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Abstract

Although the order Zoantharia (Cnidaria: Anthozoa) is distributed worldwide and plays important ecological roles, biogeographic patterns of zoantharians and their symbionts are poorly known. In my thesis I contributed to fill this gap with unprecedented large-scale analyses of species' distributional data combined with ecological traits.

In the first seven chapters I explored Zoantharia diversity across the globe. This included results that showed multiple sibling species between ocean basins and that such patterns are likely due to recent vicariant events. In chapters 8 to 12, I examined ecological traits of the order Zoantharia and their influence on species distributions and evolution. Many zoantharians are widespread, and I discussed potential dispersal mechanisms including rafting strategies. I also used stable isotope analyses to reveal that zoantharians can have a flexible nutrition acquisition mode, which contributes to survival across different environments. Furthermore, ancestral reconstruction analyses indicated that traits such as symbioses and large polyp size were gained and lost in multiple clades.

Lastly, I undertook global biogeographic analyses and my results showed similar diversity centers for both Zoantharia and associated symbionts, yet, the relationship of biogeographic provinces was distinct for endosymbiotic and epizoic interactions. The most notable patterns of Zoantharia zoogeography were that most families are cosmopolitan and that there is a relative low endemism rate, while cluster analyses grouped some biogeographical provinces of the Indian/Pacific oceans within a clade of Atlantic Ocean provinces.