**The impact of Rapid environmental change on the evolution of immunogenetic diversity in coral reef fishes**

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The innate immune system acts as the front-line for organisms defending themselves from any pathogens attacks. However, how rapid environmental shifts have shaped the evolution of the innate immune system remains unclear as the diversity of core receptors that comprise the molecular basis of the innate immune response remains poorly understood across the vast majority of vertebrate species. This is particularly problematic for tropical coral reef fishes, which face an uncertain future of shifts in pathogen exposure coincident with forecast environmental changes. In this study, we focus on the iconic family of Holocentrid fishes. We use comparative evolutionary methods (such as IQ-TREE - IQPNNI and TREE-PUZZLE) to understand the impact of the ecological collapse of the West Tethyan Biodiversity Hotspot 40 million years ago on several gene families involved in their innate immune response. We find different dynamics of persistence and diversification underlie the evolution of Toll-like receptors when compared with Novel Immune Type Receptors (Human NK receptor analogues). We further find differences between Myripristines and Holocentrines, indicating a deep divergence in gene family evolution coincident with the fragmentation of the Tethys, as well as high levels of lineage specific paralog evolution. Collectively, our results provide the first assessment of how the collapse of a biodiversity hotspot shaped the evolution of the coral reef fish immunome.