

Annual Research & Review in Biology

19(4): 1-29, 2017; Article no.ARRB.36894
ISSN: 2347-565X, NLM ID: 101632869

A Checklist of Diatom Species Reported from the Egyptian Mediterranean Lakes

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Authors' contributions

This work was carried out in collaboration between all authors. Authors KHS, MME and HMK designed the study. Author HMK wrote the protocol and the first draft of the manuscript. Author DIE managed the literature searches the analyses of the study. Authors KHS, MME and HMK read and approved the final manuscript.

Article Information

DOI: 10.9734/ARRB/2017/36894

Editor(s):

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Complete Peer review History: <http://www.sciedomain.org/review-history/21858>

Review Article

Received 22nd September 2017

Accepted 8th November 2017

Published 11th November 2017

ABSTRACT

A clear and concise checklist of the diatom species for the five Egyptian Mediterranean Lakes (Mariut, western section; Edku, Burullus, Manzala, Deltaic section and Bardawil, North Sinai) has yet been documented over 40 years of cited bibliography (also with their synonyms names). A total of 390 diatom species belong to 67 genera and 38 families have been recorded. The most recorded diatom genera were *Nitzschia* (Family: Bacillariaceae) and *Navicula* (Family: Naviculaceae). This diatom list has aided in identifying the original species, accepted names, synonyms and their habitat.

Keywords: Diatom; Egypt; Mediterranean; lakes; checklist.

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1. INTRODUCTION

The five Egyptian Mediterranean Lakes (Mariut, western section; Edku, Burullus, Manzala, Deltaic section and Bardawil, North Sinai) were the most productive Lakes in Egypt (Fig. 1). In the meantime, the lakes were subjected to a gradual shrinkage during the past few decades, due to land reclamation and transformation of significant parts of the lakes to fish farms, particularly along the southern regions. In addition, large parts of the lakes are overgrown with aquatic vegetation which reduces the open water to nearly half of its total area, speeding up the process of land transformation [1].

Lake Manzala is the largest lake (1200 km²), while Lake Mariut (63 km²) is the smallest. Lake Bardawil is the most hypersaline water, while the other lakes are brackish water. Lake Mariut is the only lake that has no natural connection with the Mediterranean Sea [2].

Diatoms contribute to a substantial portion of primary production in the oceans and many lakes. It was abundant in every habitat where water is found (oceans, lakes, streams, mosses, soils, and even the bark of trees). These algae form a part of aquatic food web base in marine and freshwater habitats. Assemblages of diatom species are often specific to particular habitats and can be used to characterize those habitats [3,4].

The species names as it appears on the original publication, the accepted names, the common

synonyms and species habitat verified through two taxonomic data bases [5,6] has been documented. Use of invalid names or synonyms can cause erroneous or confusing reports of species of micro-biota.

Based on these, this review will list both the present and past data available for examining the composition of diatom species in the Egyptian Northern Mediterranean Lakes, providing for new information about the changes occurring in species composition with environmental change.

2. IDENTIFICATION OF DIATOM SPECIES

Data collected from scientific journals were checked for diatom species and covered publications dated 40 years (1974 – 2014). The available data include diatom species from each lake collected according the previous literatures [1,7-33]. The most recorded species were checked for valid names according to World Register of Marine Species (WoRMS) and few species were checked according to algaebase (www.algaebase.com).

The checklist of diatom species in the five northern lakes of Egypt was represented in Table (1). The following check list include 390 species belong to 67 genera and 38 families (Table 2). Results indicated that the diatoms in the northern lakes are highly diverse, commensurate with the wide range of habitats found in their ecosystems. The most recorded diatom genera are *Nitzschia* and *Navicula* belonging to two families (Bacillariaceae and Naviculaceae, respectively).

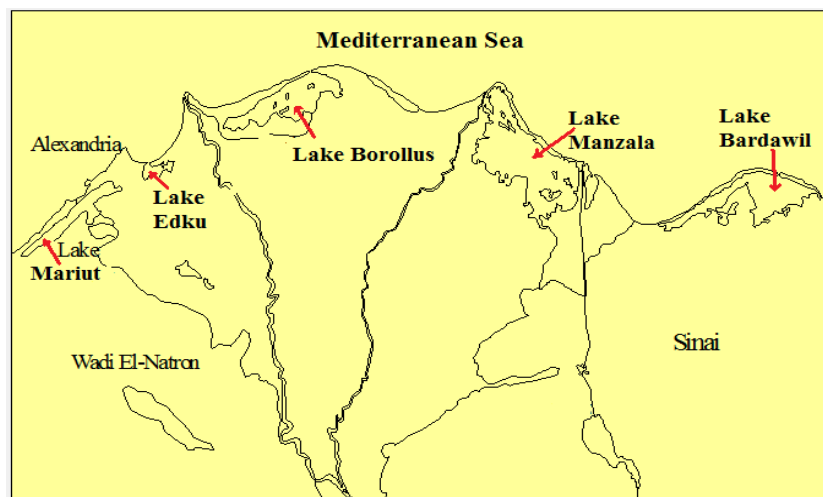


Fig. 1. Map showing the five Northern Lakes of Egypt (after Galal 2005)

Table 1. Names appear in the cited literature (in bold); accepted names, synonyms and habitats of diatom species recorded in the Egyptian Mediterranean Lakes over 40 years

Algal species	H	Lake					
	H	Ma	Ed	Br	Mn	Ba	T
Achnantheaceae							
<i>Achnanthes brevipes</i> C.Agardh 1824 (accepted)	MF	-	-	+	+	+	3
<i>Achnantella brevipes</i> (Agardh) Gaillon 1833							
<i>Achnantheidium brevipes</i> (Agardh) Heiberg 1863							
<i>Achnantheidium brevipes</i> (Agardh) Cleve 1893							
<i>Achnanthes brevipes</i> var. <i>intermedia</i> (Kützing) Cleve 1895 (accepted)	MF	+	+	-	-	-	2
<i>Achnanthes intermedia</i> Kützing, 1833							
<i>Achnanthes brevipes</i> var. <i>parvula</i> (Kützing) Cleve, 1895 (accepted)	F	+	-	-	-	-	1
<i>Achnanthes brevipes</i> var. <i>parvula</i> (Kützing) Cleve, 1895							
<i>Achnantheidium brevipes</i> var. <i>parvulum</i> (Kützing) Mereschovsky, 1901							
<i>Achnanthes delicatula</i> (Kützing) Grunow, 1880	F	-	-	-	+	-	1
accepted name (<i>Planothidium delicatulum</i> (Kützing) Round & Bukhtiyarova, 1996							
<i>Achnanthes exigua</i> (accepted)	F	-	-	-	-	+	1
<i>Microneis exigua</i> (Grunow) Comber 1901							
<i>Cocconeis exigua</i> var. <i>constricta</i> Torca, 1909							
<i>Achnanthes exigua</i> var. <i>constricta</i> (Grunow) Hüstedt 1921							
<i>Achnanthes exigua</i> var. <i>constricta</i> (Torca) Hüstedt, 1930							
<i>Stauroneis exilis</i> Kützing 1984							
<i>Achnantheidium exiguum</i> (Grunow) D. B. Czarnecki 1994							
<i>Achnanthes hauckiana</i> Grunow, 1880	MF	-	-	-	+	+	2
accepted name (<i>Planothidium hauckianum</i> (Grunow) Round & Bukhtiyarova, 1996							
<i>Achnanthes inflata</i> (Kützing) Grunow, 1867 (accepted)	FT	-	-	-	+	-	1
<i>Stauroneis inflata</i> Kützing 1844							
<i>Achnantheidium inflatum</i> (Kützing) Hutton 1883							
<i>Achnanthes ventricosa</i> Ehrenberg 1855							
<i>Achnanthes lanceolata</i> (Brébisson ex Kützing) Grunow, 1880	FT	-	-	-	+	-	1
accepted name (<i>Achnantheidium lanceolatum</i> Brébisson ex Kützing, 1846)							
<i>Achnanthes longipes</i> C.Agardh 1824 (accepted)	MF	+	-	-	+	-	2
<i>Achnantella longipes</i> (Agardh) Gaillon, 1833							
<i>Achnanthes salina</i>* (Kützing) Kützing	U	+	+	-	-	-	2
<i>Achnanthes septata</i> Cleve-Euler	U	+	-	-	+	-	2
<i>Achnanthes taeniata</i> Grunow 1880	MF	-	-	-	-	+	1
accepted name (<i>Pauliella taeniata</i> (Grunow) F.E.Round & P.W.Basson, 1997							
<i>Achnanthes ventralis</i> (Krasske) Lange Bertalot in Lange-Bertalot & Krammer 1989 (accepted)	F	+	+	-	-	-	2
<i>Achnanthes kryophila</i> var. <i>protracta</i> Hüstedt, 1937							
<i>Achnantheidium ventralis</i> (Krasske) E.Y.Haworth & M.G.Kelly, 1998							
<i>Navicula ventralis</i> Krasske, 1923							
Achnanthidiaceae							
<i>Achnantheidium exiguum</i> (Grunow) D.B.Czarnecki, 1994	M	+	-	-	+	-	2
accepted name (<i>Achnantheidium exiguum</i> (Grunow) D.B.Czarnecki, 1994							
<i>Achnantheidium minutissimum</i> (Kützing) Czarnecki, 1994 (accepted)	FT	+	-	-	-	-	1

<i>Achnanthes cryptocephala</i> (Grunow) M. Peragallo 1897							
<i>Achnanthes microcephala</i> (Kützing) Grunow 1880							
<i>Achnanthes microcephala</i> (Kützing) Cleve 1895							
<i>Achnanthes minutissima</i> f. <i>curta</i> Grunow 1880							
<i>Achnanthes minutissima</i> var. <i>cryptocephala</i> Grunow 1880							
<i>Achnanthidium lanceolatum</i> f. <i>minutissima</i> (Kützing) Tömösvary, 1879							
<i>Achnantheidum microcephalum</i> Kützing 1844							
<i>Cocconeis microcephala</i> (Kützing) Schonfeldt 1907							
<i>Cocconeis minutissima</i> (Kützing) Schönfeldt, 1907							
<i>Microneis microcephala</i> (Kützing) Cleve, 1895							
<i>Microneis microcephala</i> (Kützing) Meister, 1912							
<i>Microneis minutissima</i> (Kützing) Meister, 1912							
<i>Microneis minutissima</i> (Kützing) Cleve, 1895							
<i>Microneis minutissima</i> var. <i>cryptocephala</i> (Grunow) Cleve, 1895							
<i>Schizonema microcephalum</i> (Kützing) Kuntze, 1898							
<u>Amphipleuraceae</u>							
<i>Amphiprora alata</i> (Ehrenberg) Kützing, 1844	MF	+	+	+	+	+	5
accepted name (<i>Entomoneis alata</i> (Ehrenberg) Ehrenberg, 1845)							
<i>Amphiprora gigantea</i> Grunow, 1860 (accepted)	M	-	-	-	-	+	1
no synonym							
<i>Amphiprora marina</i> (W.Smith) Chase, 1907	M	-	-	-	-	+	1
accepted name (<i>Amphora marina</i> W.Smith, 1857)							
<i>Amphiprora paludosa</i> W.Smith, 1853	MBF	+	+	+	+	+	5
accepted name (<i>Entomoneis paludosa</i> (W.Smith) Reimer, 1975)							
<i>Amphiprora surirelloides</i> Hendeby 1951	M	-	-	-	+	+	2
accepted name (<i>Entomoneis surirelloides</i> (Hendeby) Poulin, Berard-Therriault & Cardinal 1987, 1987)							
<i>Frustulia rhomboides</i> (Ehrenberg) De Toni, 1891 (accepted)	MFT	+	-	-	+	-	2
<i>Brebissonia rhomboides</i> (Ehrenberg) Kuntze, 1898							
<i>Vanheurckia rhomboides</i> (Ehrenberg) Brébisson, 1869							
<u>Aulacoseiraceae</u>							
<i>Aulacoseira agassizii</i> (Ostenf.) Simonsen (accepted)	F	+	-	-	+	-	2
<i>Aulacoseira ambigua</i> (Grunow) Simonsen (accepted)	F	+	-	+	+	+	4
<i>Aulacoseira distans</i> (Ehrenberg) Simonsen, 1979 (accepted)	F	+	-	+	+	+	4
<i>Gaillonella distans</i> Ehrenberg, 1836							
<i>Gaillonella distans</i> Ehrenberg, 1837							
<i>Lysigonium distans</i> (Ehrenberg) Trevisan, 1848							
<i>Lysigonium distans</i> (Ehrenberg) Kuntze, 1891							
<i>Melosira distans</i> (Ehrenberg) Kützing, 1844							
<i>Melosira polymorpha</i> subsp. <i>distans</i> (Ehrenberg) H.Bethge, 1925							
<i>Aulacoseira granulata</i> (Ehrenberg) Simonsen, 1979 (accepted)	F	+	-	+	+	+	4
<i>Gaillonella granulata</i> Ehrenberg, 1843							
<i>Lysigonium granulatum</i> (Ehrenberg) Kuntze, 1891							
<i>Melosira granulata</i> (Ehrenberg) Ralfs, 1861							
<i>Melosira granulata</i> var. <i>granulata</i>							
<i>Melosira polymorpha</i> subsp. <i>granulata</i> (Ehrenberg) H.Bethge, 1925							
<i>Melosira punctata</i> var. <i>granulata</i> (Ehrenberg) Cleve & Möller, 1879							

<i>Orthosira granulata</i> (Ehrenberg) Schonfeldt, 1907							
<i>Aulacoseira granulata</i> var. <i>angustissima</i> (O.F.Müller) Simonsen, 1979 (accepted)	F	+	-	+	+	+	4
<i>Melosira granulata</i> var. <i>angustissima</i> Otto Müller, 1899							
<i>Aulacoseira islandica</i> (O.Müller) Simonsen, 1979 (accepted)	F	+	-	+	-	-	2
<i>Aulacoseira italica</i> (Ehrenberg) Simonsen, 1979 (accepted)	F	-	-	+	-	-	1
<i>Gaillonella italica</i> Ehrenberg, 1838							
Bacillariaceae							
<i>Bacillaria paradoxa</i> J.F.Gmelin, 1791	F	+	+	+	+	+	5
accepted name (<i>Bacillaria paxillifera</i> (O.F.Müller) T.Marsson, 1901							
<i>Bacillaria paxillifera</i> (O.F.Müller) T. Marsson, 1901	M	-	-	-	-	+	1
accepted name (<i>Bacillaria paxillifera</i> (O.F.Müller) T.Marsson, 1901							
<i>Fragilariopsis curta</i> (Van Heurck) Hüstedt, 1958 (accepted)	M	-	-	-	-	+	1
<i>Fragilariopsis linearis</i> var. <i>curta</i> (Van Heurck) Frenguelli 1958							
<i>Fragilariopsis cylindriformis</i> (Hasle) Hasle, 1993 (accepted)	M	-	-	-	-	+	1
<i>Fragilariopsis oceanica</i> (Cleve) Hasle, 1965 (accepted)	M	-	-	-	-	+	1
<i>Nitzschia grunowii</i> Hasle, 1972							
<i>Hantzschia amphioxys</i> (Ehrenberg) Grunow, 1880 (accepted)	MFT	+	-	-	+	+	3
<i>Eunotia amphioxys</i> Ehrenberg, 1843							
<i>Hantzschia abundans</i> Lange-Bertalot, 1993, v.27							
<i>Hantzschia amphioxys</i> var. <i>genuina</i> Grunow, 1884							
<i>Homoeocladia amphioxys</i> (Ehrenberg) Kuntze, 1898							
<i>Nitzschia amphioxys</i> (Ehrenberg) W.Smith, 1853							
<i>Nitzschia acicularis</i> (Kützing) W.Smith, 1853 (accepted)	MF	+	+	+	+	+	5
<i>Homoeocladia acicularis</i> (Kützing) Kuntze, 1898							
<i>Nitzschiella acicularis</i> (Kützing) Rabenhorst, 1864							
<i>Nitzschia acuminata</i> (W.Smith) Grunow, 1880	M	-	-	+	-	+	2
accepted name (<i>Tryblionella acuminata</i> W.Smith 1853							
<i>Nitzschia amphibia</i> Grunow, 1862 (accepted)	F	+	+	+	+	+	5
<i>Bacillaria amphibia</i> (Grunow) Elmore, 1895							
<i>Homoeocladia amphibia</i> (Grunow) Kuntze, 1898							
<i>Nitzschia angularis</i> W.Smith, 1853 (accepted)	M	-	-	+	-	+	2
<i>Nitzschia angustatula</i> Lange-Bertalot, 1987 (accepted)	F	-	-	+	-	+	2
<i>Nitzschia apiculatum</i> (W.Gregory) Grunow, 1880							
accepted name (<i>Tryblionella kuetzingii</i> Álvarez-Blanco & S.Blanco, 2014							
<i>Nitzschia bilobata</i> W.Smith, 1853 (accepted)	M	+	+	+	+	+	5
<i>Nitzschia circumsuta</i> (Bailey) Grunow, 1880	M	-	-	-	+	-	1
accepted name (<i>Tryblionella circumsuta</i> (Bailey) Ralfs, 1861							
<i>Nitzschia closterium</i> (Ehrenberg) W.Smith, 1853	F	+	+	+	+	+	5
accepted name (<i>Cylindrotheca closterium</i> (Ehrenberg) Reimann & J.C.Lewin, 1964							
<i>Homoeocladia closterium</i> (Ehrenberg) Kuntze, 1898							
<i>Nitzschia curvirostris</i> var. <i>closterium</i> (Ehrenberg) De Toni, 1892							
<i>Nitzschia longissima</i> var. <i>closterium</i> (Ehrenberg) Van Heurck, 1885							
<i>Nitzschia commutata</i> Grunow, 1880 (accepted)	MF	+	-	+	-	-	2

<i>Nitzschia pseudoamphioxys</i> Hustedt							
<i>Nitzschia conlicola</i> Østrup, 1910 (accepted)	F	-	-	+	-	-	1
<i>Nitzschia constricta</i> (Gregory) Grunow, 1880 (accepted)	MF	-	-	-	+	-	1
<i>Nitzschia fasciculata</i> (Grunow) Grunow, 1881 (accepted)	F	+	+	+	+	+	5
<i>Nitzschia filiformis</i> (W.Smith) Hustedt (accepted)	MF	+	-	+	-	-	2
<i>Nitzschia flexa</i> Schumann, 1862 (accepted)	F	+	-	+	+	+	4
<i>Nitzschia fonticola</i> Grunow, 1879 (accepted)	F	+	-	+	+	+	4
<i>Nitzschia frustulum</i> var. <i>subsalina</i> Hustedt (accepted)	F	+	-	-	-	+	2
<i>Nitzschia frustulum</i> var. <i>perminutum</i> Grunow, 1881 accepted name (<i>Nitzschia perminuta</i> (Grunow) M.Peragallo, 1903)	F	+	-	+	-	-	2
<i>Nitzschia glacialis</i> Grunow (accepted)	F	-	-	+	-	-	1
<i>Nitzschia granulata</i> Grunow, 1880 accepted name (<i>Tryblionella granulata</i> (Grunow) D.G.Mann, 1990)	MF	-	-	-	+	-	1
<i>Nitzschia hungarica</i> Grunow, 1862 accepted name (<i>Tryblionella hungarica</i> (Grunow) Frenguelli, 1942)	M	-	-	+	+	+	3
<i>Nitzschia ignorata</i> Krasske, 1929 accepted name (<i>Nitzschia nana</i> Grunow, 1881)	F	-	-	+	-	-	1
<i>Nitzschia kutizingiana</i> Hilse, 1863 (accepted)	MF	-	-	+	-	-	1
<i>Nitzschia lanceolata</i> W.Smith, 1853 (accepted)	F	-	-	-	+	-	1
<i>Nitzschia latens</i> Hustedt, 1949 (accepted)	F	+	-	+	+	+	4
<i>Nitzschia linearis</i> W.Smith, 1853 (accepted) <i>Homoeocladia linearis</i> (W.Smith) Kuntze	F	+	-	+	+	+	4
<i>Nitzschia litoralis</i> Grunow, 1880 accepted name (<i>Tryblionella litoralis</i> (Grunow) D.G.Mann, 1990)	F	+	-	+	+	+	4
<i>Nitzschia longissima</i> (Brébisson) Ralfs, 1861 (accepted) <i>Nitzschia birostrata</i> W.Smith, 1853 <i>Nitzschiella longissima</i> (Brébisson) Rabenhorst	MF	+	+	+	+	+	5
<i>Nitzschia navicularis</i> (Brébisson) Grunow, 1880 accepted name (<i>Tryblionella navicularis</i> (Brébisson) Ralfs, 1861) <i>Tryblionella marginata</i> W.Smith, 1853	M	-	-	-	+	-	1
<i>Nitzschia obtusa</i> W.Smith, 1853 (accepted) <i>Bacillaria obtusa</i> (W.Smith) Elmore, 1895	MF	-	-	-	+	-	1
<i>Nitzschia palea</i> (Kützing) W.Smith, 1856 (accepted) <i>Homoeocladia palea</i> (Kützing) Kuntze, 1898	F	+	+	+	+	+	5
<i>Nitzschia panduriformis</i> W.Gregory, 1857 accepted name (<i>Psammodictyon panduriforme</i> (W.Gregory) D.G.Mann, 1990)	F	-	-	-	+	+	2
<i>Nitzschia paradoxa</i> (J.F.Gmelin) Grunow, 1880 accepted name (<i>Bacillaria paxillifera</i> (O.F.Müller) T.Marsson, 1901)	MF	-	-	-	-	+	1
<i>Nitzschia parvula</i> W.Smith, 1853 (accepted) <i>Homoeocladia parvula</i> (W.Smith) Kuntze	MB	+	-	+	-	-	2
<i>Nitzschia perminuta</i> (Grunow) M.Peragallo, 1903 (accepted) <i>Nitzschia frustulum</i> var. <i>perminutum</i> Grunow, 1881 <i>Nitzschia hiemalis</i> Hustedt, 1943	F	+	-	+	+	+	4
<i>Nitzschia punctate</i> (W.Smith) Grunow, 1878 accepted name (<i>Tryblionella punctata</i> W.Smith, 1853)	M	-	-	-	+	-	1
<i>Nitzschia reversa</i> W. Smith accepted name (<i>Nitzschia lorenziana</i> var. <i>incerta</i> Grunow)	F	-	-	-	+	-	1

<i>Nitzschia rostellata</i> Hüstedt (accepted)	F	-	-	+	+	+	4
<i>Nitzschia seriata</i> Cleve, 1883	M	-	-	-	-	+	1
accepted name (<i>Pseudo-nitzschia seriata</i> (Cleve) H.Peragallo, 1899							
<i>Nitzschia scalaris</i> (Ehrenberg) W.Smith, 1853	F	+	+	+	+	+	5
accepted name (<i>Tryblionella scalaris</i> (Ehrenberg) P.Siver & P.B.Hamilton, 2005							
<i>Nitzschia sigma</i> (Kützing) W.Smith, 1853 (accepted)	F	+	+	+	+	+	5
<i>Homoeocladia sigma</i> (Kützing) Kuntze 1898							
<i>Sigmatella sigma</i> (Kuting) Frenguelli 1923							
<i>Nitzschia sigmoidia</i> (Nitzsch) W.Smith, 1853 (accepted)	F	+	-	+	+	+	4
<i>Cymbella sigmoidea</i> (Nitzsch) C. Agardh 1830							
<i>Synedra sigmoidea</i> (Nitzsch) Kützing 1844							
<i>Frustularia sigmoidea</i> (Nitzsch) Jenner 1845							
<i>Homoeocladia sigmoidea</i> (Nitzsch) Elmore 1921							
<i>Nitzschia elongate</i> Hassal 1845							
<i>Nitzschia tryblionella</i> Hantzsch, 1860 (accepted)	MF	+	-	+	-	-	2
<i>Homoeocladia tryblionella</i> (Hantzsch) Kuntze, 1898							
<i>Penium minutum</i> var. <i>crassum</i> f. <i>inflata</i> West, 1892							
<i>Suriella gracilis</i> (W.Smith) Grunow, 1862							
<i>Tryblionella gracilis</i> W.Smith, 1853							
<i>Tryblionella hantzschiana</i> Grunow, 1862							
<i>Tryblionella hantzschiana</i> var. <i>australiana</i> Playfair							
<i>Tryblionella hantzschiana</i> var. <i>calida</i> (Grunow) Van Heurck							
<i>Tryblionella hantzschiana</i> var. <i>maxima</i> (Grunow) Frenguelli, 1938							
<i>Tryblionella hantzschiana</i> var. <i>minor</i> Playfair							
<i>Tryblionella hantzschiana</i> var. <i>ovata</i> (Lagerstedt) Playfair							
<i>Tryblionella tryblionella</i> (Hantzsch) Prochazka, 1923							
<i>Nitzschia umbonata</i> (Ehrenberg) Lange-Bertalot, 1978 (accepted)	F	+	-	+	+	+	4
<i>Nitzschia diducta</i> Hüstedt 1988							
<i>Nitzschia fossalis</i> Hüstedt 1942							
<i>Nitzschia stagnorum</i> Rabenhorst 1860							
<i>Suriella umbonata</i> (Ehrenberg) G. L. Rabenhorst 1860							
<i>Nitzschia vermicularis</i> (Kützing) Hantzsch, 1860 (accepted)	F	+	-	+	+	+	4
<i>Nitzschia virteria</i> var. <i>recta</i> (Hantzsch; Grunow) van Heurck, 1885	M	+	-	+	-	-	2
accepted name (<i>Nitzschia recta</i> Hantzsch ex Rabenhorst, 1862							
<i>Psammodictyon panduriforme</i> (W.Gregory) D.G.Mann, 1990 (accepted)	MF	-	-	-	-	+	1
<u>Biddulphiaceae</u>							
<i>Biddulphia aurita</i> (Lyngbye) Brébisson, 1838	M	-	-	-	-	+	1
accepted name (<i>Odontella aurita</i> (Lyngbye) C.Agardh, 1832							
<i>Biddulphia leaves</i> Ehrenberg, 1843	M	+	+	-	+	+	4
accepted name (<i>Pleurosira laevis</i> (Ehrenberg) Compère, 1982							
<i>Biddulphia longicuris</i> Greville, 1859	M	-	-	-	-	+	1
accepted name (<i>Odontella longicuris</i> (Greville) M.A.Hoban, 1983							
<i>Biddulphia mobelinsis</i> (J.W.Bailey) Grunow, 1882	M	-	-	-	-	+	1
accepted name (<i>Trieres mobiliensis</i> (J.W.Bailey) Ashworth & Theriot, 2013							
<i>Biddulphia baileyi</i> W.Smith, 1856							

<i>Biddulphia obtuse</i> (Kützing) Ralfs, 1861	M	-	-	-	-	+	1
accepted name (<i>Odontella aurita</i> var. <i>obtusa</i> (Kützing) Denys, 1982 <i>Biddulphia roperiana</i> Greville, 1859							
<i>Biddulphia regina</i> W.Smith, 1856 (accepted)	U	+	-	-	+	-	2
<i>Biddulphia reticulata</i>* Roper 1859	M	-	-	-	-	+	1
accepted name (<i>Triceratium dictyotum</i> P.A.Sims & R.Ross 1990							
<i>Biddulphia rhombus</i> (Ehrenberg) W.Smith, 1854 (accepted)	M	-	-	-	-	+	1
<i>Odontella rhombus</i> (Ehrenberg) Kützing, 1849							
<i>Biddulphia tuomeyi</i> (J.W.Bailey) Roper, 1859 (accepted)	M	+	-	-	+	-	2
Catenulaceae							
<i>Amphora angusta</i> Gregory, 1857 (accepted)	M	+	+	-	+	+	4
<i>Amphora coffeaeformis</i> (C.Agardh) Kützing, 1844	MBF	+	+	+	+	+	5
accepted name (<i>Halamphora coffeaeformis</i> (C.Agardh) Levkov, 2009							
<i>Amphora commutata</i> Grunow, 1880 (accepted)	B	+	+	+	+	+	5
<i>Amphora crassa</i> Gregory, 1857 (accepted)	M	-	-	-	-	+	1
<i>Amphora descussata</i> Grunow, 1877 (accepted)	M	-	-	-	-	+	1
<i>Amphora granulata</i> Gregory 1857	MF	-	-	-	-	+	1
accepted name (<i>Halamphora granulata</i> (Gregory) Levkov 2009							
<i>Amphora holsatica</i> Hustedt, 1925	BF	+	+	+	-	+	4
accepted name (<i>Halamphora holsatica</i> (Hustedt) Levkov 2009							
<i>Amphora inariensis</i> Krammer, 1980 (accepted)	FT	-	-	-	-	+	1
<i>Amphora libyca</i> Ehrenberg, 1840 (accepted)	MF	+	+	+	+	+	5
<i>Amphora gigas</i> Ehrenberg, 1854							
<i>Amphora ovalis</i> var. <i>libyca</i> (Ehrenberg) Cleve, 1895							
<i>Amphora lineolata</i> Ehrenberg, 1838 (accepted)	MF	-	-	-	-	+	1
<i>Amphora tenera</i> W.Smith, 1853							
<i>Navicula lineolata</i> Ehrenberg, 1838							
<i>Amphora ostrearia</i> Brébisson, 1849 (accepted)	MF	+	-	-	-	+	2
<i>Amphora littoralis</i> Donkin, 1858							
<i>Amphora ovalis</i> (Kützing) Kützing, 1844 (accepted)	MF	+	+	+	+	+	5
<i>Amphora amphora</i> (Ehrenberg) Pantocsek, 1902							
<i>Amphora ocellata</i> Ehrenberg, 1838							
<i>Amphora pediculus</i> (Kützing) Grunow ex A.Schmidt, 1875 (accepted)	F	+	+	-	+	+	4
<i>Amphora ehrenbergii</i> N.Woodhead & R.D.Tweed, 1960							
<i>Amphora globulosa</i> var. <i>perpusilla</i> Grunow, 1880							
<i>Amphora ovalis</i> var. <i>pediculus</i> (Kützing) Van Heurck, 1885							
<i>Amphora ovalis</i> var. <i>pediculus</i> (Kützing) Pero, 1893							
<i>Cymbella caespitosum</i> var. <i>pediculus</i> (Kützing) Brun, 1880							
<i>Encyonema pediculus</i> (Kützing) H.Peragallo, 1889							
<i>Amphora perpusilla</i> Grunow, 1884	F	-	-	-	-	+	1
accepted name (<i>Amphora coffeaeformis</i> var. <i>perpusilla</i> (Grunow) Cleve, 1895							
<i>Amphora proteus</i> Gregory, 1857 (accepted)	M	-	-	-	-	+	1
<i>Amphora affinis</i> var. <i>proteus</i> (Gregory) Tempère & Peragallo, 1908							
<i>Amphora hexagonalis</i> O.N.Witt, 1873							
<i>Amphora speciosa</i> Castracane, 1886							
<i>Amphora robusta</i> Gregory, 1857 (accepted)	M	+	-	-	-	-	1
<i>Amphora salina</i> W.Smith, 1853	B	+	+	-	-	-	2
accepted name (<i>Halamphora coffeaeformis</i> (C.Agardh)							

Levkov 2009							
<i>Amphora strigosa</i>* Hustedt 1949	U	-	-	-	-	+	1
accepted name (<i>Seminavis strigosa</i> (Hustedt) Danieledis & Economou-Amilli in D.B. Danielidis & D.G. Mann 2003							
<i>Amphora venetra</i> Kützing, 1844	BF	+	+	+	-	+	4
accepted name (<i>Halamphora veneta</i> (Kützing) Levkov, 2009							
<u>Chaetocerotaceae</u>							
<i>Bacteriastrum delicatulum</i> Cleve, 1897 (accepted)	M	-	-	-	-	+	1
<i>Bacteriastrum hyalinum</i> Lauder, 1864 (accepted)	M	-	-	-	-	+	1
<i>Chaetoceros affinis</i> Lauder, 1864 (accepted)	M	-	-	+	-	+	2
<i>Chaetoceros angulatus</i> F.Schütt, 1895							
<i>Chaetoceros javanicus</i> Cleve, 1873							
<i>Chaetoceros ralfsii</i> Cleve, 1873							
<i>Chaetoceros curvisetus</i> Cleve, 1889 (accepted)	M	-	-	-	-	+	1
<i>Chaetoceros didymus</i> Ehrenberg, 1845 (accepted)	M	-	-	-	-	+	1
<i>Chaetoceros didymum</i> Ehrenb., 1845							
<i>Chaetoceros pendulus</i> Karsten, 1905 (accepted)	M	-	-	+	-	-	1
<i>Chaetoceros similis</i> Cleve, 1896 (accepted)	M	-	-	-	-	+	1
<u>Cocconeidaceae</u>							
<i>Cocconeis bardawillensis</i>* A. Ehrlich	U	-	-	-	-	+	1
<i>Cocconeis calcar</i> (Cleve) Cleve-Euler, 1953	F	-	-	-	-	+	1
<i>Cocconeis dirupta</i> W.Gregory, 1857 (accepted)	M	-	-	-	-	+	1
<i>Cocconeis microscopica</i> Cholnoky, 1959	F	+	-	-	+	-	2
<i>Cocconeis pediculus</i> Ehrenberg, 1838 (accepted)	F	+	+	-	+	+	4
<i>Cocconeis communis</i> f. <i>pediculus</i> (Ehrenberg) Chmielevski, 1885							
<i>Cocconeis communis</i> var. <i>pediculus</i> (Ehrenberg) O.Kirchner, 1878							
<i>Encyonema caespitosum</i> var. <i>pediculus</i> (Ehrenberg) De Toni, 1891							
<i>Cocconeis placentula</i> Ehrenberg, 1838 (accepted)	MF	-	-	-	-	+	1
<i>Cocconeis communis</i> f. <i>placentula</i> (Ehrenberg) Chmielevski, 1885							
<i>Cocconeis communis</i> var. <i>placentula</i> (Ehrenberg) O.Kirchner, 1878							
<i>Cocconeis pediculus</i> var. <i>placentula</i> (Ehrenberg) Grunow, 1867							
<i>Cocconeis placentula</i> var. <i>euglypta</i> (Ehrenberg) Grunow, 1884 (accepted)	F	+	+	+	+	+	5
<i>Cocconeis lineata</i> var. <i>euglypta</i> (Ehrenberg) Grunow, 1880							
<i>Cocconeis placentula</i> f. <i>euglypta</i> (Ehrenberg) Hustedt, 1957							
<i>Cyclotella lineata</i> var. <i>euglypta</i> Gutwinski, 1895							
<i>Cocconeis placentula</i> var. <i>lineata</i> (Ehrenberg) van Heurck, 1885 (accepted)	F	+	-	-	-	-	1
<i>Cocconeis placentula</i> f. <i>lineata</i> (Ehrenberg) Hustedt, 1957							
<i>Cocconeis pseudomarginata</i> Gregory, 1857 (accepted)	M	-	-	-	-	+	1
<i>Cocconeis scutellum</i> Ehrenberg, 1838 (accepted)	MF	-	-	-	-	+	1
<i>Cocconeis scutellum</i> var. <i>parvum</i> (Grunow) Cleve, 1895 (accepted)							
<u>Coscinodiscaceae</u>							
<i>Coscinodiscus centralis</i> Ehrenberg, 1844 (accepted)	M	-	-	-	-	+	1
<i>Coscinodiscus asteromphalus</i> var. <i>centralis</i> Grunow, 1884							
<i>Coscinodiscus oculus-iridis</i> var. <i>tenuistriata</i> Grunow, 1884							
<i>Coscinodiscus curvatulus</i> Grunow ex A.Schmidt, 1878 (accepted)	MB	-	-	-	-	+	1

<i>Coscinodiscus excentricus</i> Ehrenberg 1840 (accepted)	MF	-	-	-	-	+	1
<i>Thalassiosira eccentrica</i> (Ehrenberg) Cleve, 1904							
<i>Coscinodiscus gigas</i> Ehrenberg, 1841 (accepted)	M	-	-	-	-	+	1
<i>Coscinodiscus granii</i> Gough, 1905 (accepted)	M	-	-	-	-	+	1
<i>Coscinodiscus janischii</i> A.Schmidt, 1878 (accepted)	U	-	-	-	-	+	1
<i>Coscinodiscus perforatus</i> Ehrenberg, 1844 (accepted)	F	-	-	-	-	+	1
<i>Coscinodiscus radiatus</i> Ehrenberg, 1840 (accepted)	M	-	-	-	-	+	1
<u>Cymbellaceae</u>							
<i>Cymbella affinis</i> Kützing, 1844 (accepted)	F	+	+	+	+	+	5
<i>Cymbella tumidula</i> Grunow, 1875							
<i>Cymbella caespitosa</i> (Kützing) Brun, 1880	U	-	-	-	+	+	2
<i>Cymbella cistula</i> (Ehrenberg) O.Kirchner 1878 (accepted)	F	+	-	-	+	-	2
<i>Cocconema cistula</i> (Ehrenberg) Ehrenberg, 1831							
<i>Cocconema cistula</i> var. <i>maculata</i> (Kützing) Grunow, 1881							
<i>Cymbella maculata</i> (Kützing) Brébisson & Godey, 1835							
<i>Frustulia maculata</i> Kützing, 1833							
<i>Cymbella ehrenbergii</i> Kützing, 1844	F	+	-	-	+	-	2
<i>Cymbella laevis</i> Nägeli, 1863 (accepted)	F	-	-	-	-	+	1
<i>Cocconema laeve</i> (Nägeli) G.S.West, 1907							
<i>Cocconema laeve</i> (Nägeli) Schmidt, 1875							
<i>Cymbella gracilis</i> var. <i>laevis</i> (Nägeli) Rabenhorst, 1864							
<i>Cymbella ventricosa</i> var. <i>laevis</i> (Nägeli) Mayer, 1917							
<i>Cymbella mesiana</i> Cholnoky, 1955	F	-	-	-	+	-	1
<i>Cymbella microcephala</i> Grunow, 1885	F	-	-	-	+	+	2
<i>Navicula incompta</i> Krasske, 1932							
<i>Cymbella minuta</i> Hilse, 1862	MF	-	-	-	+	-	1
<i>Cymbella prostrata</i> (Berkeley) Cleve, 1894							
accepted name (<i>Encyonema prostratum</i> (Berkeley) Kützing, 1844)	M	-	+	-	-	-	1
<i>Cymbella silesiaca</i> Bleisch, 1864	F	-	-	-	+	-	1
accepted name (<i>Encyonema silesiacum</i> (Bleisch) D.G.Mann, 1990)							
<i>Cymbella tumida</i> (Brébisson) van Heurck, 1880 (accepted)	F	+	+	+	+	+	5
<i>Cymbella stomatophora</i> Grunow, 1875							
<i>Cymbella turgida</i> Grunow, 1875 (accepted)	F	-	-	-	+	-	1
<u>Climacospheniaceae</u>							
<i>Climacosphenia elongata</i> Mereschowsky (accepted)	U	-	-	-	-	+	1
<i>Climacosphenia moniligera</i> Ehrenberg, 1843 (accepted)	M	-	-	-	-	+	1
<u>Diploneidaceae</u>							
<i>Diploneis bombus</i> (Ehrenberg) Ehrenberg, 1853 (accepted)	BF	-	-	-	-	+	1
<i>Navicula abnormis</i> Castracane, 1886							
<i>Navicula bombus</i> (Ehrenberg) Kützing, 1849							
<i>Diploneis didyma</i> (Ehrenberg) Ehrenberg, 1839 (accepted)	MF	+	-	-	+	-	2
<i>Pinnularia didyma</i> Ehrenberg, 1844							
<i>Diploneis eliptica</i> (Kützing) Cleve, 1894 (accepted)	MF	+	+	+	+	+	5
<i>Diploneis elliptica</i> var. <i>grandis</i> (Grunow) Cleve, 1894							
<i>Navicula elliptica</i> var. <i>grandis</i> Grunow, 1882							
<i>Schizonema ellipticum</i> (Kützing) Kuntze, 1898							
<i>Diploneis fusca</i> (W.Gregory) Cleve, 1894 (accepted)	MF	-	-	-	-	+	1
<i>Navicula fusca</i> (Gregory) Ralfs, 1861							
<i>Navicula fusca</i> (Gregory) Peragallo, 1897							
<i>Navicula smithii</i> var. <i>fusca</i> Gregory, 1857							

<i>Diploneis interrupta</i> (Kützing) Cleve, 1894 (accepted)							
<i>Schizonema interruptum</i> (Cleve) Kuntze, 1898	BF	-	-	+	+	+	3
<i>Diploneis oblongella</i> (Nägeli ex Kützing) Cleve-Euler, 1922	F	+	-	-	-	+	2
accepted name (<i>Diploneis oblongella</i> (Nägeli ex Kützing) Cleve-Euler, 1922)							
<i>Diploneis ovalis</i> (Hilse) Cleve, 1891 (accepted)	MBF	+	-	-	+	+	3
<i>Diploneis oblongella</i> var. <i>ovalis</i> (Hilse) R. Ross, 1947							
<i>Navicula elliptica</i> var. <i>ovalis</i> (Hilse) Cleve & Möller, 1878							
<i>Navicula ovalis</i> (Hilse) Schmidt, 1875							
<i>Pinnularia ovalis</i> Hilse, 1860							
<i>Schizonema ovale</i> Kuntze, 1898							
<i>Diploneis pseudovalis</i>* Hüstedt	U	-	-	-	-	+	1
<i>Diploneis reichardtii</i> var. <i>tschuktschorum</i>* (Cleve) H. Heiden	U	-	-	-	-	+	1
<i>Diploneis smithii</i> (Brébisson) Cleve, 1894 (accepted)	MBF	+	-	-	+	+	3
<i>Navicula elliptica</i> W. Smith, 1853							
<i>Navicula smithii</i> Brébisson, 1856							
<i>Diploneis subovalis</i> Cleve, 1894 (accepted)	F	+	-	-	+	+	3
<i>Navicula subovalis</i> (Cleve) Mann, 1924							
<i>Schizonema subovale</i> (Cleve) Kuntze, 1898							
<i>Diploneis weissflogii</i> (A.W.F. Schmidt) (accepted)	MF	+	-	-	+	+	3
<i>Navicula weissflogii</i> A. Schmidt, 1873							
<i>Navicula weissflogii</i> A.W.F. Schmidt, 1873							
Eunotiaceae							
<i>Eunotia curvata</i> var. <i>curvata</i>* (Kützing) Lagerst, 1884	U	+	-	-	-	-	1
<i>Eunotia flexuosa</i> (Brébisson ex Kützing) Kützing, 1849 (accepted)	F	+	-	-	+	-	2
<i>Pseudo-eunotia flexuosa</i> (Brébisson ex Kützing) De Toni, 1892							
<i>Synedra flexuosa</i> Brébisson ex Kützing, 1846							
<i>Eunotia paludosa</i> Grunow, 1862	F	-	-	+	-	-	1
accepted name (<i>Eunotia exigua</i> (Brébisson ex Kützing) Rabenhorst, 1864)							
<i>Eunotia paludosa</i> var. <i>trinacria</i> (Krasske) Nörpel & Alles, 1991							
<i>Eunotia trinacria</i> Krasske, 1929							
<i>Eunotia pectinalis</i> var. <i>minor</i> (Kützing) Rabenhorst, 1864	F	+	-	-	+	-	2
accepted name (<i>Eunotia minor</i> (Kützing) Grunow, 1881)							
<i>Eunotia soleirolii</i> (Kützing) Rabenhorst 1864 (accepted)	F	+	-	-	-	-	1
<i>Eunotia pectinalis</i> var. <i>soleirolii</i> (Kützing) H.F. Van Heurck, 1896							
<i>Himantidium soleirolii</i> Kützing, 1844							
Eupodiscaceae							
<i>Cerataulus smithii</i> Ralfs ex Pritchard, 1861 (accepted)	F	-	-	-	+	-	1
<i>Biddulphia smithii</i> Van Heurck							
<i>Pleurosira laevis</i> (Ehrenberg) Compère, 1982 (accepted)	F	+	+	+	+	+	5
<i>Cerataulus laevis</i> (Ehrenberg) Ralfs, 1861							
<i>Triceratium favus</i> Ehrenberg, 1839 (accepted)	M	-	+	-	-	-	1
<i>Odontella favus</i> (Ehrenberg) Cleve, 1901							
<i>Odontella favus</i> (Ehrenberg) M. Peragallo, 1903							
Fragilariaceae							
<i>Fragilaria brevistriata</i> Grunow, 1885 (accepted)	F	-	-	-	+	-	1
<i>Nematoplata brevistriata</i> (Grunow) Kuntze, 1898							
<i>Fragilaria construens</i> (Ehrenberg) Grunow, 1862 (accepted)	BF	-	-	+	+	+	3

<i>Dimeregramma tabellaria</i> (W.Smith) Ralfs, 1861							
<i>Nematoplata construens</i> (Ehrenberg) Kuntze, 1898							
<i>Odontidium tabellaria</i> W.Smith, 1856							
<i>Staurosira tabellaria</i> (W.Smith) Leuduger-Fortmorel, 1878							
<i>Staurosira venter</i> var. <i>construens</i> (Ehrenberg) Cleve & Möller, 1879							
<i>Fragilaria construens</i> Kitton, 1869 (accepted)	F	-	-	+	+	+	3
<i>Fragilaria crotonensis</i> var. <i>prolongata</i> Grunow, 1885							
<i>Nematoplata crotonensis</i> (Kitton) Kuntze, 1898							
<i>Synedra crotonensis</i> (Kitton) Cleve & Möller, 1878							
<i>Synedra crotonensis</i> var. <i>prolongata</i> f. <i>belgica</i> Grunow, 1881							
<i>Fragilaria intermedia</i> (Grunow) Grunow, 1881	F	-	-	+	-	+	2
accepted name (<i>Fragilaria capucina</i> var. <i>vaucheriae</i> (Kützing) Lange-Bertalot, 1980)							
<i>Fragilaria tabulate</i> (C.Agardh) Lange-Bertalot, 1981	F	-	-	-	+	-	1
accepted name (<i>Tabularia fasciculata</i> (C.Agardh) D.M.Williams & Round, 1986)							
<i>Fragilaria ulna</i> (Nitzsch) Lange-Bertalot, 1980	F	-	-	-	+	-	1
accepted name (<i>Ulnaria ulna</i> (Nitzsch) P.Compère, 2001)							
<i>Martyana martyi</i> (Héribaud-Joseph) Round, 1990 (accepted)	MF	+	-	-	-	-	1
<i>Fragilaria leptostauron</i> var. <i>martyi</i> (Héribaud-Joseph) Lange-Bertalot, 1991							
<i>Fragilaria martyi</i> (Héribaud-Joseph) Lange-Bertalot, 1993							
<i>Fragilaria mutabilis</i> f. <i>martyi</i> (Héribaud-Joseph) Cleve-Euler, 1932							
<i>Fragilaria mutabilis</i> var. <i>intercedens</i> (Héribaud-Joseph) Cleve-Euler, 1932							
<i>Pseudostaurosira brevistriata</i> (Grunow) D.M.Williams & Round, 1987	F	+	-	-	-	-	1
accepted name (<i>Fragilaria brevistriata</i> Grunow, 1885)							
<i>Staurosirella lapponica</i> (Grunow) D.M. Williams & Round, 1987 (accepted)	F	+	-	-	-	-	1
<i>Fragilaria pinnata</i> var. <i>lapponica</i> (Grunow) J.Frenguelli, 1924							
<i>Nematoplata lapponica</i> (Grunow) Kuntze, 1898							
<i>Staurosira brevistriata</i> var. <i>lapponica</i> (Grunow) Grunow, 1882							
<i>Staurosirella pinnata</i> (Ehrenberg) D.M. Williams & Round, 1987 (accepted)	MF	+	-	-	-	-	1
<i>Fragilaria lancettula</i> Schumann, 1867							
<i>Fragilaria mutabilis</i> var. <i>lancettula</i> (J.Schumann) Cleve-Euler, 1915							
<i>Fragilaria pinnata</i> f. <i>lancettula</i> (Schumann) Hüstedt, 1957							
<i>Fragilaria pinnata</i> var. <i>lancettula</i> (Schumann) Hüstedt, 1913							
<i>Fragilaria pinnata</i> var. <i>pinnata</i> Ehrenberg, 1843							
<i>Navicula lestikowii</i> Lange-Bertalot							
<i>Nematoplata lancettula</i> (Schumann) Kuntze, 1898							
<i>Punctastriata pinnata</i> (Ehrenberg) D.M.Williams & Round, 1987							
<i>Synedra acus</i> Kützing, 1844	F	+	+	-	+	+	4
accepted name (<i>Fragilaria acus</i> (Kützing) Lange-Bertalot, 2000)							
<i>Synedra capitata</i> Ehrenberg, 1836	F	+	-	-	-	-	1
accepted name (<i>Ulnaria capitata</i> (Ehrenberg) P.Compère, 2001)							

<i>Synedra crystallina</i> (C.Agardh) Kützing, 1844 (accepted) <i>Diatoma crystallina</i> C. Agardh 1824 <i>Exilaria crystallina</i> (C. Agardh) Greville 1827 <i>Synedra gallionii</i> var. <i>crystallina</i> (Agardh) Rabenhorst 1847 <i>Ardissonea crystallina</i> (C. Agardh) Grunow 1880	B	-	-	-	-	+	1
<i>Synedra laevigata</i> Grunow accepted name (<i>Hyalosynedra laevigata</i> (Grunow) D.M.Williams & Round)	M	-	-	-	-	+	1
<i>Synedra longissima</i> W.Smith, 1853 accepted name (<i>Ulnaria biceps</i> (Kützing) P.Compère, 2001)	F	+	+	-	+	+	4
<i>Synedra nana</i> F.Meister, 1912 (accepted) <i>Fragilaria nana</i> (Meister) Lange-Bertalot, 1980	F	-	-	-	+	-	1
<i>Synedra reumpens</i> Kützing, 1844 accepted name (<i>Fragilaria capucina</i> subsp. <i>rumpens</i> (Kützing) Lange-Bertalot, 1993)	F	-	+	-	+	-	2
<i>Synedra tabulata</i> (C.Agardh) Kützing, 1844 accepted name (<i>Tabularia fasciculata</i> (C.Agardh) D.M.Williams & Round, 1986)	MF	+	+	+	+	+	5
<i>Synedra ulna</i> (Nitzsch) Ehrenberg, 1832 (accepted)	F	-	-	+	+	+	3
<i>Synedra ulna</i> var. <i>amphirhynchus</i> (Ehrenberg) Grunow, 1862 accepted name (<i>Ulnaria amphirhynchus</i> (Ehrenberg) Compère & Bukhtiyarova, 2006)	F	+	+	+	+	+	5
<i>Synedra undulate</i> (J.W.Bailey) Gregory, 1857 accepted name (<i>Toxarium undulatum</i> Bailey, 1854)	U	-	-	-	-	+	1
Gomphonemataceae							
<i>Encyonema caespitosum</i> Kützing, 1849 (accepted) <i>Cocconema caespitosum</i> (Kützing) G.S.West, 1905 <i>Cymbella caespitosa</i> (Kützing) Schutt, 1896 <i>Cymbella caespitosum</i> (Kützing) Brun, 1880 <i>Cymbella ventricosa</i> var. <i>caespitosa</i> (Kützing) Dippel, 1905	F	+	-	-	-	-	1
<i>Encyonema mesianum</i> (Cholnoky) D.G.Mann, 1990 accepted name (<i>Encyonema mesianum</i> (Cholnoky) D.G.Mann, 1990)	F	+	-	-	-	-	1
<i>Encyonema minutum</i> (Hilse) D.G.Mann, 1990 (accepted) <i>Cymbella gracilis</i> var. <i>minuta</i> (Hilse) Rabenhorst, 1864 <i>Cymbella ventricosa</i> f. <i>minuta</i> (Hilse) Mayer, 1913 <i>Cymbella ventricosa</i> f. <i>minuta</i> (Hilse) Cleve-Euler, 1932 <i>Cymbella ventricosa</i> f. <i>minuta</i> (Hilsek) Mereschkowsky, 1906 <i>Cymbella ventricosa</i> var. <i>minuta</i> (Hilse) Cleve-Euler, 1955 <i>Encyonema ventricosum</i> f. <i>minuta</i> (Hilse) Grunow, 1880 <i>Encyonema ventricosum</i> var. <i>minuta</i> (Hilse) Schmidt, 1881 <i>Encyonema ventricosum</i> var. <i>minutum</i> (Hilse) Mayer, 1947	MF	+	-	-	-	-	1
<i>Encyonema silesiacum</i> (Bleisch) D.G.Mann, 1990 (accepted) <i>Cymbella minuta</i> var. <i>silesiaca</i> (Bleisch) Reimer, 1975 <i>Cymbella ventricosa</i> var. <i>silesiaca</i> (Bleisch) Cleve-Euler, 1955	F	+	-	-	-	-	1
<i>Encyonema turgidum</i> (Gregory) Grunow, 1875 accepted name (<i>Encyonema elginense</i> (Krammer) D.G.Mann, 1990) <i>Cocconema turgida</i> G.S.West	F	+	-	-	-	-	1
<i>Gomphonema affine</i> Kützing, 1844 (accepted) <i>Gomphonema dichotomum</i> var. <i>affine</i> (Kützing) G.L.Rabenhorst, 1864	F	+	-	-	+	-	2

<i>Gomphonema lanceolatum</i> var. <i>affine</i> (Kützing) Cleve-Euler, 1932							
<i>Gomphonema lanceolatum</i> var. <i>affine</i> (Kützing) Cleve-Euler, 1955							
<i>Gomphonema angustata</i> (Kützing) Rabenhorst, 1864 (accepted)	F	-	-	+	-	-	1
<i>Gomphonema bohemicum</i> Hustedt, 1930							
<i>Gomphonema instabilis</i> Hohn & Hellermann, 1963							
<i>Sphenoneis angustata</i> (Kützing) Trevisan, 1848							
<i>Gomphonema augur</i> var. <i>turris</i> (Ehrenberg) Lange-Bertalot, 1985 (accepted)	F	-	-	-	+	-	1
<i>Gomphonema acuminatum</i> var. <i>turris</i> (Ehrenberg) Wolle, 1890							
<i>Gomphonema turris</i> Ehrenberg, 1843							
<i>Gomphonema clevei</i> Fricke, 1902							
accepted name (<i>Gomphoneis clevei</i> (Fricke) Gil, 1989)	F	+	-	-	+	-	2
<i>Gomphonema constrictum</i> Ehrenberg, 1832	F	-	+	-	+	-	2
accepted name (<i>Gomphonema truncatum</i> Ehrenberg, 1832)							
<i>Gomphonema gracilis</i> Ehrenberg, 1838 (accepted)	F	+	+	-	+	+	4
<i>Gomphonema intericatum</i> Kützing, 1844 (accepted)	F	-	-	-	+	-	1
<i>Gomphonema vibrio</i> var. <i>intricatum</i> (Kützing) R.Ross, 1986							
<i>Gomphonema lanceolatum</i> Ehrenberg, 1843	F	-	-	-	+	-	1
accepted name (<i>Gomphonema grunowii</i> R.M.Patrick & Reimer, 1975)							
<i>Gomphonema longiceps</i> Ehrenberg, 1854 (accepted)	F	-	-	-	-	+	1
<i>Gomphonema parvulum</i> (Kützing) Kützing, 1849 (accepted)	MF	+	+	+	+	+	5
<i>Gomphonella parvula</i> (Kützing) Rabenhorst, 1853							
<i>Sphenoneis parvula</i> (Kützing) Trevisan, 1848							
<i>Gomphonema pseudoaugur</i> Lange-Bertalot, 1979 (accepted)	F	+	-	-	-	-	1
<i>Gomphonema subclavatum</i> (Grunow) Grunow, 1884 (accepted)	F	+	+	-	+	+	4
<i>Gomphonema truncatum</i> Ehrenberg, 1832 (accepted)	F	+	-	-	+	-	2
<i>Gomphonema acuminatum</i> var. <i>constrictum</i> (Kützing) W.Carruthers, 1864							
<i>Gomphonema constrictum</i> Ehrenberg, 1832							
<i>Gomphonema constrictum</i> var. <i>truncatum</i> (Ehrenberg) Gutwinski, 1887							
<i>Placoneis gastrum</i> (Ehrenberg) Mereschkovskiy, 1903 (accepted)	F	+	-	-	-	-	1
<i>Navicula gastrum</i> (Ehrenberg) Kützing, 1844							
<i>Navicula gastrum</i> f. <i>maxima</i> Tempère & Peragallo, 1909							
<i>Schizonema gastrum</i> (Ehrenberg) Kuntze, 1898							
<u>Grammatophoraceae</u>							
<i>Grammatophora marina</i> (Lyngbye) Kützing, 1844 (accepted)	MF	+	-	-	+	-	2
<i>Diatoma marina</i> Lyngbye, 1819							
<i>Diatoma marinum</i> Lyngbye, 1819							
<u>Hyalodiscaceae</u>							
<i>Hyalodiscus laevis</i> Ehrenberg, 1845 (accepted)	U	+	-	-	+	-	2
<i>Podosira montagnei</i> Kützing, 1844 (accepted)	M	+	-	-	+	-	2
<u>Hemidiscaceae</u>							
<i>Actinocyclus ehrenbergii</i> Ralfs, 1861 (accepted)	M	-	-	-	-	+	1
<i>Actinoptychus undulatus</i> Kützing, 1844 (accepted)	M	-	-	-	-	+	1
<i>Azpeitia neocrenulata</i> (S.L.VanLandingham) G.Fryxell & T.P.Watkins (accepted)	M	-	-	-	-	+	1

<i>Hemidiscus cuneiformis</i> Wallich 1860 (accepted)	M	-	-	-	-	+	1
<i>Euodia gibba</i> (Bailey) Ralfs, 1861							
<i>Euodia inornata</i> Castracane, 1886							
<i>Euodia radiata</i> Castracane, 1886							
<u>Lithodesmiaceae</u>							
<i>Lithodismium undulatum</i> Ehrenberg, 1839 (accepted)	M	-	-	-	-	+	1
<i>Lithodesmium victoriae</i> Karsten, 1906							
<i>Triceratium undulatum</i> Brightwell, 1858							
<i>Tropidoneis lepidoptera</i> (Gregory) Cleve, 1894	BF	-	-	+	-	-	1
accepted name (<i>Plagiotropis lepidoptera</i> (Gregory) Kuntze, 1898)							
<i>Tropidoneis lepidoptera</i> var. <i>mediterranea</i> Peragallo, 1897							
<u>Licmophoraceae</u>							
<i>Licmophora abbreviata</i> C.Agardh, 1831 (accepted)	M	-	-	-	-	+	1
<i>Licmophora ehrenbergii</i> (Kützing) Grunow, 1867 (accepted)	MF	-	-	-	-	+	1
<i>Licmophora flabellata</i> (Grev.) C.Agardh, 1831 (accepted)	F	-	-	-	-	+	1
<i>Licmophora gracilis</i> (Ehrenberg) Grunow, 1867 (accepted)	MF	-	-	-	-	+	1
<i>Licmophora lyngbyei</i> (Kützing) Grunow ex Van Heurck, 1867 (accepted)	M	-	-	-	-	+	1
<i>Podosphenia lyngbyei</i> Kützing, 1844							
<i>Licmophora nubecula</i> (Kützing) Grunow, 1878 (accepted)	U	-	-	-	-	+	1
<i>Licmophora paradoxa</i> (Lyngbye) C.Agardh, 1828 (accepted)	F	-	-	-	-	+	1
<i>Gomphonema paradoxum</i> Agardh, 1824							
<i>Styllaria paradoxa</i> (Lyngbye) Bory de St.-Vincent							
<i>Licmophora remulus</i> Grunow 1867 (accepted)	M	-	-	-	-	+	1
<u>Mastogloiaaceae</u>							
<i>Mastogloia angulata</i> Lewis, 1861 (accepted)	U	-	-	-	+	+	2
<i>Mastogloia apiculata</i> W.Smith, 1856 (accepted)	U	-	-	-	-	+	1
<i>Mastogloia baltica</i> Grunow, 1880 (accepted)	F	+	-	-	-	-	1
<i>Mastogloia braunii</i> Grunow, 1863 (accepted)	MBF	+	-	-	-	-	1
<i>Mastogloia dansei</i> (Thwaites) Thwaites ex W.Smith, 1856 (accepted)	MF	+	-	+	+	+	4
<i>Dickieia dansei</i> Thwaites, 1848							
<i>Mastogloia elliptica</i> var. <i>dansei</i> (Thwaites) Cleve, 1895							
<i>Mastogloia dissimilis</i> Hüstedt, 1933 (accepted)	M	+	-	-	-	-	1
<i>Mastogloia elliptica</i> (C.Agardh) Cleve, 1893 (accepted)	MF	+	+	-	+	+	4
<i>Frustulia elliptica</i> C.Agardh, 1824							
<i>Mastogloia pumila</i> Cleve, 1895 (accepted)	MF	+	-	-	+	-	2
<i>Mastogloia braunii</i> var. <i>pumila</i> Grunow, 1880							
<i>Mastogloia braunii</i> var. <i>pumila</i> (Cleve) Cleve-Euler, 1953							
<i>Mastogloia smithii</i> Thwaites ex W.Smith, 1856 (accepted)	MF	-	-	-	-	+	1
<i>Mastogloia smithii</i> var. <i>amphicephala</i> Grunow, 1880 (accepted)	F	+	+	-	+	+	4
<u>Melosiraceae</u>							
<i>Melosira granulata</i> (Ehrenberg) Ralfs, 1861	MF	+	+	+	+	+	5
accepted name (<i>Aulacoseira granulata</i> (Ehrenberg) Simonsen, 1979)							
<i>Melosira granulata</i> var. <i>angustissima</i> Otto Müller, 1899	MF	+	+	+	+	+	5
accepted name (<i>Aulacoseira granulata</i> var. <i>angustissima</i> (O.F.Müller) Simonsen, 1979)							

Melosira moniliformis (O.F.Müller) C.Agardh, 1824 (accepted)	MF	-	-	-	-	+	1
<i>Lysigonium moniliforme</i> (O.F.Müller) Link, 1820							
<i>Lysigonium moniliforme</i> (O.F.Müller) Trevisan, 1848							
<i>Melosira borreri</i> var. <i>moniliformis</i> (O.F.Müller) Grunow, 1878							
Melosira sulcata (Ehrenberg) Kützing, 1844	M	+	-	-	-	+	2
accepted name (<i>Paralia sulcata</i> (Ehrenberg) Cleve, 1873)							
Melosira varians C.Agardh, 1827 (accepted)	F	+	-	+	+	+	4
<i>Lysigonium varians</i> (C.Agardh) De Toni, 1892							
Naviculaceae							
Caloneis amphisbaena (Bory de Saint Vincent) Cleve, 1894 (accepted)	MBF	+	-	+	-	-	2
<i>Schizonema amphisbaenum</i> (Bory de Saint Vincent) Kuntze, 1898							
Caloneis permagna (Bailey) Cleve, 1894 (accepted)	BF	+	-	-	+	-	2
<i>Caloneis bivittata</i> (Pantocsek) Cleve, 1894							
<i>Caloneis bivittata</i> var. <i>rostrata</i> Heiden, 1906							
<i>Caloneis permagna</i> var. <i>lewisiana</i> Boyer, 1916							
<i>Navicula bivittata</i> Pantocsek, 1889							
<i>Navicula bivittata</i> var. <i>robusta</i> (Heiden) F.W.Mills, 1934							
<i>Navicula oregonica</i> var. <i>bivittata</i> Pantocsek, 1889							
<i>Navicula permagna</i> (Bailey) A.M.Edwards, 1859							
<i>Pinnularia permagna</i> Bailey, 1851							
<i>Schizonema permagnum</i> (Bailey) Kuntze, 1898							
Caloneis schumanniana (Grunow) Cleve, 1894 (accepted)	F	+	-	-	+	-	2
Caloneis silicula (Ehrenberg) Cleve, 1894 (accepted)	F	+	-	-	+	-	2
<i>Navicula silicula</i> Ehrenberg, 1843							
Caloneis westii (W.Smith) Hendey 1964 (accepted)	MF	+	-	-	+	-	2
<i>Caloneis formosa</i> (Gregory) Cleve, 1894							
<i>Navicula formosa</i> Gregory, 1856							
<i>Navicula tumida</i> var. <i>westii</i> (W.Smith) Cleve-Euler, 1953							
<i>Navicula westii</i> W.Smith, 1853							
<i>Schizonema formosum</i> (Gregory) Kuntze, 1898							
Geissleria decussis (Østrup) Lange-Bertalot & Metzeltin, 1996 (accepted)	F	+	-	-	-	-	1
<i>Navicula decussis</i> Østrup, 1910							
<i>Navicula exiguiiformis</i> Hustedt, 1944							
<i>Navicula exiguiiformis</i> f. <i>capitata</i> Hustedt, 1944							
<i>Navicula terebrata</i> Hustedt, 1944							
Gyrosigma acuminatum (Kützing) Rabenhorst, 1853 (accepted)	F	+	+	+	+	+	5
<i>Gyrosigma kuetzingii</i> (Grunow) Cleve, 1894							
<i>Gyrosigma spencerii</i> (Bailey ex Quekett) Griffith & Henfrey, 1856							
<i>Navicula acuminata</i> (Kützing) Kützing, 1844							
<i>Navicula spencerii</i> Bailey ex Quekett, 1848							
<i>Pleurosigma spencerii</i> W.Smith							
<i>Pleurosigma acuminatum</i> (Kützing) W.Smith, 1852							
<i>Pleurosigma acuminatum</i> (Kützing) Grunow, 1860							
<i>Pleurosigma gracilentum</i> Rabenhorst, 1861							
<i>Pleurosigma kuetzingii</i> Grunow, 1860							
<i>Pleurosigma spenceri</i> var. <i>kuetzingii</i> (Grunow) Grunow, 1880							
<i>Pleurosigma spencerii</i> (Bailey ex Quekett) W.Smith, 1852							

<i>Scalptrum spenceri</i> (Quekett) Kuntze, 1891							
<i>Sigmatella acuminata</i> (Kützing) Brébisson & Godey, 1835							
<i>Placoneis exiguiformis</i> (Hüstedt) Lange-Bertalot, 2005							
Gyrosigma attenuatum (Kützing) Rabenhorst, 1853 (accepted)	F	-	-	-	+	-	1
<i>Frustulia hippocampus</i> (Ehrenberg) Jenner, 1845							
<i>Gyrosigma attenuatum</i> f. <i>typica</i> Rabenhorst							
<i>Gyrosigma attenuatum</i> var. <i>hippocampus</i> Schulz, 1926							
<i>Gyrosigma hippocampus</i> (Ehrenberg) Hassall, 1845							
<i>Navicula attenuata</i> (Kützing) Kützing, 1844							
<i>Navicula hippocampus</i> Ehrenberg, 1838							
<i>Pleurosigma attentuatum</i> (Kützing) W.Smith							
<i>Pleurosigma attenuatum</i> (Kützing) W.Smith, 1852							
<i>Pleurosigma hippocampus</i> W.Smith, 1852							
<i>Scalptrum attenuatum</i> (Kützing) Kuntze, 1891							
<i>Sigmatella attenuata</i> (Kützing) Brébisson & Godey, 1835							
Gyrosigma balticum (Ehrenberg) Rabenhorst, 1853 (accepted)	MF	-	-	-	-	+	1
<i>Pleurosigma balticum</i> (Ehrenberg) W.Smith, 1852							
<i>Scalptrum balticum</i> (Ehrenberg) Kuntze, 1891							
Gyrosigma eximium (Thwaites) Boyer, 1927 (accepted)	F	-	-	-	-	+	1
<i>Colletonema eximium</i> (Thwaites) Kützing, 1849							
<i>Endosigma eximium</i> (Thwaites) Juhlin-Dannfelt, 1882							
<i>Gyrosigma scalproides</i> var. <i>eximium</i> (Thwaites) P.T. Cleve, 1894							
<i>Pleurosigma eximium</i> (Thwaites) Grunow, 1880							
<i>Scalptrum eximium</i> (Thwaites) Kuntze, 1891							
Gyrosigma exilis (Grunow) C.W.Reimer, 1966 (accepted)	F	-	-	-	-	+	1
<i>Gyrosigma spenceri</i> var. <i>exilis</i> (Grunow) Cleve, 1894							
<i>Pleurosigma spencerii</i> var. <i>exilis</i> Grunow, 1880							
Gyrosigma Kützingiana (Grunow) Cleve 1894 accepted name (<i>Gyrosigma acuminatum</i> (Kützing) Rabenhorst, 1853)	F	-	-	+	-	-	1
Gyrosigma macrum (W.Smith) J.W.Griffith & Henfrey, 1856 (accepted)	F	-	-	+	+	+	3
<i>Pleurosigma fasciolum</i> var. <i>macrum</i> (W.Smith) H.Peragallo, 1891							
<i>Pleurosigma macrum</i> W.Smith, 1853							
<i>Scalptrum macrum</i> (W.Smith) Kuntze, 1891							
Gyrosigma obscurum (W.Smith) J.W.Griffith & Henfrey, 1856 (accepted)	BF	-	-	-	-	+	1
<i>Scalptrum obscurum</i> (W.Smith) Kuntze, 1891							
Gyrosigma parkerii (M.B.Harrison) Boyer, 1927 accepted name (<i>Gyrosigma wormleyi</i> (Sullivant) Boyer, 1922)	F	+	-	-	+	+	3
Gyrosigma scalproides (Rabenhorst) Cleve, 1894 (accepted)	BF	-	-	-	-	+	1
<i>Gyrosigma spenceri</i> var. <i>scalproides</i> (Rabenhorst) H.Peragallo, 1891							
<i>Pleurosigma scalproides</i> Rabenhorst, 1861							
<i>Scalptrum scalproides</i> (Rabenhorst) Kuntze, 1891							
Gyrosigma speciosum (W.Smith) J.W.Griff. & Henfrey (accepted)	F	-	-	-	-	+	1

<i>Gyrosigma spencerii</i> (Bailey ex Quekett) Griffith & Henfrey, 1856 (accepted) accepted name (<i>Gyrosigma acuminatum</i> (Kützing) Rabenhorst, 1853) <i>Pleurosigma spencerii</i> W.Smith	BF	-	-	+	-	+	2
<i>Gyrosigma strigilis</i> (W.Smith) J.W.Griffin & Henfrey, 1856 (accepted) <i>Pleurosigma strigilis</i> W.Smith, 1852 <i>Scalptrum strigile</i> (W.Smith) Kuntze, 1891	BF	-	-	-	-	+	1
<i>Gyrosigma temperii</i> Cleve, 1893 (accepted) <i>Gyrosigma quinnipiacii</i> (M.Peragallo) Boyer, 1927 <i>Pleurosigma quinipiacii</i> M.Peragallo, 1908 <i>Pleurosigma temperii</i> (Cleve) M.Peragallo, 1903	B	-	-	-	-	+	1
<i>Hippodonta capitata</i> (Ehrenberg) Lange Bertalot, Metzeltin & Witkowski 1996 (accepted) <i>Navicula capitata</i> (Ehrenberg) R.Ross, 1947, v.97 <i>Navicula digitus</i> (Ehrenberg) Ralfs, 1861 <i>Navicula hungarica</i> f. <i>capitata</i> (Ehrenberg) Hüstedt, 1957 <i>Navicula hungarica</i> var. <i>capitata</i> (Ehrenberg) Cleve, 1895 <i>Pinnularia capitata</i> Ehrenberg, 1848 <i>Pinnularia digitus</i> Ehrenberg, 1854 <i>Schizonema capitatum</i> (Ehrenberg) Kuntze, 1898	F	+	-	-	-	+	2
<i>Navicula abrupta</i> (W.Gregory) Donkin, 1870 (accepted)	F	-	-	-	-	+	1
<i>Navicula aeugyptica</i>* Salah 1955 (accepted)	B	+	-	-	-	-	1
<i>Navicula anglica</i> Ralfs, 1861 accepted name (<i>Placoneis elginensis</i> (Gregory) E.J.Cox, 1988)	MF	-	-	-	+	-	1
<i>Navicula apiculata</i> Brébisson, 1854 (accepted) <i>Navicula crucifera</i> var. <i>apiculata</i> (Brébisson) H.Peragallo & M.Peragallo, 1897	MF	+	+	-	-	-	2
<i>Navicula atomus</i> (Kützing) Grunow, 1860 accepted name (<i>Mayamaea atomus</i> (Kützing) Lange-Bertalot, 1997)	FT	-	-	-	+	-	1
<i>Navicula bacillum</i> Ehrenberg, 1839 accepted name (<i>Sellaphora bacillum</i> (Ehrenberg) D.G.Mann, 1989)	F	-	-	-	+	-	1
<i>Navicula cancellata</i> Donkin, 1872 (accepted) <i>Navicula retusa</i> var. <i>cancellata</i> (Donkin) R.Ross, 1986	MBF	-	-	+	-	+	2
<i>Navicula capitata</i> Ehrenberg, 1838 accepted name (<i>Hippodonta capitata</i> (Ehrenberg) Lange-Bertalot, Metzeltin & Witkowski, 1996)	MF	-	-	-	+	-	1
<i>Navicula cincta</i> (Ehrenberg) Ralfs, 1861 (accepted) <i>Navicula cari</i> var. <i>cincta</i> (Ehrenberg) Lange-Bertalot, 1980	BFT	-	-	-	+	-	1
<i>Navicula cryptocephala</i> f. <i>terrestris</i> Lund, 1946 accepted name (<i>Navicula lundii</i> Reichardt, 1985)	T	+	+	+	+	+	5
<i>Navicula cryptotenella</i> Lange-Bertalot in Krammer & Lange-Bertalot 1985 (accepted) <i>Navicula radiosa</i> var. <i>tenella</i> (Brébisson) Van Heurck, 1885 <i>Navicula radiosa</i> var. <i>tenella</i> (Brébisson) Cleve & Möller, 1879 <i>Navicula tenella</i> Brébisson ex Kützing, 1849	F	+	-	-	-	-	1
<i>Navicula decussis</i> Østrup, 1910 accepted name (<i>Geissleria decussis</i> (Østrup) Lange-Bertalot & Metzeltin, 1996)	F	-	-	-	+	-	1
<i>Navicula digito-radiata</i> (Gregory) Ralfs, 1861 (accepted)	MF	-	-	-	+	-	1
<i>Navicula directa</i> (W.Smith) Ralfs, 1861 (accepted)	M	-	-	-	-	+	1
<i>Navicula distans</i> (W.Smith) Ralfs, 1861 (accepted)	MB	-	-	-	-	+	1

Navicula elliptica W.Smith, 1853 accepted name (<i>Diploneis smithii</i> (Brébisson) Cleve, 1894)	MF	-	-	+	-	-	1
Navicula elkab Otto Müller, 1900 accepted name (<i>Craticula elkab</i> (Otto Müller) Lange-Bertalot, Kusber & Cocquyt, 2007)	F	+	-	-	+	-	2
Navicula gastrum (Ehrenberg) Kützing, 1844 accepted name (<i>Placoneis gastrum</i> (Ehrenberg) Mereschkovsky, 1903)	FT	-	-	-	+	-	1
Navicula globiceps (Gregory) Ralfs, 1861 accepted name (<i>Pinnularia globiceps</i> W.Gregory, 1856)	F	+	-	-	-	-	1
Navicula gracilis Ehrenberg, 1832 accepted name (<i>Navicula tripunctata</i> (O.F.Müller) Bory de Saint-Vincent, 1822)	F	+	+	-	+	+	4
Navicula graciloides A.Mayer, 1919 accepted name (<i>Navicula cari</i> Ehrenberg, 1836)	F	-	-	+	-	-	1
Navicula gregaria Donkin, 1861 (accepted)	MBF	+	-	-	+	-	2
Navicula helensis Schulz, 1926 accepted name (<i>Fallacia helensis</i> (Schulz) D.G.Mann, 1990)	U	+	-	-	+	-	2
Navicula heufleri var. <i>leptocephala</i> (Brébisson ex Grunow) Peragallo & Peragallo, 1897 accepted name (<i>Navicula erifuga</i> Lange-Bertalot, 1985)	B	+	-	-	-	-	1
Navicula humerosa Brébisson ex W. Smith, 1856 accepted name (<i>Petroneis humerosa</i> (Brébisson ex W.Smith) A.J.Stickle & D.G.Mann, 1990)	M	-	-	-	+	-	1
Navicula hungarica Grunow, 1860 accepted name (<i>Hippodonta hungarica</i> (Grunow) Lange-Bertalot, Metzeltin & Witkowski, 1996)	MF	+	-	-	-	-	1
Navicula istriana (Grunow) Pantocsek accepted name (<i>Navicula phyllepta</i> Kützing, 1844)	B	-	-	-	-	+	1
Navicula linearis Grunow, 1860 accepted name (<i>Caloneis linearis</i> (Grunow) Boyer, 1927)	M	+	-	-	-	-	1
Navicula lyra Ehrenberg, 1843 accepted name (<i>Lyrella lyra</i> (Ehrenberg) Karajeva, 1978)	MBF	-	-	-	+	+	2
Navicula membrancea Cleve, 1897 accepted name (<i>Meuniera membranacea</i> (Cleve) P.C.Silva, 1996)	M	-	-	-	-	+	1
Navicula mutica Kützing, 1844 accepted name (<i>Luticola mutica</i> (Kützing) D.G.Mann, 1990) <i>Navicula imbricata</i> Bock, 1962	FT	-	-	+	+	+	3
Navicula pelliculosa (Kützing) Hilse, 1863 accepted name (<i>Fistulifera pelliculosa</i> (Brébisson) Lange-Bertalot, 1997)	F	+	-	-	+	-	2
Navicula phyllepta Kützing, 1844 (accepted) <i>Navicula minuscula</i> var. <i>istriana</i> Grunow, 1880	BF	+	-	-	+	-	2
Navicula placentula (Ehrenberg) Kützing, 1844 accepted name (<i>Placoneis placentula</i> (Ehrenberg) Mereschkovsky, 1903)	FT	-	-	-	+	-	1
Navicula plicata * Bodeanu 1976	U	-	-	+	-	-	1
Navicula pupula Kützing, 1844 accepted name (<i>Sellaphora pupula</i> (Kützing) Mereschkovsky, 1902)	F	-	-	+	-	+	2
Navicula pupula var. <i>capitata</i> Hustedt, 1934 (accepted)	F	-	-	+	-	+	2
Navicula pygmaea Kützing, 1849 accepted name (<i>Fallacia pygmaea</i> (Kützing) A.J.Stickle & D.G.Mann, 1990)	MB	+	-	+	-	-	2
Navicula radiosa Kützing, 1844 (accepted)	MF	+	-	+	+	+	4

<i>Navicula acuta</i> (W.Smith) O'Meara, 1875							
<i>Navicula gracilis</i> var. <i>radiosa</i> (Kützing) Rabenhorst, 1847							
<i>Navicula radiosa</i> var. <i>acuta</i> (W.Smith) Grunow, 1860							
<i>Pinnularia acuta</i> W.Smith, 1853							
<i>Pinnularia radiosa</i> Rabenhorst, 1853							
<i>Schizonema radiosum</i> (Kützing) Kuntze, 1898							
<i>Navicula rhynchocephala</i> Kützing, 1844 (accepted)	MF	+	-	-	-	-	1
<i>Navicula rhynchocephala</i> var. <i>constricta</i> Hustedt, 1954							
<i>Schizonema rhynchocephala</i> (Kützing) Kuntze, 1898							
<i>Navicula salinarum</i> Grunow, 1880 (accepted)	BF	-	-	-	-	+	1
<i>Navicula schroeterii</i> Meister, 1932 (accepted)	BF	+	-	-	+	-	2
<i>Navicula scopulorum</i> de Brébisson ex Kützing, 1849							
accepted name (<i>Berkeleya scopulorum</i> (Brébisson ex Kützing) E.J.Cox, 1979	U	-	-	-	-	+	1
<i>Pinnularia johnsonii</i> W.Smith, 1853							
<i>Navicula spicula</i> (Hickie) Cleve, 1894	M	+	-	-	+	-	2
accepted name (<i>Haslea spicula</i> (Hickie) L.Bukhtiyarova, 1995							
<i>Navicula stromii</i> Hustedt, 1931	F	+	-	-	+	-	2
accepted name (<i>Sellaphora stroemii</i> (Hustedt) H.Kobayasi, 2002							
<i>Navicula tenelloides</i> Hustedt, 1937 (accepted)	F	+	-	-	-	-	1
<i>Navicula carniolensis</i> Hustedt, 1945							
<i>Navicula cryptocephala</i> var. <i>angusta</i> J.B.Petersen, 1928							
<i>Navicula treveliana</i> Donkin, 1861	M	-	-	-	-	+	1
accepted name (<i>Pinnularia trevelyana</i> (Donkin) Rabenhorst, 1864							
<i>Navicula tuscula</i> Ehrenberg, 1840	F	-	-	-	-	+	1
accepted name (<i>Aneumastus tuscula</i> (Ehrenberg) D.G.Mann & A.J.Stickle, 1990							
<i>Navicula varrensis</i> Gregory, 1855 (accepted)	F	-	-	-	+	-	1
<i>Navicula viridula</i> (Kützing) Ehrenberg, 1836 (accepted)	F	+	+	+	+	+	5
<i>Navicula silesiaca</i> (Bleisch) H.L.Smith, 1876-1888							
<i>Navicula viridula</i> var. <i>silesiaca</i> (Bleisch) De Toni, 1891							
<i>Pinnularia radiosa</i> var. <i>silesiaca</i> (Bleisch) Rabenhorst, 1864							
<i>Pinnularia silesiaca</i> Bleisch, 1862							
<i>Pinnularia viridula</i> (Ehrenberg) Ehrenberg, 1843							
<i>Pinnularia viridula</i> (Kützing) Rabenhorst, 1853							
<i>Schizonema viridulum</i> (Kützing) Kuntze, 1898							
<i>Navicula yarensis</i> Grunow, 1876	MB	+	+	-	-	-	2
accepted name (<i>Pinnunavis yarrensis</i> (Grunow) H.Okuno, 1975							
<i>Pleurosigma aestauria</i> (Brébisson ex Kützing) W.Smith, 1853 (accepted)	MB	-	-	-	-	+	1
<i>Gyrosigma aestuarii</i> (Brébisson ex Kützing) Griffith & Henfrey, 1856							
<i>Navicula aestuarii</i> Brébisson ex Kützing, 1849							
<i>Pleurosigma angulatum</i> var. <i>aestuarii</i> (Brébisson) van Heurck, 1885							
<i>Pleurosigma angulatum</i> (Queckett) W.Smith, 1852 (accepted)	B	+	-	-	+	+	3
<i>Pleurosigma decorum</i> W.Smith, 1853 (accepted)	M	+	+	+	+	+	5
<i>Pleurosigma elongatum</i> W.Smith, 1852 (accepted)	MBF	+	+	+	+	+	5
<i>Gyrosigma elongatum</i> (W.Smith) Griffith & Henfrey, 1856							
<i>Gyrosigma elongatum</i> (W.Smith) G.S.West, 1909							
<i>Pleurosigma angulatum</i> var. <i>elongatum</i> (W.Smith) van Heurck, 1885							

<i>Pleurosigma hamulifera</i> Brun, 1889 (accepted)	M	-	-	-	-	+	1
<i>Pleurosigma salinarum</i> (Grunow) Grunow, 1880 (accepted)	BF	+	-	-	+	-	2
<i>Pleurosigma angulatum</i> f. <i>salinarum</i> (Grunow) De Toni, 1891							
<i>Pleurosigma delicatulum</i> var. <i>salinarum</i> Grunow, 1878							
<i>Pleurosigma pusillum</i> Grunow, 1880							
<i>Pleurosigma pusillum</i> var. <i>salinarum</i> (Grunow) H.Peragallo, 1891							
<i>Pleurosigma salinarum</i> var. <i>pusilla</i> (Grunow) Cleve, 1894							
<i>Scalptrum pusillum</i> (Grunow) Kuntze, 1891							
<i>Scalptrum salinarum</i> (Grunow) Kuntze, 1891							
<u>Pinnulariaceae</u>							
<i>Pinnularia gibba</i> Ehrenberg, 1843 (accepted)	FT	-	-	+	-	-	1
<i>Navicula abaujensis</i> Pantocsek, 1889							
<i>Navicula gibba</i> (Ehrenberg) Kützing, 1844							
<i>Navicula stauroptera</i> Grunow, 1860							
<i>Pinnularia stauroptera</i> (Grunow) Rabenhorst, 1864							
<i>Schizonema stauropterum</i> (Grunow) Kuntze, 1898							
<i>Stauroneis gibba</i> (Ehrenberg) Kützing, 1844							
<i>Stauroptera gibba</i> Ehrenberg, 1843							
<i>Pinnularia viridis</i> (Nitzsch) Ehrenberg, 1843 (accepted)	FT	-	-	+	-	-	1
<i>Frustulia viridis</i> (Nitzsch) Kützing, 1833							
<i>Navicula viridis</i> (Nitzsch) Ehrenberg, 1833							
<i>Navicula viridis</i> (Nitzsch) Kützing							
<i>Schizonema viride</i> (Nitzsch) Kuntze, 1898							
<u>Plagiotropidaceae</u>							
<i>Plagiotropis leidoptera</i> Plagiotropis lepidoptera (accepted)	B	+	-	-	-	-	1
<i>Amphiprora lepidoptera</i> Gregory, 1857							
<i>Orthotropis lepidoptera</i> (Gregory) Van Heurck, 1896							
<i>Tropidoneis lepidoptera</i> (Gregory) Cleve, 1894							
<i>Tropidoneis lepidoptera</i> var. <i>mediterranea</i> Peragallo, 1897							
<u>Pyramimonadaceae</u>							
<i>Pyramimonas orientalis</i> R.W.Butcher, 1959	M	-	-	+	-	-	1
accepted name (<i>Pyramimonas plurioculata</i> Butcher, 1959)							
<i>Pyramimonas virginica</i> Pennick, 1977 (accepted)	M	-	-	+	-	-	1
<u>Rhabdonemataceae</u>							
<i>Rhabdonema adriaticum</i> Kützing, 1844 (accepted)	MF	-	-	-	-	+	1
<u>Rhizosoleniaceae</u>							
<i>Rhizosolenia alata</i> Brightwell, 1858	M	-	-	-	-	+	1
accepted name (<i>Proboscia alata</i> (Brightwell) Sundström, 1986)							
<i>Rhizosolenia calcar-avis</i> Schultze, 1858 (accepted)	M	-	-	-	-	+	1
<i>Rhizosolenia imbricata</i> var. <i>shrubsolei</i> (Cleve) Schröder, 1906	M	-	-	-	-	+	1
accepted name (<i>Rhizosolenia imbricata</i> Brightwell, 1858)							
<i>Rhizosolenia robusta</i> G.Norman ex Ralfs, 1861	M	-	-	-	-	+	1
accepted name (<i>Neocalyptrella robusta</i> (G.Norman ex Ralfs) Hernández-Becerril & Meave del Castillo, 1997)							
<i>Rhizosolenia setigera</i> Brightwell, 1858 (accepted)	MF	-	-	-	-	+	1
<i>Rhizosolenia japonica</i> Castracane, 1886							
<i>Rhizosolenia stolterfothii</i> H.Peragallo, 1888	M	-	-	-	-	+	1
accepted name (<i>Guinardia striata</i> (Stolterfoth) Hasle, 1996)							
<u>Rhopalodiaceae</u>							
<i>Epithemia adanta</i> (Kützing) Brébisson, 1838 (accepted)	F	+	-	-	+	-	2
<i>Cymbella zebra</i> (Ehrenberg) Hassall, 1845							

<i>Cystopleura zebra</i> (Ehrenberg) Kuntze, 1891							
<i>Epithemia zebra</i> (Ehrenberg) Kützing, 1844							
<i>Eunotia adnata</i> (Brébisson) G.L.Rabenhorst, 1853							
<i>Epithemia argus</i> (Ehrenberg) Kützing, 1844 (accepted)	F	+	-	+	+	+	4
<i>Cystopleura argus</i> (Ehrenberg) Kuntze, 1891							
<i>Epithemia argus</i> var. <i>ocellata</i> (Ehrenberg) F.Fricke, 1904							
<i>Epithemia ocellata</i> (Ehrenberg) Kützing, 1844							
<i>Eunotia ocellata</i> Ehrenberg, 1840							
<i>Epithemia faba</i>* (Ehrenberg) Kützing	U	-	-	-	+	-	1
<i>Epithemia frickei</i> Krammer, 1987 (accepted)	F	-	-	-	+	-	1
<i>Epithemia intermedia</i> Fricke, 1904							
<i>Epithemia zebra</i> var. <i>intermedia</i> (Fricke) Hustedt, 1934							
<i>Epithemia smithii</i> Carruthers, 1864 (accepted)	F	+	-	-	+	-	2
<i>Epithemia sores</i> Kützing, 1844 (accepted)	F	+	+	+	+	+	5
<i>Cystopleura sores</i> (Kützing) Kuntze, 1891							
<i>Eunotia sores</i> (Kützing) G.L.Rabenhorst, 1853							
<i>Eunotia westermanni</i> var. <i>sores</i> (Kützing) G.L.Rabenhorst, 1847							
<i>Epithemia turgida</i> (Ehrenberg) Kützing, 1844 (accepted)	MF	+	-	-	+	+	3
<i>Cystopleura turgida</i> (Ehrenberg) Kuntze, 1891							
<i>Rhopalodia turgida</i> (Ehrenberg) Kützing							
<i>Epithemia zebra</i> (Ehrenberg) Kützing, 1844	F	+	+	+	+	+	5
accepted name (<i>Epithemia adnata</i> (Kützing) Brébisson, 1838							
<i>Rhopalodia acuminata</i> Krammer, 1987 (accepted)	MF	+	+	+	+	+	5
<i>Rhopalodia brebissonii</i> Krammer, 1987 (accepted)	F	+	-	-	-	-	1
<i>Rhopalodia constricta</i> (W.Smith) Krammer, 1987 (accepted)	MF	+	-	-	-	-	1
<i>Rhopalodia gibba</i> (Ehrenberg) Otto Müller, 1895 (accepted)	MF	+	+	+	+	+	5
<i>Cystopleura gibba</i> (Ehrenberg) Kuntze, 1891							
<i>Epithemia gibba</i> (Ehrenberg) Kützing, 1844							
<i>Epithemia ventricosa</i> var. <i>gibba</i> (Ehrenberg) J.Schumann, 1869							
<i>Eunotia gibba</i> (Ehrenberg) Ehrenberg, 1843							
<i>Frustulia gibba</i> (Ehrenberg) Jenner, 1845							
<i>Navicula gibba</i> Ehrenberg, 1830							
<i>Pinnularia gibba</i> (Ehrenberg) Ehrenberg, 1843							
<i>Schizonema gibbum</i> (Ehrenberg) Kuntze, 1898							
<i>Rhopalodia gibberula</i> (Ehrenberg) Otto Müller, 1895 (accepted)	MF	-	-	-	+	+	2
<i>Cystopleura gibberula</i> (Ehrenberg) Kuntze, 1891							
<i>Epithemia gibberula</i> (Ehrenberg) Kützing, 1844							
<i>Rhopalodia musculus</i> var. <i>gibberula</i> (Ehrenberg) Peragallo & Peragallo, 1900							
<i>Rhopalodia musculus</i> (Kützing) Otto Müller, 1900 (accepted)	MF	+	-	-	+	-	2
<i>Cystopleura musculus</i> (Kützing) Kuntze, 1891							
<i>Eunotia westermanni</i> var. <i>musculus</i> (Kützing) G.L.Rabenhorst, 1847							
<i>Rhopalodia gibberula</i> var. <i>musculus</i> (Kützing) Muschler, 1908							
<i>Rhopalodia gibberula</i> var. <i>musculus</i> (Kützing) Cleve-Euler, 1952							
<u>Skeletonemaceae</u>							
<i>Skeletonema costatum</i> (Greville) Cleve, 1873 (accepted)	M	-	-	-	-	+	1
<u>Stauroneidaceae</u>							

Stauroneis acuta W.Smith, 1853 (accepted)	F	-	-	-	+	-	1
<i>Navicula acuta</i> (W.Smith) Hüstedt, 1909							
<i>Pleurostaurum acutum</i> (W.Smith) Rabenhorst, 1859							
<i>Schizonema acutum</i> (W.Smith) Kuntze, 1898							
<i>Stauroneis kochii</i> Pantocsek, 1892							
Stauroneis anceps Ehrenberg, 1843 (accepted)	F	+	-	+	+	+	4
accepted name (<i>Stauroneis anceps</i> Ehrenberg, 1843)							
<i>Navicula anceps</i> (Ehrenberg) Mann, 1907							
<i>Schizonema anceps</i> (Ehrenberg) Kuntze, 1898							
<i>Stauroneis amphicephala</i> Kützing, 1844							
<i>Stauroneis anceps f. gracilis</i> (Ehrenberg) Cleve							
<i>Stauroneis anceps var. amphicephala</i> (Kützing) van Heurck, 1880-1885							
<i>Stauroneis anceps var. amphicephala</i> (Kützing) Cleve, 1894							
Stauroneis anceps f. gracilis (Ehrenberg) Cleve (accepted)	F	+	-	+	+	+	4
Stauroneis phoenicenteron (Nitzsch) Ehrenberg, 1843 (accepted)	F	+	-	-	+	-	2
<i>Cymbella phoenicenteron</i> (Nitsch) C.Agardh, 1830							
<i>Navicula phoenicenteron</i> (Nitzsch) Ehrenberg, 1836							
<i>Schizonema phoenicenterum</i> (Ehrenberg) Kuntze, 1898							
Stauroneis smith Grunow, 1860 (accepted)	F	-	-	-	+	-	1
<i>Pleurostaurum smithii</i> (Grunow) Grunow, 1879							
Stephanodisceaceae							
Cyclotella atomus Hüstedt, 1937 (accepted)	F	-	-	+	+	+	3
accepted name (<i>Cyclotella atomus var. atomus</i> Hüstedt)							
Cyclotella antiqua W.Smith, 1853 (accepted)	F	-	-	-	-	+	1
Cyclotella comta (Ehrenberg) Kützing, 1849 (accepted)	F	+	+	+	+	+	5
<i>Discoplea comta</i> Ehrenberg, 1844							
<i>Puncticulata comta</i> (Ehrenberg) H.Hakansson, 2002							
Cyclotella Kützingiana Thwaites 1848 (accepted)	MF	+	-	-	-	+	2
<i>Cyclotella meneghiniana var. kuetzingiana</i> (Thwaites) Playfair							
Cyclotella meneghiniana Kützing, 1844 (accepted)	F	+	+	+	+	+	5
<i>Cyclotella Kützingiana var. meneghiniana</i> (Kützing) Brun, 1880							
<i>Stephanocyclus meneghiniana</i> (Kützing) Skabichevskii, 1975							
<i>Suriella melosiroides</i> G.G.A.Meneghini ms., 1844							
Cyclotella meneghiniana var. laevissima (Van Goor) Hüstedt, 1928 (accepted)	M	+	-	-	-	-	1
accepted name (<i>Cyclotella meneghiniana</i> Kützing, 1844)							
Cyclotella ocellata Pantocsek, 1901 (accepted)	F	+	+	+	+	+	5
Cyclotella operculata (C.Agardh) Brébisson, 1838 (accepted)	F	-	-	+	-	+	2
Cyclotella striata (Kützing) Grunow, 1880 (accepted)	F	-	-	+	+	+	3
<i>Cyclotella dallasiana</i> W.Smith, 1856							
Stephacnodiscus aegyptiacus Ehrenberg, 1854 (accepted)	F	-	-	-	+	-	1
Stephacnodiscus astraerea (Ehrenberg) Grunow, 1880 (accepted)	MF	-	-	-	+	-	1
<i>Discoplea astraerea</i> Ehrenberg, 1844							
Stephacnodiscus invisitatus Hohn & Hellermann, 1963	F	-	-	-	+	-	1
accepted name (<i>Cyclostephanos invisitatus</i> (Hohn & Hellermann) Theriot, Stoermer & Håkasson, 1988)							
Stephacnodiscus minutulus (Kützing) Cleve & Möller,	F	+	-	-	+	-	2

1882 (accepted)							
Stephacnodiscus rotula (Kützing) Hendey, 1964 (accepted)	F	+	-	-	-	-	1
<i>Discoplea rotula</i> (Kützing) Trevisan, 1848							
Cyclostephanos dubius (Hüstedt) Round, 1988 (accepted)	F	+	-	-	+	-	2
Surirellaceae							
Campylodiscus bicostatus W.Smith ex F.C.S.Roper (accepted)	F	+	+	+	+	+	5
<i>Campylodiscus clypeus</i> var. <i>bicostata</i> (W.Smith ex F.C.S.Roper) F.Hüstedt, 1930							
Campylodiscus clypeus Ehrenberg (accepted)	MF	-	-	-	+	-	1
<i>Campylodiscus ovatus</i> Ralfs, 1861							
<i>Cocconeis clypeus</i> Ehrenberg, 1838							
<i>Surirella clypeus</i> Ehrenberg, 1840							
Campylodiscus demelianus Grunow (accepted)	F	+	+	-	-	-	2
Campylodiscus echeneis Ehrenberg (accepted)	M	+	+	-	+	+	4
<i>Coronia echeneis</i> (Ehrenberg ex Kützing) Ehrenberg, 1912							
<i>Coronia echeneis</i> (Ehrenberg ex Kützing) Ehrenberg, 1912							
Surirella biseriata Brébisson, 1835 (accepted)	F	-	-	-	+	-	1
<i>Suriraya biseriata</i> (Brébisson) Pfitzer, 1871							
Surirella clypus (Ehrenberg) Kützing, 1844 (accepted)	MF	-	-	-	-	+	1
accepted name (<i>Campylodiscus clypeus</i> (Ehrenberg) Ehrenberg ex Kützing, 1844)							
Surirella elegans Ehrenberg Ehrenberg (accepted)	F	-	-	+	-	-	1
Surirella fastuosa Ehrenberg (accepted)	M	+	-	-	+	-	2
Surirella gemma (Ehrenberg) Kützing, 1844 (accepted)	F	-	-	-	-	+	1
Surirella linearis W.Smith, 1853 (accepted)	F	-	-	-	-	+	1
<i>Suriraya linearis</i> (W.Smith) Pfitzer, 1871							
Surirella ovalis (accepted)	F	+	+	-	+	+	4
<i>Suriraya ovalis</i> (Brébisson) Pfitzer, 1871							
<i>Surirella ovata</i> var. <i>ovalis</i> (Brébisson) Kirchner, 1878							
Surirella ovata Kützing, 1844 (accepted)	F	-	-	-	-	+	1
accepted name (<i>Surirella minuta</i> Brébisson, 1849)							
Surirella robusta Ehrenberg (accepted)	F	+	-	-	+	-	2
Surirella striatula Turpin, 1828 (accepted)	MBF	+	+	+	+	+	5
<i>Navicula striatula</i> (Turpin) Ehrenberg, 1832							
<i>Novilla striatula</i> (Turpin) Heiberg, 1863							
<i>Suriraya striatula</i> (Turpin) Pfitzer, 1871							
Surirella tenera W.Gregory, 1856 (accepted)	F	+	-	-	+	-	2
<i>Surirella robusta</i> var. <i>tenera</i> (Gregory) van Heurck, 1885							
Tabellariaceae							
Asterionella japonica Cleve, 1882 (accepted)	MF	-	-	+	+	+	3
accepted name (<i>Asterionellopsis glacialis</i> (Castracane) Round, 1990)							
Asterionella notata Grunow ex Van Heurck, 1881 (accepted)	M	-	-	-	-	+	1
Diatoma vulgaris Bory de Saint-Vincent, 1824 (accepted)	F	-	-	-	+	-	1
<i>Bacillaria vulgaris</i> (Bory) Ehrenberg, 1836							
<i>Diatoma vulgaris</i> f. <i>producta</i> (Grunow) A.Kurz, 1922							
<i>Diatoma vulgaris</i> var. <i>distorta</i> Grunow ex van Heurck							
<i>Diatoma vulgaris</i> var. <i>vulgaris</i> Bory de Saint-Vincent, 1824							
<i>Neodiatoma vulgaris</i> (Bory de Saint-Vincent) Kuntze, 1891							
<i>Odontidium vulgare</i> (Bory) Pfitzer, 1871							
Tabellaria flocculosa (Roth) Kützing, 1844 (accepted)	FT	+	-	-	+	-	2
<i>Bacillaria flocculosa</i> (Roth) Leiblein, 1827							

<i>Bacillaria tabellaris</i> Ehrenberg, 1833							
<i>Candollella flocculosa</i> (Roth) Gaillon, 1833							
<i>Striatella flocculosa</i> (Roth) Kuntze, 1898							
<i>Tabellaria fenestrata</i> f. <i>intermedia</i> (Grunow) Skabichevskii, 1960							
<i>Tabellaria fenestrata</i> var. <i>intermedia</i> Grunow, 1881							
<i>Tabellaria flocculosa</i> var. <i>ventricosa</i> (Kützing) Grunow, 1862							
<i>Tabellaria ventricosa</i> Kützing, 1844							
<u>Thalassiosiraceae</u>							
<i>Thalassiosira decipiens</i> (Grunow) E.G.Jørgensen, 1905 (accepted)	MF	+	-	+	-	-	2
<i>Coscinodiscus decipiens</i> Grunow ex Van Heurck, 1882							
<i>Thalassiosira gelatinosa</i> Hensen, 1887							
<i>Thalassiosira excentrica</i> (Ehrenberg) Cleve, 1903	M	-	-	-	-	+	1
accepted name (<i>Thalassiosira eccentrica</i> (Ehrenberg) Cleve, 1904)							
<i>Thalassiosira faurii</i> (Gasse) Hasle, 1978 (accepted)	F	-	-	-	+	-	1
<i>Coscinodiscus faurii</i> Gasse, 1975							
<i>Thalassiosira rotula</i> Meunier, 1910	MF	-	-	-	+	-	1
accepted name (<i>Thalassiosira gravida</i> Cleve, 1896)							
<u>Thalassionemataceae</u>							
<i>Thalassionema nitzschioides</i> (Grunow) Mereschkowsky, 1902 (accepted)	MF	-	-	-	-	+	1
<i>Synedra nitzschioides</i> var. <i>minor</i> Cleve, 1883							
<i>Thalassiothrix curvata</i> Castracane, 1886							
<i>Thalassiothrix fraunfeldii</i> var. <i>nitzschioides</i> (Grunow) Jørgensen, 1900							
<i>Thalassiothrix nitzschioides</i> (Grunow) Grunow, 1881							
<i>Thalassiothrix nitzschioides</i> var. <i>javanica</i> Grunow							

Notes: *M*, marine; *F*, fresh; *T*, terrestrial; *U*, unknown habitate; *B*, brackish.

Ma, Mariut; *Ed*, Edku; *Br*, Burullus; *Mn*, Manzala; *Ba*, Bardawil.

The source of these data is WoRMS, except marked by * is algaebase.com

Table 2. Diatom families; genera and species number recorded in the five Egyptian Mediterranean Lakes

Family	Genus name	Species number
Achnantheaceae	<i>Achnanthes</i>	13
Achnanthidiaceae	<i>Achnantheidium</i>	2
Amphipleuraceae	<i>Amphiprora</i>	5
	<i>Frustulia</i>	1
Aulacoseiraceae	<i>Aulacoseira</i>	7
Bacillariaceae	<i>Bacillaria</i>	2
	<i>Fragilariopsis</i>	3
	<i>Hantzschia</i>	1
	<i>Nitzschia</i>	46
	<i>Psammodictyon</i>	1
Biddulphiaceae	<i>Biddulphia</i>	9
Catenulaceae	<i>Amphora</i>	19
Chaetocerotaceae	<i>Bacteriastrum</i>	2
	<i>Chaetoceros</i>	5
Cocconeidaceae	<i>Cocconeis</i>	11
Coscinodiscaceae	<i>Coscinodiscus</i>	8
Cymbellaceae	<i>Cymbella</i>	12
Climacospheniaceae	<i>Climacosphenia</i>	2
Diploneidaceae	<i>Diploneis</i>	12

Family	Genus name	Species number
Eunotiaceae	<i>Eunotia</i>	5
Eupodiscaceae	<i>Cerataulus</i>	1
	<i>Pleurosira</i>	1
	<i>Triceratium</i>	1
Fragilariaceae	<i>Fragilaria</i>	6
	<i>Martyana</i>	1
	<i>Pseudostaurosira</i>	1
	<i>Staurosirella</i>	2
	<i>Synedra</i>	11
Gomphonemataceae	<i>Encyonema</i>	5
	<i>Gomphonema</i>	13
	<i>Placoneis</i>	1
Grammatophoraceae	<i>Grammatophora</i>	1
Hyalodiscaceae	<i>Hyalodiscus</i>	1
	<i>Podosira</i>	1
Hemidiscaceae	<i>Actinocyclus</i>	2
	<i>Azpeitia</i>	1
	<i>Hemidiscus</i>	1
Lithodesmiaceae	<i>Lithodesmium</i>	1
	<i>Tropidoneis</i>	1
Licmophoraceae	<i>Licmophora</i>	8
Mastogloiaceae	<i>Mastogloia</i>	10
Melosiraceae	<i>Melosira</i>	5
Naviculaceae	<i>Caloneis</i>	5
	<i>Geissleria</i>	1
	<i>Gyrosigma</i>	14
	<i>Hippodonta</i>	1
	<i>Navicula</i>	51
	<i>Pleurosigma</i>	6
	<i>Pinnularia</i>	2
Pinnulariaceae	<i>Pinnularia</i>	2
Plagiotropidaceae	<i>Plagiotropis</i>	1
Pyramimonadaceae	<i>Pyramimonas</i>	2
Rhabdonemataceae	<i>Rhabdonema</i>	1
Rhizosoleniaceae	<i>Rhizosolenia</i>	6
Rhopalodiaceae	<i>Epithemia</i>	8
	<i>Rhopalodia</i>	6
Skeletonemaceae	<i>Skeletonema</i>	1
Stauroneidaceae	<i>Stauroneis</i>	5
Stephanodiscaceae	<i>Cyclotella</i>	9
	<i>Stephanodiscus</i>	5
	<i>Cyclostephanos</i>	1
	<i>Surirella</i>	11
Surirellaceae	<i>Campylodiscus</i>	4
	<i>Surirella</i>	11
Tabellariaceae	<i>Asterionella</i>	2
	<i>Diatoma</i>	1
	<i>Tabellaria</i>	1
Thalassiosiraceae	<i>Thalassiosira</i>	4
Thalassionemataceae	<i>Thalassionema</i>	1
38	67	390

Nitzschia was represented by 46 species (25 fresh water, 10 marine, 10 marine - fresh and one marine and brackish. *Navicula* was represented by 51 species (16 fresh water, 8 marine - fresh, 6 marine, 3 marine - brackish, 4 terrestrial - fresh, 3 brackish, 3 brackish - fresh, 3

marine - brackish - fresh, 1 terrestrial, 1 brackish, fresh - terrestrial and 3 with unknown habitat (Table 1).

From the listed data in Table (3), Lake Manzala attained the highest number of fresh water

species (104 species). On the other hand some others are known to be introduced from the marine – fresh habitat. The highest recorded marine form was recorded in lake Bardawil (61 species).

most of them are marine forms; followed by lake Manzala (193 species). Lake Mariut was represented by 183 species, while Lake Burullus was represented by 110 species. The lowest diatom number was occurred in Lake Edku (67 species).

As shown in Table (3) and Fig. 2, Lake Bardawil have the higher species number (226 species),

Table 3. Habitat of different diatom species recorded in the five Egyptian Mediterranean Lakes

Habitat	Lake				
	Mariut (Ma)	Edku (Ed)	Burullus (Br)	Manzala (Mn)	Bardawil (Ba)
Marine and fresh (MF)	37	15	22	37	42
Fresh (F)	95	32	59	104	80
Fresh and terrestrial (FT)	2	0	3	7	2
Marine (M)	16	8	10	17	61
Marine, brakish and fresh (MBF)	9	4	6	8	8
Marine, fresh and terrestrial (MFT)	2	0	0	2	1
Marine and brakish (MB)	3	2	1	0	3
Brakish (B)	6	2	1	2	5
Brakish and fresh (BF)	6	2	6	6	10
Brakish, fresh and terrestrial (BFT)	0	0	0	1	0
Terrestrial (T)	1	1	1	1	1
Unknown habitat (U)	6	1	1	7	12
Total number of species	183	67	110	192	226

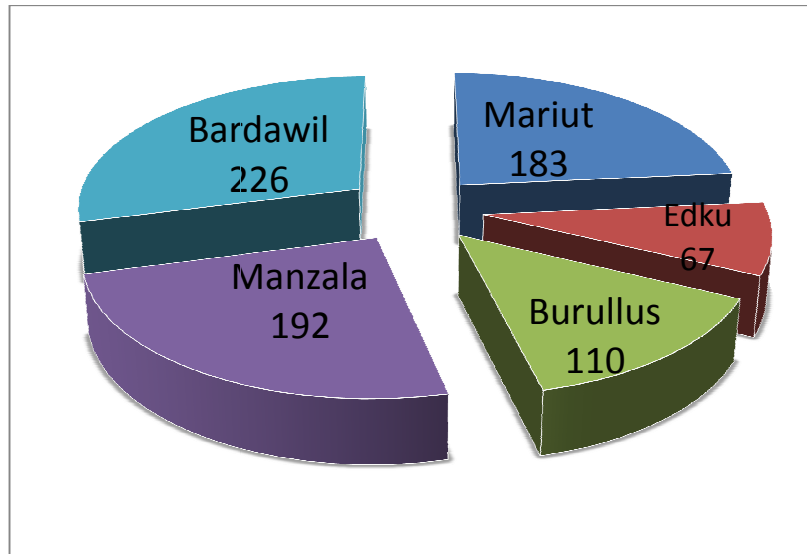


Fig. 2. Total number of recorded diatoms in the five Northern Lakes of Egypt

3. CONCLUSION

This checklist of diatom species represents the start of documenting species currently observed in the Egyptian wetland water. This publication has presented both past and present data for the composition of diatom species in the studied lakes.

This has also provided valuable baseline data and a greater understanding of the potential for introduction of new organisms from foreign locations that may exist in the lakes. From the survey of the literature on diatom assemblages of the northern lakes, there is a large variation among the researches in the species composition and density depending on the surveyed stations, water depth, sampling season and water quality.

This list has also aided in identifying the original species, accepted names, synonyms and habitat. Also, it seems inevitable that some marine organisms moved trans-oceanically into other habitats. Neglecting this information may lead to a misleading interpretation of invasion corridors, the types of communities susceptible or resistant to invasions, and invasion success rates.

Although we have included the majority of papers that list species from the Egyptian Mediterranean Lakes, we acknowledge that this may not be representative of all the data available. As more research is being conducted more species may be detected.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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