Design and Creation of an Artificial CaCo3 Porous Reef Prototype as a Support Structure for the Adaptation Capacity of the Marine Ecosystem

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Climate change is a global problem that has adversely impacted marine ecosystems, especially coral reefs, by causing their bleaching and their destruction. The purpose of this study was to design cost effective and ecofriendly artificial prototypes of coral reefs, to prove their effectiveness as a support structure capable of positively impacting the adaptation capacity of the marine ecosystems. Fifteen artificial reefs prototypes were designed and segregated in 3 groups: porous with CaCO3, porous without CaCO3 and with smooth surface without CaCO3. These artificial prototypes were placed in the ocean attached to natural coral reefs. In the artificial porous reefs with and without CaCO3 abundant green algae were observed growing, as well as some other type of ecosystem around the artificial prototypes. It was observed that, in the artificial porous reef prototypes built with CaCO3, there was an increased algae growth and the presence of other marine organisms. In the artificial porous reefs without CaCO3 the growing of the algae was observed with less marine organisms around them. All the artificial porous reefs prototypes remained in their original structure; there was no evidence of erosion or structural changed. The hypothesis was validated, thus, an artificial porous reef prototype with CaCO3 was more effective as a support structure to the adaptation capacity of the marine ecosystems.

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