

**DERMATITIS RISK ASSESSMENT OF HEAVY METALS
EXPOSURE: A CASE STUDY IN TANJUNG ARU
BEACH, KOTA KINABALU, SABAH,
MALAYSIA**

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ABSTRACT

DERMATITIS RISK ASSESSEMENT OF HEAVY METALS EXPOSURE: A CASE STUDY IN TANJUNG ARU BEACH, KOTA KINABALU, SABAH, MALAYSIA

Heavy metal is dangerous because it can affects human health in several pathways such as via dermal absorption. This study was to determine the concentration of Cadmium (Cd), Chromium (Cr), Lead (Pb), and Zinc (Zn) in five selected station along the Tanjung Aru beach by using Atomic Absorption Spectrophotometer (AAS). Besides that, the effect of heavy metals on human dermal was further determined by performing quantitative risk assessment for adults and children via dermal absorption by calculating the Hazard Quotient (HQ) and Hazard Index (HI) derived from the concentration of heavy metals in seawater at all five stations. It was found that, Cr has the highest concentration among the four heavy metals in the seawater samples and the lowest concentration is Zn as rank in the following sequence: Cr>Pb>Cd>Zn. One-way ANOVA test, showed that there was no significant difference between concentrations of heavy metals at all five stations where the P value was $P = 0.971$ ($F = 0.131$ and $\alpha = 0.05$) at 95% confidence level. In addition, the HQ values were found to be in range of 1.43×10^{-7} to 4.02×10^{-2} for adults and 4.21×10^{-7} to 0.119 for children. Meanwhile, HI value was found to be within the standard limits sets for dermal exposure. Both HQ and HI via dermal absorption pathways were less than unity. It is indicates that exposure to seawater at Tanjung Aru beach via dermal absorption could pose little or no significant health risk.