

CHEMICAL COMPOSITION AND DISTRIBUTION
OF THE SANDS ALONG
TERRONGGANI BEACH

YONG JIAT CHUAN

FACULTY OF SCIENCE AND TECHNOLOGY
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI
MALAYSIA (KUSTEM)

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21030 KUALA TERENGGANU

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**CHEMICAL COMPOSITION AND DISTRIBUTION OF TAR BALLS
ALONG TERENGGANU BEACH**

BY

YONG JAW CHUEN

**This project is submitted in partial fulfillment of the requirements for the Degree
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ABSTRACT

The Terengganu state is partially bordered by 244 Km of coastline facing the South China Sea which there are dense oil exploration and maritime transportation activities. These activities are potential in causing oil pollution in the South China Sea. Tar balls are formed from oil spill residual on sea. It can be suspended in the sea or settled at the bottom for many years. It also can travel for a long journey before it is being washed up to the beach. In this period, it can undergo a series of weathering process to reduce low molecular weight hydrocarbons content.

This project aims to document the current qualitative and quantitative of tar balls distribution on the beach at Batu Rakit, KUSTEM and Teluk Ketapang. The sampling trips were conducted during Southwest and Northeast monsoon season in March of 2002, June of 2002, September of 2002, December of 2002 and January of 2003. The statistical tests (t-test) show that there are differences for tar balls distribution between the monsoon seasons. The Northeast monsoon season deposited more tar balls than the Southwest monsoon.

The tar balls intensity is consider high in the study area. The mean and ranges of tar ball intensity at Batu Rakit beach were 2.315 g.m^{-2} to 19.272 g.m^{-2} , at KUSTEM beach were 0.042 g.m^{-2} to 29.123 g.m^{-2} and at Teluk Ketapang beach were 0.0497 g.m^{-2} to 20.790 g.m^{-2} respectively. The results show the tar balls contain of carcinogenic compounds, which are harmful to human. Besides it is also undergo a series of weathering process such as photooxidation, biodegradation, dissolution and evaporation. The study shows that the Terengganu beaches are polluted by the Tar Balls.

ABSTRAK

Sebahagian negeri Terengganu disempadani dengan garisan pantai yang sepanjang 244 Km dan menghadap ke arah Laut China Selatan yang giat dengan aktiviti carigali minyak dan pengangkutan. Kesemua aktiviti ini berpotensi menyebabkan pencemaran minyak di Laut China Selatan. Bebola tar terbentuk daripada baki minyak tumpahan. Ia boleh terapung atau termendap di dasar laut untuk beberapa tahun dan mampu bergerak jarak yang jauh sebelum dihanyutkan ke atas pantai dengan dorongan arus laut. Dalam tempoh masa ini, ia akan mengalami satu proses iklim yang mampu mengurangkan kandungan hidrokarbon yang mempunyai berat molekulnya ringan.

Tujuan menjalankan kajian kualitatif dan kuantitatif dan mendokumentasikan data terkini mengenai taburan bebola tar di Batu Rakit, KUSTEM and Teluk Ketapang. Lawatan penyampelan telah dijalankan semasa Monsun Timur Laut dan Barat Daya pada bula Mac 2002, Jun 2002, September 2002, Disember 2002 dan Januari 2003. Ujian statistik telah membuktikan terdapat perubahan ke atas taburan bebola tar di antara dua monsun yang terlibat. Monsun Timur Laut menghanyutkan lebih banyak bebola tar ke pantai berbanding Monsun Barat Daya.

Kepadatan bebola tar adalah tinggi di tempat kajian. Julat kepadatan purata bebola tar di stesen kajian masing-masing ialah 2.315 g.m^{-2} hingga 19.272 g.m^{-2} di pantai Batu Rakit, 0.042 g.m^{-2} hingga 29.123 g.m^{-2} di pantai KUSTEM dan 0.0497 g.m^{-2} hingga 20.790 g.m^{-2} di pantai Teluk Ketapang. Keputusan juga menunjukkan ia mempunyai elemen karsinogenik yang merbahayakan kesihatan manusia. Ia juga mengalami proses iklim yang melibatkan fotokimia, penguraian biologi, pemelarutan dan pemeruapan. Berdasarkan analisa keputusan, ia menunjukkan pantai Terengganu adalah tercemar.