

Implementation of biotic interactions in niche analyses unravels the patterns underneath community composition in clownfishes

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Abstract

Biotic interactions are key to understanding the ecology of species and communities. As such, integrating biotic interactions into ecological niche modelling methods has been a central topic of research for the last decade. Yet, the role of biotic interactions remains overlooked. Mutualistic systems constitute perfect study cases for analysing the effect of biotic interactions on species niches and communities' composition. Using the clownfish-sea anemone interaction, we integrate mutualistic interactions into a niche quantification framework to analyse the effect of biotic interactions in the estimation of species niches; and competition patterns among clownfish communities. Our results show that ignoring biotic interactions can strongly affect species ecological niche estimations. More importantly, sea anemones seem to mediate competition among clownfishes, structure communities and allow coexistence in competitive environments. These findings strongly support the importance of biotic interactions in shaping communities. Future studies could use the proposed analytical framework, which could also serve multiple conservation purposes.

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