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Diversity of Diatom Algae in the Lena Delta Nature Reserve and the Adjacent Territory in the Specific Ecological Factors of the Arctic

Sophia Barinova [1,*], Viktor Gabyshev [2] and Sergey Genkal [3]

[1] Institute of Evolution, University of Haifa, Mount Carmel, 199 Abba Khoushi Ave., Haifa 3498838, Israel
[2] Institute for Biological Problems of Cryolithozone Siberian Branch of Russian Academy of Science (IBPC SB RAS), Lenin av., 41, 677980 Yakutsk, Russia; v.a.gabyshev@yandex.ru
[3] Papanin Institute for Biology of Inland Waters Russian Academy of Sciences (IBIW RAS), Nekouz District, Yaroslavl Region, 152742 Borok, Russia; genkal47@mail.ru
* Correspondence: sbarinova@univ.haifa.ac.il; Tel.: +972-508024968

Abstract: A total of 413 diatom taxa were known for aquatic habitats of the Lena Delta Nature Reserve. We identified 385 taxa in 14 small tundra lakes near the reserve that significantly enriched the diatom diversity of the region (666 taxa including definitions to the genus level). Thus, the species composition of diatoms in the reserve and adjacent territories was increased by 278 species. We showed that the species of the genera *Pinnularia* (57) and *Eunotia* (51) have predominance at the family and generic levels. The index of intraspecific variability Ssp./Sp. for the lakes of the reserve was 1.11, and that for the lakes of the Tiksi region 1.14, which is typical for high-latitude and high-mountain communities. The number of rare or endangered species varied in different lakes from 1 to 10, totaling 42 species for the entire study area. Bioindication has shown that potentially threatened species prefer moderate temperatures, and slightly acidic or neutral environments free from organic pollution. A comparative analysis of the species composition of diatoms in the vicinity of the Lena Delta and other northern water bodies of Yakutia and the Arctic Islands showed that the species composition of each lake in the Arctic has a discernably different species distribution. The indicator characteristics show a certain response of the species composition of diatoms to changes in salinity, pH, and organic pollution. Regularities in the spatial distribution of diatoms in the study area were revealed in connection with the environmental variables of their habitat. Statistical mapping of diatom diversity data and bioindicators revealed a pronounced response to point pollution, and also let us assume the influence of summer northeast winds on species composition of the studied lake communities. We suggest that the high diversity inherent in the diatom lakes of the Tiksi coastal zone, which can even be updated in further studies, can be considered as a property of coastal biota inherent in ecotones. Since it is in the coastal Tiksi region that a surge in the number of species is observed, this region can be considered not only an ecotone, but also a hotspot of diatom diversity. The results of the study are important for developing the basis for monitoring biodiversity under the conditions of anthropogenic and climatic changes in the Arctic.

Keywords: diatoms; diversity; ecology; floristic; comparative floristics; climate; Red List; threatened species; bioindicators; statistical mapping

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1. Introduction

The diatom algae of Bacillariophyta Karsten are a common group of colonial or single-celled organisms characterized by an exogenous siliceous shell. The study of the ecology and species diversity of diatoms in the Arctic is of particular importance in connection with the phenomena of global climate change.

The study of diatoms of the Eurasian high Arctic aquatic ecosystems has remained in the initial stage but even now results are represented on the Eurasian northern coast of Arctic Ocean [1,2], the Arctic Ocean islands [3–6], Chukotka [7–9], and the Yakutia continental part [10,11].

Our studies of the Northern Yakutia aquatic communities were carried out to assess the impact of anthropogenic and climatic factors on them [12–18].

The water bodies of the Lena Delta Nature Reserve (Figure 1, green dots) and adjacent territories (black dots) include the lower reaches of the Lena River, the river delta, the close places of the Laptev Sea area and the New Siberian Islands, as well as tundra reservoirs on the Kharaulakh Range. All mentioned waterbodies are located beyond the Arctic Circle in the zone of continuous occurrence of permafrost soils. Algological studies of this area were started almost 100 years ago. The latest summary, including all currently available information on the algoflora of the delta region, was previously published on the GBIF.org portal [19]. Therefore, the diatom flora of the Lena Delta Nature Reserve and the area close to its border coast (Figure 1, green and black dots) included information on 413 taxa below the genus rank before this study. Investigations of diatoms in the lakes of the coastal territory adjacent to the reserve (Figure 1, blue dots) are currently ongoing due to the potential for industrial development of the coastal territory and shelf [18].

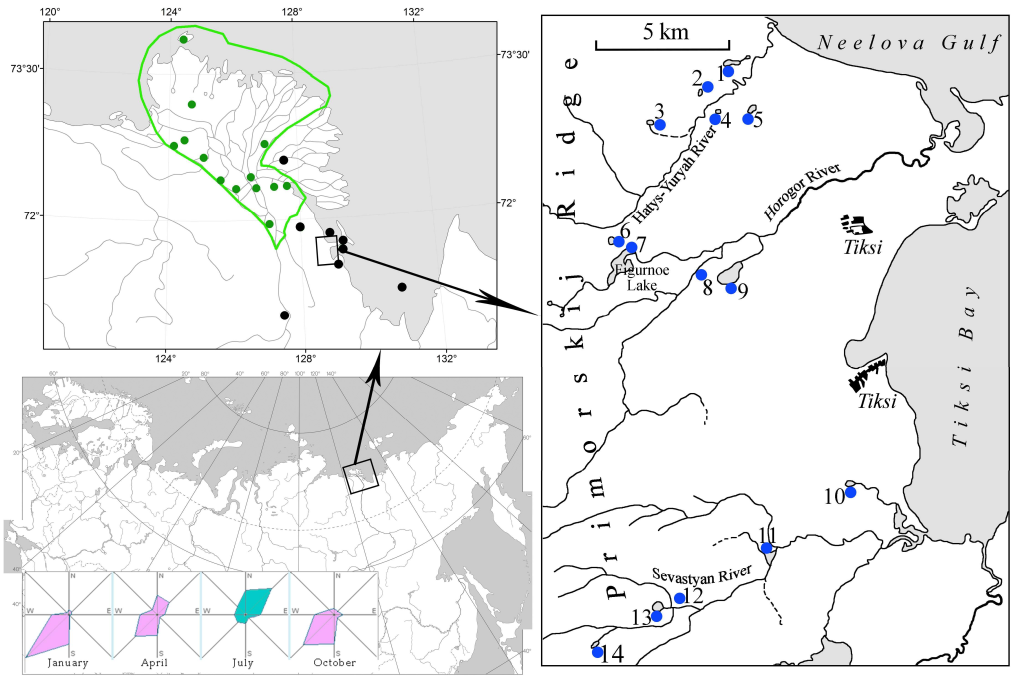

Figure 1. Investigated waterbodies in the Lena Delta Nature Reserve (green outline, green dots) and the adjacent territory (black dots), summarized as “delta region” and a recent survey of waterbodies (blue dots, “Tiksi region”) with the wind rose seasonality.

The species composition and diversity of diatoms in Arctic water bodies is influenced by several regional features: the area of the reservoir, the direction of the prevailing winds, water temperature, salinity, and pH, as mentioned in previous studies [1,18,20]. However, the detection of species worthy of inclusion in the Red Book of the Arctic [6,21] has not been done so far. Figure 1 shows that the region of the Arctic coast near the Lena River Delta needs to be studied more. As a basis for this study, we chose the data on the species composition of diatoms of the Lena Delta Nature Reserve and the adjacent territory (green and black dots), hereinafter referred to as “delta region” [19], and a recent survey of 14 water bodies in the vicinity of Tiksi settlement (blue dots), hereinafter referred to as “Tiksi region” [18]. Unfortunately, there is very little data available on the habitat for water bodies in “delta region” but the environmental data for “Tiksi region” were sufficient [18] to be used for the species–environment relationships analysis.

Our hypothesis was that by studying in detail the relationship between diatom biodiversity and environmental variables in the model zone of the Arctic coast, it is possible to identify the introduction of species from temperate latitudes to the Arctic coast in the context of global climate change.

The aim of this study was to compile a general list of diatoms of the Lena Delta Nature Reserve and the adjacent coastal area, characterize the diversity and species richness, conduct an ecological and geographical analysis, reveal environmental factors influencing the diatom diversity in the studied lakes, and identify potentially threatened species worthy of inclusion in the Red Book of the Arctic region.

2. Materials and Methods

2.1. Description of Study Area

The study area is located north of the Arctic Circle on the coast of the Laptev Sea of the Arctic Ocean and includes the Lena River Delta and reservoirs on the eastern spur of the Kharaulakh Range of the Verkhoyansk Mountain system. The maximum height reaches 400 m above sea level. The underlying rocks are mainly shales, sandstones, and limestones, as well as effusive rocks that were formed because of removal by the Lena River or accumulated because of catastrophic outbursts of a glacier-dammed lake in the late Pleistocene-early Holocene [22–24]. The territory belongs to the tundra and mountain-tundra natural zones. The climate is polar maritime, the average annual air temperature is −9–11 °C [25], and the average frost-free period is 45 days [26]. The depth of seasonal thawing of permafrost soils is 0.2–1.2 m [27]. The average annual precipitation reaches 212 mm, of which the bulk falls from June to August. The phenomena of a polar day in summer and a polar night in winter are characteristic. Strong winds are frequent, and the warmest month of the year, July, is characterized by the lowest average hourly wind speed of the year, which is 15.5 km h^{-1} (Figure 1, wind roses). The delta and coastal areas are characterized by an abundance of small tundra reservoirs due to limited drainage due to the low thickness of the seasonally thawed permafrost layer [28]. Our work on the territory adjacent to the reserve was carried out on 14 different types of water bodies, which are shallow tundra lakes, small reservoirs, and a hollow in the swampy tundra (Table 1, Figures 1 and 2).

Table 1. Sampling station parameters and the geographical coordinates of recent survey of waterbodies in "Tiksi region" (blue dots according to Figure 1).

No of Station	Lake Name	Water Temperature	Altitude, m	North	East
1	Lake 1	16.7	25	71°44′44″	128°43′12″
2	Lake 2	15.1	66	71°44′12″	128°41′37″
3	Lake 3	15.0	109	71°43′31″	128°38′31″
4	Lake 4	20.4	38	71°43′48″	128°42′35″
5	Lake 5	20.6	−4	71°43′45″	128°44′36″
6	Lake 6	16.1	76	71°41′10″	128°36′50″
7	Lake 7	14.5	76	71°40′52″	128°37′11″
8	Lake-puddle 8	10.1	55	71°40′26″	128°41′21″
9	Lake 9	15.1	54	71°40′10″	128°43′27″
10	Lake 10	13.3	52	71°35′56″	128°51′70″
11	Lake 11	14.0	38	71°34′33″	128°45′51″
12	Swampy lake 12	-	105	71°33′36″	128°40′26″
13	Lake 13	14.6	85	71°33′17″	128°38′51″
14	Lake 14	14.7	154	71°32′34″	128°34′57″

Figure 2. Natural landscape of investigated waterbodies in the Lena Delta Nature Reserve and the adjacent area. (**a**) Arctic tundra with small waterbodies; (**b**) phytoplankton sampling.

2.2. Sampling

Algae sampling on 14 waterbodies of the adjacent territory was carried out between 3 and 7 July 2021. When taking samples, Apstein's plankton net (SEFAR NITEX fabric, mesh diameter 15 µm) was used. All samples from 14 lakes were taken by throwing the Apstein net three times. Since the lakes are shallow water bodies, the shores of which are overgrown with tundra vegetation, in the process of sampling, not only the inhabitants of the water mass, but also organisms that were disturbed and torn off from the substrate were collected in the net. So, each sample accumulated both plankton and periphyton. Fixation with 4% neutral formaldehyde solution was carried out immediately after collection. The temperature of water and the morphometric parameters of each lake were determined during the collection of phytoplankton. Coordinates and altitudes of the stations were defined by a Garmin eTrex GPS-navigator (Table 1). Water samples of 1 L were collected from each lake for chemical analysis. All samples were transported for determination to the Analytical Chemistry Laboratory of the Institute for Biological Problems of Cryolithozone SB RAS, Yakutsk, Russia.

2.3. Diatom Analysis

Cleaning of diatom shells from organic matter was carried out by burning in 30% hydrogen peroxide with 6 h heat treatment in a thermostat at 85 °C [29]. Diatoms in prepared permanent preparations were examined using a JSM-6510 LV (JEOL Ltd.; Tokyo, Japan) scanning electron microscope.

Handbooks and individual articles were used for the diatom species determinations [9,30–51]. The modern species names were adopted using algaebase.org [52]. Rare and endangered species are marked based on data on the distribution of well-studied diatoms in Central Europe [53] in comparison with IUCN [54] (The International Union for Conservation of Nature) criteria (Table 2). Bioindicator analysis was performed according to [55], revealing species-specific ecological preferences [56,57]. Statistical maps were constructed as the network analysis in JASP (significant only) on the botnet package in the R Statistica package [58]. The BioDiversity Pro 2.0 program was used for similarity calculation [59].

Table 2. Threat categories for diatom species in the waterbodies of the Lena Delta Nature Reserve and the adjacent area.

IUCN Category	IUCN Code	No of Red List Category	Red List Category	Number of Species
Extinct	EX	1	Extinct or Lost	2
Critically Endangered	CR	2, 3	Threatened with Extinction, Highly Threatened	40
Endangered	EN	4, 5	Threatened, Threat of Unknown Extent	112
Vulnerable	VU	6	Extremely Rare	16
Near Threatened	NT	7	Near Threatened	28
Least Concern	LC	9	Not Threatened	198
Data Deficient	DD	8	Data Deficient	43
Not Evaluated	NE	0, 10	Not established	194

3. Results

3.1. Taxonomical and Floristic Analysis of Diatoms

A significant diversity (385 taxa, Appendix A Figures A1 and A2) of diatoms was found for 14 small tundra shallow lakes in "Tiksi region" [18], which, together with the identified previously diatom species in the Nature Reserve itself of the "delta region" [19], makes up a general floristic list of 666 taxa (including definitions to the genus level) (Appendix A Table A1). Thus, the species composition of diatoms in the reserve and adjacent protected areas was updated by 278 species.

For the diatom flora of the habitats of this Arctic coast, a wide range of generic richness of 123 genera was revealed, including from 1 to 57 species (Figure 3a), with a predominance of species of the *Pinnularia* (57) and *Eunotia* (51) genera (Figure 3b).

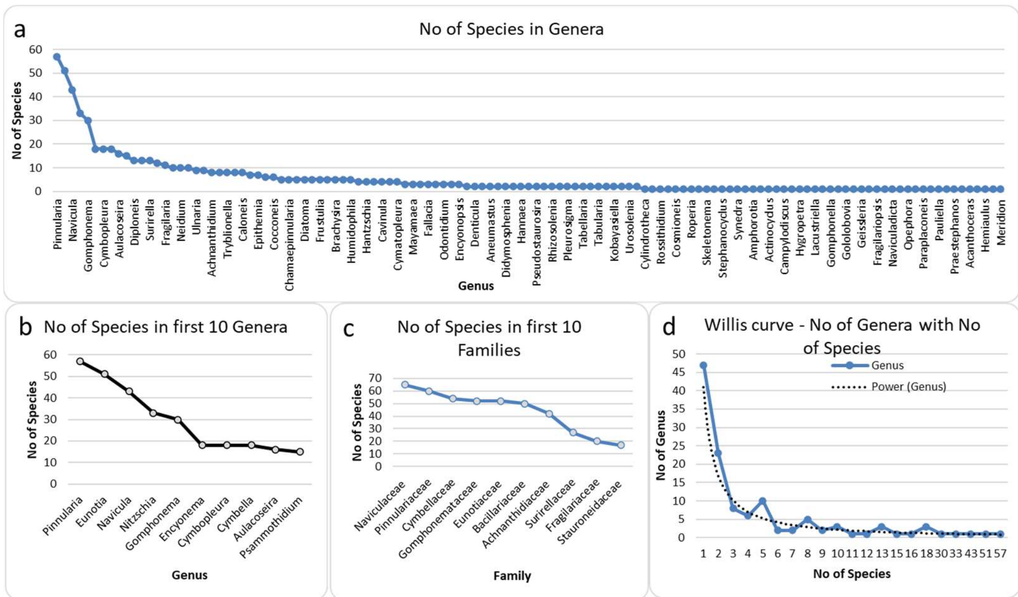

Figure 3. Distribution of diatom species over 123 genera (**a**), ten richest genera (**b**), ten richest families (**c**), and Willis's curve (**d**) in the Lena Delta Nature Reserve and the adjacent area.

Among the first 10 families out of 47, the Naviculaceae family with 65 species is the most abundant, followed by Pinnulariaceae and Eunotiaceae which move to 2nd and 5th place, respectively (Figure 3c). Floristic data were checked by us for completeness of knowledge by constructing a Willis curve comparing the number of species in genera [60]. It was found that when the Willis curve is represented by a hyperbolic distribution, it can be used as a criterion for the completeness of the list of algoflora and, therefore, for the subsequent analysis of alpha or gamma diversity. Figure 3d shows that the distribution of the number of species over the number of genera is a smooth enough line, almost coinciding with the trend line. This is evidence that the diatom flora of the Lena Delta Nature Reserve and the adjacent area is sufficiently studied to allow a systematic and ecological analysis of its species composition. However, irregularities on the distribution line indicate that the list of species has not yet been exhausted and will be increased with further research.

Floristic properties may be characteristic of the region under study. For this purpose, the index of intraspecific variability was calculated for the floristic composition of lakes in the Tiksi region. The index was defined as the quotient of the total number of identified taxa with a rank below the genus divided by the number of species. As it was revealed earlier [61], the index of intraspecific/species variability of diatom floras of Eurasia decreases from north to south, which may be associated with climate change and therefore can be used as a criterion for future warming. The index Ssp./Sp. for the entire Lena Delta Nature Reserve and the adjacent area, which includes the "Tiksi region" and "delta region", was 1.11, and for the study area of the "Tiksi region", the index was 1.14, typical for high-latitude and high-altitude communities (Table 3). The number of diatom species per area of the reserve and the "Tiksi region" differed markedly, amounting to 0.05 and 2.14 species per area, respectively.

Table 3. Floristic parameters of the entire Lena Delta Nature Reserve and the adjacent area as the "Delta region", and the "Tiksi region".

Variable	"Delta Region"	"Tiksi Region"
Area, km^2	14300	180
Species with intraspecies	666	385
Taxa without sp.	631	356
Species only	569	337
Sp./Area	0.05	2.14
Ssp./Sp.	1.11	1.14

Figure 4 makes it possible to compare the distribution of the studied lakes in the "delta region" and a group of 14 lakes in the "Tiksi region". Both studied areas have a significant number of the investigated lakes evenly distributed over the territory, the altitude of which is within 0–140 m above sea level and the number of species in individual lakes varies in a wider range on the territory of the reserve than on the territory of Tiksi. That is, environmental properties are similar, and differences are observed in the number of species in lakes. In this regard, it should be noted that the lakes in the delta were visited repeatedly over several years, while 14 lakes in the "Tiksi region" were examined only once.

The relationship between the morphometry of the studied lakes and the diatom species richness was defined by calculation data for the number of species per lake area represented in Table 4. It can be seen that highest species richness was in lake 6, but the Sp./Area index was highest in lake 4. The calculation of correlations of this index with the morphometric parameters of a group of lakes showed a significant correlation (p-value = 0.04), which is −0.502 for Sp./Area and coastline length.

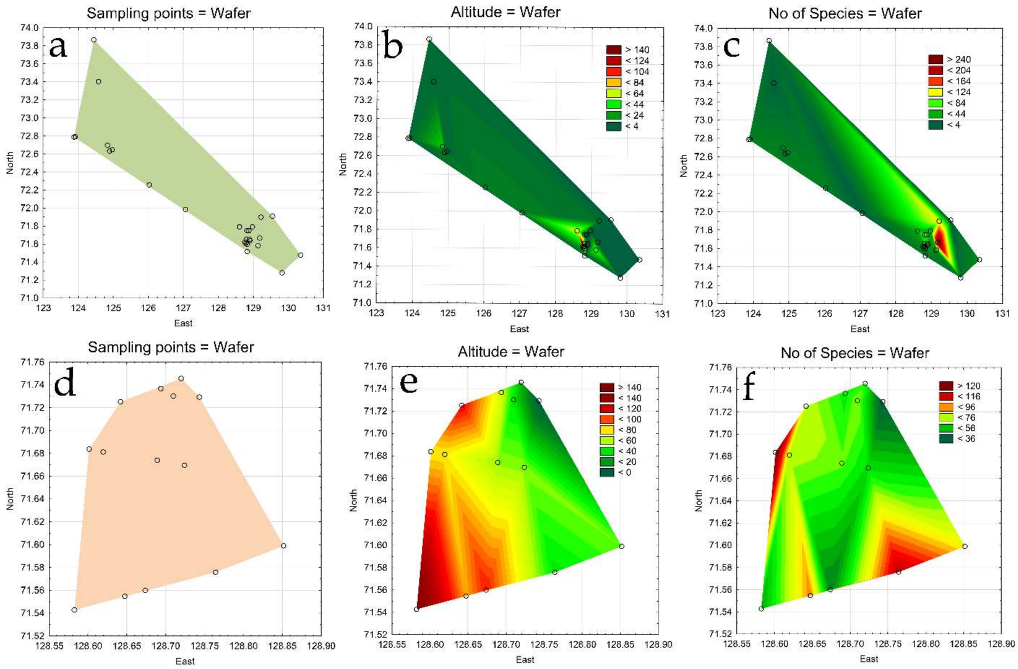

Figure 4. Distribution of the studied lakes in the territory of the "delta region" (**a**) and a group of 14 lakes in the "Tiksi region" (**d**), altitude (**b**,**e**) and the number of diatom species (**c**,**f**). The top row of graphs is Delta region and bottom row is Tiksi lakes.

Table 4. Distribution of the diatom species richness of the "Tiksi region" lakes over the lake surface.

No of Station	Lake Name	Lake Surface Area, km^2	Coastline Length, m	No of Species	Sp./Area
1	Lake 1	0.075	1618.42	66	881.601
2	Lake 2	0.038	894.56	62	1635.603
3	Lake 3	0.031	763.29	76	2460.437
4	Lake 4	0.008	359.76	72	8891.117
5	Lake 5	0.067	1188.51	33	493.171
6	Lake 6	0.042	902.78	137	3252.128
7	Lake 7	0.586	5716.74	75	128.074
8	Lake-puddle 8	-	-	69	-
9	Lake 9	0.486	3167.26	59	121.281
10	Lake 10	0.077	1153.85	85	1101.333
11	Lake 11	0.124	1800.36	117	946.742
12	Swampy lake 12	-	-	43	-
13	Lake 13	0.158	1639.88	96	609.365
14	Lake 14	0.023	712.85	50	2175.773

3.2. Bioindicators and Ecological Preferences of Diatoms

Ecological preferences of revealed species in "Tiksi region" and "delta region" are presented in Appendix A Table A2. The indicator species number distribution over the ecological categories is shown in Figure 5. Benthic and planktonic-benthic inhabitants prevail (Figure 5a). Temperate temperature species and indicators of middle oxygenated waters strongly prevail (Figure 5b,c). Indicators of low salinity group of indifferents (i) prevail in the studied area on the seacoast (Figure 5d). Indicators of water pH distribution show prevalence of groups of alkaliphiles and neutral waters (Figure 5e). Organic pollution indicators according to Watanabe demonstrated clear waters with sx and es groups, as shown in Figure 5f. Water quality was defined with the relation of the species-specific index saprobity S to 1–5 classes. Figure 5g shows the prevailing of organically unpolluted water indicators of classes 2 and 3. Between nutrition type indicators, the autotrophs (ats and ate) strongly prevail (Figure 5h). Trophic state indicator distribution was irregular, with two peaks in oligotrophic and eutrophic groups (ot and e) that reflected the impact on aquatic ecosystems, which increased the trophicity in some lakes (Figure 5i). The detailed distribution of species indicators over ecological categories is represented in Appendix A Table A3.

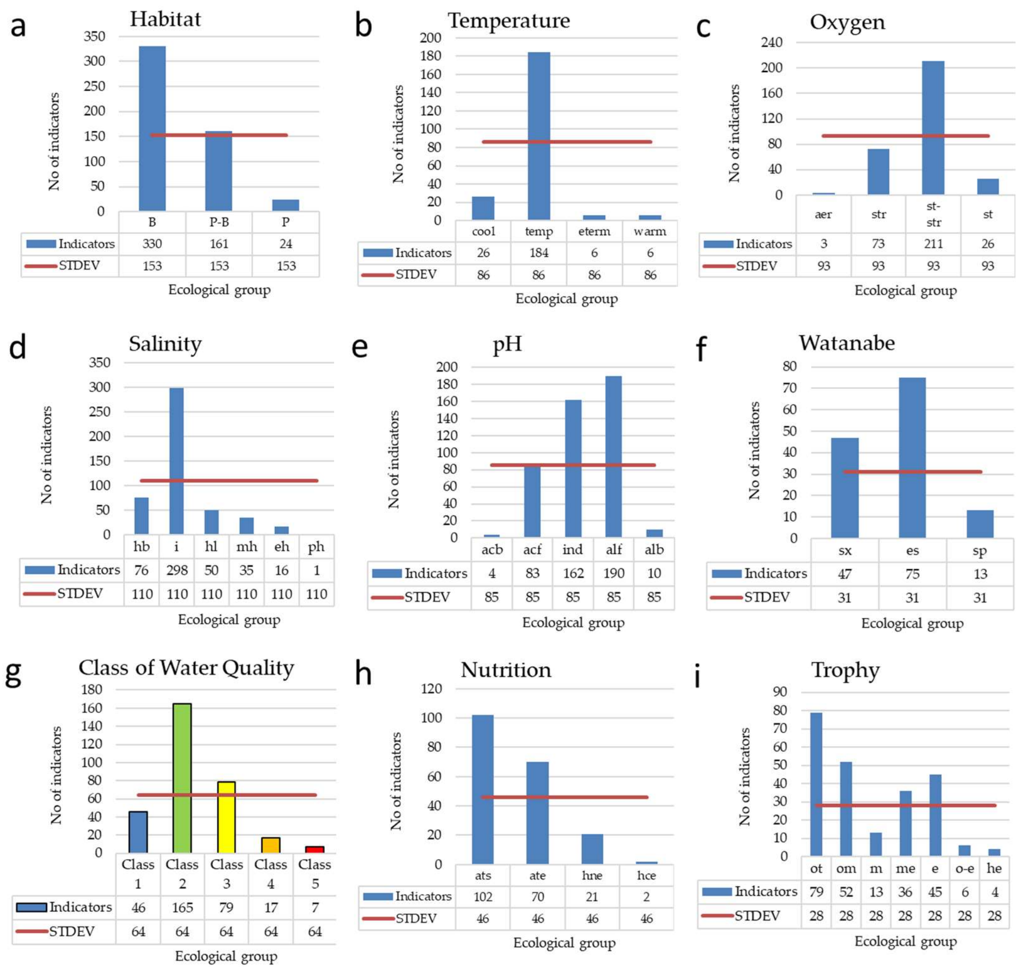

Figure 5. Distribution of species indicators of the waterbodies in the entire Lena Delta Nature Reserve and the adjacent areas over ecological groups. The ecological groups order on the axis x follows the increase in the related environmental indicator. (**a**) Habitat (P—planktonic, P-B—plankto-benthic, B—benthic). (**b**) Temperature preferences (cool—cool-water, temp—temperate, eterm—eurythermic, warm—warm-water). (**c**) Oxygen and streaming (st—standing water, str—streaming water, st-str—low streaming water, aer—aerophiles). (**d**) Salinity ecological groups according to Hustedt (1938–1939) [62] (hb—oligohalobes-halophobes, i—oligohalobes-indifferent, hl—halophiles; mh—mesohalobes, eh—euhalobes, ph—polyhalobes). (**e**) pH preferences groups (pH) according to Hustedt (1957) [63] (alb—alkalibiontes; alf—alkaliphiles, ind—indifferent; acf—acidophiles; acb—acidobiontes). (**f**) Organic pollution indicators according to Watanabe et al. (1986) [64]: sx—saproxenes; es—eurysaprobes; sp—saprophiles. (**g**) Class 1–5 of organic pollution indicators according to species-specific Index saprobity of Sládeček, 1986 [65]. (**h**) Nutrition type as nitrogen uptake metabolism (Van Dam et al., 1994) [66]: ats—nitrogen-autotrophic taxa, tolerating very small concentrations of organically bound nitrogen; ate—nitrogen-autotrophic taxa, tolerating elevated concentrations of organically bound nitrogen; hne—facultative nitrogen-heterotrophic taxa, needing periodically elevated concentrations of organically bound nitrogen; hce—obligate nitrogen-heterotrophic taxa, needing continuously elevated concentrations of organically bound nitrogen. (**i**) Trophic state indicators (Van Dam et al., 1994) [66]: (ot—oligotraphentic; om—oligomesotraphentic; m—mesotraphentic; me—mesoeutraphentic; e—eutraphentic; he—hypereutraphentic; o-e—oligo- to eutraphentic (hypereutraphentic)).

3.3. Species in Threat Categories

Appendix A Table A1 shows that the number of diatom species in the entire Lena Delta Nature Reserve and the adjacent areas is extremely high, which forces us to analyze the degree of their endemism and rarity, as well as the threat of extinction. Unfortunately, there is no mention of endangered diatom species in the Protected Areas of Russia [6]. Therefore, we used Germany's most developed Red Data Book diatom species resource [53] as a basis for identifying potentially threatened species in the Lena Delta Nature Reserve and the adjacent areas (Table 2).

The distribution of the revealed species over Threat Categories can be seen in Figure 6. Analysis of the revealed species composition of diatoms in relation to the Threatened species categories of the highest three threat levels, 1–3, from Extinct or Lost to Highly Threatened, showed that 42 species classified as such (Table 5) can be found on the Lena Delta Nature Reserve and the adjacent areas.

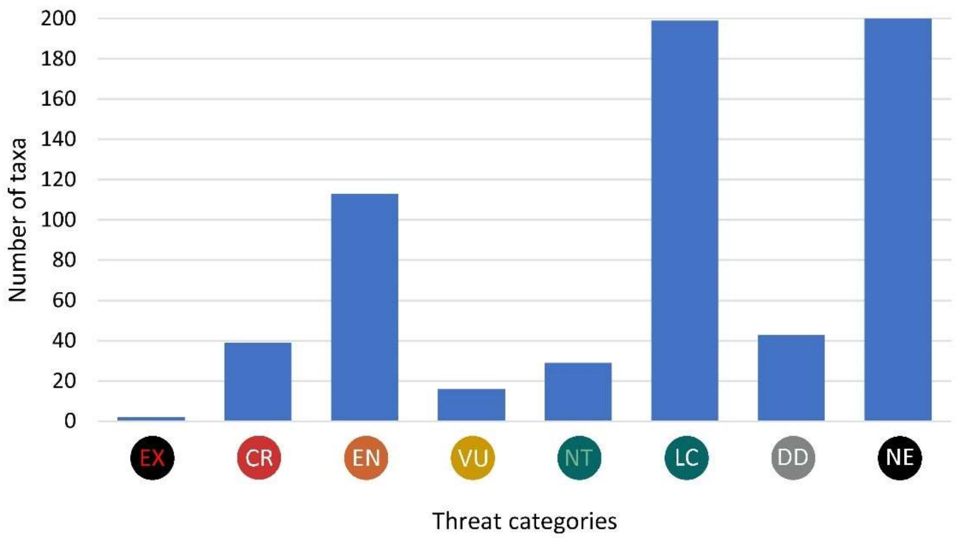

Figure 6. Distribution of the number of diatom species in the flora of water bodies of the Lena Delta Nature Reserve and adjacent territories by IUCN Threat Categories. The order of the IUCN categories on the x-axis corresponds to threat reduction.

Most of these are species of the genus *Psammothidium* (6), and there are three species each from the genera *Brachysira* and *Navicula*. Among the list of species, there are both newly described (*Boreozonacola hustedtii*) taxa without studied ecology and distribution, and widespread species (*Neidium iridis*). We have summarized the known ecological preferences (Appendix A Table A2) of these endangered species in Table 5 and found that they inhabit waters of moderate temperature (temp), well supplied with oxygen (str), having low salinity (ind), neutral, and weakly saturated with organic substances (es, o). These species are characterized by an autotrophic type of nutrition (ats) and living in communities of oligotrophic water bodies (ot). It follows that clean, fresh, pH-neutral, and unpolluted water communities are under threat.

Table 5. Ecological preferences of diatom species in IUCN Threat Categories (Red Data List) of the Lena Delta Nature Reserve and adjacent areas.

Species in Threat Categories	Hab	T	Oxy	Sal	pH	D	Index S	Sap	Aut-Het	Tro
EXTINCT (Extinct or Lost)										
Cymbopleura designata (Krammer) Bahls	B	temp	st-str	i	alf	-	1.8	o-a	ats	m
Encyonema latens (Krasske) D.G.Mann	B	-	-	-	-	-	1.0	o	ats	ot
CRITICALLY ENDANGERED (Threatened with Extinction)										
Eunotia elegans Østrup	P-B	-	st-str	hb	acf	-	0.2	x	ats	ot
Eunotia faba Ehrenberg	B	temp	st-str	-	alf	-	-	o	ats	ot
Frustulia krammeri Lange-Bertalot & Metzeltin	B	-	-	-	acf	-	-	-	-	e
Navigeia thingvallae (Østrup) Bukhtiyarova	B	-	-	-	-	-	-	-	-	-
Tetracyclus glans (Ehrenberg) F.W.Mills	P-B	temp	-	i	acf	-	1.0	x-o	-	ot
CRITICALLY ENDANGERED (Highly Threatened)										
Boreozonacola hustedtii Lange-Bertalot, Kulikovskiy & Witkowski	-	-	-	-	-	-	-	-	-	-
Brachysira calcicola Lange-Bertalot	B	-	-	-	-	-	1.0	o	-	-
Brachysira procera Lange-Bertalot & Gerd Moser	B	-	-	-	acf	-	-	-	-	-
Brachysira styriaca (Grunow) R.Ross	B	temp	-	i	ind	es	1.0	o	-	ot
Cymbella affinis Kützing	B	temp	st-str	i	alf	sx	1.1	b	ats	e
Cymbella carassius Skvortzov	-	-	-	-	-	-	-	-	-	-
Cymbellafalsa diluviana (Krasske) Lange-Bertalot & Metzeltin	B	-	-	i	alf	-	1.0	o	-	ot
Cymbopleura tynnii (Krammer) Krammer	B	-	-	-	-	-	-	-	-	-
Diploneis ovalis (Hilse) Cleve	B	-	st-str	i	alf	-	0.9	x-b	ate	m
Eucocconeis alpestris (Brun) Lange-Bertalot	B	temp	str	hb	ind	-	-	-	-	-
Eucocconeis austriaca (Hustedt) Lange-Bertalot	B	-	-	i	alf	-	0.2	x	ats	ot
Eucocconeis flexella (Kützing) F.Meister	B	temp	str	mh	ind	-	-	-	-	-
Eunotia bigibba Kützing	B	-	str	i	acf	-	0.4	x-o	-	ot
Eunotia flexuosa (Brébisson ex Kützing) Kützing	B	temp	st-str	i	acf	-	0.4	x-o	-	-
Eunotia praerupta Ehrenberg	P-B	cool	st-str	hb	acf	-	0.3	x	-	-
Eunotia triodon Ehrenberg	B	temp	-	hb	acf	-	1.0	o	-	ot
Gomphonema helveticum Brun	B	-	-	i	ind	-	-	-	-	-
Gomphonema lagerheimii A.Cleve	B	-	str	hb	acf	-	-	-	-	m
Gomphonema ventricosum W.Gregory	B	cool	str	i	ind	-	1.0	o	-	-
Iconella curvula (W.Smith) Ruck & Nakov	B	-	str	hb	acf	-	2.0	b	-	me
Kobayasiella subtilissima (Cleve) Lange-Bertalot	B	temp	st-str	i	acb	-	1.6	b-o	ats	me
Mayamaea disjuncta (Hustedt) J.Y. Li & Y.Z.Qi	B	-	str	i	ind	sp	3.0	a	ate	he
Navicula angusta Grunow	B	-	st-str	i	ind	-	1.0	o	-	-
Navicula gottlandica Grunow	P-B	-	-	hl	alf	es	2.5	b-a	ate	e
Navicula mediocostata E.Reichardt	B	-	-	oh	alf	es	3.0	a	ate	e
Navicula notha J.H.Wallace	B	-	str	i	acf	-	-	-	-	-
Neidium iridis (Ehrenberg) Cleve var. iridis	B	temp	st-str	hb	ind	-	-	-	-	-
Nitzschia frigida Grunow	-	-	-	-	-	-	-	-	-	-
Placoneis opportuna (Hustedt) Chudaev & Gololobova	B	-	-	-	-	es	-	-	-	-
Psammothidium kryophilum (J.B.Petersen) E.Reichardt	P-B	-	str	i	ind	sx	0.5	x-o	ats	ot
Psammothidium levanderi (Hustedt) Bukhtiyarova & Round	B	temp	str	i	ind	sx	2.0	b	ats	om
Psammothidium rechtense (Leclercq) Lange-Bertalot	B	-	str	hb	alf	-	1.0	o	ats	ot
Psammothidium rossii (Hustedt) Bukhtiyarova & Round	B	-	str	hb	ind	-	1.0	o	ats	ot
Psammothidium scoticum (R.J.Flower & V.J.Jones) Bukhtiyarova & Round	B	temp	-	-	-	-	-	-	-	-
Psammothidium ventrale (Krasske) Bukhtiyarova & Round	B	-	str	hb	acf	-	2.0	b	ats	om

Note: "-", not found. Abbreviations: Habitat (Hab) (P-B—plankto-benthic, B—benthic); temperature (T) preferences (cool—cool-water, temp—temperate, eterm—eurythermic, warm—warm-water); oxygenation and streaming (Oxy) (str—streaming water, st-str—low streaming water); pH preferences groups (pH) according to Hustedt (1957) [63] (alb—alkalibiontes; alf—alkaliphiles, ind—indifferent; acf—acidophiles; salinity ecological groups (Sal) according to Hustedt (1938–1939) [62] (hb—oligohalobes-halophobes, i—oligohalobes-indifferent, hl—halophiles; mh—mesohalobes, oh—oligohalobes of wide spectrum with optimum as indifferent); Index S, species-specific index saprobity according to Sládeček, 1986 [65]; self-purification zone with index of saprobity (Sap) (x/0.0—xenosaprobe; x-o/0.4—xeno-oligosaprobe; x-b/0.8—xeno-betamesosaprobe; o/1.0—oligosaprobe; b-o/1.6—beta-oligosaprobe; o-a/1.8—oligo-alphamesosaprobe; b/2.0—betamesosaprobe; a/3.0—alphamesosaprobe; organic pollution indicators according to Watanabe et al. (1986) [64] (D): sx—saproxenes; es—eurysaprobes; sp—saprophiles; nitrogen uptake metabolism (Aut-Het) (Van Dam et al., 1994) [66]: ats—nitrogen-autotrophic taxa, tolerating very small concentrations of organically bound nitrogen; ate—nitrogen-autotrophic taxa, tolerating elevated concentrations of organically bound nitrogen; Trophic state indicators (Tro) (Van Dam et al., 1994) [66]: (ot—oligotraphentic; om—oligomesotraphentic; m—mesotraphentic; me—mesoeutraphentic; e—eutraphentic; he—hypereutraphentic).

3.4. Comparative Floristic

We can see the sufficient role of climatic, morphometric, and other environmental variables in the high latitude lakes community composition because of this calculation. Therefore, we decided to compare diatom community composition in morphometrically similar lakes which were located at the north of Eurasia. Altogether 40 lakes, including

14 Tiksi lakes, were taken for similarity of diatom community calculation: 9 Yakutia lakes (Y) Aalaah, Kurelah, Sullah, Dyiere, Ynah, Nal Tungulu, Large and Small Tungulu, Abalah, Nidzhili [10]; Bolshezemelskaya Tundra lakes (BZ) Vanutkiny, Kharbeyskiye, Korotaikha, Vorkuta, Usa, Kara [2]; Tiksi (T), species from the "Tiksi region" 14 lakes [18] (Appendix A Table A1). The Bray–Curtis calculation of the diatom species composition similarity of the lakes above the Arctic circle latitude of Russia shows strong separation of each group of the lakes. Figure 7 demonstrates three clusters that were marked for North Yakutia (1), Bolshezemelskaya Tundra (2), and 14 Tiksi lakes from current research (3).

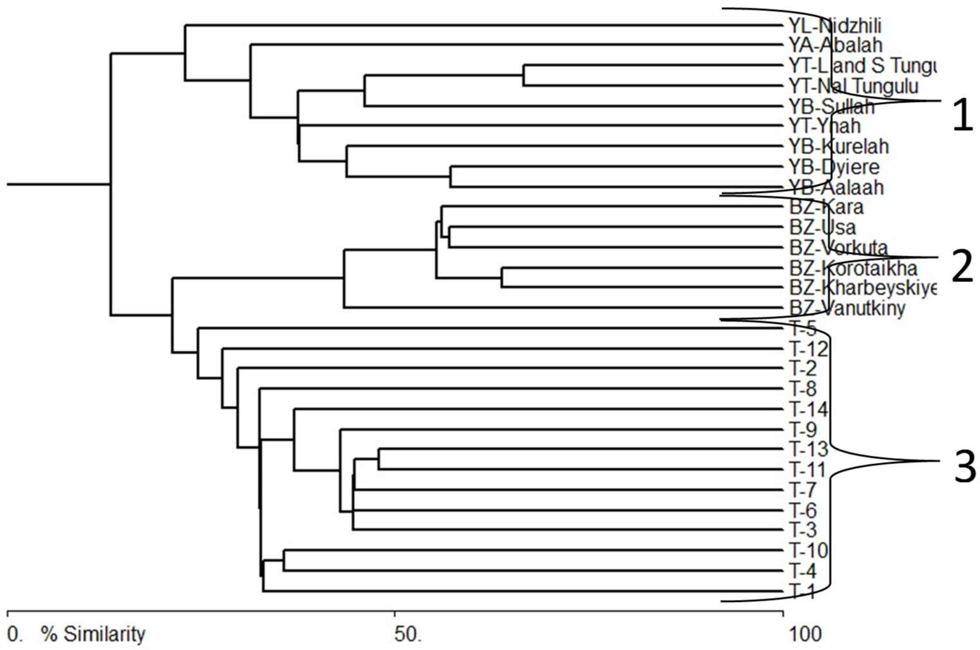

Figure 7. Bray–Curtis cluster analysis of diatom list similarity of the Arctic lakes over the Arctic circle in Eurasia. Cluster 1: Nine Yakutia lakes (Y): Aalaah, Kurelah, Sullah, Dyiere, Ynah, Nal Tungulu, L. and S. Tungulu, Abalah, Nidzhili [10]. Cluster 2: Bolshezemelskaya Tundra lakes (BZ) Vanutkiny, Kharbeyskiye, Korotaikha, Vorkuta, Usa, Kara [2]. Cluster 3: Tiksi (T), species from 14 lakes [18] (Appendix A Table A1).

We have expanded the list of diatom floras for the next step of comparison, which included Arctic Chukotka from Amguema basin lakes Ervynaygytgyn, Matachingagytgyn, Ekitiki [7,8], Bolshezemelskaya Tundra lakes Vanutkiny, Kharbeyskiye, Korotaikha, Vorkuta, Usa, Kara [2], Svalbard, ten Hornsund fiord lakes [5], and nine Yakutia lakes Aalaah, Kurelah, Sullah, Dyiere, Ynah, Nal Tungulu, Large and Small Tungulu, Abalah, and Nidzhili [10].

Comparison with the JASP program [58] represented results of similarity calculation, as shown in Figure 8. It can be seen that the species composition of each group of the lakes is strongly separated from each other. This high individuality of species composition can be the result of the influence of the geographical position of the lakes group and its climatic features.

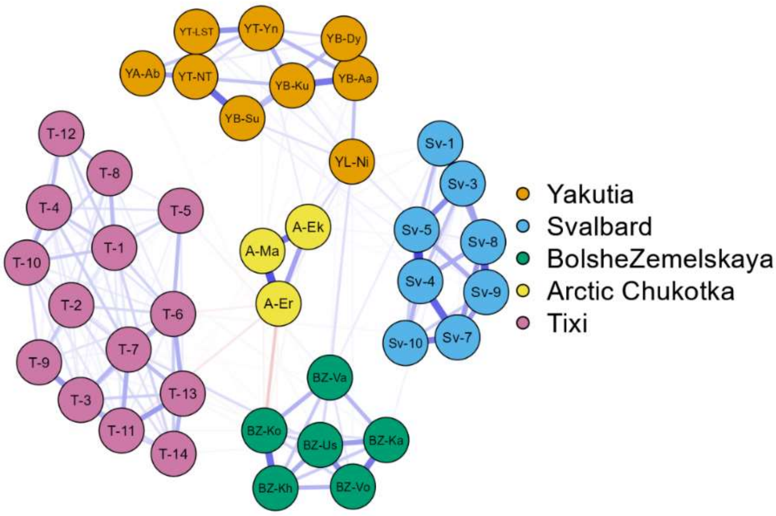

Figure 8. JASP network plot of diatom species composition similarity for the small Arctic lakes, $p< 0.5$. Tiksi (T), species from the Tiksi region 14 lakes [18]. Arctic Chukotka, species from Amguema basin lakes: Ervynaygytgyn, Matachingagytgyn, Ekitiki [7,8]. Bolshezemelskaya Tundra lakes (BZ) Vanutkiny, Kharbeyskiye, Korotaikha, Vorkuta, Usa, Kara [2]. Svalbard (Sv), Hornsund fiord, eight lakes [5]. Yakutia (Y), nine lakes: Aalaah, Kurelah, Sullah, Dyiere, Ynah, Nal Tungulu, Large and Small Tungulu, Abalah, Nidzhili [10].

4. Discussion

The subject of our study was the flora of diatoms found in the lakes of the "Tiksi region" in the vicinity of Tiksi settlement and the delta on the territory of the "delta region" of the Lena Delta Nature Reserve. The general list was compiled from our studies of the "delta region" [19] including 413 taxa, and 385 taxa of the "Tiksi region" [18], and amounted to 666 taxa of diatoms (including definitions to the genus level), 278 of which were enriched the regional flora. The floristic analysis was carried out after constructing the Willis curve, which was found to be quite smooth and close to the trend line, thereby indicating that the list of diatoms is sufficiently complete for an adequate flora of the analysis. The Willis curve was not so smooth to allow us to assume that the list of species has yet been exhausted, and the list will be increased with further research. The index of intraspecific variability Ssp./Sp. for the lakes of the "delta region" was 1.11, and for the lakes of the "Tiksi region" it was 1.14, which is typical for high-latitude and high-mountain communities.

We calculated the Sp./Area index as the number of diatom species per whole studied area, which was 0.05 for the "delta region" but 2.14 for the "Tiksi region", thereby showing differences between biodiversity of both studied areas and confirming that the coastal zone can be the hotspot of the Arctic diatoms, as was revealed for Arctic chrysophytes [67]. Our reasoning boils down to the fact that in the lakes of Northern Europe, as well as in some subarctic and temperate lakes of northwestern Russia and the Baltic states, the species lists of diatoms were proportional to the area of the lakes [68]. In the lakes of the Tiksi region and some lakes of the delta region studied here, the area of lakes does not correlate with species richness. Even though all compared lakes are shallow and have been studied many times in the delta region, and samples were taken once in the Tiksi region, the diversity in the lakes of the Tiksi region was found to be significantly higher. We attempted to remove a possible reason for the high diversity in Tiksi lakes surveyed by SEM and carried out the same study of diatoms in some lakes of the delta, but here the species composition did not increase. Thus, we concluded that the burst of diversity of diatoms in lakes of the same type morphometrically but located in the coastal zone of the lakes of the Tiksi region is associated with the Arctic coastal ecotone. Thus, the geographic factor was found to be significant for the formation of diatom communities in the Arctic floras. In addition to this, the association with individual river runoff basins on the coast, elevated habitats, and the influence of such climatic factors such as summer northeast winds on the species composition was previously revealed [18].

The Arctic deltas are responsible for nutrient transport to the sea, which varies by delta and season, and it is estimated that the Lena Delta retains about 15% of the input load, the largest in the Arctic Ocean [69]. At the same time, the deposition of nitrates by the tundra landscape in the spring and their subsequent accumulation in lakes and wetlands adjacent to river channels contributes to the enrichment of lake water with a nutrient base [69]. This makes the water of the Lena River a source of nutrients [17,70] on the one hand, but on the other hand, stimulates the diversity of algae, as has been shown in the lakes of the Tiksi coastal region [18]. Despite this, the current diatom flora shows clean, organically uncontaminated waters, although there is a diversity burst response to a one-time nutrient point impact in the Tiksi area.

Whole flora bioindicators analysis shows that the diatoms identified in the “delta region” and the coastal “Tiksi region” were mainly benthic autotrophs, preferring temperate, middle oxygenated, low-saline, low-alkalic clear class 2 water, and characterize two trophic types of waterbodies—oligotrophic and eutrophic.

The high individuality of diatom communities was revealed both for the entire Lena Delta and its adjacent areas, and in a comparative analysis with the lacustrine floras of Yakutia and the High Arctic of Eurasia. For the first time for the Arctic regions of Eurasia, a preliminary analysis of the threat of diatom species was carried out and 42 species of the IUCN categories were identified. These rare or threatened species prefer moderate temperatures, and slightly acidic or neutral environments free from organic pollution. Thus, the lake communities in clean, fresh, pH-neutral, and unpolluted waters in the coastal zone of the Arctic Ocean with the highest diversity are the most vulnerable.

As a result of comparing the properties of the natural environment of the “delta region” and the coastal zone of the “Tiksi region”, our hypothesis that one indicator of global climate change may be the introduction of diatom species from temperate latitudes to the Arctic was confirmed. The species richness in the Tiksi coastal lakes was higher than that in the delta lakes even though the lakes in the delta were sampled many times over several years, and 14 lakes in the “Tiksi region” were surveyed only once. This allows us to suggest that the high diversity inherent in the diatom lakes of the Tiksi coastal zone, which can even be enriched in further studies, can be considered as a property of coastal biota inherent in ecotones. Since it is in the coastal region of Tiksi that a surge in the number of species is observed, this region can be considered not only an ecotone, but also a hotspot of diatom diversity. Ecotones are border areas of different landscapes where there is a marked increase in the diversity of organisms [71]. Until now, the landscapes of the coast of the Arctic Ocean have not been considered as ecotones for diatom communities. However, for the diversity of algae, this term was used, for example, for communities of river habitats [72]. The diversity of diatoms in the coastal area of the “Tiksi region” may be due to several factors. As known, studies of diatoms in a scanning electron microscope give a higher percentage of certain species [73].

We have formed a hypothesis about the introduction of species from temperate latitudes into Arctic waters under the conditions of global climate change [20]. The revealed record level of species diversity of diatoms and related changes in the structure of diatom communities can be fingerprint evidence of the beginning of climate warming. On the other hand, there is an opinion that the similarity between the algal communities of the northern and temperate regions may be more apparent than real [74]. This is confirmed by the sharp predominance of species of the genera *Pinnularia* and *Eunotia*, not only in our studied lakes, but also in a comparative analysis with other Arctic floras. Moreover, the further north the flora, the more saturated with species are these two genera. This may be one of the decisive signs for assessing the impact of climate change on the aquatic communities of the Arctic. Our conclusions are in the frame of the Ruth Patrick theory [75] about the relationship between diatom biodiversity and the health of the environment that can be seen in increasing the species diversity in the tundra coastal area of Arctic. So, this type of Arctic wetlands can have high importance because of their high water cleaning capacity by absorbing and assimilating a variety of pollutants.

Therefore, we revealed the important role of climatic and other environmental variables related with geographical position of the waterbody in forming the diatom community composition in the high latitude lakes. We suggest that the results of this study can be used to create a database on the biodiversity of diatoms as indicators of changes in untouched areas, as well as pioneers in monitoring climate change in the Arctic. Their relevance for assessing the consequences of local anthropogenic impact is high.

Author Contributions: Conceptualization, S.B. and V.G.; methodology, S.B. and V.G.; software, S.B.; validation, S.B., V.G. and S.G.; formal analysis, V.G. and S.G.; investigation, V.G.; resources, V.G.; data curation, S.G. and V.G.; writing—original draft preparation, S.B. and V.G.; writing—review and editing, S.B., V.G. and S.G.; visualization, S.B.; supervision, V.G.; project administration, V.G.; funding acquisition, V.G. All authors have read and agreed to the published version of the manuscript.

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Appendix A

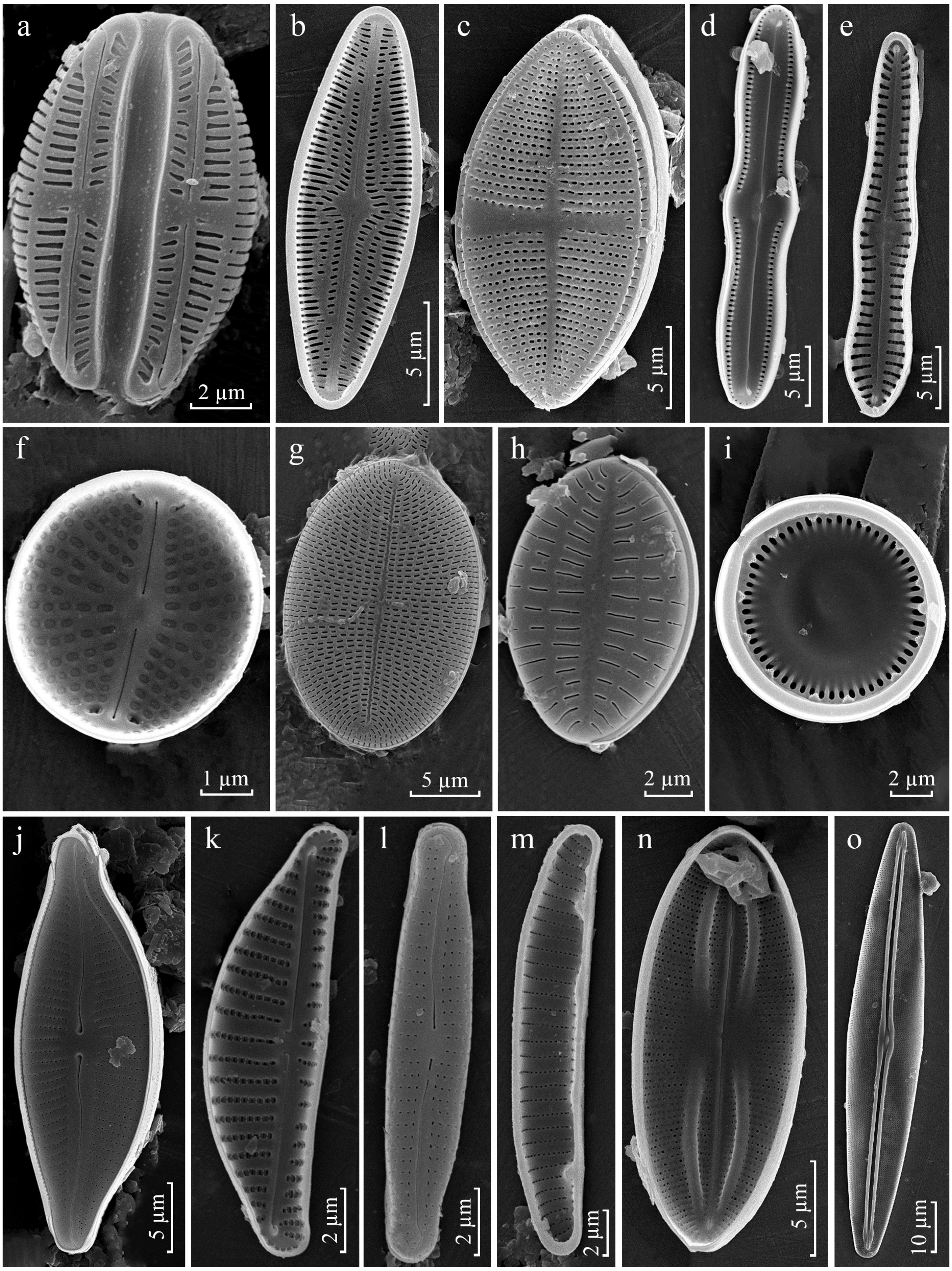

Figure A1. Electron micrographs of diatoms of studied waterbodies: (**a**)—*Amphora indistincta*, (**b**)—*Brachysira brebissonii*, (**c**)—*Gololobovia obliqua*, (**d**)—*Caloneis holarctica*, (**e**)—*Gomphonema angusticephalum*, (**f**)—*Cavinula pseudoscutiformis*, (**g**)—*Cocconeis placentula* var. *euglypta*, (**h**)—*C. neodiminuta*, (**i**)—*Cyclotella distinguenda*, (**j**)—*Cymbopleura designata*, (**k**)—*Encyonema minutum*, (**l**)—*Encyonopsis perborealis*, (**m**)—*Eunotia incisa*, (**n**)—*Fallacia pygmaea*, (**o**)—*Frustulia krammeri*.

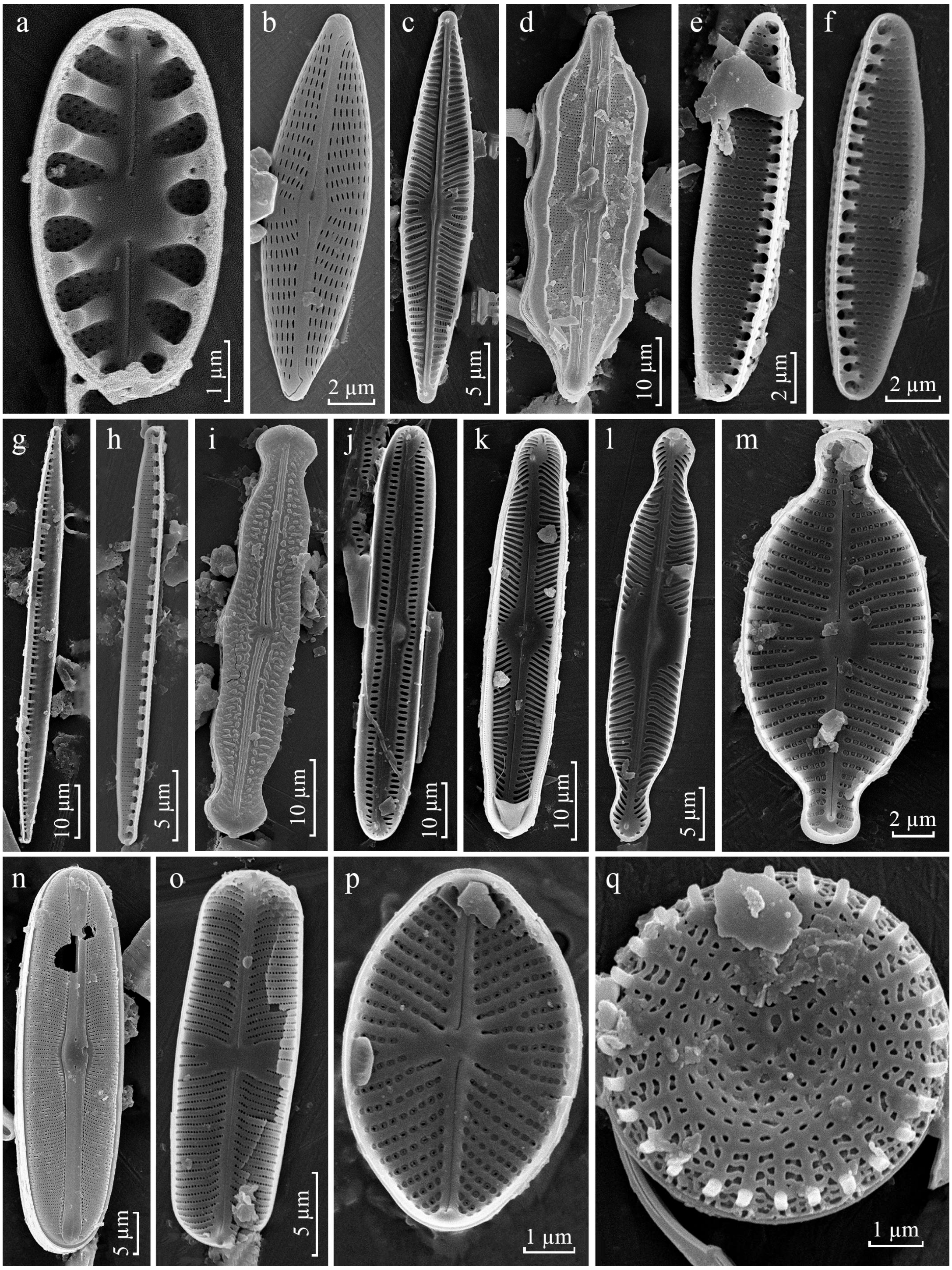

Figure A2. Electron micrographs of diatoms of studied waterbodies: (**a**)—*Hygropetra balfouriana*, (**b**)—*Navicula cryptocephala*, (**c**)—*N. radiosa*, (**d**)—*Neidium hitchcockii*, (**e**)—*Nitzschia alpina*, (**f**)—*N. inconspicua*, (**g**)—*N. media*, (**h**)—*N. perminuta*, (**i**)—*Pinnularia canadensis*, (**j**)—*P. notabilis*, (**k**)—*P. rhombarea*, (**l**)—*P. subanglica*, (**m**)—*Placoneis interglacialis*, (**n**)—*Sellaphora insolita*, (**o**)—*S. laevissima*, (**p**)—*Skabitschewskia oestrupii*, (**q**)—*Stephanodiscus hashiensis*.

Table A1. Distribution of diatom species in the Lena Delta Nature Reserve (ULR) and the adjacent area in Tiksi lakes 1–14 with Red List [53] and IUCN [54] categories. Abbreviations of categories as in Table 2. '1', present; '-', absent.

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Acanthoceras zachariasii (Brun) Simonsen	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthes adnata Bory	0	NE	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-
Achnanthes atacamae Hustedt	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthes ingratiformis Lange-Bertalot	0	NE	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Achnanthes koshovii Jasnitsky	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthes sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthidium affine (Grunow) Czarnecki	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthidium kranzii (Lange-Bertalot) Round & Bukhtiyarova	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthidium minutissimum (Kützing) Czarnecki	9	LC	1	1	1	1	-	1	1	-	1	1	1	-	1	1	1
Achnanthidium minutissimum var. *jackii* (Rabenhorst) Lange-Bertalot	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthidium nodosum (Cleve) Tseplik & Chudaev	0	NE	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Achnanthidium petersenii (Hustedt) C.E.Wetzel, L.Ector, D.M.Williams & I.Jüttner	4	EN	1	-	1	1	1	-	1	1	1	1	1	1	1	-	-
Achnanthidium saprophilum (H.Kobayashi & Mayama) Round & Bukhtiyarova	9	LC	-	-	-	-	-	1	-	-	-	-	1	-	1	1	-
Achnanthidium sp.	-	-	-	1	-	1	-	-	-	-	-	1	-	-	-	-	-
Actinocyclus kuetzingii (A.W.F.Schmidt) Simonsen	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Adlafia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Amphora copulata (Kützing) Schoeman & R.E.M.Archibald	9	LC	-	1	-	1	1	1	1	-	1	1	1	-	-	1	-
Amphora indistincta Levkov	9	LC	-	1	-	-	1	1	-	-	-	-	1	-	1	1	-
Amphora ovalis (Kützing) Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Amphora pediculus (Kützing) Grunow	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Amphora pseudosibirica Levkov & Pavlov	0	NE	-	-	1	-	-	-	-	-	-	-	1	-	1	1	-
Amphora sp.	9	LC	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphorotia clevei (Grunow) D.M.Williams & G.Reid	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Aneumastus apiculatus (Østrup) Lange-Bertalot	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Aneumastus tusculus (Ehrenberg) D.G.Mann & A.J.Stickle	0	NE	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Asterionella formosa Hassall	9	LC	-	-	-	-	-	1	1	-	-	-	1	-	-	-	1
Aulacoseira alpigena (Grunow) Krammer	5	EN	1	-	1	1	-	1	1	1	-	1	1	1	1	1	1
Aulacoseira ambigua (Grunow) Simonsen	9	LC	-	-	-	1	-	1	-	-	1	-	-	-	1	-	1
Aulacoseira distans (Ehrenberg) Simonsen	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Aulacoseira granulata (Ehrenberg) Simonsen f. *granulata*	9	LC	-	-	-	1	1	1	-	-	-	1	-	-	1	-	1
Aulacoseira granulata f. *curvata* (Hustedt) Simonsen	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Aulacoseira islandica (O.Müller) Simonsen	9	LC	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1
Aulacoseira italica (Ehrenberg) Simonsen *var. italica*	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Aulacoseira italica var. *curvata* (Pantocsek) L.Yang & Q.X.Wang	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Aulacoseira italica var. *tenuissima* (Grunow) Simonsen	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Aulacoseira lirata (Ehrenberg) R.Ross	5	EN	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Aulacoseira perglabra (Østrup) E.Y.Haworth	6	VU	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Aulacoseira pfaffiana (Reinsch) Krammer	5	EN	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Aulacoseira pusilla (F.Meister) A.Tuji & A.Houki	9	LC	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Aulacoseira scalaris (Grunow) Houk, Klee & Passauer	0	NE	1	1	-	1	-	1	-	1	-	1	-	-	-	-	-
Aulacoseira subarctica (O.Müller) E.Y.Haworth	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Aulacoseira valida (Grunow) Krammer	5	EN	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Boreozonacola hustedtii Lange-Bertalot, Kulikovskiy & Witkowski	3	CR	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-
Brachysira brebissonii R.Ross	4	EN	1	1	-	1	-	1	-	1	1	1	-	1	-	-	-
Brachysira calcicola Lange-Bertalot	3	CR	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Brachysira neoexilis Lange-Bertalot	9	LC	1	-	-	-	-	-	-	1	1	1	-	1	-	-	-
Brachysira procera Lange-Bertalot & Gerd Moser	3	CR	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-
Brachysira styriaca (Grunow) R.Ross	3	CR	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caloneis arctica (Krasske) Lange-Bertalot & S.I.Genkal	0	NE	-	1	-	-	-	1	-	-	-	-	1	-	-	-	-
Caloneis bacillum (Grunow) Cleve	8	DD	-	-	1	-	-	1	1	-	1	1	-	-	1	-	-
Caloneis holarctica Kulikovskiy, Lange-Bertalot & A.Witkowski	0	NE	1	1	1	-	-	1	1	1	-	-	1	1	-	-	-
Caloneis silicula (Ehrenberg) Cleve *var. Silicula*	9	LC	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Caloneis silicula var. *elliptica* Mayer	0	NE	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Caloneis undosa Krammer	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Caloneis ventricosa F.Meister var. *truncatula* (Grunow) Meister	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Caloneis westii (W.Smith) Hendey	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Campylodiscus hibernicus Ehrenberg	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cavinula cocconeiformis (W.Gregory ex Greville) D.G.Mann & A.J.Stickle	5	EN	1	-	-	-	1	1	1	1	1	1	1	-	1	-	-
Cavinula jaernefeltii (Hustedt) D.G.Mann & A.J.Stickle	4	EN	1	-	1	-	-	1	-	-	1	-	1	-	1	1	-
Cavinula pseudoscutiformis (Hustedt) D.G.Mann & Stickle	4	EN	-	-	1	1	1	1	1	-	-	1	1	-	1	1	-
Cavinula sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Chaetoceros borealis Bailey	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros compressus Lauder	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros debilis Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros decipiens Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros furcellatus Yendo	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Chaetoceros gracilis Pantocsek	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros mitra (Bailey) Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros simplex Ostenfeld	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros socialis H.S.Lauder	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros subtilis Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros teres Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chaetoceros wighamii Brightwell	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chamaepinnularia begeri (Krasske) Lange-Bertalot	5	EN	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Chamaepinnularia circumborealis Lange-Bertalot	0	NE	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Chamaepinnularia krookiformis (Krammer) Lange-Bertalot & Krammer	9	LC	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Chamaepinnularia soehrensis (Krasske) Lange-Bertalot & Krammer	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chamaepinnularia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Cocconeis lineata Ehrenberg	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Cocconeis neodiminuta Krammer	9	LC	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
Cocconeis pediculus Ehrenberg	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cocconeis placentula Ehrenberg var. *placentula*	8	DD	-	-	1	-	-	1	-	-	1	-	-	-	-	-	1
Cocconeis placentula var. *euglypta* (Ehrenberg) Cleve	9	LC	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-
Cocconeis sp.	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Coscinodiscus curvatulus Grunow	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cosmioneis pusilla (W.Smith) D.G.Mann & A.J.Stickle	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Craticula ambigua (Ehrenberg) D.G.Mann	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Craticula halophila (Grunow) D.G.Mann	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Craticula molestiformis (Hustedt) Mayama	9	LC	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-
Ctenophora pulchella (Ralfs ex Kützing) D.M.Williams & Round	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cyclostephanos dubius (Hustedt) Round	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Cyclostephanos makarovae (S.I.Genkal) K.Schultz	0	NE	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-
Cyclotella atomus Hustedt	9	LC	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-
Cyclotella distinguenda Hustedt	9	LC	1	-	-	1	1	1	-	-	1	-	1	1	-	-	-
Cyclotella meduanae H.Germain	9	LC	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-
Cyclotella melosiroides (Kirchner) Lemmermann	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cylindrotheca gracilis (Brébisson ex Kützing) Grunow	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymatopleura elliptica (Brébisson) W.Smith	9	LC	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Cymatopleura nobilis Hantzsch	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymatopleura solea var. *gracilis* Grunow	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Cymatopleura solea var. *vulgaris* Meister	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella affinis Kützing	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella arctica (Lagerstedt) A.W.F.Schmidt	4	EN	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1
Cymbella australica (A.W.F.Schmidt) Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella carassius Skvortzov	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella cleve-eulerae Krammer	0	NE	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-
Cymbella cymbiformis C.Agardh	4	EN	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1
Cymbella hantzschiana Krammer	8	DD	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Cymbella helvetica Kützing	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella krammeri Bahls	0	NE	-	1	1	-	-	1	1	-	1	-	-	-	1	1	-
Cymbella lanceolata C.Agardh	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella neocistula Krammer	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella neogena (Grunow) Krammer	0	NE	-	1	-	-	-	1	1	-	-	-	-	-	1	-	-
Cymbella proxima Reimer	5	EN	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-
Cymbella stuxbergii (Cleve) Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella subcistula Krammer	8	DD	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Cymbella tartuensis Molder	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella tumida (Brébisson) Van Heurck	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbella sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Cymbellafalsa diluviana (Krasske) Lange-Bertalot & Metzeltin	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbopleura amphicephala (Nägeli ex Kützing) Krammer	5	EN	-	-	-	-	-	1	-	-	-	-	-	-	1	-	1
Cymbopleura anglica (Lagerstedt) Krammer	5	EN	-	-	1	-	-	1	1	1	-	1	1	-	1	-	-
Cymbopleura angustata var. *spitsbergensis* Krammer	0	NE	-	1	1	-	-	1	-	1	1	-	-	-	1	-	-
Cymbopleura cuspidata (Kützing) Krammer	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbopleura designata (Krammer) Bahls	1	EX	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura elliptica Krammer	5	EN	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-
Cymbopleura hybrida (Grunow ex Cleve) Krammer	5	EN	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-
Cymbopleura incertiformis Krammer	5	EN	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Cymbopleura naviculiformis (Auerswald ex Heiberg) Krammer	9	LC	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Cymbopleura neoheteropleura Krammer	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbopleura oblongata var. *stenoraphe* Krammer	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Cymbopleura stauroneiformis (Lagerstedt) Krammer	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cymbopleura subanglica Krammer	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cymbopleura subapiculata Krammer	0	NE	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Cymbopleura subcuspidata (Krammer) Krammer	5	EN	-	-	1	-	-	1	1	-	-	-	1	-	1	-	1
Cymbopleura truncata Krammer	0	NE	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura tynnii (Krammer) Krammer	3	CR	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
Cymbopleura sp.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Denticula elegans Kützing	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Denticula tenuis Kützing	9	LC	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Diatoma moniliformis (Kützing) D.M.Williams	9	LC	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Diatoma moniliformis subsp. *ovalis* (F.Fricke) Lange-Bertalot, Rumrich & G.Hofmann	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diatoma problematica Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diatoma tenuis C.Agardh	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diatoma vulgaris Bory	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Diatomella balfouriana Greville	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Didymosphenia geminata (Lyngbye) Mart.Schmidt	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Didymosphenia siberica (Grunow) Mart.Schmidt	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diploneis boldtiana Cleve	0	NE	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-
Diploneis didymus (Ehrenberg) Ehrenberg	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diploneis elliptica (Kützing) Cleve	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diploneis interrupta (Kützing) Cleve	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diploneis modica Hustedt	8	DD	-	-	-	-	-	1	-	-	-	-	1	-	1	1	-
Diploneis oblongella (Nägeli ex Kützing) A.Cleve	8	DD	1	-	1	-	-	1	-	-	-	-	1	-	1	1	-
Diploneis oculata (Brébisson) Cleve	9	LC	-	-	1	-	-	1	-	-	1	1	1	-	1	-	1
Diploneis ovalis (Hilse) Cleve	3	CR	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Diploneis parma Cleve	6	VU	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Diploneis smithii (Brébisson) Cleve *var. smithii*	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diploneis smithii var. *pumila* (Grunow) Hustedt	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Diploneis subovalis Cleve	0	NE	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-
Diploneis sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Discostella pseudostelligera (Hustedt) Houk & Klee	9	LC	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1
Discostella stelligera (Cleve & Grunow) Houk & Klee	9	LC	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Encyonema auerswaldii Rabenhorst	8	DD	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Encyonema elginense (Krammer) D.G.Mann	0	NE	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Encyonema fogedii Krammer	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Encyonema gaeumannii (F.Meister) Krammer	4	EN	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Encyonema groenlandica (Foged) Kulikovskiy & Lange-Bertalot	0	NE	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Encyonema lacustre (C.Agardh) Pantocsek	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Encyonema lange-bertalotii Krammer	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Encyonema latens (Krasske) D.G.Mann	1	EX	-	-	1	1	-	1	1	-	-	1	-	-	-	-	1
Encyonema lunatum (W.Smith) Van Heurck	8	DD	-	1	-	-	-	-	-	-	1	1	1	1	-	-	-
Encyonema minutum (Hilse) D.G.Mann *var. minutum*	9	LC	1	1	1	-	1	1	1	1	-	-	-	1	-	-	1
Encyonema minutum var. *hankensis* (Skvortzow et Meyer) Kharitonov	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Encyonema neogracile Krammer	4	EN	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-
Encyonema perpusillum (A.Cleve) D.G.Mann	4	EN	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Encyonema reichardtii (Krammer) D.G.Mann	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Encyonema silesiacum (Bleisch) D.G.Mann	9	LC	1	1	-	1	1	1	1	1	1	-	1	-	1	-	1
Encyonema ventricosum (C.Agardh) Grunow	9	LC	-	-	-	-	-	-	-	1	-	1	-	-	-	-	1
Encyonema vulgare Krammer	4	EN	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-
Encyonema sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Encyonopsis cesatiformis Krammer	8	DD	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Encyonopsis cesatii (Rabenhorst) Krammer	7	NT	1	1	1	1	-	1	-	1	-	1	-	-	1	-	-
Encyonopsis perborealis Krammer	0	NE	-	1	1	-	-	1	-	-	-	-	-	-	-	-	-
Entomoneis alata (Ehrenberg) Ehrenberg	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Entomoneis ornata (Bailey) Reimer	5	EN	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1
Entomoneis paludosa (W.Smith) Reimer *var. paludosa*	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Entomoneis paludosa var. *hyperborea* (Grunow) Czarnecki & D.C.Reinke	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Envekadea sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Epithemia adnata (Kützing) Brébisson *var. adnata*	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Epithemia adnata var. *saxonica* (Kützing) R.M.Patrick	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Epithemia argus (Ehrenberg) Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Epithemia parallela (Grunow) Ruck & Nakov	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Epithemia porcellus Kützing	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Epithemia sorex Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Epithemia turgida (Ehrenberg) Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eucampia zodiacus Ehrenberg	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eucocconeis alpestris (Brun) Lange-Bertalot	3	CR	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Eucocconeis austriaca (Hustedt) Lange-Bertalot	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eucocconeis depressa (Cleve) Lange-Bertalot	0	NE	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Eucocconeis diluviana (Hustedt) Lange-Bertalot	6	VU	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Eucocconeis flexella (Kützing) F.Meister	3	CR	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Eucocconeis laevis (Østrup) Lange-Bertalot	7	NT	1	1	1	-	-	1	1	-	1	1	1	-	-	1	-
Eucocconeis leptostriata Lange-Bertalot apud H.Lange-Bertalot & S.I.Genkal	8	DD	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Eucocconeis quadratarea (Østrup) Lange-Bertalot	6	VU	1	1	1	-	-	1	1	-	-	1	1	-	-	1	-
Eunotia ambivalens Lange-Bertalot & Tagliaventi	5	EN	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Eunotia arcubus var. *bidens* (Grunow) Lange-Bertalot	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia arcus Ehrenberg	7	NT	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Eunotia bidens Ehrenberg	5	EN	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Eunotia bidentula W.Smith	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia bigibba Kützing	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia bigibboidea Lange-Bertalot & Witkowski	0	NE	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Eunotia bilunaris (Ehrenberg) Schaarschmidt	9	LC	-	1	-	-	-	-	1	-	-	-	-	1	-	-	1
Eunotia boreoalpina Lange-Bertalot & Nörpel-Schempp	0	NE	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Eunotia boreotenuis Nörpel-Schempp & Lange-Bertalot	5	EN	-	-	1	1	-	-	1	-	1	-	1	1	-	-	-
Eunotia botuliformis F.Wild, Nörpel & Lange-Bertalot	5	EN	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-
Eunotia cantonatii Lange-Bertalot & Tagliaventi	8	DD	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Eunotia chelonia Nörpel-Schempp, Lange-Bertalot & Metzeltin	0	NE	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Eunotia curtagrunowii Nörpel-Schempp & Lange-Bertalot	5	EN	-	-	-	-	-	-	-	1	-	1	-	-	-	-	1
Eunotia elegans Østrup	2	CR	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eunotia eurycephala (Grunow) Nörpel-Schempp & Lange-Bertalot	6	VU	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eunotia ewa Lange-Bertalot & Witkowski	0	NE	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Eunotia exigua (Brébisson ex Kützing) Rabenhorst	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia faba Ehrenberg	2	CR	1	-	-	-	-	1	1	1	-	-	-	-	1	-	-
Eunotia flexuosa (Brébisson ex Kützing) Kützing	3	CR	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Eunotia formica Ehrenberg	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia fureyae Lange-Bertalot	0	NE	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Eunotia genuflexa Nörpel-Schempp	8	DD	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Eunotia groenlandica Nörpel-Schempp & Lange-Bertalot	5	EN	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Eunotia incisa W.Smith ex W.Gregory	5	EN	-	-	-	1	-	-	1	1	-	1	-	-	-	-	-
Eunotia islandica Østrup	8	DD	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Eunotia julma Lange-Bertalot	0	NE	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-
Eunotia major (W.Smith) Rabenhorst	0	NE	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Eunotia meisteri Hustedt	4	EN	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Eunotia minor (Kützing) Grunow	7	NT	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Eunotia monnieri Lange-Bertalot & Tagliaventi	5	EN	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-
Eunotia monodon Ehrenberg	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Eunotia mucophila (Lange-Bertalot, Nörpel-Schempp & Alles) Lange-Bertalot	5	EN	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-
Eunotia naegelii Migula	4	EN	-	-	-	-	-	-	-	1	-	-	-	1	-	-	1
Eunotia neocompacta var. *vixcompacta* Lange-Bertalot	5	EN	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Eunotia parallela Ehrenberg	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia paralleladubia Lange-Bertalot & S.Mayama	0	NE	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
Eunotia parapraerupta Lange-Bertalot & Metzeltin	0	NE	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Eunotia praerupta Ehrenberg	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia pseudogroenlandica Lange-Bertalot & Tagliaventi	5	EN	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-
Eunotia pseudopapilio Lange-Bertalot & M.Nörpel-Schempp	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia rhomboidea Hustedt	5	EN	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Eunotia scandiorussica Kulikovskiy, Lange-Bertalot, Genkal & Witkowski	0	NE	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-
Eunotia semicircularis (Ehrenberg) Lange-Bertalot & Metzeltin	0	NE	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Eunotia septentrionalis Østrup	0	NE	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-
Eunotia subarcuatoides Alles, Nörpel & Lange-Bertalot	9	LC	1	-	-	1	-	1	-	1	-	-	-	1	-	-	-
Eunotia subherkiniensis Lange-Bertalot	0	NE	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Eunotia triodon Ehrenberg	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia ursamaioris Lange-Bertalot & Nörpel-Schempp	5	EN	1	-	1	1	-	1	-	-	1	1	1	1	-	-	-
Eunotia valida Hustedt	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Eunotia sp.	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	1
Fallacia crassicostata Lange-Bertalot & Werum	6	VU	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Fallacia pygmaea (Kützing) Stickle & D.G.Mann	9	LC	-	-	-	-	-	1	-	-	-	-	1	-	-	-	1
Fallacia sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Fragilaria amphicephaloides Lange-Bertalot	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Fragilaria aquaplus Lange-Bertalot & S.Ulrich	8	DD	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-
Fragilaria capucina Desmazières	9	LC	1	1	-	-	1	-	-	1	-	-	-	-	-	-	1
Fragilaria crotonensis Kitton	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Fragilaria goulardii var. *telezkoensis* (Poretzky) Kharitonov	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Fragilaria radians (Kützing) D.M.Williams & Round	9	LC	-	-	1	-	-	1	-	-	-	1	1	-	1	-	1
Fragilaria rumpens (Kützing) G.W.F.Carlson	9	LC	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Fragilaria saxoplanctonica Lange-Bertalot & S.Ulrich	9	LC	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Fragilaria striatula Lyngbye	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Fragilaria vaucheriae (Kützing) J.B.Petersen	9	LC	-	-	1	1	1	1	1	-	-	1	1	-	-	-	1
Fragilaria sp.	-	-	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-
Fragilariforma bicapitata (A.Mayer) D.M.Williams & Round	5	EN	-	-	-	1	-	1	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Fragilariforma constricta (Ehrenberg) D.M.Williams & Round	4	EN	-	-	1	-	-	-	-	-	1	1	1	-	1	-	-
Fragilariforma mesolepta (Rabenhorst) Kharitonov	9	LC	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Fragilariforma nitzschioides (Grunow) Lange-Bertalot	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Fragilariforma virescens (Ralfs) D.M.Williams & Round	9	LC	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Fragilariopsis oceanica (Cleve) Hasle	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Frustulia crassinervia (Brébisson ex W.Smith) Lange-Bertalot & Krammer	7	NT	1	-	-	1	-	1	1	1	1	-	-	1	-	-	-
Frustulia erifuga Lange-Bertalot & Krammer	4	EN	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-
Frustulia krammeri Lange-Bertalot & Metzeltin	2	CR	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-
Frustulia saxonica Rabenhorst	7	NT	1	-	-	1	-	1	-	-	-	1	-	1	-	1	-
Frustulia vulgaris (Thwaites) De Toni	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Geissleria davydovae Genkal et Yaruschina	0	NE	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Genkalia digituloides (Lange-Bertalot) Lange-Bertalot & Kulikovskiy	5	EN	-	1	-	-	-	-	-	1	1	1	1	-	-	-	-
Gololobovia obliqua (W.Gregory) Kulikovskiy, Glushchenko & Kociolek	0	NE	-	1	-	-	-	1	-	-	-	-	1	-	-	-	1
Gomphoneis eriensis (Grunow) Skvortzov & K.I.Meyer	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphoneis quadripunctata (Østrup) P.Dawson ex R.Ross & P.A.Sims	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphoneis septa (F.Moghadam) Kociolek, Stoermer & Bahls	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonella olivacea (Hornemann) Rabenhorst	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema acuminatum Ehrenberg	9	LC	-	1	-	-	-	-	-	1	-	-	-	-	-	-	1
Gomphonema angustatum (Kützing) Rabenhorst	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema angusticephalum E.Reichardt & Lange-Bertalot	6	VU	1	-	1	1	-	1	1	1	1	1	1	-	1	1	1
Gomphonema angustum C.Agardh	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema brebissonii Kützing	9	LC	-	-	-	1	-	-	-	1	-	-	-	-	-	-	1
Gomphonema capitatum Ehrenberg	9	LC	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Gomphonema coronatum Ehrenberg	4	EN	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Gomphonema gracile Ehrenberg	8	DD	-	-	1	-	-	-	-	-	1	-	1	-	-	-	1
Gomphonema hebridense W.Gregory	7	NT	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Gomphonema helveticum Brun	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema italicum Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Gomphonema lagenula Kützing	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema lagerheimii A.Cleve	3	CR	-	-	-	1	-	-	-	1	-	1	1	-	1	-	1
Gomphonema laticollum E.Reichardt	0	NE	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Gomphonema longiceps f. *suecicum* (Grunow) Hustedt	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Gomphonema microcapitatum Kulikovskiy, Kociolek & Solak	0	NE	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Gomphonema micropus Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema mihoi Levkov	0	NE	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
Gomphonema minutum f. *pachypus* Lange-Bertalot & E.Reichardt	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Gomphonema montanum (Schumann) Grunow	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema olivaceoides Hustedt	9	LC	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Gomphonema parvulum (Kützing) Kützing	9	LC	1	-	-	1	-	1	-	-	-	1	-	-	1	-	-
Gomphonema productum (Grunow) Lange-Bertalot & E.Reichardt	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema pseudacuminatum Kulikovskiy, Kociolek & Solak	0	NE	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
Gomphonema pumilum (Grunow) E.Reichardt & Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema subclavatum (Grunow) Grunow	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema tergestinum (Grunow) Fricke	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema truncatum Ehrenberg	9	LC	1	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Gomphonema ventricosum W.Gregory	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gomphonema sp.	-	-	1	-	1	1	-	-	1	-	1	1	1	-	1	-	1
Gomphosphenia vallei Beauger, C.E.Wetzel, Allain & Ector	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Gomphosphenia sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
Gyrosigma acuminatum (Kützing) Rabenhorst *var. acuminatum*	9	LC	-	-	1	-	-	-	1	-	-	-	-	-	1	1	1
Gyrosigma acuminatum var. *gallicum* (Grunow) Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gyrosigma attenuatum (Kützing) Rabenhorst	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gyrosigma balticum (Ehrenberg) Rabenhorst	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gyrosigma peisonis (Grunow) Hustedt	6	VU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gyrosigma strigilis (W.Smith) J.W.Griffin & Henfrey	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Gyrosigma sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Halamphora hassiaca (Krammer & S.Strecker) Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Halamphora veneta (Kützing) Levkov	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Handmannia antiqua (W.Smith) Kociolek et Khursevich	0	NE	-	1	-	-	-	-	-	-	1	-	-	-	-	-	1
Handmannia comta (Ehrenberg) Kociolek et Khursevich emend. Genkal	0	NE	-	-	-	-	1	1	-	-	1	-	-	-	-	-	1
Hannaea arcus (Ehrenberg) R.M.Patrick	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Hannaea inaequidentata (Lagerstedt) Genkal & Kharitonov	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Hantzschia amphioxys (Ehrenberg) Grunow f. *amphioxys*	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Hantzschia amphioxys f. *capitata* O.Müller	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Hantzschia virgata var. *capitellata* Hustedt	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Hantzschia sp.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Hemiaulus hauckii Grunow ex Van Heurck	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Hippodonta capitata (Ehrenberg) Lange-Bertalot, Metzeltin & Witkowski	9	LC	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Hippodonta hungarica (Grunow) Lange-Bertalot, Metzeltin & Witkowski	9	LC	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Humidophila brekkaensis (J.B.Petersen) R.L.Lowe, Kociolek, J.R.Johansen, Van de Vijver, Lange-Bertalot & Krammer et Kopalova	9	LC	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-
Humidophila gallica (W.Smith) Lowe, Kociolek, Q.You, Q.Wang & Stepanek	0	NE	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-
Humidophila perpusilla (Grunow) R.L.Lowe, Kociolek, J.R.Johansen, Van de Vijver, Lange-Bertalot & Kopalová	9	LC	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Humidophila schmassmannii (Hustedt) Buczkó & Wojtal	5	EN	1	-	1	-	-	1	-	1	-	-	-	-	-	-	-
Humidophila sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Hygropetra balfouriana (Grunow ex Cleve) Krammer & Lange-Bertalot	5	EN	-	1	-	-	-	1	-	-	-	1	-	-	1	-	1
Iconella bifrons (Ehrenberg) Ruck & Nakov	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Iconella biseriata (Brébisson) Ruck & Nakov	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Iconella curvula (W.Smith) Ruck & Nakov	3	CR	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iconella linearis (W.Smith) Ruck & Nakov	9	LC	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Iconella nervosa (A.W.F.Schmidt) C.Cocquyt & R.Jahn	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Iconella spiralis (Kützing) E.C.Ruck & T.Nakov	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Iconella splendida (Ehrenberg) Ruck & Nakov	7	NT	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-
Iconella tenera (W.Gregory) Ruck & Nakov	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Karayevia laterostrata (Hustedt) Bukhtiyarova	4	EN	1	-	-	-	-	-	-	-	-	1	1	-	1	1	-
Kobayasiella parasubtilissima (H.Kobayasi & T.Nagumo) Lange-Bertalot	7	NT	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Kobayasiella subtilissima (Cleve) Lange-Bertalot	3	CR	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Lacustriella lacustris (W.Gregory) Lange-Bertalot & Kulikovskiy	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Lemnicola hungarica (Grunow) Round & Basson	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Leptocylindrus danicus Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Lindavia costata (Loginova, Lupikina & Khursevich) Nakov, Guillory, Julius, Theriot & Alverson	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Mayamaea agrestis (Hustedt) Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Mayamaea disjuncta (Hustedt) J.Y. Li & Y.Z.Qi	3	CR	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-
Mayamaea permitis (Hustedt) K.Bruder & Medlin	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Melosira lineata var. *subangularis* (Grunow) Aboal	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Melosira moniliformis (Link) C.Agardh	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Melosira normanii Arnott ex Van Heurck	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Melosira undulata (Ehrenberg) Kützing	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Melosira varians C.Agardh	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Meridion circulare (Greville) C.Agardh	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula angusta Grunow	3	CR	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Navicula antonii Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula bottnica Grunow	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula capitatoradiata H.Germain ex Gasse	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula chiarae Lange-Bertalot & Genkal	0	NE	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Navicula cincta (Ehrenberg) Ralfs	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula cryptocephala Kützing var. *cryptocephala*	9	LC	-	-	1	1	-	1	1	-	-	-	1	-	1	-	1
Navicula cryptocephala var. *lata* Poretzky & Anisimova	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula cryptotenella Lange-Bertalot	9	LC	-	-	-	-	-	1	-	-	-	-	1	-	-	1	-
Navicula cryptotenelloides Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Navicula digitoconvergens Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula digitoradiata (W.Gregory) Ralfs	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula gottlandica Grunow	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula granii (Jørgensen) Gran	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula hasta Pantocsek	10	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula kariana Grunow	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula lanceolata var. *tenuirostris* Skvortzov	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula laterostrata Hustedt	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula margalithii Lange-Bertalot	6	VU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula mediocostata E.Reichardt	3	CR	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Navicula menisculus Schumann	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula notha J.H.Wallace	3	CR	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Navicula phyllepta Kützing	9	LC	-	1	1	-	-	1	1	-	1	-	1	-	-	-	-
Navicula phylleptosoma Lange-Bertalot	8	DD	-	-	1	-	-	-	1	-	-	-	1	-	1	-	-
Navicula pusilla var. *jacutica* Kisseleva	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula radiosa Kützing	9	LC	1	1	1	1	-	1	1	-	1	1	1	-	1	1	1
Navicula reinhardtii (Grunow) Grunow var. *reinhardtii*	9	LC	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Navicula reinhardtii var. *elliptica* Héribaud	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula rhynchocephala Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula rhynchotella Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula rostellata Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Navicula rotaeana (Rabenhorst) Grunow	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula slesvicensis Grunow	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Navicula streckerae Lange-Bertalot & Witkowski	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula striolata (Grunow) Lange-Bertalot	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula tripunctata (O.F.Müller) Bory	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Navicula trivialis Lange-Bertalot	9	LC	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Navicula venerablis Hohn & Hellerman	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula viridula (Kützing) Ehrenberg	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula viridulacalcis Lange-Bertalot	5	EN	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Navicula vulpina Kützing	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Navicula wygaschii Lange-Bertalot	5	EN	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
Navicula sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Naviculadicta sp.	-	-	-	1	1	-	-	1	1	-	1	-	1	-	1	1	1
Navigeia paludosa (Hustedt) Bukhtiyarova	4	EN	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Navigeia thingvallae (Østrup) Bukhtiyarova	2	CR	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Neidiopsis wulffii (J.B.Petersen) Lange-Bertalot	0	NE	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Neidium affine (Ehrenberg) Pfitzer	7	NT	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1
Neidium ampliatum (Ehrenberg) Krammer	7	NT	-	1	-	1	1	1	1	-	-	-	1	-	1	1	-
Neidium bisulcatum (Lagerstedt) Cleve	4	EN	-	-	-	-	-	-	1	1	-	1	-	1	1	-	-
Neidium dubium (Ehenberg) Cleve	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Neidium hercynicum Ant.Mayer	5	EN	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-
Neidium hitchcockii (Ehrenberg) Cleve	0	NE	-	-	-	-	-	1	1	-	-	-	1	-	-	-	-
Neidium iridis (Ehrenberg) Cleve var. *iridis*	3	CR	-	-	1	-	-	-	-	-	-	-	1	-	1	-	1
Neidium iridis var. *diminutum* (Pantocsek) Wislouch & Kolbe	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Neidium productum (W.Smith) Cleve	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Neidium sp.	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
Nitzschia acicularis (Kützing) W.Smith	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Nitzschia acidoclinata Lange-Bertalot	7	NT	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Nitzschia acuta Hantzsch	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia alpina Hustedt	4	EN	-	1	1	-	-	-	-	-	-	1	-	-	-	-	-
Nitzschia aquaea Wisłouch & V.S.Poretzky	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia brevissima Grunow	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia capitellata Hustedt var. *capitellata*	9	LC	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Nitzschia capitellata var. *tenuirostris* (Grunow) Bukhtiyarova	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia commutatoides Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Nitzschia denticula Grunow	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia dissipata (Kützing) Rabenhorst var. dissipata	9	LC	-	-	-	-	-	1	1	-	-	-	1	-	1	1	-

Table A1. *Cont*.

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Nitzschia flexoides Geitler	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia fonticola (Grunow) Grunow	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-
Nitzschia frigida Grunow	3	CR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia frustulum (Kützing) Grunow	9	LC	-	-	-	-	-	1	1	-	-	1	1	-	-	-	-
Nitzschia graciliformis Lange-Bertalot & Simonsen	9	LC	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Nitzschia gracilis Hantzsch	9	LC	-	-	-	-	-	-	1	-	-	-	-	1	-	-	1
Nitzschia homburgiensis Lange-Bertalot	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia inconspicua Grunow	0	NE	1	-	-	-	1	1	-	-	-	1	-	-	-	1	1
Nitzschia intermedia Hantzsch ex Cleve & Grunow	9	LC	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Nitzschia linearis W.Smith	9	LC	-	-	-	-	-	-	1	-	-	-	1	-	-	1	1
Nitzschia longissima (Brébisson) Ralfs	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia media Hantzsch	7	NT	1	-	1	-	-	-	1	-	-	-	1	-	1	-	-
Nitzschia palea (Kützing) W.Smith	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia paleacea (Grunow) Grunow	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia perminuta Grunow	9	LC	1	1	1	1	1	1	1	1	1	1	1	1	-	-	1
Nitzschia recta Hantzsch ex Rabenhorst	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia rosenstockii Lange-Bertalot	8	DD	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-
Nitzschia sigma (Kützing) W.Smith	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia sublinearis Hustedt	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia umbonata (Ehrenberg) Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia vermicularis (Kützing) Hantzsch	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nitzschia sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Nupela impexiformis (Lange-Bertalot) Lange-Bertalot	6	VU	-	-	-	-	-	-	-	-	-	-	1	-	1	1	-
Nupela neogracillima Kulikovskiy & Lange-Bertalot	0	NE	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Nupela silvahercynia (Lange-Bertalot) Lange-Bertalot	4	EN	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Nupela tenuicephala (Hustedt) Lange-Bertalot	4	EN	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-
Odontidium anceps (Ehrenberg) Ralfs	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Odontidium hyemale (Roth) Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Odontidium mesodon (Ehrenberg) Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Opephora mutabilis Sabbe & Wyverman	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pantocsekiella costei (J.C.Druart & F.Straub) K.T.Kiss & E.Ács	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Pantocsekiella kuetzingiana (Thwaites) K.T.Kiss & E.Ács	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pantocsekiella ocellata (Pantocsek) K.T.Kiss & Ács	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Paraplaconeis placentula (Ehrenberg) Kulikovskiy & Lange-Bertalot	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pauliella taeniata (Grunow) Round & Basson	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Pinnularia acoricola Hustedt	5	EN	-	-	-	-	1	-	-	-	1	-	1	-	-	-	-
Pinnularia ammerensis Kulikovskiy, Lange-Bertalot & Metzeltin	0	NE	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Pinnularia anglica Krammer	5	EN	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Pinnularia angustarea Kulikovskiy, Lange-Bertalot, A.Witkovski & N.I.Dorofeyuk	0	NE	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Pinnularia biceps W.Gregory	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia brebissonii (Kützing) Rabenhorst var. *brebissonii*	9	LC	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Pinnularia bottnica Krammer	8	DD	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Pinnularia brandelii Cleve	5	EN	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Pinnularia brevicostata Cleve	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia bullacostae Krammer & Lange-Bertalot	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia canadensis Krammer	0	NE	-	-	-	-	-	-	1	-	-	1	1	-	-	-	-
Pinnularia cardinaliculus Cleve	6	VU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia cuneola E.Reichardt	5	EN	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Pinnularia decrescens (Grunow) Krammer	8	DD	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Pinnularia divergens var. *sublinearis* Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Pinnularia divergens W.Smith	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia eifeliana (Krammer) Krammer	5	EN	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
Pinnularia gentilis (Donkin) Cleve	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia grunowii Krammer	9	LC	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-
Pinnularia halophila Krammer	6	VU	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Pinnularia intermedia (Lagerstedt) Cleve	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia krammeri Metzeltin	0	NE	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-
Pinnularia lagerstedtii (Cleve) A.Cleve	5	EN	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Pinnularia lailaensis Foged	0	NE	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-
Pinnularia lata (Brébisson) W.Smith	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia macilenta Ehrenberg	5	EN	-	-	-	1	-	1	-	1	-	-	-	1	-	-	-
Pinnularia media (Krammer) Kulikovskiy, Lange-Bertalot & Metzeltin	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia mesogongyla Ehrenberg	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia mesolepta (Ehrenberg) W.Smith	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia microstauron (Ehrenberg) Cleve var. *microstauron*	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia microstauron var. *rostrata* Krammer	0	NE	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Pinnularia neohalophila Kulikovskiy, Genkal & Mikheeva	8	DD	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-
Pinnularia neomajor Krammer	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Pinnularia nodosa (Ehrenberg) W.Smith var. *nodosa*	5	EN	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
Pinnularia nodosa var. *percapitata* Krammer	5	EN	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Pinnularia nodosa var. *robusta* (Foged) Krammer	6	VU	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Pinnularia notabilis Krammer	5	EN	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-
Pinnularia oriunda Krammer	5	EN	1	-	-	-	-	-	1	-	-	-	1	-	-	-	1
Pinnularia oriundiformis Krammer	5	EN	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Pinnularia parvulissima Krammer	8	DD	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-
Pinnularia permicrostauron Krammer & Metzeltin	0	NE	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Pinnularia pluvianiformis Krammer	0	NE	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Pinnularia quadratarea (A.W.F.Schmidt) Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia rhombarea Krammer	5	EN	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Pinnularia rupestris Hantzsch	5	EN	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-
Pinnularia septentrionalis Krammer	0	NE	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Pinnularia similiformis Krammer	9	LC	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Pinnularia spitsbergensis Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Pinnularia stricta Hustedt	0	NE	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-
Pinnularia subanglica Krammer	8	DD	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Pinnularia subrostrata (A.Cleve) A.Cleve	6	VU	-	-	-	1	-	-	-	-	-	1	-	1	1	-	-
Pinnularia subrupestris Krammer	5	EN	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Pinnularia subundulata Østrup	6	VU	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Pinnularia sudetica Hilse	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia undula (Schumann) Krammer	5	EN	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Pinnularia viridis (Nitzsch) Ehrenberg	8	DD	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Pinnularia sp.	-	-	-	1	1	-	-	-	1	1	1	-	1	-	1	1	1
Placogeia similis (Krasske) Bukhtiyarova	7	NT	-	-	1	-	-	1	-	1	1	-	1	-	1	-	-
Placoneis amphibola (Cleve) E.J.Cox	4	EN	-	1	-	-	-	1	-	-	-	-	-	-	-	-	1
Placoneis clementioides (Hustedt) E.J.Cox	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Placoneis dicephala (Ehrenberg) Mereschkowsky	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Placoneis elginensis (W.Gregory) E.J.Cox	8	DD	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Placoneis exigua (W.Gregory) Mereschkovsky	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Placoneis gastrum (Ehrenberg) Mereschkowsky	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Placoneis interglacialis (Hustedt) E.J.Cox	0	NE	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-
Placoneis opportuna (Hustedt) Chudaev & Gololobova	3	CR	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-
Placoneis placentula var. *rostrata* (Mayer) N.A.Andresen, Stoermer & R.G.Kreis, Jr.	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Placoneis sp.	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-
Planothidium delicatulum (Kützing) Round & Bukhtiyarova	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Planothidium haynaldii (Schaarschmidt) Lange-Bertalot	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Planothidium lanceolatum (Brébisson ex Kützing) Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Planothidium straubianum C.E.Wetzel, Van de Vijver & L.Ector	0	NE	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-
Planothidium sp.	-	-	-	-	-	-	-	1	-	-	-	1	-	-	1	1	1
Pleurosigma delicatulum W.Smith	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pleurosigma elongatum W.Smith	9	LC	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Praestephanos triporus (Genkal & G.V.Kuzmin) A.Tuji & J.-S.Ki	0	NE	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-
Prestauroneis crucicula (W.Smith) Genkal & Yarushina	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Psammothidium petersenii (Hastedt) Round et Bukhiyarova	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Psammothidium bioretii (H.Germain) Bukhtiyarova & Round	9	LC	-	-	1	-	-	-	-	1	1	-	1	-	1	-	-
Psammothidium chlidanos (M.H.Hohn & Hellerman) Lange-Bertalot	4	EN	-	1	-	1	-	1	1	-	1	1	1	-	-	-	-
Psammothidium daonense (Lange-Bertalot) Lange-Bertalot	5	EN	-	1	-	-	-	-	1	-	-	-	-	-	1	-	-
Psammothidium helveticum (Hustedt) Bukhtiyarova & Round	9	LC	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Psammothidium kryophilum (J.B.Petersen) E.Reichardt	3	CR	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psammothidium levanderi (Hustedt) Bukhtiyarova & Round	3	CR	1	-	-	1	-	-	-	-	-	1	-	-	-	-	-
Psammothidium marginulatum (Grunow) Bukhtiyarova & Round	8	DD	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-
Psammothidium rechtense (Leclercq) Lange-Bertalot	3	CR	-	-	1	-	-	1	1	1	1	-	1	-	-	-	-
Psammothidium rossii (Hustedt) Bukhtiyarova & Round	3	CR	-	-	1	-	-	1	-	1	-	-	-	-	1	-	-
Psammothidium scoticum (R.J.Flower & V.J.Jones) Bukhtiyarova & Round	3	CR	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Psammothidium subatomoides (Hustedt) Bukhtiyarova & Round	7	NT	-	1	-	-	-	-	-	-	-	-	1	-	-	-	1
Psammothidium subsalsum (J.B.Petersen) Kulikowskiy, Witkowski & Pliński	0	NE	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Psammothidium ventrale (Krasske) Bukhtiyarova & Round	3	CR	-	-	1	1	-	-	-	-	1	1	1	-	1	-	-
Psammothidium sp.	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-	-	-
Pseudostaurosira brevistriata (Grunow) D.M.Williams & Round	9	LC	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
Pseudostaurosira parasitica (W.Smith) E.Morales	9	LC	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
Pulchellophycus obsitus (Hustedt) Edlund & M.J.Wynne	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Pulchellophycus sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Reimeria sinuata (W.Gregory) Kociolek & Stoermer	9	LC	-	-	-	-	-	1	-	-	1	1	-	-	-	-	1

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Rexlowea parasemen (Lange-Bertalot) Kulikoviskiy, Kociolek & Genkal	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rhizosolenia hebetata f. *semispina* (Hensen) Gran	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rhizosolenia hebetata J.W.Bailey	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rhoicosphenia abbreviata (C.Agardh) Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rhopalodia gibba (Ehrenberg) O.Müller var. *gibba*	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rhopalodia gibba var. *ventricosa* (Kützing) H.Peragallo & M.Peragallo	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Roperia praetesselata H.J.Schrader	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rossithidium kreigeri (Krasske) Bahls	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Sellaphora absoluta (Hustedt) Wetzel, Ector, Van de Vijver, Compère & D.G.Mann	4	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Sellaphora bacillum (Ehrenberg) D.G.Mann	9	LC	-	-	-	-	-	1	1	-	-	-	-	1	1	-	1
Sellaphora difficillima (Hustedt) C.E.Wetzel, L.Ector & D.G.Mann	0	NE	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Sellaphora insolita (É.Manguin ex Kociolek & B.de Reviers) P.B.Hamilton & D.Antoniades	0	NE	-	-	1	-	-	1	-	-	-	1	1	-	-	1	-
Sellaphora laevissima (Kützing) D.G.Mann	9	LC	-	-	1	1	1	1	1	1	-	1	1	-	1	-	-
Sellaphora parapupula Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Sellaphora pupula (Kützing) Mereschkovsky	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Sellaphora rectangularis (W.Gregory) Lange-Bertalot & Metzeltin	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Sellaphora vitabunda (Hustedt) D.G.Mann	5	EN	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Sellaphora sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
Simonsenia delognei (Grunow) Lange-Bertalot	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-
Skabitschewskia oestrupii (A.Cleve) Kuliskovskiy & Lange-Bertalot	7	NT	-	-	1	-	-	1	1	-	1	-	1	-	1	1	-
Skabitschewskia peragalloi (Brun & Héribaud) Kuliskovskiy & Lange-Bertalot	4	EN	1	-	1	-	-	1	1	-	1	-	1	-	1	1	-
Skeletonema subsalsum (A.Cleve) Bethge	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Stauroneis amphicephala Kützing	8	DD	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
Stauroneis anceps Ehrenberg f. *anceps*	7	NT	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Stauroneis anceps f. *linearis* Rabenhorst	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Stauroneis gracilior E.Reichardt	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Stauroneis gracilis Ehrenberg	7	NT	-	-	-	-	-	-	1	-	-	-	1	1	1	-	-
Stauroneis guslyakovii Genkal & Yarushina	0	NE	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Stauroneis phoenicenteron (Nitzsch) Ehrenberg	7	NT	-	1	-	1	-	-	1	-	-	-	1	-	1	-	1
Stauroneis reichardtii Lange-Bertalot, Cavacini, Tagliaventi & Alfinito	8	DD	1	-	-	-	-	-	-	1	-	1	1	-	1	-	-

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Stauroneis schulzii Jousé	5	EN	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Stauroneis siberica (Grunow) Lange-Bertalot & Krammer	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Stauroneis smithii Grunow var. *karelica* Wislouch & Kolbe	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Stauroneis smithii Grunow var. *smithii*	9	LC	-	-	1	-	-	1	-	-	-	-	1	-	1	1	1
Stauroneis sp.	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Staurosira construens Ehrenberg	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Staurosira sviridae Kulikovskiy, Genkal & Mikheeva	0	NE	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Staurosirella lanceolata (Hustedt) E.A.Morales, C.Wetzel & L.Ector	0	NE	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Staurosirella lapponica (Grunow) D.M.Williams & Round	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Staurosirella pinnata (Ehrenberg) D.M.Williams & Round	0	NE	1	1	-	-	-	1	-	1	1	-	1	-	1	1	-
Stenopterobia heribaudii (Playfair) Playfair	0	NE	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Stephanocyclus meneghinianus (Kützing) Kulikovskiy, Genkal & Kociolek = Cyclotella meneghiniana Kützing	9	LC	-	-	-	-	1	1	-	-	-	-	-	-	1	-	1
Stephanodiscus binderanus (Kützing) Krieger	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Stephanodiscus hantzschii Grunow	9	LC	-	1	1	-	-	1	-	-	-	1	-	-	-	1	1
Stephanodiscus hashiensis H.Tanaka	0	NE	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-
Stephanodiscus minutulus (Kützing) Cleve & Möller	9	LC	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Stephanodiscus neoastraea Håkansson & Hickel emend. Casper, Scheffler et Augsten	9	LC	1	-	-	-	1	-	-	-	-	1	-	-	-	-	1
Surirella angusta Kützing	9	LC	-	-	1	-	-	-	1	-	-	-	-	-	-	-	1
Surirella brebissonii Krammer & Lange-Bertalot	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella capronii var. *hankensis* Skvortzov	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella conifera Skvortzov	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella crumena Brébisson ex Kützing	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella didyma Kützing	6	VU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella elegans Ehrenberg	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella hibernica (W.Smith) D.Kapustin & O.Kryvosheia	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella librile (Ehrenberg) Ehrenberg	0	NE	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1
Surirella minuta Brébisson ex Kützing	9	LC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Surirella ovalis Brébisson	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Surirella roba Leclercq	5	EN	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Surirella sp.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-
Synedra actinastroides (Lemmermann) Lemmermann	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tabellaria fenestrata (Lyngbye) Kützing	7	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tabellaria flocculosa (Roth) Kützing	9	LC	1	1	1	1	1	1	1	1	-	1	-	1	1	1	1
Tabularia parva (Kützing) D.M.Williams & Round	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tabularia tabulata (C.Agardh) Snoeijs	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tetracyclus glans (Ehrenberg) F.W.Mills	2	CR	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-

Table A1. *Cont.*

Taxa	Red List Category	IUCN Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	ULR
Tetracyclus rupestris (Kützing) Grunow	5	EN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassionema nitzschioides (Grunow) Mereschkowsky	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira baltica (Grunow) Ostenfeld	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira bramaputrae (Ehrenberg) Håkansson & Locker	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira decipiens (Grunow ex Van Heurck) Jørgensen	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira gravida Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira hyalina (Grunow) Gran	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira leptopus (Grunow) Hasle & G.Fryxell	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira nordenskioeldii Cleve	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Thalassiosira pseudonana Hasle & Heimdal	9	LC	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Thalassiosira sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Tryblionella angustata W.Smith var. *angustata*	0	NE	-	-	1	1	-	-	-	-	-	-	-	-	-	-	1
Tryblionella angustata var. *acuta* (Grunow) Bukhtiyarova	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tryblionella calida (Grunow) D.G.Mann	0	NE	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Tryblionella debilis Arnott ex O'Meara	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tryblionella hantzschiana Grunow	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tryblionella gracilis var. *ambigua* (Grunow) Bukhtiyarova	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tryblionella hungarica (Grunow) Frenguelli	0	NE	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Tryblionella littoralis (Grunow) D.G.Mann	0	NE	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Ulnaria acus (Kützing) Aboal	9	LC	-	-	-	-	-	-	1	-	-	-	-	-	1	1	1
Ulnaria amphirhynchus (Ehrenberg) Compère & Bukhtiyarova	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ulnaria biceps (Kützing) Compère	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ulnaria capitata (Ehrenberg) Compère	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ulnaria contracta (Østrup) E.A.Morales & M.L.Vis	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ulnaria danica (Kützing) Compère & Bukhtiyarova	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ulnaria delicatissima var. *angustissima* (Grunow) Aboal & P.C.Silva	0	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ulnaria ulna (Nitzsch) Compère	8	DD	-	-	1	-	-	1	1	1	-	-	1	-	-	-	1
Ulnaria sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Urosolenia eriensis (H.L.Smith) Round & R.M.Crawford	8	DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Urosolenia longiseta (O.Zacharias) Edlund & Stoermer	9	LC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Table A2. Ecological preferences of diatom species in waterbodies of the Lena Delta Nature Reserve and adjacent areas.

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Acanthoceras zachariasii (Brun) Simonsen	P	-	st-str	i	ind	-	-	1.4	o-b	-	-
Achnanthes adnata Bory	B	-	-	mh	alf	-	-	2.0	b	-	me
Achnanthes atacamae Hustedt	-	-	-	-	-	-	-	-	-	-	-
Achnanthes ingratiformis Lange-Bertalot	B	-	-	-	-	8.00	-	-	-	-	-
Achnanthes koshovii Jasnitsky	B	-	-	-	-	-	-	-	-	-	-
Achnanthes sp.	-	-	-	-	-	-	-	-	-	-	-
Achnanthidium affine (Grunow) Czarnecki	B	-	str	i	alf	6.8–7.1	es	1.1	o	ate	-
Achnanthidium kranzii (Lange-Bertalot) Round & Bukhtiyarova	B	temp	str	hb	acf	6.8–8.1	-	1.5	o-b	ats	ot
Achnanthidium minutissimum (Kützing) Czarnecki	P-B	eterm	st-str	i	ind	4.3–9.2	es	0.95	b	ate	e
Achnanthidium minutissimum var. *jackii* (Rabenhorst) Lange-Bertalot	B	-	-	i	ind	-	-	-	o	-	-
Achnanthidium nodosum (Cleve) Tseplik & Chudaev	B	-	-	hb	acf	-	-	1.0	o	-	ot
Achnanthidium petersenii (Hustedt) C.E.Wetzel, L.Ector, D.M.Williams & I.Jüttner	B	-	str	hb	ind	6.9	-	0.2	o	ats	ot
Achnanthidium saprophilum (H.Kobayashi & Mayama) Round & Bukhtiyarova	B	temp	-	-	-	7.3–7.8	-	-	-	-	-
Achnanthidium sp.	-	-	-	-	-	-	-	-	-	-	-
Actinocyclus kuetzingii (A.W.F.Schmidt) Simonsen	P-B	-	-	eh	-	-	-	-	-	-	-
Adlafia sp.	-	-	-	-	-	-	-	-	-	-	-
Amphora copulata (Kützing) Schoeman & R.E.M.Archibald	B	temp	st-str	i	alf	7.7	es	1.5	o-b	ate	e
Amphora indistincta Levkov	-	-	-	-	-	-	-	-	-	-	-
Amphora ovalis (Kützing) Kützing	B	temp	st-str	i	alf	6.2–9.0	sx	1.5	b	ate	e
Amphora pediculus (Kützing) Grunow	B	temp	st	i	alf	6.9–8.9	es	1.7	b	ate	me
Amphora pseudosibirica Levkov & Pavlov	-	-	-	-	-	-	-	-	-	-	-
Amphora sp.	-	-	-	-	-	-	-	-	-	-	-
Amphorotia clevei (Grunow) D.M.Williams & G.Reid	B	-	-	hb	-	-	-	-	-	-	-
Aneumastus apiculatus (Østrup) Lange-Bertalot	P-B	-	str	i	ind	-	-	2.0	b	ats	me
Aneumastus tusculus (Ehrenberg) D.G.Mann & A.J.Stickle	P-B	-	st	i	alb	-	-	0.9	b	ate	o-e
Asterionella formosa Hassall	P	temp	st-str	i	alf	6.4–7.99	sx	1.35	b	ate	me
Aulacoseira alpigena (Grunow) Krammer	P-B	temp	st-str	i	alf	4.8–8.4	sp	0.8	x-b	ate	ot
Aulacoseira ambigua (Grunow) Simonsen	P	temp	st-str	i	alf	6.0–8.5	sp	1.7	b-o	ate	om
Aulacoseira distans (Ehrenberg) Simonsen	P-B	cool	str	i	acf	4.5–7.8	sp	0.4	o	ats	ot
Aulacoseira granulata (Ehrenberg) Simonsen f. granulata	P-B	temp	st-str	i	alf	5.8–9.4	es	2.0	b	ate	e
Aulacoseira granulata f. *curvata* (Hustedt) Simonsen	P-B	-	st-str	i	alf	-	-	2.0	b	ate	e
Aulacoseira islandica (O.Müller) Simonsen	P-B	cool	st-str	i	ind	8.0	es	2.0	b	ate	o-e
Aulacoseira italica (Ehrenberg) Simonsen var. italica	P-B	cool	st-str	i	ind	5.8–8.4	es	1.45	b	ate	me
Aulacoseira italica var. *curvata* (Pantocsek) L.Yang & Q.X.Wang	P	-	-	i	acf	-	es	-	-	-	-
Aulacoseira italica var. *tenuissima* (Grunow) Simonsen	P-B	cool	st-str	i	ind	7.0	es	1.3	b	ate	me

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Aulacoseira lirata (Ehrenberg) R.Ross	P-B	temp	-	hb	acf	4.6–7.3	-	0.5	x-o	ate	-
Aulacoseira perglabra (Østrup) E.Y.Haworth	P-B	temp	-	hb	acf	4.76	-	1.0	o	ate	ot
Aulacoseira pfaffiana (Reinsch) Krammer	P-B	cool	str	hb	acf	-	-	0.3	x	ats	ot
Aulacoseira pusilla (F.Meister) A.Tuji & A.Houki	-	-	-	-	-	-	-	-	-	-	-
Aulacoseira scalaris (Grunow) Houk, Klee & Passauer	-	-	-	-	-	-	-	-	-	-	-
Aulacoseira subarctica (O.Müller) E.Y.Haworth	P	temp	st-str	i	alf	6.72–8.14	-	1.7	b-o	ats	om
Aulacoseira valida (Grunow) Krammer	P-B	-	-	i	alf	-	es	1.3	o	ate	om
Boreozonacola hustedtii Lange-Bertalot, Kulikovskiy & Witkowski	-	-	-	-	-	-	-	-	-	-	-
Brachysira brebissonii R.Ross	P-B	temp	st-str	hb	acf	4.6–7.8	sx	0.4	o	ats	ot
Brachysira calcicola Lange-Bertalot	B	-	-	-	-	-	-	1.0	o	-	-
Brachysira neoexilis Lange-Bertalot	B	-	-	-	acf	7.8	-	0.5	x-o	-	om
Brachysira procera Lange-Bertalot & Gerd Moser	B	-	-	-	acf	6.3–6.5	-	-	-	-	-
Brachysira styriaca (Grunow) R.Ross	B	temp	-	i	ind	6.45–7.26	es	1.0	o	-	ot
Caloneis arctica (Krasske) Lange-Bertalot & S.I.Genkal	-	-	-	-	-	-	-	-	-	-	-
Caloneis bacillum (Grunow) Cleve	B	temp	st-str	i	alf	6.8–8.4	es	1.3	b	ats	me
Caloneis holarctica Kulikovskiy, Lange-Bertalot & A.Witkowski	-	-	-	-	-	-	-	-	-	-	-
Caloneis silicula (Ehrenberg) Cleve var. Silicula	B	warm	st	i	ind	6.3–9.0	sp	1.3	o	ats	om
Caloneis silicula var. *elliptica* Mayer	-	-	-	-	-	-	-	-	-	-	-
Caloneis undosa Krammer	B	-	st-str	i	acf	-	-	1.0	o	ats	ot
Caloneis ventricosa F.Meister var. *truncatula* (Grunow) Meister	B	-	st-str	i	alf	-	-	1.3	b	ats	me
Caloneis westii (W.Smith) Hendey	B	-	-	mh	alf	-	-	-	-	ats	e
Campylodiscus hibernicus Ehrenberg	B	-	st	i	ind	-	es	2.0	b	ats	ot
Cavinula cocconeiformis (W.Gregory ex Greville) D.G.Mann & A.J.Stickle	P-B	temp	st-str	i	ind	6.57–7.5	es	0.4	x-o	ats	om
Cavinula jaernefeltii (Hustedt) D.G.Mann & A.J.Stickle	B	temp	str	i	acf	6.71–7.5	-	2.0	b	ats	om
Cavinula pseudoscutiformis (Hustedt) D.G.Mann & Stickle	P-B	temp	st-str	i	ind	6.2–8.4	sx	0.4	b	ats	me
Cavinula sp.	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros borealis Bailey	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros compressus Lauder	-	temp	-	eh	-	-	-	-	-	-	-
Chaetoceros debilis Cleve	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros decipiens Cleve	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros furcellatus Yendo	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros gracilis Pantocsek	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros mitra (Bailey) Cleve	P	-	-	i	-	-	-	-	-	-	-
Chaetoceros simplex Ostenfeld	-	-	-	-	-	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Chaetoceros socialis H.S.Lauder	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros subtilis Cleve	P-B	-	-	mh	alb	-	-	-	-	-	-
Chaetoceros teres Cleve	-	-	-	-	-	-	-	-	-	-	-
Chaetoceros wighamii Brightwell	P-B	-	-	mh	alb	-	-	-	-	-	-
Chamaepinnularia begeri (Krasske) Lange-Bertalot	B	temp	-	i	ind	6.35	-	1.0	o	ats	-
Chamaepinnularia circumborealis Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Chamaepinnularia krookiformis (Krammer) Lange-Bertalot & Krammer	B	-	-	hl	neu	-	-	1.0	o	-	-
Chamaepinnularia soehrensis (Krasske) Lange-Bertalot & Krammer	B	-	st-str	hb	acf	8.20	-	1.0	o	ats	ot
Chamaepinnularia sp.	-	-	-	-	-	-	-	-	-	-	-
Cocconeis lineata Ehrenberg	P-B	temp	st-str	i	alf	6.3–9.5	sx	1.2	b	ate	e
Cocconeis neodiminuta Krammer	P-B	temp	st-str	i	alf	7–9	sx	0.9	b	ats	me
Cocconeis pediculus Ehrenberg	B	temp	st-str	i	alf	6.9–8.6	sx	1.8	a-b	ate	me
Cocconeis placentula Ehrenberg var. *placentula*	P-B	temp	st-str	i	alf	5.5–9.0	es	1.35	o	ate	me
Cocconeis placentula var. *euglypta* (Ehrenberg) Cleve	P-B	temp	st-str	i	alf	5.5–9.0	sx	1.3	b	ate	om
Cocconeis sp.	-	-	-	-	-	-	-	-	-	-	-
Coscinodiscus curvatulus Grunow	P-B	-	-	eh	-	-	-	-	-	-	-
Cosmioneis pusilla (W.Smith) D.G.Mann & A.J.Stickle	P-B,aer	-	st-str	hl	ind	-	sp	1.8	o-a	ats	om
Craticula ambigua (Ehrenberg) D.G.Mann	B	temp	st	i	alf	5.5–8.0	es	2.3	b	-	me
Craticula halophila (Grunow) D.G.Mann	B	temp	st-str	mh	alf	7.2–8.9	es	3.0	a	ate	e
Craticula molestiformis (Hustedt) Mayama	B	temp	st	i	alf	6.8–8.4	-	3.6	a-p	hne	e
Ctenophora pulchella (Ralfs ex Kützing) D.M.Williams & Round	P-B,Ep	temp	st-str	mh	alf	6.5–8.8	sx	2.3	a	ate	e
Cyclostephanos dubius (Hustedt) Round	P-B	temp	st-str	hl	alf	5.7–9.5	es	2.0	a	ate	e
Cyclostephanos makarovae (S.I.Genkal) K.Schultz	-	-	-	-	-	-	-	-	-	-	-
Cyclotella atomus Hustedt	P-B	-	st-str	hl	alf	6.9–8.5	sp	2.5	b-a	ate	e
Cyclotella distinguenda Hustedt	P	-	str	hl	alf	8.2	-	1.3	o	-	om
Cyclotella meduanae H.Germain	-	-	-	-	-	-	-	-	-	-	-
Cyclotella melosiroides (Kirchner) Lemmermann	P	-	-	i	-	-	-	-	-	-	-
Cylindrotheca gracilis (Brébisson ex Kützing) Grunow	B	-	st	hl	ind	-	-	2.8	a-o	hne	e
Cymatopleura elliptica (Brébisson) W.Smith	P-B	temp	st-str	i	alf	5.7–8.5	-	1.4	b	ate	e
Cymatopleura nobilis Hantzsch	B	-	-	i	ind	-	-	1.7	b-o	hne	-
Cymatopleura solea var. *gracilis* Grunow	B	-	-	i	alf	-	-	-	-	-	-
Cymatopleura solea var. *vulgaris* Meister	B	-	-	i	ind	-	-	-	-	-	-
Cymbella affinis Kützing	B	temp	st-str	i	alf	6.3–9.5	sx	1.1	b	ats	e
Cymbella arctica (Lagerstedt) A.W.F.Schmidt	B	-	-	i	alf	8.30	-	1.0	o	-	ot
Cymbella australica (A.W.F.Schmidt) Cleve	B	-	-	i	ind	-	es	1.0	o	-	ot
Cymbella carassius Skvortzov	-	-	-	-	-	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Cymbella cleve-eulerae Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbella cymbiformis C.Agardh	B	temp	st-str	i	alf	6.2–9.0	sx	2.0	b	ats	om
Cymbella hantzschiana Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbella helvetica Kützing	B	temp	st-str	i	ind	7.36–8.4	-	0.6	b	ats	me
Cymbella krammeri Bahls	-	-	-	-	-	-	-	-	-	-	-
Cymbella lanceolata C.Agardh	B	temp	st-str	i	alf	6.5–8.6	es	2.5	b-a	ate	e
Cymbella neocistula Krammer	B	-	-	i	ind	-	-	-	-	hne	-
Cymbella neogena (Grunow) Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbella proxima Reimer	B	-	-	i	alf	-	es	1.0	o	-	m
Cymbella stuxbergii (Cleve) Cleve	B	-	-	i	neu	-	-	1.0	o	-	ot
Cymbella subcistula Krammer	B	-	-	-	-	-	-	1.2	o	-	-
Cymbella tartuensis Molder	B	-	-	i	ind	-	-	-	-	-	-
Cymbella tumida (Brébisson) Van Heurck	B	temp	st-str	i	alf	6.8–9.5	sx	2.2	b	ats	me
Cymbella sp.	-	-	-	-	-	-	-	-	-	-	-
Cymbellafalsa diluviana (Krasske) Lange-Bertalot & Metzeltin	B	-	-	i	alf	7.95	-	1.0	o	-	ot
Cymbopleura amphicephala (Nägeli ex Kützing) Krammer	B	-	st-str	i	ind	4.6–8.2	-	-	-	-	-
Cymbopleura anglica (Lagerstedt) Krammer	B	-	-	hb	ind	-	sx	1.2	o	ats	om
Cymbopleura angustata var. *spitsbergensis* Krammer	B	-	str	i	ind	4.9–8.20	-	1.0	o	-	ot
Cymbopleura cuspidata (Kützing) Krammer	P-B	temp	st-str	i	alf	5.7–7.5	-	-	-	-	-
Cymbopleura designata (Krammer) Bahls	B	temp	st-str	i	alf	6.3–9.0	-	1.8	o-a	ats	m
Cymbopleura elliptica Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura hybrida (Grunow ex Cleve) Krammer	P-B	-	-	i	ind	8.10	-	1.2	o	ats	-
Cymbopleura incertiformis Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura naviculiformis (Auerswald ex Heiberg) Krammer	B	temp	st-str	i	ind	7.8–6.94	-	-	-	-	-
Cymbopleura neoheteropleura Krammer	B	-	-	hb	acf	-	es	1.2	o	ate	om
Cymbopleura oblongata var. *stenoraphe* Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura stauroneiformis (Lagerstedt) Krammer	B	-	-	-	ind	-	-	1.0	o	ats	ot
Cymbopleura subanglica Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura subapiculata Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura subcuspidata (Krammer) Krammer	P-B	-	str	i	acf	-	sx	1.0	o	ats	om
Cymbopleura truncata Krammer	-	-	-	-	-	-	-	-	-	-	-
Cymbopleura tynnii (Krammer) Krammer	B	-	-	-	-	-	-	-	-	-	-
Cymbopleura sp.	-	-	-	-	-	-	-	-	-	-	-
Denticula elegans Kützing	P-B,aer	-	-	i	alf	7.3–9.0	-	-	-	-	-
Denticula tenuis Kützing	B	-	st-str	i	alf	7.42–8.0	-	-	-	-	-
Diatoma moniliformis (Kützing) D.M.Williams	P-B	temp	st-str	i	alf	8.0–8.5	-	0.4	x-o	-	-
Diatoma moniliformis subsp. *ovalis* (F.Fricke) Lange-Bertalot, Rumrich & G.Hofmann	B	-	st-str	i	alf	-	sx	1.4	o-b	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Diatoma problematica Lange-Bertalot	B	-	-	-	-	-	-	1.3	o	-	om
Diatoma tenuis C.Agardh	P-B	temp	st-str	hl	alf	6.9–8.39	-	2.4	b-a	-	om
Diatoma vulgaris Bory	P-B	temp	st-str	i	alf	6.2–8.9	-	2.4	b-a	-	-
Diatomella balfouriana Greville	B	-	-	-	-	-	es	2.2	b	ate	me
Didymosphenia geminata (Lyngbye) Mart.Schmidt	B	-	st-str	i	ind	-	-	2.0	b	-	-
Didymosphenia siberica (Grunow) Mart.Schmidt	-	-	-	-	-	-	-	-	-	-	-
Diploneis boldtiana Cleve	B	-	st-str	i	ind	-	-	-	-	-	-
Diploneis didymus (Ehrenberg) Ehrenberg	B	-	-	mh	alf	-	-	-	-	-	-
Diploneis elliptica (Kützing) Cleve	B	temp	str	i	alf	8.2	es	-	-	-	-
Diploneis interrupta (Kützing) Cleve	B	-	-	mh	alf	-	-	-	-	-	-
Diploneis modica Hustedt	B	-	-	-	-	6.58	-	-	-	-	-
Diploneis oblongella (Nägeli ex Kützing) A.Cleve	B	-	st-str	i	ind	6.9–8.0	-	-	-	-	-
Diploneis oculata (Brébisson) Cleve	B	temp	st-str	i	alf	7.4–8.2	-	-	-	-	-
Diploneis ovalis (Hilse) Cleve	B	-	st-str	i	alf	6.5–9.0	-	0.9	x-b	ate	m
Diploneis parma Cleve	B	cool	-	i	alf	6.6–8.6	-	-	-	-	-
Diploneis smithii (Brébisson) Cleve var. smithii	B	-	-	mh	alf	-	-	-	-	-	-
Diploneis smithii var. *pumila* (Grunow) Hustedt	B	-	-	mh	alf	-	-	0.7	o-x	-	-
Diploneis subovalis Cleve	B	temp	st-str	hl	ind	-	-	-	-	-	-
Diploneis sp.	-	-	-	-	-	-	-	-	-	-	-
Discostella pseudostelligera (Hustedt) Houk & Klee	P	temp	st-str	i	ind	6.32–8.5	-	2.7	a-o	-	-
Discostella stelligera (Cleve & Grunow) Houk & Klee	P-B	temp	st-str	i	ind	5.1–9.0	-	-	-	-	-
Encyonema auerswaldii Rabenhorst	B	-	-	i	ind	-	-	-	-	-	-
Encyonema elginense (Krammer) D.G.Mann	B	temp	st-str	hb	acf	5.5–9.0	-	-	-	-	-
Encyonema fogedii Krammer	-	-	-	-	-	8.10	sx	1.5	o-b	ats	om
Encyonema gaeumannii (F.Meister) Krammer	B	temp	str	hb	acf	4.6–7.9	-	-	-	-	-
Encyonema groenlandica (Foged) Kulikovskiy & Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Encyonema lacustre (C.Agardh) Pantocsek	B	-	-	hl	ind	-	-	-	-	-	-
Encyonema lange-bertalotii Krammer	-	-	-	-	-	-	-	-	-	-	-
Encyonema latens (Krasske) D.G.Mann	B	-	-	-	-	7.8–8.0	-	1.0	o	ats	ot
Encyonema lunatum (W.Smith) Van Heurck	B	temp	-	-	ind	4.9–7.8	es	1.3	o	ats	e
Encyonema minutum (Hilse) D.G.Mann var. minutum	B	temp	st-str	i	ind	4.9–8.9	sx	1.5	o-b	ats	-
Encyonema minutum var. *hankensis* (Skvortzow et Meyer) Kharitonov	-	-	-	-	-	-	-	-	-	-	-
Encyonema neogracile Krammer	P-B	-	-	-	ind	6.4	-	-	-	hne	-
Encyonema perpusillum (A.Cleve) D.G.Mann	P-B	temp	str	hb	ind	6.1–6.16	-	-	-	-	-
Encyonema reichardtii (Krammer) D.G.Mann	B	temp	str	i	ind	7.6–7.8	-	1.0	o	ats	ot
Encyonema silesiacum (Bleisch) D.G.Mann	B	temp	st-str	i	ind	6.2–8.6	-	-	-	-	-
Encyonema ventricosum (C.Agardh) Grunow	B	-	st-str	i	ind	6.2–8.0	-	-	-	ate	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Encyonema vulgare Krammer	B	-	-	-	-	-	-	-	o	ats	me
Encyonema sp.	-	-	-	-	-	-	-	-	-	-	-
Encyonopsis cesatiformis Krammer	-	-	-	-	-	-	-	-	-	-	-
Encyonopsis cesatii (Rabenhorst) Krammer	B	temp	str	i	ind	5.7–8.0	-	1.5	o-b	-	-
Encyonopsis perborealis Krammer	-	-	-	-	-	-	-	-	-	-	-
Entomoneis alata (Ehrenberg) Ehrenberg	P-B	-	st	mh	alf	-	-	2.5	b-a	-	-
Entomoneis ornata (Bailey) Reimer	B	-	st-str	i	alf	-	-	2.0	b	hne	-
Entomoneis paludosa (W.Smith) Reimer var. *paludosa*	B	-	-	hl	-	-	-	1.5	o-b	ats	om
Entomoneis paludosa var. *hyperborea* (Grunow) Czarnecki & D.C.Reinke	-	-	-	-	-	-	-	-	-	-	-
Envekadea sp.	-	-	-	-	-	-	-	-	-	-	-
Epithemia adnata (Kützing) Brébisson var. *adnata*	B	temp	st-str	i	alb	5.5–9.0	-	1.2	o	-	-
Epithemia adnata var. *saxonica* (Kützing) R.M.Patrick	B	temp	-	i	alf	4.8–9.0	-	1.2	o	-	-
Epithemia argus (Ehrenberg) Kützing	P-B	-	st-str	i	ind	-	sx	1.2	o	ats	me
Epithemia parallela (Grunow) Ruck & Nakov	B	-	str	i	alf	-	-	1.0	o	-	-
Epithemia porcellus Kützing	B	-	-	i	alf	-	-	-	-	-	-
Epithemia sorex Kützing	B	temp	st-str	i	alf	5.0–9.0	-	-	-	-	-
Epithemia turgida (Ehrenberg) Kützing	B	temp	st-str	i	alf	5.0–9.0	-	1.1	-	-	-
Eucampia zodiacus Ehrenberg	-	-	-	hl	-	-	-	-	-	-	-
Eucocconeis alpestris (Brun) Lange-Bertalot	B	temp	str	hb	ind	6.35–7.09	-	-	-	-	-
Eucocconeis austriaca (Hustedt) Lange-Bertalot	B	-	-	i	alf	-	-	0.2	x	ats	ot
Eucocconeis depressa (Cleve) Lange-Bertalot	B	-	-	hb	acf	-	-	1.0	o	-	ot
Eucocconeis diluviana (Hustedt) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Eucocconeis flexella (Kützing) F.Meister	B	temp	str	mh	ind	7.13–8.10	-	-	-	-	-
Eucocconeis laevis (Østrup) Lange-Bertalot	B	-	str	hb	neu	7.90	sx	0.2	x	ats	ot
Eucocconeis leptostriata Lange-Bertalot apud H.Lange-Bertalot & S.I.Genkal	B	-	-	i	neu	-	sx	-	-	ate	-
Eucocconeis quadratarea (Østrup) Lange-Bertalot	B	-	-	i	acf	-	-	1.0	o	-	-
Eunotia ambivalens Lange-Bertalot & Tagliaventi	B	-	-	i	acf	-	-	3.9	b-p	-	-
Eunotia arcubus var. *bidens* (Grunow) Lange-Bertalot	B	-	-	i	alf	-	sx	1.0	o	-	ot
Eunotia arcus Ehrenberg	B	temp	st-str	i	acf	5.8–6.95	sx	0.4	x-o	ats	ot
Eunotia bidens Ehrenberg	P-B,aer	cool	st-str	hb	acf	-	-	1.0	o	-	ot
Eunotia bidentula W.Smith	B	-	st-str	i	acf	4.66–7.0	-	0.4	x-o	ats	om
Eunotia bigibba Kützing	B	-	str	i	acf	4.6–5.0	-	0.4	x-o	-	ot
Eunotia bigibboidea Lange-Bertalot & Witkowski	-	-	-	-	-	-	-	-	-	-	-
Eunotia bilunaris (Ehrenberg) Schaarschmidt	B	temp	st-str	i	acf	5.0–7.8	-	-	-	-	-
Eunotia boreoalpina Lange-Bertalot & Nörpel-Schempp	B	-	-	hb	-	-	-	-	-	-	-
Eunotia boreotenuis Nörpel-Schempp & Lange-Bertalot	B	-	-	hb	-	-	-	1.0	o	-	ot
Eunotia botuliformis F.Wild, Nörpel & Lange-Bertalot	B	-	-	hb	acf	-	-	1.0	o	-	ot
Eunotia cantonatii Lange-Bertalot & Tagliaventi	-	-	-	-	-	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Eunotia chelonia Nörpel-Schempp, Lange-Bertalot & Metzeltin	B	-	-	i	acf	-	-	-	-	-	-
Eunotia curtagrunowii Nörpel-Schempp & Lange-Bertalot	P-B	-	-	hb	acf	-	-	0.4	x-o	ats	ot
Eunotia elegans Østrup	P-B	-	st-str	hb	acf	6.3	-	0.2	x	ats	ot
Eunotia eurycephala (Grunow) Nörpel-Schempp & Lange-Bertalot	B	-	-	i	-	-	-	-	-	-	-
Eunotia ewa Lange-Bertalot & Witkowski	-	-	-	-	-	-	-	-	-	-	-
Eunotia exigua (Brébisson ex Kützing) Rabenhorst	P-B,aer	temp	st-str	hb	acb	3.4–8.0	-	1.0	o	-	ot
Eunotia faba Ehrenberg	B	temp	st-str	-	alf	5.38–7.0	-	-	o	ats	ot
Eunotia flexuosa (Brébisson ex Kützing) Kützing	B	temp	st-str	i	acf	4.5–7.8	-	0.4	x-o	-	-
Eunotia formica Ehrenberg	B	-	st-str	i	acf	-	-	0.8	x-b	ats	om
Eunotia fureyae Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Eunotia genuflexa Nörpel-Schempp	-	-	-	-	-	-	-	-	-	-	-
Eunotia groenlandica Nörpel-Schempp & Lange-Bertalot	B	-	st-str	hb	acf	3.80	-	0.6	o-x	-	-
Eunotia incisa W.Smith ex W.Gregory	P-B	temp	st-str	i	acf	4.5–7.0	-	-	o	ats	om
Eunotia islandica Østrup	B	-	-	i	acf	-	-	0.4	x-o	-	ot
Eunotia julma Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Eunotia major (W.Smith) Rabenhorst	B	-	st-str	hb	acf	6.7	-	1.0	o	-	-
Eunotia meisteri Hustedt	P-B	-	str	i	acf	4.5–7.2	-	0.4	x-o	ats	-
Eunotia minor (Kützing) Grunow	B	temp	st-str	hb	acf	4.5–8.2	-	-	-	-	-
Eunotia monnieri Lange-Bertalot & Tagliaventi	-	-	-	-	-	-	-	-	-	-	-
Eunotia monodon Ehrenberg	B	-	st-str	hb	acf	7.3	es	0.4	x-o	ats	ot
Eunotia mucophila (Lange-Bertalot, Nörpel-Schempp & Alles) Lange-Bertalot	P-B	temp	st-str	hb	acf	5.25–6.4	-	-	-	-	-
Eunotia naegelii Migula	P-B	temp	str	hb	acf	4.5–6.0	sx	0.5	x-o	ate	ot
Eunotia neocompacta var. *vixcompacta* Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Eunotia parallela Ehrenberg	P-B	-	str	i	acf	-	-	1.0	o	-	-
Eunotia paralleladubia Lange-Bertalot & S.Mayama	-	-	-	-	-	-	-	-	-	-	-
Eunotia parapraerupta Lange-Bertalot & Metzeltin	-	-	-	-	-	-	-	-	-	-	-
Eunotia praerupta Ehrenberg	P-B	cool	st-str	hb	acf	6.68–8.0	-	0.3	x	-	-
Eunotia pseudogroenlandica Lange-Bertalot & Tagliaventi	-	-	-	-	-	-	-	-	-	-	-
Eunotia pseudopapilio Lange-Bertalot & M.Nörpel-Schempp	B	-	st-str	hb	acf	-	sx	0.4	x-o	ats	om
Eunotia rhomboidea Hustedt	B	temp	str	hb	acf	4.84–6.4	-	1.0	o	-	-
Eunotia scandiorussica Kulikovskiy, Lange-Bertalot, Genkal & Witkowski	-	-	-	-	-	-	-	-	-	-	-
Eunotia semicircularis (Ehrenberg) Lange-Bertalot & Metzeltin	-	-	-	-	-	-	-	-	-	-	-
Eunotia septentrionalis Østrup	P-B	-	str	hb	acf	4.5–7.5	-	1.0	o	-	ot
Eunotia subarcuatoides Alles, Nörpel & Lange-Bertalot	B	-	str	hb	acb	6.7	-	0.4	x-o	-	-
Eunotia subherkiniensis Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Eunotia triodon Ehrenberg	B	temp	-	hb	acf	6.33	-	1.0	o	-	ot

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Eunotia ursamaioris Lange-Bertalot & Nörpel-Schempp	B	-	-	hb	-	-	-	1.0	o	-	ot
Eunotia valida Hustedt	P-B	-	-	hb	acf	-	-	1.0	o	-	ot
Eunotia sp.	-	-	-	-	-	-	-	-	-	-	-
Fallacia crassicostata Lange-Bertalot & Werum	-	-	-	-	-	-	-	-	-	-	-
Fallacia pygmaea (Kützing) Stickle & D.G.Mann	P-B	-	st-str	mh	alf	7.4–9.1	-	-	-	ats	-
Fallacia sp.	-	-	-	-	-	-	-	-	-	-	-
Fragilaria amphicephaloides Lange-Bertalot	B	-	-	i	alf	6.76	-	1.1	o	-	-
Fragilaria aquaplus Lange-Bertalot & S.Ulrich	-	-	-	-	-	-	-	-	-	-	-
Fragilaria capucina Desmazières	P-B	temp	st-str	i	ind	6.4–8.9	-	-	-	-	-
Fragilaria crotonensis Kitton	P-B	temp	st-str	i	alf	5.7–8.9	-	-	-	-	-
Fragilaria goulardii var. *telezkoensis* (Poretzky) Kharitonov	-	-	-	-	-	-	-	-	-	-	-
Fragilaria radians (Kützing) D.M.Williams & Round	P-B	warm	st-str	i	alf	7.0–7.5	-	-	-	-	-
Fragilaria rumpens (Kützing) G.W.F.Carlson	P-B	eterm	st-str	i	ind	6.5–8.8	-	2.0	b	ats	e
Fragilaria saxoplanctonica Lange-Bertalot & S.Ulrich	-	-	-	-	-	-	-	-	-	-	-
Fragilaria striatula Lyngbye	P-B	-	-	eh	-	-	-	-	-	-	-
Fragilaria vaucheriae (Kützing) J.B.Petersen	P-B,Ep	temp	st-str	i	alf	6.5–8.8	-	-	-	-	-
Fragilaria sp.	-	-	-	i	-	4.9–7.8	es	-	-	hne	-
Fragilariforma bicapitata (A.Mayer) D.M.Williams & Round	P-B	-	st-str	hb	ind	-	-	-	-	-	-
Fragilariforma constricta (Ehrenberg) D.M.Williams & Round	B	-	str	hb	acf	4.6–7.0	-	1.3	o	ats	m
Fragilariforma mesolepta (Rabenhorst) Kharitonov	P-B	-	st-str	i	alf	6.3–9.0	-	1.0	o	-	ot
Fragilariforma nitzschioides (Grunow) Lange-Bertalot	B	-	-	i	ind	-	sx	1.9	o-a	ats	me
Fragilariforma virescens (Ralfs) D.M.Williams & Round	P-B	temp	st-str	hb	ind	4.6–8.2	-	1.0	o	-	ot
Fragilariopsis oceanica (Cleve) Hasle	P	-	-	eh	-	-	-	-	-	-	-
Frustulia crassinervia (Brébisson ex W.Smith) Lange-Bertalot & Krammer	B	-	str	hb	acf	4.7–7.2	sx	0.5	x-o	ats	ot
Frustulia erifuga Lange-Bertalot & Krammer	B	temp	str	hb	acf	5.85–6.49	-	-	o	ats	e
Frustulia krammeri Lange-Bertalot & Metzeltin	B	-	-	-	acf	-	-	-	-	-	e
Frustulia saxonica Rabenhorst	B	temp	st-str	hb	acf	4.5–7.2	-	-	-	ate	-
Frustulia vulgaris (Thwaites) De Toni	P-B	temp	st-str	i	alf	5.7–8.2	-	1.0	o	-	-
Geissleria davydovae Genkal et Yaruschina	-	-	-	-	-	-	-	-	-	-	-
Genkalia digituloides (Lange-Bertalot) Lange-Bertalot & Kulikovskiy	-	-	-	-	-	-	-	-	-	-	-
Gololobovia obliqua (W.Gregory) Kulikovskiy, Glushchenko & Kociolek	-	-	-	-	-	-	-	-	-	-	-
Gomphoneis eriensis (Grunow) Skvortzov & K.I.Meyer	B	-	-	hb	-	-	-	0.3	x	ate	ot
Gomphoneis quadripunctata (Østrup) P.Dawson ex R.Ross & P.A.Sims	B	-	-	i	ind	-	-	-	-	-	-
Gomphoneis septa (F.Moghadam) Kociolek, Stoermer & Bahls	B	-	-	-	-	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Gomphonella olivacea (Hornemann) Rabenhorst	B	temp	st-str	i	alf	6.5–8.8	-	2.3	b	ate	om
Gomphonema acuminatum Ehrenberg	B	temp	st-str	i	ind	6.3–9.5	-	0.8	x-b	-	-
Gomphonema angustatum (Kützing) Rabenhorst	B	temp	st-str	i	ind	5.7–9.0	-	1.0	o	-	-
Gomphonema angusticephalum E.Reichardt & Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Gomphonema angustum C.Agardh	B	-	st-str	i	ind	8.17–8.2	-	-	-	-	-
Gomphonema brebissonii Kützing	B	-	st	i	ind	-	-	-	-	-	m
Gomphonema capitatum Ehrenberg	B	temp	st	i	alf	6.9–8.9	-	1.2	o	-	om
Gomphonema coronatum Ehrenberg	B	-	st	i	ind	7.33	-	-	-	-	-
Gomphonema gracile Ehrenberg	B	temp	st-str	i	alf	6.4–8.6	-	-	-	-	-
Gomphonema hebridense W.Gregory	B	-	-	-	acf	6.1	-	1.0	o	-	-
Gomphonema helveticum Brun	B	-	-	i	ind	-	-	-	-	-	-
Gomphonema italicum Kützing	-	-	-	-	-	-	-	-	-	-	-
Gomphonema lagenula Kützing	B	-	-	-	-	-	-	-	b	ate	e
Gomphonema lagerheimii A.Cleve	B	-	str	hb	acf	-	-	-	-	-	m
Gomphonema laticollum E.Reichardt	-	-	-	-	-	-	-	1.0	o	ats	ot
Gomphonema longiceps f. *suecicum* (Grunow) Hustedt	-	-	-	-	-	-	-	-	-	-	-
Gomphonema microcapitatum Kulikovskiy, Kociolek & Solak	-	-	-	-	-	-	-	-	-	-	-
Gomphonema micropus Kützing	B	temp	st-str	i	ind	6.6–8.3	-	1.1	-	-	-
Gomphonema mihoi Levkov	-	-	-	-	-	-	-	-	-	-	-
Gomphonema minutum f. *pachypus* Lange-Bertalot & E.Reichardt	-	-	-	-	-	-	-	-	-	-	-
Gomphonema montanum (Schumann) Grunow	B	-	str	i	ind	-	-	-	-	ate	-
Gomphonema olivaceoides Hustedt	B	-	str	hb	ind	-	-	1.0	o	-	-
Gomphonema parvulum (Kützing) Kützing	B	temp	st-str	i	ind	4.5–8.6	-	0.7	o-x	ats	ot
Gomphonema productum (Grunow) Lange-Bertalot & E.Reichardt	B	-	str	i	ind	-	-	1.0	o	-	-
Gomphonema pseudacuminatum Kulikovskiy, Kociolek & Solak	-	-	-	-	-	-	-	-	-	-	-
Gomphonema pumilum (Grunow) E.Reichardt & Lange-Bertalot	B	temp	-	i	alf	6.6–8.4	-	-	-	-	-
Gomphonema subclavatum (Grunow) Grunow	B	-	str	i	ind	-	-	1.0	o	-	ot
Gomphonema tergestinum (Grunow) Fricke	B	-	str	i	ind	-	-	1.0	o	-	-
Gomphonema truncatum Ehrenberg	B	temp	st-str	i	ind	7.19	-	2.0	b	-	-
Gomphonema ventricosum W.Gregory	B	cool	str	i	ind	-	-	1.0	o	-	-
Gomphonema sp.	B	-	-	i	-	5.7–7.8	sx	-	-	-	-
Gomphosphenia vallei Beauger, C.E.Wetzel, Allain & Ector	-	-	-	-	-	-	-	-	-	-	-
Gomphosphenia sp.	B	-	-	-	-	-	-	-	-	-	-
Gyrosigma acuminatum (Kützing) Rabenhorst var. *acuminatum*	B	temp	st-str	i	alf	6.3–9.5	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Gyrosigma acuminatum var. *gallicum* (Grunow) Cleve	B	-	st-str	hl	alf	-	-	-	-	-	-
Gyrosigma attenuatum (Kützing) Rabenhorst	P-B	temp	st-str	i	alf	6.9–8.5	-	-	-	-	-
Gyrosigma balticum (Ehrenberg) Rabenhorst	B	temp	st	mh	alb	-	-	-	-	-	-
Gyrosigma peisonis (Grunow) Hustedt	B	-	st-str	mh	alf	-	sp	2.0	b	ate	e
Gyrosigma strigilis (W.Smith) J.W.Griffin & Henfrey	B	-	-	mh	alb	-	es	-	-	hne	-
Gyrosigma sp.	B	-	-	-	-	-	-	-	-	-	-
Halamphora hassiaca (Krammer & S.Strecker) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Halamphora veneta (Kützing) Levkov	B	temp	st-str	hl	alf	7.4–8.4	-	-	-	-	-
Handmannia antiqua (W.Smith) Kociolek et Khursevich	P-B	temp	-	hb	acf	7.25–7.27	-	1.2	o	-	-
Handmannia comta (Ehrenberg) Kociolek et Khursevich emend. Genkal	P	temp	st	i	alf	6.0–7.8	-	-	-	-	-
Hannaea arcus (Ehrenberg) R.M.Patrick	B	temp	str	i	alf	5.7–7.5	-	-	-	-	-
Hannaea inaequidentata (Lagerstedt) Genkal & Kharitonov	P-B	-	-	hb	neu	-	-	-	-	-	-
Hantzschia amphioxys (Ehrenberg) Grunow f. *amphioxys*	B,aer	temp	st-str	i	ind	6.3–9.5	-	3.0	a	-	me
Hantzschia amphioxys f. *capitata* O.Müller	B	-	st-str	I	ind	-	es	1.9	a	ate	o-e
Hantzschia virgata var. *capitellata* Hustedt	B	-	-	hl	-	-	-	2.0	b	-	m
Hantzschia sp.	B	-	-	-	-	-	-	-	-	-	-
Hemiaulus hauckii Grunow ex Van Heurck	-	-	-	-	-	-	-	-	-	-	-
Hippodonta capitata (Ehrenberg) Lange-Bertalot, Metzeltin & Witkowski	B	temp	st-str	hl	alf	6.6–9.5	-	-	a-b	-	me
Hippodonta hungarica (Grunow) Lange-Bertalot, Metzeltin & Witkowski	B	-	st-str	hl	alf	6.9–8.6	-	-	-	-	-
Humidophila brekkaensis (J.B.Petersen) R.L.Lowe, Kociolek, J.R.Johansen, Van de Vijver, Lange-Bertalot & Krammer et Kopalova	B	-	aer	mh	alf	-	-	-	-	-	-
Humidophila gallica (W.Smith) Lowe, Kociolek, Q.You, Q.Wang & Stepanek	B	-	st-str	i	ind	7.60	es	0.7	o-x	ate	om
Humidophila perpusilla (Grunow) R.L.Lowe, Kociolek, J.R.Johansen, Van de Vijver, Lange-Bertalot & Kopalová	B	warm	st-str	I	ind	-	-	-	-	-	-
Humidophila schmassmannii (Hustedt) Buczkó & Wojtal	B	cool	-	-	acf	-	sp	0.7	o-x	ats	om
Humidophila sp.	-	-	-	-	-	-	-	-	-	-	-
Hygropetra balfouriana (Grunow ex Cleve) Krammer & Lange-Bertalot	B,aer	temp	-	i	ind	6.89–7.60	-	-	-	-	ot
Iconella bifrons (Ehrenberg) Ruck & Nakov	P-B	-	st	i	ind	-	-	1.7	b-o	ats	e
Iconella biseriata (Brébisson) Ruck & Nakov	P-B	temp	st-str	i	alf	7–9	es	1.0	o	-	m
Iconella curvula (W.Smith) Ruck & Nakov	B	-	str	hb	acf	-	-	2.0	b	-	me
Iconella linearis (W.Smith) Ruck & Nakov	P-B	-	st-str	i	ind	4.6–9.0	-	-	-	-	-
Iconella nervosa (A.W.F.Schmidt) C.Cocquyt & R.Jahn	B	-	st	i	alf	6.9–7.0	es	0.5	x-o	ats	om
Iconella spiralis (Kützing) E.C.Ruck & T.Nakov	B	-	str	i	alf	-	-	1.1	o	-	-
Iconella splendida (Ehrenberg) Ruck & Nakov	P-B	-	st-str	i	alf	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Iconella tenera (W.Gregory) Ruck & Nakov	P-B	temp	st	i	alf	5.7–7.5	-	0.2	x	ats	ot
Karayevia laterostrata (Hustedt) Bukhtiyarova	B	temp	st-str	hb	ind	6.89–8.1	-	-	-	-	-
Kobayasiella parasubtilissima (H.Kobayasi & T.Nagumo) Lange-Bertalot	B	temp	str	hb	acb	5.41	-	1.5	o-b	-	-
Kobayasiella subtilissima (Cleve) Lange-Bertalot	B	temp	st-str	i	acb	4.6–7.0	-	1.6	b-o	ats	me
Lacustriella lacustris (W.Gregory) Lange-Bertalot & Kulikovskiy	B	-	-	hb	ind	-	-	-	-	-	e
Lemnicola hungarica (Grunow) Round & Basson	P-B	-	st-str	i	alf	6.7- 8.2	-	0.8	x-b	-	-
Leptocylindrus danicus Cleve	-	-	-	-	-	-	-	-	-	-	-
Lindavia costata (Loginova, Lupikina & Khursevich) Nakov, Guillory, Julius, Theriot & Alverson	-	-	-	-	-	-	-	-	-	-	-
Mayamaea agrestis (Hustedt) Lange-Bertalot	B	-	-	i	ind	7.2	es	2.6	a-o	hce	he
Mayamaea disjuncta (Hustedt) J.Y. Li & Y.Z.Qi	B	-	str	i	ind	7.5	sp	3.0	a	ate	he
Mayamaea permitis (Hustedt) K.Bruder & Medlin	B	temp	st	i	alf	6.5–8.9	-	0.7	o-x	-	-
Melosira lineata var. *subangularis* (Grunow) Aboal	P-B	cool	-	mh	alf	6.3–9.1	-	2.0	b	-	-
Melosira moniliformis (Link) C.Agardh	P-B	eterm	str	mh	alf	-	-	2.0	b	-	-
Melosira normanii Arnott ex Van Heurck	-	-	-	-	-	-	-	-	-	-	-
Melosira undulata (Ehrenberg) Kützing	P-B	-	-	i	ind	-	-	2.8	a-o	-	-
Melosira varians C.Agardh	P-B	temp	st-str	hl	ind	5–9	-	2.4	b-a	-	-
Meridion circulare (Greville) C.Agardh	P-B	temp	st-str	i	ind	6.6–8.3	-	-	-	-	-
Navicula angusta Grunow	B	-	st-str	i	ind	7.6–8.2	-	1.0	o	-	-
Navicula antonii Lange-Bertalot	B	temp	-	oh	alf	7.5–8.5	es	-	-	-	-
Navicula bottnica Grunow	B	-	-	mh	alf	-	sx	2.1	b	ate	e
Navicula capitatoradiata H.Germain ex Gasse	P-B	temp	st-str	mh	alf	7.6–8.1	-	-	-	-	-
Navicula chiarae Lange-Bertalot & Genkal	-	-	-	-	-	8.30	-	-	-	hce	-
Navicula cincta (Ehrenberg) Ralfs	B	temp	st-str	hl	alf	6.9–8.4	-	-	-	-	-
Navicula cryptocephala Kützing var. *cryptocephala*	P-B	temp	st-str	i	ind	6.5–8.4	-	2.4	b-a	-	-
Navicula cryptocephala var. *lata* Poretzky & Anisimova	B	-	-	i	-	-	-	-	-	-	-
Navicula cryptotenella Lange-Bertalot	P-B	temp	st-str	i	ind	6.5–8.7	-	-	-	-	-
Navicula cryptotenelloides Lange-Bertalot	B	-	-	oh	alf	7.9–8.19	-	1.0	o	-	-
Navicula digitoconvergens Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Navicula digitoradiata (W.Gregory) Ralfs	B	-	-	i	alf	-	-	-	-	-	-
Navicula gottlandica Grunow	P-B	-	-	hl	alf	-	es	2.5	b-a	ate	e
Navicula granii (Jørgensen) Gran	-	-	-	-	-	-	-	-	-	-	-
Navicula hasta Pantocsek	B	-	-	-	ind	-	-	-	-	-	-
Navicula kariana Grunow	-	warm	-	i	-	-	-	-	-	-	-
Navicula lanceolata var. *tenuirostris* Skvortzov	B	-	-	i	alf	-	-	1.0	o	-	-
Navicula laterostrata Hustedt	P-B	-	str	i	alf	7.1–7.9	-	1.1	o	-	-
Navicula margalithii Lange-Bertalot	B	-	-	hl	alf	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Navicula mediocostata E.Reichardt	B	-	-	oh	alf	-	es	3.0	a	ate	e
Navicula menisculus Schumann	P-B	-	st-str	hl	alf	6.7–7.6	-	-	o	ats	e
Navicula notha J.H.Wallace	B	-	str	i	acf	6.3–7.5	-	-	-	-	-
Navicula phyllepta Kützing	B	-	-	hl	-	-	-	-	-	-	-
Navicula phylleptosoma Lange-Bertalot	B	-	-	mh	alf	7.7	-	-	-	-	-
Navicula pusilla var. *jacutica* Kisseleva	B	-	-	hl	ind	-	-	-	-	-	-
Navicula radiosa Kützing	B	temp	st-str	i	ind	5–9	sx	-	-	-	-
Navicula reinhardtii (Grunow) Grunow var. *reinhardtii*	-	-	-	-	-	-	-	-	-	-	-
Navicula reinhardtii var. *elliptica* Héribaud	-	-	-	-	-	-	-	-	-	-	-
Navicula rhynchocephala Kützing	B	temp	st-str	hl	alf	6.4–9.5	-	1.3	o	-	-
Navicula rhynchotella Lange-Bertalot	B	-	-	hl	alf	-	-	-	-	-	-
Navicula rostellata Kützing	B	-	st-str	i	alf	7.7–8.6	-	0.7	o-x	ate	ot
Navicula rotaeana (Rabenhorst) Grunow	P-B	-	st	i	ind	-	-	-	-	-	-
Navicula slesvicensis Grunow	P-B	-	st-str	hl	alf	-	-	-	-	-	-
Navicula streckerae Lange-Bertalot & Witkowski	-	-	-	-	-	-	-	-	-	-	-
Navicula striolata (Grunow) Lange-Bertalot	B	-	-	i	alb	-	-	-	-	-	-
Navicula tripunctata (O.F.Müller) Bory	P-B	temp	st-str	i	alf	7.0–8.6	es	-	-	-	e
Navicula trivialis Lange-Bertalot	B	temp	st-str	i	alf	7.2–8.1	es	-	-	-	-
Navicula venerablis Hohn & Hellerman	-	-	-	-	-	-	-	-	-	-	-
Navicula viridula (Kützing) Ehrenberg	B	-	st-str	hl	alf	7.5–8.0	-	-	-	-	-
Navicula viridulacalcis Lange-Bertalot	B	-	-	-	-	-	-	-	-	-	-
Navicula vulpina Kützing	B	temp	st-str	i	ind	7.52–8.30	-	-	-	-	-
Navicula wygaschii Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Navicula sp.	-	-	-	-	-	-	-	-	-	-	-
Naviculadicta sp.	-	-	-	-	-	-	-	-	-	-	-
Navigeia paludosa (Hustedt) Bukhtiyarova	B	-	str	i	ind	8.11	sx	-	-	-	-
Navigeia thingvallae (Østrup) Bukhtiyarova	B	-	-	-	-	-	-	-	-	-	-
Neidiopsis wulffii (J.B.Petersen) Lange-Bertalot	-	-	-	-	-	7.80	-	-	-	ats	ot
Neidium affine (Ehrenberg) Pfitzer	B	temp	st-str	i	ind	4.5–7.8	-	-	-	-	-
Neidium ampliatum (Ehrenberg) Krammer	B	temp	st	i	ind	5.2–8.6	-	-	-	-	-
Neidium bisulcatum (Lagerstedt) Cleve	B	-	st-str	i	ind	4.9–7.0	-	1.0	o	-	-
Neidium dubium (Ehenberg) Cleve	B	-	str	i	alf	-	-	-	-	-	-
Neidium hercynicum Ant.Mayer	B	-	-	i	acf	-	-	-	-	-	-
Neidium hitchcockii (Ehrenberg) Cleve	P-B	-	st	I	ind	-	es	0.6	o-x	ats	ot
Neidium iridis (Ehrenberg) Cleve var. *iridis*	B	temp	st-str	hb	ind	5.1–8.9	-	-	-	-	-
Neidium iridis var. *diminutum* (Pantocsek) Wislouch & Kolbe	B	-	-	i	ind	-	-	1.0	o	-	-
Neidium productum (W.Smith) Cleve	P-B	temp	st-str	i	ind	-	-	-	-	-	-
Neidium sp.	B	-	-	-	-	4.6–6.9	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Nitzschia acicularis (Kützing) W.Smith	P-B	temp	st	i	alf	6.8–8.1	es	1.4	o-b	ats	om
Nitzschia acidoclinata Lange-Bertalot	B	temp	str	hb	ind	6.5–8.0	-	3.6	a-b	ate	e
Nitzschia acuta Hantzsch	P-B	-	st-str	i	alf	-	-	-	-	-	-
Nitzschia alpina Hustedt	P-B	temp	str	i	acf	7.39	-	1.0	o	-	-
Nitzschia aquaea Wisłouch & V.S.Poretzky		-	-	hb	-	-	es	2.1	b	ate	e
Nitzschia brevissima Grunow	B	-	st-str	hl	alf	6.5–8.0	-	-	-	-	-
Nitzschia capitellata Hustedt var. *capitellata*	B	temp	-	i	ind	6.9–8.6	-	3.6	a-b	-	o-e
Nitzschia capitellata var. *tenuirostris* (Grunow) Bukhtiyarova	P-B	-	-	i	alf	7.0–8.2	-	1.0	o	-	-
Nitzschia commutatoides Lange-Bertalot	-	-	-	hl	-	-	-	-	-	-	-
Nitzschia denticula Grunow	B	-	-	mh	alf	8.0	-	-	-	-	-
Nitzschia dissipata (Kützing) Rabenhorst var. *dissipata*	B	temp	st-str	i	alf	6.5–8.5	sx	1.4	o-b	-	-
Nitzschia flexoides Geitler	B	-	-	-	-	-	-	1.5	o-b	-	-
Nitzschia fonticola (Grunow) Grunow	P-B	temp	st-str	i	alf	6.0–8.9	-	3.6	a-b	hne	-
Nitzschia frigida Grunow	-	-	-	-	-	-	-	-	-	-	-
Nitzschia frustulum (Kützing) Grunow	P-B	temp	st-str	hl	alf	6.7–8.8	es	2.7	a-o	-	-
Nitzschia graciliformis Lange-Bertalot & Simonsen	B	-	-	i	alf	-	es	1.0	o	-	-
Nitzschia gracilis Hantzsch	P-B	temp	st-str	i	ind	5.51–8.25	-	-	-	-	-
Nitzschia homburgiensis Lange-Bertalot	B	-	st-str	i	alf	-	-	-	-	-	-
Nitzschia inconspicua Grunow	B	temp	st-str	hl	alf	6.7–8.9	-	-	-	-	-
Nitzschia intermedia Hantzsch ex Cleve & Grunow	P-B	temp	-	i	ind	6.6–8.1	-	-	-	-	-
Nitzschia linearis W.Smith	B	temp	-	i	alf	7.1–8.1	es	1.7	b-o	ate	me
Nitzschia longissima (Brébisson) Ralfs	-	-	-	mh	alf	-	-	-	-	-	-
Nitzschia media Hantzsch	-	-	-	-	-	-	-	-	-	-	-
Nitzschia palea (Kützing) W.Smith	P-B	temp	st-str	i	ind	4.5–8.8	-	2.0	b	-	-
Nitzschia paleacea (Grunow) Grunow	P-B	temp	st-str	i	alf	6.8–8.9	es	2.0	b	ate	o-e
Nitzschia perminuta Grunow	P-B	temp	str	hl	alf	5.79–8.0	-	-	-	-	-
Nitzschia recta Hantzsch ex Rabenhorst	B	temp	st-str	i	alf	6–9	-	1.0	o	-	-
Nitzschia rosenstockii Lange-Bertalot	B	-	-	hl	-	-	-	-	-	-	-
Nitzschia sigma (Kützing) W.Smith	B	temp	st-str	mh	alf	6.9–8.2	-	-	-	-	-
Nitzschia sublinearis Hustedt	P-B	-	-	i	alf	-	-	-	-	-	-
Nitzschia umbonata (Ehrenberg) Lange-Bertalot	P-B	-	st-str	i	ind	7.2–8.2	sp	2.0	b	hne	me
Nitzschia vermicularis (Kützing) Hantzsch	P-B	temp	st-str	i	alf	7.23	-	-	-	-	-
Nitzschia sp.	-	-	-	-	-	-	-	-	-	-	-
Nupela impexiformis (Lange-Bertalot) Lange-Bertalot	B	-	-	-	ind	6.8–7.3	sx	0.5	x-o	ats	ot
Nupela neogracillima Kulikovskiy & Lange-Bertalot	P-B	-	-	i	ind	-	-	-	-	-	ot
Nupela silvahercynia (Lange-Bertalot) Lange-Bertalot	B	-	-	i	-	-	-	-	-	-	-
Nupela tenuicephala (Hustedt) Lange-Bertalot	B	-	-	-	acf	-	es	-	-	-	-
Odontidium anceps (Ehrenberg) Ralfs	P-B	cool	st-str	hb	ind	7.8–8.2	-	-	-	-	-
Odontidium hyemale (Roth) Kützing	P-B	cool	st-str	hb	ind	6.5–7.5	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Odontidium mesodon (Ehrenberg) Kützing	B	cool	st-str	hb	ind	6.6–8.3	-	0.9	x-b	-	-
Opephora mutabilis Sabbe & Wyverman	B	-	-	eh	alf	-	-	-	-	-	-
Pantocsekiella costei (J.C.Druart & F.Straub) K.T.Kiss & E.Ács	-	-	-	-	-	-	-	-	-	-	-
Pantocsekiella kuetzingiana (Thwaites) K.T.Kiss & E.Ács	B	temp	st-str	hl	ind	6.6–8.3	es	3.6	a-b	-	e
Pantocsekiella ocellata (Pantocsek) K.T.Kiss & Ács	P-B	cool	st-str	hl	alf	6.61–8.18	-	0.9	x-b	-	ot
Paraplaconeis placentula (Ehrenberg) Kulikovskiy & Lange-Bertalot	B	temp	st-str	i	alf	7.3–8.4	-	2.0	b	-	ot
Pauliella taeniata (Grunow) Round & Basson	P-B	-	-	eh	alf	-	-	2.0	b	-	-
Pinnularia acoricola Hustedt	B	-	st-str	i	acf	-	-	-	-	-	-
Pinnularia ammerensis Kulikovskiy, Lange-Bertalot & Metzeltin	-	-	-	-	-	-	-	-	-	-	-
Pinnularia anglica Krammer	B	-	-	-	acf	-	es	2.3	b	-	e
Pinnularia angustarea Kulikovskiy, Lange-Bertalot, A.Witkovski & N.I.Dorofeyuk	-	-	-	-	-	-	-	-	-	-	-
Pinnularia biceps W.Gregory	B	temp	str	i	acf	5.1–7.2	es	0.3	x	ats	om
Pinnularia brebissonii (Kützing) Rabenhorst var. brebissonii	B	temp	st-str	i	ind	-	-	1.0	o	-	-
Pinnularia bottnica Krammer	B	-	-	hl	-	-	-	-	-	-	-
Pinnularia brandelii Cleve	B	-	-	hb	acf	-	-	-	-	-	-
Pinnularia brevicostata Cleve	P-B	cool	st-str	i	ind	-	-	-	-	-	-
Pinnularia bullacostae Krammer & Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-
Pinnularia canadensis Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia cardinaliculus Cleve	-	-	-	-	-	-	-	-	-	-	-
Pinnularia cuneola E.Reichardt	-	-	-	-	-	-	-	-	-	-	-
Pinnularia decrescens (Grunow) Krammer	B	-	str	hb	ind	-	-	-	-	-	-
Pinnularia divergens var. *sublinearis* Cleve	-	-	-	-	-	-	-	-	-	-	-
Pinnularia divergens W.Smith	B	-	st	hb	ind	-	-	-	-	-	-
Pinnularia eifeliana (Krammer) Krammer	B	-	-	-	-	-	-	1.0	o	-	-
Pinnularia gentilis (Donkin) Cleve	B	-	st-str	i	ind	-	-	-	-	-	-
Pinnularia grunowii Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia halophila Krammer	B	-	-	hl	-	-	-	0.2	x	ats	om
Pinnularia intermedia (Lagerstedt) Cleve	P-B	cool	st-str	i	ind	-	-	1.0	o	-	-
Pinnularia krammeri Metzeltin	-	-	-	-	-	-	-	-	-	-	-
Pinnularia lagerstedtii (Cleve) A.Cleve	B	-	aer	hb	ind	-	-	-	-	-	-
Pinnularia lailaensis Foged	-	-	-	-	-	-	-	-	-	-	-
Pinnularia lata (Brébisson) W.Smith	P-B	-	str	i	acf	-	-	0.3	x	-	-
Pinnularia macilenta Ehrenberg	B	-	-	-	-	-	-	0.9	x-b	-	-
Pinnularia media (Krammer) Kulikovskiy, Lange-Bertalot & Metzeltin	B	-	-	-	-	-	-	0.6	o-x	ate	me
Pinnularia mesogongyla Ehrenberg	B	-	st	i	ind	-	sx	0.2	o	ats	ot
Pinnularia mesolepta (Ehrenberg) W.Smith	P-B	temp	st-str	i	ind	6.9–7.1	-	-	-	-	ot

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Pinnularia microstauron (Ehrenberg) Cleve var. *microstauron*	P-B	temp	st-str	i	ind	4.5–8.7	-	0.3	x	ats	ot
Pinnularia microstauron var. *rostrata* Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia neohalophila Kulikovskiy, Genkal & Mikheeva	-	-	-	-	-	-	-	-	-	-	-
Pinnularia neomajor Krammer	B	-	-	i	ind	-	-	-	-	-	-
Pinnularia nodosa (Ehrenberg) W.Smith var. *nodosa*	B	temp	str	i	ind	6.79	-	0.4	x-o	-	-
Pinnularia nodosa var. *percapitata* Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia nodosa var. *robusta* (Foged) Krammer	B	-	-	-	-	-	-	0.4	x-o	ats	ot
Pinnularia notabilis Krammer	B	-	-	-	-	-	-	0.6	o-x	-	-
Pinnularia oriunda Krammer	B	-	-	i	neu	-	-	1.0	o	ats	ot
Pinnularia oriundiformis Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia parvulissima Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia permicrostauron Krammer & Metzeltin	-	-	-	-	-	-	-	-	-	-	-
Pinnularia pluvianiformis Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia quadratarea (A.W.F.Schmidt) Cleve	B	-	-	ph	-	-	-	0.3	x	-	-
Pinnularia rhombarea Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia rupestris Hantzsch	B	temp	str	i	acf	5.39	-	-	-	-	-
Pinnularia septentrionalis Krammer	B	-	-	i	ind	-	-	1.0	o	-	om
Pinnularia similiformis Krammer	B	-	-	-	acf	-	-	1.0	o	-	ot
Pinnularia spitsbergensis Cleve	B	-	-	hb	ind	-	-	-	-	ats	ot
Pinnularia stricta Hustedt	-	-	-	-	-	-	-	-	-	-	-
Pinnularia subanglica Krammer	-	-	-	-	-	-	-	-	-	-	-
Pinnularia subrostrata (A.Cleve) A.Cleve	B	-	-	hb	acf	-	-	1.0	o	-	-
Pinnularia subrupestris Krammer	B	-	-	hb	acf	-	-	0.4	x-o	-	-
Pinnularia subundulata Østrup	B	-	-	-	acf	-	-	0.3	x	-	ot
Pinnularia sudetica Hilse	B	-	st-str	i	acf	-	-	1.0	o	-	-
Pinnularia undula (Schumann) Krammer	B	-	-	i	ind	-	-	1.0	o	-	-
Pinnularia viridis (Nitzsch) Ehrenberg	P-B	temp	st-str	i	ind	5.24–7.1	-	0.9	x-b	-	ot
Pinnularia sp.	-	-	-	-	-	4.5–7.8	-	-	-	-	-
Placogeia similis (Krasske) Bukhtiyarova	B	-	-	i	ind	-	-	-	-	-	e
Placoneis amphibola (Cleve) E.J.Cox	B	cool	st-str	i	ind	-	-	-	-	-	-
Placoneis clementioides (Hustedt) E.J.Cox	B	-	-	i	alf	-	-	-	-	-	-
Placoneis dicephala (Ehrenberg) Mereschkowsky	B	-	-	i	ind	-	es	2.0	b	ate	me
Placoneis elginensis (W.Gregory) E.J.Cox	P-B	-	st-str	i	alf	7.0–8.2	-	-	-	-	-
Placoneis exigua (W.Gregory) Mereschkovsky	B	-	str	i	ind	-	es	1.4	o-b	-	-
Placoneis gastrum (Ehrenberg) Mereschkowsky	B	-	st-str	i	ind	-	-	-	-	-	-
Placoneis interglacialis (Hustedt) E.J.Cox	B	-	-	i	ind	-	-	2.0	b	-	-
Placoneis opportuna (Hustedt) Chudaev & Gololobova	B	-	-	-	-	-	es	-	-	-	-
Placoneis placentula var. *rostrata* (Mayer) N.A.Andresen, Stoermer & R.G.Kreis, Jr.	B	-	-	i	alf	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Placoneis sp.	-	-	-	-	-	-	-	-	-	-	-
Planothidium delicatulum (Kützing) Round & Bukhtiyarova	P-B	-	st-str	mh	alb	6.6–8.5	-	1.0	o	ats	ot
Planothidium haynaldii (Schaarschmidt) Lange-Bertalot	B	-	st-str	i	alf	-	-	1.0	o	hne	om
Planothidium lanceolatum (Brébisson ex Kützing) Lange-Bertalot	P-B	temp	st-str	i	alf	6.4–9.0	sx	1.0	o	ats	om
Planothidium straubianum C.E.Wetzel, Van de Vijver & L.Ector	B	-	str	i	alf	8.0	-	-	a	ats	e
Planothidium sp.	-	-	-	-	-	-	-	-	-	-	-
Pleurosigma delicatulum W.Smith	B	-	-	mh	-	-	-	-	-	-	-
Pleurosigma elongatum W.Smith	P-B	-	-	mh	alf	-	-	-	-	-	-
Praestephanos triporus (Genkal & G.V.Kuzmin) A.Tuji & J.-S.Ki	P	-	-	i	alf	-	-	-	-	-	-
Prestauroneis crucicula (W.Smith) Genkal & Yarushina	B	-	-	mh	ind	-	-	0.2	x	-	-
Psammothidium petersenii (Hastedt) Round et Bukhiyarova	-	-	-	-	-	-	-	-	-	-	-
Psammothidium bioretii (H.Germain) Bukhtiyarova & Round	B	-	str	i	ind	6.08–7.9	-	0.7	o-x	ats	ot
Psammothidium chlidanos (M.H.Hohn & Hellerman) Lange-Bertalot	B	-	-	hb	acf	7.1–7.9	-	1.0	o	-	ot
Psammothidium daonense (Lange-Bertalot) Lange-Bertalot	B	temp	str	hb	ind	6.6–8.2	-	-	o	ats	ot
Psammothidium helveticum (Hustedt) Bukhtiyarova & Round	B	temp	st-str	hb	alf	6.0–7.4	es	2.4	b-a	ate	m
Psammothidium kryophilum (J.B.Petersen) E.Reichardt	P-B	-	str	i	ind	8.10	sx	0.5	x-o	ats	ot
Psammothidium levanderi (Hustedt) Bukhtiyarova & Round	B	temp	str	i	ind	6.6–8.4	sx	2.0	b	ats	om
Psammothidium marginulatum (Grunow) Bukhtiyarova & Round	B	temp	st-str	hb	acf	4.6–7.9	sx	0.2	x	ats	ot
Psammothidium rechtense (Leclercq) Lange-Bertalot	B	-	str	hb	alf	-	-	1.0	o	ats	ot
Psammothidium rossii (Hustedt) Bukhtiyarova & Round	B	-	str	hb	ind	-	-	1.0	o	ats	ot
Psammothidium scoticum (R.J.Flower & V.J.Jones) Bukhtiyarova & Round	B	temp	-	-	-	6.42	-	-	-	-	-
Psammothidium subatomoides (Hustedt) Bukhtiyarova & Round	P-B	temp	str	hb	acf	6.4–8.01	sx	2.0	b	ats	me
Psammothidium subsalsum (J.B.Petersen) Kulikowskiy, Witkowski & Pliński	B	-	-	-	-	-	-	-	-	-	-
Psammothidium ventrale (Krasske) Bukhtiyarova & Round	B	-	str	hb	acf	7.45	-	2.0	b	ats	om
Psammothidium sp.	-	-	-	-	-	-	-	-	-	-	-
Pseudostaurosira brevistriata (Grunow) D.M.Williams & Round	P-B	temp	st-str	i	alf	5.2–8.4	-	2.0	b	ate	-
Pseudostaurosira parasitica (W.Smith) E.Morales	P-B	temp	st-str	i	alf	6.41–8.22	-	1.0	o	ate	ot
Pulchellophycus obsitus (Hustedt) Edlund & M.J.Wynne	-	-	-	-	-	-	-	-	-	-	-
Pulchellophycus sp.	-	-	-	-	-	-	-	-	-	-	-
Reimeria sinuata (W.Gregory) Kociolek & Stoermer	P-B,aer	temp	st-str	i	ind	6.6–8.9	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Rexlowea parasemen (Lange-Bertalot) Kulikoviskiy, Kociolek & Genkal	B	-	-	i	ind	-	es	-	-	-	-
Rhizosolenia hebetata f. semispina (Hensen) Gran	P	cool	-	eh	-	-	-	-	-	-	-
Rhizosolenia hebetata J.W.Bailey	P	cool	-	eh	-	-	-	-	-	-	-
Rhoicosphenia abbreviata (C.Agardh) Lange-Bertalot	B	temp	st-str	i	alf	6.5–8.6	es	1.9	o-a	ate	me
Rhopalodia gibba (Ehrenberg) O.Müller var. *gibba*	P-B	temp	st-str	i	alf	6.2–9.0	es	1.4	x-o	ate	om
Rhopalodia gibba var. *ventricosa* (Kützing) H.Peragallo & M.Peragallo	B	temp	-	i	alf	6.2–9.0	es	1.4	o-b	hne	-
Roperia praetesselata H.J.Schrader	-	-	-	-	-	-	-	-	-	-	-
Rossithidium kreigeri (Krasske) Bahls	B	-	-	hb	-	-	sx	1.0	o	-	ot
Sellaphora absoluta (Hustedt) Wetzel, Ector, Van de Vijver, Compère & D.G.Mann	B	-	str	i	ind	-	es	1.0	o	ats	m
Sellaphora bacillum (Ehrenberg) D.G.Mann	B	-	st-str	i	alf	7–9	sx	1.5	o-b	ats	me
Sellaphora difficillima (Hustedt) C.E.Wetzel, L.Ector & D.G.Mann	B	temp	str	hb	acf	7.8	-	1.0	o	ate	om
Sellaphora insolita (É.Manguin ex Kociolek & B.de Reviers) P.B.Hamilton & D.Antoniades	-	-	-	-	-	-	-	-	-	-	-
Sellaphora laevissima (Kützing) D.G.Mann	B	-	st-str	i	ind	5.7–8.1	-	2.0	b	ats	om
Sellaphora parapupula Lange-Bertalot	B	-	st	i	ind	6.5–7.6	-	1.0	o	ate	m
Sellaphora pupula (Kützing) Mereschkovsky	B	eterm	st-str	hl	ind	5.2–9.0	sx	1.9	o-a	ate	me
Sellaphora rectangularis (W.Gregory) Lange-Bertalot & Metzeltin	B	temp	st-str	hl	ind	6.5–9.0	sx	1.9	o-a	ate	me
Sellaphora vitabunda (Hustedt) D.G.Mann	B	-	-	i	alf	8.06	es	1.0	o	ats	om
Sellaphora sp.	B	-	-	-	-	-	-	-	-	-	-
Simonsenia delognei (Grunow) Lange-Bertalot	B	temp	str	oh	alf	7.5–8.1	-	3.0	a	hne	e
Skabitschewskia oestrupii (A.Cleve) Kuliskovskiy & Lange-Bertalot	B	-	str	i	ind	7.6	-	1.0	o	ats	om
Skabitschewskia peragalloi (Brun & Héribaud) Kuliskovskiy & Lange-Bertalot	B	-	str	i	ind	8.20	sx	0.4	x-o	ats	om
Skeletonema subsalsum (A.Cleve) Bethge	P	-	-	i	ind	-	-	2.3	b	-	me
Stauroneis amphicephala Kützing	P-B	temp	st-str	i	ind	4.8–8.2	sx	1.3	o	ats	om
Stauroneis anceps Ehrenberg f. anceps	P-B	temp	st-str	i	ind	4.8–8.2	sx	1.3	o	ats	om
Stauroneis anceps f. linearis Rabenhorst	B	-	st-str	i	alf	-	-	-	-	-	-
Stauroneis gracilior E.Reichardt	B	-	-	-	-	-	-	-	-	-	-
Stauroneis gracilis Ehrenberg	B	-	-	I	ind	5.3	-	-	o	-	-
Stauroneis guslyakovii Genkal & Yarushina	-	-	-	-	-	-	-	-	-	-	-
Stauroneis phoenicenteron (Nitzsch) Ehrenberg	P-B	temp	st-str	i	ind	6.01–8.5	-	-	-	-	-
Stauroneis reichardtii Lange-Bertalot, Cavacini, Tagliaventi & Alfinito	P-B	temp	st-str	i	ind	4.8–8.2	sx	1.3	o	ats	om
Stauroneis schulzii Jousé	B	-	-	i	alf	-	-	-	-	ats	-
Stauroneis siberica (Grunow) Lange-Bertalot & Krammer	B	-	-	i	alf	-	-	-	-	-	-

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Stauroneis smithii Grunow var. karelica Wislouch & Kolbe	B	cool	-	i	-	-	-	1.0	o	-	ot
Stauroneis smithii Grunow var. smithii	P-B	-	st-str	i	alf	-	-	1.0	o	-	om
Stauroneis sp.	B	-	-	-	-	-	-	1.5	o-b	ate	o-e
Staurosira construens Ehrenberg	P-B	temp	st-str	i	alf	5.5–9.0	-	1.0	o	-	-
Staurosira sviridae Kulikovskiy, Genkal & Mikheeva	-	-	-	-	-	-	-	-	-	-	-
Staurosirella lanceolata (Hustedt) E.A.Morales, C.Wetzel & L.Ector	-	-	-	-	-	-	-	-	-	-	-
Staurosirella lapponica (Grunow) D.M.Williams & Round	P-B	temp	st-str	i	ind	7.24–8.2	-	1.1	o	ate	ot
Staurosirella pinnata (Ehrenberg) D.M.Williams & Round	P-B	temp	st-str	hl	alf	6.2–9.3	es	1.1	o	ats	om
Stenopterobia heribaudii (Playfair) Playfair	P-B	-	st	-	-	-	-	0.4	x-o	-	-
Stephanocyclus meneghinianus (Kützing) Kulikovskiy, Genkal & Kociolek = Cyclotella meneghiniana Kützing	P-B	temp	st-str	hl	alf	5.5–9.0	sp	2.8	a	hne	e
Stephanodiscus binderanus (Kützing) Krieger	P	-	-	hl	ind	-	es	1.5	o-b	ate	me
Stephanodiscus hantzschii Grunow	P	temp	-	i	-	8.0–8.5	-	-	-	-	-
Stephanodiscus hashiensis H.Tanaka	-	-	-	-	-	-	-	-	-	-	-
Stephanodiscus minutulus (Kützing) Cleve & Möller	P	temp	st-str	i	alb	6.5–9.0	es	3.6	a-o	hne	he
Stephanodiscus neoastraea Håkansson & Hickel emend. Casper, Scheffler et Augsten	P	temp	st-str	i	alb	5.5–9.0	es	-	-	-	-
Surirella angusta Kützing	P-B	temp	st-str	i	alf	6.9–8.9	-	-	-	-	-
Surirella brebissonii Krammer & Lange-Bertalot	B	temp	st-str	hl	alf	7.2–8.4	-	0.5	x-o	-	-
Surirella capronii var. *hankensis* Skvortzov	-	-	-	-	-	-	-	-	-	-	-
Surirella conifera Skvortzov	-	-	-	-	-	-	-	-	-	-	-
Surirella crumena Brébisson ex Kützing	B	-	st-str	hl	alf	-	-	-	-	-	-
Surirella didyma Kützing	B	-	-	i	alf	-	-	-	-	-	-
Surirella elegans Ehrenberg	P-B	-	str	i	alf	-	-	1.0	o	-	om
Surirella hibernica (W.Smith) D.Kapustin & O.Kryvosheia	P-B	-	st-str	i	alf	-	-	-	-	-	-
Surirella librile (Ehrenberg) Ehrenberg	P-B	temp	st-str	i	alf	8.0	-	-	-	hne	-
Surirella minuta Brébisson ex Kützing	B	temp	st-str	i	alf	6.9–8.6	-	-	-	-	-
Surirella ovalis Brébisson	P-B	-	st-str	mh	alf	-	es	1.7	b-o	-	-
Surirella roba Leclercq	B	-	str	i	acf	-	-	-	-	-	-
Surirella sp.	B	-	-	mh	-	-	es	1.85	o-a	hne	-
Synedra actinastroides (Lemmermann) Lemmermann	-	-	-	-	-	-	-	-	-	-	-
Tabellaria fenestrata (Lyngbye) Kützing	P-B	-	st-str	i	ind	6.2	-	1.9	o-a	-	-
Tabellaria flocculosa (Roth) Kützing	P-B	eterm	st-str	i	acf	4.5–8.0	-	3.0	a	-	-
Tabularia parva (Kützing) D.M.Williams & Round	-	-	-	mh	alf	-	-	-	-	-	-
Tabularia tabulata (C.Agardh) Snoeijs	B	-	-	mh	alf	-	-	-	-	-	-
Tetracyclus glans (Ehrenberg) F.W.Mills	P-B	temp	-	i	acf	6.95	-	1.0	x-o	-	ot
Tetracyclus rupestris (Kützing) Grunow	P-B	cool	aer	i	acf	-	-	0.8	x-b	-	ot
Thalassionema nitzschioides (Grunow) Mereschkowsky	P	-	-	eh	-	-	-	-	-	-	-
Thalassiosira baltica (Grunow) Ostenfeld	P-B	cool	-	mh	-	-	-	-	-	-	-
Thalassiosira bramaputrae (Ehrenberg) Håkansson & Locker	P-B	-	st-str	hl	alf	-	sp	1.4	o-b	ate	m

Table A2. *Cont.*

Taxa	Hab	Temp	Oxy	Sal	pH	pH Range	D	Index S	Sap	Aut-Het	Tro
Thalassiosira decipiens (Grunow ex Van Heurck) Jørgensen	P-B	cool	-	eh	-	-	-	-	-	-	-
Thalassiosira gravida Cleve	P	cool	-	eh	alf	-	es	2.0	b	-	-
Thalassiosira hyalina (Grunow) Gran	-	warm	-	eh	-	-	-	-	-	-	-
Thalassiosira leptopus (Grunow) Hasle & G.Fryxell	P-B	cool	-	eh	alf	-	-	2.0	b	-	-
Thalassiosira nordenskioeldii Cleve	P	eterm	-	eh	-	-	-	-	-	-	-
Thalassiosira pseudonana Hasle & Heimdal	P	temp	st-str	hl	alf	7.4–8.0	-	2.4	b-a	hne	he
Thalassiosira sp.	B	-	-	-	-	-	-	-	-	-	-
Tryblionella angustata W.Smith var. *angustata*	P-B	temp	st	i	alf	6.86–7.7	sx	1.5	o-b	ats	e
Tryblionella angustata var. *acuta* (Grunow) Bukhtiyarova	P-B	-	-	i	alf	-	-	2.0	b	-	m
Tryblionella calida (Grunow) D.G.Mann	P-B	-	-	hl	-	7.8–8.2	-	2.6	a-o	-	e
Tryblionella debilis Arnott ex O'Meara	P-B	temp	st-str,aer	i	alf	6.9–8.3	es	2.6	a-o	ate	e
Tryblionella hantzschiana Grunow	B	-	st-str	hl	alf	-	-	2.6	a-o	ate	e
Tryblionella gracilis var. *ambigua* (Grunow) Bukhtiyarova	B	-	-	hl	-	-	-	2.0	b	-	-
Tryblionella hungarica (Grunow) Frenguelli	P-B	-	st-str	mh	alf	7.0–7.8	sp	2.9	a	ate	e
Tryblionella littoralis (Grunow) D.G.Mann	B	-	st-str	eh	alf	-	es	2.6	a-o	ats	e
Ulnaria acus (Kützing) Aboal	P-B	warm	st-str	i	alf	6.8–8.0	es	1.85	o-a	ate	me
Ulnaria amphirhynchus (Ehrenberg) Compère & Bukhtiyarova	P-B	-	-	i	alf	-	es	2.0	b	hne	om
Ulnaria biceps (Kützing) Compère	P-B	temp	-	i	alf	5–9	-	1.9	o-a	-	om
Ulnaria capitata (Ehrenberg) Compère	P-B	-	st-str	i	alf	-	es	2.0	b	ats	e
Ulnaria contracta (Østrup) E.A.Morales & M.L.Vis	B	-	-	i	alf	6.3–9	es	2.4	b-a	hne	-
Ulnaria danica (Kützing) Compère & Bukhtiyarova	P-B	temp	-	i	alf	6.5–9.0	es	1.7	b-o	hne	om
Ulnaria delicatissima var. *angustissima* (Grunow) Aboal & P.C.Silva	P-B	-	-	i	alf	8.0	es	1.7	b-o	-	om
Ulnaria ulna (Nitzsch) Compère	P-B	temp	st-str	i	alf	5.0–9.5	es	2.4	b-a	ate	e
Ulnaria sp.	-	-	-	-	-	-	-	-	-	-	-
Urosolenia eriensis (H.L.Smith) Round & R.M.Crawford	P-B	-	str	hl	acf	7.93	-	0.5	x-o	ats	om
Urosolenia longiseta (O.Zacharias) Edlund & Stoermer	P	-	str	i	acf	-	-	0.9	x-b	ats	me

Note: "-", not found. Abbreviations: Habitat (Hab) (P—planktonic, P-B—plankto-benthic, B—benthic); temperature (T) preferences (cool—cool-water, temp—temperate, eterm—eurythermic, warm—warm-water); oxygenation and streaming (Oxy) (st—standing water, str—streaming water, st-str—low streaming water, aer—aerophiles); pH preferences groups (pH) according to Hustedt (1957) [63] (alb—alkalibiontes; alf—alkaliphiles, ind—indifferent; acf—acidophiles; acb—acidobiontes, neu—neutrophiles); salinity ecological groups (Sal) according to Hustedt (1938–1939) [62] (hb—oligohalobes-halophobes, i—oligohalobes-indifferent, hl—halophiles; mh—mesohalobes, oh—oligohalobes of wide spectrum with optimum as indifferent, eh—euhalobes, ph—polyhalobes); Index S, species-specific index saprobity according to Sládeček, 1986 [65]; self-purification zone with index of saprobity (Sap) (x/0.0—xenosaprobe; x-o/0.4—xeno-oligosaprobe; x-b/0.8—xeno-betamesosaprobe; o/1.0—oligosaprobe; b-o/1.6—beta-oligosaprobe; o-a/1.8—oligo-alphamesosaprobe; b/2.0—betamesosaprobe; a/3.0—alphamesosaprobe; o-x/0.6—oligo-xenosaprobe; o-b/1.4—oligo-betamesosaprobe; b-p/2.8—beta-polysaprobe; b-a/2.4—beta-alphamesosaprobe; a-p/3.4—alpha-polysaprobe; a-o/2.6—alpha-oligosaprobe; a-b/3.6—alpha-betamesosaprobe; organic pollution indicators according to Watanabe et al. (1986) [64] (D): sx—saproxenes; es—eurysaprobes; sp—saprophiles; nitrogen uptake metabolism (Aut-Het) (Van Dam et al., 1994) [66]: ats—nitrogen-autotrophic taxa, tolerating very small concentrations of organically bound nitrogen; ate—nitrogen-autotrophic taxa, tolerating elevated concentrations of organically bound nitrogen; hne—facultative nitrogen-heterotrophic taxa, needing periodically elevated concentrations of organically bound nitrogen; hce—obligate nitrogen-heterotrophic taxa, needing continuously elevated concentrations of organically bound nitrogen; Trophic state indicators (Tro) (Van Dam et al., 1994) [66]: (ot—oligotraphentic; om—oligomesotraphentic; m—mesotraphentic; me—mesoeutraphentic; e—eutraphentic; he—hypereutraphentic; o-e—oligo- to eutraphentic (hypereutraphentic)).

Table A3. Distribution of species indicators over ecological groups in the waterbodies of the Lena Delta Nature Reserve and adjacent areas. Abbreviation of ecological groups as in Appendix A Table A2.

Ecological Group	No of Indicators
Habitat	
B	330
P-B	161
P	24
Temperature	
cool	26
temp	184
eterm	6
warm	6
Oxygen	
aer	3
str	73
st-str	211
st	26
Salinity	
hb	76
i	298
hl	50
mh	35
eh	16
ph	1
Water pH	
acb	4
acf	83
ind	162
alf	190
alb	10
Saprobity Watanabe	
sx	47
es	75
sp	13
Nutrition type	
ats	102
ate	70
hne	21
hce	2
Trophic state	
ot	79
om	52
m	13
me	36
e	45
o-e	6
he	4
Class of Water Quality	
Class 1	46
Class 2	165
Class 3	79
Class 4	17
Class 5	7

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