

Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfillment of the requirements for the degree of Master of Science

**THE IMPACT AQUACULTURE ACTIVITIES ON MACROBENTHOS IN
SETIU WETLAND, TERENGGANU, MALAYSIA**

SYARIFAH FATIMAH SYED MAHDZAR

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A study to determine the impact of aquaculture on the community structure of macrobenthos was conducted in Setiu Wetland, Terengganu during post-monsoon (April 2015), pre-monsoon (October 2015) and monsoon (December 2015) periods. Samples were collected at 13 stations based on fixed plot radius sampling method starting from the centre of the fish cage to areas farther away from the cage. Macrobenthos were analysed based on total abundance as well as diversity indices, Shannon-Wiener index and Simpson index. Overall, 793 individuals were collected and classified into 29 families and 51 species. Mollusca were the most diverse taxon with 31 species while the other taxa, Polychaeta and Crustacea comprised 12 and 13 species, respectively. The assemblages of macrobenthos showed no significant difference (one-way ANOVA, $p > 0.05$) between the seasons but a significant difference (one-way ANOVA, $p < 0.05$) between stations. The diversity of bivalves was highest where the salinity was higher and the percentages of total organic matter were lower with sandy sediment. The diversity index recorded a significant correlation with total organic matter (TOM) as well as with the abundance of Mollusca and Annelida. In conclusion, the organic depositions from fish cages may have affected the macrobenthos assemblages by reducing the number of individuals and number of

species. However, the diversity of macrobenthos in Setiu Wetland can be considered as high in comparison to the small area in which this study was conducted. The findings from this study suggest that further study is important to determine the trend of changes in the benthos community following aquaculture activity.

Abstrak tesis yang dikemukakan kepada Senat Universiti Malaysia Terengganu
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**KESAN AKTIVITI AKUAKULTUR KEPADA MAKROBENTOS DI TANAH
BENCAH SETIU, TERENGGANU, MALAYSIA**

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2023

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Satu kajian untuk menentukan kesan kegiatan akuakultur terhadap organisma makrobentos di Tanah Bencah Setiu, Terengganu telah dijalankan pada musim pasca-monsun (April 2015), pra- monsun (Oktober 2015) dan monsun (Disember 2015). Sampel telah diambil di 13 stesen persampelan (St.) menggunakan kaedah pensampelan jejari plot tetap bermula daripada kawasan tengah sangkar ikan ke kawasan yang jauh daripada sangkar. Analisis makrobentos telah dijalankan mengikut jumlah keseluruhan dan kepelbagaian indek, indeks Shannon-Wiener dan indeks Simpson. Secara keseluruhan, 793 individu telah dikumpul dan dikelaskan kepada 29 keluarga dan 51 spesis. Moluska mempunyai kepelbagaian yang paling tinggi bilangannya iaitu 31 spesis, manakala taksa lain, Poliket dan Krustasea masing-masing mencatat bilangan sebanyak 12 and 13 spesis. Makrobentos yang terkumpul menunjukkan tiada perbezaan ketara di antara musim (ANOVA sehala, $p > 0.05$) tetapi ada perbezaan yang ketara (ANOVA sehala, $p < 0.05$) di antara stesen. Kepelbagaian Bivalvia paling tinggi pada tahap kemasinan yang lebih tinggi dan jumlah bahan organik lebih rendah dengan keadaan berpasir. Kepelbagaian indek menunjukkan perbezaan yang saling berkaitan antara kandungan bahan organik dengan jumlah

Moluska dan Anelida yang terkumpul. Secara keseluruhan, mendapan bahan organik telah mempengaruhi jumlah makrobenthos berdasarkan pengurangan jumlah individu dan jumlah spesis yang terkumpul. Namun, kepelbagaian makrobentos di Tanah Bencah Setiu boleh dianggap tinggi jika dibandingkan dengan saiz kecil tempat kajian ini dijalankan. Hasil daripada kajian ini menunjukkan bahawa kajian yang lebih terperinci dan meluas adalah penting untuk menentukan corak perubahan komuniti bentik berikutan kegiatan akuakultur.