × 9 µm. L 2374.
2. *Eunotia arcus* Ehr. 46 × 10 µm. L 2368.
3. *Eunotia praerupta* Ehr. var. *inflata* Grun. 34 × 13 µm. L 2359.
4. *Eunotia praerupta* Ehr. var. *inflata* Grun. 36 × 12 µm. L 2347.
5. *Eunotia praerupta* Ehr. var. *bidens* (W. Smith) Grun. 32 × 12 µm. L 2365.
6. *Frustulia rhomboides* (Ehr.) De Toni var. *saxonica* (Rabh.) De Toni. 50 × 13 µm. L 2389.
7. *Caloneis silicula* (Ehr.) Cleve. 44 × 9 µm. L 2347.
8. *Eunotia papilio* (Ehr.) Hust. 34 × 12 µm. L 2347.
9. *Eunotia praerupta* Ehr. var. *bidens* (W. Smith) Grun. 30 × 8.5 µm. L 2368.
10. *Achnanthes holstii* Cleve. 29 × 9 µm. L 2383.
11. *Achnanthes flexella* (Kütz.) Brun var. *alpestris* Brun. 23 × 8 µm. L 2356.
12. *Anomoeoneis exilis* (Kütz.) Cleve var. *lanceolata* A. Mayer. 28 × 4 µm. L 2377.
13. *Anomoeoneis serians* (Bréb.) Cleve var. *brachysira* (Bréb.) Cleve. 28 × 6 µm. L 2377.
14. *Anomoeoneis serians* var. *brachysira* (Bréb.) Cleve. 20 × 8.5 µm. L 2359.
15. *Anomoeoneis serians* var. *brachysira* (Bréb.) Cleve. 31 × 9 µm. L 2365.
16. *Anomoeoneis serians* var. *brachysira* (Bréb.) Cleve. 39 × 8 µm. L 2392.
17. *Stauroneis anceps* Ehr. 66 × 16 µm. L 2347.

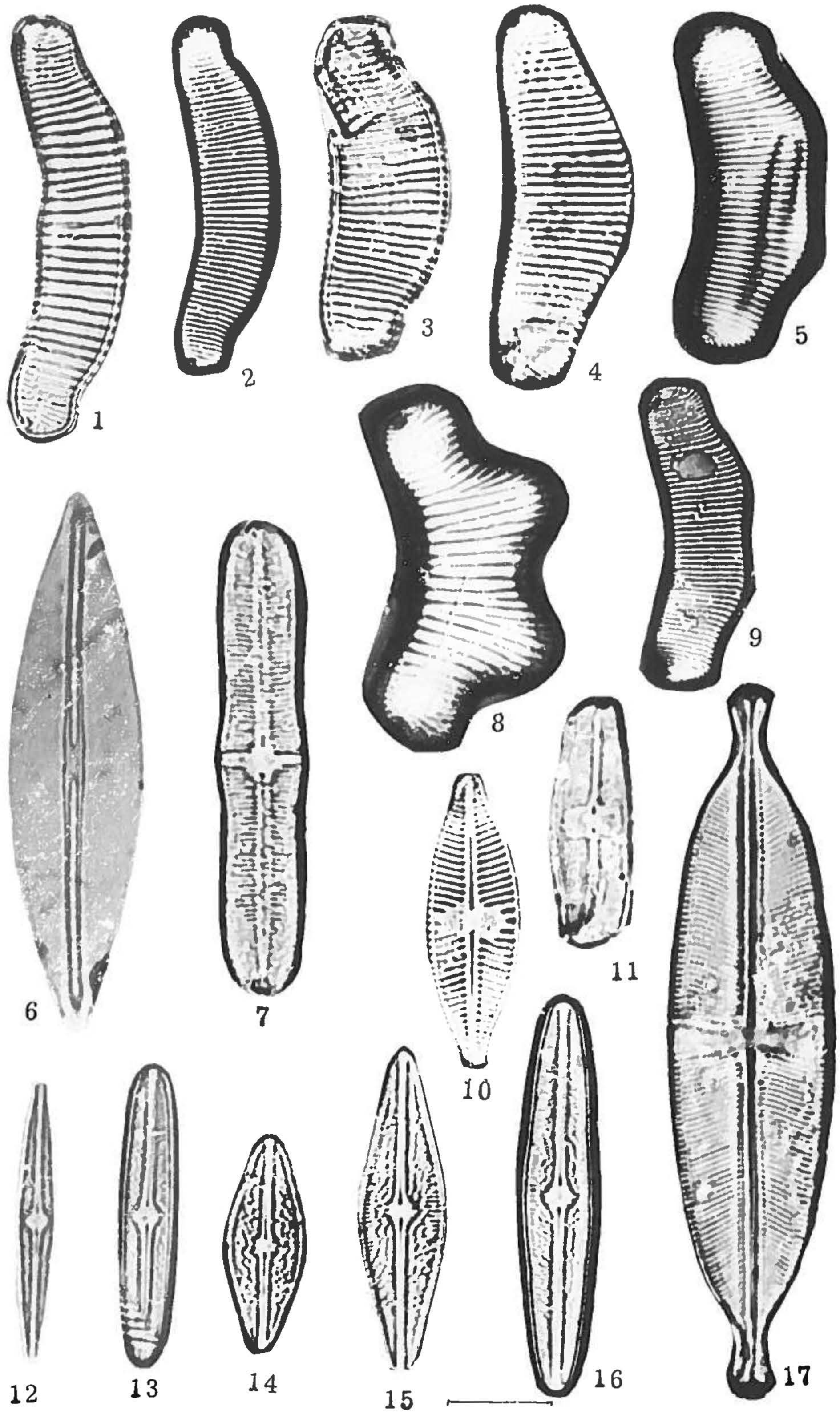

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

Plate T IV. Scale 10 µm

1. *Neidium iridis* (Ehr.) Cleve var. *porsildii* Foged. 81 × 19 µm. L 2377.
2. *Neidium iridis* (Ehr.) Cleve var. *porsildii* Foged. 59 × 17 µm. L 2377.
3. *Neidium iridis* (Ehr.) Cleve var. *porsildii* Foged. 75 × 18 µm. L 2377.
4. *Pinnularia viridis* (Nitzsch) Ehr. 146 × 21 µm. L 2356.
5. *Neidium iridis* (Ehr.) Cleve var. *porsildii* Foged. 44 × 15 µm. L 2380.
6. *Neidium temperei* Reimer. 52 × 16 µm. L 2347.
7. *Neidium bisulcatum* (Lagerst.) Cleve var. *baicalense* (Skv. & Meyer) Reimer. 45 × 10 µm. L 2377.
8. *Neidium affine* (Ehr.) Cleve fo. *undulata* (Grun.) Hust. 44 × 9 µm. L 2374.
9. *Neidium affine* (Ehr.) Cleve var. *amphirhynchus* (Ehr.) Cleve fo. *undulata* (Grun.) Hust. 35 × 7 µm. L 2368.

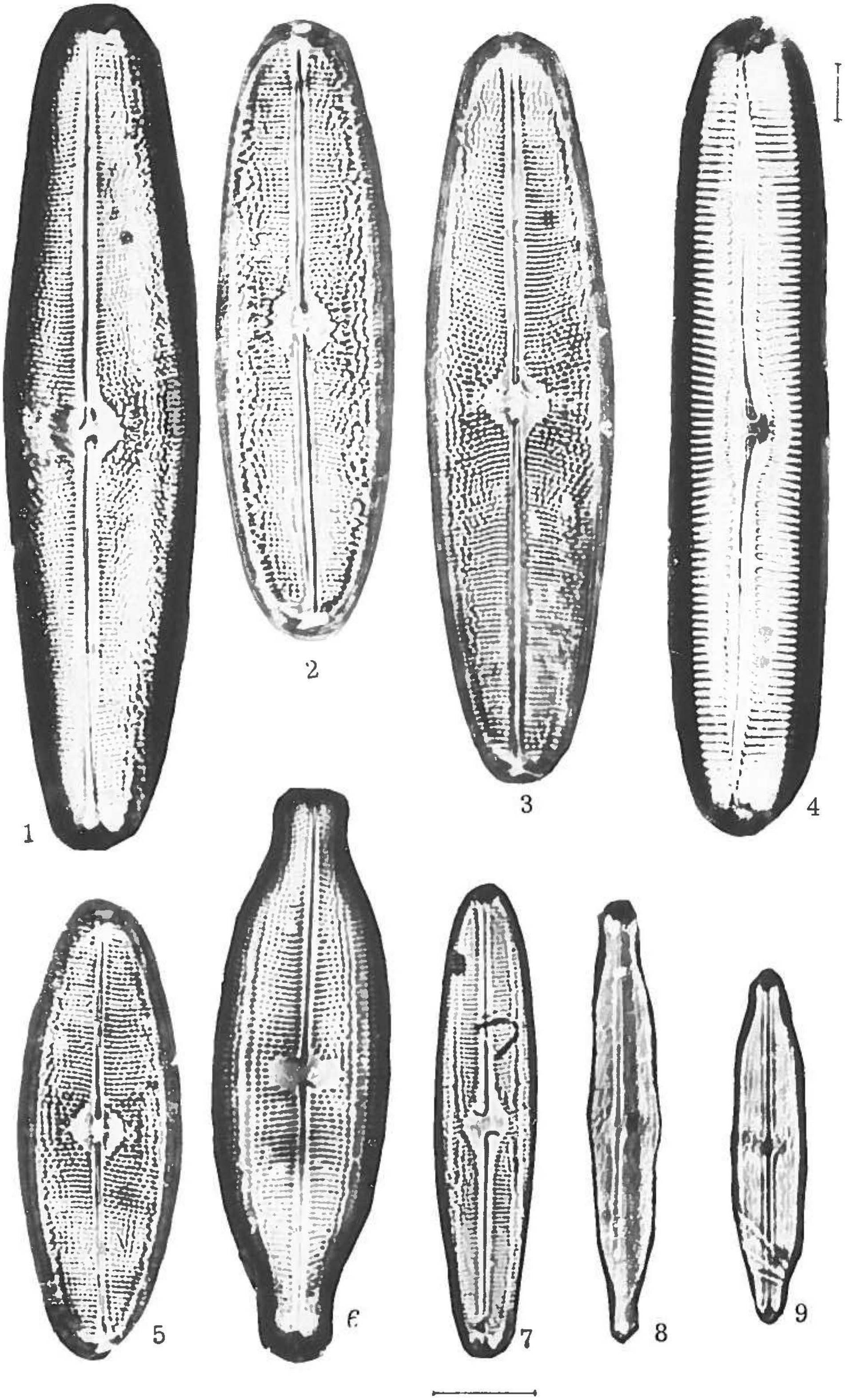

1
2
3
4
5
6
7
8
9

Plate T V. Scale 10 µm

1. *Neidium distincte-punctatum* Hust. 72 × 20 µm. L 2404.
2. *Neidium distincte-punctatum* Hust. 78 × 18 µm. L 2404.
3. *Neidium distincte-punctatum* Hust. 59 × 17 µm. L 2404.
4. *Neidium distincte-punctatum* Hust. 51 × 17 µm. L 2404.
5. *Neidium affine* (Ehr.) Cleve var. *longiceps* (Greg.) Cleve. 31 × 7.5 µm. L 2368.
6. *Neidium bisulcatum* (Lagerst.) Cleve var. *baicalense* (Skv. & Meyer) Reimer. 37 × 10 µm. L 2377.
7. *Neidium distincte-punctatum* Hust. 51 × 17 µm. L 2404.
8. *Stauroneis nobilis* Schum. fo. *minima* Foged. 54 × 12 µm. L 2404.
9. *Pinnularia lacunicola* Patrick & Freese. 28 × 8 µm. L 2404.
10. *Navicula subtilissima* Cleve. 26 × 5 µm. L 2389.
11. *Pinnularia microstauron* (Ehr.) Cleve. 38 × 8 µm. L 2347.
12. *Pinnularia subsolaris* (Grun.) Cleve. 70 × 13 µm. L 2362.

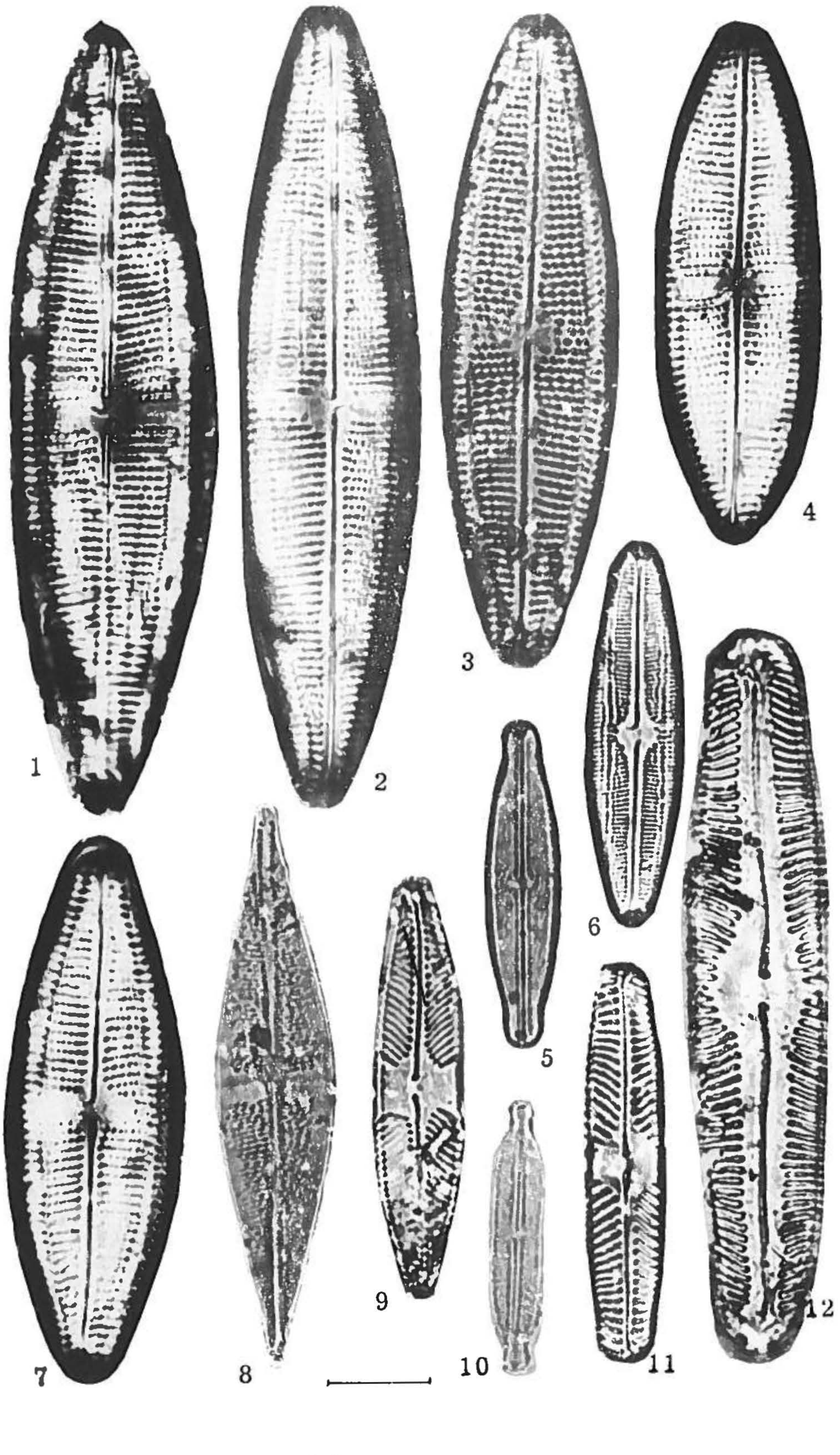
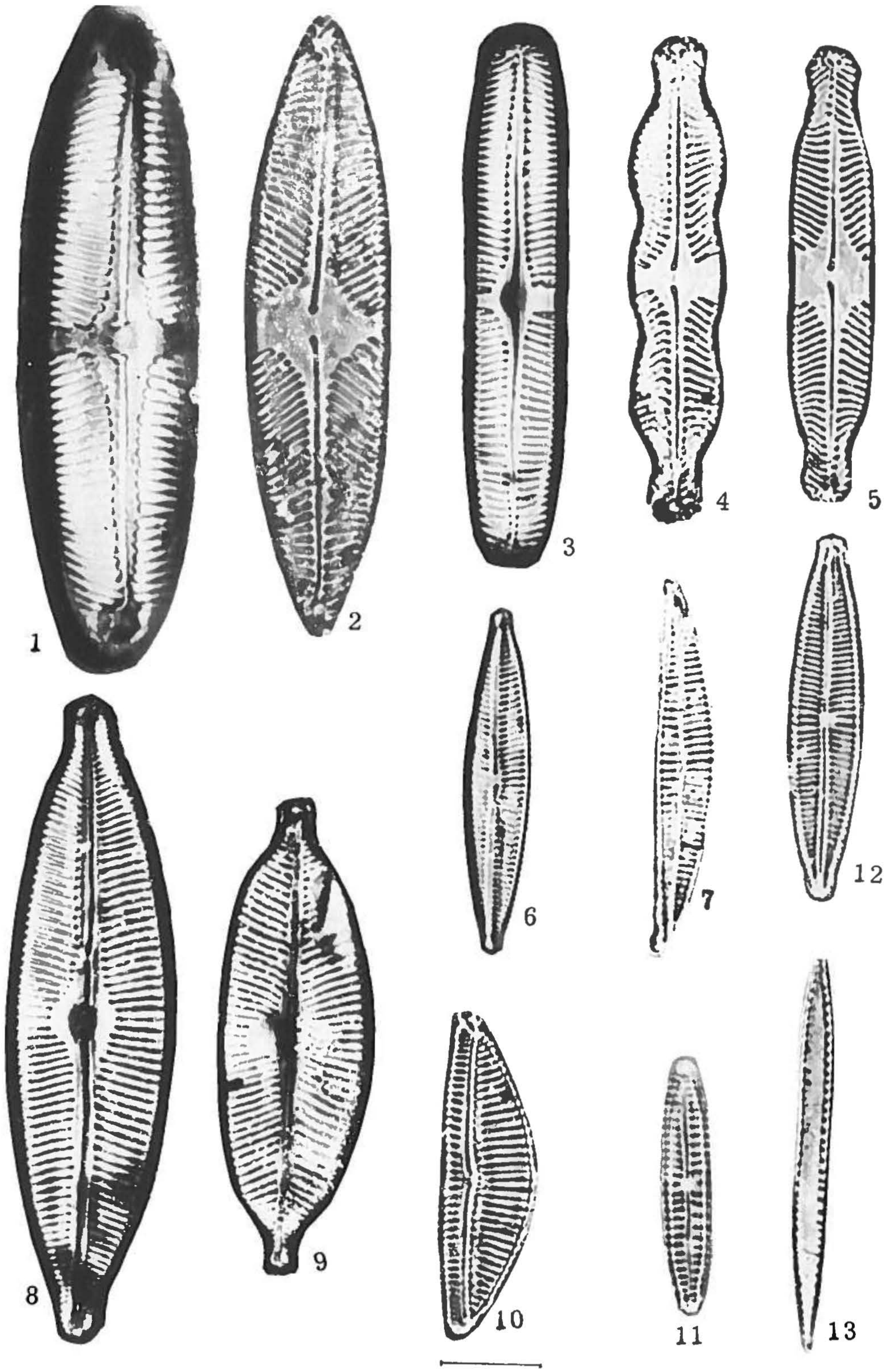

1
2
3
4
5
6
7
8
9
10
11
12

Plate T VI. Scale 10 µm

1. *Pinnularia divergens* W. Smith var. *elliptica* (Grun.) Cleve. 60 × 15 µm. L 2347.
2. *Pinnularia suchlandtii* Hust. 60 × 14 µm. L 2404.
3. *Pinnularia microstauron* (Ehr.) Cleve. 51 × 10 µm. L 2380.
4. *Pinnularia mesolepta* (Ehr.) W. Smith. 46 × 9 µm. L 2347.
5. *Pinnularia interrupta* W. Smith. 38 × 8 µm. L 2404.
6. *Cymbella rupicola* Grun. 31 × 6 µm. L 2356.
7. *Cymbella gracilis* (Rabh.) Cleve. 36 × 7 µm. L 2353.
8. *Cymbella laterostrata* Pant. var. *alaskana* Patrick & Freese. 60 × 16 µm. L 2368.
9. *Cymbella cuspidata* Kütz. 46 × 15 µm. L 2347.
10. *Cymbella turgida* (Greg.) Cleve. 30 × 9 µm. L 2347.
11. *Gomphonema angustatum* (Kütz.) Rabh. var. *linearis* Hust. 24 × 4 µm. L 2353.
12. *Cymbella incerta* Grun. var. *naviculacea* (Grun.) Cleve. 33 × 6 µm. L 2347.
13. *Nitzschia palea* (Kütz.) W. Smith. 39 × 3 µm. L 2365.


1
2
3
4
5
6
7
8
9
10
11
12
13

Instructions to authors

Two copies of the manuscript, each complete with illustrations, tables, captions, etc. should be sent to the Secretary, Kommissionen for videnskabelige Undersøgelser i Grønland. Manuscripts will be forwarded to referees for evaluation. Authors will be notified as quickly as possible about acceptance, rejection, or desired alterations. The final decision on these matters rests with the editor.

Manuscripts corresponding to less than 16 printed pages (of 6100 type units) including illustrations are not accepted, unless they are part of a special theme issue. Manuscripts that are long in relation to their content will not be accepted without abridgement.

Manuscript

Language. – Manuscripts should be in English (preferred language), French, or German. Authors who are not writing in their native language must have the language of their manuscript corrected before submission.

Place names. – All Greenland place names used in the text and in illustrations must be names authorised by The Greenlandic Language Committee. Authors are advised to submit sketch-maps with all required names to the Secretary for checking before the manuscript is submitted. Names of Greenland localities outside the area with which the paper is concerned should be accompanied by co-ordinates (longitude and latitude).

Title. – Titles should be as short as possible, with emphasis on words useful for indexing and information retrieval.

Abstract. – An abstract in English must accompany all papers. It should be short (no longer than 250 words), factual, and stress new information and conclusions.

Typescript. – Typescripts must be clean and free of handwritten corrections. Use double spacing throughout, and leave a 4 cm wide margin on the left-hand side. Avoid as far as possible dividing words at the right-hand end of a line. Consult a recent issue for general lay-out.

Page 1 should contain 1) title, 2) name(s) of author(s), 3) abstract, 4) key words (max. 10), 5) author's full postal address(es). Manuscripts should be accompanied by a table of contents, typed on separate sheet(s).

Underlining should only be used in generic and species names. The use of italics in other connections can be indicated by a wavy line in pencil under the appropriate words.

Use at most three grades of headings, but do not underline. The grade of heading can be indicated in soft pencil in the left hand margin of one copy of the typescript. Avoid long headings.

References. – References to figures and tables in the text should have the form: Fig. 1, Figs 2–4, Table 3. Bibliographic references in the text are given thus: Shergold (1975: 16) ... (Jago & Daily 1974b).

In the list of references the following style is used:

Boucot, A. J. 1975. Evolution and extinction rate controls. – Elsevier, Amsterdam: 427 pp.

Sweet, W. C. & Bergström, S. M. 1976. Conodont biostratigraphy of the Middle and Upper Ordovician of the United States midcontinent. – In: Bassett, M. G. (ed.). The Ordovician System: Proceedings of a Palaeontological Association symposium, Birmingham, September 1974: 121–151. Univ. Wales Press.

Tarling, D. H. 1967. The palaeomagnetic properties of some Tertiary lavas from East Greenland. – Earth planet Sci. Lett. 3: 81–88.

Titles of journals should be abbreviated according to the latest (4th) edition of the World List of Scientific Periodicals and supplementary lists issued by BUCOP (British Union-Catalogue of Publications). If in doubt, give the title in full.

Meddelelser om Grønland, Bioscience (Geoscience, Man & Society) should be abbreviated thus: *Meddr om Grønland, Biosci. (Geosci., Man & Soc.).*

Illustrations

General. – Submit two copies of all diagrams, maps, photographs, etc., all marked with number and author's name. Normally all illustrations will be placed in the text.

All figures (including line drawings) must be submitted as glossy photographic prints suitable for direct reproduction, and preferably have the dimensions of the final figure. Do not submit original artwork. Where appropriate the scale should be indicated on the illustration or in the caption.

The size of the smallest letters in illustrations should not be less than 1.3 mm. Intricate tables are often more easily reproduced as text figures than by type-setting; when lettering such tables use "Letraset" or a typewriter with carbon ribbon.

Colour plates may be included at the author's expense, but the editor must be consulted before such illustrations are submitted.

Size. – The width of figures must be that of a column (76.5 mm), 1½ columns (117 mm), or a page (157 mm). The maximum height of a figure (including caption) is 217 mm. Horizontal figures are preferred. If at all possible, fold-out figures and tables should be avoided.

Caption. – Captions to figures must be typed on a separate sheet and submitted, like everything else, in duplicate.

Proofs

Authors receive two page proofs. Prompt return to the editor is requested. Only typographic errors should be corrected in proof; the cost of making alterations to the text and figures at this stage will be charged to the author(s).

Fifty copies of the publication are supplied free, seventy-five if there are two or more authors. Additional copies can be supplied at 55% of the retail price. Manuscripts (including illustrations) are not returned to the author after printing unless specifically requested.

Copyright

Meddelelser om Grønland

Bioscience
Geoscience
Man & Society

Published by
The Commission
for Scientific
Research
in Greenland

Printed in Denmark by AiO Print as, Odense