

IDENTIFYING HOMOLOGY IN MORPHOLOGICAL SUBCOMPONENTS OF FULTOPORTULA

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The fultoportulae is considered a homologous structure, and has been the preferred feature for diagnosing membership and shared ancestry among species in the Thalassiosirales. Since the structure's discovery, numerous species have been moved from other centric orders to the Thalassiosirales transforming it from a small genus and species poor group to the largest centric diatom order. Phylogenetic reconstructions utilizing molecular data support the order's monophyly and the fultoportulae's derivation in the group. Systematic studies considering relationships among Thalassiosirales species have used morphological components of fultoportula as putative homologies for reconstructing evolutionary relationships. Many of these features have withstood tests of homology, and relationships reconstructed using morphological features have been validated with analyses utilizing multiple genes as the basis for phylogenetic reconstruction. These homologous morphological components of the fultoportula have utility in diagnosing monophyletic subgroups within the Thalassiosirales, but are rarely considered or illustrated in investigations describing and comparing species. Even when fultoportula morphologies are compared among species, discussions are limited to comparisons coarse comparisons of non-homologous features such as satellite pore number. In this presentation, we review the fultoportulae's morphological composition and clarify terminology for these morphological subcomponents. These features are then discussed in context of the current understanding of evolutionary relationships among Thalassiosirales species. Structures with utility as diagnostic features are highlighted and information is provided concerning how these features should be illustrated in species descriptions and comparisons. Additionally, morphometric patterns in distribution of valve face and marginal fultoportulae are discussed and suggestions are presented concerning how these patterns should be documented in morphologically focused investigations.