

The bryozoan family Adeonidae as potential model organism for evolutionary studies

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Owing to their clonal nature and the presence of polymorphic zooids, bryozoans are potentially excellent model organisms in evolutionary studies that aim to answer questions concerning, among others, the development of new morphological traits, functional morphology, or carbonate secretion. As most taxa also have a decent fossil record, findings of analyses of modern species can be verified and traced back through time and space.

The family Adeonidae has been selected for such a comprehensive study as it combines numerous advantages. For instance, the Adeonidae are distributed globally and often form large, erect and colourful colonies, often in relatively shallow depths, which means that the species can be easily detected and sampled by scuba diving. Their colour and erect growth strongly suggests that the species host symbiotic bacteria that produce potent secondary metabolites in order to keep predators away. In addition, the species have evolved different types of heterozooids (termed avicularia) with which they can mechanically defend themselves. In contrast to most other bryozoans, which brood their embryos in globular structures that are exposed on the colony surface, and which are therefore prone to predation, brooding in Adeonidae takes place internally within specialised brooding zooids. All species are also well calcified and have a fossil record that goes back to at least the Eocene (i.e. some 50 million years). While the skeletons of all species are primarily calcitic, some have bimineralic skeletal walls and consist partly of aragonite.

In this talk I will give an introduction to the peculiar biology of the Adeonidae, demonstrate the usefulness of this taxon in answering a variety of general and specific evolutionary questions, and present preliminary results concerning their phylogeny.