

## Biodiversity and ecosystem functioning in coastal lagoons: Does microbial diversity play any role?



"Although prokaryotes are small in size, they are a significant biomass component in aquatic ecosystems and play a major role in biogeochemical processes. It is generally assumed that the relative importance of prokaryotes to material and energy fluxes is maximized in low-productivity (oligotrophic) ecosystems and decreases in high-productivity (eutrophic) ecosystems. Lagoon and coastal ecosystems are extremely dynamic, typically highly productive and dominated by macro-size organisms (both macrofauna and macrophytes). As such, their functional characteristics are typically evaluated from a "macrobial" perspective. An efficient ecosystem functioning, with fast nutrient cycling, high productivity, low C accumulation and lack of hypoxic/dystrophic crises is, however, intimately dependent on the interaction between microbial and macrobial organisms. We make here an attempt to relate prokaryote biodiversity (genotype richness, using fingerprinting techniques, ARISA) and ecosystem functioning (using a series of parameters including meiofaunal biomass, prokaryote C production and organic matter turnover rates) in different Mediterranean lagoon systems. The lagoons differed significantly with each other for all the variables. While no relationships were observed between the environmental characteristics of the lagoons and the bacterial diversity, the latter was significantly and positively correlated with the functioning and efficiency of the lagoons. The investigation of the links between microbial diversity and functioning in

lagoons is still at its infancy, but these preliminary results suggest that a better understanding of the role of prokaryote diversity on ecosystem functioning and efficiency could open new perspectives for the conservation and management of these highly productive and vulnerable ecosystems."

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