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Phylogenetic, taxonomic and biogeographical studies in the Pithophoraceae (Cladophorales, Chlorophyta)

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Phylogenetic, taxonomic and biogeographical studies
in the Pithophoraceae (Cladophorales, Chlorophyta)



The *Aegagropila*-clade is a unique lineage of algae within the large order Cladophorales and consists of poorly known taxa that mainly occur in brackish and freshwater environments. The clade is sister to the species-rich, primarily marine *Cladophora*- and *Siphonocladus*-lineages. Most of its members occur in narrow niches such as on the carapaces of freshwater turtles (some members of *Basicladia*), on freshwater snails and bivalves (monotypic *Arnoldiella* and several *Basicladia* species), on and endophytically in saltmarsh plants and mangrove pneumatophores (some members of *Wittrockiella*), or on marine intertidal snails (*Cladophora conchopheria*). *Aegagropila linnaei* is the best known representative of the lineage and has gained considerable scientific, cultural and economic fame due to the peculiar lake balls formed under specific conditions.

The confused taxonomy of the *Aegagropila*-clade was clarified using methods of molecular phylogenetic inference, resulting in the re-instatement of the **Pithophoraceae**, descriptions of two new genera and several nomenclatural changes. Phylogenetic analyses led to an understanding of the evolution of the heterotrichous habit as an adaptation to changeable environmental conditions. In selected taxa, topics such as phylogeography and dispersal abilities, historical biogeography and glacial refugia, and ecology and declining populations were studied in detail.