

Settlement and Survival Patterns of Coral Spat Across a Newly Developed Settlement Substrate

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ABSTRACT

Coral reefs are crucial to the health and biodiversity of ocean ecosystems. However, they face many threats, including ocean warming. A study by Mayard *et al.* (2019) exhibited 67% coral cover loss between 2012 and 2018, among 35 surveyed coral reef sites in Saipan, within the Commonwealth of the Northern Mariana Islands (CNMI). There is a critical need to investigate ways to optimize coral growth and survival. Mortality rates of newly settled and juvenile corals are naturally high, but restoration practices like supportive breeding, which include fertilizing gametes and settling larvae on artificial substrates, can improve their survival.

This study will assess larval settlement and survival of *Acropora muricata* corals amongst various areas of a newly developed dome-shaped settlement substrate. The substrate areas include the top, ridged sides, shaded grooves, and the bottom. All settlers on each area of 30 substrates were counted under a microscope, then tagged and out planted onto a patch reef in the Saipan lagoon. The substrates will be retrieved in two weeks and recounted to determine if settlers on specific areas of the substrate have different short-term survival rates.

This study will contribute information on the effectiveness of a new coral settlement substrate to be used in coral restoration efforts, further develop and improve research designs, and potentially lead to other conservationists implementing these substrates. This information will also help researchers better understand coral larval settlement and survival patterns and how they are affected by biological factors, such as settler density and substrate structural features.

KEY WORDS: Thermal stress, Coral recruitment and juvenile, *Acropora muricata*, Settlement substrate

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