

1. Alisphaeraceae Young, Kleijne & Cros in Young et al. (2003)

Diagnosis: Coccolithophores, dominant stage of life-cycle typically: motile, bearing heterococcoliths arranged in meridional rows. Coccoliths asymmetrical with edge directed toward flagellar opening extended into a flange or protrusion. Entire coccolith formed of rim units; proto-coccolith ring locus within tube; V-units form upper tube and distal flange; R-units form two-layered lower tube and proximal structures, sometimes with distal extension.

Alternate life-cycle phase typically: motile, bearing quadrate, aragonitic, nannoliths. Nannoliths with conical upper part and cruciform base.

NB The Latin diagnosis is given in an appendix.

Type genus: *Alisphaera* Heimdal 1973.

Taxa included: The genera *Alisphaera*, and *Canistrolithus* are combined in this family on the grounds of very similar, and distinctive coccolith structure. *Polycrater* is included following observation of combination coccospheres (Cros & Fortuño 2002). This is an aragonitic nannolith (Manton & Oates 1980, Young et al. 1999) and strongly supports the family-level separation of this group.

Life-cycles and culture studies: None of these species have been cultured yet. Observations of combination coccospheres of *Alisphaera* with *Polycrater* and of *Canistrolithus* with *Polycrater* suggest that these are alternate phases (Cros et al. 2000a, Cros & Fortuño 2002). By analogy with other taxa, we predict that the heterococcolith phase (*Alisphaera/Canistrolithus*) is diploid and that the nannolith phase (*Polycrater*) is haploid.

Heterococcolith structure: As discussed by Kleijne et al. (2002), the proto-coccolith ring is located approximately halfway up the tube. Our LM observations indicate that the upper unit (D-unit of Kleijne et al. 2002) is the V-unit, this forms the distal flange and upper tube. The R-unit forms the inner and outer layers of the lower tube (with slightly different imbrication directions), and in *Alisphaera* the proximal flange and irregular central area grill.

Young, J. R., Geisen, M., Cros, L., Kleijne, A., Probert, I. & Ostergaard, J. B., 2003. A guide to extant coccolithophore taxonomy. *Journal of Nannoplankton Research*, **S1**: 1-132.