

**EFFECT OF MONSOONS ON FECAL COLIFORM AND
Escherichia coli (E.coli) DISTRIBUTION IN WATER AND
SEDIMENTS OF SETIU LAGOON, TERENGGANU**

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UNIVERSITI MALAYSIA TERENGGANU
2008**

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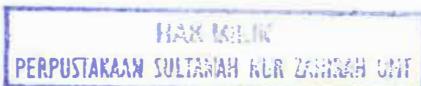
Effect of monsoons on fecal coliform and Escherichia coli (*E.coli*) distribution in water and sediments of Setiu lagoon, Terengganu Nurul Syazana Yahaya.



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IN WATER AND SEDIMENTS OF SETIU LAGOON, TERENGGANU.**

By
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PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

*Effect of Monsoons on Fecal Coliform and *Escherichia coli* (*E.coli*) distribution in water and sediments of Setiu Lagoon* oleh Nurul Syazana bt Yahaya, No.Matrik UK12261 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains (Biologi Marin), Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

APHA	—	American Public Health Association
Apr	—	April
Aug	—	August
ASEAN	—	Association of South East Asia Nations
°C	—	degree centigrade
Dec	—	December
DO	—	dissolve oxygen
DOE	—	Department of Environment
<i>E. coli</i>	—	<i>Escherichia coli</i>
EU	—	European Union
FC	—	Fecal Coliform
FDA	—	Food and Drug Administration
g	—	gram
GAD	—	glutamic acid decarboxylase
INWQS	—	Interim National Water Quality Standards
kg	—	kilogram
M	—	molarity
mg	—	milligram
mL	—	mililitre
mm	—	milimetre
MF	—	Membrane Filter

MPN	—	Most Probable Number
MTF	—	Multiple-tube Fermentation Technique
NaCl	—	natrium chloride
NaOH	—	natrium hydroxide
Nov	—	November
Oct	—	October
pH	—	potential of hydrogen
ppt	—	parts per thousand
Sept	—	September
TC	—	total colifom
USEPA	—	United States Environmental Protection Agency
WHO	—	World Health Organisation

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ABSTRACT

The study on fecal coliform and *E.coli* distribution in waters and sediments of Setiu lagoon is aimed to evaluate the level of fecal contamination caused by sewage pollution and other aquaculture activities in that area. Three sampling trips have been conducted, during 8th September 2007, 21st October 2007 and 29th December 2007. Fourteen sampling stations were established in this study. Total coliform, fecal coliform and *E. coli* counts in waters and sediments were estimated by using Multiple Test Fermentation Tube of Standard Method. GAD test was done for detection of *Escherichia coli* (*E. coli*) in water and sediment samples. Results of this study showed that the mean of total coliform, fecal coliform and *E. coli* counts in waters of Setiu lagoon in September, October and December were 344.023 MPN.100mL⁻¹, 204.333 MPN.100mL⁻¹ and 11.9037 MPN.100mL⁻¹ respectively. The mean of total coliform, fecal coliform and *E. coli* counts in sediments were 7.4953 MPN.g⁻¹, 8.2377 MPN.g⁻¹ and 1.1553 MPN.g⁻¹ for September, October and December respectively. Presence of coliform bacteria indicates that the waters in Setiu lagoon had been contaminated with domestic sewage pollution. Based on the standard set by DOE, the mean fecal coliform counts in September, October and December 2007 exceeded the water quality standard. Strict enforcement should therefore be taken in this area to prevent further deterioration..

ABSTRAK

Objektif kajian mengenai tahap pencemaran najis and *E. coli* di dalam air dan tanah mendapan lagun Setiu adalah untuk menilai taburan najis yang berpunca dari sisa kumbahan dan aktiviti akuakultur di kawasan tersebut. Persampelan telah dibuat sebanyak tiga kali iaitu pada 8 September 2007, 21 Oktober 2007 dan 29 Disember 2007. Sebanyak 14 stesen telah didirikan semasa persampelan dijalankan. Jumlah ‘total coliform, fecal coliform dan *E. coli*’ di dalam air dan tanah mendapan ditentukan dengan menggunakan ‘Multiple Test Fermentation Tube of Standard Method’. Ujian GAD telah dijalankan untuk mengesahkan kehadiran bakteria *Escherichia coli* (*E. coli*) di dalam sampel air dan tanah mendapan. Min taburan ‘total coliform, fecal coliform dan *E. coli*’ di dalam air pada bulan September, Oktober dan Disember adalah $344.023 \text{ MPN.}100\text{mL}^{-1}$, $204.333 \text{ MPN.}100\text{mL}^{-1}$ dan $11.9037 \text{ MPN.}100\text{mL}^{-1}$ masing-masing. Manakala min taburan bagi ‘total coliform, fecal coliform dan *E. coli*’ di dalam tanah adalah $7.4953 \text{ MPN.g}^{-1}$, $8.2377 \text{ MPN.g}^{-1}$ dan $1.1553 \text{ MPN.g}^{-1}$ bagi bulan September, Oktober dan Disember masing-masing. Kehadiran bakteria ‘coliform’ menunjukkan bahawa kawasan lagun Setiu telah dicemari dengan sisa kumbahan serta najis. Berasaskan piawaian yang telah ditetapkan oleh Jabatan Alam Sekitar, min taburan bagi ‘fecal coliform’ semasa persampelan dijalankan (September, Oktober dan Disember), kesemuanya telah melebihi tahap kualiti air yang ditetapkan. Tindakan tegas perlu dilaksanakan bagi menjamin kualiti air di kawasan lagun Setiu tidak bertambah buruk dengan pencemaran najis.