

Using non-invasive method to detect the actually growth rate of hard corals on electro-stimulated structure in Sabang-Aceh, Indonesia

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Abstract

The aim of this study is to evaluate the coral transplantation that stimulated by electrolysis process as known as a biorock technique. Biorock is capable producing minerals by applying a low voltage direct electrical current, which is commonly recognized as mineral accretion. The study will use following materials, i.e. iron, titanium mesh, solar panel, power supply, controller, wire, cable ties, epoxy, multimeter, GoPro 3+ black with dual 3D hero system, a camera sitting frame, a distance metal for camera with calibration bar, underwater stationery, diving equipment, coral fragments and a software which can generate the 3D model base on underwater photos. We have conducted two trials including swimming pool and Kenting between November 2018 to March 2019 with either coral skeleton or live fragments. Through series of photographs covered a parametric view of fragments, we are able to develop an auto-detected software which can generate the 3D model of coral fragment. The software is expected to complete around May 2019. This software will be used to estimate surface area and volume of fragments in the field. Three electro-stimulated structures will be installed at 5m depth in Sabang-Aceh with an additional control (no-electricity). This study uses 3 genera comprising of *Acropora*, *Pocillopora* and *Porites*. The number of *Acropora* and *Pocillopora* at a biorock structure are 16 fragments that are obtained from 4 different colonies, respectively. While, samples of *Porites* are 32 fragments consisting of 8 different colonies. Therefore, samples are scattered on a structure has 64 live fragments. Then, the total coral fragments that will be used for 3 biorock structures and a control structure are 256 fragments. All coral fragments will be photographed with a fix distance between lences and coral fragment. We will collect photos every four months in a year. Several projects will be developed base on this experimental design including the biodiversity of benthos associated with this structure and mineral composition on cathode etc.

Keywords: electrolysis, coral, 3D modelling