

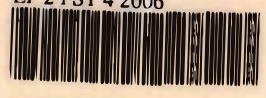
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Setiu Lagoon, Terengganu, South China Sea / Ambika Devi a/p
Doran



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**FECAL COLIFORM AND *Escherichia coli* (*E. coli*) IN CULTURED OYSTERS
(*Crassostrea iredalei*), SURROUNDING WATERS AND SEDIMENTS OF SETIU
LAGOON, TERENGGANU, SOUTH CHINA SEA**

**By
Ambika Devi A/P Daran**

**Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Marine Science)**

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**JABATAN SAINS SAMUDERA
FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA**

**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **Fecal coliform and Escherichia coli (E. coli) in cultured oysters (Crasostrea iredalei), surrounding waters and sediment of Setiu lagoon, Terengganu, South China Sea** oleh **Ambika Devi A/P Daran**, No Matrik **UK8038** Telah diperiksa dan semua pembedaan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah **Sarjana Muda Sains: Sains Samudera**, Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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LIST OF ABBREVIATIONS

APHA	-	American Public Health Association
Apr	-	April
ASEAN	-	Association of South East Asia Nations
Aug	-	August
Dec	-	December
DO	-	dissolve oxygen
DOE	-	Department of Environment
DOM	-	Dissolved organic material
DSP	-	Diarrheic shellfish poison
<i>E. coli</i>	-	<i>Escherichia coli</i>
EU	-	European Union
FDA	-	Food and Drug Administration
FC	-	fecal coliform
g	-	Gram
GAD	-	glutamic acid decarboxylase
GPS	-	Global Position System
HCl	-	hydrochloride acid
INWQS	-	Interim National Water Quality Standards
kg	-	kilogram
LKIM	-	Lembaga Kemajuan Ikan Malaysia
M	-	molarity

MF	-	Membrane filter
Mg	-	milligram
mL	-	milliliter
MPN	-	Most Probable Number
MTF	-	Multiple-tube Fermentation Technique
NaCl	-	Sodium Chloride
NaOH	-	Sodium Hydroxide
NSSP	-	National Shellfish Sanitation Program
°C	-	degree centigrade
Oct	-	October
pH	-	potential of hydrogen
ppt	-	parts per thousands
PSP	-	Paralytic shellfish poison
TC	-	Total coliform
USEPA	-	United States Environmental Protection Agency
WHO	-	World Health Organization

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ABSTRAK

Kajian ini bertujuan untuk menentukan tahap pencemaran najis akibat pembuangan bahan kumbahan ke dalam lagun Setiu dan juga menentukan sama ada tiram yang dikultur di lagun itu selamat untuk dimakan. Kerja persampelan dilakukan sebanyak tiga kali iaitu, pada 25th Ogos 2005, 6th Oktober 2005 and 14th Disember 2005. Empat belas stesen persampelan dipilih di sekeliling lagun Setiu. "Multiple Test Tube Fermentation of Standard Method" digunakan untuk menentukan bilangan coliform, fecal coliform dan *E. coli* di dalam air, sedimen, dan tiram yang dikultur (*Crassostrea iredalei*) di lagun Setiu. Ujian GAD telah digunakan untuk mengesan kehadiran *E. coli* di dalam sample. Nilai purata untuk bilangan coliform, fecal coliform dan *E. coli* dalam air masing-masing ialah 108.74 MPN.100 mL⁻¹, 32.67 MPN.100 mL⁻¹ dan 7.21 MPN.100 mL⁻¹. Nilai purata untuk bilangan coliform, fecal coliform dan *E. coli* dalam sedimen masing-masing ialah 2.32 MPN.g⁻¹, 0.62 MPN.g⁻¹ dan 0.25 MPN.g⁻¹ manakala bagi tiram yang dikultur di Setiu pula masing-masing 56.20 MPN.g⁻¹, 14.27 MPN.g⁻¹ dan 1.26 MPN.g⁻¹. Kehadiran total coliform, fecal coliform dan *E. coli* di dalam air dan sedimen menunjukkan bahawa lagun Setiu telah dicemari oleh bahan kumbahan. Kajian ini menunjukkan tahap fecal coliform dan *E. coli* di dalam lagun Setiu masih dalam tahap keselamatan untuk aktiviti-aktiviti akuakultur. Walaubagaimanapun langkah-langkah yang sewajarnya perlu diambil untuk mewujudkan persekitaran lagun dengan kualiti yang bersih bagi penggunaan masa depan.

ABSTRACT

This study is aimed to evaluate the level of fecal contamination that caused by sewage pollution in the Setiu lagoon, Terengganu and also to determine whether the cultured oysters in the lagoon are safe for human consumption. Three samplings were conducted on 25th August 2005, 6th October 2005 and 14th December 2005. Fourteen sampling stations were established around the lagoon. Total coliform, fecal coliform, *Escherichia coli* (*E. coli*) counts in water, sediment and cultured oysters (*Crassostrea iredalei*) were estimated by using Multiple Test Tube Fermentation of Standard Method. GAD test was carried out to determine the presence of *E. coli* in the samples. The mean of total coliform, fecal coliform and *E. coli* in waters of Setiu lagoon were 108.74 MPN.100 mL⁻¹, 32.67 MPN.100 mL⁻¹ and 7.21 MPN.100 mL⁻¹ respectively. The mean of total coliform, fecal coliform and *E. coli* in the sediments of Setiu lagoon were 2.32 MPN.g⁻¹, 0.62 MPN.g⁻¹ and 0.25 MPN.g⁻¹ respectively. The mean of total coliform, fecal coliform and *E. coli* counts in cultured oysters were 56.20 MPN.g⁻¹, 14.27 MPN.g⁻¹ and 1.26 MPN.g⁻¹ respectively. The presence of total coliform, fecal coliform and *E. coli* in the waters and sediment of Setiu lagoon indicates that the lagoon has been contaminated by domestic sewage. This current study show that, the level of fecal coliform and *E. coli* in Setiu lagoon are still within the safety level for aquaculture and human consumption. A proper measurement should be taken to maintain a healthy environment quality for future use.