

Investigation on frequency of Vibrionaceae family bacteria in summer, autumn and winter seasons with emphasis on the process of oxygen free radical changes, superoxide dismutase and catalase in oyster muscle tissue (*Pinctada radiata*)

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Abstract

In this study, the effect of temperature on the antioxidant properties and the effect of seasonal changes on the bacterial flora of the Vibrionaceae family in the soft tissue of *Pinctada radiata* oysters were investigated. One hundred fifty oysters were collected from Bandar-e-Lengeh beach from September to January and the flesh of each individual was excised. The total count of Vibrio colonies was performed on TCBS culture medium. The combination of Vibrio bacteria, including *V. parahaemolyticus*, *V. anguillarum*, *V. anguillarum*, *V. harveyi*, *V. alginolyticus*, in oyster meat was done based on 16S rRNA gene. Catalase and superoxide dismutase activities was determined by detection kits based on the manufacturer's instructions. The results of this study showed that a decrease in temperature led to a decrease in the number of Vibrio colonies, so that the highest value in September decreased from 4.64 ± 0.06 CFU/gr to the lowest value in January by $1.99 \log$ CFU/g ($P < 0.05$). The highest and lowest SOD activity were observed in September (68%) and January (29%), respectively ($P < 0.05$). Catalase activity was a temperature dependence, so that the lowest catalase activity was recorded in January ($P < 0.05$). In addition, *V. parahaemolyticus*, *V. harveyi*, *V. alginolyticus* and *V. anguillarum* were the most abundant of Vibrio in *Pinctada radiata*. However, the number of colonies of pathogenic strains of Vibrio such as *V. parahaemolyticus* and *V. alginolyticus* decreased with decreasing temperature. The results of study show that increase in water temperature had a negative effect on health and physiology of *Pinctada radiata*.

Keywords: superoxide dismutase, catalase, Vibrio, antioxidant enzymes, *Pinctada radiata*.