

Biodiversity of aquatic algal communities in the Sikhote-Alin biosphere reserve (Russia)

Ljubov A. MEDVEDEVA*

*Institute of Biology and Soil, Far East Branch, Russian Academy of Sciences,
159, 100 years of Vladivostok Ave., Vladivostok-22, 690022, Russia*

(Received 13 January 2000, accepted 20 July 2000)

Abstract — This paper presents the results of long-term research regarding the algal biodiversity of the Sikhote-Alin biosphere reserve, Primorsky region (Russian Far East). The algal flora is comprised of 675 species represented by 839 subspecific taxa from seven divisions: Cyanophyta, 77 (91 including subspecific taxa); Euglenophyta, 18 (21); Chlorophyta, 84 (86); Streptophyta, 137 (169); Rhodophyta, 3; Ochrophyta, 355 (468): Diatomophyceae, 331 (444), Chrysophyceae, 6, Xanthophyceae, 16, Phaeophyceae, 2; Dinophyta, 1. The algal floras of ecologically different reserve water bodies are described, including the brackish, Blagodatnoe Lake, the shallow freshwater Golubichnoe Lake, the alpine Solontsovskie Lakes, the rapid cold-water Serebryanka and Dzhigitovka rivers, and the lowland Kolombe River. The taxonomic composition of the algal flora has been analysed. Differences between the algal communities of lakes and rivers are described and rare species are noted. The algal flora of the Sikhote-Alin biosphere reserve is currently the richest and most diverse of the six reserves studied in the Primorsky region. © 2001 Adac/Éditions scientifiques et médicales Elsevier SAS

algal flora / brackish water / Chlorophyta / Cyanophyta / diatoms / freshwater algae / lakes / rivers / Russian Far East / Sikhote-Alin biosphere reserve

Résumé — Biodiversité des communautés algales de la réserve de la biosphère Sikhote-Alin (Russie). Les résultats d'une recherche de longue durée sur la biodiversité algale de la réserve de la biosphère Sikhote-Alin, région de Primorsky (Extrême-Orient russe), sont présentés. La flore algale comprend 675 espèces (839 en comprenant les taxons infraspécifiques) appartenant à sept divisions : Cyanophyta, 77 espèces (91 taxons en comprenant les taxons infraspécifiques) ; Euglenophyta, 18 (21) ; Chlorophyta, 84 (86) ; Streptophyta, 137 (169) ; Rhodophyta, 3 ; Ochrophyta, 355 (468) dont : Diatomophyceae, 331 (444), Chrysophyceae, 6, Xanthophyceae, 16 et Phaeophyceae, 2 ; Dinophyta, 1. La flore algale de différents milieux aquatiques de la réserve est décrite : eau saumâtre, lac Blagodatnoe ; eau douce peu profonde, lac Golubichnoe ; lacs alpins, lacs Solontsovskie ; eau courante, rapide et froide, rivières Serebryanka et Dzhigitovka ; rivière de plaine, rivière Kolombe. La composition taxinomique des flores algales a été analysée. Les différences entre communautés algales des divers lacs et rivières sont décrites et les espèces rares sont signalées. La flore algale de la réserve de la biosphère Sikhote-Alin est actuellement la plus riche et la plus diverse parmi les six réserves étudiées dans la région de Primorsky. © 2001 Adac/Éditions scientifiques et médicales Elsevier SAS

Chlorophyta / Cyanobacteria / Cyanophyta / diatomées / algues d'eaux douces / eaux saumâtres / Extrême-Orient russe / flore algale / lacs / réserve de Sikhote-Alin / rivières

* Correspondence and reprints: zoology@eastnet.fcbras.ru

INTRODUCTION

Given the continual increase of pollution pressure on aquatic biota, it is increasingly urgent to study intact, natural ecosystems prior to their disturbance. The waters of the Sikhote–Alin biosphere reserve are ideal examples of natural systems unaffected by anthropogenic pollution. The reserve is largely ecologically intact and remote from the industrial and agricultural centres of Primorye. As such, it presents unparalleled opportunities for research into fully functional, unperturbed aquatic ecosystems in the Russian Far East.

The author started algal research in the reserve in 1976. Prior to this, no algal research had been undertaken in the area (Medvedeva, 1981; 1984; 1986a, b; 1987 a-c; 1990; 1992a, b; 1994). The present paper combines the earlier data sets and provides a broad overview of algal biodiversity in the reserve.

MATERIALS AND METHODS

The Sikhote–Alin reserve is located in the middle part of Primorsky region (Russian Far East), in the Sikhote–Alin Mountains (Fig. 1). The Sikhote–Alin Range runs north-north-east, bisecting the territory of the reserve into west- and east-facing slopes. In general, the western slope of the Sikhote–Alin Range is long and gentle, while the eastern slopes are short and steep. The river networks are densely developed dendritic systems. The Serebryanka and Dzhigitovka rivers are the largest submontane rivers draining eastern slope of the reserve. The largest drainage on the western slope of the reserve is the lowland Kolumbe River (Amur River basin) (Fig. 1, Tab. 1).

There are numerous montane and submontane tributaries to these systems, with V-shaped valleys, narrow channels (up to 1–8 m), steep slopes and rapid currents ($1\text{--}3\text{ m}\cdot\text{s}^{-1}$). Water temperature ranges from 4.5 up to 13.0 °C, while pH varies from 6.4–7.1.

There are several lakes in the reserve: Blagodatnoe Lake, Golubichnoe Lake and five Solontsovskie Lakes (Fig. 1, Tab. 2). Blagodatnoe Lake is located near the sea shore in Blagodatnaya Bay and is periodically linked with the Sea of Japan, depending on the level of precipitation. Following high rainfall the channel connecting the lake and sea can be reopened. On these occasions there is mixing of fresh and salt water, resulting in Blagodatnoe Lake experiencing freshwater and saltwater periods. Golubichnoe Lake is located in Golubichnaya Bay. This is a shallow freshwater system isolated from the sea. Significant summer warming and the availability of nutrients due to the die-off of higher plants provide favorable conditions for algal vegetation. The five Solontsovskie Lakes (Tsarskoe, Sokhatinoe, Krugloe, Mutnoe and Kamennoe) are located in mountainous areas of the reserve at 500–800 m above sea level.

The climate of this area is monsoonal, so summer is very wet and cool (seasonal average temperature 16.2 °C, precipitation 82 mm), winter is dry and cold (seasonal average temperature 14.7 °C below zero, precipitation 15 mm). There are typhoons in July and August, which account for about 80 % of the annual precipitation. The main vegetation in the reserve is coniferous and deciduous forest. Vegetation components of riparian zones are trees, shrubs, herbs and mosses, including *Salix schwerinii*, *Alnus hirsuta*, *Populus maximowiczii*, *Chosenia macrolepis*, *Sorbaria sorbifolia*, *Cacalia hastata*, and *Carex* spp. (Vasil'ev & Matjushkin, 1982).

Algal samples were collected sporadically from June to October 1976–1982 at Sikhote–Alin reserve and bordering territories by standard techniques (Vasser, 1989).

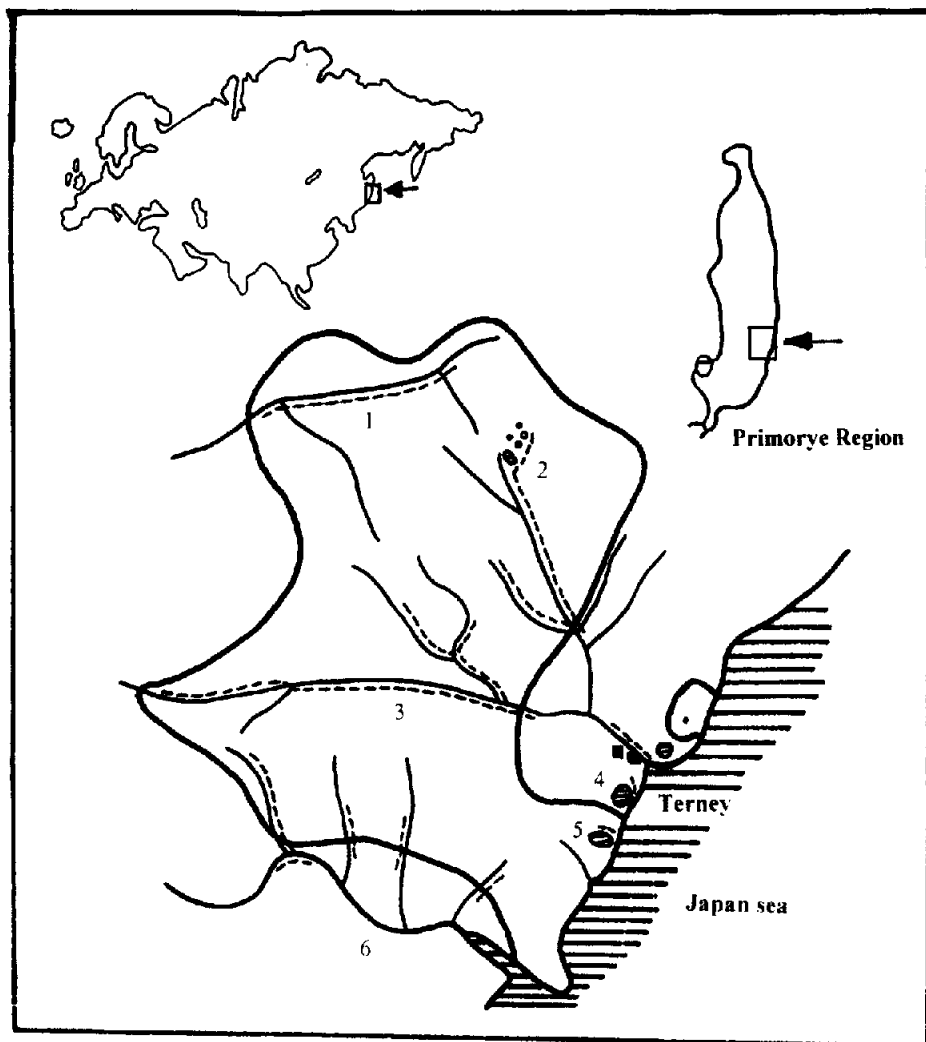


Fig. 1. Water system scheme of Sikhote-Alin biosphere reserve.

1 = Kolumbe River, 2 = Solontsovskie Lakes, 3 = Serebryanka River, 4 = Blagodatnoe Lake, 5 = Golubichnoe Lake, 6 = Dzhigitovka River.

----- collecting trips

———— border of the reserve

765 samples of epilithon, epiphyton, epipelon, metaphyton and phytoplankton were collected and processed. Epilithon and epiphyton samples were collected by brushing, epipelon and metaphyton samples by simply collecting, and phytoplankton was collected with a phytoplankton net. In each water body a variety of samples were taken. All samples were fixed in 4 % formalin. For diatom identification, permanent slides were prepared by the peroxide method (Swift, 1967; Barinova, 1988). Samples were examined under the

Tab. 1. Hydrological characteristics of main Sikhote-Alin biosphere reserve rivers.

<i>River characteristics</i>	<i>Serebryanka</i>	<i>Dzhigitovka</i>	<i>Kolumbe</i>
Length (km)	72	71	89
Width (m)	3–100 (mouth 400)	8–70 (mouth 420)	3–60 (mouth 100)
Depth (m)	0.05–2.5	0.05–2.4	0.05–1.8
Current rate (m·s ⁻¹)	0.2–3.2	0.8–4.8	0.5–2.3
Average annual discharge (m ³ ·s ⁻¹)	32.3	30.7	27.4
Bottom	stones, pebbles	rocks, stones, pebbles	pebbles, sand
Temperature (°C)	0.2–20	0.2–19	0.2–22
pH	7.0–7.1	7.0–7.1	6.9–7.0

Tab. 2. Hydrological characteristics of Sikhote-Alin biosphere reserve lakes.

<i>Lake characteristics</i>	<i>Blagodatnoe Lake</i>	<i>Golubichnoe Lake</i>	<i>Solontsovskie Lakes</i>				
			<i>Tsarskoe</i>	<i>Sokhatinoe</i>	<i>Krugloe</i>	<i>Mutnoe</i>	<i>Kamennoe</i>
Salinity	brackish	freshwater	freshwater	freshwater	freshwater	freshwater	freshwater
Size (m)	450 × 350	500 × 250	500 × 300	80 × 40	200 × 170	80 × 50	80 × 50
Depth (m)	2.5	1.8	0.1–4	0.2–2	0.1–4	0.2–2	0.2–2
Bottom	pebbles, a little swampy	pebbles, a little swampy	swampy with higher plants and mosses	swampy with mosses	rocks and stones	swampy with mosses	swampy with mosses
T (°C)	0.2–16	0.2–23	0.2–14	0.2–4	0.2–17	0.2–10	0.2–10
pH	7.0	6.9–7.0	6.4–7.0	6.4–6.8	7.0	6.7	6.7
Inputs	surface and sea waters	surface waters	surface and ground-waters	surface and ground-waters	surface and ground-waters	surface and ground-waters	surface and ground-waters

NU-2 and Amplival light microscopes (magnification × 600 and × 1 200). For the description of algal communities, qualitative estimates were used: 1 – sole (1–5 exemplars in the slide), 2 – very rare (10–15 ex. in the slide), 3 – rare (25–30 ex. in the slide), 4 – not rare (1 ex. in each line of the slide), 5 – often (some ex. in each line of the slide), 6 – very abundant (some ex. in each field of the vision) (Zhadin & Pavlovsky, 1956). Algal species lists were compiled using the classification proposed by Reviere (1999). Full author names are in Tab. 7. To evaluate richness and diversity among algal communities of the different water bodies, Shannon-Weaver's species diversity index (H) was used (Shannon & Weaver, 1949). All the waterbodies studied are listed in the legend to Tab. 7.

RESULTS

Floristic composition

The algal flora of the Sikhote-Alin biosphere reserve contains 675 species (839 including subspecific taxa) from seven divisions and 188 genera (Tab. 3).

Tab. 3. Systematic composition of the algal flora of Sikhote-Alin biosphere reserve.

<i>Division</i>	<i>Number of genera</i>	<i>Number of species (number including subspecific taxa)</i>
Cyanophyta	26	77 (91)
Euglenophyta	6	18 (21)
Chlorophyta	41	84 (86)
Streptophyta	26	137 (169)
Rhodophyta	3	3 (3)
Ochrophyta	85	355 (468)
Diatomophyceae	73	331 (444)
Chrysophyceae	4	6 (6)
Xanthophyceae	6	16 (16)
Phaeophyceae	2	2 (2)
Dinophyta	1	1 (1)
Total	188	675 (839)

The diatoms (Bacillariophyceae) display the greatest specific and subspecific diversity and comprise almost half of the total taxa found, with 331 species (444 including subspecific taxa). The most common diatoms are *Hannaea arcus*, *Diatoma mesodon*, *Meridion circulare*, *Synedra ulna*, *S. inaequalis*, *Encyonema minutum*, *E. silesiacum*, *Cocconeis placentula* var. *euglypta*, and *Achnanthes minutissima*. Also present are 137 (169) species of Streptophyta, which is therefore the second most diverse division. Members of this division, however, are not as abundant as the diatoms. The third most diverse division is the Chlorophyta, with 84 species and 86 subspecific taxa. Filamentous algae belonging to the genera *Spirogyra*, *Mougeotia*, *Zygnema*, *Oedogonium* and *Ulothrix* are very common. The Cyanophyta is the next most diverse division with 77 species (91), including some that play a significant role in overgrowth communities such as *Phormidium autumnale*, *Ph. uncinatum*, *Oscillatoria tenuis*, and *Homoeothrix simplex* (Tab. 3). Among other divisions, only *Hydrurus foetidus* (Chrysophyceae), *Batrachospermum moniliforme* (Rhodophyta) and some species of the genus *Tribonema* (Xanthophyceae) are represented in large numbers.

Algal communities

The flora of brackish **Blagodatnoe Lake** includes 137 algal species (with subspecific taxa: 162) from four divisions (Tab. 4) (Medvedeva, 1992a). During a saline period (August 1981), sessile algal overgrowths occurred, comprised primarily of species

characteristic of desalinated seas and river mouths including brown algae and chlorophytes (Tab. 7). Mezohalobic diatom algae were dominant.

In the less saline period the brown algae disappear and the composition of the green algae changes. Xanthophytes and blue-green algae are present. Diatom composition also changes, with the number of halophilic and indifferent species increasing.

The algal flora of **Golubichnoe Lake** and small tributary streams is comprised of 284 species (with subspecific taxa: 340) from six divisions (Tab. 4) (Medvedeva, 1986b). The most diverse in number of species and abundance were diatoms, streptophytes and chlorophytes. The diatoms prevailed both in plankton and in benthos and overgrowths. Some chlorophytes were also dominant. The desmid algae of this lake were highly diverse, with 78 taxa (Tab. 7).

The total algal flora of the five **Solontsovskie Lakes** includes 278 species (with subspecific taxa: 339) from six divisions (Tab. 4) (Medvedeva, 1987a). **Tsarskoe Lake** is the largest lake in the group. Depending on the amount of atmospheric precipitation, it can experience significant fluctuations in water level (from 0.1 to 4 m). In drought periods (June 1976, June 1979), the water surface is only a residual pool at the bottom of the lake depression (20 m × 5 m). Sessile algae on the mosses and the sedges were filamentous chlorophytes and cyanophytes. Desmids were numerous. The composition of diatoms was highly variable. After the rainy season (July 1981, October 1982), the water level rose to fill half of the depression (height of water column about 4 m) and some diatom and chlorophyte algae were observed in the plankton.

Three of the Solontsovskie Lakes – **Sokhatinoe, Kamennoe and Mutnoe** – are considerably smaller, variable in their degree of swampiness and have almost constant water levels. The algal floras of these lakes are generally similar. Large algal accumulations among the mosses were formed by green filamentous, xanthophytes and blue-green algae. Species composition of the diatoms and the desmids was extremely diverse. In Sokhatinoe Lake euglenophytes were noted (Tab. 7).

In the plankton of **Krugloe Lake**, blue-green and chlorophytes algae occur. Sessile algae on the stones were represented by a number of species, which were typical for the rivers. The distinctive elevation of this lake system and its distinct character give it a unique algal flora.

In the **Serebryanka River** four sites were sampled: upper, middle, lower reaches and the estuary. Tributaries of this river are numerous small montane and submontane rivers and streams.

In the Serebryanka River basin, including its tributaries, 425 species (with subspecific taxa: 494) from seven divisions were found (Tab. 4) (Medvedeva, 1986a, 1990, 1994). The species composition of Serebryanka River is the most diverse.

In the upper reaches of the river (by extent about 15 km) only 46 algal species were found. Sessile algae on the stones included primarily rheophilic cold water diatoms, with cyanophytes and Chrysophyceae occasionally present (Tab. 7).

The middle segment of the Serebryanka River is approximately 50 km long. In comparison with the upper reaches, the diatom species composition of this part of the river has almost doubled and three species of the genus *Ulothrix* were observed. The most abundant species were some cyanophytes, Chrysophyceae and the diatoms (Tab. 7).

The lower section of the Serebryanka River extends from the mouth of the Zabolochennaya River to the town of Terney. Two hundred and forty one species of algae (with subspecific taxa: 278) from six divisions were found (Tab. 4). The algal flora of this segment of the river is dramatically different from that of the upstream segments. There were abundant accumulations of a diverse range of diatoms. The composition of blue-green algae also changed. Desmids and filamentous streptophytes algae were also plentiful (Tab. 7).

Tab. 4. Systematic composition of the algae in different reserve water bodies (Dash = zero).

Water body	CYAN	EUGL	CHLOR	STREP	RHO	DIAT	CHR	XAN	PHA	DIN	TOTAL
Blagodarnoe Lake	5/3 %	-	6/3.7 %	2/1.3 %	-	142/88 %	-	5/3 %	2/1 %	-	162/100 %
Golubichnoe Lake	36/11 %	4/1 %	42/12 %	79/23 %	1/0.3 %	172/51 %	1/0.3 %	5/1.4 %	-	-	340/100 %
Solontsovskie Lakes, total	28/8 %	15/4.4 %	28/8 %	89/26 %	-	170/51 %	1/0.3 %	7/2 %	-	1/0.3 %	339/100 %
Tsarstoe Lake	6/4.5 %	2/1.5 %	19/13 %	18/13 %	-	92/66 %	-	3/2 %	-	-	140/100 %
Sokhatinoe Lake	16/7 %	9/3.7 %	16/7 %	63/26 %	-	129/53 %	1/0.4 %	6/2.5 %	-	1/0.4 %	242/100 %
Krugloe Lake	5/10.5 %	-	4/8.5 %	-	-	38/81 %	-	-	-	-	47/100 %
Mutnoe Lake	5/5 %	7/7 %	8/8 %	42/41 %	-	35/34 %	1/1 %	3/3 %	-	1/1 %	102/100 %
Kamennoc Lacc	7/8 %	1/1 %	4/4 %	19/22 %	-	56/62 %	-	3/3 %	-	-	90/100 %
Serebryanka River, watershed	41/8.2 %	8/1.6 %	42/8.4 %	65/13 %	2/0.4 %	322/65.2 %	3/0.6 %	12/2.4 %	-	1/0.2 %	494/100 %
Serebryanka River, upper section	3/7 %	-	4/9 %	1/2 %	1/2 %	36/78 %	1/2 %	-	-	-	46/100 %
Serebryanka River, middle section	3/4 %	-	1/1 %	-	-	79/94 %	1/1 %	-	-	-	84/100 %
Serebryanka River, lower section	17/6 %	3/1 %	35/12.6 %	40/14.4 %	-	175/63 %	2/0.7 %	5/2 %	-	1/0.3 %	278/100 %
Serebryanka River, estuary	3/2 %	-	6/4.3 %	1/0.7 %	1/0.7 %	128/91 %	-	2/1.3 %	-	-	141/100 %
Dzhigitovka River, watershed	11/6.2 %	-	7/4 %	16/9 %	1/0.6 %	139/79 %	1/0.6 %	1/0.6 %	-	-	176/100 %
Kolumbe River, watershed	6/3.5 %	1/0.6 %	3/1.8 %	15/8.7 %	1/0.6 %	138/80.2 %	2/1.1 %	6/3.5 %	-	-	172/100 %

CYAN = Cyanophyta, EUGL = Euglenophyta, CHLOR = Chlorophyta, STREP = Streptophyta, RHO = Rhodophyta, DIAT = Diatomophyceae, CHR = Chrysophyceae, XAN = Xanthophyceae, PHA = Phaeophyceae, DIN = Dinophyta, TOTAL = total number of species and subspecific taxa in water body/percentage of the water body's flora.

Near the town of Terney two factors, organic pollution from human activity and salt water influx from the Sea of Japan, influence water quality in the Serebryanka River. The range of algae observed is very wide. The algal flora of the Serebryanka River estuary totalizes 135 species (with subspecific taxa: 141) from five divisions (Tab. 4). As in other areas, diatoms were the most diverse and numerous (Tab. 7). Chlorophytes belonging to *Enteromorpha* and *Cladophora* were dominant. Desmids were completely absent.

The range of dominant species in the numerous tributaries of the Serebryanka River is essentially identical to that found in the upper and middle segments of the river.

The algal flora of the **Dzhigitovka River** basin includes 154 species (with subspecific taxa: 176) from five divisions (Tab. 4). Among sessile algae the following taxa were common: cyanophytes, Chrysophyceae (*Hydrurus foetidus*), filamentous chlorophytes and numerous diatoms.

The list of algae found in the lowland **Kolumbe River** basin contains 154 species (with subspecific taxa: 172) from seven divisions (Tab. 4) (Medvedeva, 1984). This river, formerly known as the Peschernaya River, has hydrological characteristics different from those of the high-velocity cold water streams of the east slope of the Sikhote-Alin Range (Tab. 1). As a consequence, the species composition of diatom flora (which was typically numerous and diverse) differed greatly from that in other areas. The next most frequently observed taxa were the cyanophytes, the Chrysophyceae (*Dinobryon sertularia*), the xanthophytes, the rhodophytes and the chlorophytes (Tab. 7). The desmids were also diverse and numerous (especially *Closterium*). The algal flora of the Kolumbe's tributaries differs from that of the mainstream and has many species in common with the floras of the east slope rivers.

Common species

There are some 30 [3.5 %] common species in the Sikhote-Alin biosphere reserve, occurring in more than 50 % of water bodies. These species and their ecological characteristics are shown in Tab. 5. They are mainly diatoms, with only one species belonging to the Cyanophyta. As regards saprobity, they are mostly xeno- and oligosaprobic; only a few are beta- and alpha-mesosaprobic. The majority prefer oligohalobic conditions (indifferent). Regarding pH values, most are alkaliphilic. In general, they are species widely distributed in the world; boreal and arcto-alpine elements are less numerous. All of these species are typical cold water species; some are rheophilic. Detailed descriptions of the different algal groups according to their habitats as well as to water salinity, pH value and saprobity are presented in Medvedeva (1999a).

Diversity evaluation

The changes in species diversity of the algal communities in the various water bodies of the Sikhote-Alin reserve were analysed using the Shannon-Weaver's species diversity index (H).

The lowest values were obtained for the cold water rivers (upper and middle sections of Serebryanka River, Dzhigitovka River) and some lakes (Krugloe, Kamennoe and Mutnoe lakes) (Tab. 6). Uniformity of environmental conditions in these water bodies results in impoverishment and constancy of species composition. Higher species richness, with higher species diversity values, occurred in some lakes (Blagodatnoe, Tsarskoe, Sokhatinoe), in the lower section of Serebryanka River and its estuary, and in the lowland Kolumbe River. Their H values ranged from 2.08 to 2.41, indicating a high level of algal

Tab. 5. Common species in the Sikhote-Alin biosphere reserve.

Species	Ecological characteristics				Distribution
	Habitat	Saprobity	Salinity	pH	
<i>Phormidium autumnale</i>	L	β - α	-	-	WD
<i>Achnanthes lanceolata</i>	L	χ - β	ind	alkf	WD
<i>A. lanceolata</i> var. <i>haynaldii</i>	L	χ - β	ind	alkf	WD
<i>A. minutissima</i>	L	α - β	ind	ind	WD
<i>Adlafia minuscula</i>	L	α	ind	alkf	WD
<i>Caloneis silicula</i>	L	α	ind	alkb	WD
<i>Cocconeis placentula</i> var. <i>euglypta</i>	L	-	ind	alkf	B
<i>Cymbella cistula</i>	L	β	ind	alkf	B
<i>Cymbopleura naviculiformis</i>	L	α	ind	ind	B
<i>Diatoma mesodon</i>	L	χ	hb	alkf	A-A
<i>Encyonema minutum</i>	L	β	ind	ind	WD
<i>E. silesiacum</i>	L	-	ind	ind	WD
<i>Eunotia bilunaris</i>	L	α	hb	acf	WD
<i>Fragilaria vaucheriae</i>	L	β	ind	alkf	WD
<i>Gomphonema angustatum</i>	L	α	ind	alkf	B
<i>G. clavatum</i>	L	α	ind	ind	B
<i>G. olivaceum</i>	L	β	ind	alkf	B
<i>G. parvulum</i>	L	β	ind	alkf	B
<i>G. productum</i>	L	β - α	ind	alkf	B
<i>G. quadripunctatum</i>	L	-	ind	ind	B
<i>G. truncatum</i>	L	β	ind	alkf	B
<i>Hannaea arcus</i>	L	χ	ind	alkf	A-A
<i>H. arcus</i> var. <i>linearis</i> f. <i>recta</i>	L	χ	ind	alkf	A-A
<i>Meridion circulare</i>	L	χ - α	hb	alkf	WD
<i>Navicula cryptocephala</i>	L-P	α	hl	alkf	WD
<i>Nitzschia palea</i>	L	α	ind	alkb	WD
<i>Reimeria sinuata</i>	L	α	ind	alkf	B
<i>Synedra inaequalis</i>	L	-	-	-	B
<i>S. ulna</i>	L	β	ind	alkf	WD
<i>Tabellaria flocculosa</i>	L-P	α - χ	hb	acf	A-A

Habitat: L = littoral, L-P = littoral-planktonic; **saprobity:** χ = xenosaprobic, χ - α = xenosaprobic- α -oligosaprobic, α - χ = oligosaprobic-xenosaprobic, χ - β = xenosaprobic-beta-mesosaprobic, α = oligosaprobic, α - β = oligosaprobic-beta-mesosaprobic, β = beta-mesosaprobic, β - α = beta-alpha-mesosaprobic, α = alpha-mesosaprobic; **salinity:** hb = halophobic, ind = indifferent, hl = halophilic, **pH:** alkb = alcalibiontic, alkf = alkaliphilic, ind = indifferent, acf = acidophilic; **distribution:** A-A = arcto-alpine, B = boreal, WD = widely distributed, dash = data are absent.

community complexity. The H value of 3.03 for Golubichnoe Lake also demonstrates a relatively high diversity. The algal flora of the Serebryanka River watershed was the most diverse, with the highest H value of 3.82.

Tab. 6. Values of Shannon–Weaver's species diversity index (H) for each water body studied.

<i>Water bodies</i>	<i>H</i>
Blagodatnoe Lake	2.12
Golubichnoe Lake	3.03
Tsarskoe Lake	2.08
Sokhatinoe Lake	2.30
Krugloe Lake	1.57
Kammenoe Lake	1.87
Mutnoe Lake	1.92
Serebryanka River, watershed	3.82
Upper section of Serebryanka River	1.57
Middle section of Serebryanka River	1.87
Lower section of Serebryanka River	2.41
Estuary of Serebryanka River	2.12
Dzhigitovka River	1.89
Kolumbe River	2.11

Tab. 7. List and distribution of species in the Sikhote–Alin biosphere reserve.

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>Division Cyanophyta</i>	
<i>Amorphonostoc paludosum</i> (Kützing ex Bornet et Flahault) Elenkin <i>f. paludosum</i>	3, 4, 7, 62
<i>A. paludosum f. longius</i> Kossinskaja	10
<i>A. punctiforme</i> (Kützing) Elenkin	7, 62, 66
<i>Anabaena aequalis</i> Borge	2
<i>A. constricta</i> (Szafer) Geitler	2
<i>A. contorta</i> Bachmann	2, 5
<i>A. cylindrica</i> Lemmermann <i>f. cylindrica</i>	63
<i>A. cylindrica f. intermedia</i> Elenkin	10
<i>A. echinospora</i> Skuja	2
<i>A. flos-aquae</i> (Lyngbye) Brébisson ex Bornet et Flahault	5
<i>A. inaequalis</i> (Kützing) Bornet et Flahault	1
<i>A. laxa</i> (Rabenhorst) A. Braun ex Bornet et Flahault	11
<i>A. lemmermannii</i> P. Richter	2
<i>A. minutissima</i> Lemmermann	4
<i>A. spiroides</i> Kleb.	2
<i>A. variabilis</i> K(ützing ex Bornet et Flahault)	2,3
<i>Aphanothece clathrata</i> W. et G.S. West	2
<i>A. elabens</i> (Brébisson) Elenkin	6
<i>A. microscopica</i> Nägeli	2

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>A. stagnina</i> (Sprengel) Brébisson-J. Petersen et Geitler	76
<i>Aulosira laxa</i> Kirchner	2, 3
<i>Calothrix fusca</i> f. <i>parva</i> (Ercegovic) V. Poljansky	2
<i>C. gypsophila</i> (Kützing) Thuret emend. V. Poljansky	66
<i>C. parietina</i> (Nägeli) Thuret ex Bornet et Flahault	1, 11, 60
<i>C. weberi</i> Schmidle	2
<i>Chamaesiphon fuscus</i> (Rostafinski) Hansgirg	40
<i>Ch. incrustans</i> Grunow	55
<i>Clastidium setigerum</i> Kirchner	27
<i>Cyanarcus hamiformis</i> Pascher	2
<i>Cylindrospermum alatosporum</i> Fritsch	3
<i>C. muscicola</i> Kützing	71
<i>C. caucasicum</i> Woronichin	63
<i>C. licheniforme</i> (Bory) Kützing	78
<i>Dactylococcopsis raphidioides</i> Hansgirg	10
<i>Gloeocapsa limnetica</i> (Lemmermann) Hollerbach	7
<i>G. minima</i> (Keissler) Hollerbach	10
<i>G. minuta</i> (Kützing) Hollerbach	2, 4, 10, 62
<i>G. turgida</i> (Kützing) Hollerbach emend.	4, 6, 7
<i>Gloeotrichia pisum</i> (Agardh) Thuret	2
<i>Gomphosphaeria lacustris</i> Chodat f. <i>lacustris</i>	2, 4, 10, 11
<i>G. lacustris</i> f. <i>compacta</i> (Lemmermann) Elenkin	2, 10, 37
<i>Hapalosiphon fontinalis</i> (Agardh) Bornet emend. Elenkin f. <i>fontinalis</i>	2, 4, 7, 64, 66
<i>H. fontinalis</i> f. <i>intricatus</i> (W. et G.S. West) Elenkin	4
<i>Homoeothrix simplex</i> Woronichin	5, 8, 12, 13, 18, 23–26, 29, 35, 39, 40, 41, 43, 44, 49, 51, 55, 61
<i>Hydrocoryne spongiosa</i> Schwabe	1
<i>Lyngbya aerugineo-coerulea</i> (Kützing) Gomont	7
<i>L. aestuarii</i> (Mertens) Liebman ex Gomont	14, 15, 51, 64
<i>L. circumcreta</i> G.S. West	14
<i>L. cryptovaginata</i> Schkorbatov	10
<i>L. kuetzingii</i> (Kützing) Schmidle f. <i>kuetzingii</i>	1, 12, 53
<i>L. kuetzingii</i> f. <i>ucrainica</i> (Schirschow) Elenkin	2, 46, 47, 57, 58
<i>L. limnetica</i> Lemmermann f. <i>limnetica</i>	1, 10
<i>L. limnetica</i> f. <i>granulifera</i> (Tschernow) V. Poljansky	2
<i>L. scottii</i> f. <i>minor</i> (Fritsch) Elenkin	12, 26, 53
<i>L. scottii</i> f. <i>ucrainica</i> Elenkin	26
<i>Merismopedia elegans</i> A. Braun	2
<i>M. glauca</i> (Ehrenberg) Nägeli f. <i>glauca</i>	3, 4, 57
<i>M. glauca</i> f. <i>insignis</i> (Schkorbatov) Geitler	2
<i>M. punctata</i> Meyen	2, 19

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>M. tenuissima</i> Lemmermann	2, 10
<i>Microchaete tenera</i> Thuret ex Bornet et Flahault	2, 3, 4, 6, 7
<i>Microcystis aeruginosa</i> Kützing emend. Elenkin	2
<i>M. grevillei</i> (Hassall) Elenkin emend.	10
<i>M. pulvereae</i> (Wood) Forti emend. Elenkin f. <i>pulvereae</i>	2, 6, 10
<i>M. pulvereae</i> f. <i>conferta</i> (W. et G.S. West) Elenkin	3, 4
<i>M. pulvereae</i> f. <i>delicatissima</i> (W. et G.S. West) Elenkin	2
<i>M. pulvereae</i> f. <i>elachista</i> (W. et G.S. West) Elenkin	4
<i>M. pulvereae</i> f. <i>irregularis</i> (Brébisson-J. Petersen) Elenkin	2, 4
<i>Oscillatoria limosa</i> Agardh ex Gomont	4, 10, 12, 22
<i>O. princeps</i> Vaucher	2
<i>O. sancta</i> (Kützing) Gomont	14
<i>O. tenuis</i> Agardh ex Gomont	2, 4, 6, 10, 18, 22, 57
<i>O. woronichinii</i> Anissimova	2
<i>Phormidium ambiguum</i> Gomont f. <i>ambiguum</i>	2
<i>Ph. ambiguum</i> f. <i>majus</i> (Lemmermann) Elenkin	51
<i>Ph. autumnale</i> Agardh ex Gomont	5, 8, 9, 12–14, 17–21, 23, 25, 27–30, 33, 36, 38–41, 43–47, 49–55, 57, 60, 71, 77
<i>Ph. corium</i> (Agardh) Gomont	12, 24, 25, 27, 45
<i>Ph. foveolarum</i> (Montagne) Gomont	13, 43
<i>Ph. mucicola</i> Huber-Pestalozzi et Naumann	21
<i>Ph. retzii</i> (Agardh) Gomont	5
<i>Ph. setchellianum</i> Gomont	9, 12, 23, 57
<i>Ph. subfuscum</i> f. <i>inaequale</i> (Nägeli) Elenkin	14, 28, 34, 43
<i>Ph. uncinatum</i> Agardh ex Gomont	8, 12, 17–21, 25, 27, 29, 35, 43, 45, 47, 50–53
<i>Rivularia aquatica</i> (De Wildeman) Geitler sensu lato	2, 10
<i>R. borealis</i> P. Richter	2
<i>Scytonema hofmani</i> Agardh	60
<i>Stratonostoc linckia</i> (Roth ex Bornet et Flahault) Elenkin	2, 10, 63, 76
<i>S. verrucosum</i> (Vaucher) Elenkin	16
<i>Tolypothrix distorta</i> f. <i>penicillata</i> (Agardh) Kossinskaja	9, 10, 12, 16, 23
<i>T. tenuis</i> Kützing ex Bornet et Flahault f. <i>tenuis</i>	2, 66
<i>T. tenuis</i> f. <i>lanata</i> (Wartmann) Kossinskaja	10
Division <i>Euglenophyta</i>	
<i>Astasia klebsii</i> Lemmermann	4
<i>Euglena granulata</i> var. <i>polymorpha</i> (Dangeard) Popova	6
<i>E. limnophila</i> Lemmermann var. <i>limnophila</i>	2
<i>E. limnophila</i> var. <i>swirenkoi</i> (Arnoldi) Popova	4
<i>E. oxyuris</i> Schmarda f. <i>skvortzovii</i> (Popova) Popova	4

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>E. spirogyra</i> Ehrenberg	76
<i>E. tripteris</i> (Dujardin) Klebs	6, 19, 76
<i>Gyropaigne kosmos</i> Skuja	4
<i>Lepocinclis ovum</i> (Ehrenberg) Lemmermann	4
<i>Phacus caudatus</i> Hübner	2, 10
<i>Ph. curvicauda</i> Swirenko	6
<i>Ph. dangeardii</i> Lemmermann	4
<i>Ph. lismorensis</i> Playfair	4, 6
<i>Ph. longicauda</i> (Ehrenberg) Dujardin var. <i>longicauda</i>	6, 37
<i>Ph. longicauda</i> var. <i>tortus</i> Lemmermann	6
<i>Ph. orbicularis</i> Hübner f. <i>orbicularis</i>	3, 4, 10, 71, 76
<i>Ph. orbicularis</i> f. <i>communis</i> Popova	3, 4
<i>Ph. pleuronectes</i> (Ehrenberg) Dujardin	6, 7
<i>Trachelomonas hispida</i> (Perty) Stein emend. Deflandre	2, 76
<i>T. lacustris</i> Drežepolski emend. Balech	10
<i>T. volvocina</i> Ehrenberg	2
Division <i>Chlorophyta</i>	
<i>Acrosiphonia heterocladia</i> (Sakai) Vinogradova	1
<i>Ankistrodesmus falcatus</i> (Corda) Ralfs	2, 4, 10
<i>A. fusiformis</i> Corda	2–4, 6, 10, 63
<i>Aphanochaete repens</i> A. Braun	11
<i>Botryosphaera sudetica</i> (Lemmermann) Chodat	2, 71, 73
<i>Bulbochaete intermedia</i> De Bary ex Hirn	2, 64
<i>B. nana</i> Wittrock	2
<i>B. rectangularis</i> Wittrock	2
<i>B. sp.</i> (sterile)	2–4, 6, 10
<i>Chaetophora elegans</i> (Roth) Agardh	2–4, 14, 19, 37, 56, 64, 66, 76
<i>Characium acuminatum</i> A. Braun	73
<i>Chlorella vulgaris</i> Beijerinck	2, 4, 10, 12, 71, 73
<i>Cladophora glomerata</i> (Linnaeus) Kützing	11
<i>Closteriopsis acicularis</i> (G.M. Smith) Belcher ex Swale	2
<i>Coelastrum microporum</i> Nägeli	2–4, 10
<i>C. sphaericum</i> Nägeli	10
<i>Crucigenia fenestrata</i> (Schmidle) Schmidle	11
<i>C. quadrata</i> Morren	2, 5
<i>C. tetrapedia</i> (Kirchner) W. et G.S. West	2
<i>Dictyosphaerium ehrenbergianum</i> Nägeli	10
<i>D. pulchellum</i> Wood	2–5, 7, 10
<i>D. tetrachotomum</i> Printz	3, 10, 71
<i>Draparnaldia glomerata</i> (Vaucher) Agardh	3, 6, 14, 57
<i>D. plumosa</i> (Vaucher) Agardh	2, 12, 14, 76

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>Enteromorpha clathrata</i> (Roth) Greville	1
<i>E. intestinalis</i> (Linnaeus) Link	1
<i>E. prolifera</i> (O. Müller) Agardh	11
<i>Eremosphaera viridis</i> De Bary	10
<i>Eudorina elegans</i> Ehrenberg	2, 3, 10, 72
<i>Golenkinia brevispina</i> Korschikoff	2
<i>Kirchneriella irregularis</i> (Smith) Korschikoff	10
<i>K. lunaris</i> (Kirchner) Möbius	2
<i>K. obesa</i> (W. West) Schmidle	7, 10
<i>Korschikoviella gracilipes</i> (Lambert) Silva	3
<i>Lagerheimia quadriseta</i> (Lemmermann) G.M. Smith	10
<i>L. subsalsa</i> Lemmermann	10
<i>Microspora abbreviata</i> (Rabenhorst) Lagerheim	8
<i>M. pachyderma</i> (Wille) Lagerheim	2, 19, 64
<i>Monoraphidium arcuatum</i> (Korschikoff) Hindák	2, 10
<i>M. griffithii</i> (Berkeley) Komarkova-Legnerova	4
<i>M. irregulare</i> (G.M. Smith) Komarkova-Legnerova	2, 10
<i>Nephrocytium obesum</i> West	2
<i>Oedogonium oblongum</i> Wittrock ex Hirn	2, 3
<i>O. suecicum</i> Wittrock ex Hirn	2
<i>O. undulatum</i> (Brébisson) A. Braun	4, 6
<i>O. varians</i> Wittrock et Lundell	3
<i>O. sp.</i> (sterile)	1–7, 10, 63, 64, 66, 73, 76
<i>Oocystis borgei</i> Snow	10
<i>O. pellagica</i> Lemmermann	10
<i>O. solitaria</i> Wittrock	4
<i>Pandorina morum</i> (O. Müller) Bory	2–4, 6, 10
<i>Pediastrum angulosum</i> (Ehrenberg) Meneghini	2
<i>P. boryanum</i> (Turpin) Meneghini var. <i>boryanum</i>	2, 10
<i>P. boryanum</i> var. <i>cornutum</i> (Raciborski) Sulek	2, 3
<i>P. duplex</i> Meyen	2, 10
<i>P. tetras</i> (Ehrenberg) Ralfs	2–4, 10
<i>Pseudocharacium obtusum</i> (A. Braun) Petry-Hesse	10
<i>Rhizoclonium profundum</i> Brand	2
<i>R. riparium</i> (Roth) Harvey	1
<i>Rhopalosolen cylindrica</i> (Korschikoff) Fott	4
<i>Scenedesmus acuminatus</i> (Lagerheim) Chodat var. <i>acuminatus</i>	2, 10
<i>S. acuminatus</i> var. <i>elongatus</i> G.M. Smith	6, 10
<i>S. caudato-aculeolatus</i> Chodat	1
<i>S. ellipticus</i> Corda	2–4, 10, 11
<i>S. granulatus</i> West et G.S. West	3
<i>S. obliquus</i> (Turpin) Kützing	2, 3, 10

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>S. obtusus</i> Meyen	63
<i>S. quadricauda</i> (Turpin) Brébisson	2, 10
<i>S. sempervirens</i> Chodat	2
<i>Sorastrum spinulosum</i> Nägeli	2, 10
<i>Sphaerocystis planctonica</i> (Korschikoff) Bourrelly	4, 5
<i>S. schroeteri</i> Chodat	13
<i>S. sphaerocystiformis</i> (Korschikoff) Bourrelly	6, 14
<i>Stigeoclonium tenue</i> (Agardh) Kützing	12, 14, 18, 66
<i>Tetra(dron incus</i> (Teiling) G.M. Smith	2
<i>T. minimum</i> (A. Braun) Hansgirg	10
<i>T. minutissimum</i> Korschikoff	10
<i>Tetraspora imperfecta</i> Korschikoff	2
<i>T. lacustris</i> Lemmermann	2
<i>T. simplex</i> Korschikoff	12, 14, 51
<i>Tetrastrum triangulare</i> (Chodat) Komárek	2
<i>Trentepohlia umbrina</i> (Kützing) Bornet	79
<i>Ulothrix tenerrima</i> Kützing	2, 8, 10
<i>U. variabilis</i> Kützing	8
<i>U. zonata</i> (Weber et Mohr) Kützing	8–10, 12–14, 16, 18, 19, 21–23, 25, 26, 48, 49, 51, 53, 57
<i>Volvox aureus</i> Ehrenberg	3, 7
Division <i>Streptophyta</i>	
<i>Actinotaenium cucurbita</i> (Brébisson) Teiling ex Ruzicka et Pouzar	2, 4, 6, 71
<i>A. globosum</i> (Bulnheim) Förster	2, 4
<i>Bambusina brebissonii</i> Kützing	4
<i>Closterium acerosum</i> (Schrank) Ehrenberg f. <i>acerosum</i>	4, 10, 14, 19, 51, 57
<i>Cl. acerosum</i> f. <i>elongatum</i> (Brébisson) Kossinskaja	51
<i>Cl. angustatum</i> (Wittrock) Nordstedt	4, 6
<i>Cl. costatum</i> Corda	2
<i>Cl. delpontei</i> (Klebs) Wolle	4
<i>Cl. diana</i> e Ehrenberg var. <i>diana</i> e	2, 6, 19
<i>Cl. diana</i> e f. <i>intermedium</i> (Hustedt) Kossinskaja	4
<i>Cl. diana</i> e var. <i>compressum</i> Klebs	2
<i>Cl. gracile</i> Brébisson ex Ralfs f. <i>gracile</i>	2
<i>Cl. gracile</i> f. <i>elongatum</i> (W. et G.S. West) Kossinskaja	6
<i>Cl. incurvum</i> Brébisson	2, 10
<i>Cl. kuetzingii</i> Brébisson	10, 19, 66
<i>Cl. lanceolatum</i> Kützing	19
<i>Cl. leibleinii</i> Kützing	2, 51
<i>Cl. libellula</i> var. <i>interruptum</i> (W. et G.S. West) Donat	4
<i>Cl. lineatum</i> Ehrenberg	4, 6, 19

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>Cl. littorale</i> Gay f. <i>littorale</i>	19, 76
<i>Cl. littorale</i> f. <i>minus</i> Komarenko	74
<i>Cl. lunula</i> (O. Müller) Nitzsch	2, 4, 6
<i>Cl. macilentum</i> Brébisson	16
<i>Cl. moniliferum</i> (Bory) Ehrenberg var. <i>moniliferum</i>	4, 10, 17, 30, 51, 74
<i>Cl. moniliferum</i> f. <i>subrectum</i> (Grönblad) Poljansky	4, 30
<i>Cl. moniliferum</i> var. <i>conconvum</i> Klebs	4, 18, 74
<i>Cl. moniliferum</i> var. <i>malinvernianiforme</i> (Grönblad) Kossinskaja	1
<i>Cl. navicula</i> (Brébisson) Lütkenmüller	6
<i>Cl. parvulum</i> Nägeli f. <i>parvulum</i>	6, 19
<i>Cl. parvulum</i> f. <i>majus</i> W. West	6
<i>Cl. prorum</i> f. <i>brevius</i> (W. West) Kossinskaja	10
<i>Cl. pseudodiana</i> Roy	2, 19
<i>Cl. pseudolunula</i> Borge	14, 65
<i>Cl. ralfsii</i> var. <i>hybridum</i> Rabenhorst	2, 6
<i>Cl. rostratum</i> Ehrenberg f. <i>rostratum</i>	16, 74
<i>Cl. rostratum</i> f. <i>brevirostratum</i> (W. West) Kossinskaja	37, 51
<i>Cl. spetsbergense</i> Borge	14
<i>Cl. striolatum</i> Ehrenberg var. <i>striolatum</i>	2, 4, 6, 7, 16, 37, 76
<i>Cl. striolatum</i> var. <i>erectum</i> Klebs	2, 16
<i>Cl. subulatum</i> (Kützing) Brébisson	74
<i>Cl. tumidulum</i> Gay	2, 10, 19, 57
<i>Cl. tumidum</i> Johnston var. <i>tumidum</i>	17, 19
<i>Cl. tumidum</i> var. <i>nylandicum</i> Grünblad	17
<i>Cl. ulna</i> Focke	4
<i>Cosmarium angulosum</i> var. <i>concinnum</i> (Rabenhorst) W. et G.S. West	3
<i>C. bioculatum</i> Brébisson	2, 10
<i>C. blytii</i> Wille	2, 6
<i>C. botrytis</i> Meneghini var. <i>botrytis</i>	2, 4, 6, 10, 76
<i>C. botrytis</i> var. <i>depressum</i> W. et G.S. West	2
<i>C. circulare</i> Reinsch	2
<i>C. connatum</i> Brébisson	2
<i>C. contractum</i> Kirchner var. <i>contractum</i>	2
<i>C. contractum</i> var. <i>ellipsoideum</i> (Elfving) W. et G.S. West	2, 10
<i>C. decedens</i> (Reinsch) Raciborski	62
<i>C. formosulum</i> Hoff	10, 57
<i>C. hammeri</i> Reinsch	2
<i>C. impressulum</i> Elfving	2
<i>C. laeve</i> Rabenhorst	10
<i>C. lundellii</i> Delponte	2
<i>C. margaritifera</i> Meneghini	2, 4

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>C. meneghinii</i> Brébisson	2–4, 6, 7, 10
<i>C. portianum</i> Archer	4, 6
<i>C. pseudamoenum</i> Wille	2
<i>C. punctulatum</i> Brébisson var. <i>punctulatum</i>	2, 6, 10, 13, 30
<i>C. punctulatum</i> var. <i>subpunctulatum</i> (Nordstedt) Børgesen	10, 73
<i>C. pusillum</i> (Brébisson) Archer	4
<i>C. pygmaeum</i> Archer	2, 4, 6, 7
<i>C. pyramidatum</i> Brébisson	4, 6
<i>C. quadratum</i> Ralfs	78
<i>C. regnesi</i> var. <i>montanum</i> Schmidle	2
<i>C. regnesi</i> var. <i>subornatum</i> Woronichin	2
<i>C. sexangulare</i> f. <i>minima</i> Nordstedt	3
<i>C. slewdrumense</i> Roy	2
<i>C. speciosum</i> Lundell var. <i>speciosum</i>	2, 17
<i>C. speciosum</i> var. <i>simplex</i> Nordstedt	10
<i>C. subcrenatum</i> Hantzsch	19
<i>C. subprotumidum</i> Nordstedt	2, 4, 10
<i>C. subundulatum</i> Wille	64
<i>C. tetraophthalmum</i> Brébisson	4, 10
<i>C. turpinii</i> Brébisson	57
<i>C. undulatum</i> var. <i>crenulatum</i> (Nägeli) Wittrock	10
<i>C. venustum</i> (Brébisson) Archer	2
<i>Cosmoastrum alternans</i> (Brébisson) Palamar-Mordvintzeva	3, 4
<i>C. brebissonii</i> (Archer) Palamar-Mordvintzeva var. <i>brebissonii</i>	2, 3, 6, 10, 12, 51, 57
<i>C. brebissonii</i> var. <i>maximum</i> (Cedercreutz) Palamar-Mordvintzeva	14
<i>C. dilatatum</i> (Ehrenberg) Palamar-Mordvintzeva	4, 6
<i>C. gladiusum</i> (Turner) Palamar-Mordvintzeva	4, 6
<i>C. lapponicum</i> (Schmidle) Palamar-Mordvintzeva	2
<i>C. muticum</i> (Brébisson) Palamar-Mordvintzeva	2–4, 10
<i>C. orbiculare</i> var. <i>depressum</i> (Roy et Bisset) Palamar-Mordvintzeva	4
<i>C. polytrichum</i> (Perty) Palamar-Mordvintzeva	4, 7, 14, 37
<i>C. punctulatum</i> (Brébisson) Palamar-Mordvintzeva var. <i>punctulatum</i>	2, 6, 10, 17, 25, 30, 51, 57, 76
<i>C. punctulatum</i> var. <i>subproductum</i> (W. et G.S. West) Palamar-Mordvintzeva	3
<i>Cylindrocystis crassa</i> De Bary	10
<i>Desmidiium cylindricum</i> Greville	6
<i>D. quadratum</i> Nordstedt	4
<i>D. swartzii</i> Agardh ex Ralfs	2, 4, 6, 66, 77
<i>Euastrum affine</i> Ralfs	4, 6
<i>E. ansatum</i> (Ehrenberg) Ralfs	4, 6, 77
<i>E. bidentatum</i> Nägeli	2–4, 7, 78
<i>E. cuneatum</i> Jener	64

Taxon	Number of the waterbodies
<i>E. denticulatum</i> (Kirchner) Gay	2, 4
<i>E. dubium</i> Nägeli	4
<i>E. gemmatum</i> var. <i>alatum</i> Kossinskaja	2
<i>E. germanicum</i> (Schmidle) W. Krieger	2
<i>E. insulare</i> (Wittrock) Roy	2, 4, 6, 64
<i>E. oblongum</i> (Greville) Ralfs	4
<i>E. pinnatum</i> Ralfs	6
<i>E. verrucosum</i> Ehrenberg	3, 10
<i>Gonatozygon monotaenium</i> De Bary var. <i>monotaenium</i>	10, 66
<i>G. monotaenium</i> var. <i>pilosellum</i> Nordstedt	2
<i>Hyalotheca dissiliens</i> (Smith) Brébisson var. <i>dissiliens</i>	2, 3, 7, 10, 19, 76
<i>H. dissiliens</i> var. <i>hians</i> Wolle	37
<i>H. mucosa</i> (Mertens) Ehrenberg	2
<i>Micrasterias decemdentata</i> (Nägeli) Archer	4, 6
<i>M. denticulata</i> Brébisson	4
<i>M. fimbriata</i> Ralfs	2
<i>M. mahabuleshwarensis</i> var. <i>kowdensis</i> Roll	2
<i>M. rotata</i> (Greville) Ralfs	10
<i>Mougeotia</i> sp. (sterile)	2-4, 6, 10, 12, 14, 15, 19, 22, 57, 66, 73, 76
<i>Netrium digitus</i> (Ehrenberg ex Ralfs) Itzigsohn et Rothe var. <i>digitus</i>	2-4, 6, 7, 64
<i>N. digitus</i> var. <i>constrictum</i> W. et G.S. West	4
<i>N. oblongum</i> (De Bary) Lütkemüller	4
<i>Pachyphorium obsoletum</i> (Hantzsch) Palamar-Mordvintzeva	2
<i>Penium margaritaceum</i> (Ehrenberg) Brébisson	76
<i>P. polymorphum</i> Perty	4, 7
<i>P. spirostriolatum</i> Barker	76
<i>Pleurotaenium ehrenbergii</i> (Brébisson) De Bary	6, 66
<i>P. minutum</i> (Ralfs) Delponte	56
<i>P. trabecula</i> (Ehrenberg) Nägeli var. <i>trabecula</i>	2, 4, 6, 10
<i>P. trabecula</i> var. <i>rectum</i> (Delponte) W. et G.S. West	4, 10
<i>Raphidiastrum avicula</i> (Brébisson) Palamar-Mordvintzeva	2
<i>Sphaerososma aubertianum</i> West var. <i>aubertianum</i>	3, 4, 6, 7, 10
<i>S. aubertianum</i> var. <i>archeri</i> (Gutwinski) W. et G.S. West	7
<i>Spirogyra setiformis</i> (Roth) Kützing	11
<i>S. weberi</i> Kützing	11
<i>S.</i> sp. (sterile)	1-4, 6-8, 10, 12-19, 22, 30, 37, 57, 64, 66, 76, 77
<i>Spirotaenia condensata</i> Brébisson	4
<i>Spondylosium planum</i> (Wolle) W. et G.S. West	2, 3, 10
<i>S. pygmaeum</i> (Cooke) West	10
<i>Staurastrum arciscon</i> (Ehrenberg) Lundell	2

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>S. furcatum</i> (Ehrenberg) Brébisson	2, 4
<i>S. furcigerum</i> Brébisson	4, 7
<i>S. gracile</i> Ralfs var. <i>gracile</i>	2, 4, 6, 7, 10
<i>S. gracile</i> var. <i>nanum</i> Wille	2, 4, 10
<i>S. hexacerum</i> (Ehrenberg) Wittrock	3, 10
<i>S. inflexum</i> Brébisson	2, 7, 10
<i>S. margaritaceum</i> (Ehrenberg) Meneghini	7
<i>S. paradoxum</i> Meyen var. <i>paradoxum</i>	2
<i>S. paradoxum</i> var. <i>nodulosum</i> West	2
<i>S. paradoxum</i> var. <i>parvum</i> West	2
<i>S. polymorphum</i> Brébisson var. <i>polymorphum</i>	2, 4, 6, 7, 10, 37
<i>S. polymorphum</i> var. <i>pusillum</i> West	10
<i>S. pseudosebaldii</i> Wille	2
<i>S. tetracerum</i> Ralfs	2
<i>S. tohopekaligense</i> Wolle	2
<i>Staurodesmus convergens</i> (Ehrenberg) Teiling	4
<i>S. cuspidatus</i> (Brébisson) Teiling	2
<i>S. dejectus</i> (Brébisson) Teiling var. <i>dejectus</i>	2, 4, 7, 10
<i>S. dejectus</i> var. <i>apicularis</i> (Brébisson) Teiling	3, 4, 6, 10
<i>S. dickiei</i> (Ralfs) Lillier var. <i>dickiei</i>	2, 4, 6, 7, 10
<i>S. dickiei</i> var. <i>circularis</i> (Turner) Croasdale	4
<i>S. patens</i> (Nordstedt) Croasdale	2
<i>Teilingia granulata</i> (Roy et Bisset) Bourrelly	2, 6, 10
<i>Xanthidium antilopaeum</i> (Brébisson) Kützing var. <i>antilopaeum</i>	2, 4, 7
<i>X. antilopaeum</i> var. <i>polymazum</i> f. <i>pseudopolymazum</i> Kossinskaja	2
<i>X. cristatum</i> Brébisson var. <i>cristatum</i>	6
<i>X. cristatum</i> var. <i>uncinatum</i> Brébisson	2
<i>Zygnema</i> sp. (sterile)	2–4, 6, 10, 19, 57
Division <i>Rhodophyta</i>	
<i>Audouiniella chalybea</i> (Roth) Kylin	8, 11, 15, 18, 19, 21
<i>Batrachospermum moniliforme</i> Roth	26, 27, 28, 40, 65, 66
<i>Sirodotia suecica</i> Kylin	64
Division <i>Ochrophyta</i>	
Class <i>Diatomophyceae</i>	
<i>Achnanthes brevipes</i> Agardh	1, 11
<i>A. conspicua</i> A. Mayer	51
<i>A. delicatula</i> (Kützing) Grunow subsp. <i>delicatula</i>	1, 2, 9, 11, 18, 33
<i>A. delicatula</i> subsp. <i>hauckiana</i> (Grunow) Lange-Bertalot et Ruppel	1, 8, 10, 11, 25, 61
<i>A. dispar</i> Cleve	1

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>A. exigua</i> Grunow	37
<i>A. joursacense</i> Héribaud	1, 2, 10, 11, 16, 25, 26,
<i>A. laevis</i> Oestrup	9
<i>A. lanceolata</i> (Brébisson) Grunow subsp. <i>lanceolata</i>	1–5, 7–21, 23–26, 28, 30, 32, 34–39, 42, 43, 45–51, 55, 56, 58, 61, 62, 65, 69, 74, 76
<i>A. lanceolata</i> subsp. <i>lanceolata</i> var. <i>haynaldii</i> (Schaarschmidt) Cleve	2–7, 9–14, 17–19, 21, 23–26, 28, 30, 34–36, 39, 40, 43, 45–47, 49, 57, 58, 61, 62, 65, 71, 76
<i>A. lanceolata</i> subsp. <i>frequentissima</i> Lange-Bertalot	26
<i>A. laterostrata</i> Hustedt	2, 5, 12, 14–16, 18, 19, 22–24, 26, 30, 33, 35, 48, 51, 55, 58
<i>A. linearis</i> (W. Smith) Grunow	10, 12, 13, 21, 22, 25, 37, 44
<i>A. marginulata</i> Grunow	2, 5, 9, 12–15, 17, 18, 21, 23–26, 28, 33, 35, 37, 43, 45, 46, 48 50, 55–58, 65, 74
<i>A. minutissima</i> Kützing var. <i>minutissima</i>	1–5, 8–28, 33, 35–41, 43, 44, 49, 51, 54, 55, 57, 58, 62, 64–67, 74
<i>A. minutissima</i> var. <i>affinis</i> (Grunow) Lange-Bertalot	4, 9, 10, 15, 16, 23, 26, 57
<i>A. minutissima</i> var. <i>gracillima</i> (Meister) Lange-Bertalot	23
<i>A. oestrupii</i> (A. Cleve-Euler) Hustedt	2, 33
<i>A. peragalli</i> Brun et Héribaud	2, 9–11, 13, 24–26, 30, 33, 35, 50
<i>A. thermalis</i> (Rabenhorst) Schoenfeld	11
<i>Actinocyclus octonarius</i> Ehrenberg	1, 11
<i>Adlafia minuscula</i> (Grunow) Lange-Bertalot	3, 4, 6, 9–11, 13–16, 18–22, 24–26, 30, 32, 36, 37, 42, 43, 45–49, 51, 55, 57, 58, 65–67, 71, 76
<i>Amphipleura pellucida</i> (Kützing) Kützing	10, 15
<i>Amphora copulata</i> (Kützing) Schoeman et Archer	1, 2, 11
<i>A. delphinea</i> var. <i>minor</i> Cleve	11
<i>A. holsatica</i> Hustedt	1, 11, 64
<i>A. ovalis</i> (Kützing) Kützing	2–5, 9–11, 13, 16, 18, 19, 22, 26, 30, 37, 64, 69, 74, 76
<i>A. pediculus</i> (Kützing) Grunow	1, 2, 8–11, 13–19, 24–26, 32, 33, 35, 39, 43, 45, 48, 50, 51, 55
<i>A. proteus</i> Gregory	1
<i>Aneumastus apiculatus</i> (Oestrup) Lange-Bertalot	1
<i>Arachnoidiscus ehrenbergii</i> Bailey	1
<i>Asterionella formosa</i> Hassall	2
<i>Aulacoseira alpigena</i> (Grunow) Krammer	16, 18, 56
<i>A. ambigua</i> (Grunow) Simonsen	1–7
<i>A. distans</i> (Ehrenberg) Simonsen	2, 26, 43, 48
<i>A. granulata</i> (Ehrenberg) Simonsen	2, 4, 10, 64
<i>A. islandica</i> (O. Müller) Simonsen	1
<i>A. italica</i> (Ehrenberg) Simonsen	1, 10, 16, 18, 23, 64, 66

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>Bacillaria paxillifera</i> (O. Müller) Hendey	1, 10, 11
<i>Bacteriastrium delicatulum</i> Cleve	1
<i>Brachysira brebissonii</i> R. Ross	10
<i>B. vitrea</i> (Grunow) R. Ross	2, 10, 37, 64
<i>Brebissonia boeckii</i> (Ehrenberg) Grunow	11, 14, 19, 57, 74
<i>Caloneis amphisbaena</i> (Bory) Cleve	11
<i>C. bacillum</i> (Grunow) Cleve var. <i>bacillum</i>	2, 10, 71, 78
<i>C. bacillum</i> var. <i>lancettula</i> (Schulz) Hustedt	10
<i>C. brevis</i> var. <i>distoma</i> Grunow	1, 11
<i>C. molaris</i> (Grunow) Krammer	3, 7, 23, 26, 36, 71
<i>C. pulchra</i> Messikommer	48
<i>C. silicula</i> (Ehrenberg) Cleve var. <i>silicula</i>	1–3, 9, 10, 12–19, 22–26, 30, 36, 37, 50, 56, 57, 64, 74
<i>C. silicula</i> var. <i>truncatula</i> (Grunow) Cleve	74
<i>C. silicula</i> var. <i>ventricosa</i> (Ehrenberg) Donkin	2–4, 7, 10, 11, 15, 19, 22, 36, 37, 41, 67,–74
<i>Campylodiscus clypeus</i> (Ehrenberg) Ehrenberg	1
<i>C. echeneis</i> Ehrenberg ex Kützing	1
<i>Cavinula lacustris</i> (Gregory) D. Mann et Stickle	1
<i>C. pseudoscutiformis</i> (Hustedt) D. Mann et Stickle	2–4, 10, 16, 18, 37, 64, 66
<i>Chamaepinnularia krookii</i> (Grunow) Lange-Bertalot et Krammer	1, 3, 10, 14, 19, 43, 64
<i>Cocconeis minuta</i> Cleve	57
<i>C. neothumensis</i> Krammer	2
<i>C. pediculus</i> Ehrenberg	1
<i>C. placentula</i> Ehrenberg var. <i>placentula</i>	1–3, 9, 14–16, 19, 23, 24, 30, 55, 56, 76
<i>C. placentula</i> var. <i>euglypta</i> (Ehrenberg) Cleve	1, 2, 4, 8–26, 28, 30, 32, 33, 35–39, 42–45, 47–51, 54, 55, 57, 58, 64, 61, 65, 66, 70, 74
<i>C. placentula</i> var. <i>intermedia</i> (Héribaud et PerAgardh) Cleve	15
<i>C. scutellum</i> Ehrenberg var. <i>scutellum</i>	1,11
<i>C. scutellum</i> var. <i>parva</i> Grunow	11
<i>Craticula cuspidata</i> (Kützing) D. Mann f. <i>cuspidata</i>	2, 10
<i>C. cuspidata</i> f. <i>craticula</i> (Van Heurck) M. Peragallo	3
<i>C. cuspidata</i> f. <i>primigena</i> Dippel	2, 19, 22, 77
<i>C. halophila</i> (Grunow) D. Mann	11
<i>Ctenophora pulchella</i> (Ralfs ex Kützing) Williams et Round	1, 4, 10, 11, 28
<i>Cyclotella kuetzingiana</i> Thwaites var. <i>kuetzingiana</i>	1, 2, 19
<i>C. kuetzingiana</i> var. <i>radiosa</i> Fricke	11
<i>C. meneghiniana</i> Kützing	1, 2, 4, 7, 10, 11, 15, 27
<i>C. operculata</i> (Agardh) Kützing	19
<i>C. radiosa</i> (Grunow) Lemmermann	4, 5, 11
<i>C. stelligera</i> (Cleve et Grunow) Van Heurck	2, 3, 10, 11

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>Cymbella acuta</i> (A. Schmidt) Cleve	16
<i>C. aequalis</i> W. Smith ex Greville	4, 37
<i>C. affinis</i> Kützing	19, 25, 26, 33, 74
<i>C. amphioxys</i> (Kützing) Cleve	2, 4, 64
<i>C. aspera</i> (Ehrenberg) H. Peragallo	2, 4, 10, 45, 50, 56, 57, 65
<i>C. cistula</i> (Ehrenberg) Kirchner var. <i>cistula</i>	1–4, 9–19, 21, 23–28, 30, 33, 35–40, 43, 44, 47–50, 54–58, 61, 62, 74, 76
<i>C. cistula</i> var. <i>gibbosa</i> Brun	48, 78
<i>C. cymbiformis</i> Agardh	2, 19
<i>C. incerta</i> (Grunow) Cleve	64
<i>C. lata</i> var. <i>minor</i> Molder	22
<i>C. mesiana</i> Cholnoky	2, 67
<i>C. reinhardtii</i> Grunow ex A. Schmidt	22
<i>C. tumida</i> (Brébisson) Van Heurck var. <i>tumida</i>	1–4, 8–11, 15, 16, 19, 22, 57
<i>C. tumida</i> var. <i>borealis</i> Grunow	1, 2
<i>C. turgidula</i> Grunow	8, 9, 12–18, 41, 43, 57
<i>Cymbopleura cuspidata</i> (Kützing)	2, 9–11, 13–19, 23–26, 33, 35, 36, 43, 50, 55, 57
<i>C. ehrenbergii</i> (Kützing)	4, 19
<i>C. naviculiformis</i> (Auerswald)	2, 4, 8–12, 14–19, 22, 23–26, 28, 30, 33, 36, 37, 43, 46, 48, 56–58, 64–67, 74
<i>C. subcuspidata</i> (Krammer)	2, 3, 9, 10, 11, 12, 6, 19, 22, 26, 50, 58, 64
<i>Denticula elegans</i> Kützing	9, 14, 23, 37, 38
<i>D. tenuis</i> Kützing	2, 14, 64
<i>Diatoma anceps</i> (Ehrenberg) Kirchner	7, 19, 28, 64
<i>D. hiemale</i> (Roth) Heiberg	9, 10, 12–18, 23–26, 28, 30, 32–36, 38, 39, 43, 45–51, 53–56, 61, 69, 70, 76
<i>D. mesodon</i> (Ehrenberg) Kützing	1–4, 7–10, 12–19, 21, 23–28, 30–58, 61, 62, 64, 65, 67, 69, 70, 71, 74, 76
<i>D. tenue</i> Agardh var. <i>tenue</i>	18, 23, 27, 57
<i>D. tenue</i> var. <i>elongatum</i> Lyngbye	1, 10, 19
<i>D. vulgare</i> Bory var. <i>vulgare</i>	4, 5, 10, 65
<i>D. vulgare</i> var. <i>lineare</i> Grunow	11
<i>Didymosphenia geminata</i> (Lyngbye) M. Schmidt	4, 9, 10, 12, 14–16, 18, 43, 44, 51, 54
<i>Diploneis elliptica</i> (Kützing) Cleve	1, 3, 4, 10, 37, 43
<i>D. interrupta</i> (Kützing) Cleve	11
<i>D. oblongella</i> (Nägeli) A. Cleve-Euler	1
<i>D. oculata</i> var. <i>nipponica</i> Skvortzow	2
<i>D. ovalis</i> (Hilse) Cleve	1, 2, 11, 25, 64
<i>D. smithii</i> (Brébisson) Cleve var. <i>smithii</i>	1, 10, 11
<i>D. smithii</i> var. <i>pumila</i> (Grunow) Hustedt	3

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>D. smithii</i> var. <i>rhombica</i> Mereschkowsky	1, 11
<i>Encyonema gracile</i> Ehrenberg	2–4, 6, 7, 30, 36, 64
<i>E. minutum</i> (Hilse ex Rabenhorst) D. Mann	1–28, 30, 32–51, 53–58, 60, 61, 64–67, 71, 74, 76–78
<i>E. silesiacum</i> (Bleisch) D. Mann	1–4, 6–19, 22–26, 28, 35, 36, 42–44, 46–50, 54, 55, 57, 61, 65, 66, 76
<i>Encyonopsis cesatii</i> (Rabenhorst) Krammer	3, 9, 10, 14–16, 19, 22, 23, 26, 28, 33, 37, 38, 40, 48, 50, 56, 57, 74
<i>Entomoneis alata</i> (Ehrenberg) Ehrenberg	1, 10
<i>E. paludosa</i> (W. Smith) Reimer var. <i>paludosa</i>	1, 10
<i>E. paludosa</i> var. <i>subsalina</i> Cleve	1
<i>Epithemia adnata</i> (Kützing) Rabenhorst var. <i>adnata</i>	1, 2, 10–12, 55, 57, 62
<i>E. adnata</i> var. <i>porcellus</i> (Kützing) R. Ross	2, 10, 11, 16
<i>E. adnata</i> var. <i>saxonica</i> (Kützing) Patrick	2, 10, 11, 16
<i>E. turgida</i> (Ehrenberg) Kützing var. <i>turgida</i>	1, 11
<i>E. turgida</i> var. <i>granulata</i> (Ehrenberg) Brun	1, 2, 16
<i>Eucocconeis flexella</i> (Kützing) P.T. Cleve	37, 38
<i>Eunotia arcus</i> Ehrenberg var. <i>arcus</i>	10
<i>E. arcus</i> var. <i>trinacria</i> (Krasske) Nörpel	23, 30
<i>E. baicalensis</i> Skvortzow	1
<i>E. bilunaris</i> (Ehrenberg) Souza var. <i>bilunaris</i>	2–8, 10, 14, 19–22, 25, 26, 28, 33, 35, 37, 40, 42, 46–48, 50, 54–57, 66–69, 71, 73, 74, 76
<i>E. bilunaris</i> var. <i>mucophila</i> Lange-Bertalot et Nörpel	4, 37
<i>E. crista-galli</i> Cleve	2, 19, 22, 64
<i>E. diodon</i> Ehrenberg	2, 3, 6, 7, 16, 23
<i>E. exigua</i> (Brébisson ex Kützing) Rabenhorst	1, 4, 19, 25, 64, 76
<i>E. faba</i> (Ehrenberg) Grunow var. <i>faba</i>	3, 5, 21
<i>E. faba</i> var. <i>densestriata</i> Oestrup	26, 30, 64, 65
<i>E. fallax</i> A. Cleve-Euler	2, 62, 64, 69, 78
<i>E. flexuosa</i> Brébisson ex Kützing	2–4, 6, 7, 10, 19, 22, 40, 64, 66, 77
<i>E. glacialis</i> Meister	9
<i>E. hexaglyphis</i> Ehrenberg	64
<i>E. incisa</i> W. Smith ex Gregory	1, 10
<i>E. lapponica</i> Grunow ex A. Cleve-Euler	2
<i>E. microcephala</i> Krasske ex Hustedt	2, 23
<i>E. minor</i> (Kützing) Grunow	2–4, 9, 13, 19, 22, 23, 25, 26, 28, 30, 33, 34, 35, 37, 46, 48, 50, 56, 57, 61, 65, 66, 69, 74
<i>E. monodon</i> Ehrenberg	2–4, 7, 25, 62, 64, 76
<i>E. muscicola</i> var. <i>perminuta</i> (Grunow) Nörpel et Lange-Bertalot	2, 9, 10, 11, 18, 25, 26, 30, 56, 64
<i>E. muscicola</i> var. <i>tridentula</i> Nörpel et Lange-Bertalot	2, 18, 30, 33, 56, 71
<i>E. naegelii</i> Migula	2, 6, 7, 37, 64, 66
<i>E. nymanniana</i> Grunow	2

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>E. pectinalis</i> (O. Müller) Rabenhorst var. <i>pectinalis</i>	2, 10, 14, 19, 32, 37, 47, 56, 64, 74
<i>E. pectinalis</i> var. <i>undulata</i> (Ralfs) Rabenhorst	2, 10
<i>E. pectinalis</i> var. <i>ventricosa</i> Grunow	2
<i>E. praerupta</i> Ehrenberg var. <i>praerupta</i>	2–4, 6, 7, 10, 19, 37, 64, 67, 76
<i>E. praerupta</i> var. <i>bidens</i> (Ehrenberg) Grunow	2–4, 11, 19, 34, 55, 64, 76
<i>E. praerupta</i> var. <i>bigibba</i> (Kützing) Grunow	2, 64
<i>E. praerupta</i> var. <i>curta</i> Grunow	3, 7, 11, 16, 22, 25, 28, 64, 74, 76
<i>E. praerupta</i> var. <i>inflata</i> Grunow	7, 17, 37, 64, 76
<i>E. rostellata</i> Hustedt ex Patrick	2
<i>E. septentrionalis</i> Oestrup	2, 11, 19, 22, 66, 74, 77
<i>E. serra</i> Ehrenberg var. <i>serra</i>	2, 4, 64
<i>E. serra</i> var. <i>tetraodon</i> (Ehrenberg) Nörpel	2
<i>E. sudetica</i> O. Müller	1–4, 10, 11, 64
<i>E. tenella</i> (Grunow) Hustedt	3, 4, 66
<i>Fallacia pygmaea</i> (Kützing) Stickle et D. Mann	10, 11
<i>Fragilaria brevistriata</i> Grunow var. <i>brevistriata</i>	2, 4, 10, 11, 26, 32, 56
<i>F. brevistriata</i> var. <i>elliptica</i> Héribaud	10
<i>F. capucina</i> Desmazieres var. <i>capucina</i>	10, 19, 20, 30, 35, 48, 65
<i>F. capucina</i> var. <i>lanceolata</i> Grunow	10
<i>F. capucina</i> var. <i>mesolepta</i> Rabenhorst	2, 4, 10, 15
<i>F. crotonensis</i> Kitton	2, 10, 48
<i>F. vaucheriae</i> (Kützing) J. Petersen	2–4, 6, 9–11, 13–21, 25, 28, 44, 49, 55–58, 64, 66, 67, 76
<i>Fragilariforma bicapitata</i> (A. Mayer) Williams et Round	2–5, 8, 10, 11, 14, 19, 33, 37, 43, 57, 64, 74
<i>F. constricta</i> (Ehrenberg) Williams et Round f. <i>constricta</i>	2, 4, 56
<i>F. constricta</i> f. <i>stricta</i> (A. Cleve-Euler) Hartley	2
<i>F. virescens</i> (Ralfs) Williams et Round	4, 10, 76
<i>Frustulia amphipleuroides</i> (Grunow) A. Cleve-Euler	8, 14, 26, 35, 39, 42, 47, 50, 54–56
<i>F. rhomboides</i> De Toni var. <i>rhomboides</i>	2–4, 6, 7, 9, 14–16, 18, 19, 23–26, 28, 33, 35, 43, 46–50, 56, 64, 74
<i>F. rhomboides</i> var. <i>saxonica</i> (Rabenhorst) De Toni	2, 64
<i>F. vulgaris</i> (Thwaites) De Toni	1, 10, 11, 15, 16, 19, 20, 22, 23, 25, 30, 36, 42, 47, 48, 64, 71, 74, 76
<i>Gomphoneis eriense</i> (Grunow) Skvortzow et Meyer	30
<i>Gomphonema acuminatum</i> Ehrenberg var. <i>acuminatum</i>	1–4, 7, 10, 11, 16, 18, 19, 32, 40, 48, 56, 57, 64, 66, 67, 69
<i>G. acuminatum</i> var. <i>brebissonii</i> (Kützing) Cleve	2, 4, 5, 7
<i>G. acuminatum</i> var. <i>coronatum</i> (Ehrenberg) W. Smith	1–4
<i>G. acuminatum</i> var. <i>trigonocephalum</i> (Ehrenberg) Grunow	4, 19, 74
<i>G. affine</i> Kützing	8–10, 12–20, 22–26, 28, 30, 32, 39, 40, 43–45, 47–49, 54, 55, 61, 64, 67, 69

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>G. angustatum</i> (Kützling) Rabenhorst var. <i>angustatum</i>	1–5, 7–28, 30, 32–45, 47–51, 53–56, 58, 61, 64, 66, 69, 74, 76, 77
<i>G. angustatum</i> var. <i>lineare</i> Hustedt	67
<i>G. angustatum</i> var. <i>obtusatum</i> Kützling	22
<i>G. angustatum</i> var. <i>undulatum</i> Grunow	1, 2, 10, 11, 37, 65, 69, 71
<i>G. angustum</i> Agardh	2, 10, 11, 16, 19, 21, 23–25, 35, 36, 43, 64
<i>G. augur</i> Ehrenberg	2, 10
<i>G. clavatum</i> Ehrenberg	1–5, 8–11, 13–16, 18, 19, 22, 23, 25, 26, 33, 36, 37, 43, 46–50, 54–57, 64, 66, 67, 69, 71, 74, 76, 78
<i>G. gracile</i> Ehrenberg emend. Van Heurck	2, 6, 10, 11, 14, 28, 55
<i>G. grovei</i> var. <i>lingulatum</i> (Hustedt) Lange-Bertalot	2
<i>G. olivaceum</i> (Hornemann) Brébisson var. <i>olivaceum</i>	2, 4, 5, 8–15, 17–19, 21–25, 28, 30, 32, 34–36, 38, 43–50, 54, 57, 66, 69, 74, 77
<i>G. olivaceum</i> var. <i>calcareum</i> (Cleve) Cleve	7, 12, 23, 46
<i>G. olivaceum</i> var. <i>minutissimum</i> Hustedt	4, 8–10, 12–16, 19–23, 26, 30, 35, 37, 39, 43, 51, 55, 58, 61, 64, 74, 77
<i>G. parvulum</i> Kützling var. <i>parvulum</i>	1–4, 6, 7, 9–16, 18, 21, 23–26, 30, 36, 37, 41, 43, 49, 51, 55–58, 65–67, 69, 74, 76, 78
<i>G. parvulum</i> var. <i>lagenula</i> (Kützling) Frenguelli	2–4, 19
<i>G. productum</i> (Grunow) Lange-Bertalot et Reichardt	1–6, 8–11, 13, 14, 16, 17, 19, 22, 23, 26, 28, 32, 35, 39, 41–43, 46, 47, 49, 54–57, 61, 71, 74, 76
<i>G. quadripunctatum</i> (Oestrup) Wislouch	2, 8–10, 12–15, 18–28, 32, 35–37, 39, 41, 43, 44, 46, 48, 49, 50, 51, 55
<i>G. sarcophagus</i> Gregory	30
<i>G. subtile</i> Ehrenberg	2, 64
<i>G. truncatum</i> Ehrenberg	1–4, 6, 7, 9–16, 18, 19, 23, 26, 30, 35, 37, 46, 48, 51, 54, 56, 57, 64, 74, 76
<i>G. vastum</i> Hustedt	8, 10, 12–16, 19–23, 38, 39, 43, 48, 49, 57, 74
<i>G. ventricosum</i> Gregory	3, 12, 16, 18, 23
<i>Gyrosigma acuminatum</i> (Kützling) Rabenhorst	10, 19, 22
<i>G. distortum</i> (W. Smith) Griffith et Henfrey	10
<i>G. fasciola</i> (Ehrenberg) Griffith et Henfrey	1, 10,
<i>G. spenceri</i> (Quekett) Griffith et Henfrey	1
<i>Hannaea arcus</i> (Ehrenberg) Patrick var. <i>arcus</i>	1–4, 8–28, 31, 32, 34–47, 49–51, 53–56, 58, 60, 62, 64, 67
<i>H. arcus</i> var. <i>amphioxys</i> (Rabenhorst) Patrick	2, 5, 9, 10, 12–14, 16–19, 25, 26, 32, 36, 38, 39, 43, 51, 54, 55
<i>H. arcus</i> var. <i>linearis</i> (Holmboe) R. Ross	8, 9, 12, 18, 23

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>H. arcus</i> var. <i>linearis</i> f. <i>recta</i> (Skvortzow et Meyer) Proschkina-Lavrenko	1–4, 8–28, 30, 32, 34–36, 38, 39, 43, 45–51, 53–58, 61, 67, 69, 74, 76, 77
<i>Hantzschia amphioxys</i> (Ehrenberg) Grunow var. <i>amphioxys</i>	1, 10, 19, 21, 28, 36, 43, 47, 48, 51, 57, 61, 66, 69, 71, 76, 78
<i>H. amphioxys</i> f. <i>capitata</i> O. Müller	3, 4, 7, 71, 76
<i>H. amphioxys</i> var. <i>major</i> Grunow	10
<i>H. spectabilis</i> (Ehrenberg) Hustedt	4
<i>Hippodonta capitata</i> (Ehrenberg) Lange-Bertalot	10, 19–22
<i>H. costulata</i> (Grunow) Lange-Bertalot	11
<i>H. hungarica</i> (Grunow) Lange-Bertalot	1, 10, 11
<i>H. lueneburgensis</i> (Grunow) Lange-Bertalot	26
<i>Licmophora abbreviata</i> Agardh	1
<i>L. paradoxa</i> var. <i>tincta</i> (Agardh) Hustedt	1
<i>Luticola cohnii</i> (Hilse) D. Mann	19
<i>L. mutica</i> (Kützing) D. Mann	3, 10, 16, 19, 26, 30, 43, 57, 58, 71, 74, 76
<i>Martyana martyi</i> (Héribaud) F. Round	1, 11
<i>Mastogloia baltica</i> Grunow	1
<i>M. elliptica</i> (Agardh) Cleve ex A. Schmidt var. <i>elliptica</i>	1
<i>M. elliptica</i> var. <i>dansei</i> (Thwaites) Cleve ex A. Schmidt	1
<i>M. smithii</i> Thwaites ex W. Smith var. <i>smithii</i>	1
<i>M. smithii</i> var. <i>lacustris</i> Grunow	1
<i>Melosira lineata</i> (Dillwyn) Agardh	1, 10, 11
<i>M. moniliformis</i> (O. Müller) Agardh var. <i>moniliformis</i>	1, 11
<i>M. moniliformis</i> var. <i>octogona</i> Grunow	1
<i>M. moniliformis</i> var. <i>subglobosa</i> Grunow	1
<i>M. varians</i> Agardh	3–5, 10, 12, 14–16, 18, 19, 48, 51, 57, 58
<i>Meridion circulare</i> (Greville) Agardh var. <i>circulare</i>	2, 4, 8–10, 12–19, 21–23, 25–28, 30, 32–39, 41–52, 54–58, 61, 62, 65–67, 71, 76
<i>M. circulare</i> var. <i>constricta</i> (Ralfs) Van Heurck	1, 2, 4, 9, 10, 14, 17–19, 24–26, 30, 36, 37, 42, 48, 56, 57, 64, 65, 74, 76
<i>Navicula amphibola</i> Cleve var. <i>amphibola</i>	1, 11
<i>N. amphibola</i> var. <i>orientalis</i> (Kisselew) Zabelina	1
<i>N. capitatoradiata</i> Germain	10
<i>N. cincta</i> (Ehrenberg) Ralfs	11, 55, 64
<i>N. concentrica</i> Carter	11
<i>N. crucicula</i> (W. Smith) Donkin	1, 10, 11, 27
<i>N. cryptocephala</i> Kützing var. <i>cryptocephala</i>	2–5, 7, 9–12, 14–20, 22–24, 26, 27, 30, 33, 35, 37, 43, 46–48, 50, 56–58, 66, 71, 74, 76
<i>N. cryptocephala</i> var. <i>angusta</i> J. Petersen	9, 32, 61
<i>N. elegans</i> W. Smith	1, 11

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>N. elongata</i> Poretzky	56
<i>N. gregaria</i> Donkin	1, 10, 11, 19
<i>N. hasta</i> Pantocsek	4
<i>N. hustedtii</i> Krasske	2
<i>N. integra</i> (W. Smith) Ralfs	1, 10, 11, 19, 22, 26, 30, 57
<i>N. laterostrata</i> Hustedt	2
<i>N. menisculus</i> Schumann	2, 5, 8–19, 22, 23, 30, 39, 43, 48, 54, 58, 64
<i>N. peregrina</i> (Ehrenberg) Kützing var. <i>peregrina</i>	1, 9, 10
<i>N. peregrina</i> var. <i>lanceolata</i> Skvortzow	9
<i>N. punctulata</i> W. Smith	1
<i>N. pusio</i> Cleve	8, 9, 12, 13, 16, 18, 19, 20, 23, 25, 37, 43, 48, 49, 50, 57
<i>N. radiosa</i> Kützing	1, 2, 4, 8–11, 14–16, 18, 19, 22–25, 37, 43, 48, 55, 64, 65, 74
<i>N. rhyngocephala</i> Kützing	1, 2, 4, 10, 11, 19, 20, 22, 30, 46, 48, 74
<i>N. rotaeana</i> (Rabenhorst) Grunow	3, 4, 9, 10, 14–16, 18, 19, 21, 23, 26, 43, 49
<i>N. salinarum</i> Grunow	1, 10, 11, 23, 25, 30
<i>N. slesvicensis</i> Grunow	11, 16, 19, 39
<i>N. tripunctata</i> (O. Müller) Bory	1
<i>N. veneta</i> Hustedt	11, 20
<i>N. viridula</i> (Kützing) Ehrenberg	2, 8–10, 12, 14, 16, 19–21, 23, 26, 32, 35, 43, 45–47, 57
<i>Naviculadicta protracta</i> Grunow	2, 10, 11, 19
<i>N. pseudosilicula</i> Hustedt	2, 4, 34, 37, 50, 56, 67
<i>N. subtilissima</i> Cleve	3
<i>N. tridentula</i> Krasske	71
<i>Neidium affine</i> (Ehrenberg) Pfitzer var. <i>affine</i>	2, 4, 7, 10, 11, 17, 19, 22, 30, 33, 37, 56, 76
<i>N. affine</i> f. <i>medium</i> Cleve	2
<i>N. affine</i> var. <i>amphirhynchus</i> (Ehrenberg) Cleve	2, 18, 19, 22, 37, 76
<i>N. affine</i> f. <i>capitatum</i> Skvortzow et Meyer	2, 19, 22, 30, 76
<i>N. affine</i> f. <i>undulatum</i> Hustedt	4
<i>N. affine</i> var. <i>undulatum</i> Grunow	4
<i>N. ampliatum</i> (Ehrenberg) Krammer	2–4, 19, 23, 28, 30, 78
<i>N. bisulcatum</i> (Lagerst.) Cleve var. <i>bisulcatum</i>	2–4, 9, 10, 16, 18, 19, 37, 66, 67, 76, 78
<i>N. bisulcatum</i> var. <i>subundulatum</i> (Grunow) Reimer	10
<i>N. bisulcatum</i> var. <i>undulatum</i> O. Müller	64
<i>N. dilatatum</i> (Ehrenberg) Cleve	11, 19
<i>N. dubium</i> (Ehrenberg) Cleve	19

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>N. iridis</i> (Ehrenberg) Cleve var. <i>iridis</i>	2, 4, 5, 7, 9, 10, 11, 15, 19, 22, 36, 37, 40, 48, 64, 71
<i>N. iridis</i> var. <i>amphigomphus</i> (Ehrenberg) A. Mayer	2, 4
<i>N. iridis</i> var. <i>diminutum</i> (Pantocsek) Wislouch et Kolbe	2, 4, 5, 7, 10, 11, 22, 35, 36, 43, 64, 77
<i>N. productum</i> (W. Smith) Cleve	4
<i>Nitzschia acicularis</i> (Kützing) W. Smith	2, 10, 30, 67
<i>N. amphibia</i> Grunow	10, 11, 19, 23, 69, 74
<i>N. bremensis</i> Hustedt	10
<i>N. brevissima</i> Grunow	1, 10, 71
<i>N. capitellata</i> Hustedt	2, 4, 11, 24–26, 32, 43, 51
<i>N. communis</i> Rabenhorst	14, 16, 37, 55
<i>N. commutata</i> Grunow	11
<i>N. constricta</i> (Kützing) Ralfs	1, 10
<i>N. denticula</i> var. <i>baicalensis</i> Skvortzow	2
<i>N. dissipata</i> (Kützing) Grunow	4, 10, 12, 14, 16, 18, 19, 21, 30, 42, 46, 48, 55, 57
<i>N. dubia</i> W. Smith	10
<i>N. filiformis</i> (W. Smith) Van Heurck	1, 10
<i>N. fonticola</i> Grunow	1, 2, 4, 9, 10, 14–16, 21, 23, 30, 37, 38, 43, 48, 51, 55, 57, 61
<i>N. frustulum</i> (Kützing) Grunow	1–7, 10, 11, 13, 14, 16, 21, 23, 32, 56, 66, 76, 78
<i>N. gracilis</i> Hantzsch var. <i>gracilis</i>	2, 4, 26, 43, 65
<i>N. gracilis</i> var. <i>minor</i> Skabitshevsky	9
<i>N. heufleriana</i> Grunow var. <i>heufleriana</i>	10
<i>N. heufleriana</i> var. <i>elongata</i> Pantocsek	19, 20, 22
<i>N. hamburgiensis</i> Lange-Bertalot	3, 4, 26, 30
<i>N. linearis</i> (Agardh) W. Smith	14, 35, 41, 43, 50, 54, 55, 76
<i>N. microcephala</i> Grunow	11
<i>N. nana</i> Grunow	2, 11
<i>N. palea</i> (Kützing) W. Smith var. <i>palea</i>	1–7, 10–17, 19–23, 30, 34, 35, 37, 39, 40, 43, 46, 51, 54, 55, 57, 58, 65, 66
<i>N. palea</i> var. <i>capitata</i> Wislouch et Poretzky	2, 4, 9, 19, 22, 74, 78
<i>N. paleacea</i> Grunow	3, 66
<i>N. perminuta</i> (Grunow) M. Peragallo	11
<i>N. pusilla</i> Grunow emend Lange-Bertalot	10
<i>N. recta</i> Hantzsch ex Rabenhorst	2, 28
<i>N. reversa</i> W. Smith	1
<i>N. scalpelliformis</i> (Grunow) Grunow	1, 7, 10, 64
<i>N. sigma</i> (Kützing) W. Smith	1, 9, 10, 11
<i>N. umbonata</i> (Ehrenberg) Lange-Bertalot	23, 26, 43, 46
<i>N. vermicularis</i> (Kützing) Hantzsch	1

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>Opephora schulzii</i> (Brockmann) Simonsen	11
<i>Pinnularia acrosphaeria</i> W. Smith	3–6
<i>P. borealis</i> Ehrenberg var. <i>borealis</i>	1, 3, 6, 7, 9–12, 19, 21, 22, 36, 47, 64, 65, 67, 74, 76
<i>P. borealis</i> var. <i>brevicostata</i> Hustedt	1, 14
<i>P. braunii</i> (Grunow ex A. Schmidt) Cleve var. <i>braunii</i>	7, 9, 37, 69, 74
<i>P. braunii</i> var. <i>amphicephala</i> (A. Mayer) Cleve	46
<i>P. brebissonii</i> (Kützing) Rabenhorst	35
<i>P. brevicostata</i> Cleve	2–7, 9, 10, 13, 23, 33, 34, 36, 61, 62, 66, 67, 74, 76
<i>P. cardinalis</i> (Ehrenberg) W. Smith	2, 7
<i>P. divergens</i> W. Smith	2, 4, 6, 7, 37, 64
<i>P. episcopalis</i> Cleve var. <i>episcopalis</i>	3, 4, 7, 66
<i>P. episcopalis</i> var. <i>hankensis</i> Skvortzow	76
<i>P. gentilis</i> (Donkin) Cleve	2–4, 18, 37, 56, 71, 76
<i>P. gibba</i> Ehrenberg var. <i>gibba</i>	2, 4, 6, 7, 9, 10, 19, 22, 37, 56, 57, 74, 76
<i>P. gibba</i> f. <i>subundulata</i> A. Mayer	2, 3, 23, 46, 64, 65, 69, 71
<i>P. gibba</i> var. <i>linearis</i> Hustedt	1–4, 6, 7, 19, 69, 76, 77
<i>P. gibba</i> var. <i>parva</i> (Ehrenberg) Grunow	19
<i>P. globiceps</i> Gregory	1
<i>P. hemiptera</i> (Kützing) Rabenhorst	2, 3, 7,
<i>P. interrupta</i> W. Smith f. <i>interrupta</i>	2, 3, 66, 67, 76
<i>P. interrupta</i> f. <i>minor</i> J. Petersen	19, 45
<i>P. lata</i> (Brébisson) Rabenhorst	76
<i>P. legumen</i> Ehrenberg	19
<i>P. major</i> (Kützing) Rabenhorst var. <i>major</i>	2–4, 6, 7, 10, 14, 16, 19, 56, 57, 66, 67
<i>P. major</i> var. <i>lacustris</i> Meister	2
<i>P. major</i> var. <i>linearis</i> Cleve	2
<i>P. mesogongyla</i> Ehrenberg	2, 19, 22, 64
<i>P. mesolepta</i> (Ehrenberg) W. Smith	2, 4, 10, 16, 19, 22, 25, 28, 37, 43, 48, 64, 69, 74, 76
<i>P. microstauron</i> (Ehrenberg) Cleve var. <i>microstauron</i>	2–4, 7, 10, 17–19, 30, 37, 48, 62, 64, 66, 69, 71, 76, 78
<i>P. microstauron</i> var. <i>ambigua</i> Meister	2, 4, 7
<i>P. microstauron</i> f. <i>biundulata</i> O. Müller	3, 4, 19, 69
<i>P. nodosa</i> (Ehrenberg) W. Smith	2–4, 19, 22, 71, 74, 78
<i>P. pulchra</i> var. <i>angusta</i> (Cleve) Krammer	64
<i>P. semicrucata</i> (Ehrenberg) A. Cleve-Euler	76
<i>P. subcapitata</i> Gregory	4, 9, 30, 56, 76
<i>P. viridis</i> (Nitzsch) Ehrenberg var. <i>viridis</i>	1–4, 6, 10, 14, 16, 17, 19, 22, 23, 25, 26, 30, 36, 37, 46–48, 56, 64, 66, 74, 76, 78

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>P. viridis</i> var. <i>commutata</i> (Grunow) Cleve	3, 4, 6, 7, 11, 37, 41, 56, 69, 76
<i>P. viridis</i> var. <i>leptogongyla</i> (Ehrenberg ? Grunow) Cleve	1, 6, 19, 33, 46
<i>P. viridis</i> var. <i>sudetica</i> (Hilse) Hustedt	2, 23
<i>Placoneis elginensis</i> (Gregory) Ralfs	1, 4, 10, 16, 19, 30, 74
<i>P. gastrum</i> (Ehrenberg) Mereschkowsky	1, 2, 10, 19, 25, 57
<i>P. placentula</i> (Ehrenberg) E. Cox f. <i>placentula</i>	10
<i>P. placentula</i> f. <i>rostrata</i> A. Mayer	11
<i>Pleurosigma elongatum</i> W. Smith	1, 10, 64
<i>P. salinarum</i> Grunow	1
<i>P. strigosum</i> W. Smith	1
<i>Reimeria sinuata</i> (Gregory) Kosiolek et Stoermer f. <i>sinuate</i>	2, 5, 8–27, 32–37, 39–41, 43–51, 54–56, 58, 61, 64, 67, 69, 74
<i>R. sinuata</i> f. <i>ovata</i> (Hustedt) Hartley	10
<i>Rhabdonema minutum</i> Kützing	11
<i>Rhoicosphenia abbreviata</i> (Agardh) Lange-Bertalot	1, 10, 11
<i>Rhopalodia gibba</i> (Ehrenberg) O. Müller var. <i>gibba</i>	1, 2, 4, 10, 11, 12, 16
<i>R. gibba</i> var. <i>parallela</i> (Grunow) H. et M. Peragallo	2
<i>R. gibberula</i> (Ehrenberg) O. Müller	11
<i>R. musculus</i> (Kützing) O. Müller	1, 2, 11
<i>Sellaphora bacillum</i> (Ehrenberg) D. Mann var. <i>bacillum</i>	1, 2, 9, 10, 12, 14, 16, 26, 35, 37, 39, 48
<i>S. bacillum</i> var. <i>hankensis</i> Skvortzow	10
<i>S. bacillum</i> var. <i>minor</i> Van Heurck	4, 10
<i>S. bacillum</i> f. <i>trinodis</i> J. Petersen	4
<i>S. laevis</i> (Kützing) D. Mann	2, 9, 23, 76
<i>S. pupula</i> (Kützing) Mereschkowsky var. <i>pupula</i>	4, 10, 16, 69
<i>S. pupula</i> var. <i>capitata</i> Hustedt	2, 3, 4, 10, 16, 18, 19, 22, 23, 37, 69, 74
<i>S. pupula</i> var. <i>elliptica</i> Hustedt	4, 10
<i>S. rectangularis</i> (Gregory) Lange-Bertalot et Metzeltin	1–4, 7, 10, 16, 19, 20, 22, 37, 40, 69
<i>S. seminulum</i> (Grunow) D. Mann	23, 26, 61
<i>Stauroneis acuta</i> W. Smith	34, 37, 48
<i>S. anceps</i> Ehrenberg f. <i>anceps</i>	2–7, 10, 14, 16, 19, 22, 26, 28, 30, 34, 36, 43, 45, 46, 56, 66, 68, 73, 74, 76
<i>S. anceps</i> f. <i>gracilis</i> Rabenhorst	2, 4, 19, 27, 62
<i>S. anceps</i> f. <i>linearis</i> Rabenhorst	22, 30, 71
<i>S. phoenicenteron</i> (Nitzsch) Ehrenberg	2–7, 10, 13, 18, 19, 22, 26, 37, 43, 48, 56, 64, 67, 74, 76
<i>S. producta</i> Grunow	1, 2, 26
<i>S. smithii</i> Grunow	9, 13, 19, 22, 36, 65
<i>Staurosira construens</i> Ehrenberg	1–4, 10, 18, 26, 64
<i>Staurosirella leptostauron</i> (Ehrenberg) Williams et Round	1–3, 8–19, 22–26, 30, 32, 33, 35–37, 40, 43, 47–51, 54–56, 58, 61, 67, 76

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>S. pinnata</i> (Ehrenberg) Williams et Round	1–5, 7–11, 15, 23, 26, 33, 37, 43, 45, 48, 64
<i>Stenopterobia capitata</i> (Fontell) Lange-Bertalot et Metzeltin	2, 4, 6, 7, 57
<i>Stephanodiscus hantzschii</i> Grunow	11
<i>S. rotula</i> (Kützing) Hendey	1, 64
<i>Surirella alisoviana</i> Skvortzow	19
<i>S. angusta</i> Kützing	1–5, 10, 11, 13, 19, 22, 30, 36, 43, 51, 54, 66, 67, 71, 74, 76, 78
<i>S. biseriata</i> Brébisson ex Godey var. <i>biseriata</i>	3
<i>S. biseriata</i> f. <i>punctata</i> (Meister) Hustedt	3
<i>S. biseriata</i> var. <i>constricta</i> Grunow	7
<i>S. brebissonii</i> Krammer et Lange-Bertalot	2, 3, 4, 6, 8, 10, 11, 14, 19, 21, 22, 23, 32, 36, 39, 40, 43, 48, 55, 57, 64, 65
<i>S. capronii</i> Brébisson var. <i>capronii</i>	1
<i>S. capronii</i> var. <i>obtusata</i> Hustedt	1
<i>S. didyma</i> var. <i>minor</i> Skvortzow	33
<i>S. gracilis</i> (W. Smith) Grunow	30
<i>S. linearis</i> W. Smith var. <i>linearis</i>	3, 7, 18, 36, 37
<i>S. linearis</i> var. <i>constricta</i> Grunow	2, 19
<i>S. linearis</i> var. <i>helvetica</i> (Brun) Meister	35
<i>S. minuta</i> Brébisson	10, 19, 21, 22, 30, 59, 74, 76
<i>S. ovalis</i> Brébisson var. <i>ovalis</i>	1, 11, 7
<i>S. ovalis</i> var. <i>apiculata</i> Schmidt	11, 37
<i>S. pantocsekii</i> Meister	4, 19, 59
<i>S. robusta</i> Ehrenberg var. <i>robusta</i>	4, 5
<i>S. robusta</i> var. <i>punctata</i> Hustedt	4, 5, 14, 48, 78
<i>S. splendida</i> (Ehrenberg) Kützing	2, 3, 7, 10, 19, 30, 57, 67, 74
<i>S. turgida</i> W. Smith f. <i>turgida</i>	2
<i>S. turgida</i> f. <i>baicalensis</i> Skvortzow	11
<i>Synedra acus</i> Kützing	10
<i>S. amphicephala</i> Kützing	1, 3, 22
<i>S. inaequalis</i> H. Kobayasi	1–2, 4, 8, 10–18, 23–26, 28, 30, 33–47, 49–51, 54–56, 62, 64, 65, 76
<i>S. parasitica</i> (W. Smith) Hustedt var. <i>parasitica</i>	2, 4, 10, 57
<i>S. parasitica</i> var. <i>subconstricta</i> (Grunow) Hustedt	11
<i>S. rumpens</i> Kützing var. <i>rumpens</i>	2–4, 10, 11, 14, 17–19, 22, 23, 37, 64, 73, 74, 76
<i>S. rumpens</i> var. <i>familiaris</i> (Kützing) Hustedt	3, 4
<i>S. rumpens</i> var. <i>fragilarioides</i> Grunow	2
<i>S. ulna</i> (Nitzsch) Ehrenberg var. <i>ulna</i>	1–4, 8–28, 30, 31, 33, 35–41, 43, 46–51, 53–58, 61, 67, 73, 74, 76, 78
<i>S. ulna</i> var. <i>amphirhynchus</i> (Ehrenberg) Grunow	2, 10, 27
<i>S. ulna</i> var. <i>contracta</i> Oestrup	9, 18

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>S. ulna</i> var. <i>danica</i> (Kützing) Van Heurck	10
<i>Tabellaria fenestrata</i> (Lyngbye) Kützing	1-7, 9, 10, 12, 14-16, 18, 19, 22, 23, 37, 40, 48, 55-57, 64, 69-71, 73, 74, 77
<i>T. flocculosa</i> (Roth) Kützing	1-7, 9, 10, 12, 14-19, 22, 28, 30, 37, 43, 46, 48, 55-58, 64, 66, 67, 69, 73, 74, 76, 77
<i>Tabularia fasciculata</i> (Agardh) Williams et Round	1, 4, 9-11, 14, 32, 64, 76
<i>Thalassiosira bramaputrae</i> (Ehrenberg) Håkansson et Locker	1, 11
<i>T. eccentrica</i> (Ehrenberg) Cleve	1
<i>Tryblionella acuminata</i> W. Smith var. <i>acuminata</i>	1
<i>T. acuminata</i> var. <i>acuta</i> Grunow	2, 4, 10, 11, 15, 16, 37, 71
<i>T. acuta</i> (Cleve) D. Mann	2
<i>T. coarctata</i> Grunow	2
<i>T. debilis</i> Arnott	19
<i>T. gracilis</i> W. Smith	1, 2, 9-11
<i>T. hungarica</i> (Grunow) D. Mann	1, 10, 11, 43
<i>T. levidensis</i> W. Smith	10, 11, 19, 22
Class Chrysophyceae	
<i>Chrysopyxis bipes</i> Stein	19
<i>Dinobryon divergens</i> Imhof	1
<i>D. sertularia</i> Ehrenberg	2, 4, 6, 10, 19
<i>D. utriculus</i> Stein	71
<i>Hydrurus foetidus</i> Kirchner	8, 9, 12-14, 17, 18, 24-26, 28, 31-33, 35, 36, 43, 44, 46, 49-51, 53-55
<i>Mallomonas charkowiensis</i> Swirenko	10
Class Xanthophyceae	
<i>Characiopsis longipes</i> (Rabenhorst) Borzi	4
<i>Ch. minuta</i> (A. Braun) Lemmermann	10
<i>Ch. subulata</i> (A. Braun) Borzi	10
<i>Heteropedia polychloris</i> Pascher	1
<i>Ophiocytium capitatum</i> Wolle	4, 11
<i>O. cochleare</i> A. Braun	4, 6, 19
<i>O. parvulum</i> A. Braun	3, 4, 6, 7, 10
<i>Peroniella hyalothecae</i> Gobi	10
<i>Tribonema aequale</i> Pascher	1, 2, 14, 19, 22, 51, 71, 77, 78
<i>T. affine</i> West	2, 3, 4, 6, 10, 66, 67
<i>T. ambiguum</i> Skuja	66
<i>T. minus</i> Hazen	1, 2, 13, 30, 78
<i>T. subtilissimum</i> Pascher	1, 2, 4, 7, 19, 78
<i>T. viride</i> Pascher	19, 43, 66

<i>Taxon</i>	<i>Number of the waterbodies</i>
<i>T. vulgare</i> Pascher	1–3, 7, 13, 19, 30, 51, 67, 71, 73, 78
<i>Vaucheria</i> sp. sterile	11, 20, 42, 75
Class <i>Phaeophyceae</i>	
<i>Desmarestia viridis</i> (O. Müller) Lamouroux	1
<i>Pylaiella littoralis</i> (Linnaeus) Kjellman	1
Division <i>Dinophyta</i>	
<i>Peridinium cinctum</i> (O. Müller) Ehrenberg	4, 6, 10

1 = Blagodatnoe Lake, 2 = Golubichnoe Lake, 3 = Tsarskoe Lake, 4 = Sokhatinoe Lake, 5 = Krugloe Lake, 6 = Mutnoe Lake, 7 = Kamennoe Lake, 8 = Serebryanka River, upper section, 9 = Serebryanka River, middle section, 10 = Serebryanka River, lower section, 11 = Serebryanka River, estuary, 12 = Zabolochennaya River, 13 = Yasnaya River, 14 = Dzhigitovka River, 15 = Bolschaya Lianovaya River, 16 = Kuruma River, 17 = Kunaleika River, 18 = Khanova River, 19 = Kolumbe River, 20 = Rezvuschka River, 21 = Serokamenka River, 22 = Poludennaya River, 23 = Serebryanyi Stream, 24 = Gluboki Stream, 25 = Gorelyi Stream, 26 = Podnebesnyi Stream, 27 = Maly Podnebesnyi Stream, 28 = Zimoveinyi Stream, 29 = Sukhoi Stream (Serebryanka River basin), 30 = Sukhoi Stream (Blagodatnaya Bay), 31 = Soplivyi Stream, 32 = D'yachkovski Stream, 33 = Tikhi Stream, 34 = Kedrovyyi Stream, 35 = Elovyyi Stream, 36 = Medvezhi Stream, 37 = Izyubrinyi Stream, 38 = Goremykin Stream, 39 = Kuklin Stream, 40 = Sporny Stream, 41 = Spokoinyi Stream, 42 = Kabani Stream, 43 = Solontsovyi Stream, 44 = Sakhalinski Stream, 45 = Pervyyi Stream, 46 = Vtoroi Stream, 47 = Treti Stream, 48 = Chetvertiyi Stream, 49 = Beloborodovski Stream, 50 = Ivanovski Stream, 51 = Berezovyyi Stream, 52 = Temnyi Stream, 53 = Bazhenov Stream, 54 = Kozly Stream, 55 = Nevidimka Stream, 56 = Teplyi Stream, 57 = Dolgi Stream, 58 = Maly Inokov Stream, 59 = left-hand unnamed creek in Serebryanka River basin (near Terney), 60 = left-hand unnamed creek in Yasnaya River basin, 61 = right-hand unnamed creek in Zabolochennaya River basin, 62 = unnamed creek from wet rocks near mouth Serebryanyi Stream, 63 = unnamed creek flowed into Blagodatnoe Lake, 64 = unnamed creek flowed into Golubichnoe Lake, 65 = spring near izba "Ust'-Serebryanyi", 66 = pool in Zabolochennaya River valley near izba 'Yasnaya', 67 = pool in Zabolochennaya River valley near border of the reserve, 68 = pool in Yasnaya River valley, 69 = pool in Serebryanyi Stream valley, 70 = puddle in Serebryanka River valley, 71 = puddle near izba 'Yasnaya', 72 = puddle near izba 'Schandui', 73 = puddle near Blagodatnoe Lake, 74 = puddle near izba '56 km', 75 = puddle in Serokamenka River valley, 76 = bog in upper section of Solontsovyi Stream, 77 = bog near izba 'Uralskaya', 78 = wet alkali soil in upper section of Solontsovyi Stream, 79 = on the rind of *Betula mandshurica*.

It would appear that the different environmental conditions, including the nature of the substrate, seem to play an important role in determining the species richness and diversity of particular water bodies.

Rare species

There were rare species noted from virtually every division. The rare cyanophytes include *Lyngbya circumcreta*, *Cylindrospermum alatosporum*, *Anabaena echinospora* and *A. inaequalis*. For the red algae, the record of *Sirodotia suecica* is only the second observation of this genus within Russia (Skuja, 1933–1934). Several rare species were found among the chlorophytes, including *Rhopalosolen cylindrica*, *Oedogonium suecicum*, *Rhizoclonium profundum* and *Cosmoastrum lapponicum*. Rare species among the diatoms were *Eunotia rostellata* and *Gomphoneis eriense*. *Eunotia baicalensis*,

Diploneis oculata var. *nipponica* and *Amphora delphinea* var. *minor* had previously been observed in Russia only at Lake Baikal (Skvortzow & Meyer, 1928; Skvortzow, 1937), and *Surirella alisoviana* only at Khanka Lake (Skvortzow, 1929).

DISCUSSION

Diverse families are of great diagnostic importance in floristic analyses. In the present study more than 65 % of the species found belong to ten families. By far the best represented are the diatom families *Naviculaceae* and *Desmidiaceae*. The present results are therefore similar to descriptive data for other large regions, including water bodies of Northern Russia, Yakutia, Ukraine and Western Siberia (Palamar-Mordvintzeva, 1982; Safonova, 1984; Getzen, 1985; Vasil'eva, 1989). The *Fragilariaceae*, *Closteriaceae*, *Eunotiaceae* and *Achnanthaceae* are typically northern algal families. The variety of species within these families reflects some holoarctic characteristics of northern hemisphere floras. As a whole, the taxonomic structure found in the present study is typical of temperate zones of Eurasia.

The most abundant genera are *Cosmarium*, *Nitzschia*, *Closterium*, *Eunotia* and *Pinnularia*. The uniqueness of the range of genera found in the reserve is best exemplified by the desmid algae. It is generally acknowledged that *Cosmarium* and *Staurastrum* are the most significant desmids in the composition of the northern flora (Getzen, 1985). The prevalence of *Cosmarium* is characteristic for the arctic flora, while *Staurastrum* is more characteristic for more southerly floras (Getzen, *loc. cit.*). The prevalence of *Closterium* in the composition of the reserve algal flora is an evidence of its uniqueness.

A high number of single-species families and few-species genera is typical of most northern floras (Getzen, 1985). Single-species families comprise 26.3 % of the total number of families in our Sikhote-Alin observations. Single-species and few-species (2–5 taxa) genera comprise 40 % of the total number of genera.

The algal flora of the Sikhote-Alin biosphere reserve is comprised of 675 species represented by 839 subspecific taxa from seven divisions. Within the reserve, the floristic compositions of the individual water bodies are very different and reflect the variety of environmental conditions present, including the brackish Blagodatnoe Lake, the shallow freshwater Golubichnoe Lake, the alpine Solontsovskie Lakes, the rapid cold-water Serebryanka and Dzhigitovka rivers, and the lowland Kolumbe River.

The present study describes the taxonomic structure and richness of the algal flora of the Sikhote-Alin reserve. It is currently the richest and most diverse algal flora found among the six reserves studied in the Primorsky region (Medvedeva, 1999b). The waters of this reserve are a prime example of natural systems unaffected by any pollution to date. We can therefore regard the algal assemblages of the reserve (as described herein) as 'models' that will be of great value in providing baseline data for future monitoring and for assessing the effects of anthropogenic pollution.

Acknowledgements. I thank Dr Bruno de Reviers, Prof. Pierre Compère, Prof. Wm J. Woelkerling, Dr Linda Ashkenas, Dr Xanthippe Augerot and reviewers of my paper for critically reading the manuscript, mutual understanding and correcting the language. This research was carried out with the financial support of the Russian Fund for Fundamental Research (Project 96-04-51019).

REFERENCES

- BARINOVA S.S., 1988 — Polymorphism of connective structures in diatom algae. In: Krassilov V.A. (Ed.), *Evolutionary studies. Vavilov's themes*. Vladivostok, Far Eastern Branch Academy of Science USSR, pp. 110–122 (In Russian).
- GETZEN M.V., 1985 — *Algae in ecosystems of the Extreme North (on the example of Bolshezemelskaja tundra)*. Leningrad, Nauka, 165 p. (In Russian).
- MEDVEDEVA L.A., 1981 — Materials to the flora of freshwater algae of Sikhote-Alin state reserve. In: Egorova L.N. (Ed.), *Systematics, ecology and geography of spore plants in Far East*. Vladivostok, Far Eastern Branch of Academy Science USSR, pp. 10–20. (In Russian).
- MEDVEDEVA L.A., 1984 — Materials to the algoflora of Peschernaja River and some its tributaries (Sikhote-Alin reserve). In: Tcherdantseva V.Ya. (Ed.), *Systematic and floristic researches of spore plants of Far East*. Vladivostok, Far Eastern Branch of Academy Science USSR, pp. 76–82. (In Russian).
- MEDVEDEVA L.A., 1986a — Algal flora of the Serebryanka River basin (Primorye Region). *Botanicheskii Zhurnal* 71 (5): 634–637. (In Russian).
- MEDVEDEVA L.A., 1986b — Algal flora of Golubichnoe Lake (Sikhote-Alin reserve). In: Vassilieva L.N. (Ed.), *Flora and systematics of spore plants of Far East*. Vladivostok, Far Eastern Branch of Academy Science USSR, pp. 22–35. (In Russian).
- MEDVEDEVA L.A., 1987a — Algal flora of Solontsovskie Lakes of Sikhote-Alin reserve. In: Petropavlovsky B.S. (Ed.), *Sikhote-Alin biosphere region: background state of natural components*. Vladivostok, Far Eastern Branch of Academy Science USSR, pp. 49–70. (In Russian).
- MEDVEDEVA L.A., 1987b — De algis pro Oriente extremo novis notula. *Novitates systematicae plantarum non vascularium* 24: 55–58. (In Russian).
- MEDVEDEVA L.A., 1987c — De *Sirodotia suecica* Kytlin in reservato Sichote-Alinensi inventa notula. *Novitates systematicae plantarum non vascularium* 24: 58–60. (In Russian).
- MEDVEDEVA L.A., 1990 — Materials to algal flora of Serebryanka River and some its tributaries (Sikhote-Alin reserve). In: Vassilieva L.N. (Ed.), *Cryptogamic investigations in the Far East*. Vladivostok, Far Eastern Branch of Academy Science USSR, pp. 23–28. (In Russian).
- MEDVEDEVA L.A., 1992a — Algae of Blagodatnoe Lake (Sikhote-Alin reserve, Russia). *Algologia* 2 (3): 61–67. (In Russian).
- MEDVEDEVA L.A., 1992b — About new species *Cyanophyta* of the Russian Far East. *Algologia* 2 (4): 56–63. (In Russian).
- MEDVEDEVA L.A., 1994 — Diatom algae of Serebryanka River basin (Sikhote-Alin reserve). *Botanicheskii Zhurnal* 79 (3): 46–56. (In Russian).
- MEDVEDEVA L.A., 1999a — Ecological review of algoflora of the Sikhote-Alin biosphaeric reserve (Primorsky region). *Botanicheskii Zhurnal* 84 (7): 71–79. (In Russian).
- MEDVEDEVA L.A., 1999b — Review of algal investigations in Primorye Region reserves. *Botanicheskii Zhurnal* 84 (1): 136–144. (In Russian).
- PALAMAR-MORDVINTZEVA G.M., 1982 — *CHLOROPHYTA. Class Conjugatophytes. Order Desmids*. (Identification book of freshwater algae USSR). 11 (2). Leningrad, Nauka, 620 p. (In Russian).
- REVIERS B. de, 1999 — Classification du “Végétal”: quelle classification adopter pour les ‘algues’ ? *Bulletin de la Société Française de Systématique* 22: 27–39.
- SAFONOVA T.A., 1984 — The algal flora, its peculiarities and role in biological productivity of the waterbodies of Western Siberia. In: Berdichev L.S. (Ed.), *Biological resources of inland waterbodies of Siberia and Far East*. Moskow, Nauka, pp. 108–117. (In Russian).
- SHANNON C.E. & WEAVER W., 1949 — *The mathematical theory of communication*. Urbana, University of Illinois Press, 117 p.
- SKUJA H., 1933 – 1934 — Die *Batrachospermaceen* und *Lemaneaceen* Finnlands. *Memoranda Societatis pro Fauna et Flora Fennica* 9: 139–141.
- SKVORTZOW B.W., 1929 — Diatoms of Hanka Lake. *Memoirs of the Southern Ussuri Branch of the State Russian Geographical Society* 3, 66 p. (In Russian).

- SKVORTZOW B.W., 1937 — Bottom Diatoms from Olhon gate of Baikal Lake, Siberia. *Philippine Journal of Science* 62 (3): 293–377.
- SKVORTZOW B.W. & MEYER C.I., 1928 — A contribution to the diatoms of Baikal Lake. *Proceedings of Sungaree River Biological Station* 1 (5): 21–86.
- SWIFT E., 1967 — Cleaning diatoms frustules with ultraviolet radiation and peroxide. *Phycologia* 6 (2–3): 161–163.
- VASSER S.P. (Ed.), 1989 — *Algae*. The reference book. Kiev, Naukova dumka, 608 p. (In Russian).
- VASIL'EV N.G. & MATJUSHKIN E.N. (Ed.), 1982 — *Vegetable and animal world of the Sikhote-Alin reserve*. Moscow, Nauka, 304 p. (In Russian).
- VASIL'EVA I.I., 1989 — *Analysis of species composition and dynamics of the development of algae in waterbodies of Yakutia*. Yakutsk, Yakutsk Science Centre, 48 p. (In Russian).
- ZHADIN V.I. & PAVLOVSKY E.N. (Eds.), 1956 — *Life of the fresh waters*. Moskow-Leningrad, Nauka 4 (1): 470 p. (in Russian).