CORAL ECOLOGY OF A UNIQUE CONTINENTAL ISLAND
OF PULAU PERAK, KEDAH, MALAYSIA

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KUALA LUMPUR

2011
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DISsertation submitted in fulfilment of the requirements for the degree of Master of science

INSTITUTE OF BIOLOGICAL SCIENCES
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KUALA LUMPUR

2011
UNIVERSITI MALAYA
ORIGINAL LITERARY WORK DECLARATION

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Abstract

Coral reef research in Peninsular Malaysia has mainly been concentrated on the east coast with little emphasis on the Straits of Malacca (SOM) in the west coast. The coral reefs in SOM are extremely important, more so than their east coast counterparts due to the fact that they are only a few viable coral reef ecosystems in SOM. In the northern part of SOM stands Pulau Perak, an island which has underwater vertical reef walls. Pulau Perak reef walls are unique compared to other continental islands in Peninsular Malaysia which have typical fringing reefs. In addition the scientific knowledge of reef wall coral ecology is scarce. Therefore the present study had two objectives aimed to address this knowledge gap. For the first objective a belt-quadrat method on vertical transects with 5m intervals was used from 0 - 45 m depth. The results showed significant differences between East and West reef wall benthic community substrate cover and their coral growth-forms along the depth gradient. On the East Wall similar ‘Live Coral’ cover and coral growth-forms indicated that the this wall had an analogous environment from the surface of the water until to the depths of 45 m. Whereas for the West Wall, ‘Live Coral’ cover was found to be less in deeper depths of 30-45m (p<0.001) and dominance of coral growth-forms changed with depth. These differences are speculated to be due to the orientation of the wall to sunlight and its quality. For the second objective, a modified Reef Check method with horizontal transects were used to document the benthic community substrate cover at Shallow (10 m) and Deep (20 m) depths for six distinct facing reef walls. Pulau Perak is found to be pristine as 7 out of 12 reef areas surveyed (1 Shallow and 6 Deep) were above the mean coral cover value of 42.2% for islands on the east coast of Peninsular Malaysia. Nevertheless Shallow area coral cover ranged from ‘poor’ (23.8%) to ‘good’ (56.9%) and for Deep areas they ranged from ‘poor’ (16.9%) to ‘good’ (64.4%). The results also show significant differences between the six walls around the island with regards to their
orientation to sunlight and depths. Three reef walls (East, West and North Walls) have significantly different substrate cover between Shallow and Deep areas. The reason for this is uncertain but the orientation of the walls to available sunlight is hypothesized to be an important factor. Only the West Wall has a ‘Hard Coral’ cover difference (p<0.01) where the Shallow area having a lower percentage cover which could have been caused by physical damage from constructing a jetty. Cluster dendrograms using ‘Hard Coral’ cover shows that the Shallow reef wall areas are divided into North and South groups whereas the Deep reef wall areas were divided into three groups which are firstly East Wall and South-east Wall, secondly North Wall and thirdly North-west Wall and West Wall. The grouping shows similar results from Objective 1 where there is a difference between East and West Walls and it is hypothesised that the shadow of the island itself cuts off the high quality light of the morning sunlight which leads to the differences in their light quality. Possible reasons for the differences between reef walls which included several physical factors such as sea water temperature, hydrodynamics, upwelling and in particular light quality are discussed. The hypothesis that the orientation of the reef walls to sunlight is the main factor affecting their substrate cover is to be tested in future studies. A comprehensive sustainable development plan to conserve the island reef walls is recommended.
Abstrak

Acknowledgements

This thesis is dedicated to everyone that has helped me to finish it.

Special thanks go to
Associate Prof Dr Rosman Abdullah, Prof Dr Chong Ving Ching,
Rosli Idris, Anne Deidre, SEABUDS
and lastly to my family, Amirah and Ammar.
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