

ABSTRACT

Analyses of dispersion patterns, habitat preferences, diel activity and feeding cycles, grain size selection when feeding and the source of organic carbon utilized, have been used to assess the niche dimensions of species in a deposit-feeding assemblage of six holothurians, Holothuria mexicana, H. arenicola, H. thomasi, Isostichopus badionotus, Actinopyga agassizi and Euapta lappa, and two spatangoid urchins, Meoma ventricosa and Plagiobrissus grandis, in the shallow western lagoon at Discovery Bay. Similar investigations were conducted on the clypeastroid urchin, Clypeaster rosaceus, in the eastern lagoon. The species are characterized by: aggregated dispersions and recognizable habitat associations, except in A. agassizi, which was randomly dispersed; nocturnal activity and/or feeding, with various degrees of diurnal crypsis, except in the infaunal H. arenicola and P. grandis; non-selective feeding with respect to grain size, and; exploitation of bacteria and, perhaps, detritus as a source of organic carbon. Two pairs of species coexisting at different locations, H. mexicana/I. badionotus and M. ventricosa/P. grandis, showed virtually complete overlap of resource utilization, in circumstances in which food resources were non-limiting, due to the low densities of the species. Resources were probably also not limiting for other species in the assemblage, which nevertheless showed niche separation based on microhabitat differences. An hypothesis is advanced which accounts for these phenomena as results of predation, which operates by maintaining population levels sufficiently low for coexistence of species with mutually indistinguishable niches, and by regulating habitat preferences in species which require diurnal cover to avoid predation. Investigations of the dissolution of calcium carbonate in the guts of H. mexicana, I. badionotus, H. arenicola, M. ventricosa, P. grandis revealed that the spatangoids do not dissolve CaCO_3 , while the small but measurable dissolution occurring in the holothurian guts is of no geological or sedimentological significance.