TÜBİTAK

Research Article

Turk J Bot
35 (2011) 729-774

doi:10.3906/bot-1009-83

Diversity and ecology of algae in the Algeti National Park as a part of the Georgian system of protected areas

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Received: 24.09.2010
Accepted: 14.01.2011

Abstract: Algal communities from the Algeti National Park in eastern Georgia were studied between 2005 and 2008. The algal species diversity comes from 77 algological samples and includes 315 species and infraspecies, which belong to 7 taxonomical divisions. Of these findings, 295 species are reported for the first time in the Algeti National Park and 9 of them are new for Georgia. The most abundant are diatoms, with 220 species. Communities were dominated by *Cladophora glomerata* (L.) Kütz. (Chlorophyta), *Spirogyra* sp. (Charophyta), *Ulnaria ulna* (Nitzsch) Compère (diatom), and *Phormidium autumnale* (C.Agardh) R.Trevis. ex Gomont (Cyanobacteria). The index of species diversity per area in the Algeti is 6.89. The comparative floristic and statistical analysis of algal communities from Algeti and 13 other Georgian Natural Reserves, altogether 1063 species, divides the communities into groups of less than or more than 200 species, with diatom or nondiatom domination that correlates with climatic variables. The species diversity in the natural reserves increases from the Black Sea coast to the east, a movement that corresponds to a similar increase in altitude. In this study, 3 floristic groups are recognized: mountainous areas, lowlands, and piedmonts. The most species-rich communities are found in extreme environments. A correlation of algal diversity with environmental conditions shows that the altitude-dependent regional climatic variables and the lowest winter air temperature in particular, are the major factors. The index of infraspecies variation in each reserve is a small range (1.01-1.15) and shown to be a result of constant altitude combined with seasonal climatic fluctuations. The diversity indices and bioindication analysis reflect a moderate level of anthropogenic disturbance for the protected areas.

Key words: Algal communities, comparative floristic, natural reserves, Georgia

Introduction

The biodiversity of algal communities in the Georgian protected areas was formed under natural climatic and anthropogenic conditions. Research into algal diversity in the rivers of the southern Caucasian region still remains at an initial stage, whereas a rather advanced algal monitoring system has been developed for the European Mediterranean and Black Sea coasts (Dell'Uomo, 1999; Prygiel et al., 1999). In Georgia, knowledge of regional algal diversity is far from exhaustive; the algal communities of the Natural Reserves and Parks are better known but still sporadically studied (Kanchaveli, 1970, 1973; Kanchaveli et al., 1986; Kukhaleishvili, 2008, 2009a, 2009b, 2009c). Prior to this report, however,

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the Algeti Natural Park, located in an inaccessible mountainous area, was insufficiently studied in this respect.

Therefore, this work was aimed at creating an inventory of algal diversity in this area and comparing the species content with those of other Georgian natural reserves. We have assumed that a comparison of species diversity in protected areas will help to reveal trends in algal diversity under climatic impacts. The main characteristics of the southern Caucasian region are the wide-ranging altitudes and the sharp seasonality of the climate. Of these factors, elevation plays a larger role in regulating plant species richness patterns. Altitudinal studies of high plant diversity distribution are very developed, especially for rare species. From the standpoint of the factors that regulate distribution, however, the study of common species is the most important (Jaccard, 1912). The diversity-temperature relationship for the high plants is well known (Qian et al., 2007). Altitude-diversity correlations have been studied for vascular plants, bryophytes, and lichens (Qian et al., 1999), but the relationship has not been made clear for freshwater algal communities.

The studied areas are protected from strong anthropogenic impact. The methods used to reveal environmental impacts with the help of ecological indicators are as follows: community structure fluctuation analysis, bioindication of major impacting factors, calculations of integral density-diversity indices, and statistical approaches linking structural and functional aspects of the community with environmental fluctuation (Heywood, 2004).

Description of the study area

The Algeti National Park is located at the upper reaches of the Algeti River in the Tetrizkaro district (Figure 1). The park was organized in 2007 at the base of Algeti National Reserve, which has been protected since 1965. The area of the park is 68.22 km^2 (Figure 2). Most of this space is covered with coniferous and broad-leaved forests, the protection of which, in particular the Caucasian fir at the eastern border, is the basic purpose of the park (Mamisashvili, 1975). The relief of the park is mountainous and the altitude ranges from 1000 to 2000 m. The main river of the park is the Algeti River with its many tributaries. It originates from a height of 1900 m on the eastern slope of the Trialeti Range and is typically mountainous. The river flow is supplied with ample rains in summer and thaw waters in winter and spring, causing a considerable rise in the water level. The velocity of the river is about 1 m/s, with water temperatures that fluctuated from 18 °C to 25 °C during the sampling period (Zhovrebashvili, 1956; Maruashvili, 1971; Zomaya, 1974). In the territory of the park, there are many streamlets, springs, temporary reservoirs, and artificial ponds. Before the current study, the algal flora of the Algeti National Park had been episodically studied by Kanchaveli (1970, 1973; Kanchaveli et al., 1986) and Kukhaleishvili (2008, 2009a, 2009b, 2009c).

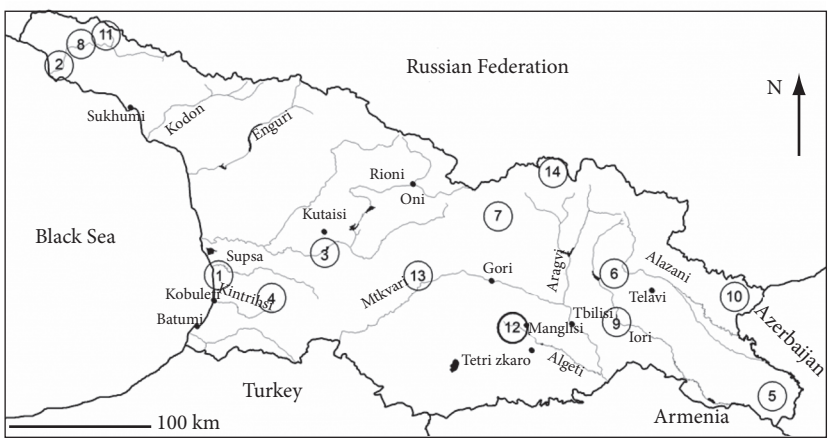

Figure 1. The location of the Algeti National Park (as 12, bold) within the Georgian Natural Reserves system.

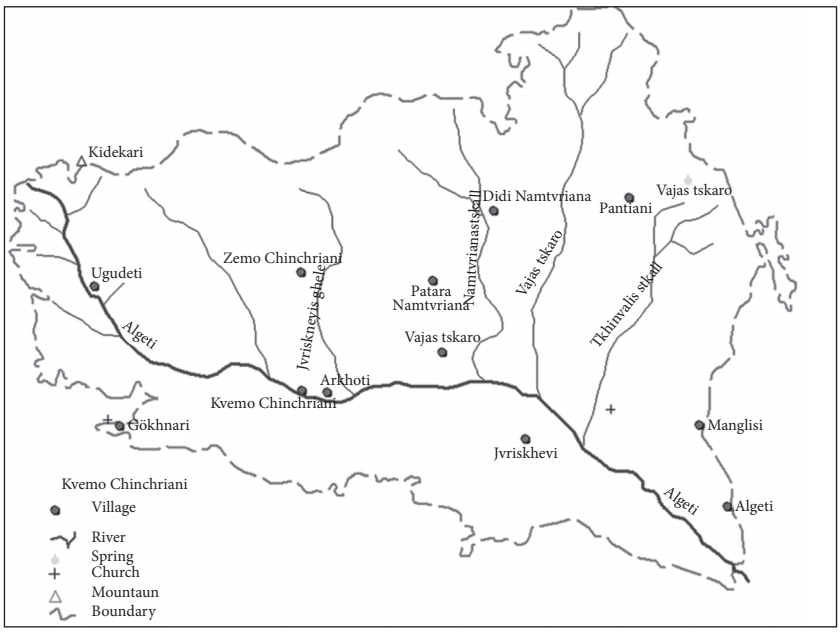

Figure 2. A schematic map of Algeti National Park.

Materials and methods

The Algeti National Park species list includes algae from 77 benthic and planktonic samples collected from 17 different sampling stations in each of the above mentioned types of rivers and pools during the summer periods of 2005, 2007, and 2008. The samples were fixed in a solution of 4% formaldehyde and studied in temporary and permanent Canadian balsam slides under an Amplival microscope. Species were identified according to international guides and the taxonomy follows the modern taxonomical system (Guiry & Guiry, 2009), including the recent taxonomic revision. The list also contains some "unchecked" taxa from the international system.

For species diversity and ecological analysis, we applied the bioindication methods widely used in European countries under the Framework Directive (European Parliament, 2000). Our database for indicator species was published by Barinova et al. (2006). The statistical methods used were those recommended by Heywood (2004) for the development of floristic and taxonomic studies, namely the CANOCO program (ter Braak & Šmilauer, 2002) for representational difference analysis (RDA) and canonical correspondence analysis (CCA) (ter Braak, 1987, 1990), the GRAPHS program (Novakovsky, 2004) for comparative floristic studies, and the Statistica 7.0 program for stepwise regression analysis and distance-weighted least squares calculations.

Results and discussion

Diversity and environmental variables

A total of 317 species of algae were identified in the studied river systems of the Algeti National Park. As a result, the comprehensive species list, including those recorded before this study, contains 404 species and infraspecies (Table 1). Compiled for the first time, Table 1 represents the complete freshwater algal species diversity list for all Georgian Natural Reserves; it has been assembled as a part of our database (Barinova et al., 2006) and includes information on ecology and distribution.

Table 2 contains not only the physical variables, species richness, and our calculations of diversity indices for Algeti National Park, but also the similar information that we have compiled for the 13 other Georgian Natural Reserves (Kanchaveli et al., 1986; Kukhaleishvili, 2008, 2009a, 2009b, 2009c).

Table 1. Diversity and ecology of algae and cyanobacteria in the Georgian Natural Reserves.

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
	Cyanobacteria																							
1	*Anabaena aequalis* Borge	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st	-	-	-	o-b	-	-
2	*Anabaena contorta* Bachmann	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	st-str	-	-	-	-	-	-
3	*Anabaena cylindrica* Lemmermann	-	-	-	-	-	-	1	-	-	-	-	-	-	-	P	-	-	-	-	-	b-o	-	-
4	*Anabaena laxa* (Rabenhorst) A.Braun	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
5	*Anabaena macrospora* Klebahn	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	*Anabaena pseudoscillatoria* Bory de Saint-Vincent	-	1	-	-	-	-	1	-	-	-	-	-	-	1	P-B	-	-	-	-	-	b	-	-
7	*Anabaena scheremetievii* Elenkin	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	i	-	-	-	-
8	**Anabaena* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
9	*Anabaena spiroides* Klebahn	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	st-str	-	i	-	o-b	-	-
10	*Aphanocapsa fusco-lutea* Hansgirg	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B,S	warm	-	-	-	-	-	-	-
11	*Aphanocapsa grevillei* (Hassall) Rabenhorst	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	temp	-	-	hb	acf	o-b	-	-
12	*Aphanocapsa muscicola* (Meneghini) Wille	-	1	1	-	-	-	-	-	-	-	-	-	1	-	B,S	-	-	-	i	-	-	-	-
13	*Aphanothece castagnei* (Brébisson) Rabenhorst	-	-	-	-	-	-	-	1	-	-	-	-	-	-	P-B,S	-	-	-	-	-	-	-	-
14	*Aphanothece microscopica* Nägeli	-	-	-	-	-	-	1	-	-	-	-	-	-	-	B,Ep,S	temp	-	-	hb	-	o	-	-
15	*Aphanothece saxicola* Nägeli	-	1	-	-	-	-	1	-	-	-	-	-	-	-	P,S	-	-	-	i	-	-	-	-
16	*Aphanothece stagnina* (Sprengel) A.Braun	-	-	1	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	-	hl	ind	b-a	-	-
17	*Arthrospira major* (Kützing) Crow	-	-	1	-	-	-	-	-	-	-	-	-	1	1	P,S	-	st	-	ph	-	a	-	-
18	*Borzia trilocularis* Cohn ex Gomont	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
19	**Calothrix braunii* Bornet & Flahault	-	-	1	-	-	-	-	-	-	-	-	1	-	-	B,S	temp	st-str	-	-	-	o	-	-
20	*Calothrix brevissima* G.S.West	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B,S	-	st-str	-	-	-	-	-	-
21	**Calothrix elenkinii* Kossinskaja	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
22	*Calothrix gypsophila* Thuret	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
23	**Calothrix kossinskajae* Poljansky	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
24	*Calothrix stellaris* Bornet & Flahault	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	st-str	-	-	-	-	-	-
25	*Calothrix weberi* Schmidle	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
26	*Chamaesiphon incrustans* Grunow	-	-	-	-	1	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	o	-	-
27	*Chroococcus limneticus* Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	i	-	o-b	-	-
28	*Chroococcus minimus* (Keissler) Lemmermann	-	-	-	-	-	-	-	-	-	-	1	-	-	1	P	-	-	-	hl	-	-	-	-
29	**Chroococcus minutus* (Kützing) Nägeli	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	-	-	i	ind	o	-	-
30	**Chroococcus turgidus* (Kützing) Nägeli	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	-	hl	alf	o	-	-
31	*Chroococcus vacuolatus* Skuja	-	-	-	-	-	-	-	-	-	-	1	-	-	1	B	-	-	-	i	-	-	-	-
32	*Coelosphaerium dubium* Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
33	*Coelosphaerium kuetzingianum* Nägeli	-	1	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	i	-	b-o	-	-
34	*Cyanobacterium cedrorum* (Sauvageau) Komárek, Kopecky & Cepák	-	-	-	-	-	-	-	-	-	-	-	-	-	1	S	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
35	*Cyanothece aeruginosa* (Nägeli) Komárek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	b-a	-	-
36	*Cyanothece major* (Schröter) Komárek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
37	*Cylindrospermum caucasicum* Woronichin	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	*Cylindrospermum gregarium* (Zakrz.) Elenk.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	*Cylindrospermum licheniforme* (Bory) Kützing ex Bornet & Flahault	-	1	-	-	-	-	1	-	-	-	-	-	-	-	B,S	-	-	-	-	-	-	-	-
40	*Cylindrospermum majus* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
41	*Dactylococcopsis fascicularis* Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
42	*Dolichospermum flos-aquae* (Brébisson ex Bornet & Flahault) P.Wacklin, L.Hoffmann & J.Komárek	1	1	-	-	1	-	-	-	-	-	-	-	1	-	P	-	st	-	i	-	b	-	-
43	*Geitlerinema acutissimum* (Kufferath) Anagnostidis	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	*Geitlerinema amphibium* (C. Agardh) Anagnostidis	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B,S	-	st-str	-	hl	-	o-a	-	-
45	*Geitlerinema splendidum* (Greville) Anagnostidis	-	-	-	-	-	-	-	-	-	-	-	1	1	-	P-B,S	-	st	-	-	-	o-a	-	-
46	*Gloeocapsa alpina* (Nägeli) Brand	-	1	1	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-	-
47	**Gloeocapsa atrata* Kützing	-	-	1	-	-	-	-	-	-	-	-	1	-	1	B	temp	-	-	hl	-	-	-	-
48	*Gloeocapsa cohaerens* (Brébisson) Golerbach	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	-	-	hb	-	-	-	-
49	*Gloeocapsa kuetzingiana* Nägeli	-	-	-	-	-	-	-	-	-	-	-	-	-	1	S	-	-	-	-	-	-	-	-
50	*Gloeocapsa minor* (Kutzing) Hollerbach	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
51	*Gloeocapsa punctata* Nägeli	-	-	-	-	-	-	-	-	-	-	-	-	-	1	S	-	-	-	hl	-	-	-	-
52	*Gloeocapsa rupestris* Kützing	-	-	-	-	-	-	1	-	-	-	-	-	1	-	S	-	-	-	-	-	-	-	-
53	*Gloeocapsa tenax* (Kirchner) Hollerbach	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	i	-	-	-	-
54	*Gloeocapsopsis magma* (Brébisson) Komárek & Anagnostidis	-	-	-	-	-	-	-	-	-	-	-	-	1	-	S	-	-	-	i	ind	-	-	-
55	*Gloeothece palea* (Kützing) Nägeli	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B,S	-	-	-	-	-	-	-	-
56	*Hydrocoleus homoeotrichus* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
57	**Jaaginema pseudogeminatum* (G.Schmid) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	1	-	1	P-B,S	warm	st-str	-	-	-	-	-	-
58	*Jaaginema subtilissimum* (Kützing ex De Toni) Anagnostidis & Komárek	-	-	-	-	-	-	-	1	-	-	-	-	-	-	P-B	-	st	-	-	-	a	-	-
59	*Leibleinia epiphytica* (Hieronymus) Compère	-	-	-	-	-	-	-	-	-	-	-	-	1	-	Ep	-	st-str	-	ph	-	o	-	-
60	*Leptolyngbya boryana* (Gomont) Anagnostidis & Komárek	-	1	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	st	-	i	-	o-b	-	-
61	*Leptolyngbya foveolara* (Montagne ex Gomont) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	-	-	-	-	b-o	-	-
62	*Leptolyngbya foveolara* (Montagne ex Gomont) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B,S	-	st-str	-	i	-	o-a	-	-
63	*Leptolyngbya gelatinosa* (Woronichin) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
64	*Leptolyngbya henningsii* (Lemmermann) Anagnostidis	-	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
65	*Leptolyngbya notata* (Schmidle) Anagnostidis & Komárek	-	-	-	-	-	-	1	-	-	-	-	-	-	1	B,S	-	-	-	-	-	x-b	-	-
66	*Leptolyngbya orientalis* (G.S.West) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	warm	-	-	-	-	-	-	-
67	*Leptolyngbya purpurascens* (Gomont) Anagnostidis & Komárek	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	str	-	-	-	x	-	-
68	*Leptolyngbya valderiana* (Gomont) Anagnostidis & Komárek	-	-	1	-	-	-	-	-	-	-	-	-	-	-	B,S	-	st-str	-	-	-	o	-	-
69	*Lyngbya aestuarii* (Mertens) Liebman ex Gomont	-	-	-	-	1	-	-	1	-	-	-	-	-	-	P-B,S	-	-	-	ph	-	o	-	-
70	*Lyngbya hieronymusii* Lemmermann	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
71	**Lyngbya martensiana* Meneghini ex Gomont	-	1	1	-	-	-	-	-	-	-	-	1	1	1	P-B,S	-	st-str	-	-	-	o-a	-	-
72	**Lyngbya* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
73	*Merismopedia elegans* A.Braun ex Kützing	-	-	-	-	1	-	-	-	-	-	-	-	-	1	P-B	-	-	-	i	ind	b-o	-	-
74	*Merismopedia glauca* (Ehrenberg) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	-	i	ind	o-a	-	-
75	*Merismopedia marssonii* Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
76	*Merismopedia minima* Beck	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B,S	-	-	-	-	-	-	-	-
77	*Merismopedia punctata* Meyen	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	-	i	ind	o-a	-	-
78	*Merismopedia tenuissima* Lemmermann	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	-	hl	-	b-a	-	-
79	*Microcoleus paludosus* (Kützing) Gomont	-	-	1	-	-	-	-	-	-	-	-	-	-	1	B,S	-	st	-	-	-	o	-	-
80	*Microcoleus vaginatus* (Vaucher) Gomont ex Gomont	-	-	1	-	1	-	-	-	-	-	-	-	1	1	B,S	-	st	-	hl	-	-	-	-
81	*Microcystis aeruginosa* (Kützing) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	-	-	hl	-	o-a	-	-
82	*Microcystis ichthyoblabe* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	i	-	b-o	-	-
83	**Microcystis pulverea* (Wood) Forti in De Toni	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B,S	-	-	-	i	-	o-b	-	-
84	*Nodularia harveyana* (Thwaites) Thuret	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	-	-	-	-	o	-	-
85	*Nodularia spumigena* Mertens	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B,S	-	-	-	-	-	o-a	-	-
86	**Nostoc calcicola* Brébisson ex Bornet & Flahault	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
87	*Nostoc coeruleum* Lyngbye ex Bornet & Flahault	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	i	-	b	-	-
88	**Nostoc commune* Vaucher ex Bornet & Flahault	-	1	1	-	-	-	1	-	-	-	-	1	-	1	P-B,S	-	-	-	-	-	b-o	-	-
89	*Nostoc linckia* (Roth) Bornet ex Bornet & Flahault	-	1	-	-	-	-	1	-	-	-	-	1	1	1	-	-	-	-	-	-	o-a	-	-
90	**Nostoc microscopicum* Carmichael ex Bornet & Flahault	-	-	-	-	-	-	-	-	-	-	-	1	1	-	S	-	-	-	i	-	-	-	-
91	*Nostoc paludosum* Kützing ex Bornet & Flahault	-	-	1	-	-	-	-	-	-	-	-	-	-	1	P-B,S	-	st	-	-	-	-	-	-
92	*Oscillatoria amoena* (Kützing) Gomont	-	-	1	-	1	-	-	-	-	-	-	-	-	1	P-B,S	-	st-str	-	-	-	x	-	-
93	*Oscillatoria anguina* Bory ex Gomont	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
94	*Oscillatoria princeps* Vaucher ex Gomont	-	1	1	-	1	-	-	-	-	-	1	-	1	1	P-B,S	-	st-str	-	-	-	b-p	-	-
95	**Oscillatoria* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
96	*Oscillatoria spirulinoides* Woronichin	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
97	*Phormidium aerugineo-coeruleum* (Gomont) Anagnostidis & Komárek	-	-	-	-	-	-	1	1	-	-	-	-	1	1	P-B,S	-	st-str	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
98	*Phormidium ambiguum* Gomont	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B,S	eterm	st-str	-	i	ind	b	-	-
99	**Phormidium autumnale* (C.Agardh) Trevisan ex Gomont	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B,S	-	st-str	-	-	-	b	-	-
100	*Phormidium beggiatoiforme* (Gomont) Anagnostidis & Komárek	-	-	1	-	-	-	-	-	-	-	-	-	-	1	P-B	cool	st-str	-	-	alf	x	-	-
101	**Phormidium bohneri* Schmidle	-	1	-	-	-	-	-	-	-	-	-	1	-	-	B,S	-	-	-	-	-	-	-	-
102	**Phormidium breve* (Kützing ex Gomont) Anagnostidis & Komárek	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B,S	-	st	-	-	-	b-p	-	-
103	*Phormidium chalybeum* (Mertens ex Gomont) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B,S	-	st-str	-	-	-	a	-	-
104	**Phormidium corium* (C.Agardh) Kützing ex Gomont	-	1	-	-	-	-	-	-	-	-	-	1	1	1	B,S	cool	st-str	-	-	-	o-b	-	-
105	*Phormidium deflexoides* (Elenkin & Kossinskaja) Anagnostidis & Komárek	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
106	*Phormidium diguetii* (Gomont) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
107	**Phormidium favosum* (Bory) Gomont	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	cool	str	-	-	alf	b	-	-
108	**Phormidium formosum* (Bory de Saint-Vincent) Anagnostidis & Komárek	-	-	1	-	-	-	-	-	-	-	-	1	-	1	P-B,S	-	st	-	-	-	b-p	-	-
109	*Phormidium inundatum* Kützing ex Gomont	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	st-str	-	-	-	o-b	-	-
110	*Phormidium jadinianum* Gomont	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	str	-	-	-		-	-
111	*Phormidium limosum* (Dillwyn) P.C.Silva	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B,S	-	st-str	-	hl	-	b-a	-	-
112	*Phormidium mucicola* Huber-Pestalozzi & Naumann	1	1	-	-	-	-	-	-	-	-	-	-	-	-	Ep	-	-	-	i	-	o-b	-	-
113	*Phormidium nigroviride* (Thwaites ex Gomont) Anagnostidis & Komárek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
114	*Phormidium ornatum* (Kützing) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B,S	-	st-str	-	i	-	o-b	-	-
115	*Phormidium retzii* (C.Agardh) Kützing ex Gomont	-	-	-	-	1	-	-	-	-	-	-	-	1	1	B,S	-	st-str	-	-	-	o	-	-
116	*Phormidium rupicola* (Hansgirg ex Gomont) Anagnostidis & Komárek	-	1	-	-	-	-	-	-	-	-	-	-	-	-	Ep,S	-	-	-	-	-	-	-	-
117	*Phormidium schroeteri* (Hansgirg ex Hansgirg) Anagnostidis	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
118	**Phormidium setchellianum* Gomont	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
119	**Phormidium* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
120	Phormidium subfuscum Kützing ex Gomont	-	1	-	-	-	-	-	-	-	-	-	-	1	1	B,S	-	st-str	-	-	-	b	-	-
121	*Phormidium tenuissimum* Woronichin	-	1	-	-	-	-	-	-	-	-	-	-	-	-	Ep,S	-	-	-	-	-	x-o	-	-
122	*Phormidium terebriforme* (C.Agardh ex Gomont) Anagnostidis & Komárek	-	1	1	-	-	-	-	-	-	-	-	-	-	1	B,S	eterm	st-str	-	-	-	b-p	-	-
123	**Phormidium tergestinum* (Kützing) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	-	i	-	b-a	-	-
124	*Planktothrix agardhii* (Gomont) Anagnostidis & Komárek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
125	*Planktothrix cryptovaginata* (Schkorbatov) Anagnostidis & Komárek	-	-	-	-	1	-	-	-	-	-	-	-	-	-	P	-	st	-	-	-	o-a	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
126	**Pleurocapsa minor* Hansgirg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	-	-	x-o	-	-
127	*Pseudanabaena catenata* Lauterborn	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st	-	-	-	b-p	-	-
128	**Pseudanabaena limnetica* (Lemmermann) Komárek	1	-	-	-	-	-	-	-	-	-	-	1	1	-	P-B	-	-	-	-	-	b-o	-	-
129	*Pseudanabaena papillaterminata* (Kiselev) Kukk	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
130	*Rhabdoderma lineare* Schmidle & Lauterborn	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	hb	-	x-b	-	-
131	*Rivularia aquatica* De Wildeman	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
132	**Rivularia* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
133	*Schizothrix lardacea* (Cesati) Gomont	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B,S	warm	str	-	-	-	-	-	-
134	**Schizothrix lenormandiana* Gomont	-	1	1	-	-	-	-	-	-	-	-	1	-	-	B,S	-	st	-	-	-	-	-	-
135	*Schizothrix tenuis* Woronichin	-	1	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
136	*Scytonema crustaceum* (C.Agardh) Bornet & Flahault	-	-	-	-	-	-	-	-	-	-	-	-	1	-	S	-	-	-	-	-	-	-	-
137	*Scytonema hofman-bangii* C.Agardh ex P.C.Silva	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
138	*Snowella lacustris* (Chodat) Komárek & Hindák	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	-	-	i	-	b	-	-
139	**Spirulina* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
140	**Spirulina subtilissima* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	-	-	-	-	-	-
141	*Stigonema ocellatum* (Dillwyn) Thuret ex Bornet & Flahault	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	a-b	-	-
142	**Symploca meneghiniana* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
143	**Symploca muralis* (Kützing) Gomont	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B,S	-	st-str	-	-	-	x	-	-
144	*Symploca muscorum* C.Agardh ex Gomont	-	1	1	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	x	-	-
145	*Synechococcus elongatus* (Nägeli) Nägeli	-	1	-	-	-	-	-	1	-	-	-	-	-	-	P-B,S	-	-	-	-	-	x	-	-
146	*Synechocystis crassa* Voronichin	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
147	**Synechocystis pevalekii* Ercegovic	-	-	-	-	-	-	-	-	-	-	-	1	-	-	Ep,S	-	-	-	-	-	-	-	-
148	*Tolypothrix byssoidea* (C.Agardh) Kirchner	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	-	-	-	-	-	-	-
149	*Tolypothrix calcarata* Schmidle	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
150	**Tolypothrix distorta* Kützing ex Bornet & Flahault	-	-	-	-	-	-	-	-	-	-	-	1	-	1	B,S	-	-	-	-	-	o	-	-
151	*Tolypothrix tenuis* Kützing	-	1	-	-	-	-	1	-	-	-	-	-	-	-	B,S	-	st	-	i	-	x-b	-	-
152	*Trichocoleus sociatus* (W.West & G.S.West) Anagnostidis	-	1	-	-	-	-	-	1	-	-	-	-	-	1	B,S	-	st-str	-	-	-	-	-	-
153	*Trichodesmium lacustre* Klebahn	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	st	-	-	-	-	-	-
154	**Trichormus variabilis* (Kützing ex Bornet & Flahault) Komárek & Anagnostidis	-	1	-	-	-	-	1	-	-	-	-	1	-	-	P-B	-	st	-	mh	-	-	-	-
155	*Xenotholos kerneri* (Hansgirg) M.Gold-Morgan, G.Montejano & J.Komárek	-	-	1	-	-	-	-	-	-	-	-	-	-	-	B,Ep	-	-	-	-	-	-	-	-
	Euglenozoa																							
156	*Anisonema acinus* Dujardin	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	eterm	st-str	-	-	acf	b-a	-	-
157	*Distigma proteus* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	st-str	-	-		a-b	-	-
158	*Euglena acus* var. *angularis* Johnson	1	-	1	-	-	-	-	-	-	-	-	-	1	-	P	eterm	st	-	i	ind	b	-	-
159	**Euglena acus* var. *minor* Hansgirg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
160	*Euglena adhaerens* Matvienko	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	st	-	i	acf	o-b	-	-
161	**Euglena bucharica* I.Kisselev	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P	warm	st-str	-	-	-	-	-	-
162	*Euglena deses* Ehrenberg	-	-	-	-	1	-	-	-	-	-	-	-	-	1	P-B,S	-	st-str	-	mh	ind	m	-	-
163	**Euglena geniculata* Dujardin	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	eterm	st-str	-	-	alf	i	-	-
164	*Euglena limnophila* Lemmermann var. *limnophila*	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	eterm	st-str	-	-	-	o-b	-	-
165	**Euglena limnophila* var. *swirenkoi* (Arnoldi) T.G.Popova	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
166	**Euglena longicauda* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st	-	i	ind	a-b	-	-
167	*Euglena oxyuris* f. *skvortzovii* (Popowa) Popowa	-	-	1	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st-str	-	mh	ind	b-a	-	-
168	*Euglena pisciformis* Klebs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	eterm	st-str	-	mh	alf	a-p	-	-
169	**Euglena proxima* P.A.Dangeard	-	-	1	-	-	-	-	-	-	-	-	1	-	1	P-B	eterm	st-str	-	mh	ind	p	-	-
170	*Euglena sanguinea* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	i	acf	b	-	-
171	**Euglena* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
172	*Euglena tripteris* (Dujardin) Klebs	-	-	1	-	-	-	-	-	-	-	-	-	-	-	P-B	eterm	st-str	-	mh	ind	b	-	-
173	*Euglena variabilis* G.A.Klebs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	-	ind	b	-	-
174	**Euglena viridis* (O.F.Müller) Ehrenberg	-	-	1	-	-	-	-	-	-	-	-	1	1	1	P-B,S	eterm	st-str	-	mh	ind	i	-	-
175	*Eutreptia lanowii* Steuer	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	mh	-	-	-	-
176	*Lepocinclis acicularis* Francé	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
177	**Lepocinclis fusiformis* (H.J.Carter) Lemmermann	-	-	1	-	-	-	-	-	-	-	-	1	-	-	P	eterm	st-str	-	i	ind	b	-	-
178	*Lepocinclis marssonii* Lemmermann	-	-	1	-	-	-	-	-	-	-	-	-	-	-	P	-	st	-	-	-	b	-	-
179	**Lepocinclis ovum* (Ehrenberg) Lemermann	-	-	1	-	-	-	-	-	-	-	-	1	-	1	P	eterm	st	-	i	ind	a-b	-	-
180	**Lepocinclis* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P	warm	st	-	-	alf	-	-	-
181	**Lepocinclis spirogyroides* (Ehrenberg) Marin & Melkonian	-	-	1	-	-	-	-	-	-	-	-	1	1	1	P-B	-	st-str	-	i	ind	b	-	-
182	*Monomorphina pyrum* (Ehrenberg) Mereschkowski	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	eterm	st-str	-	i	ind	b	-	-
183	*Phacus acuminatus* Stokes	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	eterm	st-str	-	i	-	b-a	-	-
184	*Phacus alatus* G.A.Klebs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	st	-	i	ind	o	-	-
185	**Phacus ankylonoton* Pochmann	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	st	-	-	-	-	-	-
186	**Phacus caudatus* Hübner var. *caudatus*	-	-	-	-	-	-	-	-	-	-	-	1	-	1	P-B	eterm	st-str	-	i	alf	b	-	-
187	**Phacus caudatus* var. *minor* Drezepolski	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	st-str	-	-	ind	-	-	-
188	Phacus curvicauda Svirenko	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st	-	i	ind	b	-	-
189	*Phacus longicauda* (Ehrenberg) Dujardin	-	1	1	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st	-	i	ind	a-b	-	-
190	*Phacus orbicularis* K. Hübner	-	1	1	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st-str	-	i	ind	b	-	-
191	**Phacus pleuronectes* (O.F.Müller) Dujardin var. *pleuronectes*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	ind	b-a	-	-
192	**Phacus pleuronectes* var. *hyalinus* Klebs	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P	-	st-str	-	-	ind	-	-	-
193	**Phacus* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
194	*Phacus swirenkoi* Skvortzov	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	st-str	-	-	ind	-	-	-
195	*Phacus triqueter* (Ehrenberg) Dujardin	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st-str	-	i	-	b	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
196	*Strombomonas fluviatilis* (Lemmermann) Deflandre	-	-	1	-	-	-	-	-	-	-	-	-	-	-	P-B	eterm	st-str	-	i	ind	b	-	-
197	*Trachelomonas abrupta* Svirenko	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	eterm	-	-	-	-	b	-	-
198	*Trachelomonas allia* Drezepolski	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	eterm	-	-	-	-	b-o	-	-
199	*Trachelomonas bernardinensis* Vischer emend. Deflandre	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	eterm	st	-	-	-	b	-	-
200	*Trachelomonas caudata* (Ehrenberg) Stein	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	eterm	st-str	-	-	-	b	-	-
201	*Trachelomonas cervicula* A. Stokes	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	-	-	b	-	-
202	*Trachelomonas conradii* Skvortzov	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
203	*Trachelomonas curta* A.M.Cunha	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
204	*Trachelomonas granulata* Svirenko	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	st-str	-	-	ind	-	-	-
205	*Trachelomonas granulosa* Playfair	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	eterm	-	-	-	-	b	-	-
206	*Trachelomonas hispida* (Perty) F.Stein var. *hispida*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	eterm	st-str	-	i	-	b	-	-
207	**Trachelomonas hispida* var. *crenulatocollis* (Maskell) Lemmermann	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
208	**Trachelomonas hispida* var. *granulata* Playfair	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
209	*Trachelomonas intermedia* P.A.Dangeard	-	-	1	-	-	-	-	-	-	-	-	-	-	-	P-B	eterm	-	-	i	-	b	-	-
210	*Trachelomonas lacustris* Drezepolski	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	eterm	-	-	hb	-	o	-	-
211	*Trachelomonas oblonga* Lemmermann	-	-	1	-	-	-	-	-	-	-	-	-	1	1	P	eterm	st-str	-	i	-	b-a	-	-
212	*Trachelomonas rugulosa* F.Stein ex Deflandre	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	b	-	-
213	*Trachelomonas scabra* Playfair	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	eterm	st	-	-	-	b	-	-
214	**Trachelomonas volvocina* Ehrenberg var. *volvocina*	1	-	1	-	-	-	-	-	-	-	-	1	1	1	B	eterm	st-str	-	i	ind	b	-	-
215	**Trachelomonas volvocina* var. *subglobosa* Lemmermann	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	b	-	-
216	*Trachelomonas volvocinopsis* Svirenko	-	-	-	-	-	-	-	-	-	-	-	-	1	1	P	-	st-str	-	i	-	b	-	-
	Heterokontophyta																							
217	*Botrydiopsis arhiza* A.Borzí	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B,S	-	-	-	-	-	o	-	-
218	*Botrydiopsis eriensis* Snow	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B,S	-	st	-	-	-	-	-	-
219	*Botryochloris simplex* Pascher	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
220	*Bumilleriopsis peterseniana* Vischer & Pascher	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
221	*Bumilleriopsis terricola* Matwienko	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
222	*Dictyocha triacantha* Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
223	*Dinobryon sertularia* Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	i	-	o-a	-	-
224	*Distephanus speculum* (Ehrenberg) Haeckel	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
225	*Ducellieria chodatii* (Ducellier) Teiling	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
226	*Ellipsoidion regulare* Pascher	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
227	*Ellipsoidion solitare* (Geitler) Pascher	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
228	*Eustigmatos magnus* (J.B.Petersen) D.J.Hibberd	-	1	-	-	-	-	-	-	-	-	-	-	-	1	S	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
229	*Hydrurus foetidus* (Villars) Trevisan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	-	-	o-x	-	-
230	*Kephyrion boreale* Skuja	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	i	-	x	-	-
231	*Monallantus brevicylindrus* Pascher	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
232	*Monodus acuminata* (Gerneck) Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
233	*Ophiocytium cochleare* (Eichwald) A.Braun	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	-	i	-	o-b	-	-
234	*Ophiocytium parvulum* (Perty) A.Braun	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i	-	o	-	-
235	*Pleurochloris imitans* Pascher	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
236	*Pleurochloris inaequalis* Pascher	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
237	*Polyedriella irregularis* Pascher	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
238	*Tribonema aequale* Pascher	-	-	1	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	-	-	x-b	-	-
239	*Tribonema ambiguum* Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
240	*Tribonema elegans* Pascher	-	-	1	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	x	-	-
241	*Tribonema intermixtum* Pascher	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
242	*Tribonema minus* (Wille) Hazen	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	i	-	b-o	-	-
243	*Tribonema viride* Pascher	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	-	i	-	o	-	-
244	*Tribonema vulgare* Pascher	-	-	1	-	-	-	-	-	-	-	-	-	-	-	P-B	-	-	-	i	-	o-a	-	-
245	*Vaucheria* sp.	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
246	*Vaucheria synandra* Woronin	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
247	*Vischeria helvetica* (Vischer & Pascher) D.J.Hibberd	-	-	-	-	-	-	-	-	-	-	-	-	-	1	S	-	-	-	-	-	-	-	-
248	*Xanthonema monochloron* (Ettl) P.C.Silva	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
	Glaucophyta																							
249	*Glaucocystis caucasica* Tarnogradskij	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
250	*Glaucocystis nostochinearum* Itzigsohn	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
251	*Gloeochaete wittrockiana* Lagerheim	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	o	-	-
	Myzozoa																							
252	*Ceratium furca* (Ehrenberg) Claparéde & Lachmann	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
253	**Ceratium hirundinella* (O.F.Müller) Dujardin	-	1	-	-	-	-	-	-	-	-	1	1	-	1	P	-	st-str	-	i	-	o	-	-
254	*Cystodinium cornifax* (Schilling) Klebs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	-	-	o	-	-
255	*Dinophysis sacculus* Stein	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
256	*Dinophysis tripos* Gourret	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
257	*Exuviaella baltica* Lohmann	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
258	*Exuviaella caspica* Kiselev	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	*Gonyaulax spinifera* (Claparède et Lachmann) Diesing	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	*Gymnodinium fuscum* (Ehrenberg) F.Stein	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	o	-	-
261	**Gymnodinium* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
262	**Gymnodinium uberrimum* (G.J.Allman) Kofoid & Swezy	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	x-b	-	-
263	*Peridiniopsis penardiforme* (Lindemann) Bourrelly	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	st	-	-	-	o-b	-	-
264	**Peridiniopsis thompsonii* (Thompson) Bourrelly	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P	-	-	-	-	-	-	-	-
265	*Peridinium cinctum* (O.F.Müller) Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	i	-	b-o	-	-
266	*Prorocentrum cordatum* (Ostenfeld) Dodge	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
267	*Protoperidinium divergens* (Ehrenberg) Balech	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
268	*Protoperidinium globosum* (P.A.Dangeard) E. Balech	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bacillariophyta																							
269	*Achnanthes brevipes* C.Agardh	1	1	-	-	-	1	-	-	-	-	1	-	-	-	B	-	-	-	hl	alf	-	-	-
270	*Achnanthes laevis* Østrup	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	str	-	hb	neu	o-b	ats	ot
271	**Achnanthes lanceolata* f. *capitata* O.F.Müller	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	ind	x-b	-	-
272	**Achnanthes lanceolata* f. *ventricosa* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	warm	-	sx	i	alf	x-b	-	-
273	*Achnanthes lanceolata* var. *haynaldii* (Schaarschmidt) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	warm	st-str	sx	i	alf	o-x	ate	o-e
274	**Achnanthes lanceolata* var. *rostrata* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	i	alf	a	ate	e
275	**Achnanthes linearis* (W.Smith) Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	1	B	-	-	es	i	ind	x-o	-	-
276	**Achnanthidium affine* (Grunow) Czarnecki	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	-	-	b	-	-
277	*Achnanthidium coarctatum* Brébisson ex W.Smith	-	-	-	-	-	-	-	-	-	1	-	-	-	-	B	-	ae	-	-	neu	o-a	-	-
278	*Achnanthidium exilis* (Kützing) Round & Bukhtiyarova	-	-	-	-	-	-	-	-	-	-	-	-	1	1	B	-	str	sx	i	alb	o-a	ats	o-m
279	**Achnanthidium minutissimum* (Kützing) Czarnecki	-	-	-	-	-	-	-	1	-	-	-	1	-	1	B	eterm	st-str	es	i	alf	b	ate	o-e
280	**Achnanthidium pyrenaicum* (Hust.) H.Kobayasi	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	-	-	b-a	-	-
281	*Actinocyclus octonarius* Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
282	*Adlafia minuscula* (Grunow) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	es	i	alf	b-a	-	ot
283	*Amphipleura pellucida* (Kützing) Kützing	1	-	-	-	-	1	-	-	-	-	-	-	1	1	B	-	st	-	i	alf	a-b	ate	o-m
284	*Amphora coffeaeformis* (C.Agardh) Kützing	1	1	-	-	-	-	-	1	-	-	-	-	-	-	B	-	st-str	-	mh	alf	a	ate	e
285	*Amphora commutata* Grunow in van Heurck	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	hl	-	-	-	e
286	*Amphora mongolica* E.V.Østrup	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	i	ind	-	-	-
287	**Amphora normanii* Rabenhorst	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
288	**Amphora ovalis* (Kützing) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	sx	i	alf	a-b	ate	e
289	**Amphora pediculus* (Kützing) Grunow ex A.Schmidt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	temp	st	sx	i	alf	o-a	ate	e
290	**Amphora perpusilla* (Grunow) Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	temp	st	es	i	alf	-	-	-
291	**Anomoeoneis sphaerophora* E.Pfitzer	-	-	-	-	-	1	-	-	-	-	-	1	-	-	P-B	warm	st-str	-	hl	alb	x-b	ate	e
292	*Asterionella formosa* Hassall	-	1	-	-	-	-	-	-	-	-	1	-	-	-	P	-	st-str	sx	i	alf	o	ate	me
293	*Aulacoseira granulata* (Ehrenberg) Simonsen	1	1	-	-	-	-	-	1	-	-	1	-	-	1	P-B	temp	st-str	es	i	alf	b-a	ate	e
294	*Aulacoseira italica* (Ehrenberg) Simonsen	1	1	-	-	-	-	-	-	-	-	-	-	1	-	P-B	cool	st-str	es	i	neu	o-a	ate	me
295	*Bacillaria paradoxa* J.F.Gmelin	1	1	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	-	es	mh	ind	o	ate	e
296	*Bacillaria socialis* (Gregory) Ralfs	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
297	*Biddulphia mobiliensis* (J.W.Bailey) Grunow	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
298	**Brachysira serians* (Brébisson ex Kützing) Round & D.G.Mann	-	-	-	-	-	-	-	-	-	-	1	1	-	1	B	-	st-str	-	hb	acf	x-o	ats	ot
299	**Caloneis alpestris* (Grunow) Cleve	-	-	-	-	-	-	-	1	-	-	-	1	-	1	B	-	str	-	i	alf	o	ats	m
300	*Caloneis amphisbaena* (Bory de Saint Vincent) Cleve	-	1	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	hl	alf	o	ate	e
301	**Caloneis bacillum* (Grunow) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	i	alf	o	ats	me
302	**Caloneis molaris* (Grunow) Krammer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	i	neu	-	-	-
303	*Caloneis permagna* (J.W.Bailey) Cleve	-	1	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	hl	alf	-	-	e
304	*Caloneis schumanniana* (Grunow) Cleve	-	-	-	-	-	1	-	-	-	-	-	-	-	-	P-B	-	st-str	es	i	alf	o-x	ats	m
305	**Caloneis silicula* (Ehrenberg) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st	sp	i	alf	x	ats	me
306	**Caloneis* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
307	**Caloneis ventricosa* (Ehrenberg) F.Meister	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st	sp	i	alf	x	-	-
308	*Campylodiscus noricus* Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	i	alf	o-b	-	me
309	*Cavinula pseudoscutiformis* (Hustedt) D.G.Mann & A.J.Stickle	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	st-str	sx	i	ind	o	ats	me
310	*Chaetoceros curvisetus* Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
311	*Chaetoceros lauderi* Ralfs	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
312	*Chaetoceros lorenzianus* Grunow	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
313	*Chaetoceros similis* Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
314	*Chaetoceros simplex* Ostenfeld	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	*Chaetoceros socialis* H.S.Lauder	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
316	*Chaetoceros subtilis* Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	mh	alb	-	-	-
317	*Cocconeis disculus* (Schumann) Cleve	-	1	-	-	-	-	-	1	-	-	-	-	-	-	B	-	st	es	i	alf	x-o	-	-
318	**Cocconeis fluviatilis* J.H.Wallace	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
319	**Cocconeis neodiminuta* Krammer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	temp	st-str	sx	i	alf	x	-	-
320	**Cocconeis pediculus* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	sx	i	alf	o-a	ate	e
321	**Cocconeis placentula* Ehrenberg var. *placentula*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st-str	es	i	alf	o-b	ate	e
322	**Cocconeis placentula* var. *euglypta* (Ehrenberg) Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	temp	st-str	sx	i	alf	b	ate	e
323	**Cocconeis placentula* var. *intermedia* (Héribaud & M.Peragallo in Héribaud) Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	i	alf	b	ate	e
324	**Cocconeis placentula* var. *lineata* (Ehrenberg) van Heurck	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	sx	i	alf	x-o	ate	e
325	*Cocconeis scutellum* Ehrenberg	1	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	hl	-	-	-	-
326	**Cocconeis* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
327	*Coscinodiscus concinnus* W.Smith	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
328	*Cosmioneis pusilla* (W.Smith) D.G.Mann & A.J.Stickle	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	str	sp	hl	ind	o-b	ats	-
329	**Craticula cuspidata* (Kutzing) D.G.Mann	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	i	alf	o	ate	e

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
330	*Ctenophora pulchella* (Ralfs ex Kützing) D.M.Williams & Round	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	st-str	-	hl	alf	b	ate	e
331	*Cyclotella choctawhatcheeana* Prasad	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	hl	-	-	-	-
332	*Cyclotella comta* (Ehrenberg) Kützing	-	-	-	-	-	-	-	-	-	-	1	-	1	-	P	-	st	sx	i	alf	b-o	-	-
333	*Cyclotella kuetzingiana* Thwaites	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st	sp	hl	ind	b	-	-
334	**Cyclotella meneghiniana* Kützing	1	1	-	-	1	-	-	-	-	-	-	1	-	1	P-B	temp	st	sp	hl	alf	o-a	hne	e
335	*Cyclotella ocellata* Pantocsek	-	-	-	-	-	-	-	-	1	-	-	-	-	-	P-B	-	st	es	i	ind	o	ats	me
336	**Cyclotella operculata* (C.Agardh) Brébisson	-	-	-	-	-	-	-	1	-	-	-	1	-	-	P	-	st	-	i	ind	o	-	-
337	*Cymatopleura elliptica* (Brébisson) W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	alf	b-o	ate	e
338	**Cymatopleura solea* (Brébisson) W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	alf	o	ate	e
339	**Cymbella aequalis* W.Smith	-	-	-	-	-	1	-	-	-	-	-	1	-	1	B	-		-	i	-	o	-	-
340	**Cymbella affinis* Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	sx	i	alf	b-o	ats	e
341	**Cymbella amphicephala* Näegeli	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	sx	i	ind	o-b	ats	o-m
342	**Cymbella angustata* (W.Smith) Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	i	ind	o	ats	ot
343	**Cymbella aspera* (Ehrenberg) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	es	i	alf	b-o	ats	o-e
344	**Cymbella cesatii* var. *paradoxa* Geitler	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
345	**Cymbella cistula* (Hemprich & Ehrenberg) O.Kirchner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	sx	i	alf	o-b	ats	e
346	*Cymbella cuspidata* Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	-	-	i	ind	o-a		
347	**Cymbella cymbiformis* C.Agardh	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	str	sx	i	neu	o	ats	o-m
348	**Cymbella delicatula* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	sx	i	alf	o	ats	ot
349	*Cymbella ehrenbergii* Kützing	-	-	-	-	-	-	-	1	-	-	-	-	-	1	B	-	st-str	-	i	alb	b-o	ats	m
350	*Cymbella gregorii* Ralfs	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
351	**Cymbella helvetica* Kützing var. *helvetica*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	-	i	alf	o-a	-	-
352	**Cymbella helvetica* var. *balatonis* (Grunow) Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	alf	-	-	-
353	**Cymbella helvetica* var. *curta* Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	alf	-	-	-
354	**Cymbella hustedtii* Krasske	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	-	i	alf	o	ats	o-m
355	**Cymbella hybrida* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	1	B	-	-	-	hl	alb	-	-	-
356	*Cymbella laevis* Nägeli	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	cool	-	sx	i	ind	-	-	-
357	*Cymbella lanceolata* (Ehrenberg) Kirchner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	sx	i	alf	o	ats	o-e
358	*Cymbella lata* Grunow ex Cleve var. *lata*	-	1	-	-	-	-	-	-	-	-	-	-	1	1	B	-	-	sx	i	ind	-	-	-
359	**Cymbella lata* var. *minor* K.Mölder	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	ind	-	-	-
360	*Cymbella leptoceros* (Ehrenberg) Kützing	-	1	-	-	-	-	-	1	-	-	1	-	-	-	B	temp	st	sx	i	alb	o	ats	ot
361	**Cymbella naviculiformis* (Auerswald) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	es	i	ind	o	ate	e
362	**Cymbella parva* (W.Smith) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	-	-	-	-	-
363	*Cymbella scotica* W.Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
364	**Cymbella* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
365	*Cymbella tumida* (Brébisson in Kützing) van Heurck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	str	sx	i	alf	x	ats	me
366	*Cymbella turgidula* Grunow in A. Schmidt et al.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	es	-	ind	-	-	-
367	**Cymbella ventricosa* C. Agardh var. *ventricosa*	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	i	ind	o-b	-	-
368	**Cymbella ventricosa* var. *ovata* Prescott	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	i	ind	o-b	-	-
369	**Denticula elegans* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	1	-	B	-	-	-	i	alf	o	-	-
370	**Denticula tenuis* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	sx	i	alb	o-a	ats	m
371	*Diadesmis perpusilla* (Grunow) D.G.Mann	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	-	-	i	-	b	-	-
372	**Diatoma hiemale* (Roth) Heiberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	cool	st-str	sx	hb	ind	b-o	ats	-
373	**Diatoma mesodon* (Ehrenberg) Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	cool	st-str	sx	hb	neu	o-b	ats	m
374	**Diatoma moniliformis* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	-	-	-	b-a	-	-
375	**Diatoma* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
376	*Diatoma tenue* C.Agardh	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st	sx	hl	ind	b-a	ate	e
377	*Diatoma vulgare* Bory de Saint-Vincent var. *vulgare*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	sx	i	ind	b-a	ate	me
378	**Diatoma vulgare* var. *productum* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	es	i	alf	o-b	ate	me
379	*Diatomella balfouriana* Greville	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	b	-	-
380	**Didymosphenia geminata* (Lyngbye) M.Schmidt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	sx	i	ind	o-a	-	-
381	*Diploneis gemmatula* (Grunow) Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
382	*Diploneis ovalis* (Hilse) Cleve	-	-	-	-	-	1	-	-	-	-	1	1	1	-	B	-	str	sp	i	alb	b	ats	-
383	**Diploneis pseudovalis* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	-	alf	-	-	-
384	*Diploneis subadvena* Hustedt	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	**Diploneis subovalis* Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	temp	st-str	-	i	ind	-	-	-
386	**Encyonema alpinum* (Grunow) D.G.Mann	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
387	*Encyonema caespitosum* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	sx	-	-	b-a	-	-
388	**Encyonema elginense* (Krammer) D.G.Mann	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st	sx	hb	acf	-	-	-
389	**Encyonema gracile* Rabenhorst	1	1	-	-	-	-	-	-	-	-	-	1	1	1	B	-	-	sx	hb	ind	x	-	-
390	**Encyonema hebridica* Grunow ex Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	acf	-	-	-
391	*Encyonema minutum* (Hilse in Rabenhorst) D.G.Mann in Round, Crawford & Mann	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	sx	i	ind	x-o	-	-
392	*Encyonema prostratrum* (Berkeley) Kützing	1	1	-	-	-	-	-	-	-	-	-	-	1	1	B	-	-	es	i	alb	o-a	-	-
393	**Encyonopsis microcephala* (Grunow) Krammer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	i	alf	b	ats	me
394	*Entomoneis alata* (Ehrenberg) Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st	-	mh	alf	-	-	-
395	*Entomoneis paludosa* (W.Smith) Reimer	1	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	hl	neu	o	-	-
396	*Eolimna minima* (Grunow) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	es	hl	ind	x	hne	e
397	**Epithemia adnata* (Kützing) Brébisson	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st	sx	i	alb	b-a	ats	me
398	*Epithemia argus* (Ehrenberg) Kützing	-	-	-	-	-	-	-	1	-	-	-	-	-	-	P-B	-	st-str	es	i	ind	o	-	m
399	*Epithemia sorex* Kützing	-	1	-	-	1	-	-	-	-	-	1	-	1	1	B	temp	st	sx	i	alf	o-a	ats	e

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
400	*Epithemia turgida* (Ehrenberg) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st	sx	i	alf	o	ats	me
401	**Epithemia zebra* var. *saxonica* (Kützing) Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	temp	-	-	i	alb	b-o	-	-
402	**Eucocconeis flexella* (Kützing) Meister	-	-	-	-	-	-	-	-	-	-	-	1	1	-	B	-	-	sx	mh	ind	o	-	-
403	**Eunotia alpina* (Nägeli) Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	sx	hb	acf	b-o	-	-
404	*Eunotia arcus* Ehrenberg	-	1	-	-	-	1	-	-	-	-	-	-	1	1	B	-	-	-	i	acf	x-b	ats	o-m
405	*Eunotia bigibba* Kützing	-	-	-	-	-	-	-	-	-	1	1	-	-	1	B	-	-	-	i	acf	x	-	-
406	**Eunotia bilunaris* (Ehrenberg) Schaarschmidt	-	-	-	-	-	-	-	-	-	1	-	1	1	-	B	temp	st-str	es	i	acf	b	ate	o-e
407	*Eunotia cristagalli* Cleve	-	-	-	-	-	-	-	-	-	1	1	-	-	-	B	-	-	-	i	acf	-	-	-
408	*Eunotia diodon* Ehrenberg	-	-	-	-	-	-	-	-	-	1	-	-	1	-	B	cool	st	-	i	acf	o-x	ats	ot
409	*Eunotia exigua* (Brébisson ex Kützing) Rabenhorst	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	st-str	es	hb	acf	o-b	ate	o-e
410	**Eunotia exigua* var. *compacta* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	-	-	-	-
411	*Eunotia faba* (Ehrenberg) Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	temp	st	sx	i	alf	o	ats	o-m
412	*Eunotia fallax* A.Cleve	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	str	-	hb	acf	o	ats	ot
413	*Eunotia glacialis* Meister	-	-	-	-	-	-	-	-	-	-	-	-	1	1	B	-	str	-	hb	acf	p	ats	o-m
414	**Eunotia monodon* Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	-	hb	acf	b-o	ats	ot
415	*Eunotia muscicola* Krasske	-	-	-	-	-	-	-	-	-	1	-	-	-	-	B	-	-	sx	-	acf	-	-	-
416	*Eunotia parallela* Ehrenberg	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	str	-	i	acf	b-o	ats	ot
417	**Eunotia pectinalis* (Kützing) Rabenhorst	1	-	-	-	-	-	-	-	-	-	-	1	-	1	B	-	str	sx	hb	acf	x-b	ate	m
418	**Eunotia praerupta* Ehrenberg var. *praerupta*	-	-	-	-	-	-	-	-	-	1	1	1	1	-	B	cool	st-str	sx	hb	acf	b	ats	o-m
419	**Eunotia praerupta* var. *curta* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	-	acf	-	-	-
420	*Eunotia suecica* A.Cleve	-	-	-	-	-	-	-	-	-	-	1	-	-	-	P-B	-	str	sx	i	acf	o-b	ats	o-m
421	**Eunotia tautoniensis* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
422	**Eunotia tenella* (Grunow) Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	hb	acf	o-b	ats	ot
423	**Eunotia vanheurckii* R.M.Patrick	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
424	*Fallacia pygmaea* (Kützing) A.J.Stickle & D.G.Mann in Round, Crawford & Mann	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	es	mh	alf	b-o	hne	e
425	*Fragilaria bituminosa* Pantocsek	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i	-	-	-	-
426	*Fragilaria capucina* Desmazières var. *capucina*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	es	i	neu	o	-	m
427	**Fragilaria capucina* subsp. *rumpens* (Kützing) H.Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	i	alf	o	-	-
428	**Fragilaria capucina* var. *amphicephala* (Kützing) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	sp	i	alf	x	-	o-m
429	**Fragilaria capucina* var. *austriaca* (Grunow) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	i	alf	o	-	-
430	**Fragilaria capucina* var. *vaucheriae* (Kützing) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P,Ep	-	st-str	sx	i	alf	o-b	ate	e
431	*Fragilaria crotonensis* Kitton	1	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	st	es	hl	alf	a-b	ate	m
432	**Fragilaria danica* (Kützing) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	temp	-	es	i	alf	x-b	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
433	**Fragilaria famelica* (Kützing) Lange-Bertalot	-	-	-	-	-	1	-	-	-	-	-	1	-	-	Ep	-	str	-	hl	acf	b-o	ats	m
434	*Fragilaria lapponica* Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	es	i	ind	o	-	-
435	**Fragilaria virescens* var. *subsalina* Grunov	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	hl	alf	-	-	-
436	*Fragilariforma bicapitata* (Meyer) D.M.Williams & Round	-	-	-	-	1	-	-	-	-	-	-	-	-	-	B	-	str	-	hb	ind	o-b	ats	o-e
437	**Fragilariforma virescens* (Ralfs) D.M.Williams & Round	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st	es	i	neu	o	ats	o-m
438	*Frustulia rhomboides* (Ehrenberg) De Toni	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st	es	hb	acf	x-b	ats	ot
439	*Frustulia vulgaris* (Thwaites) De Toni	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st	es	i	alf	x-b	ate	me
440	*Gomphonema acuminatum* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st	es	i	alf	x-b	ats	e
441	*Gomphonema affine* Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st	es	-	-	o-b	-	-
442	**Gomphonema angustatum* (Kützing) Rabenhorst var. *angustatum*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	es	i	alf	b	-	-
443	**Gomphonema angustatum* var. *linearis* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	ind	-	-	-
444	**Gomphonema angustatum* var. *sarcophagus* (Gregory) Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	sx	i	alf	-	-	-
445	*Gomphonema augur* Ehrenberg	1	1	-	-	-	-	-	1	-	-	1	-	-	-	B	-	str	es	i	ind	b	ats	me
446	*Gomphonema clavatum* Ehrenberg	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	str	es	i	ind	o-b	ats	me
447	**Gomphonema dichotomum* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	es	i	ind	o	ats	me
448	**Gomphonema gracile* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st	es	i	alf	b-o	ats	m
449	**Gomphonema gracile* var. *naviculacea* (W.Sm.) Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	ind	-	-	-
450	**Gomphonema intricatum* Kützing var. *intricatum*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	es	i	ind	x-o	-	-
451	**Gomphonema intricatum* var. *pumilum* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	es	i	ind	x-o	-	-
452	**Gomphonema intricatum* var. *vibrio* (Ehrenberg) Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	-	-	-	-
453	**Gomphonema olivaceum* (Hornemann) Brébisson var. *olivaceum*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	es	i	alf	b-a	-	-
454	**Gomphonema olivaceum* var. *calcareum* (Cleve) Van Heruck	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	i	alf	b	ate	-
455	**Gomphonema olivaceum* var. *minutissimum* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	-	i	alf	o	ats	o-m
456	**Gomphonema parvulum* (Kützing) Kützing var. *parvulum*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	str	es	i	ind	x	hne	e
457	**Gomphonema parvulum* var. *subellipticum* Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
458	**Gomphonema productum* (Grunow) Lange-Bertalot & Reichardt in Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	i	alf	b	ate	o-m
459	**Gomphonema sphaerophorum* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	i	alf	-	-	-
460	*Gomphonema subtile* Ehrenberg	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	str	es	i	ind	o	ats	o-m
461	**Gomphonema tergestinum* (Grunow) Fricke	-	-	-	-	-	1	-	-	-	-	-	1	-	-	B	-	str	es	i	alf	x	ats	o-m
462	**Gomphonema truncatum* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	es	i	alf	o-x	ats	me
463	**Gomphonema vibrio* var. *bohemicum* Reichelt & Fricke	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	es	i	ind	o	-	ot
464	*Grammatophora marina* (Lyngbye) Kützing	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
465	*Grammatophora oceanica* Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
466	*Grunowia sinuata* (Thwaites) Rabenhorst	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	-	i	ind	b-a	ats	m
467	**Grunowia tabellaria* (Grunow) Rabenhorst	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	sx	i	ind	o-b	ats	m
468	**Gyrosigma acuminatum* (Kützing) Rabenhorst	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	cool	st-str	-	i	alf	o-x	ate	e
469	**Gyrosigma attenuata* (Kützing) Rabenhorst	1	-	-	-	-	-	-	-	-	-	-	1	-	1	P-B	-	st	-	i	alf	x	ate	e
470	*Gyrosigma distortum* (W.Smith) Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	es	mh	ind	-	-	-
471	**Gyrosigma nodiferum* (Grunow) Reimer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	i	-	o-b	-	-
472	**Gyrosigma scalproides* (Rabenhorst) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	es	i	alf	x-o	-	-
473	**Gyrosigma* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
474	**Gyrosigma spencerii* (J.W.Bailey ex Quekett) Griffith & Henfrey var. *spencerii*	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	mh	alf	o	-	-
475	**Gyrosigma spencerii* var. *curvula* (Grunow) C.W.Reimer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
476	**Hannaea arcus* (Ehrenberg) R.M.Patrick var. *arcus*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	es	i	alf	o	-	-
477	**Hannaea arcus* var. *amphioxys* (Rabenhorst) Patrick	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
478	**Hantzschia amphioxys* (Ehrenberg) Grunow in Cleve & Grunow var. *amphioxys*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	i	neu	b-o	ate	o-e
479	**Hantzschia amphioxys* var. *vivax* Grunow in Cleve et Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	hl	alb	-	-	-
480	**Hantzschia* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
481	**Hantzschia virgata* var. *intermedia* (Grunow) Round	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	hl	-	-	-	-
482	*Haslea spicula* (Hickie) Lange-Bertalot	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	-	-	mh	-	-	-	-
483	*Hippodonta capitata* (Ehrenberg) Lange-Bertalot, Metzeltin & Witkowski	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	hl	alf	o-b	ate	me
484	*Lemnicola hungarica* (Grunow) F.E.Round & P.W.Basson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	st	es	mh	alf	o-a	ate	he
485	*Licmophora hastata* Mer.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
486	*Licmophora oedipus* (Kützing) Grunow	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
487	*Luticola mutica* (Kützing) D.G.Mann	-	1	-	-	-	-	-	-	-	-	1	-	1	1	B,S	-	st-str	sp	i	ind	o	ate	e
488	*Mastogloia elliptica* (C.Agardh) Cleve in Schmidt et al.	-	-	-	-	-	1	-	-	-	-	-	-	-	-	B	-	-	-	mh	alf	-	-	-
489	*Mastogloia grevillei* W.Smith	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	i	alf	o	-	e
490	*Mastogloia smithii* Thwaites ex W.Smith	1	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	sx	mh	alf	b	-	-
491	*Melosira binderana* Kützing	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	i	ind	o-a	-	-
492	*Melosira dubia* C.G. Kützing	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
493	*Melosira moniliformis* (O.F.Müller) C.Agardh	1	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	str	-	hl	-	-	-	-
494	*Melosira nummuloides* C.Agardh	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	sp	mh	-	-	-	-
495	*Melosira varians* C.Agardh	1	-	-	-	-	1	-	1	-	-	-	-	-	1	P-B	temp	st-str	es	hl	alf	a-b	hne	e
496	**Meridion anceps* (Ehrenberg) D.M.Williams	-	-	-	-	1	-	-	-	-	-	1	1	-	-	P-B	cool	st-str	sx	hl	alf	b	-	-
497	**Meridion circulare* (Greville) C.Agardh var. *circulare*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	es	i	alf	o-b	ate	o-e
498	**Meridion circulare* var. *constricta* (Ralfs) Van Heurck	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	sx	hb	alf	x	ate	o-e

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
499	*Navicula amphibola* Cleve	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	cool	str	-	i	ind	o	ats	o-m
500	**Navicula capitatoradiata* Germain	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	-	i	alf	b	ate	e
501	**Navicula cari* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	-	es	i	ind	b-a	-	o-e
502	**Navicula cincta* (Ehrenberg) Ralfs	-	-	-	-	-	-	-	1	-	-	-	1	-	-	B	warm	st-str	es	hl	alf	x-o	ate	e
503	*Navicula dicephala* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	i	ind	o-a	-	-
504	*Navicula directa* (W.Smith) Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
505	*Navicula delginensis* O'Meara	-	-	-	-	-	1	-	-	-	-	-	-	-	1	B	-	st-str	sx	i	alf	x-o	ate	e
506	*Navicula exigua* Gregory	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	es	i	alf	x-o	ats	e
507	*Navicula exilis* Kützing	-	-	-	-	-	-	-	-	-	-	1	-	1	-	B	-	-	es	i	alb	x-b	-	-
508	**Navicula gottlandica* Grunow	-	1	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
509	**Navicula gregaria* Donkin	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st-str	es	i	alf	a	ate	o-e
510	*Navicula grimmei* Krasske	-	-	-	-	-	1	-	-	-	-	-	1	1	-	B	-	-	-	i	acf	-	-	-
511	*Navicula hasta* Pantocsek	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	-	es	-	ind	-	-	-
512	*Navicula kotschyi* Grunow	-	-	-	-	-	-	-	-	-	-	1	-	1	-	B	warm	st-str	-	i	acf	o	-	-
513	**Navicula menisculus* Schumann	-	1	-	-	-	-	-	-	-	-	-	1	1	-	B	-	st-str	es	i	alf	x-b	ate	e
514	*Navicula oblonga* (Kützing) Kützing	-	-	-	-	-	1	-	-	-	-	-	-	-	-	B	-	st-str	sx	i	alf	b	ate	e
515	*Navicula pelliculosa* (Brébisson ex Kützing) Hilse	-	1	-	-	-	-	-	-	-	-	-	-	-	1	B	-	ae	es	i	alf	o-b	-	o-m
516	**Navicula peregrina* (Ehrenberg) Kützing	-	-	-	-	-	1	-	-	-	-	-	1	-	-	B	-	-	es	mh	alf	-	-	e
517	*Navicula placentula* (Ehrenberg) Grunow	1	-	-	-	-	-	-	-	-	-	1	-	-	-	B	temp	st-str	sx	i	alf	x-b	ate	e
518	*Navicula platystoma* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	i	ind	-	-	-
519	**Navicula radiosa* Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	i	ind	o	ate	me
520	*Navicula reinhardtii* (Grunow) Grunow	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	st	sx	i	alf	o-a	ate	e
521	**Navicula rhynchocephala* Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	hl	alf	b	ate	o-e
522	**Navicula rostellata* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	1	-	B	-	st-str	es	i	alf	a-b	ate	e
523	*Navicula rotaeana* (Rabenhorst) Grunow	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	st	-	i	acf	b-o	-	-
524	*Navicula semen* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	i	ind	o	-	ot
525	**Navicula slesvicensis* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	sx	hl	alf	a-b	ate	e
526	**Navicula* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
527	*Navicula thomasii* Schumann	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
528	**Navicula tripunctata* (O.F.Müller) Bory var. *tripunctata*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	es	i	alf	b	ate	e
529	**Navicula tripunctata* var. *schizonemoides* (Van Heurck) R.M.Patrick	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	mh	alf	-	-	e
530	**Navicula trivialis* Lange-Bertalot	-	1	-	-	1	-	-	-	-	-	-	1	1	-	B	-	st-str	es	i	alf	x-b	ate	e
531	**Navicula veneta* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	hl	alf	x-o	ate	e
532	*Navicula viridula* (Kützing) Kützing var. *viridula*	-	-	-	-	-	-	-	1	-	-	-	-	-	-	B	-	st-str	es	hl	alf	o	ate	e

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
533	**Navicula viridula* var. *avenacea* (Brébisson) Van Heurck	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	hl	-	-	-	-
534	*Navicula zeta* Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	hl	-	-	-	-
535	**Neidium affine* (Ehrenberg) Pfizer	-	1	-	-	1	1	-	1	-	1	1	1	1	1	B	-	str	-	i	alf	o	ats	me
536	**Neidium ampliatum* (Ehrenberg) Krammer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st	es	hb	ind	-	-	o-m
537	*Neidium binodis* (Ehrenberg) Hustedt	-	-	-	-	-	1	-	-	-	-	-	-	1	-	B	-	str	-	hb	ind	o	ats	me
538	*Neidium bisulcatum* (Lagerstedt) Cleve	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	str	es	hb	alf	o-b	ats	ot
539	**Neidium dubium* (Ehenberg) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	-	i	alf	x	ats	me
540	**Neidium iridis* (Ehrenberg) Cleve var. *iridis*	-	-	-	-	-	-	-	-	-	1	1	1	1	1	B	-	st	es	hb	ind	o-x	ats	m
541	**Neidium iridis* var. *amphigomphus* (Ehrenberg) Mayer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	hb	acf	-	-	-
542	**Neidium iridis* var. *diminutum* (Pant.) Wislouch et Kolbe	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	ind	o	-	-
543	**Neidium productum* (W. Smith) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	temp	-	sx	i	ind	o-b	ats	
544	**Neidium* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
545	*Nitzschia acicularis* (Kützing) W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	-	es	i	alf	o-b	hce	e
546	**Nitzschia amphibia* Grunow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B,S	temp	st-str	sp	i	alf	o	hne	e
547	**Nitzschia austriaca* Hustedt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	sp	hl	alf	b	hce	e
548	**Nitzschia clausii* Hantzsch	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	es	mh	acf	o-a	ate	e
549	*Nitzschia communis* Grunow	-	1	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	sp	i	alf	o	hce	e
550	**Nitzschia commutata* Grunow in Cleve & Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	mh	-	-	-	-
551	**Nitzschia dissipata* (Kützing) Grunow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	sx	i	alf	x	ate	me
552	*Nitzschia filiformis* (W.Smith) Hustedt	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	st-str	es	hl	alf	x	hne	e
553	**Nitzschia fonticola* (Grunow) Grunow in Van Heurck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	-	i	alf	o-b	ate	me
554	**Nitzschia gracilis* Hantzsch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st-str	sp	i	ind	o-x	-	m
555	**Nitzschia hantzschiana* Rabenhorst	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	i	alf	o-x	ats	m
556	**Nitzschia heufleriana* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	sp	i	alf	o-b	-	-
557	**Nitzschia linearis* (Agardh) W.Smith var. *linearis*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	i	alf	x	ate	me
558	*Nitzschia linearis* var. *subtilis* (Grunow) Hustedt	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	es	i	ind	o	-	-
559	*Nitzschia linearis* var. *tenuis* (W.Smith) Grunow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	sp	i	ind	o-b	-	-
560	**Nitzschia lorenziana* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	mh	-	-	-	-
561	*Nitzschia macilenta* W.Gregory	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	hl	-	-	-	-
562	*Nitzschia microcephala* Grunow in Cleve & Möller	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	st-str	sx	hl	acf	o-b	hce	e
563	*Nitzschia obtusa* W.Smith	-	-	-	-	-	-	-	-	-	-	-	1	1	-	B	-	-	es	mh	-	b	-	-
564	**Nitzschia palea* (Kützing) W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	-	sp	i	ind	o-x	hce	he
565	*Nitzschia pusilla* Grunow	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B,S	-	st-str	es	i	neu	x	ate	o-e
566	*Nitzschia reversa* W.Smith	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	hl	-	-	-	-
567	*Nitzschia scalaris* (Ehrenberg) W.Smith	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	mh	alf	-	-	e

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
568	*Nitzschia sigma* (Kützing) W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	mh	ind	a	ate	e
569	**Nitzschia sigmoidea* (Nitzsch) W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	alf	o	ate	e
570	**Nitzschia* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
571	**Nitzschia sublinearis* Hustedt	-	1	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	-	es	i	alf	o-b	-	-
572	*Nitzschia tenuirostris* Manguin	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
573	**Nitzschia thermalis* Kützing var. *thermalis*	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P	-	-	es	i	ind	x	-	-
574	**Nitzschia thermalis* var. *minor* Hilse	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	-	acf	o	-	-
575	*Nitzschia tryblionella* Hantzsch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	-	hl	alf	o	ate	e
576	**Nitzschia umbonata* (Ehrenberg) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	1	1	P	-	st-str	es	-	-	b-o	-	-
577	**Nitzschia vermicularis* (Kützing) Hantzsch in Rabenhorst	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	-	i	alf	o	-	o-e
578	*Nitzschia vitrea* G.Norman	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	-	-	mh	alf	o-b	-	e
579	*Odontella aurita* (Lyngbye) C.Agardh	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
580	*Paralia sulcata* (Ehrenberg) Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
581	*Parlibellus cruciculus* (W.Smith) Witkowski, Lange-Bertalot & Metzeltin	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	mh	ind	-	-	-
582	*Peronia heribaudii* Brun & Peragallo	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
583	*Pinnularia alpina* W.Smith	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	i	acf	o	-	ot
584	*Pinnularia appendiculata* (C.Agardh) Cleve	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	str	es	i	ind	x	ats	o-m
585	**Pinnularia borealis* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	ae	es	i	ind	o-b	ate	o-m
586	**Pinnularia brebissonii* var. *acuta* Cleve-Euler	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	es	i	ind	o-x	-	e
587	*Pinnularia brevicostata* Cleve	-	-	-	-	-	-	-	-	-	1	-	-	1	-	B	cool	-	-	i	ind	o	-	ot
588	*Pinnularia dactylus* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	st-str	-	hb	acf	o	-	ot
589	*Pinnularia divergens* W.Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	st	-	i	ind	o-b	-	ot
590	*Pinnularia divergentissima* (Grunow) Cleve	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i	ind	o	-	ot
591	*Pinnularia gentilis* (Donkin) Cleve	-	-	-	-	-	-	-	-	-	1	-	-	1	-	B	-	str	-	i	ind	o	-	m
592	**Pinnularia gibba* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	es	i	ind	o-b	ate	o-e
593	*Pinnularia globiceps* W.Gregory	-	-	-	-	-	1	-	-	-	-	-	-	1	-	B	-	-	-	i	acf	-	-	-
594	*Pinnularia hemiptera* (Kützing) Cleve	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	str	-	i	acf	o	-	ot
595	*Pinnularia intermedia* (Lagerstedt) Cleve	-	1	-	-	-	-	-	-	-	1	-	-	-	-	B	-	st	-	i	ind	x	-	o-e
596	**Pinnularia interrupta* f. *minutissima* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	-	-	-	-
597	*Pinnularia interrupta* W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	sp	i	acf	b-o	ats	o-m
598	*Pinnularia lata* (Brébisson) Rabenhorst	-	-	-	-	-	-	-	-	-	1	1	-	-	-	B	-	str	-	i	acf	o	-	ot
599	*Pinnularia legumen* Ehrenberg	-	-	-	-	-	-	-	-	-	1	-	-	-	-	B	-	-	-	hb	neu	x	ats	ot
600	**Pinnularia major* (Kützing) Rabenhorst var. *major*	-	-	-	-	-	1	-	-	-	1	1	1	1	1	B	temp	st-str	-	i	ind	x	ate	me
601	**Pinnularia major* var. *lacustris* F.Meister	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	i	-	-	-	-
602	**Pinnularia mesolepta* (Ehrenberg) W.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	-	i	ind	o-x	ate	me

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
603	**Pinnularia microstauron* (Ehrenberg) Cleve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	sp	i	ind	x	ate	o-e
604	*Pinnularia nobilis* (Ehrenberg) Ehrenberg	-	-	-	-	-	-	-	-	-	-	1	-	-	-	B	-	str	-	i	acf	x	ats	ot
605	**Pinnularia* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
606	*Pinnularia streptoraphe* Cleve	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	str	-	i	acf	o	ats	o-m
607	**Pinnularia subborealis* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	hb	-	o	-	-
608	*Pinnularia subcapitata* W.Gregory	-	-	-	-	-	-	-	-	-	-	1	-	1	-	B	-	st-str	sp	i	ind	x-o	ate	o-m
609	**Pinnularia viridis* (Nitzsch) Ehrenberg var. *viridis*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st-str	es	i	ind	o-x	ate	o-e
610	**Pinnularia viridis* var. *commutata* (Grunow) Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	-	-	o-x	-	-
611	**Placoneis dicephala* (W. Smith) Meresch.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
612	**Placoneis elginensis* f. *exigua* (Greg.) Bukht.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
613	**Planothidium ellipticum* (Cleve) M.B.Edlund in M.B.Edlund, N.Soninkhishig, R.M.Williams & E.F.Stoermer	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
614	**Planothidium haukianum* (Grunow) Round & L.Bukhtiyarova	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
615	**Planothidium lanceolatum* (Brébisson ex Kützing) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	-	-	x-o	-	-
616	*Pleurosigma delicatulum* W.Smith	-	1	-	-	-	-	-	1	-	-	1	-	-	-	B	-	-	-	mh	-	-	-	-
617	*Pleurosigma elongatum* W.Smith	1	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	mh	ind	-	-	-
618	*Pleurosigma strigosum* W.Smith	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
619	*Pleurosira laevis* (Ehrenberg) Compère	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	temp	-	-	mh	alf	o	-	e
620	*Proboscia alata* (Brightwell) B.G.Sundström	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
621	*Pseudo-nitzschia delicatissima* (Cleve) Heiden	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
622	*Pseudo-nitzschia seriata* (Cleve) H.Peragallo	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
623	*Pseudostaurosira brevistriata* (Grunow) D.M Williams & Round var. *brevistriata*	-	1	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	i	alf	x-o	ats	o-e
624	**Pseudostaurosira brevistriata* var. *inflata* (Pantocsek) M.B.Edlund	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	es	i	alf	o	ats	o-e
625	**Reimeria sinuata* (Gregory) Kociolek & Stoermer	1	1	-	-	-	-	-	-	-	-	-	1	1	1	B	-	st	sx	i	ind	-	-	-
626	*Rhabdonema arcuatum* (Lyngbye) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
627	*Rhizosolenia calcaravis* M.J.S.Schultze	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
628	**Rhoicosphenia abbreviata* (C.Agardh) Lange-Bertalot	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	es	i	alf	x-o	ate	e
629	**Rhopalodia gibba* (Ehrenberg) G.F.O.Müller var. *gibba*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	-	es	i	alb	x-o	-	-
630	**Rhopalodia gibba* var. *parallela* (Grunow) H.Peragallo & M.Peragallo	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	str	es	i	alb	o	ats	ot
631	**Rhopalodia gibba* var. *ventricosa* (Ehrenberg) Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	temp	-	es	i	alb	x-o	-	-
632	*Rhopalodia gibberula* (Ehrenberg) O.F.Müller	1	-	1	-	-	1	-	1	-	-	-	-	1	-	B	temp	str	es	mh	ind	-	-	-
633	*Rhopalodia musculus* (Kützing) O.F.Müller var. *musculus*	-	-	-	-	-	1	-	-	-	-	-	-	1	-	P-B,S	-	-	-	mh	alb	x	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
634	**Rhopalodia musculus* var. *mirabilis* Fricke	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	mh	-	-	-	-
635	*Sellaphora americana* (Ehrenberg) D.G.Mann	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	str	-	i	alf	o	ats	ot
636	*Sellaphora bacillum* (Ehrenberg) D.G.Mann	-	1	-	-	-	-	-	-	-	-	1	-	1	-	B	-	st-str	sx	i	alf	o-b	ats	me
637	**Sellaphora pupula* (Kützing) Mereschkovsky f. *pupula*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	eterm	st	sx	hl	ind	x-o	ate	me
638	**Sellaphora pupula* f. *capitata* (Skvortsov & K.I.Mey.) Poulin	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	temp	st-str	sp	hl	ind	b	ate	me
639	*Skeletonema costatum* (Greville) Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
640	**Stauroneis acuta* W.Smith	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	st-str	-	i	alf	o-x	-	-
641	**Stauroneis anceps* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	sx	i	ind	x	ate	me
642	*Stauroneis anceps* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	sx	i	ind	x	ate	me
643	**Stauroneis phoenicenteron* (Nitzsch) Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	i	ind	x-o	ate	me
644	**Stauroneis pygmaea* Krieger	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	sx	-	ind	o-x	-	-
645	**Stauroneis smithii* Grunow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	alf	x-o	ate	o-e
646	*Staurosira construens* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st-str	sx	i	alf	o	ats	me
647	**Staurosirella leptostauron* var. *dubia* (Grunow) Bukhtiyarova	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
648	*Staurosirella pinnata* (Ehrenberg) D.M.Williams & Round	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	temp	st-str	es	hl	alf	b-a	ate	o-e
649	*Stephanodiscus dubius* Hustedt	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	i	alb	b	-	-
650	*Stephanodiscus hantzschii* Grunow	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	temp	st	es	i	alf	a-b	hne	he
651	*Stephanodiscus minutulus* (Kützing) Cleve & Möller	-	-	-	-	-	-	-	-	-	-	1	-	-	-	P	-	st	es	i	alf	o-b	ate	he
652	*Stephanodiscus niagarae* Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	i	-	-	-	-
653	*Stephanodiscus rotula* (Kützing) Hendey	-	-	-	-	-	-	-	-	-	-	1	-	-	-	P	temp	st	es	i	alb	b	-	-
654	**Surirella angustata* Kützing var. *angustata*	1	1	-	-	-	-	-	-	-	-	-	1	1	1	B	-	-	-	i	alf	b	-	-
655	**Surirella angustata* var. *constricta* F. Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	-	-	-	-
656	**Surirella angustata* var. *hankensis* Skvortzow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
657	*Surirella biseriata* Brébisson	-	-	-	-	-	1	-	-	-	-	1	-	1	-	P-B	-	st-str	sx	i	alf	o-b	-	e
658	*Surirella brebissonii* Krammer & Lange-Bertalot	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	-	i	alf	x	-	-
659	*Surirella capronii* Brébisson ex F.Kitton	-	-	-	-	-	1	-	-	-	-	-	-	1	-	P-B,S	-	st	-	i	ind	x	-	me
660	**Surirella linearis* W.Smith	1	-	-	-	-	-	-	-	-	-	-	1	1	-	P-B	-	-	es	i	ind	o-b	-	o-m
661	**Surirella minuta* Brébisson in Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	es	i	ind	o-a	-	ot
662	**Surirella ovalis* Brébisson	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	es	mh	alf	o	ate	e
663	**Surirella patella* Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	mh	-	-	-	-
664	**Surirella* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
665	**Surirella spiralis* Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	str	-	i	neu	o	ats	ot
666	*Surirella striatula* P.J.Turpin	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	temp	-	-	mh	alf	-	-	e
667	**Surirella tenera* W.Gregory	-	1	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st	es	i	alf	o	-	e
668	*Surirella turgida* W.Smith	-	-	-	-	-	-	-	1	-	-	-	1	-	-	B	-	-	-	i	ind	b-a	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
669	*Synedra amphicephala* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	sp	i	-	x	-	-
670	*Synedra fasciculata* Ehrenberg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st	sx	hl	alf	x-o	-	-
671	**Synedra rumpens* var. *scotia* Grunow	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	i	-	-	-	-
672	**Synedra ulna* var. *contracta* Østrup	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	es	-	-	-	-	-
673	**Synedra ulna* var. *impressa* Hustedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
674	*Synedrella parasitica* (W.Smith) Round & N.I.Maidana	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
675	*Tabellaria fenestrata* (Lyngbye) Kützing var. *fenestrata*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	es	hb	neu	x	ats	o-m
676	**Tabellaria fenestrata* var. *geniculata* A.Cleve	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P	-	-	-	hb	-	b	-	-
677	**Tabellaria flocculosa* (Roth) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	eterm	st-str	es	hb	acf	o-a	ats	m
678	*Tetracyclus rupestris* (Braun) Grunow	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	cool	ae	-	i	-	x-b	-	-
679	*Thalassionema nitzschioides* (Grunow) Mereschkowsky	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
680	*Thalassiosira angulata* (W.Gregory) Hasle	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
681	*Thalassiosira bramaputrae* (Ehrenberg) Håkansson & Locker	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	st-str	sp	hl	alf	b	ate	e
682	*Thalassiosira excentrica* (Ehrenberg) Cleve	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	ind	-	-	-
683	*Thalassiosira parva* Proshkina-Lavrenko	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
684	*Thalassiosira subsalina* Proshkina-Lavrenko	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
685	**Tryblionella acuta* (Cleve) D.G.Mann	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	i	ind	-	-	-
686	**Tryblionella angustata* W.Smith var. *angustata*	1	-	-	-	-	1	-	-	-	-	1	1	-	1	P	-	st	sx	i	alf	x-b	ats	m
687	**Tryblionella angustata* var. *acuta* (Grunow) Bukht.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
688	**Tryblionella apiculata* Gregory	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	mh	alf	o-a	-	-
689	*Tryblionella granulata* (Grunow) D.G.Mann	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	hl	alf	-	-	-
690	**Tryblionella hungarica* (Grunow) Frenguelli	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	sp	mh	alf	a-b	ate	e
691	**Tryblionella levidensis* W.Smith	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	st-str	sp	mh	ind	a	ate	e
692	**Ulnaria biceps* (Kützing) P.Compère	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	es	i	alf	b	-	e
693	*Ulnaria delicatissima* (W. Smith) M. Aboal & P.C.Silva	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	es	-	-	o	-	-
694	**Ulnaria delicatissima* var. *angustissima* (Grunow) M.Aboal & P.C.Silva	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P	-	-	sx	i	alf	o-a	-	-
695	**Ulnaria ulna* (Nitzsch) P.Compère var. *ulna*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	temp	st-str	es	i	ind	b-o	ate	o-e
696	**Ulnaria ulna* var. *amphirhynchus* (Ehrenberg) M.Aboal	-	-	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	es	i	alf	-	-	-
697	*Urosolenia eriensis* (H.L.Smith) Round & R.M.Crawford	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	str	-	hl	acf	-	ats	m
	Chlorophyta																							
698	*Actinastrum hantzschii* var. *subtile* J.Woloszynska	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	b	-	-
699	*Actinochloris sphaerica* Korschikov	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
700	*Acutodesmus acuminatus* (Lagerheim) Tsarenko	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	ind	b	-	-
701	*Acutodesmus obliquus* (Turpin) Hegewald & Hanagata	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B,S	-	st	-	i	-	b-p	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
702	**Acutodesmus pectinatus* (Meyen) Tsarenko	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
703	*Aegagropila linnaei* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
704	*Ankistrodesmus arcuatus* Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	i	-	-	-	-
705	*Ankistrodesmus densus* Korshikov	1	1	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	o-a	-	-
706	*Ankistrodesmus falcatus* (Corda) Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	hb	-	b	-	-
707	*Ankistrodesmus fusiformis* Corda ex Korshikov	1	1	-	-	-	-	-	1	-	-	1	-	-	1	P-B	-	st-str	-	i	-	b-o	-	-
708	*Ankistrodesmus mucosus* Korshikov	1	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	i	-	-	-	-
709	*Ankistrodesmus spiralis* (W.B.Turner) Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	b	-	-
710	*Ankyra ocellata* (Korshikov) Fott	-	1	-	-	-	-	-	-	-	-	-	-	-	-	Ep	-	-	-	i	-		-	-
711	*Aphanochaete repens* A.Braun	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st	-	-	-	b	-	-
712	*Binuclearia tectorum* (Kützing) Berger ex Wichmann	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	x-o	-	-
713	*Borodinella polytetras* Miller	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
714	*Botryococcus braunii* Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st	-	i	ind	o-b	-	-
715	*Botryosphaera sudetica* (Lemmermann) Chodat	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	hb	-	-	-	-
716	*Bracteacoccus anomalus* (E.J.James) R.C.Starr	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
717	*Bulbochaete brebissonii* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-		-	-
718	*Bulbochaete nana* Wittrock	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	-	-	-	-	o	-	-
719	*Bulbochaete nordstedetii* Wittrock	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	o	-	-
720	*Chaetomorpha linum* (O.F.Müller) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st	-	-	-	-	-	-
721	*Chaetophora elegans* (Roth) C.Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	-	-	b-o	-	-
722	*Characiopsis minima* Pascher	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
723	*Characium braunii* Brügger	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
724	*Characium falcatum* Schröder	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
725	*Chlamydomonas atactogama* A.A.Korshikov	-	1	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	i	-	-	-	-
726	*Chlamydomonas elliptica* Korshikov	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
727	*Chlamydomonas gloeogama* Korshikov	-	1	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
728	*Chlamydomonas microscopica* G.S.West	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
729	*Chlamydomonas minutissima* Korschikoff	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
730	*Chlamydomonas oblongella* Lund	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
731	*Chlamydomonas pertusa* Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	b	-	-
732	*Chlamydomonas proboscigera* var. *conferta* (Korshikov) H.Ettl	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
733	*Chlamydomonas stellata* Dill	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	b	-	-
734	*Chlorella minutissima* Fott & Nováková	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B,S	-	st	-	-	-	a	-	-
735	*Chlorella vulgaris* Beijerinck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B,S	-	-	-	hl	-	a	-	-
736	*Chlorochytrium bristolae* (G.M.Smith) D.M.John & Tsarenko	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
737	*Chlorococcum dissectum* Korshikov	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
738	*Chlorococcum humicola* (Nägeli) Rabenhorst	-	-	-	-	-	-	1	-	-	-	-	-	-	1	P	-	-	-	-	-	b	-	-
739	*Chlorococcum hypnosporum* Starr	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
740	*Chlorococcum infusionum* (Schrank) Meneghini	-	-	-	-	-	-	1	-	-	-	-	1	-	-	P,S	-	st	-	-	-	b	-	-
741	*Chloroplana terricola* Hollerbach	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
742	*Chlorotetraedron incus* (Teiling) Komarek & Kovácik	1	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	b	-	-
743	*Cladophora canalicularis* (L.) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
744	*Cladophora fracta* (O.F.Müller ex Vahl) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	-	-	o-a	-	-
745	*Cladophora globulina* (Kützing) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	o-b	-	-
746	**Cladophora glomerata* (L.) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	alf	b-o	-	-
747	*Closteriopsis longissima* (Lemmermann) Lemmermann	1	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	st-str	-	i	-	o-b	-	-
748	*Coccomyxa confluens* (Kützing) Fott	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
749	*Coccomyxa solorinae* Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
750	*Coelastropsis costata* (Korshikov) Fott & Kalina	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-
751	*Coelastrum proboscideum* Bohlin	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	o	-	-
752	*Coelastrum pulchrum* Schmidle	1	-	-	-	-	-	-	-	-	-	1	-	-	1	P-B	-	st-str	-	-	-	o	-	-
753	*Coelastrum reticulatum* (P.A. Dangeard) Senn	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	b	-	-
754	*Coelastrum sphaericum* Nägeli	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i		o	-	-
755	*Ctenocladus circinnatus* A. Borzì	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
756	*Desmatractum indutum* (Geitler) Pascher	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
757	*Desmococcus olivaceus* (Persoon ex Acharius) J.R.Laundon	-	1	-	-	-	-	-	1	-	-	1	-	-	1	B	-	-	-	i	-	o	-	-
758	*Diacanthos belenophorus* Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
759	*Dictyococcus varians* Gerneck	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	i	-	-	-	-
760	*Dictyosphaerium ehrenbergianum* Nägeli	1	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st-str	-	-	-	o-b	-	-
761	*Dictyosphaerium pulchellum* H.C.Wood	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	ind	b	-	-
762	*Didymocystis inconspicua* Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	b	-	-
763	*Dispora crucigenioides* Printz	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
764	*Draparnaldia glomerata* (Vaucher) C.Agardh	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	o-x	-	-
765	*Draparnaldia mutabilis* (Roth) Cedergren	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	-	-	o-x	-	-
766	*Draparnaldiella simplex* C.Meyer et Skabitsch.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
767	*Enallax costatus* (Schmidle) Pascher	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
768	*Eremosphaera viridis* De Bary	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
769	*Fernandinella alpina* Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
770	*Fottea stichococcoides* F.Hindák	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
771	*Gloeococcus minor* A.Braun	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
772	*Golenkinia paucispina* W.West & G.S.West	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	o-a	-	-
773	*Golenkinia radiata* Chodat	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	o-a	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
774	*Gongrosira sclerococcus* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
775	*Granulocystopsis decorata* (Svirenko) Tsarenko & D.M.John	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
776	*Hyaloraphidium contortum* Pascher & Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	-	-	i	-	b	-	-
777	*Hydrodictyon reticulatum* (L.) Bory de Saint-Vincent	1	-	-	-	1	-	-	-	-	-	-	-	-	-	P-B	-	st	-	-	-	o-a	-	-
778	*Kentrosphaera bristolae* G.M.Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
779	*Kirchneriella irregularis* (G.M.Smith) Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	b	-	-
780	*Kirchneriella lunaris* (Kirchner) K.Möbius	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	-	b	-	-
781	*Kirchneriella obesa* (G.S.West) Schmidle	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	b	-	-
782	*Lagerheimia genevensis* (Chodat) Chodat	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	i	-	b	-	-
783	*Lagerheimia octacantha* Lemmermann	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
784	*Leptosira mediciana* Borzí	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
785	*Lobosphaera incisa* (Reisigl) Karsten, Friedl, Schumannn, Hoyer & Lembcke	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
786	*Micractinium pusillum* Fresenius	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	b-a	-	-
787	*Microspora abbreviata* (Rabenhorst) Lagerheim	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
788	**Microspora quadrata* Hazen	-	1	-	-	-	-	-	-	-	-	-	1	-	-	B	-	-	-	-	-	b	-	-
789	**Microspora stagnorum* (Kützing) Lagerheim	-	-	-	-	-	-	-	-	-	-	-	1	1	-	B	-	st	-	-	-	b-o	-	-
790	*Microspora tumidula* Hazen	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
791	*Monoraphidium contortum* (Thuret) Komàrková-Legnerová	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	b	-	-
792	*Monoraphidium griffithii* (Berkeley) Komárková-Legnerová	1	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	-	-	b	-	-
793	*Monoraphidium obtusum* (Korshikov) Komárková-Legnerová	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	st-str	-	i	-	o	-	-
794	*Muriella magna* F.E.Fritsch & R.P.John	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
795	*Myrmecia irregularis* (J.B.Petersen) H.Ettl & G.Gärtner	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
796	*Nephrochlamys allanthoidea* Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	b	-	-
797	*Nephrochlamys rostrata* Nygaard et al.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	o-b	-	-
798	*Nephrocytium lunatum* West	-	1	-	-	-	-	-	-	-	-	-	-	1	1	P-B	-	st	-	-	-	b	-	-
799	*Oedogonium capillare* (L.) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	o-b	-	-
800	*Oedogonium capitellatum* Wittrock	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
801	**Oedogonium* sp.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	-	-	-	-	-
802	*Oedogonium undulatum* (Brébisson) A.Braun	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i	-	-	-	-
803	*Oocystidium ovale* O.Korshikov	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	st	-	-	-	-	-	-
804	*Oocystis borgei* J.Snow	1	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	ind	b-o	-	-
805	*Oocystis elliptica* West	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st-str	-	-	-	-	-	-
806	*Oocystis lacustris* Chodat	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	hl	-	b-o	-	-
807	*Oocystis novae-semliae* Wille	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st	-	i	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
808	*Oocystis parva* W.West & G.S.West	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P	-	st-str	-	-	-	b	-	-
809	*Oocystis pusilla* Hansgirg	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	i	-	o	-	-
810	*Oocystis solitaria* Wittrock	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	st	-	i	ind	b-o	-	-
811	*Oocystis submarina* Lagerheim	1	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st	-	i	-	-	-	-
812	*Oonephris obesa* (W.West) Fott	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
813	*Palmodictyon varium* (Nägeli) Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
814	*Pandorina elegans* (Ehrenberg) Dujardin	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	st-str	-	i	-	b	-	-
815	**Pandorina mora* (O.F.Müller) Bory de Saint-Vincent	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	st	-	i	-	b	-	-
816	*Pediastrum angulosum* Ehrenberg ex Meneghini	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	-	-	o	-	-
817	*Pediastrum boryanum* (Turpin) Meneghini var. *boryanum*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	ind	o-a	-	-
818	*Pediastrum boryanum* var. *brevicorne* Braun	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	-	-	-	-	-	-
819	*Pediastrum braunii* Wartmann	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	o	-	-
820	*Pediastrum duplex* Meyen	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	st-str	-	i	ind	o-a	-	-
821	**Pediastrum simplex* Meyen	1	1	-	-	-	-	-	-	-	-	-	1	-	1	P-B	-	st-str	-	-	-	o-b	-	-
822	*Phycopeltis epiphyton* Millardet	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
823	*Prasiola crispa* (Lightfoot) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	x	-	-
824	*Pseudopediastrum kawraiskyi* (Schmidle) E.Hegewald	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	o-b	-	-
825	*Pseudoschroederia robusta* (O.Korshikov) E.Hegewald & E.Schnepf	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	o-a	-	-
826	*Pseudotetrastrum punctatum* Hindák	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	b	-	-
827	*Quadrigula closterioides* (Bohlin) Printz	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	-	o-b	-	-
828	**Rhizoclonium hieroglyphicum* (C.Agardh) Kützing	-	-	-	-	-	-	-	-	-	-	-	1	-	1	B	-	st-str	-	hl	-	o	-	-
829	*Scenedesmus apiculatus* (W.West & G.S.West) Chodat	-	-	-	-	-	-	1	-	-	-	-	-	-	-	P	-	st-str	-	-	-	-	-	-
830	*Scenedesmus arcuatus* Lemmermann	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	-	o-a	-	-
831	*Scenedesmus brasiliensis* Bohlin	1	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	-	-	b	-	-
832	**Scenedesmus ellipticus* Corda	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B,S	-	st-str	-	-	-	o-b	-	-
833	*Scenedesmus granulatus* W.West & G.S.West	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	b-a	-	-
834	*Scenedesmus obliquus* (Turpin) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	st	-	i	ind	o-a	-	-
835	*Scenedesmus opoliensis* P.G.Richter	1	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	b	-	-
836	*Scenedesmus quadricauda* var. *parvus* G.M.Smith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	-	-	i	ind	b	-	-
837	**Scenedesmus* sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-		-	-
838	*Scenedesmus subspicatus* Chodat	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	-	-	o	-	-
839	**Schroederia setigera* (Schröder) Lemmermann	1	-	-	-	-	-	-	-	-	-	-	1	-	-	P	-	st-str	-	i	-	b-o	-	-
840	*Schroederiella papillata* Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
841	*Scotiellopsis levicostata* (Gollerbach) Puncocharova & Kalina	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
842	*Selenastrum bibraianum* Reinsch	-	1	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	b	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
843	*Selenastrum gracile* Reinsch	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	o-a	-	-
844	*Siderocelis ornata* (Fott) Fott	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	b	-	-
845	*Sorastrum spinulosum* Nägeli	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	b-o	-	-
846	*Sphaerellopsis gelatinosa* (Korshikov) Gerloff	-	1	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	b	-	-
847	*Sphaerocystis schroeteri* Chodat	-	1	-	-	-	-	-	-	-	-	1	-	-	1	P	-	-	-	i	ind	b-o	-	-
848	*Stauridium tetras* (Ehrenberg) E.Hegewald	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	ind	o-a	-	-
849	*Stichococcus bacillaris* Nägeli	-	1	-	-	-	-	-	-	-	-	-	-	-	1	P-B,S	-	-	-	-	-	o-a	-	-
850	*Stigeoclonium flagelliferum* Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	b	-	-
851	*Stigeoclonium lubricum* (Dillwyn) Kützing	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
852	*Stigeoclonium tenue* (C.Agardh) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	-	-	-	b-p	-	-
853	*Tetrachlorella alternans* (G.M.Smith) Korshikov	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	-	-	-	-	-	-	-
854	*Tetracoccus botryoides* W.West	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
855	*Tetraedron caudatum* (Corda) Hansgirg	1	1	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	i	ind	b	-	-
856	*Tetraedron minimum* (A.Braun) Hansgirg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	-	b	-	-
857	*Tetraedron trigonum* (Nägeli) Hansgirg	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	-	-	-	-	b	-	-
858	*Tetrapedia gothica* Reinsch	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
859	*Tetraspora lubrica* (Roth) C.Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	hb	-	-	-	-
860	*Tetrastrum elegans* Playfair	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	st-str	-	i	-	o-b	-	-
861	*Tetrastrum staurogeniaeforme* (Schröder) Lemmermann	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	b	-	-
862	*Tetrastrum triangulare* (Chodat) Komárek	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	b	-	-
863	*Trentepohlia abietina* (Flotow) Hansgirg	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
864	*Trentepohlia aurea* (L.) C.F.P.Martius	-	-	-	-	-	-	-	-	-	-	-	-	1	-	S	-	-	-	-	-	-	-	-
865	*Treubaria triappendiculata* C.Bernard	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	-	-	-
866	*Ulothrix limnetica* Lemmermann	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
867	*Ulothrix mucosa* Thuret	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
868	*Ulothrix oscillarina* Kützing	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
869	*Ulothrix tenerrima* (Kützing) Kützing	1	1	1	1	1	-	1	1	-	-	1	1	1	1	B	-	-	-	i	-	o-a	-	-
870	*Ulothrix tenuissima* Kützing	-	1	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	i	-	b	-	-
871	**Ulothrix zonata* (Weber & Mohr) Kützing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	ind	o-a	-	-
872	*Ulva prolifera* O.F.Müller	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
873	*Volvox globator* L.	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	o-a	-	-
874	*Westella botryoides* var. *major* G.M.Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P	-	st-str	-	-	-	b	-	-
	Charophyta																							
875	*Actinotaenium cucurbita* (Brébisson ex Ralfs) Teiling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	-	-	acf	x-b	-	-
876	*Actinotaenium cucurbitinum* (Bisset) Teiling	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
877	*Actinotaenium didymocarpum* (P.Lundell) Coesel & Delfos	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
878	*Actinotaenium rufescens* (Cleve) Teiling	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
879	*Actinotaenium silvae-nigrae* (Rabanus) Kouwets & Coesel	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	o	-	-
880	Actinotaenium turgidum (Brébisson ex Ralfs) Teiling ex Ruzicka & Pouzar	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
881	*Chara vulgaris* L.	-	-	-	-	-	-	-	-	-	-	-	1	1	1	B	-	st-str	-	-	-	o	-	-
882	*Closterium acerosum* Ehrenberg ex Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	ind	a-b	-	-
883	**Closterium acerosum* var. *elongatum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
884	**Closterium acerosum* var. *minus* Hantzsch	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
885	*Closterium angustatum* Kützing ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
886	*Closterium archerianum* Cleve ex P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
887	*Closterium closteroides* (Ralfs) A.Louis & Peeters	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	x-b	-	-
888	*Closterium cynthia* De Notaris	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	-	-	o	-	-
889	*Closterium directum* W.Archer	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	-	-	-	acf	-	-	-
890	*Closterium doliolatum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
891	*Closterium ehrenbergii* Meneghini ex Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	hb	ind	o-a	-	-
892	*Closterium incurvum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
893	*Closterium intermedium* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	st	-	-	-	o	-	-
894	*Closterium jenneri* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
895	*Closterium juncidum* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	-	-	-	-
896	**Closterium kuetzingii* Brébisson	1	-	-	-	-	-	-	-	-	-	-	1	-	-	P	-	st	-	i	-	x-b	-	-
897	*Closterium lanceolatum* Kütz.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st	-	-	-	-	-	-
898	*Closterium leibleinii* Kützing ex Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	-	-	a-b	-	-
899	**Closterium littorale* Gay	-	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	b-a	-	-
900	*Closterium lunula* Ehrenberg & Hemprich ex Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	x-b	-	-
901	*Closterium macilentum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	i	-	-	-	-
902	**Closterium moniliferum* Ehrenberg ex Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	-	b	-	-
903	*Closterium navicula* (Brébisson) Lütkemüller	-	-	-	-	-	-	-	-	-	-	-	-	1	1	P-B	-	-	-	-	acf	x-b	-	-
904	*Closterium nematodes* Joshua	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
905	**Closterium parvulum* Nägeli	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	-	-	i	-	b	-	-
906	*Closterium pritchardianum* W.Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
907	*Closterium pseudolunula* Borge	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
908	*Closterium regulare* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
909	*Closterium rostratum* Ehrenberg ex Ralfs	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	acf	x-b	-	-
910	*Closterium ruficeps* C.G.Ehrenberg	1	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	-	-	x-b	-	-
911	*Closterium setaceum* Ehrenberg ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
912	*Closterium strigosum* Brébisson	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	-	-	b	-	-
913	*Closterium striolatum* Ehrenberg ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	-	-	acf	x-b	-	-
914	*Closterium subrectum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	o	-	-
915	**Closterium tumidulum* F.Gay	-	-	-	-	-	-	-	-	-	-	-	1	-	-	P-B	-	-	-	-	acf	-	-	-
916	*Closterium venus* Kützing ex Ralfs	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	b	-	-
917	*Coleochaete soluta* (Brébisson) E.G.Pringsheim	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	o	-	-
918	*Cosmarium angulosum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
919	*Cosmarium binum* Nordstedt	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
920	*Cosmarium bioculatum* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	hb	-	-	-	-
921	*Cosmarium boeckii* Wille	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
922	**Cosmarium botrytis* Meneghini ex Ralfs var. *botrytis*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	st-str	-	i	ind	b	-	-
923	**Cosmarium botrytis* var. *gemmiferum* (Brébisson) Nordstedt	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
924	*Cosmarium brebissonii* Meneghini ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	1	P-B	-	st-str	-	-	acf	-	-	-
925	*Cosmarium caelatum* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
926	*Cosmarium calcareum* Wittrock	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
927	*Cosmarium circulare* Reinsch	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
928	*Cosmarium connatum* Brébisson ex Ralfs	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
929	*Cosmarium contractum* O.Kirchner	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
930	*Cosmarium elegantissimum* P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
931	*Cosmarium gayanum* De Toni	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
932	*Cosmarium geminatum* P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
933	*Cosmarium granatum* Brébisson ex Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	-	i	ind	o	-	-
934	*Cosmarium holmiense* P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
935	*Cosmarium hornavanense* Gutwinski	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	o	-	-
936	*Cosmarium humile* Nordstedt ex De Toni	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i		o	-	-
937	*Cosmarium impressulum* Elfving	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	-	hb	ind	o-a	-	-
938	**Cosmarium laeve* Rabenhorst	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	st-str	-	hb	ind	o-a	-	-
939	*Cosmarium margaritatum* (P.Lundell) J.Roy & Bisset	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
940	*Cosmarium margaritiferum* Meneghini ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i	-	-	-	-
941	*Cosmarium meneghinii* Brébisson ex Ralfs	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
942	*Cosmarium nitidulum* De Notaris	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
943	**Cosmarium obtusatum* (Schmidle) Schmidle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P	-	-	-	i	-	o	-	-
944	*Cosmarium octhodes* Nordst	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
945	*Cosmarium orthostichum* P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
946	*Cosmarium pachydermum* P.Lundell	-	-	1	-	-	-	-	-	-	-	-	-	1	1	B	-	-	-	i	-	x-b	-	-
947	*Cosmarium phaseolus* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
948	*Cosmarium portianum* W.Archer	1	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	i	-	-	-	-
949	*Cosmarium prominulum* Raciborski	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
950	*Cosmarium pseudoornatum* B.Eichler & Gutwinski	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
951	*Cosmarium pseudopyramidatum* P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
952	*Cosmarium punctulatum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	-	hb	acf	o	-	-
953	*Cosmarium pygmaeum* W.Archer	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
954	*Cosmarium pyramidatum* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	o	-	-
955	*Cosmarium quadratum* Ralfs ex Ralfs	-	-	-	-	1	-	-	-	-	-	-	-	-	1	B	-	-	-	hb	-	o-x	-	-
956	*Cosmarium raciborskii* Lagerheim	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
957	*Cosmarium ralfsii* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
958	*Cosmarium regnesii* Reinsch	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
959	*Cosmarium reniforme* (Ralfs) W.Archer	1	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	st-str	-	hb	-	o	-	-
960	*Cosmarium sexnotatum* Gutwinski	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
961	*Cosmarium speciosum* P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
962	**Cosmarium subcostatum* Nordstedt	-	-	-	-	-	-	-	-	-	-	-	1	-	1	P-B	-	-	-	i	ind	-	-	-
963	**Cosmarium subcrenatum* Hantzsch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	o	-	-
964	*Cosmarium subcucumis* Schmidle	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
965	*Cosmarium subprotumidum* Nordstedt	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	st-str	-	-	acf	-	-	-
966	*Cosmarium subtumidum* Nordstedt	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
967	*Cosmarium subundulatum* Wille	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
968	*Cosmarium tenue* W.Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
969	*Cosmarium tetraophthalmum* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	1	P-B	-	st-str	-	-	-	-	-	-
970	*Cosmarium thwaitesii* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
971	*Cosmarium tumens* Nordstedt	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
972	*Cosmarium turpinii* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	i	ind	o-x	-	-
973	*Cosmarium tyrolicum* (Nordstedt) Willi Krieger & Gerloff	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
974	**Cosmarium undulatum* Corda ex Ralfs var. undulatum	-	1	-	-	-	-	-	-	-	-	-	1	1	1	P-B	-	-	-	i	acf	-	-	-
975	**Cosmarium undulatum* var. *minutum* Wittrock	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
976	*Cosmarium vexatum* W.West	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
977	*Cosmoastrum alternans* (Brébisson) Palamar-Mordvintseva	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
978	*Cosmoastrum muticum* (Brébisson) Palamar-Mordvintseva	1	-	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	i	-	-	-	-
979	*Cosmoastrum orbiculare* (Ralfs) G.H.Tomaszewicz	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
980	*Cosmoastrum punctulatum* (Brébisson) Palamar-Mordvintseva	1	1	1	1	1	1	1	1	1	1	1	1	1	1	P-B	-	st-str	-	i	-	-	-	-
981	*Cosmoastrum setigerum* (Cleve) Palamar-Mordvintseva	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
982	*Cosmoastrum teliferum pecten* (Perty) G.H.Tomaszewicz	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
983	*Cylindrocystis brebissonii* (Ralfs) de Bary	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	o	-	-
984	*Desmidium aptogonum* Brébisson ex Kützing	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P-B	-	st-str	-	i	-	-	-	-
985	*Desmidium schwartzii* Agardh	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	i	-	o	-	-
986	*Euastrum bidentatum* Nägeli	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	-	-	hb	-	o	-	-
987	*Euastrum binale* var. *gutwinskii* (Schmidle) Homfeld	-	-	-	-	-	-	-	-	-	-	-	-	-	1	P-B	-	-	-	-	acf	o	-	-
988	*Euastrum crispulum* (Nordstedt) W.West & G.S.West	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
989	*Euastrum denticulatum* Gay	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	-	-	-	acf	x-b	-	-
990	*Euastrum obesum* Joshua	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
991	*Euastrum oblongum* Ralfs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	x-b	-	-
992	*Euastrum sublobatum* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
993	*Euastrum validum* W.West & G.S.West	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	-	-	-	-
994	*Euastrum verrucosum* Ehrenberg ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	acf	x-b	-	-
995	*Haplotaenium minutum* (Ralfs) T.Bando	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	x-b	-	-
996	*Hyalotheca dissiliens* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	1	P	-	-	-	hb	-	x-b	-	-
997	*Klebsormidium flaccidum* (Kützing) P.C.Silva, K.R.Mattox & W.H.Blackwell	-	-	-	-	-	-	-	-	-	-	-	1	-	1	B,S	-	-	-	-	-	b-o	-	-
998	*Klebsormidium nitens* (Meneghini) Lokhorst	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	-	-	-	-	o-b	-	-
999	*Koliella longiseta* (Vischer) Hindák	1	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	st	-	i	-	b	-	-
1000	*Mesotaenium chlamydosporum* De Bary	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	x-b	-	-
1001	*Mesotaenium endlicherianum* Nägeli	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	o	-	-
1002	*Micrasterias apiculata* Meneghini ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1003	*Micrasterias fimbriata* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1004	*Micrasterias papillifera* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	x-b	-	-
1005	*Micrasterias rotata* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1006	*Micrasterias truncata* (Corda) Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	x-b	-	-
1007	**Mougeotia* sp.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	-	-	o	-	-
1008	*Netrium digitus* var. *naegelii* (Archer) Willi Krieger	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
1009	*Netrium oblongum* (De Bary) Lütkemüller	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	x-b	-	-
1010	*Pachyphorium obsoletum* (Hantzsch) Palamar-Mordvintseva	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1011	*Pachyphorium taxichondriforme* (B.Eichler & Gutwinski) Palamar-Mordvintseva	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1012	*Penium clevei* P.Lundell	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1013	*Penium digitus* Brébisson ex Ralfs	1	-	-	-	-	-	-	-	-	-	-	-	1	1	P-B	-	-	-	i	acf	x-b	-	-
1014	*Penium heimerlianum* Schmidle	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1015	*Penium polymorphum* Perty	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	st	-	-	-	x-b	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
1016	*Penium spirostriolatum* J. Barker	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	x-b	-	-
1017	*Pleurotaenium ehrenbergii* (Brébisson ex Ralfs) Delponte	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	i	-	o-x	-	-
1018	*Pleurotaenium trabecula* (Ehrenberg) Nägeli	1	-	1	-	-	-	-	-	-	-	-	-	1	1	P-B	-	-	-	i	-	o	-	-
1019	*Raphidiastrum bifidum* (Ehrenberg) Palamar-Mordvintseva	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1020	*Spirogyra bellis* (Hassall) Cleve	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1021	**Spirogyra decimina* (O.Müller) Kützing	-	-	-	-	1	-	-	-	-	-	-	1	-	-	B	-	-	-	-	-	b-a	-	-
1022	*Spirogyra inflata* (Vaucher) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	o	-	-
1023	*Spirogyra porticalis* (O.F.Müller) Cleve	-	-	-	-	-	-	-	-	-	-	-	-	-	1	B	-	-	-	-	-	o-b	-	-
1024	*Spirogyra rivularis* (Hassall) Rabenhorst	-	1	-	-	-	-	-	-	-	-	-	-	-	-	B	-	st	-	-	-	-	-	-
1025	**Spirogyra* sp.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	-	-	-	-	-
1026	*Spirogyra varians* (Hassall) Kützing	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P-B	-	-	-	i	-	b-a	-	-
1027	*Spirogyra weberi* Kützing	-	1	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
1028	*Spirotaenia obscura* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	o-x	-	-
1029	*Staurastrum acarides* Nordstedt	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1030	*Staurastrum aculeatum* Meneghini ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1031	*Staurastrum arachne* Ralfs ex Ralfs var. *arachne*	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1032	**Staurastrum arachne* var. *curvatum* W.West & G.S.West	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
1033	*Staurastrum arcuatum* Nordstedt	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1034	*Staurastrum brachiatum* Ralfs ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1035	*Staurastrum cristatum* (Nägeli) W.Archer in Pritchard	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1036	*Staurastrum dorsidentiferum* W.West & G.S.West	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1037	*Staurastrum furcatum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	-	o	-	-
1038	*Staurastrum glontii* D.A.Tarnogradskii	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1039	*Staurastrum gracile* Ralfs ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	1	P	-	st	-	i	-	o-b	-	-
1040	*Staurastrum hantzschii* Reinsch	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1041	*Staurastrum ibericum* D.A.Tarnogradskii	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1042	*Staurastrum inconspicuum* Nordstedt	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	o	-	-
1043	*Staurastrum oxyacanthum* W.Archer	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	i	-	-	-	-
1044	*Staurastrum paradoxum* Meyen ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	st	-	i	-	-	-	-
1045	*Staurastrum polymorphum* Brébisson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	i	-	-	-	-
1046	*Staurastrum senarium* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1047	*Staurastrum spongiosum* Brébisson ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	o	-	-
1048	*Staurastrum tetracerum* Ralfs ex Ralfs	-	1	-	-	-	-	-	-	-	-	-	-	1	1	P	-	st-str	-	i	-	o	-	-
1049	*Staurastrum trapezicum* R.Boldt	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-

Table 1. (Continued).

No.	Taxon	No. of Natural Reserves														Ecology of Species								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Sub	Tem	Reo	D	Hal	pH	S	Het	Tro
1050	*Staurastrum vestitum* Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	-	-	-	-
1051	*Staurodesmus connatus* (P.Lundell) Thomasson	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1052	*Staurodesmus convergens* (Ehrenberg ex Ralfs) S.Lilleroth	1	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	i	-	-	-	-
1053	*Staurodesmus cuspidatus* (Brébisson) Teiling	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
1054	*Staurodesmus dejectus* (Brébisson) Teiling	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	hb	-	-	-	-
1055	*Staurodesmus dickiei* (Ralfs) S.Lillieroth	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1056	*Staurodesmus incus* (Hassal ex Ralfs) Teiling	-	-	-	-	-	-	-	-	-	-	-	-	1	-	P	-	-	-	hb	-	-	-	-
1057	*Tetmemorus intermedius* Woronichin	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1058	*Tetmemorus laevis* Kützing ex Ralfs	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	o-x	-	-
1059	*Zygnema pectinatum* (Vaucher) C.Agardh	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	st-str	-	i	-	-	-	-
1060	**Zygnema* sp.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	B	-	-	-	-	-	x-b	-	-
	Rhodophyta															-	-	-		-	-	-	-	-
1061	*Batrachospermum gelatinosum* (L.) De Candolle	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	-	-	-	-	o-x	-	-
1062	*Hildenbrandia rivularis* (Liebmann) J.Agardh	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
1063	*Lemanea fluviatilis* (L.) C.Agardh	-	-	-	-	-	-	-	-	-	-	-	-	1	-	B	-	st-str	-	-	-	x-b	-	-
	Total number of species in the Natural Reserve system	327	297	205	155	181	181	172	181	155	169	205	405	414	433									

Note: **Substrate**: P = planktonic, P-B = plankto-benthic, B = benthic, Ep = epiphyte, S = soil. **Temperature**: cool = cool water, temp = temperate, eterm = eurythermic, warm = warm water. **Oxygenation**: st = standing water, str = streaming water, st-str = low streaming water, ae = aerophiles. **Salinity**: hb = oligohalobes-halophobes, i = oligohalobes-indifferent, mh = mesohalobes, hl = halophiles, ph = polyhalobes. **Acidity**: alb = alkalibiontes, alf = alkaliphiles, ind = indifferents, acf = acidophiles, neu = neutrophiles as a part of indifferents. **Saprobity DAIpo**: sx = saproxenes, es = eurysaprobes, sp = saprophiles. **Autotrophy-Heterotrophy**: ats = nitrogen-autotrophic taxa tolerating very small concentrations of organically-bound nitrogen, ate = nitrogen-autotrophic taxa tolerating elevated concentrations of organically-bound nitrogen, hne = facultatively nitrogen-heterotrophic taxa needing periodically elevated concentrations of organically-bound nitrogen, hce = obligately nitrogen-heterotrophic taxa needing continuously elevated concentrations of organically-bound nitrogen. **Trophy**: ot = oligotraphentic, o-m = oligo-mesotraphentic, m = mesotraphentic, me = meso-eutraphentic, e = eutraphentic, hy = oligo- to eutraphentic (hypereutraphentic). **Saprobity** S: x = xenosaprobes, x-o = xeno-oligosaprobes, o-x = oligo-xenosaprobes, x-b = xeno-betamesosaprobes, o = oligosaprobes, o-b = oligo-betamesosaprobes, b-o = beta-oligosaprobes, b = betamesosaprobes, b-a = beta-alphamesosaprobes, b-p = beta-polysaprobes, o-a = oligo-alphasaprobes, a-b = alpha-betamesosaprobes, a = alphamesosaprobes, a-p = alpha-polysaprobes, p = polysaprobes, i = i-eusaprobes, m = m-eusaprobes.

Table 2. Physical and climatic parameters of the protected areas of Georgia, the numbers of algal species, and the diversity indices against the increase of altitude.

No.	Name	Altitude (m) a.s.l.	Area (km²)	No. of Infraspecies	Index Sp/Area	Index Infrasp/ Species	T max. °C	T mean °C	T Jan. °C	T July °C	T min. °C	Rainfall (mm/ year)
1	Sataplia-Colchis	4	5.00	327	65.40	1.0093	41.0	14.5	5.2	23.0	-18.0	1600.0
2	Pizunda	12	37.71	297	7.90	1.0068	39.0	14.6	6.2	24.0	-11.0	1500.0
3	Adzameti	50	48.48	205	4.23	1.0099	41.0	14.2	4.8	23.0	-18.0	1525.0
4	Kintrishi	350	71.66	155	2.16	1.0131	42.0	11.0	6.5	21.0	-18.0	2750.0
5	Vashlovani	400	80.34	181	2.27	1.0111	41.0	10.0	0.4	22.0	-26.0	420.0
6	Akhmeta	600	162.97	181	1.11	1.0112	37.3	10.8	1.6	20.5	-24.6	912.5
7	Liakhvi	720	60.84	172	2.83	1.0118	32.5	6.0	6.5	14.7	-33.0	1100.0
8	Pskhu-Gumista	750	276.43	181	0.66	1.0111	41.0	14.0	5.5	23.0	-14.0	1450.0
9	Saguramo-Mariamdzhvari	950	52.47	155	2.95	1.0131	38.5	10.5	0.0	22.0	-25.0	625.0
10	Lagodekhi	1000	177.00	169	0.95	1.0120	38.0	7.0	3.0	17.0	-27.0	1510.0
11	Rizini	1055	162.87	205	1.26	1.0099	29.0	13.0	3.0	20.0	-27.0	1800.0
12	Algeti	1200	68.22	404	6.89	1.1530	29.0	5.0	-7.0	15.0	-29.0	850.0
13	Borzhomi	1350	180.48	414	2.30	1.0048	32.5	4.5	-6.0	16.0	-23.0	1300.0
14	Kazbegi	2500	87.07	433	4.98	1.0070	31.0	0.0	-8.0	12.5	-36.0	950.0

Before diversity analysis, we constructed the Willis curve (Figure 3) to assess how representative the assumed material is. As was concluded from many investigations into the algal floras of Eurasia (Barinova et al., 2006), the Willis curve has a hyperbolic shape in sufficiently studied cases. In the case of the Algeti freshwater flora, the Willis curve approaches hyperbolic shape, thereby confirming that a sufficient amount of material is known in order to make taxonomic and ecological analysis feasible.

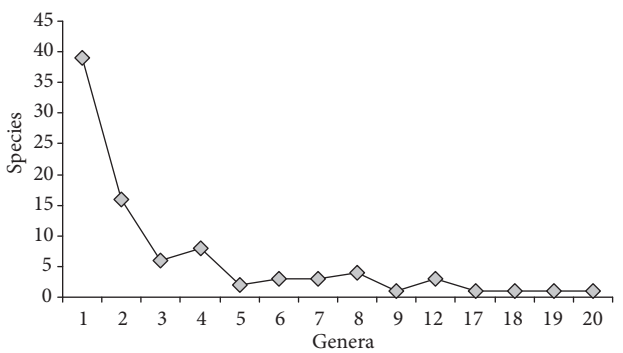

Figure 3. The Willis curve for the algal flora of Algeti National Park shows the number of species per genera (such as 1 genus with 38 species, 2 genera with 16 species, 3 genera with 6 species, etc.).

The Willis proportion is also close to hyperbolic for the consideration of algal diversity in other Georgian natural reserves.

The taxonomic structure of the algal communities of Algeti National Park is represented in Table 3. The Algeti algal flora belongs to the most species-rich group found in the Georgian Natural Reserves. Of 8 taxonomic divisions represented in the flora, the diatoms are the most species-rich.

To infer the major factors of the alpha-diversity forming process, we compared the taxonomic structure of algal floras from all of the protected areas of Georgia.

Figure 4 presents the species richness of algal taxonomic divisions in the Algeti flora compared to that from other natural reserves in Georgia. The plot has been organized in order of increasing altitude. As can be seen, the richest algal floras are located near the Black Sea and in the Caucasus Mountains. Overall, 3 groups of flora can be distinguished: 1) the coastal zone group (Sataplia-Colchis and Pizunda), 2) the high mountain group (Algeti, Borzhomi, Kazbegi), and 3) the piedmont group (the rest). The first and third groups include floras with more than

Table 3. Taxonomical structure of algal communities in the Georgian Natural Reserves. No. of reserves given as in Table 2.

No. of Reserves	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Bacillariophyta	170	143	95	94	100	121	94	112	95	109	133	262	159	140
Charophyta	34	29	27	19	24	19	19	19	19	19	20	33	125	75
Chlorophyta	75	61	25	24	25	23	28	26	23	23	28	34	53	88
Cyanobacteria	24	48	35	13	25	13	26	19	13	13	18	45	50	72
Euglenozoa	6	4	17	2	4	2	2	2	2	2	2	23	17	31
Heterokontophyta	7	11	6	3	3	3	3	3	3	3	3	3	4	23
Myzozoa	11	1	0	0	0	0	0	0	0	0	1	4	1	2
Glaucophyta	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Rhodophyta	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Index Species/Area	65.4	7.90	4.23	2.16	2.27	1.11	2.83	0.66	2.95	0.95	1.26	6.89	2.30	4.98
Total Species No.	327	297	205	155	181	181	172	181	155	169	205	404	414	433

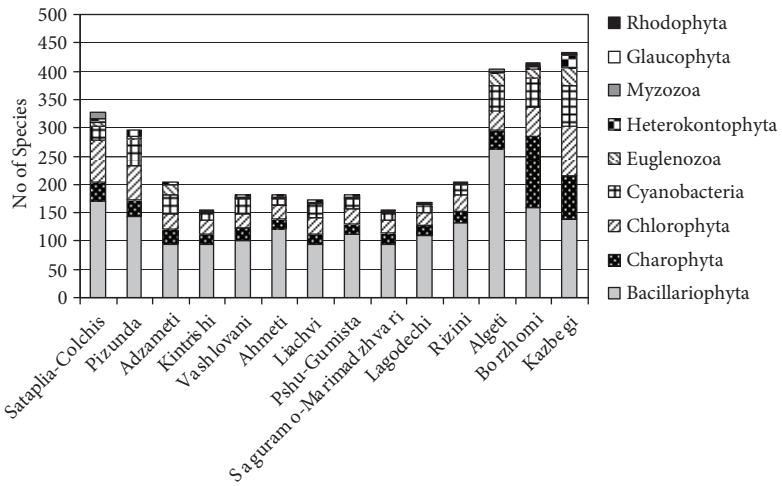

Figure 4. The species diversity of algae in the Georgian Natural Reserves, arranged in order of increasing altitude.

200 species, whereas the floras of the second group have no more than 200 species.

The percentage of taxonomic divisions in each flora, shown in Figure 5, indicates that the high mountain floras are considerably richer in nondiatom species, whereas in the floras found in the piedmont and coastal zones, diatoms prevail. The species diversity distribution in the natural reserves (Figure 4) has 2 peaks: a smaller peak near the Black Sea coast and a larger peak in the mountains to the east.

RDA and CCA analysis

Statistical analysis of algal diversity and environmental variables was performed in order to reveal the major factors that influence the algal diversity in the Georgian Natural Reserves.

The biplot of RDA calculation at the level of taxonomic divisions shows 4 floristic groups (Figure 6). Circle 1 (top right) includes the rich floras of the high mountain regions. Circle 2 (top left) assembles

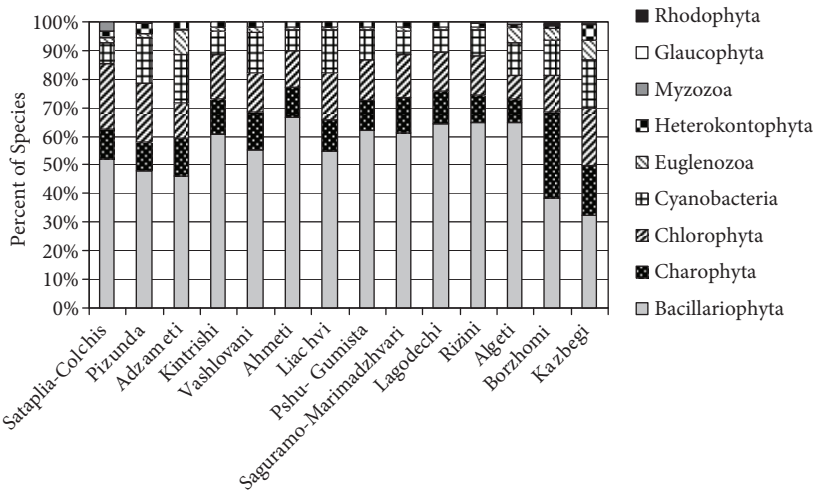

Figure 5. The relative species richness of taxonomic divisions in the Georgian Natural Reserves, in order of increasing altitude.

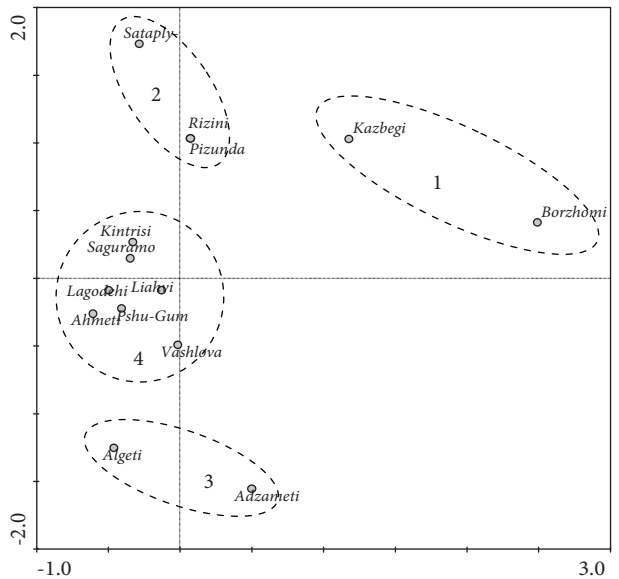

Figure 6. Biplot of RDA analysis of the taxonomic diversity at the divisional level throughout the Georgian Natural Reserves. Dashed lines delineate 4 groups of reserves: 1- high mountain floras, 2- lowland floras found near the Black Sea coast, 3- transboundary floras shared by lowland and high mountain groups, and 4- floras of the piedmonts.

the lowland floras located near the Black Sea coast. Circle 3 (bottom left) comprises the transboundary floras inhabiting the lowland and high mountain groups. The central circle, Circle 4, includes the floras of the piedmonts.

The triplot of CCA analysis (Figure 7) shows that climatic variables depend on the altitude of the preserved areas. Whereas minimum and January air temperatures are correlated with altitude positively, mean and July air temperatures and rainfall are correlated negatively. The species diversity of the algal communities is correlated with the complex of most important environmental factors, including the

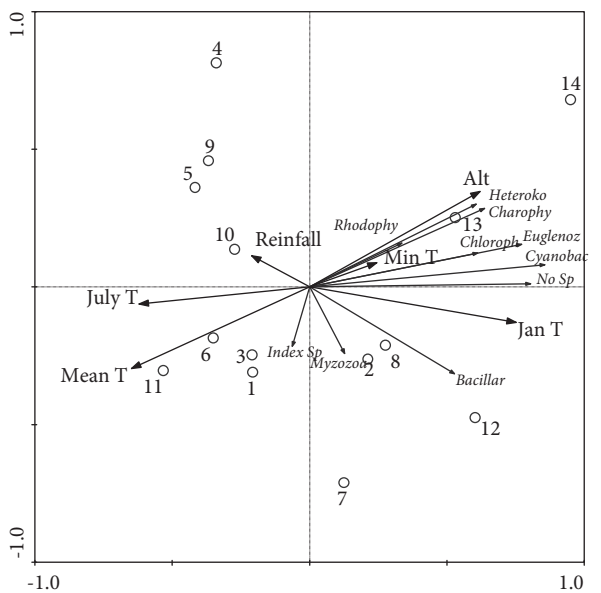

Figure 7. Triplot of CCA analysis of the climatic variables and taxonomic diversity at the divisional level in the Georgian Natural Reserves.

January temperatures and minimal air temperatures (grouped with altitude), whereas July temperatures, mean air temperatures, and rainfall appear to be much less significant in the plot (Figure 7). Only the indices of infraspecies per species ratio were negatively correlated with altitude. That allows us to conclude that the species of the high mountain ecosystems are less polymorphic.

Bioindication of environmental variables for the protected areas

The bioindication analysis gives us the basis for assessing the sustainability of the ecosystems represented in the natural reserves and, therefore, for evaluating the effectiveness of the system of protected areas in Georgia. The bioindication results are presented in Figure 8. It can be seen that each analysed group includes a wide ecological range of indicator species, but the trend lines for each variable cuts off the middle indicator group, with the exception of those that indicate trophic levels and heterotrophy. As a result of this analysis, it is possible to conclude that the aquatic communities of the Georgian natural protected areas form planktonic and periphytonic communities that indicated temperate, moderately oxygenated, fresh, neutral water with a moderate level of organic pollution. Therefore, bioindication shows that the Georgian protected areas are only slightly anthropogenically impacted.

Comparative floristics

The comparative floristic approach provides for the grouping of freshwater floras of protected areas with respect to their taxonomic similarities and phytogeographic affinities.

A similarity tree of floristic composition was constructed for the Georgian Natural Reserves (Figure 9), showing 3 species diversity clusters at a similarity level of 50%. Cluster 1 includes 3 floras with more than 200 species each. Cluster 2 includes the richest high mountain floras, and Cluster 3 comprises all other floras with a species diversity of less than 200 each.

The dendrite of taxonomic overlap (Figure 10) shows that the algal flora of the Kintrishi Natural Reserve shares species with many other floras (about 90%), and therefore it is placed in the centre of the dendrite. The floras with minimal overlap are found in the Kazbegi, Borzhomi, and Algeti reserves; these are the richest high mountain algal floras. Of these 3, the Kazbegi and Borzhomi are peculiar in the richness of nondiatom species.

The ratio of higher-to-lower taxa for vascular plants can help to characterise a floristic region. Diversity ratios in Asian flora parity are primarily due to the temperate-tropical taxa (White, 1983). In Georgian algal floras, the index of infraspecies variation (Table 2) is rather low, less than 1.01, which means that only a few species of the total species list of each reserve are divided into taxonomic varieties. Yet in the algal flora found in the Algeti Natural Reserve, this index is more than 1.15 (species of the total species list are divided into taxonomic varieties, including *Fragilaria capucina* Desm. with 5 varieties, *Planothidium lanceolatum* (Bréb. ex Kütz.) Lange-Bert. (as *Achnanthes lanceolata* (Bréb. ex Kütz.) Grunow), and *Cocconeis placentula* Ehrenb. with 4 varieties, 9 species with 3 varieties, and 26 species with 2 varieties). This calculation reflects a low infraspecies variation. This can be explained by the location within the Georgian Natural Reserves, an environment with marked seasonal fluctuations and low-to-moderate anthropogenic impact.

As was revealed for the high plants, species richness is dependent upon the studied area and is close to maximal in certain territories (Palmer & White, 1994). It can therefore be used as one of the characteristics of each studied territory. We calculated the index of species richness over the unit of area from the data provided in Table 2. As can be seen (Figure 11), the range of the index is rather high, from 65.4 to 0.66. Figure 11 represents the dynamic of the species/area index together with the total species diversity in the protected areas. Using this Figure, we find that the most species-rich areas are those near the Black Sea coast (in the Sataplia-Colchis and Pizunda Reserves). The Sataplia-Colchis Reserve is a small territory, about 5 km^2, which includes a river estuary inhabited by a large number of bird species (Nankinov, 1996). The index also fluctuates slightly in the high mountain areas, while in the majority of protected piedmont areas, it ranges between 0.66 and 2.95. Therefore, the most species-rich areas are those located in extreme environments.

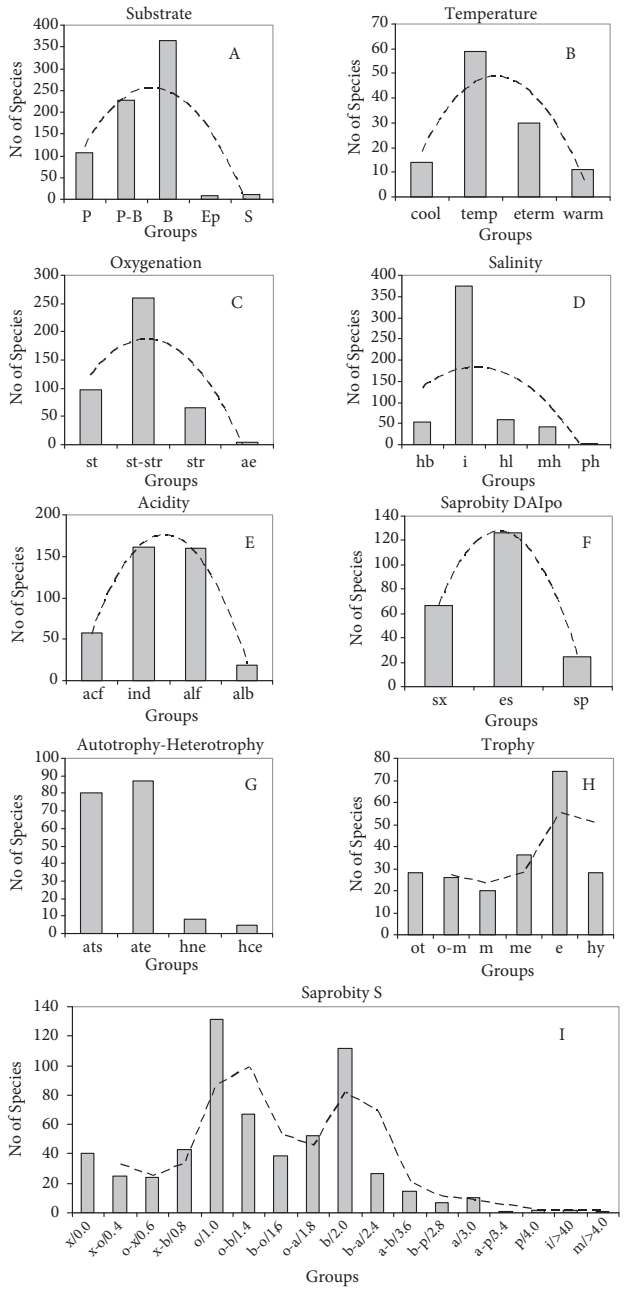

Figure 8. Bioindications of major environmental variables by the algal floras of the Georgian Natural Reserves. A- P = planktonic, P-B = plankto-benthic, B = benthic, Ep = epiphyte, S = soil; B- cool = cool water, temp = temperate water, eterm = eurythermic water, warm = warm water; C- st = standing water, str = streaming water, st-str = low streaming water, ae = aerophiles; D- hb = oligohalobes-halophobes, i = oligohalobes-indifferent, hl = halophiles, mh = mesohalobes, ph = polyhalobes; E- alb = alkalibiontes, alf = alkaliphiles, ind = indifferents, acf = acidophiles, neu = neutrophiles as a part of indifferents; F- sx = saproxenes, es = eurysaprobes, sp = saprophiles; G- ats = nitrogen-autotrophic taxa tolerating very small concentrations of organically-bound nitrogen, ate = nitrogen-autotrophic taxa tolerating elevated concentrations of organically-bound nitrogen, hne = facultatively nitrogen-heterotrophic taxa needing periodically elevated concentrations of organically-bound nitrogen, hce = obligately nitrogen-heterotrophic taxa needing continuously elevated concentrations of organically-bound nitrogen; H- ot = oligotraphentic, o-m = oligo-mesotraphentic, m = mesotraphentic, me = meso-eutraphentic, e = eutraphentic, hy = oligo- to eutraphentic (hypereutraphentic); I- x = xenosaprobes, x-o = xeno-oligosaprobes, o-x = oligo-xenosaprobes, x-b = xeno-betamesosaprobes, o = oligosaprobes, o-b = oligo-betamesosaprobes, b-o = beta-oligosaprobes, b = betamesosaprobes, b-a = beta-alphamesosaprobes, b-p = beta-polysaprobes, o-a = oligo-alphasaprobes, a-b = alpha-betamesosaprobes, a = alphamesosaprobes, a-p = alpha-polysaprobes, p = polysaprobes, i = i-eusaprobes, m = m-eusaprobes.

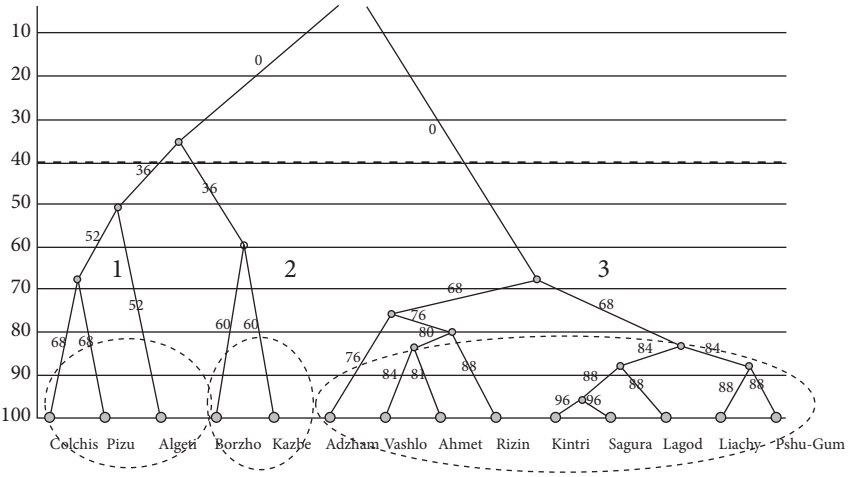

Figure 9. The clustering of the taxonomic structure in the Georgian Natural Reserves, as calculated based on the Sørensen-Chekanovsky indices. The figure shows 3 clusters that are cut off at a similarity level of 50%.

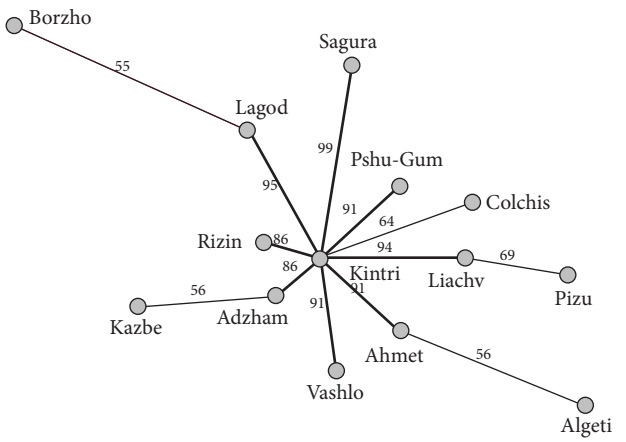

Figure 10. A dendrite of taxonomic diversity overlaps within the Georgian Natural Reserves, as constructed by the pair-similarity calculating method on the basis of the Sørensen-Chekanovsky indices. The floristic core of the Georgian Natural Reserves algal diversity is marked by bold lines.

A tree of the taxonomic structure similarity (Figure 12) shows 3 groups of diversity. Both the Borzhomi-Kazbegi and Pizunda-Colchis-Algeti groups represent different types of extreme areas characterised by species diversity of more than 200 and they are quite different from the third group, which includes the rest of the reserves. Each of the reserves in Group 3 contains no more than 200 species.

Analysis of climate impact

We analysed the correlation of the algal species diversity in the natural reserves with the climatic conditions occurring in each of the reserve areas (Table 2). Table 4 presents the stepwise calculation results for the diversity of algal communities and climatic variables of the Georgian Natural Reserves. Using this method, we were able to determine the major variables that impact the algal species richness, the taxonomic structure of algal communities, and the index of the number of algal species per area in each of the natural reserves. As can be seen, the species richness of an algal community is dependent on the minimal air temperature in the reserve area, and especially on the January temperatures. These results correlate with the altitudinal position of the natural reserves (from 0 to 2500 m above sea level) and the species richness distribution over the higher taxonomic divisions (Table 3 and Figure 4). For the latter, the mean air temperature is the most important impact factor (Table 4). Comparing the data from Tables 2 and 4, we can conclude that the minimal air temperature is a strong regulator of the species richness as a whole, whereas the mean temperature is more important for diversity among the higher taxa. The species richness per area index (Table 2) is related to the total species diversity and is shown to be the result of a complexity of factors including, in descending order of importance, the mean, minimal, and maximal annual temperatures.

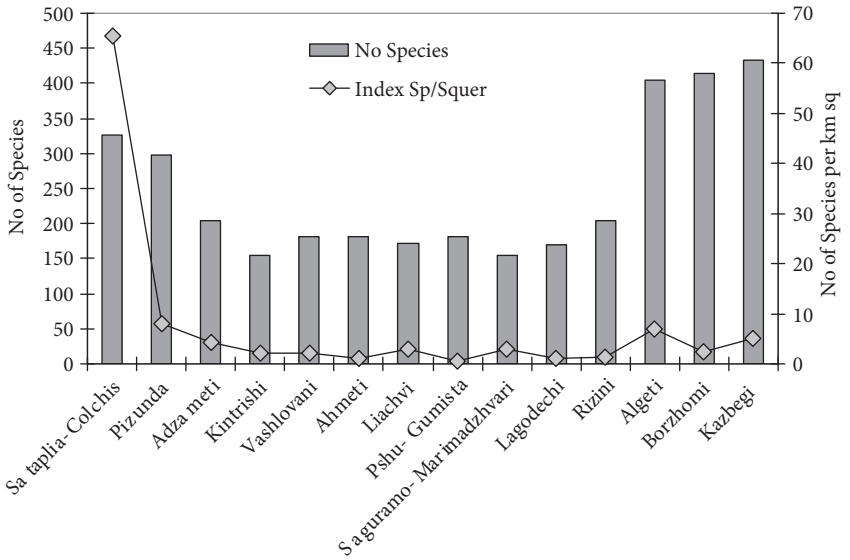

Figure 11. Distribution of algal species numbers in the Georgian Natural Reserves and the index of species richness over the unit of area (1 km^2).

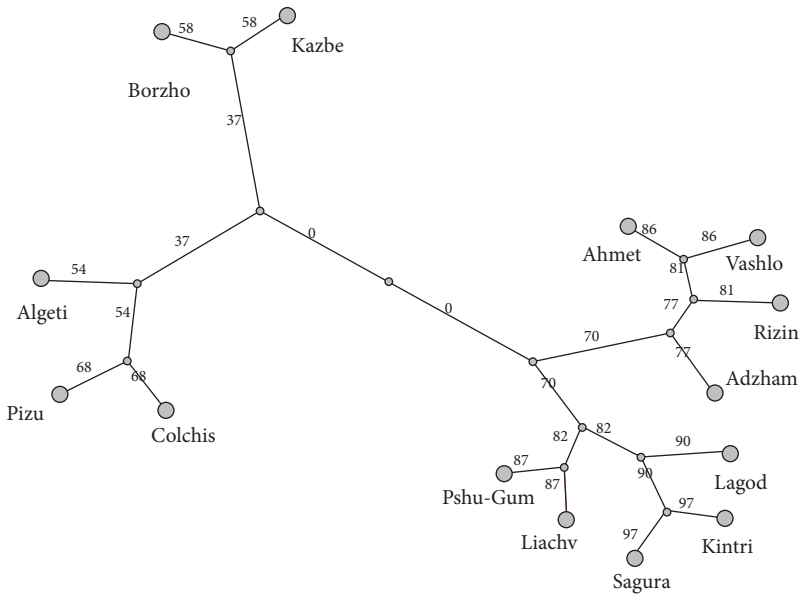

Figure 12. Tree of the taxonomic structure similarity in the Georgian Natural Reserves, as calculated based on the Sørensen-Chekanovsky indices and Brave calculations. The dashed line cuts off reserves with fewer than 200 algal species.

Correlation between species richness and major climatic condition variables was calculated by distance-weighted least squares using the Statistica 7.0 program. Figure 13 presents the relationship between species richness, especially diatom numbers, and the altitude of the preserved territory. This plot confirms that species richness increases with altitude even though the number of diatom species decreases.

Table 4. Multiple regression coefficients (R^2) relating the diversity estimates as dependent variables to climatic factors as independent variables (T_{min}: minimal temperature years' average; T_{max}: maximal temperature years' average, T_{mean}: mean temperature years' average, T_{Jan}: January temperature years' average, N_{Sp}: species richness).

Diversity Estimates	Stepwise Model by Climatic Factors					
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Species Richness	-	T_{Jan} 0.52**	T_{Jan} 0.60**	T_{Jan}, T_{min} 0.71**	T_{Jan}, T_{min} 0.74**	T_{Jan} 0.75**
Taxonomic Divisions Content	-	T_{mean} 0.48**	T_{mean} 0.60**	T_{min} 0.71**	-	-
Index Species/Area	-	-	N_{Sp} 0.75#	T_{max}, N_{Sp}, T_{min}, T_{mean} 0.65*	T_{min}, T_{max}, N_{Sp}, T_{mean} 0.77**	T_{min}, N_{Sp} 0.78*

Note: #,*, ** = statistically significant at $P < 0.1$, $P < 0.05$, and $P < 0.01$, respectively.

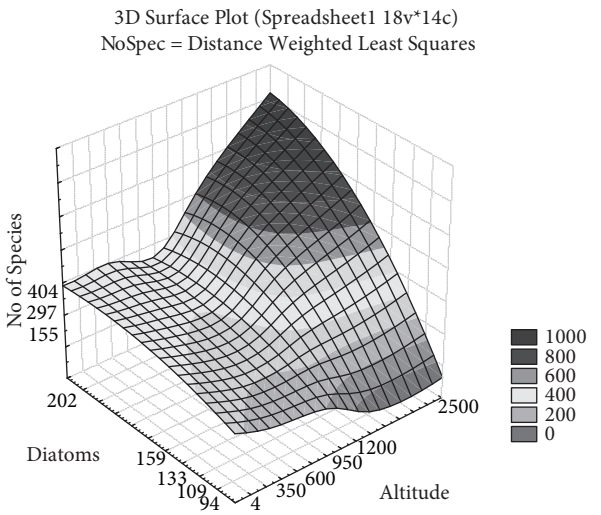

Figure 13. The relationship between species richness, particularly with regard to diatom numbers, and the altitude of the studied location.

In Figure 14, information is presented on the distribution of species numbers with regard to altitude and the annual minimal temperature in the Georgian Natural Reserves. In the centre of the plot, a curve representing 200 species is correlated with an altitude of approximately 600 m, and the distribution is divided into 2 different parts.

Figure 15 reflects the relationship between species number, altitude, and annual rainfall rate in the Georgian Natural Reserves. The curve in the centre of the plot represents a species number of 200 and is correlated with an altitude of about 600 m; distribution is divided into 3 different parts.

The analysis thus reveals a strong climatic control over the major diversity estimates in the Georgian Natural Reserves. In particular, the January temperature is shown to be the critical factor in the development of high altitude algal communities, while a species number of 200 per flora is found to be the critical diversity level.

Conclusion

We studied floristic diversity of algal communities in Algeti National Park and compared it to what is known about freshwater algae present in the country's other national reserves. After extensive sampling and a revision of the previously described materials, a total of 1063 species were listed. All of the local algal floras reflect temperate, moderately oxygenated, fresh, neutral water affected by only a moderate level of organic pollution. The pattern of diversity distribution depends on altitude and local climatic conditions. The study identified 4 floristic groups corresponding to the high mountain, low mountain, piedmont, and lowland regions. The

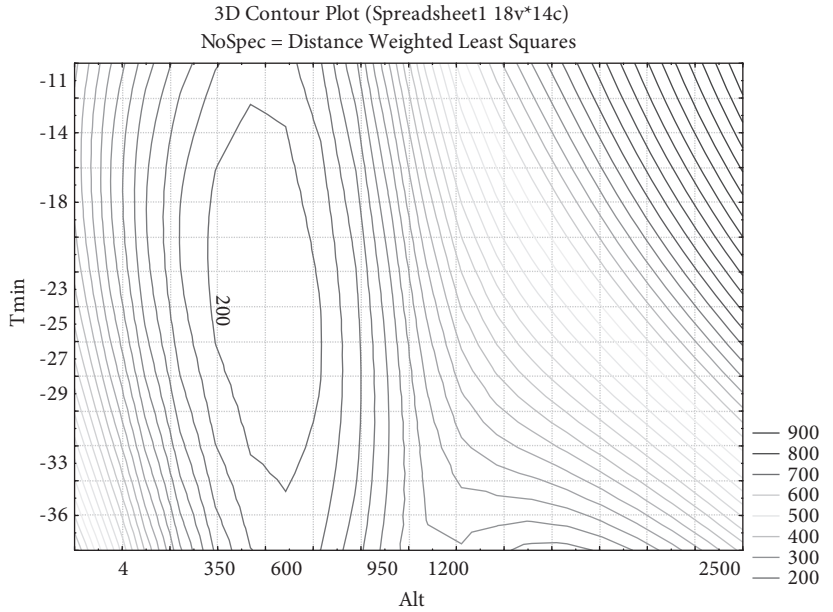

Figure 14. The relationship between the species richness, location altitude, and annual minimal air temperature in the Georgian Natural Reserves.

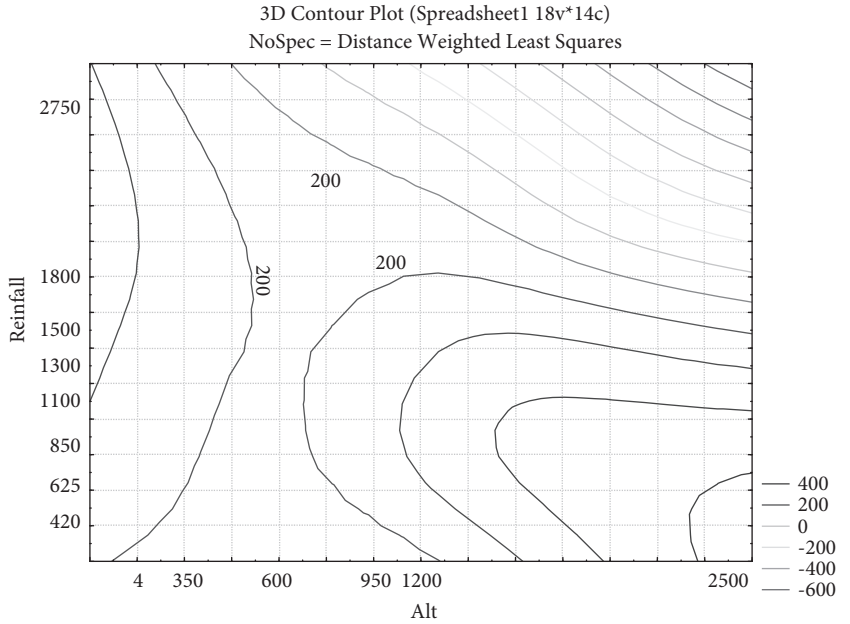

Figure 15. The relationship between the species richness, altitude, and precipitation levels in the Georgian Natural Reserves.

statistical analysis identified a threshold of 200 species per natural reserve, dividing the sites into species-rich and species-poor assemblages. In terms of the total species numbers and the numbers per area unit (1 km^2), the most species-rich areas occur at the extremes of the altitudinal ranges, that is, in the coastal lowlands and in high mountains. The numbers of infraspecies per species are negatively correlated with altitude and, therefore, species of the high mountain ecosystems are less polymorphic.

The general trend indicates a decrease of species diversity from the mountainous areas in the east to the Black Sea, with a secondary peak over the narrow coastal zone. The intergroup dominant relationships (the relative species richness of the higher taxonomic divisions) change in parallel with floristic diversity in such a way that diatoms prevail in the coastal zone and piedmont floras, whereas the nondiatom groups come to the forefront throughout the mountainous areas. This inversion of the traditional dominant relationships between diatom and nondiatom can be seen as a regional peculiarity of the Georgian protected areas. Thus, on the west coast of the Black Sea, in Moldova (Biodiversity, 2010; Cocirta, 2000) and Romania (Cărăuş, 2002), and in the high mountain habitats of Turkey (Kolaylı & Şahin 2009; Şahin, 2009; Şahin et al., 2010), the algal floras are, as a whole, enriched by nondiatom algae (the green algae and euglenoids), as is found in the mountainous regions of Georgia, whereas diatoms are ubiquitously prominent in the freshwater floras occurring along the Turkish coast (Gönülol et al., 1995; Kolayli & Baysal, 1998; Kara & Şahin, 2001; Dere et al., 2002; Şahin, 2003; Aysel, 2005; Baykal et al., 2009). In contrast, diatoms constitute only about 50% of the freshwater algal flora in Turkey as a whole, a total that is represented by 2030 species (Aysel, 2005). According to Azovsky (2002), algal diversity per area is cell size-dependent. Diatoms, a small-celled group, are less dependent on the area for their diversity than most of the nondiatom algae.

Our analysis reveals a strong climatic control over the major diversity estimates in the Georgian Natural Reserves. The January temperature is shown to be the single most critical factor, particularly for the high altitude algal communities.

Acknowledgements

We would like to thank Dr. Olga Anissimova (Moscow State University) for help in the initial stage of constructing an algal database for the Georgian Natural Reserves. This work was partially funded by Israel's Ministry of Absorption.

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