Standard Operating Procedure for Phytoplankton Analysis

LG401

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Standard Operating Procedure for Phytoplankton Analysis

1.0 SCOPE AND APPLICATION

1.1 This method, as first described by Utermöhl (1958), is utilized to identify and enumerate the phytoplankton community from many different types of aquatic habitats.

2.0 SUMMARY OF METHOD

2.1 The method, called the Modified Utermöhl method, involves the microscopic examination of a preserved water sample. Initially a preliminary scan is made to determine the volume of sample needed for other portions of the procedure. A settled sample of appropriate volume is then examined for non-diatom algae and *Urosolenia* species (hereafter referred to as 'soft algae'). A second examination is performed on a cleaned diatom preparation for identification and enumeration.

3.0 SAMPLE COLLECTION

3.1 See U.S. EPA GLNPO Standard Operating Procedure for Phytoplankton Sample Collection and Preservation Field Procedures (LG400), accessible by logging into glnpo.net and then going to R/V *Lake Guardian* SOP Repository.

3.2 A composite (integrated) sample is prepared from the upper region of the water column. For an unstratified water column, the integrated sample is prepared by taking equal volumes of water from SRF (1-2 m), 5 m, 10 m and 20 meters unless the depth is less than 20 meters. If the total depth is between 15 and 22 meters, the 20 meter sample is replaced by the bottom sample (B-1 or B-2). If the total depth is less than 15 meters, equal volumes are taken from surface, mid-depth, and bottom sample (B-1 or B-2).

For a stratified water column, equal volumes are taken from the surface, 5 m, 10 m, and lower epilimnion (LEP). If the epilimnion is very shallow, equal volumes are taken from a maximum of four sampling depths and a minimum of two sampling depths. The underlying strategy is to collect a representative sample from the epilimnion.

For more detailed instructions on depth selection for the integrated sample, see Field Sampling Using the Rosette Sampler (LG200), accessible by logging into glnpo.net and then going to R/V *Lake Guardian* SOP Repository.

4.0 APPARATUS

4.1 Inverted microscope with an objective system for magnification up to 600x (Leitz Diavert or another equal quality inverted microscope)

4.2 Compound microscope with an objective system of magnification of 1000x or greater

4.3 Sedimentation chambers: 5-, 10-, 25-, 50- and 100-cc

4.4 Beakers: 300- and 600-mL

4.5 Large hotplate capable of boiling water

4.6 Centrifuge

4.7 Centrifuge tubes, graduated 50-mL

4.8 Coverslips, round, #1 thickness, 22-mm diameter

4.9 Pre-cleaned microscope slides, 25 x 75 mm

4.10 Syringe, 20-mL with cannula, 14-gauge 4-inch (optional for strewing, or use macropipetter)

4.11 Long-neck disposable pipettes or macropipetter

4.12 Rubber bulbs for pipettes (if disposable pipettes used)

4.13 10-mL autopipette

5.0 REAGENTS

5.1 HNO_3 = Nitric Acid (concentrated)

5.2 H_2O_2 = Hydrogen peroxide (30% solution)

5.3 $K_2Cr_2O_7$ = Potassium dichromate

5.4 Hyrax™ mounting media, or equivalent (Naphrax, Pleurax, etc.)

5.5 Toluene/xylene

5.6 Commercial formaldehyde solution 37 - 40% (= formalin)

5.7 Immersion oil for upright microscopy

6.0 ANALYTICAL PROCEDURE

6.1 Phytoplankton samples received at the lab shall be logged-in and spiked with 10 ml of Formalin.

6.2 10-mL Preliminary Investigation

6.2.1 An initial screening of each sample must be done in order to determine the final settled volume needed for analyses unless historical data is available to show what volumes have traditionally been used for samples from the same site. This is done by sedimenting 10 mL of each sample and counting the total number of photosynthetic organisms, and the number

of diatom cells, within a select area of the slide (10 mm^2 minimum or 3 transects of the chamber). No identifications are done at this time, but any irregularities such as excessive sediment in the sample are noted.

The volume needed for settling and subsequent soft algae analysis is determined from the number of all organisms counted. The sample volume to be digested for diatom analysis is determined from the preliminary diatom cell counts. However, the minimum volume for digestion is recommended to be 500 mL. For example:

10-mL preliminary counts

1) 101 organisms total
2) 103 diatom cells (note: 1 cell has 2 frustules/valves)

Count needed (minimum)

1) 250 organisms total
2) 500 diatom frustules (250 cells)

Final volumes

1) 25-mL sample for sedimentation
2) 500-mL sample for digestion

The final volume may be slightly over-estimated to ensure that the minimum counts required are met. The preliminary count also helps to ensure that there is enough sample for both final investigations.

The definition of an organism is as follows:

> A colony, a filament, or a single cell. The units of a colony or a filament are not counted as organisms at this time but the whole aggregate is counted as one organism.

6.2.2 All information from the 10-mL preliminary count is recorded in a pre-printed data form, generally on the first page of the countsheet used for soft algae analysis. This includes unusual observations such as poor sample preservation, high bacterial/fungal populations, occurrence of special/rare phytoplankton taxa, and the degree of matrix interference, etc.

6.3 Sample Sedimentation

6.3.1 The phytoplankton sample is homogenized by gently inverting the sample bottle for 60 seconds. The predetermined sample volume is loaded into a settling Utermöhl chamber of appropriate volume. Samples should be added to the chamber with a syringe and/or macropipettor with a clean tip. The sample bottle should be inverted at least once between each addition. This is done because larger organisms settle quickly and may remain in the bottle if the sample is simply poured. The chamber is topped with a round top plate.

6.3.2 Algae are allowed to settle onto the base of the settling chamber. Since oil immersion may be used in the course of identification, the coverglass at the bottom of the chamber should not be thicker than 0.2 - 0.3 mm inches (or No. 1 coverglass). The time recommended for complete sedimentation varies with the height of the chamber (8 cm/day to 4 cm/day depending on accuracy required in enumeration (Furet & Benson-Evans, 1982)).

6.3.3 Approximate settling times necessary are as follows:

100 mL ---------- 100 hours
50 mL ---------- 50 hours
25 mL ---------- 25 hours
10 mL ---------- 10 hours
5 mL ---------- 5 hours
2 mL ---------- 2 hours

6.4 Total Sample Analysis

6.4.1 A complete phytoplankton analysis consists of two parts. The first part is a count of all organisms in the settled sample at 400-500x. The second part is a count made on a prepared diatom slide at least 1000x.

6.5 Sedimented Sample Analysis

6.5.1 The soft algae portion of the settled phytoplankton samples are examined and analyzed using an inverted microscope (Leitz Diavert, Olympus BX51 or equivalent microscope).

6.5.2 All “live” forms (chloroplast containing organisms) are counted and identified at 400x. Higher magnification may be used for identification when necessary.

6.5.3 Procedure

6.5.3.1 The entire chamber of settled material is scanned and the dominant (4 or 5 most common organisms) as well as subdominant species determined. This is to give the biologist an idea of the sample composition as well as to ensure that the sample is evenly settled.

6.5.3.2 A minimum of 250 “live” organisms is counted along transects. The area counted is recorded since it is needed for cells per mL calculation.

6.5.3.3 For the purposes of determining the numbers of organisms to count, colonies and filaments are considered one organism. However, for the purposes of calculating biovolume, individual cells within colonies and filaments are counted and measured. Where numbers of cells cannot be counted, e.g., in extremely large cyanobacterial colonies, estimates can be made.

6.5.3.4 Large organisms, such as *Ceratium hirundinella*, should be enumerated from the whole chamber. Calculations of cell numbers of such organisms should be done using the area of the entire chamber bottom.

6.5.3.5 The number of "live" cells are enumerated at the lowest taxonomic unit possible (i.e., genus, species, variety, etc.). All "empty" lorica from Chrysophyta are also enumerated and identified to species level where possible, although these are not included in the 'regular' cell counts.

6.5.3.6 As many as 20 specimens of each species are measured for cell volume calculations. When fewer than 20 specimens are present, those present are measured as they occur. The measurements required are those which are necessary for the volume calculation of a solid which best approximates the shape of any particular organism. For most organisms the measurements are taken from out-side wall to outside wall. In cases where a taxon's size is invariable (as for some small green algae and cyanophytes) it is permissible to record the measurement once.

6.5.3.7 Those forms which are loricate (Chlorophyta: Phacotaceae and Chlorococaceae; Chrysophyta: many forms) must have the active portion, i.e., protoplast measured. Filamentous and colonial forms require measurements of individual components. If cell walls are not readily visible in the filament, the length of the entire colony is measured and the number of cells is determined by dividing by the average cell length which is measured when possible.

6.5.3.8 During examination of the settled sample, most diatoms are enumerated and identified only as live pennates, empty pennates, live centrics, and empty centrics, with the only exception being species of *Urosolenia* (=*Rhizosolenia*). Actual species identification of diatoms (excluding *Urosolenia*) and cell volume measurements are done under oil immersion (1000-1250x) by another method (Section 6.6). While not included in the regular counts, note should be made of the presence of other identifiable species, such as *Fragilaria capucina*, *Fragilaria crotonensis, Tabellaria flocculosa,* and *Stephanodiscus binderanus*, to provide corroboration of identifications in cases where colonial configuration is a characteristic feature.

6.6 Diatom Sample Analysis

6.6.1 The cellular contents of diatoms obscure the wall markings on which the taxonomy is based. Therefore, the organic matter must be removed (oxidized) prior to identification. The following method describes a cleaning method, slide preparation, enumeration, as well as identification.

6.6.2 Cleaning of Diatoms

Sample cleaning and slide preparation must be performed in the hood.

6.6.2.1 Homogenize the sample by gently inverting the sample bottle every second for a minimum of one minute. Pour a specified volume (dependent upon diatom density and determined by the initial 10-mL count discussed previously) of homogenized sample is put into a 600-mL (or larger) beaker. Unless diatom densities are extremely high, a minimum volume of 500 mL should be used.

6.6.2.2 Add 20 mL of concentrated HNO_3 to the beaker. Then place the beaker on a hotplate and heat until volume is reduced to about 50 mL.

6.6.2.3 Pour the remaining sample into a 300-mL beaker. Completely rinse the sides of the beaker with RO/DI or distilled water at least three times and empty this rinse water into the beaker. If necessary, repeat this process several times until a volume of 125 mL is reached. Put 25 mL 30% H_2O_2 into the beaker, and a few grains of crystal $K_2Cr_2O_7$. Place sample on hotplate again and heat until volume is reduced to less than 10-15 mL.

6.6.2.4 After sample is reduced, transfer the sample into a 50-mL graduated centrifuge tube. Rinse the beaker at least three times with small quantities of distilled water and add rinse water to the tube to ensure all diatom remains are transferred to the centrifuge tube. All centrifuge tubes should contain the same volume, approximately 35 mL, to ensure centrifuge is balanced. Centrifuge at low speed (2000 rpm) for 15 minutes. Alternatively, samples can be concentrated by settling in glass test tubes or vials, using the same settling assumptions as shown in Section 6.3.3.

6.6.2.5 Draw off all but 5 mL of supernatant, ensuring that the pellet is not disturbed. Add distilled water to 35 mL, gently shake the sample using a vortex mixer, and centrifuge again for 15 minutes at 2000 rpm. Repeat this step 7 times.

6.6.2.6 Upon final centrifugation draw off all but ~5 mL of supernatant. Bring volume to approximately 5 mL with RO/DI or distilled water as necessary. This is the "cleaned" sample to be used to prepare diatom slide for analysis.

6.6.3 Diatom Slide Preparation

6.6.3.1 Two slides are made from each sample; "A" and "B". The "B" slide is considered a duplicate.

6.6.3.2 Place a clean coverslip on a slide warmer (not turned on). The slide warming tray reduces static charge that may come from other surfaces, but the samples are never warmed; drying coverslips by warming tends to cause clumping of the diatom remains, so the coverslips are allowed to evaporate at room temperature.

6.6.3.3 Gently homogenize the pellet and pipette about 0.5 mL of the concentrated sample on the center of a coverslip and let dry. A larger or smaller aliquot may be used depending on the diatom densities. When dry, observe each coverslip under a compound microscope to be sure that there is an adequate density of frustules to

allow counting. If there is not a sufficient density for counting, increase frustule density by adding more sample.

6.6.3.4 When coverslip drying is complete add a drop of mounting medium (Hyrax, Naphrax, Pleurax or comparable high-refractive-index medium) to the center of a clean pre-labeled slide (75 x 25 mm). If the mounting medium is too viscous, add a few drops (1 to 2 mL) of toluene and/or xylene to dilute the medium.

6.6.3.5 Mount the coverslip, diatom side down, on the medium on the slide and place on hotplate.

6.6.3.6 Allow solvent to evaporate until bubbles are no longer formed under the coverslip. Remove from hotplate.

6.6.3.7 Press coverslip gently with pencil eraser or tweezers to extrude excess mounting medium immediately after removing from heat, as the medium sets up very quickly.

6.6.3.8 Allow slide to cool and remove excess mounting medium before examining. It will scrape away easily with a razor blade if all of the solvent is removed: if it is sticky, return to the hotplate to remove any remaining solvent.

6.6.3.9 Clean, label, and store the slide properly. The label should include the sample number, year, and station.

6.6.4 Diatom Enumeration and Identification

6.6.4.1 Diatoms should be identified and enumerated at 1000-1250x. Identification should be down to the finest taxonomic rank possible.

6.6.4.2 Count at least 500 frustules (2 frustules = 1 diatom cell) per sample.

6.6.4.3 At least 10 specimens of each species are measured (wall to wall) for cell volume calculations. When fewer than 10 specimens are present, those present are measured as they occur. Measurements should be recorded as cell measurements. For example, when measuring the depth (i.e., length) of *Aulacoseira*, be sure to **either** measure two frustules together, **or** double the measurement of a single valve. In some species, e.g. most *Stephanodiscus* and *Cyclotella*, depth measurements are problematic in that cells are seldom oriented in girdle view, and even when they are, total cell depth is not easily estimable from the depth of a single frustule due to overlap of the girdles. Care must therefore be taken in making these measurements.

6.6.5 General Analysis Guidelines

6.6.5.1 Unknown species should be referred to as *Genus* spp. Taxa for which in-house descriptions exist, but descriptions have not been published, should be given the appropriate number (e.g., *Stephanodiscus* #10). It is crucial that these designations

correspond only to previously established taxa. If an analyst encounters a species that is not on the species list and feels there is sufficient evidence that it should be added to the list, it must be confirmed by an outside expert and approved by the GLBMP Technical Lead before it is added to the species list. In the case of 'soft' algae, the organism should be photographed or a drawing should be made, making clear the distinguishing characteristics of the species, a written description provided, and reference made to the taxonomic work which contains the key/description that was used to identify the organism.

For diatoms, in addition to the above, the frustule should be marked on the slide, using, e.g., a diamond tipped etching tool. These materials should be sent to an appropriate expert for confirmation, and the results of confirmation, in addition to the original supporting materials, should be sent to the WAM, along with a brief memo describing the species and requesting inclusion in the species list. The WAM will then send a memo back, either approving of disapproving inclusion of the taxon on the species list.

6.6.5.2 *A note on phytoplankton taxonomy*. Appendix 2 contains the currently accepted list of phytoplankton taxa enumerated from Great Lakes samples. To ensure long-term consistency, this list contains taxonomic nomenclature from earlier versions of this SOP (columns 3 and 4). Many of these genus and species names are deprecated, so a corresponding list of contemporary names and authorities is provided. This updated taxonomy for the flora is considered correct as of October 2019. In some cases we have noted taxonomy that is actively undergoing transition, such as the ambiguity in the *Cyclotella sensu lato* genera *Lindavia* and *Pantocsekiella*. Further, some taxa have been merged (e.g. *Gyrosigma nodiferum* has been deemed a synonym of *Gyrosigma sciotoense*) but we have retained the obsolete names in the list to ensure older phytoplankton data are correctly assigned when contemporary taxonomy is used.

7.0 ARCHIVING

7.1 Soft algae

7.1.1 Soft algae samples are to be archived one data set (usually one year) at a time.

7.1.2 Gently homogenize the remainder of the phytoplankton sample by inverting the bottle for about 1 minute. Carefully empty the sample into a 500-mL graduated cylinder and cover the cylinder with a plastic Petri plate. Record the volume of sample settled on a pre-printed phytoplankton archive form. A larger and/or smaller graduated cylinder may be used depending on the volume remaining in phytoplankton sample bottle.

7.1.3 Rinse the sample bottle three times with a small amount of RO/DI or distilled water (about 5 mL). Empty the rinse water into the graduated cylinder.

7.1.4 Settle the sample for a minimum of 7 days, but not more than 14 days. Do not disturb the cylinder.

7.1.5 At the end of the settling period, carefully siphon off the top of the water column without disturbing the settled materials. Generally, about 18 - 22 mL of the sample should be remaining in the cylinder.

7.1.6 Decant the remaining sample from the graduated cylinder into a pre-labeled 25-mL glass liquid scintillation vial. Rinse the cylinder two times with about 2 mL of RO/DI or distilled water and empty the rinse water into the vial. This is the archived sample.

7.1.7 Add about 0.5 mL of formalin solution into the vial before putting the cap on the vial.

7.1.8 To minimize evaporation, parafilm, or some other suitable substance, should be wrapped around the cap.

7.1.9 Store the archived sample in a pre-labeled tray/box.

7.2 Diatoms

7.2.1 After the diatom slides are made, transfer the remainder of "cleaned" sample to a pre-labeled glass vial.

7.2.2 Store the diatom archived sample in a box for future reference.

8.0 CALCULATIONS

8.1 Report the results of the sample sedimentation procedure as cells per mL, which is calculated as follows:

$$Cells/mL = (C * TA) / (L * W * V * S)$$

where:

C	=	cell tally
L	=	length of strip (mm)
W	=	width of strip (mm)
V	=	volume of chamber (mL)
S	=	number of strips counted
TA	=	total area of chamber bottom (mm^2)

In the case of species (e.g., *Ceratium hirundinella*) for which the entire chamber bottom is examined, the formula reduces to:

$$Cells/mL = (C/V)$$

8.2 Biovolume is calculated using formulas representing the closest approximation of geometric shape. A list of geometric forms and the measurements required, are listed in the appendices.

8.3 The data from the diatom slides is reported as percent composition of the 1250x count. This percent is applied back to the live diatom counts at 500x to determine a cells/mL count for each species.

8.3.1 Calculate the total live centric (excluding *Urosolenia*) and live pennate diatom cells/mL as per formula in Section 8.1.

8.3.2 For each diatom species encountered during the slide counts, calculate what percentage of the total number of centrics or pennates it represents by dividing the number observed by the total centric or pennate diatom values enumerated.

8.3.3 Multiply this number by the appropriate number calculated in 8.3.1. This is the cells/mL for that species.

9.0 QUALITY CONTROL AUDITS AND METHOD PRECISION

9.1 Ten percent of all samples collected are analyzed by a second analyst.

9.1.1 Duplicate counts and measurements by two analysts are performed for both Utermöhl samples and diatom slide counts from a given sample selected for precision analyses.

9.1.2 Utermöhl samples are counted by the second analyst while still in the counting chamber so that only interanalyst variation is quantified, and not variation associated with sub-sampling.

9.1.3 Results from the second analyst are reported under the same sample number as the original sample, with the exception that the seventh character is replaced by a "Q". For instance, 12GC19I72 becomes 12GC19Q72.

9.1.4 The Bray-Curtis Index is used as a quantitative method of species-level comparison for both enumerations and calculated biovolumes produced by the two analysts. The Bray-Curtis measure is calculated as follows:

$$PS_{jk} = 200\frac{\sum_{i=1}^{n}(minimum[A_{ij}, A_{ik}])}{\sum_{i=1}^{n} A_{ij} + A_{ik}}$$

where:

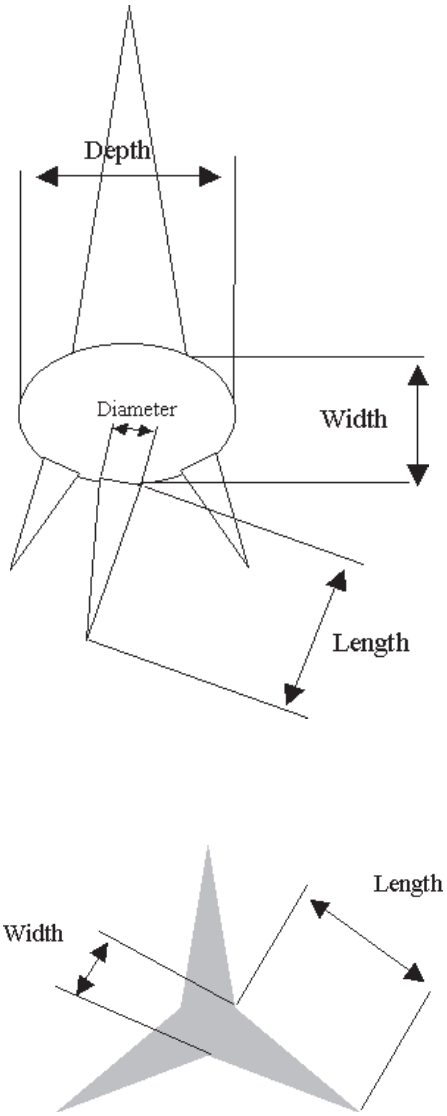
PS_{jk} = percentage similarity between sample analyses *j* and *k,*
A_{ij} = abundance of taxon *i* in sample analysis *j*,
A_{ik} = abundance of taxon *i* in sample analysis *k*, and
n = total number of taxa in sample analyses *j* and *k*.

9.1.5 An interim minimum acceptance value of 60% similarity is currently being used until enough data accumulate to determine a more appropriate value. The two taxonomists will discuss the results from all samples which fail to meet this criterion. Outcomes of such discussions are included as part of dataset reporting to the USEPA. If a major difference is found in how the two analysts have been identifying or measuring organisms, the last batch of samples that have been counted by the analyst under review will be recounted or measured.

Appendix 1: Geometric Forms and the Measurements Required

Shape	Dimensions Required				
	Code	Length	Width	Depth	Diameter
Ceratium	CER	L	W	DP	D
Cone	CON	L	W		
Crucigenia	CRU	L			
Cylinder	CYL	L	W	DP	D
Dumbell box	DBB	L	W	DP	
Dumbell	DBL	L	W	DP	
Diamond Box	DMB	L	W	DP	
Fusiform	FUS	L	W		
Ovoid box	OVB	L	W	DP	
Ovoid	OVO	L	W		
Rectangular box	RTB	L	W	DP	
Staurastrum	STR	L	W		
Tabellaria flocculosa v. *geniculata*	TFG	L	W	DP	D
Teardrop	TRP	L	W		

Figure 1: Image of Ceratium



Appendix 2: Taxonomy and Shape Codes for Great Lakes Phytoplankton Taxa

DIVISION	SPECCODE	GENUS-SPECIES NAME	AUTHORITY	2019 UPDATED TAXONOMIC NAME (IF APPLICABLE)	2019 UPDATED AUTHORITY (IF APPLICABLE)	SHAPE
BAC	ACYNORM	Actinocyclus normanii	(Gregory ex Grev.) Hust.			CYL_DISK
BAC	ACYNORMS	Actinocyclus normanii f. subsalsa	(Juhl.-Dannf.) Hust.			CYL_DISK
BAC	ACYSP	Actinocyclus sp.				CYL_DISK
BAC	ATTZACH	Attheya zachariasi	Brun.	Acanthoceras zachariasii	(Brun) Simonsen	CYL_TUBE
BAC	AULAGASM	Aulacoseira agassizii var. malayensis	(Hust.) Simonsen			CYL_TUBE
BAC	AULAMBI	Aulacoseira ambigua	(Grunow) Simonsen			CYL_TUBE
BAC	AULDIST	Aulacoseira distans	(Ehrenb.) Simonsen			CYL_TUBE
BAC	AULDISTA	Aulacoseira distans var. alpigena	(Grun.) Simonsen	Aulacoseira alpigena	(Grunow) Krammer	CYL_TUBE
BAC	AULDISTL	Aulacoseira distans var. limnetica	(O.Müll.) Simonsen			CYL_TUBE
BAC	AULGRAN	Aulacoseira granulata	(Ehrenb.) Simonsen			CYL_TUBE
BAC	AULGRANA	Aulacoseira granulata var. angustissima	(O.Müll.) Simonsen			CYL_TUBE
BAC	AULGRANV	Aulacoseira granulata var. valida	(Hust.) Simonsen			CYL_TUBE
BAC	AULISLA	Aulacoseira islandica	(O.Müll.) Simonsen			CYL_TUBE
BAC	AULITAL	Aulacoseira italica	(Ehrenb.) Simonsen			CYL_TUBE
BAC	AULITALT	Aulacoseira italica var. tenuissima	(Grunow) Simonsen			CYL_TUBE
BAC	AULSP	Aulacoseira sp.				CYL_TUBE
BAC	AULSUBA	Aulacoseira subarctica	(O.Müll.) E.Y.Haw			CYL_TUBE
BAC	CTOSP	Chaetoceros sp.				CYL_TUBE
BAC	COSLACU	Coscinodiscus lacustris	Grun.	Thalassiosira lacustris	(Grunow) Hasle	CYL_DISK
BAC	COSLACUS	Coscinodiscus lacustris var. septentrionalis	Grun.	Thalassiosira hyperborea var. septentrionalis	(Grunow) Hasle	CYL_DISK
BAC	COSSPB	Coscinodiscus sp.		Thalassiosira sp.		CYL_DISK
BAC	CYSCOST	Cyclostephanos costatilimbus	(H.Kobayasi & H.Kobay.) Stoermer, Håk. & E.C.Ther.			CYL_DISK
BAC	CYSDUBI	Cyclostephanos dubius	(Fricke) Round			CYL_DISK
BAC	CYSINVI	Cyclostephanos invisitatus	(M.H.Hohn & Hellermann) E.C.Ther., Stoermer & Håk.			CYL_DISK
BAC	CYSSP	Cyclostephanos sp.				CYL_DISK
BAC	CYSTHOL	Cyclostephanos tholiformis	Stoermer, Håk. & E.C.Ther.			CYL_DISK
BAC	CYCANTI	Cyclotella antiqua	W. Sm.	Lindavia antiqua (likely Pantocsekiella)	(W.Sm.) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCATOM	Cyclotella atomus	Hust.			CYL_DISK
BAC	CYCATOMF	Cyclotella atomus “fine form”	In-house form			CYL_DISK
BAC	CYCCATE	Cyclotella catenata	(Brun) H.Bachm.			CYL_DISK
BAC	CYCCOMES	Cyclotella comensis	Grun.	Lindavia comensis (likely Pantocsekiella)	(Grunow) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCCOMRC	Cyclotella comensis rough center w/ process	In-house taxon	Lindavia delicatula (likely Pantocsekiella)	(Hust.) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCCOME1	Cyclotella comensis var. 1		Pantocsekiella laurentiana	Alexson, Wellard Kelly, Estepp & Reavie	CYL_DISK
BAC	CYCCOMT	Cyclotella comta	(Ehr.) Kutz.	Lindavia comta (likely Pantocsekiella)	(Ehrenb.) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCCOMTO	Cyclotella comta var. oligactis	(Ehr.) Grun.	Lindavia rossii (likely Pantocsekiella)	(Håk.) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCCRYP	Cyclotella cryptica	Reimann, J.C.Lewin & Guillard			CYL_DISK
BAC	CYCDELI	Cyclotella delicatula	Hust.	Lindavia delicatula (likely Pantocsekiella)	(Hust.) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCGAMM	Cyclotella gamma	Sovereign			CYL_DISK
BAC	CYCGLOM	Cyclotella glomerata	Bachm.	Lindavia glomerata (likely Pantocsekiella)	(H.Bachm) Adesalu & M.L.Julius	CYL_DISK

DIVISION	SPECCODE	GENUS-SPECIES NAME	AUTHORITY	2019 UPDATED TAXONOMIC NAME (IF APPLICABLE)	2019 UPDATED AUTHORITY (IF APPLICABLE)	SHAPE
BAC	CYCKRAM	Cyclotella krammeri	Håk.			CYL_DISK
BAC	CYCMENE	Cyclotella meneghiniana	Kütz.			CYL_DISK
BAC	CYCMICH	Cyclotella michiganiana	Skv.	Lindavia michiganiana (likely Pantocsekiella)	(Skvortzov) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCOCEL	Cyclotella ocellata	Pant.	Lindavia ocellata (likely Pantocsekiella)	(Pant.) Nakov, Guillory, M.L.Julius, E.C.Ther. and A.J.Alverson	CYL_DISK
BAC	CYCOPER	Cyclotella operculata	(Ag.) Kutz.	Cyclotella distinguenda	Hust.	CYL_DISK
BAC	CYCOPERU	Cyclotella operculata var. unipunctata	Hust.	Cyclotella distinguenda var. unipunctata	(Hust.) Håk. & J.R.Carter	CYL_DISK
BAC	CYCPSEU	Cyclotella pseudostelligera	Hust.	Discostella pseudostelligera	(Hust.) Houk & Klee	CYL_DISK
BAC	CYCROSSI	Cyclotella rossi	Hak.	Lindavia rossii (likely Pantocsekiella)	(Håk.) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCSOCI	Cyclotella socialis	Schutt (?)	Lindavia socialis (likely Pantocsekiella)	(F.Schütt) De Toni & Forti	CYL_DISK
BAC	CYCSP	Cyclotella sp.				CYL_DISK
BAC	CYCSTEL	Cyclotella stelligera	(Cl. & Grun.) V.H.	Discostella stelligera	(Cleve & Grunow) Houk & Klee	CYL_DISK
BAC	CYCSTRI	Cyclotella striata	(Kütz.) Grunow			CYL_DISK
BAC	CYCTRIP	Cyclotella tripartita	Pant.	Lindavia tripartita (likely Pantocsekiella)	(Pant.) Nakov, Guillory, M.L.Julius, E.C.Ther. & A.J.Alverson	CYL_DISK
BAC	CYCWOLT	Cyclotella wolterecki	Hust.	Discostella woltereckii	(Hust.) Houk & Klee	CYL_DISK
BAC	MELROSE	Melosira roseana	Rabh.	Orthoseira roeseana	(Rabenh.) Pfitzer	CYL_TUBE
BAC	MELSP	Melosira sp.				CYL_TUBE
BAC	MELUNDU	Melosira undulata	(Ehrenb.) Kütz.			CYL_TUBE
BAC	MELVARI	Melosira varians	C.Agardh			CYL_TUBE
BAC	RHIERIE	Rhizosolenia eriensis	H.L. Sm.	Urosolenia eriensis	(H.L.Sm.) Round & R.M.Crawford	CYL_TUBE
BAC	RHILONG	Rhizosolenia longiseta	Zach.	Urosolenia longiseta	(O.Zacharias) Edlund & Stoermer	CYL_TUBE
BAC	RHISPB	Rhizosolenia sp.				CYL_TUBE
BAC	SKEPOTA	Skeletonema potamos	(C.I.Weber) Hasle			CYL_DISK
BAC	SKESP	Skeletonema sp.				CYL_DISK
BAC	STEPHCOS	Stephanocostis sp.	Genkal & Kosmina 1985			CYL_DISK
BAC	STEALPI	Stephanodiscus alpinus	Hust.			CYL_DISK
BAC	STEALP1	Stephanodiscus alpinus type I	Hust.			CYL_DISK
BAC	STEALP23	Stephanodiscus alpinus type II/III	Hust.			CYL_DISK
BAC	STEBIND	Stephanodiscus binderanus	(Kütz.) Willi Krieg.			CYL_DISK
BAC	STEBINDO	Stephanodiscus binderanus var. oestrupii	(A. Cl.) A. Cl.	Stephanodiscus binderanus var. öestrupi	(A.Cleve) A.Cleve	CYL_DISK
BAC	STECARC	Stephanodiscus carconensis	Grunow			CYL_DISK
BAC	STECARCP	Stephanodiscus carconensis var. pusilla	Grun.	Stephanodiscus klamathensis	Houk, Klee & H.Tanaka	CYL_DISK
BAC	STECONSP	Stephanodiscus conspicueporus	Stoermer, Håk. & E.C.Ther.			CYL_DISK
BAC	STEHANTH	Stephanodiscus hantzschii f. hantzschii	Hak. & Stoerm.	Stephanodiscus hantzschii	Grunow	CYL_DISK
BAC	STEHANTT	Stephanodiscus hantzschii f. tenuis	(Hust.) Håk. & Stoermer			CYL_DISK
BAC	STEMINUT	Stephanodiscus minutulus	(Kütz.) Cleve & J.D.Möller			CYL_DISK
BAC	STENIAG	Stephanodiscus niagarae	Ehrenb.			CYL_DISK
BAC	STENIAGM	Stephanodiscus niagarae var. magnifica	Fricke			CYL_DISK
BAC	STEPARV	Stephanodiscus parvus	Stoermer & Håk.			CYL_DISK
BAC	STESPB	Stephanodiscus sp.				CYL_DISK
BAC	STESP10	Stephanodiscus sp. #10	in house taxon			CYL_DISK
BAC	STESP16	Stephanodiscus sp. #16	in house taxon			CYL_DISK
BAC	STEPARV	Stephanodiscus sp. #21	in house taxon			CYL_DISK
BAC	STESP51	Stephanodiscus sp. #51	in house taxon			CYL_DISK
BAC	STESUBT	Stephanodiscus subtilis	(Goor) A.Cleve			CYL_DISK
BAC	STEPSBTR	Stephanodiscus subtransylvanicus	Gasse			CYL_DISK
BAC	THABALT	Thalassiosira baltica	(Grunow) Ostenf.			CYL_DISK
BAC	THASP	Thalassiosira sp.				CYL_DISK
BAC	THAWEIS	Thalassiosira weisflogii	(Grun.) G. Fryx. & Hasle	Thalassiosira weissflogii	(Grunow) G.A.Fryxell & Hasle	CYL_DISK
BAC	UNICENT	Unidentified Centrales				CYL_DISK

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BAP	ACHAFFI	Achnanthes affinis	Grun.	Achnanthidium affine	(Grunow) Czarn.	DMB
BAP	ACHAMOE	Achnanthes amoena	Hust.	Karayevia amoena	(Hust.) Bukht.	OVB
BAP	ACHBIAS	Achnanthes biasolettiana	(Kutz.) Grun.	Achnanthidium rosenstockii	(Lange-Bert.) Lange-Bert	OVB
BAP	ACHBIOR	Achnanthes bioreti	Germ.	Psammothidium bioretii	(H.Germ.) Bukht. & Round	OVB
BAP	ACHBREV	Achnanthes brevipes	C.Agardh			OVB
BAP	ACHBREVI	Achnanthes brevipes var. intermedia	(Kütz.) Cleve			OVB
BAP	ACHCALC	Achnanthes calcar	Cl.	Gliwiczia calcar	(Cleve) Kulikovskiy, Lange-Bert. & Witkowski	OVB
BAP	ACHCLEV	Achnanthes clevei	Grun.	Karayevia clevei	(Grunow) Bukht.	DMB
BAP	ACHCLEVR	Achnanthes clevei var. rostrata	Hust.	Karayevia clevei var. rostrata	(Hust.) Bukht.	DMB
BAP	ACHCONS	Achnanthes conspicua	A. Mayer	Platessa conspicua	(A.Mayer) Lange-Bert.	OVB
BAP	ACHDEFL	Achnanthes deflexa	Reim. in Patr. & Reim.	Achnanthidium deflexum	(Reimer) Kingston	DMB
BAP	ACHDELI	Achnanthes delicatula	(Kutz.) Grun.	Planothidium delicatulum	(Kütz.) Round & Bukht.	OVB
BAP	ACHDETH	Achnanthes detha	Hohn & Hellerm.	Psammothidium subatomoides	(Hust.) Bukht. & Round	OVB
BAP	ACHDISP	Achnanthes dispar	Cl.	Planothidium dispar	(Cleve) Witkowski, Lange-Bert. & Metzeltin	OVB
BAP	ACHDUTH	Achnanthes duthii	Screen.	Achnanthidium duthiei	(Sreen.) Edlund	OVB
BAP	ACHEXIG	Achnanthes exigua	Grun.	Achnanthidium exiguum	(Grunow) Czarn.	DMB
BAP	ACHEXIGC	Achnanthes exigua var. constricta	(Grun.) Hust.	Achnanthidium exiguum	(Grunow) Czarn.	DMB
BAP	ACHEXIGH	Achnanthes exigua var. heterovalva	Krass.	Achnanthidium exiguum var. heterovalvum	(Krasske) Czarn.	DMB
BAP	ACHEXIL	Achnanthes exilis	Kutz.	Achnanthidium exile	(Kütz.) Heib.	DMB
BAP	ACHFLEX	Achnanthes flexella	(Kutz.) Brun	Eucocconeis flexella	(Kütz.) F.Meister	DMB
BAP	ACHFLEXA	Achnanthes flexella var. alpestris	Brun	Eucocconeis alpestris	(Brun) Lange-Bert.	OVB
BAP	ACHHAUC	Achnanthes hauckiana	Grun.	Planothidium hauckianum	(Grunow) Bukht.	OVB
BAP	ACHHAUCR	Achnanthes hauckiana var. rostrata	Schultz			DMB
BAP	ACHHUNG	Achnanthes hungarica	(Grun.) Grun.	Lemnicola hungarica	(Grunow) Round & Basson	OVB
BAP	ACHKOLB	Achnanthes kolbei	Hust.	Karayevia kolbei	(Hust.) Bukht.	OVB
BAP	ACHKRYO	Achnanthes kryophila	Pet.	Achnanthidium kryophila	(J.B.Petersen) Bukht.	OVB
BAP	ACHKRYOA	Achnanthes kryophila var. africana	Choln.	Psammothidium subatomoides	(Hust.) Bukht. & Round	OVB
BAP	ACHLANC	Achnanthes lanceolata	(Breb.) Grun.	Planothidium lanceolatum	(Bréb. ex Kütz.) Lange-Bert.	DMB
BAP	ACHLANCA	Achnanthes lanceolata var. abbreviata	Reim.	Planothidium abbreviatum	(Reimer) Potapova	OVB
BAP	ACHLANCD	Achnanthes lanceolata var. dubia	Grun.	Planothidium dubium	(Grunow) Round & Bukht.	DMB
BAP	ACHLANCE	Achnanthes lanceolata var. elliptica	Schulz	Planothidium ellipticum	(Cleve) Edlund	OVB
BAP	ACHLANCO	Achnanthes lanceolata var. omissa	Reim.	Planothidium joursacense	(Hérib.) Lange-Bert.	OVB
BAP	ACHLANCR	Achnanthes lanceolata var. rostrata	Hust.	Planothidium rostratum	(Østrup) Lange-Bert.	DMB
BAP	ACHLAPPN	Achnanthes lapponica var. ninckei	(Guerm. & Mang.) Reim	Eucocconeis lapponica var. ninckei	(Guermeur & Manguin) Edlund	DMB
BAP	ACHLATE	Achnanthes laterostrata	Hust.	Karayevia laterostrata	(Hust.) Bukht.	OVB
BAP	ACHLAUE	Achnanthes lauenbergiana	Hust.	Psammothidium lauenburgianum	(Hust.) Bukht. & Round	OVB
BAP	ACHLEMM	Achnanthes lemmermanni	Hust.	Planothidium lemmermannii	(Hust.) E.Morales	DMB
BAP	ACHLEVA	Achnanthes levanderi	Hust.	Psammothidium levanderi	(Hust.) Bukht. & Round	OVB
BAP	ACHLINE	Achnanthes linearis	(W. Sm.) Grun.	Rossithidium linearis	(W.Sm.) Round & Bukht.	DMB
BAP	ACHLINEC	Achnanthes linearis f. curta	H.L. Sm.	Achnanthidium biasolettianum	(Grunow) Bukht.	DMB
BAP	ACHMARG	Achnanthes marginulata	Grun.	Psammothidium marginulatum	(Grunow) Bukht. & Round	OVB
BAP	ACHMICR	Achnanthes microcephala	(Kutz.) Grun.	Achnanthidium microcephalum	Kütz.	DMB

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BAP	ACHMINU	Achnanthes minutissima	Kutz.	Achnanthidium minutissimum	(Kütz.) Czarn.	DMB
BAP	ACHMINUC	Achnanthes minutissima var. cryptocephala	Grun.	Achnanthidium neocryptocephalum	(Grunow) Novais & Van de Vijver	DMB
BAP	ACHOEST	Achnanthes oestrupii	(Backm. & A. Cl.) Hust.	Planothidium oestrupii	(A.Cleve) Edlund	OVB
BAP	ACHOESTL	Achnanthes oestrupii var. lanceolata	Hust.	Planothidium pungens	(A.Cleve) Lange-Bert.	OVB
BAP	ACHPINN	Achnanthes pinnata	Hust.	Platessa conspicua	(A.Mayer) Lange-Bert.	OVB
BAP	ACHPLOE	Achnanthes ploenensis	Hust.	Karayevia ploenensis	(Hust.) Bukht.	OVB
BAP	ACHSP	Achnanthes sp.				OVB
BAP	ACHSUBL	Achnanthes sublaevis	Hust.	Psammothidium ventralis	(Krasske) Bukht & Round	DMB
BAP	ACHSUCH	Achnanthes suchlandti	Hust.	Karayevia suchlandtii	(Hust.) Bukht.	OVB
BAP	APLPELL	Amphipleura pellucida	(Kütz.) Kütz.			DMB
BAP	APLRUTI	Amphipleura rutilans	(Trente.) Cl.	Berkeleya rutilans	(Trentep. ex Roth) Grunow	DMB
BAP	AMACOFF	Amphora coffeiformis	(Ag.) Kutz.	Halamphora coffeaeformis	(C.Agardh) Levkov	DMB
BAP	AMAHEMI	Amphora hemicycla	Stoermer & J.J.Yang			DMB
BAP	AMAINAR	Amphora inariensis	Krammer			DMB
BAP	AMANEGL	Amphora neglecta	Stoermer & J.J.Yang			DMB
BAP	AMAOVAL	Amphora ovalis	(Kütz.) Kütz.			DMB
BAP	AMAOVALA	Amphora ovalis var. affinis	(Kutz.) V.H. ex DeT.	Amphora affinis	Kütz.	DMB
BAP	AMAOVALP	Amphora ovalis var. pediculus	(Kutz.) V.H. ex DeT.	Amphora pediculus	(Kütz.) Grunow	DMB
BAP	AMAPERP	Amphora perpusilla	(Grun.) Grun.	Halamphora perpusilla	(Grunow) Q-M.Wang & Kociolek	DMB
BAP	AMASP	Amphora sp.				DMB
BAP	AMATENU	Amphora tenuistriata	Manguin			DMB
BAP	AMATHUM	Amphora thumensis	(Mayer) Cl.-Euler.	Halamphora thumensis	(A.Mayer) Levkov	DMB
BAP	AMAVENEC	Amphora veneta var. capitata	Haworth	Halamphora oligotraphenta	(Lange-Bert) Levkov	DMB
BAP	ANOSERIB	Anomoeoneis serians var. brachysira	(Breb.) Hust.	Brachysira brebissonii		DMB
BAP	ANOSP	Anomoeoneis sp.				DMB
BAP	ANOVITR	Anomoeoneis vitrea	(Grun.) Ross	Brachysira vitrea	(Grunow) R.Ross	DMB
BAP	ASTFORM	Asterionella formosa	Hassall			RTB
BAP	ASTFORMG	Asterionella formosa var. gracillima	(Hantzsch) Grunow			RTB
BAP	ASTRALF	Asterionella ralfsii	W.Sm.			RTB
BAP	CALBACIT	Caloneis bacillaris var. thermalis	(Grun.) A. Cl.(?)	Caloneis thermalis	(Grunow) Krammer	OVB
BAP	CALBACI	Caloneis bacillum	(Grunow) Cleve			OVB
BAP	CALHYAL	Caloneis hyalina	Hust.			OVB
BAP	CALSP	Caloneis sp.				OVB
BAP	CALVENTM	Caloneis ventricosa var. minuta	(Grunow) Mills			OVB
BAP	CALVENTT	Caloneis ventricosa var. truncata	Grun.	Caloneis ventricosa var. truncatula	(Grunow) F.Meister	OVB
BAP	COCDIMI	Cocconeis diminuta	Pant.	Cocconeis neodiminuta	Krammer	OVB
BAP	COCDISC	Cocconeis disculus	(Schum.) Cleve			OVB
BAP	COCPEDI	Cocconeis pediculus	Ehrenb.			OVB
BAP	COCPLAC	Cocconeis placentula	Ehrenb.			OVB
BAP	COCPLACE	Cocconeis placentula var. euglypta	(Ehrenb.) Grunow			OVB
BAP	COCPLACL	Cocconeis placentula var. lineata	(Ehrenb.) Van Heurck			OVB
BAP	COCPLACR	Cocconeis placentula var. rouxii	(Hérib. & Brun) Cleve			OVB
BAP	COCCSP	Cocconeis sp.				DBL
BAP	COCSPB	Cocconeis sp.	Ehr.			OVB
BAP	COCTHUM	Cocconeis thumensis	A. Mayer	Cocconeis neothumensis	Krammer	OVB
BAP	CYMANGUA	Cymatopleura angulata	Grev.			DBB
BAP	CYMELLI	Cymatopleura elliptica	(Bréb. ex Kütz.) W.Sm.			OVB
BAP	CYMSOLE	Cymatopleura solea	(Bréb.) W.Sm.			DBB
BAP	CYMSOLEA	Cymatopleura solea var. apiculata	(W.Sm.) Ralfs			DBB
BAP	CYMSOLER	Cymatopleura solea var. regula	(Ehr.) Grun.	Surirella regula	Ehrenb.	DBB

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BAP	CYMSOLES	Cymatopleura solea var. subconstricta	D.M.	Surirella comperei	(Cocquyt & R.Jahn) Cocquyt & R.Jahn	DBB
BAP	CYMAFFI	Cymbella affinis	Kütz.			DMB
BAP	CYMAMPH	Cymbella amphicephala	Nag.	Cymbopleura amphicephala	(Nägeli) Krammer	DMB
BAP	CYMANGUB	Cymbella angustata	(W. Sm.) Cl.	Cymbopleura angustata	(W.Sm.) Krammer	DMB
BAP	CYMCESA	Cymbella cesatii	(Rabh.) Grun. ex A.S.	Encyonopsis cesatii	(Rabenh.) Krammer	DMB
BAP	CYMCIST	Cymbella cistula	(Ehr.) Kirchn.	Cymbella neocistula	Krammer	DMB
BAP	CYMCISTG	Cymbella cistula var. gibbosa	Brun	Cymbella neocistula var. islandica	Krammer	DMB
BAP	CYMCISTM	Cymbella cistula var. maculata	(Kutz.) V.H.)	Cymbella cistula	Krammer	DMB
BAP	CYMCUSP	Cymbella cuspidata	Kutz.	Cymbopleura apiculata	Krammer	DMB
BAP	CYMCYMB	Cymbella cymbiformis	C.Agardh			DMB
BAP	CYMDELI	Cymbella delicatula	Kutz.	Delicata delicatula	(Kütz.) Krammer	DMB
BAP	CYMDILU	Cymbella diluviana	(Krasske) C. E.	Cymbellafalsa diluviana	(Krasske) Lange-Bert. & Metzeltin	DMB
BAP	CYMHUST	Cymbella hustedtii	Krasske			DMB
BAP	CYMHYBR	Cymbella hybrida	Grun.	Cymbopleura hybrida	(Grunow) Krammer	DMB
BAP	CYMLAEV	Cymbella laevis	Nägeli			DMB
BAP	CYMLANC	Cymbella lanceolata	(C.Agardh) C.Agardh			DMB
BAP	CYMLEPTR	Cymbella leptoceros var. rostrata	Hust.	Cymbella designata	Krammer	DMB
BAP	CYMLUNA	Cymbella lunata	W. Sm.	Encyonema lunatum	(W.Sm) Van Heurck	DMB
BAP	CYMMEXI	Cymbella mexicana	(Ehrenb.) Cleve			DMB
BAP	CYMMICR	Cymbella microcephala	Grun.	Encyonopsis microcephala	(Grunow) Krammer	DMB
BAP	CYMMINU	Cymbella minuta	Hilse ex Rabh.	Encyonema minutum	(Hilse) D.G.Mann	DMB
BAP	CYMMINUL	Cymbella minuta f. latens	(Krasske) Reim.	Encyonema latens	(Krasske) D.G.Mann	DMB
BAP	CYMMINUP	Cymbella minuta var. pseudogracilis	(Choln.) Reim.	Encyonema minutum var. pseudogracilis	(Cholnoky) Czarn.	DMB
BAP	CYMMINUS	Cymbella minuta var. silesiaca	(Bleisch ex Rabh.) Reim.	Encyonema silesiacum	(Bleisch) D.G.Mann	DMB
BAP	CYMNAVI	Cymbella naviculiformis	Auersw.	Cymbopleura naviculiformis	(Auersw.) Krammer	DMB
BAP	CYMNORV	Cymbella norvegica	Grun.	Encyonema norvegicum	(Grunow) A.Mayer	DMB
BAP	CYMOBTU	Cymbella obtusiuscula	Kütz.			DMB
BAP	CYMPROS	Cymbella prostrata	(Berk.) Cl.	Encyonema leibleinii	(C.Agardh) Silva et al.	DMB
BAP	CYMPROAU	Cymbella prostrata var. auerswaldii	(Rabh.) Reim.	Encyonema auerswaldii	Rabenh.	DMB
BAP	CYMPUSI	Cymbella pusilla	Grun.	Navicymbula pusilla	(Grunow) Krammer 2003	DMB
BAP	CYMSINU	Cymbella sinuata	Greg.	Reimeria sinuata	(W.Greg.) Kociolek & Stoermer	DMB
BAP	CYMSINUA	Cymbella sinuata var. antiqua	(Grun.) Cl.	Reimeria sinuata f. antiqua	(Grunow) Kociolek & Stoermer	DMB
BAP	CYMSP	Cymbella sp.				DMB
BAP	CYMTRIA	Cymbella triangulum	(Ehr.) Cl.	Encyonema triangulum	(Ehrenb.) Kütz.	DMB
BAP	CYMTUMIA	Cymbella tumida	(Bréb.) Van Heurck			DMB
BAP	CYMTUMIU	Cymbella tumidula	Grunow			DMB
BAP	DENELEG	Denticula elegans	Kütz.			OVB
BAP	DENSP	Denticula sp.				DMB
BAP	DENSUBT	Denticula subtilis	Grunow			DMB
BAP	DENTENU	Denticula tenuis	Kütz.			DMB
BAP	DENTENUC	Denticula tenuis var. crassula	(Nägeli ex Kütz.) West & G.S.West			OVB
BAP	DIAANCE	Diatoma anceps	(Ehr.) Kirchn.	Odontidium anceps	(Ehrenb.) Ralfs	RTB
BAP	DIAHIEM	Diatoma hiemale	(Roth) Heib.	Odontidium hyemale	(Roth) Kütz.	RTB
BAP	DIAHIEMM	Diatoma hiemale var. mesodon	(Ehr.) Grun.	Odontidium mesodon	(Ehrenb.) Kütz.	RTB
BAP	DIASP	Diatoma sp.				RTB
BAP	DIATENU	Diatoma tenue	Ag.	Diatoma tenuis	C.Agardh	RTB
BAP	DIATENUE	Diatoma tenue var. elongatum	Lyngb.	Diatoma tenuis	C.Agardh	RTB
BAP	DIAVULG	Diatoma vulgare	Bory.	Diatoma vulgaris	Bory	RTB
BAP	DIPBOLD	Diploneis boldtiana	Cleve			OVB
BAP	DIPELLI	Diploneis elliptica	(Kütz.) Cleve			OVB
BAP	DIPOBLO	Diploneis oblongella	(Nägeli ex Kütz.) A.Cleve			OVB
BAP	DIPOCUL	Diploneis oculata	(Bréb.) Cleve			OVB

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BAP	DIPOVAL	Diploneis ovalis	(Hilse) Cleve			OVB
BAP	DIPPARM	Diploneis parma	Cleve			OVB
BAP	DIPPSEU	Diploneis pseudovalis	(Schum.) Cleve			OVB
BAP	DIPPUEL	Diploneis puella	(Schum.) Cl.			OVB
BAP	DIPSPE	Diploneis sp.	(J.W.Bailey) Riemer			OVB
BAP	ENTORNA	Entomoneis ornata	(J.W. Bail.) Reim. in Patr. & Reim.			OVB
BAP	ENTSP	Entomoneis sp.				OVB
BAP	EPISPX	Epithemia sp.				OVB
BAP	EUNCURV	Eunotia curvata	(Kutz.) Lagerst.	Eunotia bilunaris	(Ehrenb.) Schaarschm.	DMB
BAP	EUNINCI	Eunotia incisa	W.Sm. ex W.Greg			DMB
BAP	EUNPECT	Eunotia pectinalis	(Kütz.) Rabenh.			DMB
BAP	EUNPRAE	Eunotia praerupta	Ehrenb.			DMB
BAP	EUNSP	Eunotia sp.				DMB
BAP	FRABREV	Fragilaria brevistriata	Grun.	Pseudostaurosira brevistriata	(Grunow) D.M.Williams & Round	DMB
BAP	FRABREVI	Fragilaria brevistriata var. inflata	(Pant.) Hust.	Pseudostaurosira brevistriata var. inflata	(Pant.) Edlund	DMB
BAP	FRACAPU	Fragilaria capucina	Desm.			DMB
BAP	FRACAPUL	Fragilaria capucina var. lanceolata	Grunow			DMB
BAP	FRACAPUM	Fragilaria capucina var. mesolepta	(Rabh.) Grun.	Fragilaria mesolepta	Rabenh.	DMB
BAP	FRACONS	Fragilaria construens	(Ehr.) Grun.	Staurosira construens	Ehrenb.	DMB
BAP	FRACONSB	Fragilaria construens var. binodis	(Ehr.) Grun.	Staurosira construens var. binodis	(Ehrenb.) Hamilton	DMB
BAP	FRACONSM	Fragilaria construens var. minuta	Temp. & Perag.	Staurosira construens var. minuta	(Temp & H.Perag.) N.A.Andresen, Stoermer & Kreis	DMB
BAP	FRACONSP	Fragilaria construens var. pumila	Grun.	Staurosira construens var. pumila	(Grunow) Kingston	DMB
BAP	FRACONSS	Fragilaria construens var. subsalina	Hust.	Staurosira subsalina	(Hust.) Lange-Bert.	DMB
BAP	FRACONSV	Fragilaria construens var. venter	(Ehr.) Grun.	Staurosira construens var. venter	(Ehrenb.) Hamilton	DMB
BAP	FRACROT	Fragilaria crotonensis	Kitton			DMB
BAP	FRACROTO	Fragilaria crotonensis var. oregona	Sovereign			DMB
BAP	FRAINTE	Fragilaria intermedia	Grun.	Fragilaria vaucheriae	(Kütz.) J.B.Petersen	DMB
BAP	FRAINTEF	Fragilaria intermedia var. fallax	(Grunow) Stoermer & J.J.Yang			DMB
BAP	FRALAPP	Fragilaria lapponica	Grun.	Staurosirella lapponica	(Gronow) D.M.Williams & Round	OVB
BAP	FRALEPT	Fragilaria leptostauron	(Ehr.) Hust.	Staurosirella leptostauron	(Ehrenb.) D.M.Williams & Round	DMB
BAP	FRALEPTD	Fragilaria leptostauron var. dubia	(Grun.) Hust.	Staurosirella leptostauron var. dubia	(Grunow) Edlund	DMB
BAP	FRANITZ	Fragilaria nitzschioides	Grun.	Fragilariforma nitzschioides	(Grunow) Lange-Bert.	DMB
BAP	FRAPINN	Fragilaria pinnata	Ehr.	Staurosirella pinnata	(Ehrenb.) D.M.Williams & Round	OVB
BAP	FRAPINNI	Fragilaria pinnata var. intercedens	(Grun.) Hust.	Staurosirella pinnata var. intercedens	(Grunow) Hamilton	OVB
BAP	FRAPINNL	Fragilaria pinnata var. lancettula	(Schum.) Hust.	Punctastriata lancettula	(Schum.) Hamilton & Siver	DMB
BAP	FRASPC	Fragilaria sp.				DMB
BAP	FRAVAUC	Fragilaria vaucheriae	(Kutz.) Peters.			DMB
BAP	FRAVAUCC	Fragilaria vaucheriae var. capitellata	(Grun.) Patr.	Fragilaria recapitellata	Lange-Bert. & Metzeltin	DMB
BAP	FRAVIRE	Fragilaria virescens	Ralfs	Fragilariforma virescens	(Ralfs) D.M.Williams & Round	DMB
BAP	FRURHOMA	Frustulia rhomboides var. amphipleuroides	(Grun.) Cl.	Frustulia amphipleuroides	(Grunow) A.Cleve	DMB
BAP	FRURHOMS	Frustulia rhomboides var. saxonica	(Rabh.) DeT.	Frustulia saxonica	Rabenh.	DMB
BAP	FRUVULG	Frustulia vulgaris	(Thwaites) De Toni			DMB
BAP	GOMACUM	Gomphonema acuminatum	Ehrenb.			OVB
BAP	GOMAFFI	Gomphonema affine	Kütz.			OVB
BAP	GOMAFFII	Gomphonema affine var. insigne	(Greg.) Andrews	Gomphonema insigne	W.Greg.	OVB

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BAP	GOMANGU	Gomphonema angustatum	(Kütz.) Rabenh.			OVB
BAP	GOMANGUP	Gomphonema angustatum var. productum	Grun.	Gomphonema productum	(Grunow) Lange-Bert. & E.Reichardt	OVB
BAP	GOMBRAS	Gomphonema brasiliense	Grun.	Gomphosphenia lingulatiformis	(Lange-Bert. & E.Reichardt) Lange-Bert	OVB
BAP	GOMCLEV	Gomphonema clevei	Fricke	Gomphoneis clevei	(Fricke) M.Gil	OVB
BAP	GOMDICH	Gomphonema dichotomum	Kütz.			OVB
BAP	GOMGRAC	Gomphonema gracile	Ehrenb.			OVB
BAP	GOMOLIV	Gomphonema olivaceum	(Hornem.) Bréb.			OVB
BAP	GOMPARV	Gomphonema parvulum	(Kütz.) Kütz.			OVB
BAP	GOMSIMU	Gomphonema simus	Hohn & Hellerm	Gomphonema simum	M.H.Hohn & Hellerman	OVB
BAP	GOMSP	Gomphonema sp.				OVB
BAP	GOMSUBCM	Gomphonema subclavatum var. mexicanum	(Grunow) R.M.Patrick			OVB
BAP	GOMSUBT	Gomphonema subtile	Ehrenb.			OVB
BAP	GOMTENE	Gomphonema tenellum	Kütz.			OVB
BAP	GOMTERG	Gomphonema tergestinum	(Grunow) Fricke			OVB
BAP	GOMVENT	Gomphonema ventricosum	W.Greg.			OVB
BAP	GYRACUM	Gyrosigma acuminatum	(Kütz.) Rabenh.			RTB
BAP	GYRATTE	Gyrosigma attenuatum	(Kütz.) Rabenh.			RTB
BAP	GYRNODI	Gyrosigma nodiferum	(Grun.) Reim.	Gyrosigma sciotoense	(Sull.) Cleve	RTB
BAP	GYROBSC	Gyrosigma obscurum	(W.Sm.) J.W.Griff. & Henfr.			RTB
BAP	GYRSCAL	Gyrosigma scalproides	(Rabenh.) Cleve			RTB
BAP	GYRSCIO	Gyrosigma sciotense	(Sulliv. & Wormley) Cl.	Gyrosigma sciotoense	(Sull.) Cleve	RTB
BAP	GYRSP	Gyrosigma sp.				RTB
BAP	GYRSPEN	Gyrosigma spencerii	Quek.	Gyrosigma acuminatum	(Kütz.) Rabenh.	RTB
BAP	GYRSPENC	Gyrosigma spencerii var. curvula	(Grunow) Reimer			RTB
BAP	HANARCU	Hannaea arcus	(Ehrenb.) R.M.Patrick			OVB
BAP	HANAMPH	Hantzschia amphioxys	(Ehrenb.) Grunow			OVB
BAP	HANAMPHC	Hantzschia amphioxys f. capitata	O.Müll.			OVB
BAP	MERCIRC	Meridion circulare	(Grev.) C.Agardh			OVB
BAP	MERCIRCC	Meridion circulare var. constrictum	(Ralfs) Brun			OVB
BAP	NAVACCE	Navicula acceptata	Hust.	Geissleria acceptata	(Hust.) Lange-Bert. & Metzeltin	OVB
BAP	NAVANGL	Navicula anglica	Ralfs	Placoneis elginensis	(W.Greg.) E.J.Cox	OVB
BAP	NAVANGLU	Navicula anglica var. subsalsa	(Grunow) Cleve			OVB
BAP	NAVARVE	Navicula arvensis	Hust.	Sellaphora arvensis	(Hust.) C.E.Wetzel & Ector	OVB
BAP	NAVATOM	Navicula atomus	(Kutz.) Grun.	Mayamaea atomus	(Kütz.) Lange-Bert	OVB
BAP	NAVAURO	Navicula aurora	Sovereign			OVB
BAP	NAVBACI	Navicula bacillum	Ehr.	Sellaphora bacillum	(Ehrenb.) D.G.Mann	OVB
BAP	NAVCAPI	Navicula capitata	Ehr.	Hippodonta capitata	(Grunow) Lange-Bert, Metzeltin & Witkowski	DMB
BAP	NAVCAPIH	Navicula capitata var. hungarica	(Grun.) Ross	Hippodonta hungarica	(Grunow) Lange-Bert, Metzeltin & Witkowski	DMB
BAP	NAVCAPIL	Navicula capitata var. luneburgensis	(Grun.) Patr.	Hippodonta luneburgensis	(Grunow) Lange-Bert, Metzeltin & Witkowski	DMB
BAP	NAVCINC	Navicula cincta	(Ehrenb.) Ralfs			OVB
BAP	NAVCITR	Navicula citrus	Krasske	Craticula citrus	(Krasske) E.Reichardt	OVB
BAP	NAVCLEM	Navicula clementis	Grun.	Placoneis clementis	(Grunow) E.J.Cox	OVB
BAP	NAVCOCC	Navicula cocconeiformis	Greg. ex Grev.	Cavinula cocconeiformis	(Gregory ex Grev.) D.G.Mann & A.J.Stickle	OVB
BAP	NAVCONF	Navicula confervacea	Kutz.	Diadesmis confervacea	Kütz.	OVB
BAP	NAVCONTB	Navicula contenta var. biceps	(Arn.) V.H.	Diadesmis contenta var. biceps	(Grunow) P.B.Hamilton	OVB
BAP	NAVCOST	Navicula costulata	Grun. in Cl. & Grun.	Hippodonta costulata	(Grunow) Lange-Bert, Metzeltin & Witkowski	OVB
BAP	NAVCRYP	Navicula cryptocephala	Kütz.			DMB
BAP	NAVCRYPV	Navicula cryptocephala var. veneta	(Kutz.) Rabh.	Navicula veneta	Kütz.	OVB
BAP	NAVCUSP	Navicula cuspidata	(Kutz.) Kutz.	Craticula cuspidata	(Kütz.) D.G.Mann	DMB
BAP	NAVDECU	Navicula decussis	Ostr.	Navigeia decussis	(Østrup) Bukht.	DMB

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BAP	NAVDETE	Navicula detenta	Hust.			OVB
BAP	NAVDISJ	Navicula disjuncta	Hust. (?)	Sellaphora disjuncta	(Hust.) D.G.Mann	OVB
BAP	NAVELGIL	Navicula elginensis var. lata	(M. Perag.) Patr.	Placoneis lata	(Perag.) R.L.Lowe	OVB
BAP	NAVEXIG	Navicula exigua	Greg. ex Grun.	Placoneis exigua	(W.Greg.) Mereschk.	OVB
BAP	NAVEXIGC	Navicula exigua var. capitata	R.M.Patrick			OVB
BAP	NAVEXPL	Navicula explanata	Hust.	Placoneis explanata	(Hust.) Mayama	OVB
BAP	NAVFART	Navicula farta	Hust.			OVB
BAP	NAVFOSS	Navicula fossilis	Krasske	Mayamaea fossalis	(Krasske) Lange-Bert.	OVB
BAP	NAVFRAC	Navicula fracta	Hust.	Fallacia fracta	(Hust. ex Simonsen) D.G.Mann	OVB
BAP	NAVFRUG	Navicula frugalis	Hust.	Craticula subminuscula	(Manguin) C.E.Wetzel & Ector	OVB
BAP	NAVGAST	Navicula gastrum	(Ehr.) Kutz.	Placoneis gastrum	(Ehrenb.) Mereschk.	OVB
BAP	NAVGASTS	Navicula gastrum var. signata	Hust.			OVB
BAP	NAVGOTT	Navicula gottlandica	Grunow			OVB
BAP	NAVGRACO	Navicula graciloides	A. Mayer sensu Hust.	Navicula cari	Ehrenb.	DMB
BAP	NAVGREG	Navicula gregaria	Donkin			DMB
BAP	NAVHAMB	Navicula hambergii	Hust.	Placoneis hambergii	(Hust.) Bruder	OVB
BAP	NAVHARD	Navicula harderi	Hust.	Sellaphora harderi	(Hust.) Foets &C.E.Wetzel	OVB
BAP	NAVHASS	Navicula hassiaca	Krasske	Chamaepinnularia hassiaca	(Krasske) Cantonati & Lange-Bert.	OVB
BAP	NAVHELE	Navicula helensis	Schutz	Fallacia helensis	(P.F.F.Schulz) D.G.Mann	OVB
BAP	NAVIMBR	Navicula imbricata	Bock	Luticola imbricata	(W.Bock) Levkov, Metzeltin & A.Pavolv	OVB
BAP	NAVINGR	Navicula ingrata	Krasske			OVB
BAP	NAVINTE	Navicula integra	(W. Sm.) Ralfs	Prestauroneis integra	(W.Sm.) Bruder	OVB
BAP	NAVJAER	Navicula jaernefeltii	Hust.	Cavinula jaernefeltii	(Hust.) D.G.Mann & A.J.Stickle	OVB
BAP	NAVLACU	Navicula lacustris	Greg.	Lacustriella lacustris	(W.Greg.) Lange-Bert. & Kulikovskiy	OVB
BAP	NAVLAEV	Navicula laevissima	Kutz.	Sellaphora laevissima	(Kütz.) D.G.Mann	OVB
BAP	NAVLANC	Navicula lanceolata	(Ag.) Kutz.	Navicula trivialis	Lange-Bert.	DMB
BAP	NAVLATE	Navicula latens	Krasske	Navigeia thingvallae	(Østrup) Bukht.	OVB
BAP	NAVMEDI	Navicula mediocris	Krasske	Chamaepinnularia mediocris	(Krasske) Lange-Bert	OVB
BAP	NAVMENI	Navicula menisculus	Schum.			DMB
BAP	NAVMENIU	Navicula menisculus var. upsaliensis	(Grun.) Grun.	Navicula upsaliensis	(Grunow) Perag.	DMB
BAP	NAVMINI	Navicula minima	Grun.			OVB
BAP	NAVMINU	Navicula minuscula	Grun.	Adlafia minuscula	(Grunow) Lange-Bert.	OVB
BAP	NAVMINUM	Navicula minuscula var. muralis	(Grun.) Lange-Bert.	Adlafia minuscula var. muralis	(Grunow) Lange-Bert.	OVB
BAP	NAVMURAF	Navicula muraliformis	Hust.			OVB
BAP	NAVMURAS	Navicula muralis	Grun.	Adlafia minuscula var. muralis	(Grunow) Lange-Bert.	OVB
BAP	NAVMUTI	Navicula mutica	Kutz.	Luticola mutica	(Kütz.) D.G.Mann	OVB
BAP	NAVMUTIC	Navicula mutica var. cohnii	(Hilse) Grun.	Luticola cohnii	(Hilse) D.G.Mann	OVB
BAP	NAVMUTIU	Navicula mutica var. undulata	(Hilse) Grun.	Luticola undulata	(Hilse) D.G.Mann	OVB
BAP	NAVOCHR	Navicula ochridana	Hust.			OVB
BAP	NAVODIO	Navicula odiosa	J.H.Wallace			DMB
BAP	NAVOMIS	Navicula omissa	Hust.	Fallacia omissa	(Hust.) D.G.Mann	OVB
BAP	NAVPAUC	Navicula paucivisitata	R.M.Patrick			OVB
BAP	NAVPELL	Navicula pelliculosa	Hilse	Fistulifera pelliculosa	(Kütz.) Lange-Bert.	OVB
BAP	NAVPERP	Navicula perpusilla	(Kutz.) Grun.	Humidophila perpusilla	(Grunow) R.L.Lowe, Kociolek, J.R.Johans., Van de Vijver, Lange-Bert. & Kopalová	OVB
BAP	NAVPHYL	Navicula phyllepta	Kütz.			OVB
BAP	NAVPLAC	Navicula placentula	(Ehr.) Kutz.	Paraplaconeis placentula	(Ehrenb.) Kulikovskiy & Lange-Bert.	OVB
BAP	NAVPLAT	Navicula platysoma	Ehrenb.			OVB
BAP	NAVPORI	Navicula porifera	Hust.	Placoneis porifera	(Hust.) T.Ohtsuka & Y.Fujita	OVB
BAP	NAVPROT	Navicula protracta	Grun.	Prestauroneis protracta	(Grunow) I.W.Bishop, Minerovic, Q.Liu & Kociolek	OVB
BAP	NAVPSEUL	Navicula pseudolanceolata	Lange-Bert.			OVB
BAP	NAVPSEUM	Navicula pseudomuralis	Hust. (?)	Fallacia pseudomuralis	(Hust.) D.G.Mann	OVB
BAP	NAVPSEUR	Navicula pseudoreinhardtii	R.M.Patrick			DMB

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BAP	NAVPSEUS	Navicula pseudoscutiformis	Hust.	Cavinula pseudoscutiformis	(Hust.) D.G.Mann & Stickle	OVB
BAP	NAVPSEUY	Navicula pseudoventralis	Hust.	Sellaphora pseudoventralis	(Hust.) Chudaev & Gololobova	OVB
BAP	NAVPUPU	Navicula pupula	Kutz.	Sellaphora pupula	(Kütz.) Mereschk.	OVB
BAP	NAVPUPUE	Navicula pupula f. elliptica	Hust.	Sellaphora wummensis	J.R.Johans.	OVB
BAP	NAVPUPUC	Navicula pupula var. capitata	Hust.	Sellaphora parapupula	Lange-Bert.	OVB
BAP	NAVPUPUM	Navicula pupula var. mutata	(Krasske) Hust.	Sellaphora mutata	(Krasske) Lange-Bert.	OVB
BAP	NAVRADI	Navicula radiosa	Kütz.			DMB
BAP	NAVRADIP	Navicula radiosa var. parva	Wallace	Navicula radiosafallax	Lange-Bert.	DMB
BAP	NAVRADIT	Navicula radiosa var. tenella	(Breb.) Cl. & Moll.	Navicula cryptotenella	Lange-Bert.	DMB
BAP	NAVREIN	Navicula reinhardtii	(Grunow) Grunow			OVB
BAP	NAVREINE	Navicula reinhardtii var. elliptica	Hérib.			OVB
BAP	NAVRHYN	Navicula rhynchocephala	Kutz.	Navicula rhynchotella	Lange-Bert.	OVB
BAP	NAVRHYNA	Navicula rhynchocephala var. amphiceros	(Kutz.) Grun.	Navicula rhynchotella	Lange-Bert.	OVB
BAP	NAVSALI	Navicula salinarum	Grunow			OVB
BAP	NAVSALII	Navicula salinarum var. intermedia	(Grun.) Cl.	Navicula capitatoradiata	H.Germ. ex Gasse	OVB
BAP	NAVSAXO	Navicula saxophila	Bock	Luticola saxophila	(W.Bock ex Hust.) D.G.Mann	OVB
BAP	NAVSCHO	Navicula schoenfeldii	Hust.	Geissleria schoenfeldii	(Hust.) Lange-Bert. & Metzeltin	OVB
BAP	NAVSCUT	Navicula scutelloides	W. Sm.	Cavinula scutelloides	(W.Sm.) Lange-Bert.	OVB
BAP	NAVSEMIO	Navicula seminuloides	Hust.			OVB
BAP	NAVSEMIU	Navicula seminulum	Grun.	Sellaphora seminulum	(Grunow) D.G.Mann	OVB
BAP	NAVSIMI	Navicula similis	Krasske emend. Hust.	Placogeia similis	(Krasske) Bukht.	OVB
BAP	NAVSP	Navicula sp.				OVB
BAP	NAVSPLE	Navicula splendicula	VanLand.			DMB
BAP	NAVSTRO	Navicula stroemii	Hust.	Sellaphora stroemii	(Hust.) H.Kobayasi	OVB
BAP	NAVSUBH	Navicula subhamulata	Grun.	Fallacia subhamulata	(Grunow) D.G.Mann	OVB
BAP	NAVSUBHU	Navicula subhamulata var. undulata	Hust.			OVB
BAP	NAVSUBMI	Navicula submitis	Hust.	Fallacia submitis	(Hust.) D.G.Mann	OVB
BAP	NAVSUBMU	Navicula submuralis	Hust.			OVB
BAP	NAVSUBO	Navicula subocculata	Hust.			OVB
BAP	NAVSUBR	Navicula subrotundata	Hust.	Sellaphora subrotundata	(Hust.) C.E.Wetzel, Ector, Van de Vijver, Compère & D.G.Mann	OVB
BAP	NAVSUBT	Navicula subtilissima	Cl.	Kobayasiella subtilissima	(Cleve) Lange-Bert.	OVB
BAP	NAVTANT	Navicula tantula	Hust.	Eolimna tantula	(Hust.) Lange-Bert.	OVB
BAP	NAVTENE	Navicula tenelloides	Hust.			OVB
BAP	NAVTRIP	Navicula tripunctata	(O.F.Müll.) Bory			OVB
BAP	NAVTRIPS	Navicula tripunctata var. schizonemoides	(Van Heurck) R.M.Patrick			OVB
BAP	NAVTRIV	Navicula trivialis	Lange-Bert.			OVB
BAP	NAVTUSC	Navicula tuscula	Ehr.	Aneumastus tusculus	(Ehrenb.) D.G.Mann & Stickle	DMB
BAP	NAVTUSCM	Navicula tuscula f. minor	Hust.	Aneumastus minor	Lange-Bert	OVB
BAP	NAVTUSCR	Navicula tuscula f. rostrata	Hust.	Aneumastus rostratus	(Hust.) Lange-Bert. 2001	OVB
BAP	NAVUTER	Navicula utermoehlii	Hust.	Sellaphora utermoehlii	(Hust.) C.E.Wetzel & D.G.Mann	OVB
BAP	NAVVIRI	Navicula viridula	(Kütz.) Ehrenb.			OVB
BAP	NAVVIRIA	Navicula viridula var. avenacea	(Bréb.) Van Huerck			OVB
BAP	NAVVIRIR	Navicula viridula var. rostellata	(Kutz.) Cl.	Navicula rostellata	Kütz.	OVB
BAP	NAVVITA	Navicula vitabunda	Hust.	Sellaphora vitabunda	(Hust.) D.G.Mann	OVB
BAP	NAVVULP	Navicula vulpina	Kütz.			DMB
BAP	NAVWITT	Navicula wittrockii	(Lagst.) A. Cl.-Eu.	Sellaphora laevissima	(Kütz.) D.G.Mann	OVB
BAP	NAVZANO	Navicula zanoni	Hust.	Navicula zanonii	Hust.	OVB
BAP	NEIAFFI	Neidium affine	(Ehrenb.) Pfitzer			OVB
BAP	NEIDUBI	Neidium dubium	(Ehrenb.) Cleve			OVB
BAP	NEISP	Neidium sp.				OVB
BAP	NITACCO	Nitzschia accomodata	Hust.			DMB
BAP	NITACICO	Nitzschia acicularioides	Hust.	Nitzschia spiculum		DMB
BAP	NITACICS	Nitzschia acicularis	(Kütz.) W.Sm.			DMB

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BAP	NITACUL	Nitzschia acula	(Kütz.) Hantzsch			DMB
BAP	NITACUM	Nitzschia acuminata	(W.Sm.) Grun.	Tryblionella acuminata	W.Sm.	DMB
BAP	NITACUT	Nitzschia acuta	Hantzsch			DMB
BAP	NITALPI	Nitzschia alpina	Hust.			DMB
BAP	NITAMPH	Nitzschia amphibia	Grun.			DMB
BAP	NITAMPHA	Nitzschia amphibia var. activiscula	Grunow			DMB
BAP	NITANGU	Nitzschia angustata	(W. Sm.) Grun.	Tryblionella angustata	W.Sm.	DMB
BAP	NITANGA	Nitzschia angustatula	Lange-Bertalot 1987	Tryblionella angustatula	(Lange-Bert.) Cantonati & Lange-Bert.	DMB
BAP	NITAPIC	Nitzschia apiculata	(Greg.) Grun.	Tryblionella apiculata	W.Greg.	DMB
BAP	NITARCH	Nitzschia archibaldii	Lange-Bert.			DMB
BAP	NITBACA	Nitzschia bacata	Hust.			DMB
BAP	NITCAPI	Nitzschia capitellata	Hust.			DMB
BAP	NITCLAU	Nitzschia clausii	Hantzsch			DMB
BAP	NITCLOS	Nitzschia closterium	(Ehr.) W. Sm.	Cylindrotheca closterium	(Ehrenb.) Reimann & J.C.Lewin	DMB
BAP	NITCOMM	Nitzschia communis	Rabenh.			DMB
BAP	NITCONF	Nitzschia confinis	Hust.			DMB
BAP	NITDENT	Nitzschia denticula	Grun.	Denticula kuetzingii	Grunow	DMB
BAP	NITDISS	Nitzschia dissipata	(Kütz.) Rabenh.			DMB
BAP	NITDISSM	Nitzschia dissipata var. media	(Hantzsch) Grunow			DMB
BAP	NITEPIP	Nitzschia epiphytica	O.Müll.			DMB
BAP	NITFONT	Nitzschia fonticola	(Grunow) Grunow			DMB
BAP	NITFRUS	Nitzschia frustulum	(Kütz.) Grunow			DMB
BAP	NITFRUST	Nitzschia frustulum var. perminuta	Grun.	Nitzschia perminuta	(Grunow) Perag.	DMB
BAP	NITFRUSP	Nitzschia frustulum var. perpusilla	(Rabenh.) Van Heurck			DMB
BAP	NITFRUT	Nitzschia fruticosa	Hust.			DMB
BAP	NITGAND	Nitzschia gandersheimiensis	Krasske			DMB
BAP	NITGRACF	Nitzschia graciliformis	Lange-Bert. & Simonsen			DMB
BAP	NITGRACS	Nitzschia gracilis	Hantzsch			DMB
BAP	NITHANT	Nitzschia hantzschiana	Rabenh.			DMB
BAP	NITHOLL	Nitzschia hollerupensis	Foged			DMB
BAP	NITIMPR	Nitzschia impressa	Hust.			DMB
BAP	NITINCO	Nitzschia inconspicua	Grunow			DMB
BAP	NITINTE	Nitzschia intermedia	Hantzsch			DMB
BAP	NITKUETA	Nitzschia kuetzingiana	Hilse			DMB
BAP	NITKUETO	Nitzschia kuetzingioides	Hust.	Nitzschia pumila		DMB
BAP	NITLACU	Nitzschia lacuum	Lange-Bert.			DMB
BAP	NITLATE	Nitzschia latens	Hust.			DMB
BAP	NITLAUE	Nitzschia lauenburgiana	Hust.			DMB
BAP	NITLINE	Nitzschia linearis	(Agardh) W.Sm.			DMB
BAP	NITLUZO	Nitzschia luzonensis	Hust.			DMB
BAP	NITMEDI	Nitzschia mediocris	Hust.			DMB
BAP	NITMICR	Nitzschia microcephala	Grunow			DMB
BAP	NITMINUA	Nitzschia minuta	Bleisch			DMB
BAP	NITMINUU	Nitzschia minutula	Grunow			DMB
BAP	NITOBSI	Nitzschia obsidialis	Hust.			DMB
BAP	NITOVAL	Nitzschia ovalis	H.J.Arn.			DMB
BAP	NITPALEA	Nitzschia palea	(Kütz.) W.Sm.			DMB
BAP	NITPALED	Nitzschia palea var. debilis	(Kütz.) Grunow			DMB
BAP	NITPALET	Nitzschia palea var. tenuirostris	Grunow			DMB
BAP	NITPALEC	Nitzschia paleacea	Grunow			DMB
BAP	NITPARV	Nitzschia parvula	Lewis	Nitzschia brevissima	Grunow	DMB
BAP	NITPERM	Nitzschia perminuta	(Grunow) Perag.			DMB
BAP	NITPSEU	Nitzschia pseudofonticola	Hust.			DMB
BAP	NITPUMI	Nitzschia pumila	Hust.			DMB
BAP	NITPURA	Nitzschia pura	Hust.			DMB
BAP	NITPUSI	Nitzschia pusilla	Grunow			DMB
BAP	NITRECT	Nitzschia recta	Hantzsch ex Rabenh.			DMB
BAP	NITROMA	Nitzschia romana	Grun.	Nitzschia fonticola	(Grunow) Grunow	DMB

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BAP	NITROST	Nitzschia rostellata	Hust.			DMB
BAP	NITSIGM	Nitzschia sigmoidea	(Nitzsch) W.Sm.			DMB
BAP	NITSINUT	Nitzschia sinuata var. tabellaria	(Grunow) Grunow			DMB
BAP	NITSOCI	Nitzschia sociabilis	Hust.			DMB
BAP	NITSP	Nitzschia sp.				DMB
BAP	NITSPICO	Nitzschia spiculoides	Hust.			DMB
BAP	NITSPICU	Nitzschia spiculum	Hust.			DMB
BAP	NITSUBA	Nitzschia subacicularis	Hust.			DMB
BAP	NITSUBC	Nitzschia subcommunis	Hust.			DMB
BAP	NITSUBL	Nitzschia sublinearis	Hust.			DMB
BAP	NITTENU	Nitzschia tenuis	W.Sm.			DMB
BAP	NITTHER	Nitzschia thermalis	(Ehrenb.) Auersw.			DMB
BAP	NITTROP	Nitzschia tropica	Hust.	Nitzschia fonticola	(Grunow) Grunow	DMB
BAP	NITTRYBD	Nitzschia tryblionella var. debilis	(Arn.) A. Mayer	Tryblionella debilis	H.J.Arn. ex O'Meara	OVB
BAP	NITTRYBS	Nitzschia tryblionella var. subsalina	Grun.	Tryblionella gracilis var. subsalina	(O'Meara) Aboal	OVB
BAP	NITTRYBV	Nitzschia tryblionella var. victoriae	Grun.	Tryblionella victoriae	Grunow	OVB
BAP	NITVALD	Nitzschia valdestriata	Aleem & Hust.			DMB
BAP	NITVERM	Nitzschia vermicularis	(Kütz.) Hantzsch			DMB
BAP	OPEMART	Opephora martyi	Herib.	Staurosirella martyi	(Hérib.) E.Morales & Manoylov	OVB
BAP	OPESP	Opephora sp.				OVB
BAP	PININTEM	Pinnularia interrupta var. minutissima	Hust.	Pinnularia subinterrupta	Krammer & S.Schroet.	OVB
BAP	PINLATA	Pinnularia lata	(Bréb.) Rabenh.			OVB
BAP	PINMICR	Pinnularia microstauron	(Ehrenb.) Cleve			OVB
BAP	PINRUPE	Pinnularia rupestris	Hantzsch			OVB
BAP	PINSP	Pinnularia sp.				OVB
BAP	PINSUBC	Pinnularia subcapitata	W.Greg.			OVB
BAP	PINVIRIC	Pinnularia viridis var. commutata	(Grunow) Cleve			OVB
BAP	PLALEPIP	Plagiotropis lepidoptera var. proboscidia	(Cleve) Reimer			DMB
BAP	RHOCURV	Rhoicosphenia curvata	(Kutz.) Grun. ex Rabh.	Rhoicosphenia abbreviata	(C.Agardh) Lange-Bert.	OVB
BAP	RHOSPB	Rhoicosphenia sp.				OVB
BAP	STUKRIE	Stauroneis kriegeri	R.M.Patrick			DMB
BAP	STUSMIT	Stauroneis smithii	Grunow			DMB
BAP	STUSMINC	Stauroneis smithii var. incisa	Pant.			DMB
BAP	STUSMVMI	Stauroneis smithii var. minima	E.Y.Haw.			DMB
BAP	STUASP	Stauroneis sp.				DMB
BAP	SURANGU	Surirella angusta	Kütz.			OVB
BAP	SURBIRO	Surirella birostrata	Hust. ex Ant.Mayer			OVB
BAP	SURBISEP	Surirella biseriata var. bifrons f. punctata	Meist.			OVB
BAP	SURLINEC	Surirella linearis var. constricta	Grun.	Surirella grunowii	Kulikovskiy, Lange-Bert. & Witkowski	OVB
BAP	SUROVAL	Surirella ovalis	Bréb.			OVB
BAP	SUROVAT	Surirella ovata	Kutz.	Surirella brebissonii	Krammer & Lange-Bert.	OVB
BAP	SUROVATP	Surirella ovata var pinnata	(W. Sm.) Hust.	Surirella minuta	Bréb. ex Kütz.	OVB
BAP	SUROVATS	Surirella ovata var. salina	(W. Sm.) Hust.	Surirella salina	W.Sm.	OVB
BAP	SURSP	Surirella sp.	W.Sm.			OVB
BAP	SURTURG	Surirella turgida	W. Sm.			OVB
BAP	SYNACUS	Synedra acus	Kutz.	Ulnaria acus	(Kütz.) Aboal	DMB
BAP	SYNAMPH	Synedra amphicephala	Kutz.	Fragilaria amphicephaloides	Lange-Bert	DMB
BAP	SYNAMPHA	Synedra amphicephala var. austriaca	(Grun.) Hust.	Fragilaria austriaca	(Grunow) Lange-Bert.	DMB
BAP	SYNCYCL	Synedra cyclopum	Brutschy			DMB
BAP	SYNDELI	Synedra delicatissima	W. Sm.	Ulnaria delicatissima	(W.Sm.) Aboal & P.C.Silva	DMB
BAP	SYNDELIA	Synedra delicatissima var. angustissima	Grun.	Ulnaria delicatissima var. angustissima	(Grunow) Aboal & P.C.Silva	DMB

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BAP	SYNDEME	Synedra demerarae	Grun.	Fragilaria demerarae	(Grunow) Lange-Bert.	DMB
BAP	SYNFAMI	Synedra familica	Kütz.			DMB
BAP	SYNFILI	Synedra filiformis	Grunow			DMB
BAP	SYNFILIE	Synedra filiformis var. exilis	A.Cleve			DMB
BAP	SYNMINU	Synedra miniscula	Grun.	Synedra famelica	(Kütz.) Lange-Bert	DMB
BAP	SYNNANA	Synedra nana	F.Miester			DMB
BAP	SYNOSTE	Synedra ostenfeldii	(Krieg.) A.Cleve			DMB
BAP	SYNPARA	Synedra parasitica	W. Sm.	Pseudostaurosira parasitica	(W.Sm.) E.Morales	DMB
BAP	SYNPARAS	Synedra parasitica var. subconstricta	(Grun.) Grun.	Pseudostaurosira subconstricta	(Grunow) Kulikovskiy & Genkal	DMB
BAP	SYNPULC	Synedra pulchella	Ralfs ex Kutz	Ctenophora pulchella	(Ralfs ex Kütz.) D.M.Williams & Round	DMB
BAP	SYNRADI	Synedra radians	Kutz.	Fragilaria radians	(Kütz.) D.M.Williams & Round	DMB
BAP	SYNRUMP	Synedra rumpens	Kutz.	Fragilaria rumpens	(Kütz.) G.W.F.Carlson	DMB
BAP	SYNRUMPS	Synedra rumpens var. scotica	Grunow			DMB
BAP	SYNSOC	Synedra socia	Wallace			DMB
BAP	SYNSPP	Synedra sp.				DMB
BAP	SYNSP3	Synedra sp. # 3	in house taxon			DMB
BAP	SYNTENE	Synedra tenera	W. Sm.	Fragilaria tenera	(W.Sm.) Lange-Bert.	DMB
BAP	SYNULNA	Synedra ulna	(Nitz.) Ehr.	Ulnaria ulna	(Nitzsch) Compère	DMB
BAP	SYNULNAB	Synedra ulna var. biceps	Kutz.	Ulnaria biceps	(Kütz) Compère	DMB
BAP	SYNULNAH	Synedra ulna var. chaseana	B.W.Thomas			DMB
BAP	SYNULNAO	Synedra ulna var. contracta	Venkt.	Ulnaria contracta	(Østrup) E.Morales and M.L.Vis	DMB
BAP	SYNULNAD	Synedra ulna var. danica	(Kutz.) V.H.	Ulnaria danica	(Kütz) Compère & Bukht.	DMB
BAP	SYNULNAL	Synedra ulna var. longissima	(W. Sm.) Brun.	Ulnaria biceps	(Kütz) Compère	DMB
BAP	TABFENE	Tabellaria fenestrata	(Lyngb.) Kütz.			RTB
BAP	TABFLOC	Tabellaria flocculosa	(Roth) Kütz.			RTB
BAP	TABFLOCG	Tabellaria flocculosa var. geniculata	(A.Cleve) B.M.Knudson			TFG
BAP	TABSP	Tabellaria sp.				RTB
BAP	UNIPENN	Unidentified Pennales				DMB
CHL	ACASP	Acanthosphaera sp.				OVO
CHL	ACTACICM	Actinastrum aciculare f. minimum	(Hub.-Pest.) Compère			OVO
CHL	ACTGRAC	Actinastrum gracilimum	G.M.Sm.			OVO
CHL	ACTHANT	Actinastrum hantzschii	Lagerh.			OVO
CHL	ANKBRAU	Ankistrodesmus braunii	(Naeg.) Brun.	Chlorolobion braunii	(Nägeli) Komárek	FUS
CHL	ANKCONVM	Ankistrodesmus convolutus var. minutus	(Nägeli) Rabenh.			FUS
CHL	ANKFALC	Ankistrodesmus falcatus	(Corda) Ralfs			FUS
CHL	ANKFALCF	Ankistrodesmus falcatus var. fasciculatus	Margalef			FUS
CHL	ANKFALCM	Ankistrodesmus falcatus var. mirabilis	(W. & G.S. West) G.S. West	Monoraphidium mirabile	(West & G.S.West) Pankow	FUS
CHL	ANKGELI	Ankistrodesmus gelifactum	(Chod.) Bourr.	Elakatothrix gelifacta	(Chodat) Hindák	FUS
CHL	ANKGRAC	Ankistrodesmus gracilis	(Reins.) Kors.	Messastrum gracile	(Reinsch) T.S.Garcia	FUS
CHL	ANKSETI	Ankistrodesmus setigerus	(Schroed.) G.S. West	Schroederia setigera	(Schröd.) Lemmerm.	FUS
CHL	ANKSPI	Ankistrodesmus sp.				FUS
CHL	ANKSPIR	Ankistrodesmus spiralis	(W.B.Turner) Lemmerm.			FUS
CHL	ANKSTIP	Ankistrodesmus stipitatus	Komárk.-Legn.			FUS
CHL	AKYJUDA	Ankyra judayi	(G.M.Sm.) Fott			FUS
CHL	AKYLANC	Ankyra lanceolata	(Kors.) Fott	Lanceola spatulifera	(Korshikov) Hindák	FUS
CHL	AKYSP	Ankyra sp.				FUS
CHL	ARTBIFI	Arthrodesmus bifidus	Breb.	Octacanthium bifidum	(Bréb.) Compère	OVO
CHL	ARTSP	Arthrodesmus sp.				OVO
CHL	ARTTRIA	Arthrodesmus triangularis	Lag.	Staurodesmus triangularis	(Lagerh.) Teiling	OVO
CHL	ASTSUPE	Asterococcus superbus	(Cienk.) Scherff.			OVO
CHL	BOTBRAU	Botryococcus braunii	Kütz.			OVO
CHL	BOTSPC	Botryococcus sp.				OVO
CHL	BOTSPS	Botryosphaera sp.				OVO

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CHL	CARCORD	Carteria cordiformis	(H.J.Carter) Diesing			OVO
CHL	CARSP	Carteria sp.				OVO
CHL	CARWISC	Carteria wisconsinensis	Hub.-Pest.			OVO
CHL	CHMSP	Characium sp.				FUS
CHL	CHLGLOB	Chlamydomonas globosa	J.Snow			OVO
CHL	CHLSP	Chlamydomonas sp.				OVO
CHL	CRLSP	Chlorella sp.				OVO
CHL	CBHSP	Chlorobrachis sp.				OVO
CHL	CHGMINI	Chlorogonium minimum	Playfair			OVO
CHL	CHGSP	Chlorogonium sp.				OVO
CHL	CDASUBS	Chodatella subsalsa	Lemm.	Lagerheimia subsala	Lemmerm.	OVO
CHL	CDPSP	Chodatellopsis sp.				OVO
CHL	CLOACICC	Closteriopsis acicularis	(Chodat/G.M.Sm) J.H.Belcher & Swale			FUS
CHL	CLOLONG	Closteriopsis longissima	(Lemmerm.) Lemmerm.			FUS
CHL	CLOLONGA	Closteriopsis longissima var. acicularis	G.M. Sm.	Closteriopsis acicularis	(Chodat/G.M.Sm) J.H.Belcher & Swale	FUS
CHL	CLOSPC	Closteriopsis sp.				FUS
CHL	CLOACICD	Closterium aciculare	T.West			FUS
CHL	CLOACICS	Closterium aciculare var. subpronum	W. & G.S. West	Closterium aciculare	T.West	FUS
CHL	CLOACUTV	Closterium acutum var. variabile	(Lemmerm.) Willi Krieg.			FUS
CHL	CLOEXIL	Closterium exile	West & G.S.West			FUS
CHL	CLOGRAC	Closterium gracile	Bréb. ex Ralfs			FUS
CHL	CLOPARV	Closterium parvulum	Nägeli			FUS
CHL	CLOSPD	Closterium sp.				FUS
CHL	CLOSTRIE	Closterium strigosum var. elegans	(G.S.West) Willi Krieg.			FUS
CHL	COCBICE	Coccoid bicells				DBL
CHL	COCFUSI	Coccoid fusiform				FUS
CHL	COCOVAL	Coccoid oval				OVO
CHL	COCSP4	Coccoid sp. #4				OVO
CHL	COCSPHE	Coccoid sphere				OVO
CHL	COEASTR	Coelastrum astroideum	De Not.			OVO
CHL	COECAMB	Coelastrum cambricum	W.Archer			OVO
CHL	COEMICR	Coelastrum microporum	Nägeli			OVO
CHL	COEMORU	Coelastrum morus	W. & G.S. West	Coelastrum sphaericum	Nägeli	OVO
CHL	COEPSEU	Coelastrum pseudomicroporum	Korshikov			OVO
CHL	COERETI	Coelastrum reticulatum	(Dang.) Senn.	Hariotina reticulata	P.A.Dang.	OVO
CHL	COESPT	Coelastrum sp.				OVO
CHL	COESPHA	Coelastrum sphaericum	Nägeli			OVO
CHL	COESPY	Coenocystis sp.				OVO
CHL	CORSP?	Coronastrum sp. (?)				OVO
CHL	COSBOTR	Cosmarium botrytis	Menegh. ex Ralfs			OVO
CHL	COSDEPR	Cosmarium depressum	(Nägeli) P.Lundell			OVO
CHL	COSMELA	Cosmarium melanosporum	W.Archer & J.Roy			OVO
CHL	COSPHAS	Cosmarium phaseolus	Bréb. ex Ralfs			OVO
CHL	COSREGN	Cosmarium regnellii	Wille			OVO
CHL	COSSPD	Cosmarium sp.				OVO
CHL	COSSUBC	Cosmarium subcostatum	Nordst.			OVO
CHL	CRUFENE	Crucigenia fenestrata	(Schmidle) Schmidle			OVO
CHL	CRUIRRE	Crucigenia irregularis	Wille	Crucigeniella irregularis	(Wille) P.M.Tsarenko & D.M.John	OVO
CHL	CRUPULC	Crucigenia pulchra	(W. & G. S. West) Kom.	Crucigeniella apiculata	(Lemmerm.) Komárek	OVO
CHL	CRUQUAD	Crucigenia quadrata	Morren			OVO
CHL	CRURECT	Crucigenia rectangularis	A. Braun	Willea rectangularis	(A.Braun) D.M.John, M.J.Wynne & P.M.Tsarenko	OVO
CHL	CRUSP	Crucigenia sp.				OVO
CHL	CRUTETR	Crucigenia tetrapedia	(Kirchn.) Kuntze			OVO
CHL	CRUTRUN	Crucigenia truncata	G.M. Sm.	Willea truncata	(G.M.Sm.) D.M.John, M.J.Wynne & P.M.Tsarenko	OVO
CHL	CROCRAS	Crucigloea crassiseta	(Skuja) Soeder			OVO
CHL	DACINFU	Dactylococcus infusionum	Nägeli			FUS

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CHL	DICEHRE	Dictyosphaerium ehrenbergianum	Nägeli			OVO
CHL	DICELEG	Dictyosphaerium elegans	(Bachm.)	Mychonastes elegans	(H.Bachm.) Krienitz, C.Bock, Dadheech & Pröschold	OVO
CHL	DICPULC	Dictyosphaerium pulchellum	Wood	Mucidosphaerium pulchellum	(H.C.Wood) C.Bock, Pröschold, Krientz	OVO
CHL	DICSP	Dictyosphaerium sp.				OVO
CHL	DIDANOM	Didymogenes anomala	(G.M.Sm.) Hindák			FUS
CHL	DIDPALA	Didymogenes palatina	Schmidle			FUS
CHL	DIDSPG	Didymogense sp.				OVO
CHL	DIMLUNA	Dimorphococcus lunatus	A.Braun			OVO
CHL	DIMSP	Dimorphococcus sp.				OVO
CHL	DIPDECU	Diplochloris decussata	Korshikov			FUS
CHL	DIPLUNA	Diplochloris lunata	(Fott) Fott			FUS
CHL	ECHSPC	Echinocoleum sp.				OVO
CHL	ECHLIMN	Echinosphaerella limnetica	G.M.Sm.			OVO
CHL	ECHSPS	Echinosphaeridium sp.				OVO
CHL	ELAGENE	Elakatothrix genevensis	(Reverdin) Hindák			FUS
CHL	ELASP	Elakatothrix sp.				FUS
CHL	ELAVIRI	Elakatothrix viridis	(Snow) Printz	Fusola viridis	J.Snow	FUS
CHL	ENACOEL	Enallax coelastroides	(Bohl.) Skuja			OVO
CHL	EUDELEG	Eudorina elegans	Ehrenb.			OVO
CHL	EUDSP	Eudorina sp.				OVO
CHL	EUTSPC	Eutetramorus sp.				OVO
CHL	FRADROE	Franceia droescheri	(Lemmerm.) G.M.Sm.			OVO
CHL	FRAELON	Franceia elongata	Korshikov			OVO
CHL	FRAMINU	Franceia minuscula	Hind.			OVO
CHL	FRAOVAL	Franceia ovalis	(Francé) Lemmerm.			OVO
CHL	FRASPB	Franceia sp.				OVO
CHL	GLOLIMN	Gloeactinium limneticum	G.M. Sm.	Dichotomococcus curvatus	Korshikov	OVO
CHL	GLOBACI	Gloeocystis bacillus	(Teil.) Fott	Chlamydocapsa bacillus	(Teiling) Fott	OVO
CHL	GLOGIGA	Gloeocystis gigas	(Kutz.) Lag.	Chlamydocapsa planctonica	(West & G.S.West) Fott	OVO
CHL	GLOPLAN	Gloeocystis planktonica	(W. & G.S. West) Lemm.	Chlamydocapsa planctonica	(West & G.S.West) Fott	OVO
CHL	GLOSPC	Gloeocystis sp.				OVO
CHL	GLOSPT	Gloeotila sp.				CYL_TUBE
CHL	GOLMAXI	Golenkinia maxima	Tiffany & Ahlstrom			OVO
CHL	GOLRADI	Golenkinia radiata	Chodat			OVO
CHL	GOLRADIB	Golenkinia radiata var. brevispina	Tiff. & Ahlstr.	Golenkinia brevispina	Korshikov	OVO
CHL	GOLSPK	Golenkinia sp.				OVO
CHL	GOLSPI	Golenkiniopsis sp.				OVO
CHL	GONPECT	Gonium pectorale	O.F.Müll.			OVO
CHL	GONSP	Gonium sp.				OVO
CHL	GYRCORD	Gyromitus cordiformis	Skuja			CON
CHL	HETGALL	Heterodesmus gallicus	Bourr. & Coute			FUS
CHL	KIRCONT	Kirchneriella contorta	(Schm.) Bohlin	Raphidocelis danubiana	(Hindák) Marvan, Komárek & Comas	FUS
CHL	KIRELON	Kirchneriella elongata	G.M. Sm.	Pseudokirchneriella elongata	(G.M.Sm.) Hindák	FUS
CHL	KIRLUNA	Kirchneriella lunaris	(Kirchn.) K.Möbius			FUS
CHL	KIRMAYO	Kirchneriella mayori	(G. S. West) Kom.-Legn. in Kom.	Raphidocelis mayorii	(G.S.West) Marvan, Komárek & Comas	FUS
CHL	KIROBES	Kirchneriella obesa	(West) West & G.S.West			FUS
CHL	KIROBESM	Kirchneriella obesa var. major	(Bern.) G.M. Sm.	Kirchneriella major	C.Bernard	FUS
CHL	KIRSP	Kirchneriella sp.				FUS
CHL	KIRSUBS	Kirchneriella subsolitaria	G. S. West	Nephrochlamys subsolitaria	(G.S.West) Korshikov	FUS
CHL	KORLIMN	Korshikoviella limnetica	(Lemmerm.) P.C.Silva			FUS
CHL	LAGBALA	Lagerheimia balatonica	(Scherff.) Hindák			OVO
CHL	LAGCHOD	Lagerheimia chodatii	C.Bernard			OVO
CHL	LAGCILI	Lagerheimia ciliata	(Lagerh.) Chodat			OVO

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CHL	LAGCING	Lagerheimia cingula	G.M. Sm.	Lagerheimia circumfilata	(Seligo) E.Hegewald & A.Schmidt	OVO
CHL	LAGCITR	Lagerheimia citriformis	(J.Snow) Collins			OVO
CHL	LAGCITRP	Lagerheimia citriformis var. paucispina	Tiffany & Ahlstrom			OVO
CHL	LAGGENE	Lagerheimia genevensis	(Chodat) Chodat			OVO
CHL	LAGLONG	Lagerheimia longiseta	(Lemmerm.) Printz			OVO
CHL	LAGLONGM	Lagerheimia longiseta var. major	G.M.Sm.			OVO
CHL	LAGQUAD	Lagerheimia quadriseta	(Lemmerm.) G.M.Sm.			OVO
CHL	LAGSPL	Lagerheimia sp.				OVO
CHL	LAGSUBS	Lagerheimia subsalsa	Lemmerm.			OVO
CHL	LAGWRAT	Lagerheimia wratislaviensis	Schröd.			OVO
CHL	LOBSPC	Lobocystis sp.				OVO
CHL	LOBAMPLO	Lobomonas ampla var. okensis	Korschikov			OVO
CHL	LOBSPM	Lobomonas sp.				OVO
CHL	MITBORN	Micractinium bornheimiense	(Cour.)Kors.	Micractinium bornhemiense	(W.Conrad) Korshikov	OVO
CHL	MITPUSI	Micractinium pusillum	Fresen.			OVO
CHL	MITQUAD	Micractinium quadrisetum	(Lemmerm.) G.M.Sm.			OVO
CHL	MITSP	Micractinium sp.	Fresnius			OVO
CHL	MPASPA	Microspora sp.				CYL_TUBE
CHL	MONARCU	Monoraphidium arcuatum	Kors.	Ankistrodesmus arcuatus	Korshikov	FUS
CHL	MONBRAU	Monoraphidium braunii	(Nag. in Kutz.) Kom.-Legn.	Chlorolobion braunii	(Nägeli) Komárek	FUS
CHL	MONCIRC	Monoraphidium circinale	(Nygaard) Nygaard			FUS
CHL	MONCONT	Monoraphidium contortum	(Thur.) Komárk.-Legn.			FUS
CHL	MONCONV	Monoraphidium convolutum	(Corda) Komárk.-Legn.			FUS
CHL	MONDYBO	Monoraphidium dybowskii	(Wolosz.) Hindák & Komárk.-Legn.			FUS
CHL	MONGRIF	Monoraphidium griffithii	(Berk.) Komárk.-Legn.			FUS
CHL	MONIRRE	Monoraphidium irregulare	(G.M.Sm.) Komárk.-Legn.			FUS
CHL	MONMINU	Monoraphidium minutum	(Nägeli) Komárek.-Legn.			FUS
CHL	MONOBTU	Monoraphidium obtusum	(Korshikov) Komárk.-Legn.			FUS
CHL	MONPUSI	Monoraphidium pusillum	(Printz) Komárk.-Legn.			FUS
CHL	MONSAXA	Monoraphidium saxatile	Komárk.-Legn.			FUS
CHL	MONSETI	Monoraphidium setiforme	(Nyg.) Kom.-Legn.	Monoraphidium komarkovae	Nygaard	FUS
CHL	MONSKUJ	Monoraphidium skujae	Fott			FUS
CHL	MONSPH	Monoraphidium sp.				FUS
CHL	MONTORT	Monoraphidium tortile	(West & G.S.West) Komárk.-Legn.			FUS
CHL	MOUSP	Mougeotia sp.				CYL_TUBE
CHL	NEODANU	Neodesmus danubialis	Hindák			OVO
CHL	NCHPSP	Nephrochlamys sp.				FUS
CHL	NCHSUBS	Nephrochlamys subsolitaria	(G.S.West) Korshikov			FUS
CHL	NCHWILL	Nephrochlamys willeana	(Printz) Korshikov			FUS
CHL	NCTAGAR	Nephrocytium agardhianum	Nägeli			FUS
CHL	NCTECDY	Nephrocytium ecdysiscepanum	W. West in W. & G.S. West.	Oonephris obesa	(West & G.S.West) Fott	FUS
CHL	NCTLIMN	Nephrocytium limneticum	(G.M.Sm.) G.M.Sm.			FUS
CHL	NCTSP	Nephrocytium sp.				FUS
CHL	OEDSP	Oedogonium sp.				CYL_TUBE
CHL	OOCBORG	Oocystis borgei	J.Snow			OVO
CHL	OOCCRAS	Oocystis crassa	Witt.	Neglectella solitaria	(Wittr.) Stenclová & Kaštovský	OVO
CHL	OOCELLIP	Oocystis elliptica	West			OVO
CHL	OOCELVMI	Oocystis elliptica f. minor	W. West	Oocystis elliptica	West	OVO
CHL	OOCGIVIN	Oocystis gigas var. incrassata	West & G.S.West			OVO
CHL	OOCLACU	Oocystis lacustris	Chodat			OVO
CHL	OOCMARS	Oocystis marssonii	Lemmerm.			OVO
CHL	OOCNATAM	Oocystis natans v. major	G.M. Smith	Oocystis natans var. major	G.M.Sm.	OVO

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CHL	OOCNODU	Oocystis nodulosa	West & G.S.West			OVO
CHL	OOCPARV	Oocystis parva	West & G.S.West			OVO
CHL	OOCPUSI	Oocystis pusilla	Hansg.			OVO
CHL	OOCRHOM	Oocystis rhomboidea	Fott			OVO
CHL	OOCSOLI	Oocystis solitaria	Witt.	Neglectella solitaria	(Wittr.) Stenclová & Kaštovský	OVO
CHL	OOCSP	Oocystis sp.				OVO
CHL	OOCSUBM	Oocystis submarina	Lagerh.			OVO
CHL	PANMORU	Pandorina morum	(O.F.Müll.) Bory			OVO
CHL	PANSP	Pandorina sp.				OVO
CHL	PARMULT	Paradoxia multiseta	Svirenko			CLA
CHL	PAUTENE	Paulschulzia tenera	(Korshikov) J.W.G.Lund			OVO
CHL	PEDBIRA	Pediastrum biradiatum	Meyer 1829	Parapediastrum biradiatum	(Meyen) E.Hegewald	OVB
CHL	PEDBORY	Pediastrum boryanum	(Turp.) Menegh.	Pseudopediastrum boryanum	(Turpin) E.Hegwald	OVB
CHL	PEDDUPL	Pediastrum duplex	Meyen			OVB
CHL	PEDDUPLC	Pediastrum duplex var. clathratum	(A. Braun) Lag.	Pediastrum duplex	Meyen	OVB
CHL	PEDDUPLG	Pediastrum duplex var. gracillimum	W. & G.S. West	Lacunastrum gracillimum	(West & G.S.West) H.McManus	OVB
CHL	PEDDUPLR	Pediastrum duplex var. reticulatum	Lag.	Pediastrum duplex	Meyen	OVB
CHL	PEDINTEP	Pediastrum integrum var. priva	Printz (?)	Stauridium privum	(Printz) E.Hegewald	OVB
CHL	PEDSIMP	Pediastrum simplex	(Meyen) Lemm.	Monactinus simplex	(Meyen) Corda	OVB
CHL	PEDSIMPE	Pediastrum simplex v. echin	Wittrock	Monactinus simplex var. echinulatum	(Wittr.) M.C.Pérez, Maidana & Comas	OVB
CHL	PEDSIMPD	Pediastrum simplex var. duodenarium	(Bail.) Rabh.	Monactinus simplex	(Meyen) Corda	OVB
CHL	PEDSP	Pediastrum sp.				OVB
CHL	PEDTETR	Pediastrum tetras	(Ehr.) Ralfs	Stauridium tetras	(Ehrenb.) E.Hegewald	OVB
CHL	PEDTETRT	Pediastrum tetras var. tetraedon	(Corda) Hansg.			OVB
CHL	PHAMINU	Phacotus minuscula	Bourr.	Phacotus minusculus	Bourr.	OVO
CHL	PHASPC	Phacotus sp.				OVO
CHL	PHYSP	Phythelios sp.				OVO
CHL	PLKLAUT	Planktonema lauterborni	Schm.	Binuclearia lauterbornii	(Schmidle) Proshk.-Lavr.	CYL_TUBE
CHL	PLKSP	Planktonema sp.		Planctonema sp.		CYL_TUBE
CHL	PKAGELA	Planktosphaeria gelatinosa	G.M.Sm.			OVO
CHL	PTESP	Pteromonas sp.				OVO
CHL	PYRSP	Pyramidomonas sp.				CON
CHL	QUACHOD	Quadrigula chodatii	(Tanner-Füll.) G.M.Sm.			FUS
CHL	QUACLOS	Quadrigula closterioides	(Bohlin) Printz			OVO
CHL	QUALACU	Quadrigula lacustris	(Chod.) G.M. Sm.	Gregiochloris lacustris	(Chodat) Marvan, Komárek & Comas	OVO
CHL	RAPSIGM	Raphidiocelis sigmoidea	Hindák			FUS
CHL	RAYHEMI	Rayssiella hemisphaerica	Edelst. & Prescott			OVO
CHL	SCEABUN	Scenedesmus abundans	(Kirch.) Chod.	Desmodesmus abundans	(Kirchn.) E.Hegewald	OVO
CHL	SCEACUM	Scenedesmus acuminatus	(Lag.) Chod.	Tetradesmus lagerheimii	M.J.Wynne & Guiry	FUS
CHL	SCEACUMT	Scenedesmus acuminatus var. tortuosus	(Skuja) Uherk.	Pectinodesmus pectinatus f. tortuosus	(Skuja) E.Hegewald	FUS
CHL	SCEACUT	Scenedesmus acutus	Meyen	Tetradesmus obliquus	(Turpin) M.J.Wynne	FUS
CHL	SCEARCU	Scenedesmus arcuatus	(Lemmerm.) Lemmerm.			FUS
CHL	SCEARMA	Scenedesmus armatus	(Chodat) Chodat			OVO
CHL	SCEARMAB	Scenedesmus armatus var. bicaudatus	(Gugl.-Prinz) Chod.	Desmodesmus armatus var. bicaudatus	(Guglielm.) E.Hegewald	OVO
CHL	SCEBALA	Scenedesmus balantonicus	Hort.	Scenedesmus balatonicus	Hortob.	OVO
CHL	SCEBICA	Scenedesmus bicaudatus	(Hansg.) Chodat			OVO
CHL	SCEBICAB	Scenedesmus bicaudatus var. brevicaudatus	Hortob.			OVO
CHL	SCEBIJU	Scenedesmus bijuga	(Turp.) Lag.	Scenedesmus bijugus	(Turpin) Lagerh.	OVO
CHL	SCEBRAS	Scenedesmus brasiliensis	Bohlin	Desmodesmus brasiliensis	(Bohlin) E.Hegewald	OVO
CHL	SCEBREV	Scenedesmus brevispina	(G.M.Sm.) Chodat			OVO
CHL	SCECARI	Scenedesmus carinatus	(Lemm.) Chod.	Desmodesmus opoliensis var. carinatus	(Lemmerm.) E.Hegewald	OVO
CHL	SCEDENT	Scenedesmus denticulatus	Kirch.	Desmodesmus denticulatus	(Lagerh.) S.S.An, Friedl & E.Hegewald	OVO

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CHL	SCEDENTL	Scenedesmus denticulatus var. linearis	Hansg.	Desmodesmus denticulatus var. linearis	(Hansg.) E.Hegewald	OVO
CHL	SCEDIMO	Scenedesmus dimorphus	(Turp.) Kutz.	Tetradesmus dimorphus	(Turpin) M.J.Wynne	OVO
CHL	SCEDISP	Scenedesmus dispar	Breb.	Desmodesmus dispar	(Bréb.) E.Hegewald	OVO
CHL	SCEECOR	Scenedesmus ecornis	(Ehrenb.) Chodat			OVO
CHL	SCEECORD	Scenedesmus ecornis var. disciformis	Chod.	Scenedesmus obtusus f. disciformis	(Chodat) Compère	OVO
CHL	SCEECORS	Scenedesmus ecornis var. disciformis f. spinosus	Hort. & Nemeth			OVO
CHL	SCEELLI	Scenedesmus ellipsoideus	Chod.	Desmodesmus armatus	(Chodat) E.Hegewald	OVO
CHL	SCEGRAN	Scenedesmus granulatus	W. & G.S. West	Desmodesmus granulatus	(West & G.S.West) P.M.Tsarenko	OVO
CHL	SCEINTE	Scenedesmus intermedius	Chod.	Desmodesmus intermedius	(Chodat) E.Hegewald	OVO
CHL	SCEINTEA	Scenedesmus intermedius var. acaudatus	Hortob.			OVO
CHL	SCEINTEB	Scenedesmus intermedius var. balatonicus	Hort.	Desmodesmus intermedius var. balatonicus	(Hortob.) P.M.Tsarenko	OVO
CHL	SCEINTEI	Scenedesmus intermedius var. bicaudatus	Hort.	Desmodesmus intermedius var. acutispinus	(Y.V.Roll) E.Hegewald	OVO
CHL	SCEMICR	Scenedesmus microspina	Chod.	Desmodesmus microspina	(Chodat) P.M.Tsarenko	OVO
CHL	SCEOPOL	Scenedesmus opoliensis	P. Richt.	Desmodesmus opoliensis	(P.G.Richt.) E.Hegewald	OVO
CHL	SCEQUAD	Scenedesmus quadricauda	(Turpin) Bréb.			OVO
CHL	SCEQUADB	Scenedesmus quadricauda var. biornatus	Kiss			OVO
CHL	SCEQUADL	Scenedesmus quadricauda var. longispina	(Chod.) G.M. Sm	Desmodesmus armatus var. longispina	(Chodat) E.Hegewald	OVO
CHL	SCEQUADM	Scenedesmus quadricauda var. maxima	W. & G.S. West	Desmodesmus maximus	(West & G.S.West) E. Hegewald	OVO
CHL	SCEQUADQ	Scenedesmus quadricauda var. quadrispina	(Chod.) G.M. Sm.	Desmodesmus abundans	(Kirchn.) E.Hegewald	OVO
CHL	SCEQUADC	Scenedesmus quadricauda var.longispina f capricornus	(Skuja) Uher.			OVO
CHL	SCESECU	Scenedesmus securiformis	Playfair			OVO
CHL	SCESERR	Scenedesmus serratus	(Corda) Bohl.	Desmodesmus serratus	(Corda) S.S.An, Friedl & E.Hegewald	OVO
CHL	SCESP	Scenedesmus sp.				OVO
CHL	SCESPIC	Scenedesmus spicatus	W.& G.S. West	Desmodesmus subspicatus	(Chodat) E.Hegewald & Ant.Schmidt	OVO
CHL	SCESPIN	Scenedesmus spinosus	Chod.	Desmodesmus spinosus	(Chodat) E.Hegewald	OVO
CHL	SCESUBS	Scenedesmus subspicatus	Chod.	Desmodesmus subspicatus	(Chodat) E.Hegewald & Ant.Schmidt	OVO
CHL	SCEVELI	Scenedesmus velitaris	Komárek			OVO
CHL	SCHCOMP	Schizoclamys compacta	Prescott			OVO
CHL	SCHANTI	Schroederia antillarum	Kom.	Pseudoschroederia antillarum	(Komárek) E.Hegewald & Schnepf	FUS
CHL	SCHINDI	Schroederia indica	Philipose			FUS
CHL	SCHJUDA	Schroederia judayi		Ankyra judayi	(G.M.Sm.) Fott	FUS
CHL	SCHSETI	Schroederia setigera	(Schröd.) Lemmerm.			FUS
CHL	SLCELLI	Sphaerellocystis ellipsoidea	H.Ettl			OVO
CHL	SLCLATE	Sphaerellocystis lateralis	Fott & Nováková			OVO
CHL	SPLELON	Sphaerellopsis elongata	Skvortsov			OVO
CHL	SPLSP	Sphaerellopsis sp.				OVO
CHL	SPYSCHR	Sphaerocystis schroeteri	Chodat			OVO
CHL	STAANAT	Staurastrum anatinum	Cooke & Wills			STR
CHL	STAELLIM	Staurastrum ellipticum var. minor	West			STR
CHL	STAGRAC	Staurastrum gracile	Ralfs ex Ralfs			STR
CHL	STALACU	Staurastrum lacustris	G.M. Sm.	Staurastrum lacustre	G.M.Sm.	STR
CHL	STALEPT	Staurastrum leptocladum	Nordst.			STR
CHL	STAPARA	Staurastrum paradoxum	Meyen ex Ralfs			STR
CHL	STASPD	Staurastrum sp.				STR
CHL	STSMAMI	Staurodesmus mamillatus	(Nordst.) Teiling			STR
CHL	STISP	Stichococcus sp.				OVO
CHL	TETALTE	Tetrachlorella alternans	(G.M.Sm.) Korshikov			OVO
CHL	TETARTH	Tetraedron arthrodesmiforme	(G.S. West) Woloz.	Tetraëdron arthrodesmiforme	Wolosz.	CRU
CHL	TETCAUD	Tetraedron caudatum	(Corda) Hansg.	Tetraëdron caudatum	(Corda) Hansg.	CRU
CHL	TETCAUDL	Tetraedron caudatum var. longispinum	Lemm.	Tetraëdron caudatum var. longispinum	Lemmerm.	CRU

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CHL	TETDUOS	Tetraedron duospinum	Ackley	Tetraëdron duospinum	Ackley	CRU
CHL	TETLIMN	Tetraedron limneticum	Borge	Pseudostaurastrum limneticum	(Borge) Couté & Rousselin	CRU
CHL	TETLUNU	Tetraedron lunula	(Reins.) Wille	Tetraëdron lunula	(Reinsch) Hansg.	CRU
CHL	TETMINI	Tetraedron minimum	(A. Braun) Hansg.	Tetraëdron minimum	(A.Braun) Hansg.	CRU
CHL	TETMIVTE	Tetraedron minimum var. tetralobulatum	Reins	Tetraëdron minimum var. tetralobulatum	Reinsch	CRU
CHL	TETMUTI	Tetraedron muticum	(A. Braun) Hansg.	Goniochloris mutica	(A.Braun) Fott	CRU
CHL	TETREGU	Tetraedron regulare	Kutz.	Tetraëdriella regularis	(Kütz.) Fott	CRU
CHL	TETREGUI	Tetraedron regulare var. incus	Teil.	Chlorotetraëdron incus	(Teiling) Komárek & Kováčik	CRU
CHL	TETTRIG	Tetraedron trigonum	(Nag.) Hangs.	Tetraëdron trigonum	(Nägeli) Hansg.	CRU
CHL	TETREGUL	Tetraedron tumidulum	(Reins.) Hansg.	Tetraëdron tumidulum	(Reinsch) Hansg.	CRU
CHL	TETLACU	Tetraspora lacustris	Lemm.	Pseudosphaerocystis lacustris	(Lemmerm.) Nováková	OVO
CHL	TETLEMM	Tetraspora lemmermannii	Fott			OVO
CHL	TETSP	Tetraspora sp.	(Y.V.Roll) Ahlstrom & Tiffany			OVO
CHL	TETGLAB	Tetrastrum glabrum	(Roll) Ahlstr. & Tiff.			OVO
CHL	TETHETE	Tetrastrum heteracanthum	(Nordst.) Chodat			OVO
CHL	TETHETEE	Tetrastrum heteracanthum f. elegans	(Playf.) Ahlstr. & Tiff.	Tetrastrum elegans	Playfair	OVO
CHL	TETSTAU	Tetrastrum staurogeniaeformae	(Schroed.) Lemm.	Tetrastrum staurogeniiforme	(Schröd.) Lemmerm.	CON
CHL	TREPLAN	Treubaria planktonica	(G.M. Sm.) Kor.	Treubaria planctonica	(G.M.Sm.) Korshikov	OVO
CHL	TREQUAD	Treubaria quadrispina	(G.M.Sm.) Fott & Kováčik			OVO
CHL	TRESCHM	Treubaria schmidlei	(Schröd.) Fott & Kováčik			CON
CHL	TRESETIA	Treubaria setigera	(W.Archer) G.M.Sm.			CON
CHL	TRESETIU	Treubaria setigerum	(Arch.) G.M. Sm.	Treubaria setigera	(W.Archer) G.M.Sm.	CON
CHL	TRESP	Treubaria sp.				CON
CHL	TRETRIA	Treubaria triappendiculata	Bern.	Treubaria triappendiculata	C.Bernard	CON
CHL	TROSP	Trochiscia sp.				OVO
CHL	ULOSP	Ulothrix sp.				CYL_TUBE
CHL	UNICGR	Unidentified Colonial greens				OVO
CHL	UNIFILA	Unidentified filamentous green				CYL_TUBE
CHL	UNICLFLA	Unidentified green flagellate				OVO
CHL	WESSP	Westella sp.				OVO
CHL	XANCONC	Xanthidium concinnum	Arch. (?)			STR
CHM	BODSP	Bodopsis sp.				OVO
CHM	VACSP	Vacuolaria sp.				OVO
CHR	BITCHOD	Bitrichia chodatii	(Reverdin) Chodat			OVO
CHR	BITLONG	Bitrichia longispina	(J.W.G.Lund) Bourr.			OVO
CHR	BITOHRI	Bitrichia ohridiana	(Fott) Nich.			OVO
CHR	BITOLLU	Bitrichia ollula	(Fott) Fott			OVO
CHR	BITSP	Bitrichia sp.				OVO
CHR	CHMSPM	Chromulina sp.				OVO
CHR	CRNINSI	Chrysarachnion insidians	Pascher			OVO
CHR	CHRSP	Chrysococcus sp.				OVO
CHR	CYKANGU	Chrysolykos angulatus	(Willén) Nauwerck			OVO
CHR	CYKPLAN	Chrysolykos planktonicus	Mack.	Chrysolykos planctonicus	B.Mack	OVO
CHR	CYKSKUJ	Chrysolykos skujae	(Nauw.) Bourr.	Chrysoikos skujae	(Nauwerck) Willén	OVO
CHR	CYKSP	Chrysolykos sp.				OVO
CHR	CSLCONR	Chrysosphaerella conradi	Bourr.	Chrysosphaerella conradii	Bourr.	OVO
CHR	CSLLONG	Chrysosphaerella longispina	Lauterborn			OVO
CHR	CSLRODH	Chrysosphaerella rodhei	Skuja			OVO
CHR	CHYSP	Chrysosphaerella sp.				OVO
CHR	CODINCL	Codonoeca inclinata	(Kent) Kent			OVO
CHR	DESBRAC	Desmarella brachycalyx	Skuja			OVO
CHR	DESMONI	Desmarella moniliformis	Kent			OVO
CHR	DESSP	Desmarella sp.				OVO
CHR	DIDSPC	Didymochrysis sp.				OVO

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CHR	DINACUM	Dinobryon acuminatum	Ruttner			OVO
CHR	DINBALT	Dinobryon balticum	(Schütt) Lemmerm.			OVO
CHR	DINBAVA	Dinobryon bavaricum	O.E.Imhof			OVO
CHR	DINBAVAM	Dinobryon bavaricum var. medium	(Lemmerm.) Krieg.			OVO
CHR	DINBAVAV	Dinobryon bavaricum var. vanhoeffenii	(Bachm.) Krieg.	Dinobryon vanhoeffenii	H.Bachm.	OVO
CHR	DINBORG	Dinobryon borgei	Lemmerm.			OVO
CHR	DINCALC	Dinobryon calciformis	Bachm.	Dinobryon caliciforme	H.Bachm.	OVO
CHR	DINCONDP	Dinobryon condensatum var. planktonicum	Skuja	Dinobryon condensatum var. planctonicum	Skuja	OVO
CHR	DINCREN	Dinobryon crenulatum	West & G.S.West			OVO
CHR	DINCYLI	Dinobryon cylindricum	O.E.Imhof			OVO
CHR	DINCYLIA	Dinobryon cylindricum var. alpinum	(O.E.Imhof) H.Bachm.			OVO
CHR	DINCYLIP	Dinobryon cylindricum var. palustre	Lemmerm.			OVO
CHR	DINDIVE	Dinobryon divergens	O.E.Imhof			OVO
CHR	DINDIVES	Dinobryon divergens var. schauinslandii	(Lemmerm.) Brunnth.			OVO
CHR	DINEURY	Dinobryon eurystoma	(A.Stokes) Lemmerm.			OVO
CHR	DINSERT	Dinobryon sertularia	Ehrenb.			OVO
CHR	DINSERTP	Dinobryon sertularia var. protuberans	(Lemm.) Kreig.	Dinobryon protuberans	Lemmerm.	OVO
CHR	DINSOCI	Dinobryon sociale	(Ehrenb.) Ehrenb.			OVO
CHR	DINSOCIA	Dinobryon sociale var. americanum	(Brunnth.) H.Bachm.			OVO
CHR	DINSOCIS	Dinobryon sociale var. stipitatum	(F.Stein) Lemmerm.			OVO
CHR	DINSP	Dinobryon sp.				OVO
CHR	DINSTOK	Dinobryon stokesii	Lemm.	Epipyxis stokesii	(Lemmerm.) G.M.Sm.	OVO
CHR	DINSTOKE	Dinobryon stokesii var. epiplanktonicum	Skuja	Epipyxis epiplanctica	(Skuja) D.K.Hilliard & Asmund	OVO
CHR	DINTUBA	Dinobryon tubaeformae	Nyg.	Dinobryon tubaeforme	Nygaard	OVO
CHR	DINUTRI	Dinobryon utriculus	Stein	Epipyxis utriculus	(Ehrenb.) Ehrenb.	OVO
CHR	DINUTRIA	Dinobryon utriculus var. acutum	Shil.	Epipyxis utriculus var. acuta	(J.Schiller) D.K.Hilliard & Asmund	OVO
CHR	DINUTRIT	Dinobryon utriculus var. tabellariae	Lemm.	Epipyxis tabellariae	(Lemmerm.) G.M.Sm.	OVO
CHR	DIPSPI	Diplosiga sp.				OVO
CHR	EPISP	Epipyxis sp.				OVO
CHR	HAPSP	Haptophyceae				OVO
CHR	HYASP	Hyalobryon sp.				OVO
CHR	KEPASPE	Kephyrion asper	(Lackey) Bourr.			OVO
CHR	KEPBORE	Kephyrion boreale	Skuja			OVO
CHR	KEPCINC	Kephyrion cinctum	(Lackey) Bourr.			OVO
CHR	KEPCUPU	Kephyrion cupuliformae	Conr.	Kephyrion cupuliforme	W.Conrad	OVO
CHR	KEPCYLI	Kephyrion cylindricum	(Lackey) W.Conrad			OVO
CHR	KEPDOLI	Kephyrion doliolum	W.Conrad			OVO
CHR	KEPHEMI	Kephyrion hemisphaericum	(Lackey) W.Conrad			OVO
CHR	KEPHILL	Kephyrion hilliardii	N.H.Nocholls			OVO
CHR	KEPLITT	Kephyrion littorale	J.W.G.Lund			OVO
CHR	KEPMAST	Kephyrion mastigophorum	G.W.Schmidt			OVO
CHR	KEPOVAL	Kephyrion ovale	(Lackey) Hub.-Pest.			OVO
CHR	KEPPRIS	Kephyrion prismaticum	W.Conrad			OVO
CHR	KEPRUBR	Kephyrion rubri-claustri	W.Conrad			OVO
CHR	KEPRUBRA	Kephyrion rubri-claustri var. amphora	(Lackey) W.Conrad			OVO
CHR	KEPSP	Kephyrion sp.				OVO
CHR	KEPSPIR	Kephyrion spirale	(Lackey) W.Conrad			OVO
CHR	LAGSPR	Lagynion sp.				OVO
CHR	MALACAR	Mallomonas acaroides	Perty (?)	Mallomonas ploesslii	Perty	OVO
CHR	MALAKRO	Mallomonas akrokomos	Ruttner			OVO
CHR	MALALLO	Mallomonas allorgei	(Deflandre) W.Conrad			OVO
CHR	MALCAUD	Mallomonas caudata	Iwanoff			OVO

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CHR	MALMAJO	Mallomonas majorensis	Skuja			OVO
CHR	MALPSEU	Mallomonas pseudocoronata	Prescott			OVO
CHR	MALRADI	Mallomonas radiata	W.Conrad			OVO
CHR	MALSP	Mallomonas sp.				OVO
CHR	MALSP3	Mallomonas sp. #3				OVO
CHR	MALTONSA	Mallomonas tonsurata var. alpina	(Pasch. & Rutt.) Krieg. (?)	Mallamonas alpina	Pascher & Ruttner	OVO
CHR	MALVALK	Mallomonas valkanoviana	W.Conrad			OVO
CHR	MASSP	Mastigella sp.				OVO
CHR	MONOVAT	Monosiga ovata	Kent			OVO
CHR	MONSPO	Monosiga sp.				OVO
CHR	OCHCOLO	Ochromonadaceae colonial form				OVO
CHR	OCHSPOV	Ochromonas sp. - ovoid				OVO
CHR	PARSP	Paraphysomonas sp.				OVO
CHR	PORSP	Porochrysis sp.	Pascher			OVO
CHR	PSEACUT	Pseudokephyrion acutum	J.Schiller			OVO
CHR	PSEALAS	Pseudokephyrion alaskanum	D.K.Hilliard			OVO
CHR	PSEATTE	Pseudokephyrion attenuatum	D.K.Hilliard			OVO
CHR	PSECONI	Pseudokephyrion conicum	J.Schiller			OVO
CHR	PSECYLI	Pseudokephyrion cylindrcum	Bourr.	Pseudokephyrion cylindricum	Bourr.	OVO
CHR	PSEELLI	Pseudokephyrion ellipsoidium	(Pasch.) Schm.	Pseudokephyrion ellipsoideum	(Pascher) W.Conrad	OVO
CHR	PSEENTZ	Pseudokephyrion entzii	W.Conrad			OVO
CHR	PSEFORM	Pseudokephyrion formosissimum	W.Conrad			OVO
CHR	PSELATU	Pseudokephyrion latum	(J.Shiller) G.W.Schmidt			OVO
CHR	PSEMILL	Pseudokephyrion millerense	K.H.Nicholls			OVO
CHR	PSEMINU	Pseudokephyrion minutissimum	W.Conrad			OVO
CHR	PSESP	Pseudokephyrion sp.				OVO
CHR	PSEUNDU	Pseudokephyrion undulatissimium	Scherf.	Pseudokephyrion undulatissimum	Scherff.	OVO
CHR	RHIMAJO	Rhizochrysis major	Naumann			OVO
CHR	RHISPC	Rhizochrysis sp.				OVO
CHR	SPISP	Spiniferomonas sp.				OVO
CHR	STCSP	Stichogloea sp.				OVO
CHR	STYAURE	Stylotheca aurea	(Bachm.) Boloch.	Stylochrysalis aurea	(Chodat) H.Bachm.	OVO
CHR	STYSP1	Stylotheca sp. #1				OVO
CHR	STYSP?)	Stylotheca sp. (?)				OVO
CHR	SYNSPR	Synura sp.				OVO
CHR	UNCFLAG	Unidentified chrysophyte flagellate				OVO
CHR	UNCOVO	Unidentified chrysophyte ovoid (nonflagellate)				OVO
CHR	UROLIND	Uroglena lindii	Bourr.	Uroglena lindiae	Bourr.	OVO
CHR	UROSP	Uroglena sp.				OVO
CHR	UROVOLV	Uroglena volvox	Ehrenb.			OVO
CRY	CRYEROS	Cryptomonas erosa	Ehrenb.			OVO
CRY	CRYPHAS	Cryptomonas phaseolus	Skuja			OVO
CRY	CRYPYRE	Cryptomonas pyrenoidifera	Geitler			OVO
CRY	CRYREFL	Cryptomonas reflexa	Skuja			OVO
CRY	CRYROST	Cryptomonas rostratiformis	Skuja	Cryptomonas curvata	Ehrenb.	OVO
CRY	UNICRYP	Cryptomonas sp.				OVO
CRY	RHOLENS	Rhodomonas lens	Pascher & Ruttner			TRP
CRY	RHOMINU	Rhodomonas minuta	Skuja	Plagioselmis nannoplanctica	(Skuja) Novarino, I.A.N.Lucas & S.Morrall	TRP
CRY	RHOSPC	Rhodomonas sp.				TRP
CRY	SENPARV	Sennia parvula	Skuja			OVO
CRY	UNICRYP	Unidentified cryptomonad				OVO

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CYA	ANBCIRC	Anabaena circinalis	Rabh.	Dolichospermum circinale	(Rabenh. ex Bornet & Flahault) Wacklin, L.Hoffm. & Komárek	OVO
CYA	ANBFLOS	Anabaena flos-aquae	(Lyngb.) Breb.	Dolichospermum flosaquae	(Bréb. Ex Bornet & Flahualt) Wacklin, L.Hoffm. & Komárek	OVO
CYA	ANBSP	Anabaena sp.				OVO
CYA	ANBSPIR	Anabaena spiroides	Kleb.	Dolichospermum spiroides	(Klebhan) Wacklin, L.Hoffm. & Komárek	OVO
CYA	ANBSPCR	Anabaena spiroides var. crassa	Lemm.	Dolichospermum spiroides	(Klebhan) Wacklin, L.Hoffm. & Komárek	OVO
CYA	ANACYAN	Anacystis cyanea	Dr. & Daily	Microcystis aeruginosa	(Kütz.) Kütz.	OVO
CYA	ANAMONT	Anacystis montana	Dr. & Daily	Sorospora montana	(Lightf.) Hassall	OVO
CYA	APHFLOS	Aphanizomenon flos-aquae	(Lyngb.) Ralfs	Aphanizomenon flosaquae	Ralfs ex Bornet & Flahault	CYL_TUBE
CYA	APHSP	Aphanizomenon sp.				CYL_TUBE
CYA	APASP	Aphanocapsa sp.				OVO
CYA	APOSP	Aphanothece sp.				OVO
CYA	CRODISP	Chroococcus dispersus	(Keissl.) Lemmerm.			OVO
CYA	CROLIMN	Chroococcus limneticus	Lemm.	Limnococcus limneticus	(Lemmerm.) Komárková, Jezberová, O.Komárek & Zapomelová	OVO
CYA	CROSP	Chroococcus sp.				OVO
CYA	CROTURG	Chroococcus turgidus	(Kütz.) Nägeli			OVO
CYA	COEDUBI	Coelosphaerium dubium	Grunow			OVO
CYA	COENAEG	Coelosphaerium naegelianum	Ung.	Woronichinia naegeliana	(Unger) Elenkin	OVO
CYA	COESPP	Coelosphaerium sp.				OVO
CYA	CYASP	Cyanarcus sp.				FUS
CYA	DACSP	Dactylococcopsis sp.				FUS
CYA	GLCSP	Gloeocapsa sp.				OVO
CYA	GLTSP	Gloeothece sp.				OVO
CYA	GMAAPON	Gomphosphaeria aponina	Kütz.			OVO
CYA	GMALACU	Gomphosphaeria lacustris	Chod.	Snowella lacustris	(Chodat) Komárek & Hindák	OVO
CYA	GMASP	Gomphosphaeria sp.				OVO
CYA	LYNBIRG	Lyngbya birgei	G.M. Sm.	Limnoraphis birgei	(G.M.Sm.) Komárek, Zapomelová, J.Šmarda, Kopecký, Rejmánková, Woodhouse, Neilan & Komárková	CYL_TUBE
CYA	LYNLAGE	Lyngbya lagerheimii	(Moeb.) Gom.	Leptolyngbya lagerheimii	(Gomont ex Gomont) Anagn. & Komárek	CYL_TUBE
CYA	LYNLIMN	Lyngbya limneticum	Lemm.	Planktolyngbya limnetica	(Lemmerm.) Komárk.-Legn. & Cronberg	CYL_TUBE
CYA	LYNSP1	Lyngbya sp. #1				CYL_TUBE
CYA	LYNSPIR	Lyngbya spirulinoides	Gomont ex Gomont			CYL_TUBE
CYA	MERSP	Merismopedia sp.				OVO
CYA	MERTENU	Merismopedia tenuissima	Lemmerm.			OVO
CYA	MICAERU	Microcystis aeruginosa	(Kütz.) Kütz.			OVO
CYA	MICSPA	Microcystis sp.				OVO
CYA	OSCAGAR	Oscillatoria agardhii	Gom.	Planktothrix agardhii	(Gomont) Anagn. & Komárek	CYL_TUBE
CYA	OSCAMOE	Oscillatoria amoena	(Kutz.) Gom.	Microcoleus amoenus	(Gomont) Strunecký, Komárek & J.R.Johans.	CYL_TUBE
CYA	OSCBORN	Oscillatoria bornetii	Zukal	Tychonema bornetii	(Zukal) Anagn. & Komárek	CYL_TUBE
CYA	OSCFORM	Oscillatoria formosa	Bory	Kamptonema formosum	(Bory ex Gomont) Strunecký, Komárek & J.Šmarda	CYL_TUBE
CYA	OSCLIMN	Oscillatoria limnetica	Lemm.	Pseudanabaena limnetica	(Lemmerm.) Komárek	CYL_TUBE
CYA	OSCMINI	Oscillatoria minima	Gick.	Jaaginema minimum	(Gicklhorn) Anagn. & Komárek	CYL_TUBE
CYA	OSCPROL	Oscillatoria prolifica	(Grev.) Gom.	Planktothrix prolifica	(Gomont) Anagn. & Komárek	CYL_TUBE
CYA	OSCRUBE	Oscillatoria rubescens	De Cand.	Planktothrix rubescens	(DC. ex Gomont) Anagn. & Komárek	CYL_TUBE
CYA	OSCSP	Oscillatoria sp.				CYL_TUBE
CYA	OSCSUBB	Oscillatoria subbrevis	Schmidle			CYL_TUBE
CYA	OSCTENU	Oscillatoria tenuis	C.Agardh ex Gomont			CYL_TUBE
CYA	OSCTENUN	Oscillatoria tenuis var. natans	Gom.	Lyngbya natans	Hansg.	CYL_TUBE
CYA	OSCTENUT	Oscillatoria tenuis var. tergestina	(Kutz.) Rabh.	Phormidium tergestinum	(Rabenh.ex Gomont) Anagn. & Komárek	CYL_TUBE
CYA	PHOINUN	Phormidium inundatum	Kütz. ex Gomont			CYL_TUBE
CYA	PHOSP	Phormidium sp.				CYL_TUBE
CYA	RAPSP	Raphidiopsis sp.				FUS
CYA	RHASP	Rhabdoderma sp.				FUS

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CYA	SCHSP	Schizothrix sp.				CYL_TUBE
CYA	SPUMAJO	Spirulina major	Kütz. ex Gomont			CYL_TUBE
CYA	SPUSP	Spirulina sp.				CYL_TUBE
CYA	SPUSUBT	Spirulina subtilissima	Kütz. ex Gomont			CYL_TUBE
CYA	SYESP	Synechococcus sp.				OVO
CYA	UNICOCCY	Unidentified coccoid cyanophyta				OVO
CYA	UNIMONIC	Unidentified moniliform coccoid				OVO
EUG	EUGSP	Euglena sp.				OVO
EUG	EUTSPO	Eutreptia sp.				OVO
EUG	PHASPE	Phacus sp.				OVO
EUG	TRAABRU	Trachelomonas abrupta	Svirenko			OVO
EUG	TRAGRAN	Trachelomonas granulosa	Playfair			OVO
EUG	TRAHISP	Trachelomonas hispida	(Perty) F.Stein			OVO
EUG	TRALACU	Trachelomonas lacustris	Drezep.			OVO
EUG	TRASCAB	Trachelomonas scabra	Playfair			OVO
EUG	TRASP	Trachelomonas sp.				OVO
PYR	AMPLUTE	Amphidinium luteum	Skuja			OVO
PYR	AMPSPP	Amphidinium sp.				OVO
PYR	AMPWIGR	Amphidinium wigrense	Wolosz.			OVO
PYR	CERHIRU	Ceratium hirundinella	(O.F.Müll.) Dujard.			CER
PYR	GLESP	Glenodinium sp.				OVO
PYR	GYMEXCA	Gymnodinium excavatum	Nygaard			OVO
PYR	GYMHELV	Gymnodinium helveticum	Pen.	Gyrodinium helveticum	(Penard) Y.Takano & T.Horig.	OVO
PYR	GYMHELVA	Gymnodinium helveticum f. achroum	Skuja			OVO
PYR	GYMPARA	Gymnodinium paradoxum	A.J.Schill.			OVO
PYR	GYMSP	Gymnodinium sp.				OVO
PYR	HEMNASU	Hemidinium nasutum	F.Stein			OVO
PYR	HEMSP	Hemidinium sp.				OVO
PYR	PERSP	Peridinium sp.				OVO
UNI	UNICOCCS	Unidentified coccoid spherical				OVO
UNI	UNIFLAG5	Unidentified flagellate #5				OVO
UNI	UNIFLAGO	Unidentified flagellate ovoid				OVO
UNI	UNIFLAGF	Unidentified flagellates fusiform				FUS
UNI	UNIHEAR	Unidentified heartshaped				OVO
UNI	UNILORIP	Unidentified loricate sp.				OVO
UNI	UNILORIH	Unidentified loricate sphere				OVO
XAN	CENBELA	Centritractus belanophorus	(Schmidle) Lemmerm.			OVO
XAN	CLBPOLY	Chlorobotrys polychloris	Pascher			OVO
XAN	CLBSP	Chlorobotrys sp.				OVO
XAN	ISTTRIS	Isthmochloron trispinatum	(West & G.S.West) Skuja			OVO
XAN	TETSMIT	Tetraplektron smithii	(Bourr.) Bourr. (?)			OVO
XAN	UNICOCCX	Unidentified coccoid xanthophyte				OVO

Appendix 3: Formulas for Calculating Biomass for Various Phytoplankton Shapes

SHAPE CODE	BIOVOLUME FORMULA
"ARC"	(3.1416 * width ^ 2 * length) / 12
"BUT"	((4 / 3) * 3.1416 * (width / 2) ^ 2 * (length / 2))
"CER"	(4 * (1 / 3) * 3.1416 * (diam / 2) ^ 2 * (length)) + (3.1416 * (width / 2) ^ 2 * (depth))
"CLA"	((1 / 3) * 3.1416 * (length) * (width / 2) ^ 2)
"CLB"	(3.1416 * (length / 2) * (width / 2) * (depth))
"CON"	((1 / 3) * 3.1416 * (width / 2) ^ 2 * (length))
"CRU"	(length ^ 3) / 4
"CYB"	(width * depth * (length / 2))
"CYL_DISK"	(3.1416 * (diam / 2) ^ 2 * (depth)); Typically observed in "valve view"
"CYL_TUBE"	(3.1416 * (width / 2) ^ 2 * (length)); Typically observed lying on its side ("girdle view")
"CYM"	(3.1416 * (width / 2) ^ 2 * (length)) / 2
"DBL"	((8 / 3) * 3.1416 * (length / 2) * (width / 2) * (depth / 2))
"DBB"	((8 / 3) * 3.1416 * (length / 2) * (width / 2) * (depth / 2))
"DMB"	(width * depth * (length / 2))
"FUS"	((2 / 3) * 3.1416 * (width / 2) ^ 2 * (length / 2))
"LEN"	((2 / 3) * 3.1416 * (width / 2) ^ 2 * (length / 2))
"LUN"	((2 / 3) * 3.1416 * (width / 2) ^ 2 * (length))
"OVB"	(3.1416 * (length / 2) * (width / 2) * (depth))
"OVO"	(4 / 3) * 3.1416 * (width / 2) ^ 2 * (length / 2); Diameter values from spherical specimens, if present, are converted to length and width
"PYR"	((1 / 3) * 3.1416 * (width / 2) ^ 2 * (length))
"RNF"	(3.1416 * (width / 2) ^ 2 * (length))
"ROD"	(3.1416 * (width / 2) ^ 2 * (length))
"RTB"	(length * width * depth)
"SGB"	(length * width * depth)
"STR"	6 * ((1 / 3) * 3.1416 * (width / 2) ^ 2 * length)
"TFG"	(3.1416 * (width / 2) ^ 2 * depth) + (2 * (diam * length * width))
"TRP"	(3.1416 * width ^ 2 * ((length + width) / 2)) / 12