STUDIES ON THE RESPONSES OF EUCHEUMA STRIATUM TO ORGANIC POLLUTION IN CEBU HARBOUR AND MAGELLAN BAY

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by

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APPROVAL SHEET

This thesis entitled "Studies on the Responses of Eucheuma Striatum to Organic Pollution in Cebu Harbour and Magellan Bay," prepared and submitted by Mrs. Genoveva G. Padilla in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE IN BIOLOGY has been examined and is recommended for acceptance and approval for ORAL EXAMINATION.

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ABSTRACT

BOD_5 is an index of the amount of organic substances in the water. High % BOD_5 is taken to indicate the total organic substance derived from pollutants, phytoplankton, autochtonous detritus and dissolved organic substances. The sources of eutrophication are the inorganic limiting nutrients and dissolved organic substances which originate from organic pollution in the harbour.

In general, the culture of Eucheuma in areas with organic pollution is favorable since it increases growth rate. However, there are positive and negative aspects in the environment which influence the growth of Eucheuma.

The positive aspects are:

1. High % O_2 content (supersaturation) and correspondingly high CO_2 content during the night favors growth of Eucheuma. Exceptional growth of Eucheuma can be observed during intensive phytoplankton blooms.

2. Current favors the growth of Eucheuma in areas with organic pollution. In the absence of high current velocity, surface waves are found to favor the growth of Eucheuma. Consequently this favors the culture of Eucheuma in rafts.

3. Aside from this, the culture in rafts is advantageous because it: (1) assures constant favorable light conditions in turbid waters and prevents prolonged exposure at very low tides; (2) minimizes predation; (3) and promotes good efficiency in the maintenance of Eucheuma farms.

As the negative aspects in areas with organic pollution are considered:

1. Turbidity and reduced light conditions influence growth of Eucheuma especially those plants which are fixed in a certain depth where tide water levels change frequently.

2. The settling of detritus (silt) on the thalli of the plants decreases growth rate of Eucheuma.

3. Dilution of the seawater as a result of run-offs from sewage effluents, rivers, creeks and other outlets is one of the most critical factors influencing the growth of Eucheuma. Fluctuations in salinity were found to be the

main source of the presence of white-tips, epiphytes and the bacterial disease "ice-ice" on the algae.

4. In areas where oil films frequently existed, severe damages of Eucheuma are manifested.

5. There are a number of other factors such as toxic organic and inorganic substances, reduced CO_2 content in the seawater due to autotrophic bacterial activity and pH changing factors which when found in high concentration adversely affect the growth of Eucheuma in polluted areas.

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