Speciation in pebble beaches

Exploring an intertidal fish radiation

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Background

Mostly invisible to the human eye, miniaturised and characterized by a hidden lifestyle, “cryptobenthic” fishes are among the scientifically least studied groups of vertebrates on this planet. Denoted as the “hidden half”\(^1\), cryptobenthic fish diversity is thought to be considerably underestimated, even in generally well studied biomes like the Mediterranean Sea. This is especially true for the monotypic clingfish genus Gouania, a Mediterranean endemic, inhabiting the interstitial of intertidal gravel beaches. Indeed, only few species of vertebrates worldwide cope with the life-hostile conditions prevailing in this particular environment\(^2\). However, the results of my Bachelor and Master theses revealed that the genus harbours at least five (four more than originally thought) fairly distinct species that have been diversifying since millions\(^3\).

Additionally, Gouania come in two morphotypes, “slender” and “stout”, that convergently evolved in the Eastern Mediterranean and the Adriatic Sea. This independent evolution of morphology likely mirrors the adaptation to certain microhabitats which was shaped by different selective pressures acting in these environments. Using cutting edge technology (such as high quality genomic data), but also more classical approaches, I aim to illuminate this enigmatic system from different methodological angles in the course of my 3-year funded ÖAW DOC fellowship project (see right & below).

References