



## **Historical ecology of the northern Adriatic Sea: Down-core changes in molluscan death assemblages as indicators of ecological shifts**

Ivo Gallmetzer (1), Alexandra Haselmair (1), Adam Tomasovych (2), Michael Stachowitsch (1), and Martin Zuschin (1)

(1) Department of Palaeontology, University of Vienna, Austria, (2) Geological Institute, Slovak Academy of Sciences, Bratislava, Slovakia

Modern marine ecological studies investigating ecosystem responses to environmental changes are normally restricted to annual or decadal time scales. The historical ecology approach used in the present study aims to shed light on the younger ecological history of the northern Adriatic Sea, targeting the period of the last 500 to 2000 years that have experienced major anthropogenic ecosystem impacts. Our investigations focus on down-core changes in death assemblages of benthic hard-part producers (molluscs, foraminifera, ostracods), where the degree of variation between different community structures serves as a proxy for ecological shifts. The northern Adriatic Sea, with its densely populated shoreline, lists among the most degraded marine ecosystems worldwide and is therefore particularly suited to study ecosystem modification under human pressure. Another advantage of this study area is the availability of historical data from marine surveys dating back to the 1930s. We incorporate these data in our analyses of more recent ecological shifts.

More than 50 cores of 1.5 m length and diameters of 90 and 160 mm were taken at seven sampling stations throughout the northern Adriatic Sea, covering different sediment types, nutrient conditions and degrees of exposure to bottom trawling. The cores were sliced into smaller subsamples and analysed for species composition, abundance, taxonomic similarity, evidence for ecological interactions (i.e. frequencies of drilling predation) and taphonomic condition of shells. First results concerning down-core changes in species composition and abundance point to significant differences within single cores as well as between sites. The radiometric dating of the sediments revealed substantial differences in sedimentation rates and in the ratio between sediment depth and age. This information, together with carbon-calibrated amino acid- racemisation (AAR) of shells from selected species, will help to specify the timing of major ecological changes. Our approach should also deliver an image of “pristine” benthic communities that can serve as a reference for future conservation and management efforts in the northern Adriatic Sea.