



## Behavior of *Dictyota dichotoma* in acidified environments

Vitale Ermenegilda<sup>1,2,\*</sup>, Rosa Donadio<sup>1,2</sup>, Lucia Buono<sup>1</sup>, Erika Fabbrizzi<sup>1,2</sup>, Patrizia Stipcich<sup>1,2</sup>, Simonetta Frascchetti<sup>1,2,3</sup>, Carmen Arena<sup>1,2</sup>.

\*Lead presenter: [ermenegilda.vitale@unina.it](mailto:ermenegilda.vitale@unina.it)

1 University of Naples Federico II, Department of Biology, Via Cupa Cinthia, 80126 Naples, Italy

2 National Biodiversity Future Center (NBFC), Piazza Marina 61, 90133 Palermo, Italy

3 CoNISMa, Consorzio Nazionale Interuniversitario per le Scienze del Mare, Roma, Italy

Within the Mediterranean Sea, Ischia Island (Italy) offers a natural laboratory where CO<sub>2</sub> vents generate chronic low-pH conditions, making it an ideal setting to study ocean acidification's long-term effects, a relevant concern in the semi-enclosed Mediterranean basin. Previous studies of the Ischia macroalgal community have highlighted the tolerance of the brown alga *Dictyota dichotoma* to acidic conditions among rocky shore macroalgae. This study provides a portrait of the macroalgal assemblage at Ischia Island in acidified sites, exploring the functional and biochemical adaptation strategies of *D. dichotoma* along the natural pH gradient. Sampling was conducted at three sites spanning the acidification gradient: low pH (6.25), intermediate pH (7.14), and control pH (8.13), each including three replicated areas. An external sampling control area was also included to prevent possible influence from the pH gradient. The results showed a progressively simplified assemblage from the control to the acidified site, which was completely dominated by *D. dichotoma*. With decreasing pH levels, the individuals reinforced their structural tissues and increased antioxidant defenses in order to reduce the oxidative damage and support photosynthetic efficiency. These results provide a good basis for future long-term monitoring efforts, useful for the assessment of temporal changes in *D. dichotoma* productivity and offering a deeper insight into the adaptive responses of this and other species under future high-CO<sub>2</sub> ocean conditions.