

Thesis Title Biotic Communities Around
Artificial Reef in the Gulf of
Thailand

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ABSTRACT

The study of biotic communities around artificial reef in the gulf of the Thailand was held on 1993 - 1994. The methodology was consisted of site selection, material selection, artificial reef installation and monitoring observation. Ten sites: Ko Sak, Ko Krok, Ko Larn, Ko Kluangbadal, Ko Chan and Ko Kudee in Rayong province and Ko Kradat in Trad province, were used for study on physical and biological parameters. The physical parameters; i.e. water temperature, salinity, alkalinity, dissolved oxygen, sedimentation rate, turbidity, dissolved nitrate, nitrite and phosphate were studied and the studies of seafloor charcters, direction and velocity of current were also included. The biological parameters : the quantity of fish in the selected area and targeted reefal community by visual census technic as well as the benthic life from were studied by using Australian Institute of marine Science's method. From the observation of those parameters, the results showed that Ko Sak was the most suitable site for artificial reef installation in this study.

Four types of materials; concrete block, tyres, plastic plate and bamboo stem were used for installation on horizontal and vertical plan at each studied sites. The biomass accumulated on those materials were investigated every month for 1 year. We found that the plastic plate on vertical axis were the best substrate for biomass settlement. The biomass weight on plastic plate on vertical axis at Ko Sak was 17.15 mg/sqcm/year, followed by tyres sheet, which was 16.52 mg/sqcm/year. Due to the high cost and difficulty in fixing plastic plate on the sea floor, it was then wise to use the tyre as the selected material for the artificial reef at Ko Sak.

The installation of tyre artificial reef at Ko Sak was conducted in December, 1992 by laying two hundred bundles of 5 tyres in the area of 2,500 squaremetres at depth of 10 metres at Ko Sak. Quantity of biomass which were accumulated on these tyres were investigated along with numbers and species composition of immigratory fish around this artificial reef. The settlement of biomass onthis artificial reef was devided into 3 stage. The first stage, the filamentous green algae, calcareus algae and polychaetes were settled and covered the investigated sheet rapidly within 1-3 months. The second stage started on the third or fourth month after the installation, the other invertebrates such as foranminiferan, ascidian, calcareous sponge tunicates and tube polychaetes including the planular larvae of corals and other anthozoans were covered the algae film especially the calcareous algae in the first stage algae in the first stage very well. The third stage was the stage of competition between the living organisms on the investigated sheet. This mechanism would controlled the populations on the investigate sheet in this level. And the monthly increasing weight of biomasses were decreased from the last two months. A lot of anthozoan larvae occured on the bare spaces and covered some calcareous algae during November and December.

In December, 1993, we found 44 colonies of 3 genera of corals occured on this artificial reef. The three genera are *Porites*, *Acropora*, and *Pocillopora*. Ninety species of 32 immigratory fish families were found in this area and pomacentridae was the dominant species.

From this study, we can state that tyre artificial reef in suitable site can use to rehabilitate the coral community and use in order to promote the sustainable development of other marine resources.