

ID: W2802600793

TITLE: Demographics of the zooxanthellate coral *Oculina patagonica* along the Mediterranean Iberian coast in relation to environmental parameters

AUTHOR: ['Eduard Serrano', 'Marta Ribes', 'R Coma']

ABSTRACT:

Marine ecosystems are threatened by cumulative human-related impacts that cause structural and functional alterations. In the Mediterranean Sea, the zooxanthellate coral *Oculina patagonica* (Scleractinia, Oculinidae) can turn algal forests into coral-dominated ecosystems and provides a case study for examining how zooxanthellate corals can affect the structure of algal-dominated shallow-water rocky ecosystems in temperate areas. Our goal was to provide a quantitative baseline assessment of *O. patagonica* demographics along ~1300km of the Mediterranean Iberian coast and relate them to environmental parameters. The highest coral success was in the South Balearic Sea zone, where the populations exhibited >6-fold higher mean living coral cover, lower partial colony mortality and colony size distributions indicating that the populations in this zone were growing faster than those in the peripheral south-west (North Alborán Sea) and north-east (Mid and North Balearic Sea, and West Gulf of Lyons) zones. The coral demographics (i.e., density, cover, and skewness and kurtosis coefficients of colony size distributions) were positively correlated with each other and the annual mean seawater temperature (ST), 10th-ST percentile (P10th-ST), 90th-ST percentile (P90th-ST) and photosynthetically active radiation at 3-m depth (PAR-3m), but they were negatively correlated with chlorophyll-a. Based on these results, we identified the following thresholds that may constrain the growth of *O. patagonica* colonies and populations: annual mean ST <19-20°C, P10th-ST <14°C, P90th-ST <25°C and >27°C, and PAR-3m <30molphotonsm<sup>-2</sup>day<sup>-1</sup>. The species abundance along the Iberian coast conforms to the abundant-center pattern of distribution. However, the coral demographics indicated that this pattern was not only related to the time of establishment but also to differences in coral population growth, which were correlated with key environmental parameters. Our results contribute understanding of the forces driving population growth of *O. patagonica* and support the hypothesis of an ongoing coral-mediated tropicalization of macroalgae-dominated temperate ecosystems.

SOURCE: Science of the total environment

PDF URL: None

CITED BY COUNT: 8

PUBLICATION YEAR: 2018

TYPE: article

CONCEPTS: ['Demographics', 'Coral', 'Mediterranean climate', 'Mediterranean sea', 'Geography', 'Oceanography', 'Ecology', 'Fishery', 'Biology', 'Demography', 'Geology', 'Sociology']