

Primeira Sessão: Ecologia e Fisiologia – Pôsteres

Does photosymbiosis affect coral metabolism? An experimental approach under simulated climate changes

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Coral reefs are valuable, essential ecosystems: although they cover less than 0.1% of the ocean floor, they host approximately 25% of all marine biodiversity. Stony corals (Anthozoa, Scleractinia) show 21 independent appearances of symbiosis with intracellular photosynthetic dinoflagellates, and four events occurring in lineages with facultative mutualism, all from an asymbiotic, plesiomorphic condition. The historical profile of scleractinian coral diversity reveals that symbiotic forms were the most affected during the Cretaceous-Paleogene extinction, and the same holds true in the Anthropocene, as 75% of the world's reefs are threatened by bleaching (expulsion of symbionts and/or chlorophyll degradation). Therefore, the objective of this project is to test, under simulated conditions of warming (+3.5°C) and acidification (-0.6 pH unit) for 15 days of exposure, whether: (i) symbiotic corals show a greater reduction in oxygen consumption; (ii) symbiotic corals demonstrate higher levels of oxidative stress; (iii) asymbiotic corals show lower reductions in enzyme activities of energy metabolism and calcification process. The absence of photosymbiosis should promote a higher tolerance to simulated climate changes in scleractinian corals owing to the putative more balanced redox homeostasis under stressful conditions. The evolution of physiology associated with symbiosis acquisition, as well as the comparative perspective on oxidative and energy metabolism in the face of climate change, will reveal the role of shared ancestry in coral sensitivity, as well as shed light on some of the physiological causes of the potential greater tolerance of asymbiotic corals.

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