

ACE-Inhibitory and Antioxidant Activities of Hydrolysates from the By-Products of Hybrid Grouper (*Epinephelus lanceolatus* × *Epinephelus fuscoguttatus*)

ABSTRACT

Protein hydrolysates, generated from the by-products of fish, have received much attention over recent years, due to their antihypertensive and antioxidant activities. The potency of bioactive peptides, however, is affected by the type of enzyme selected and the duration of hydrolysis required to generate the protein hydrolysate. This study was aimed to investigate the effects of using four different enzymes (Alcalase, Proteinase K, Trypsin, and Pepsin) and hydrolysis time (1 - 48 h), on the ACE-inhibitory and antioxidant activities (hydroxyl radical scavenging activity and reducing power), of protein hydrolysates from the head and bones of hybrid grouper (*Epinephelus lanceolatus* × *Epinephelus fuscoguttatus*). Among the enzymes tested, Alcalase was the most effective enzyme hydrolysing the by-product of hybrid grouper, followed by Proteinase K, Trypsin, and Pepsin ($p < 0.05$). According to the results attained, enzyme with the higher degree of hydrolysis exhibited higher antioxidant activities, but not ACE-inhibitory activity. This indicates that the ACEinhibition potency of hydrolysate, from the by-product of hybrid grouper, is very much dependent on the type of enzyme, and the treatment duration during hydrolysis. The ACE-inhibitory activity of Alcalase and Trypsin hydrolysates was found to decrease in tandem with the increase in hydrolysis time. On the other hand, a longer hydrolysis time resulted in a higher ACE-inhibitory activity for Proteinase K and Pepsin hydrolysate ($p < 0.05$). The results attained suggest that the selection of an appropriate enzyme, together with an effective hydrolysis time, can enhance the bioactivities of the hydrolysate obtained from the by-product of hybrid grouper.