

1 **Could the intertidal *Ellisolandia elongata* reef be affected by climate changes expected in**
2 **the near future in the Mediterranean Sea?**

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30 **Abstract**

31 The concentration of Green House Gasses and specifically the concentration of CO₂ in the
32 atmosphere is continuously increasing since the industrial revolution and it is the most
33 relevant anthropic cause driving climate changes. Two of the strongest symptoms of those
34 changes are the Global Warming and the Ocean Acidification which are progressively altering

35 marine ecosystems and the populations of living organisms they support.

36 The Mediterranean Sea is widely considered a 'laboratory basin' by suffering dramatic
37 changes in its oceanographic and biogeochemical conditions derived from natural and
38 anthropogenic forces. Calcifying seaweeds are the most important 'bioconstructors', from
39 mesolittoral to circalittoral fringe, providing habitats and ecological niches for other species
40 (i.e. biodiversity promoters) but also are good 'recorders' of the environmental condition they
41 experience (i.e. bioindicators).

42 In this study we focused on the reef-forming *Ellisolandia elongata* from the Gulf of La Spezia
43 (N-W Mediterranean Sea) by comparing the physical properties, growth rate and abundance
44 of associated fauna in natural and experimental conditions (temperature and pH expected for
45 2050-2100).

46 Four sampling sites were chosen in the intertidal zone. Reef samples were brought in the
47 laboratory and put in experimental conditions for a month. Four aquaria simulated the actual
48 conditions of temperature and pH, other 4 aquaria simulated temperature (+3°C) and pH (7.7)
49 expected for the year near future. *E. elongata* grown in the natural and experimental
50 conditions withstand mechanical stress in slightly different ways. The study of the effect of
51 temperature and pH variations on growth rate and associated fauna of *E. elongata* reef is still
52 in progress.