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# APPROACH TO THE PHYLOGENY OF AXINELLIDAE (PORIFERA: DEMOSPONGIAE) USING MORPHOLOGICAL AND MOLECULAR DATA.

*Memoirs of the Queensland Museum* 44: 43. 1999:- A set of 27 species of marine sponges of the Axinellidae and related families was selected with the aim of testing the monophyly of Axinellidae and investigating their phylogenetic relationships using cladistic methods. Partial 28S rDNA sequences, including the D3 domain, and traditional morphological characters were used independently to construct phylogenetic trees. Alignment of the sequences using the appropriate model of secondary structure of the RNA was compared to that produced by the ClustalW. The alignment using secondary structure constraints produced a better estimate of the phylogeny and was demonstrated to be an effective and objective method.

The results from the analyses of the molecular and morphological data sets are not fully congruent; the morphological data suggest that Axinellidae is monophyletic, however the molecular data suggest

that it is not monophyletic. In both cases the sampled members of the family are closely related to those of Halichondriidae and Dictyonellidae. Tests of heterogeneity (reciprocal T-PTP and partition homogeneity test) shown that the data partitions are heterogeneous, which could be due to sampling errors (in either data set) or differences in the underlying phylogenies, and therefore data were not combined in a single analysis. □ *Porifera, Axinellidae, secondary structure, D3 domain 28S ribosomal DNA, phylogeny.*

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