



## **Population dynamics of suspension feeders structuring the Mediterranean rocky shores: simulations of possible scenarios based on mortality events of 1999 and 2003.**

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Gorgonians are among the most long-lived marine animals. Provided of complex morphologies, they are “structuring species” shaping the benthic communities of Mediterranean rocky shores. Several populations of the red gorgonian (*Paramuricea clavata*) and the red coral (*Corallium rubrum*) in the North-Western Mediterranean, have been affected by mortality events in 1999 and 2003, which were associated with a sharp temperature increase linked to GCC. As a consequence of these mortality events, the *P. clavata* population living in the Gulf of La Spezia (Ligurian Sea, Italy), reduced by 74% and the dominant size class in the population shifted towards smaller-younger colonies. However, in the last years this population revealed an unexpected resilience capability. Some shallow-water *C. rubrum* populations in Italy and France suffered, at the same time, a mortality affecting 8-15 % of the colonies. In order to simulate the effects of such mortalities on the structure and dynamics of gorgonian populations we developed demographic models, based on Leslie-Lewis transition matrixes, that allowed projecting the population trends over time. Results suggest that, also if both gorgonian populations show a good resilience due to the high reproductive output of the younger-smaller colonies an increased frequency of such mortality events, if coupled with other mortality sources, could lead local populations to extinction.