HEAVY METALS CONTENT IN MARINE MOLLUSCS AND THE BARNACLE, *Tetraclita sp.* ALONG THE ROCKY SHORES OF THE EAST & WEST COAST OF PENINSULAR MALAYSIA

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ABSTRACT

A study was undertaken to determine the influence of body size upon heavy metals concentration in marine molluscs and the barnacle, *Tetraclita sp.* and to compare heavy metals level between genus and between sampling sites. The concentrations of zinc, iron, copper, cadmium, chromium and lead in *Saccostrea sp.*, *Nerita sp.*, *Thais sp.* a, *Thais sp.* b, *Littorina sp.*, *Neritina sp.*, *Tetraclita sp.* and *Patella sp.*, which were collected from the East and West Coast of Peninsular Malaysia, were studied for this purpose.

Anova of regression showed that the majority of metals content did not have significant correlation with body size ($P>0.05$). These results indicate that metals concentration were independent of size. A significant inverse correlation between metals concentration and size was detected in most of the marine molluscs and the barnacle, *Tetraclita sp.*, particularly for iron, cadmium, chromium, lead and zinc ($P<0.05$). For these elements, the smallest individuals had the highest levels. In a few cases, highest concentrations were recorded in the largest individuals, especially copper.

The levels of lead in *Neritina sp.* and the levels of zinc, copper and cadmium in most of the marine molluscs and the barnacle, *Tetraclita sp.* exceeded maximum permissible levels (MPL) stipulated in the Malaysian Food Act 1983 , which limits metal contents in fish and fish products to 2 ppm Pb, 100 ppm Zn, 30 ppm Cu and 1 ppm Cd dry weight. For the other metals, the limits have not been specified in the Food Act 1983.

ABSTRAK

Satu kajian tentang pengaruh saiz badan terhadap kepekatan logam berat dalam invertebrat dan perbandingan tahap logam berat antara genus dan antara lokasi telah dikaji. Kepekatan zink, ferum, kadmium, kromium dan plumbum dalam *Saccostrea sp.*, *Nerita sp.*, *Thais sp.* a, *Thais sp.* b, *Littorina sp.*, *Neritina sp.*, *Tetraclita sp.* dan *Patella sp.* yang dikutip di sepanjang pantai timur dan barat Semenanjung Malaysia dikaji bagi tujuan tersebut.

Anova regresi tidak menunjukkan perbezaan bererti bagi perhubungan korelasi bagi kebanyakan kandungan logam dengan saiz badan ($P>0.05$). Keputusan ini menyatakan kepekatan logam-logam adalah tidak dipengaruh oleh saiz. Perbezaan bererti bagi perhubungan korelasi yang tersongsang antara kepekatan logam-logam dengan saiz dikesan bagi kebanyakan invertebrat, terutamanya ferum, kadmium, kromium, plumbum dan zink ($P<0.05$). Semakin kecil saiz, semakin tinggi kepekatan logam yang didapati. Kadang-kadang, kepekatan logam yang tinggi juga dapat dikesan bagi invertebrat yang mempunyai saiz yang besar, terutamanya kuprum.

Tahap kepekatan plumbum dalam *Neritina sp.* dan tahap kepekatan zink, kuprum dan kadmium dalam kebanyakan invertebrat didapati melebihi tahap maksimum kebenaran penggunaan yang ditetapkan oleh Akta Makanan Malaysia 1983 di mana had kandungan logam dalam ikan dan pengeluaran ikan adalah 2 ppm plumbum, 100 ppm zink, 30 ppm kuprum dan 1 ppm kadmium (berdasarkan berat kering). Bagi logam-logam yang lain, keterhadannya adalah tidak ditetapkan dalam Akta makanan 1983.