CHANGES OF Pb/Ca IN CORAL CORES OF PULAU REDANG BETWEEN 1990 - 2010

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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT
UNIVERSITI MALAYSIA TERENGGANU
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Lihat Sebelah

CHANGES OF Pb/Ca IN CORAL CORES OF PULAU REDANG BETWEEN 1990 - 2010

By

Mohammad Ikram Bin Mohammad Naser

Research Report submitted in partial fulfillment of

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DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled Changes of Pb/Ca in coral cores of Pulau Redang between 1990 – 2010 by Mohammad Ikram Bin Mohammad Naser, UK26351 have been examined and all errors identified have been corrected. This report is submitted to the School of Marine Science and Environment as partial fulfillment towards obtaining the Degree Marine Biology, School of Marine Science and Environment, Universiti Malaysia Terengganu.

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Marine Biology

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mm	-	milimeter
cm	-	centimeter
g	-	gram
mg	-	milligram
µg	-	microgram
L	-	liter
ml	-	mililiter
mol	-	mole
µmol	-	micromole
nm	-	nanometer

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ABSTRACT

Lead (Pb) is one of the most pervasive pollutants in the marine ecosystem. Pb pollution and their effect to the coral reef area at the Pulau Redang, massive coral skeleton (*Porites* sp.) was determined between 1990 and 2010. Inductively Coupled Plasma Mass Spectrometry (ICP-MS) was used to measure the Pb content in the coral skeleton. Meanwhile the study of linear extension rate was using ultra violet light. Dark box was used to see the bands in the coral slab. The alternating density (high density band and low density band) determined the growth rate (linear extension). The growth rate of massive coral *Porites* in Pulau Redang between 1990 and 2010 was decreasing, while the Pb concentration showed increasing trend from 1990 to 2010. The lowest growth rate is in year 2010 with 1.3 cm/year, the second lowest are 2005 with 1.5 cm/year and the highest growth rate were 2.5 cm/year which in year 1996. Linear extension growth decreased. Meanwhile Pb showed high concentration from 2000 to 2010, where Pb/Ca ratio was 0.068 μmol/mol and growth rate was 1.7 cm/year, while in 2001 the mean of Pb/Ca was 0.069 μmol/mol and growth rate was also 1.7 cm/year. The same pattern that shown in 2008 to 2010, where the mean of Pb/Ca of each year respect to growth rate for 2008, 2009 and 2010 are 0.035, 0.045 and 0.056 μmol/mol and 2.2, 1.9 and 1.3 cm/year respectively. Besides that, the changes in Pb/Ca also showed high concentration in year 2001, 2007 and 2010 with mean of Pb/Ca ratio are 0.069, 0.075 and 0.056 μmol/mol respectively.

PERUBAHAN Pb/Ca DI DALAM TERAS KARANG DI PULAU REDANG ANTARA 1990 – 2010

ABSTRAK

Plumbum (Pb) adalah antara bahan pencemar yang paling ketara dalam ekosistem marin. Pencemaran Pb dan kesan terhadap kawasan terumbu karang di Pulau Redang di antara 1990 dan 2010 ditentukan menggunakan rangka karang (*Porites* sp). Inductively Coupled Plasma Mass Spectrometry (ICP -MS) telah digunakan untuk mengukur kandungan Pb dalam rangka karang. Manakala kajian kadar pertumbuhan linear dengan menggunakan sinaran ultra ungu. Kotak gelap digunakan untuk melihat lapisan pada kepingan rangka karang. Kepadatan bersilih ganti (lapisan berkepadatan tinggi dan lapisan berkepadatan rendah) akan menentukan kadar pertumbuhan karang (pertumbuhan linear). Kadar pertumbuhan karang *Porites* di Pulau Redang di antara tahun 1990 dan 2010 telah berkurangan, manakala kepekatan Pb menunjukkan peningkatan dari 1990 ke 2010. Kadar pertumbuhan terendah adalah pada tahun 2010 dengan 1.3 cm/tahun, diikuti tahun 2005 dengan 1.5 cm/tahun dan kadar pertumbuhan yang paling tinggi adalah 2.5 cm/tahun pada tahun 1996. Kadar pertumbuhan linear menurun. Sementara Pb menunjukkan kepekatan tinggi dari 2000 hingga 2010, di mana purata nisbah Pb/Ca adalah 0.068 μmol/mol dan kadar pertumbuhan adalah 1.7 cm/tahun , manakala pada tahun 2001 purata Pb/Ca adalah 0.069 μmol/mol dan kadar pertumbuhan juga 1.7 cm/tahun. Corak yang sama yang ditunjukkan pada tahun 2008 hingga 2010, dengan purata kandungan Pb/Ca kepada kadar pertumbuhan bagi tahun 2008, 2009 dan 2010 adalah 0.035, 0.045 dan 0.056 μmol/mol dan 2.2, 1.9 dan 1.3 cm/tahun. Di samping itu, perubahan dalam Pb/Ca juga menunjukkan kepekatan tinggi pada tahun 2001, 2007 dan 2010 dengan purata Pb/Ca adalah 0.069, 0.075 dan 0.056 μmol/mol.