

Evaluation and Risk Assessment of Heavy Metals Pollution Using Edible Crabs, Based on Food Intended for Human Consumption

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Abstract : The management and utilization of food resources is becoming a big issue due to rapid urbanization, wastage and non-sustainable use of food, especially in developing countries. Therefore, the use of seafood as alternative sources is strongly promoted worldwide. Marine pollution strongly affects marine organisms, which ultimately decreases their export quality. The monitoring of contamination in marine organisms is a good indicator of the environmental quality as well as seafood quality. Monitoring the accumulation of chemical elements within various tissues of organisms has become a useful tool to survey current or chronic levels of heavy metal exposure within an environment. In this perspective, this study was carried out to compare the previous and current levels (Year 2012 and 2014) of heavy metals (Cd, Pb, Cr, Cu and Zn) in crabs marketed in Karachi and to estimate the toxicological risk associated with their intake. The accumulation of metals in marine organisms, both essential (Cu and Zn) and toxic (Pb, Cd and Cr), natural and anthropogenic, is an actual food safety issue. Significant ($p > 0.05$) variations in metal concentrations were found in all crab species between the two years, with most of the metals showing high accumulation in 2012. For toxicological risk assessment, EWI (Estimated weekly intake), Target Hazard quotient (THQ) and cancer risk (CR) were also assessed and high EWI, Non- cancer risk ($THQ < 1$) showed that there is no serious threat associated with the consumption of shellfish species on Karachi coast. The Cancer risk showed the highest risk from Cd and Pb pollution if consumed in excess. We summarize key environmental health research on health effects associated with exposure to contaminated seafood. It could be concluded that considering the Pakistan coast, these edible species may be sensitive and vulnerable to the adverse effects of environmental contaminants; more attention should be paid to the Pb and Cd metal bioaccumulation and to toxicological risks to seafood and consumers.

Keywords : cancer risk, edible crabs, heavy metals pollution, risk assessment

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