

Effect of Cd and Pb pollutions on physiological growth: Wavelet Neural Network (WNN) as a new approach on age determination of *Coenobita scaevola*

ABSTRACT

Environmental pollution of aquatic ecosystems leads to an interference in several fundamental biochemical and physiological functions. In this study the interference of Cd and Pb pollutions on the physiological growth and subsequently on the age determination was investigated. The hermit crab, *Coenobita scaevola* (C.s) was selected as a bioaccumulator in this study. The direct and indirect age determination methods were carried out using annual band counts and carapace length, respectively. The results showed that, there was very low correlation ($R^2 < 0.5$) between direct and indirect age determination. Wavelet Neural Network (WNN) was applied to take into account the environmental effects such as the accumulation of Cd and Pb elements in the C.s' tissues. It was observed that WNN successfully enhanced the growth rate model and estimated the C.s' age ($R^2 > 0.95$). In addition, it was concluded that the environmental pollution had interaction with the growth physiology such as weight and length.

Keyword: WNN; Hermit crab; Heavy metals; Bioaccumulator; Age determination