



Inferred level of calcification decreases along an increasing temperature gradient in a Mediterranean endemic coral

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ABSTRACT: The correlation between solar radiation and sea surface temperature (SST) and growth was assessed along a latitudinal gradient. Extension rate and skeletal density were both correlated with calcification rate, indicating that calcium carbonate deposition was allocated evenly between skeletal density and linear extension. Unlike most studies on other tropical and temperate corals, in which calcification was positively correlated with solar radiation and SST, in the present study calcification was not correlated with solar radiation, whereas it was negatively correlated with SST. We hypothesize that photosynthesis of the symbiotic algae of *Balanophyllia europaea* is inhibited at high temperatures, consequently causing an inhibition of calcification. The regressions between calcification and SST predicted that the calcification of *B. europaea* would be depressed at 20.5-21.0° C mean annual SST. The scenarios of the Intergovernmental Panel on Climate Change conclude that by 2100, SST will exceed this physiological threshold for most of the populations considered in this study. This study comprises the first field investigation of the relationships between environmental parameters and calcification of a Mediterranean coral and highlights the risks of losing Mediterranean marine biodiversity over the course of future decades.

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