



Basin-wide homogenization of soft-bottom benthic communities in the wake of anthropogenic habitat degradation in the northern Adriatic Sea

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We studied the origin and collapse of Holocene benthic baseline communities in the northern Adriatic Sea from sediment cores and surface grab samples at eight widely spaced sites. They cover areas with sedimentation rates spanning two orders of magnitude, with different nutrient input and with different degrees of time-averaging, ranging from decadal to millennial temporal resolution. Data from sediment cores indicate that during the transgressive phase and maximum flooding, sea-level and establishment of the modern circulation pattern determined the development of benthic communities in shallow-water, vegetated habitats with epifaunal biostromes and, in deeper waters, with bryozoan meadows. After sea-level stabilization, the composition of these baseline communities remained relatively uniform and started to change markedly only with the intensification of human impacts in the late highstand, leading to a dominance of infauna and a decline of epifauna at all sites. This profound ecological change reduced species richness, increased the abundance of infaunal suspension feeders, and led to a decline of grazers and deposit feeders. Live-dead data from grab samples give deeper insight into the degree of anthropogenic impact in historical times. At all sites the living assemblages differ strongly from the death assemblages. At some sites from oligotrophic settings with low sedimentation rates, a total overturn in the community composition is obvious: formerly abundant species have disappeared completely, while the living assemblage is numerically dominated by species that were not present before. Even at sites, which are characterized by physically stressful conditions (i.e., high sedimentation rates in the Po delta), some species that were abundant in the death assemblage have totally disappeared from the living assemblage. Comparison with the dataset from sediment cores documents the recent establishment of an impoverished community, which has no analogue in the Holocene history of the northern Adriatic Sea.