

## DEVELOPING A NEW ARTIFICIAL REEF MATERIAL USING ARTIFICIAL LIVE ROCK (ALR) FOR MARINE HABITAT RESTORATION

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### ABSTRACT

Artificial reefs are mostly adopted to enhance the biological and ecological benefits for the marine ecosystem. In Malaysia, the first artificial reef material was from tyres and introduced in 1975. Since then, various artificial reefs material has started to emerge such as wood, metal, concrete, ceramic and PVC. This study aimed to develop a new material, namely artificial live rock (ALR) that can be potential to be used as artificial reef material for marine habitat restoration. ALR was adopted from the natural live rock which is the foundation for the marine ecosystem. Designated ALRs were deployed at Tioman Island in March 2018 at three different locations, namely Teluk Salang, Teluk Bakau and Teluk Sanggit with a total of 250 pieces of ALR. In this work, terracotta tiles have been used as a control. The ALRs and tiles were retrieved with three months interval until June 2019. Identification in terms of coral spat species and macrobenthic organisms was done after retrieval. The coral spat was identified based on the morphology of their columella, septa and corallite wall by using Dinolight Digital Camera. Three species of coral juveniles (*Pocillopora damicornis*, *Stylophora pistillata* and *Seriatopora hystrix*) were found attached on ALR surfaces. Whereby, 11 phyla of epibenthic organisms were found attach on ALR. Percentage coverage of epibenthic calculated using Coral Point Count with Excel extension (CPCe) shown ALR was dominated by coralline algae (CCA) and has a significant difference ( $p < 0.05$ ) with tiles at all sites. The presence of CCA was a good indicator since CCA have positive effects on coral settlement and recruitment. Based on the results, ALR only takes 12 months to become a good substrate for epibenthic organism and corals juveniles. Hence, ALR is an ideal material that can be applied and has a huge potential to be upgraded as an artificial reef in the future.

**Keywords:** Artificial reef, artificial live rock, live rock, coral juveniles.