



## **Shelf gradients of echinoid assemblages from the Miocene of Sardinia**

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Well exposed Miocene echinoid assemblages from Sardinia representing various environmental settings including both siliciclastics and carbonates have been studied with respect to reconstructing palaeoenvironmental conditions along a shelf gradient. The basis of this study includes 1) detailed logging of sedimentary facies in the field, 2) interpreting their behavior and life habits of the preserved echinoids by applying functional morphological reconstructions of the echinoid skeletons and comparing them to related Recent echinoid taxa, 3) quantifying taphonomic features of test preservation including predation, abrasion, fragmentation, encrustation and bioerosion, and finally 4) analyzing accompanying fauna and flora as well as trace fossils.

The assemblages included clypeasteroid dominated assemblages in shallow water settings where often mass accumulations of sand dollars are present. Spatangoid dominated assemblages are found in more offshore settings where diversity is determined by varying burrowing depths, feeding strategies and resource partitioning accompanied by varying rates of bioturbation and episodes of sediment deposition by storms. Mixed assemblages also occur ranging from shallow to deeper water with varying substrates including sea grass, as well as coarser and finer sediments. Finally, deeper water monotypic assemblages are present in storm-dominated siliciclastic shelf environments including both regular and irregular echinoids. In general, echinoid presence is determined by the ecological preferences of the taxa involved, their propensities for gregarious behavior, the differential preservation potentials of the varied skeletal architectures present as well as sedimentary environment in which they occur.