

Biofunctional activities of squid milt hydrolysate

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Reactive oxygen species (ROS) are a toxic product of aerobic metabolism which is generated abundantly in inflammatory tissues. Oxidative stress induces the production and the release of mast cell mediators. H₂O₂ upregulates IL-4 and IL-6 genes expression and cytokine secretion through an apurinic/aprimidinic endonuclease (APE/Ref-1)-dependent pathway in mast cell⁽¹⁾. Tumor necrosis factor- α (TNF- α) can increase the level of ROS and activate NF- κ B which is responsible for up-regulation of matrix metalloproteinases (MMPs)⁽²⁾. MMPs belong to the family of neutral endopeptidases which participate in many physiological processes including tissue remodeling and inflammation. In this study, the biofunctional activities of squid milt hydrolysates on antioxidant and MMPs inhibitory activity were investigated.

Squid milt was hydrolyzed with trypsin at 50°C for 5 h in 0.05 M phosphate buffer, pH 8. The squid milt hydrolysate was purified using 10, 5 and 3 kDa cut-off ultrafiltration membranes. Ultrafiltration fractions were freeze-dried and further used for antioxidant and MMPs inhibitory activity assessment⁽³⁾.

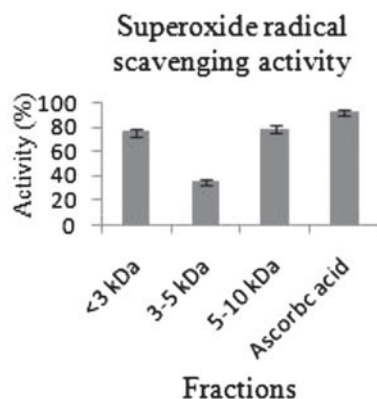


Fig. 1. Superoxide radical scavenging activity of squid milt hydrolysate (100 µg/mL).

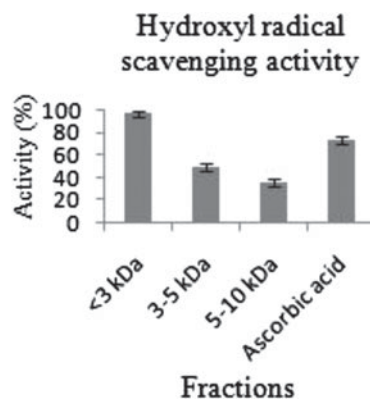


Fig. 2. Hydroxyl radical scavenging activity of squid milt hydrolysate (100 µg/mL).

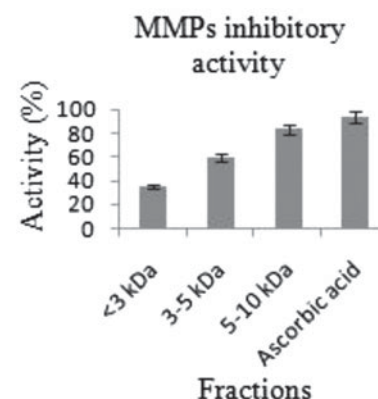


Fig. 3. MMPs inhibitory activity of squid milt hydrolysate (100 µg/mL).

There was no significant difference between <3 kDa and 5–10 kDa molecular weight of squid milt hydrolysates ($p > 0.05$) on superoxide radical scavenging activity (Fig. 1), but significantly different on hydroxyl radical scavenging activity (Fig. 2). The high molecular weight of fraction (5–10 kDa) had highest activity on MMPs inhibition ($p < 0.05$). In conclusion, the squid milt hydrolysate with high molecular weight (5–10 kDa) had strong antioxidant and MMPs inhibitory activity. These results may useful to promote squid milt which is fishery industry by-product as material for biofunctional food resources with the benefits as antioxidant and antiinflammation.

1. Frossi B, Carli MD, Daniel KT *et al.* (2003) *Eur J Immunol* **33**, 2168–2177.
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3. Sin BY & Kim HP (2005) *Arch Pharm Res* **10**, 1151–1155.