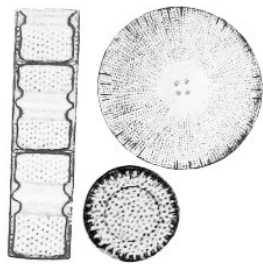


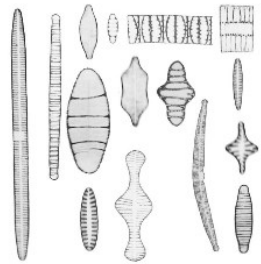
## Key to Morphological Groups of Diatoms

This key was adapted from the web flora, Diatoms of North America. A morphological grouping was chosen by the developers of the flora when they found that relationships of diatoms were still so uncertain that organizing the web site around a phylogenetic tree was rather useless. As diatom systematics advances, they hope to incorporate phylogeny (DONA 2022a). For terminology, see the Glossary in that flora (DONA 2022b).

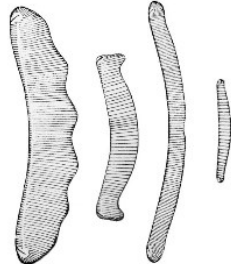
This key was started by Rob Kimmich in October 2014 and last revised on 12-Jun-2022.



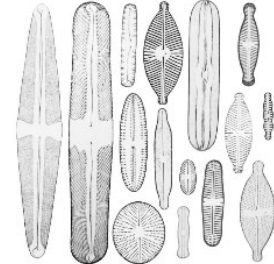
Centric



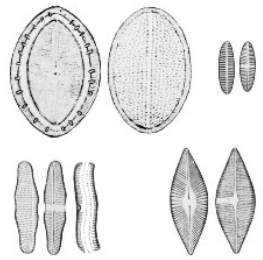
Araphid



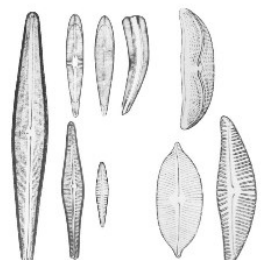
Eunotioid



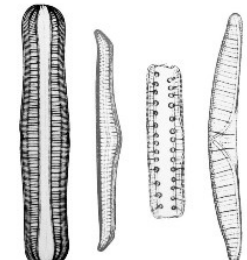
Symmetric Biraphid



Monoraphid



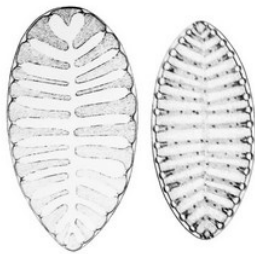
Asymmetric Biraphid



Epithemioid



Nitzschioid



Surirelloid

Image of morphological groups retrieved from Diatoms of North America on 2 Nov 2021 (DONA 2022a).

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1. Valve having radial symmetry.

Symmetric about a point or points. The points (poles) may be central or lateral. Outline circular, oval, elliptical, sometimes polygonal, rarely with shape of crescent or spindle. Processes common. Ornamentation never arranged in relation to a mid-line. No raphe present (Cox 2011, Cupp 1943)

2. Valve usually circular, often with a ring of processes, but without distinctive poles (*Psammodiscus* is circular but is an araphid.) ..... **Radial Centric**

2' Valve with one or more poles. A pole may be an angle, horn, spine, or combination of these. Outline usually oval but sometimes polygonal, circular, or semicircular. (Cupp 1943)

3. Valve with one pole (e.g., *Urosolenia*, *Rhizosolenia*) ..... **Unipolar Centric**

3' Valve with more than one pole (e.g., *Hydrosera*, *Terpsinoë*) ..... **Multipolar Centric**

1' Valve having bilateral symmetry

Symmetric about a line. A line can be the apical or transapical axis.

4. Raphe absent from both valves..... **Araphid**

4' Raphe present on at least one valve.

5. Raphe present on only one valve of the frustule ..... **Monoraphid**

5' Raphe present on both valves.

6. Raphe branches short, usually located on valve mantle and face. (*Peronia* has one valve with diminutive raphe branches.) ..... **Eunotioid**

6' Raphe branches long, each extending from the central nodule. This nodule may be on the valve face or on the margin.

7. Raphe lying in the valvar plane (set on or into the valve face), not in a canal and not supported by fibulae (Cox 2012).

8. Valve symmetric to apical and transapical axes ..... **Symmetric biraphid**

8' Valve asymmetric to the apical axis, the transapical axis, or both axes. (*Rhoicosphenia* on the convex valve has a reduced raphe consisting of short branches lying close to the apices.) ..... **Asymmetric biraphid**

7' Raphe on a canal supported by fibulae (Cox 2012).

9. Raphe lying partly to completely around the valve margin and raised onto a keel or lying on a tall, central keel (Round et al. 1990) ..... **Surirelloid**

9' Raphe lying partly or completely against one of the valve margins, eccentric. (*Bacillaria* is an exception.)

10. Valve strongly asymmetric to apical axis, often arcuate. Transapical costae robust, acting as fibulae beneath the raphe ..... **Epithemioid**

10' Valve usually symmetric to apical axis, not arcuate. Fibulae usually short but sometimes form transapical costae ..... **Nitzschioid**

## Appendix

### Comparison of two key styles

Two styles of dichotomous keys are commonly used: the linked key and the nested key (Wikipedia 2022). Both of these are single access keys, having a single starting point at the beginning of the key. Multiaccess keys are possible by using computers. Single access keys are simpler to build.

A linked key keeps the dichotomous choices together and takes less printed space. By contrast, when adding leads to the key, care must be taken avoid errors in numbering and to avoid orphan leads.

A nested key more easily shows relationships among characters and allows easier rearranging of leads. If deep indenting makes printing difficult, groups can be formed with their own keys. This key uses the dichotomous numbering of the Jepson Manual (Hickman 1993, Baldwin 2012).

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