

Bioactive Potentials of Peptides and Lipids from Green Mussel (*Perna viridis*), Horse Mussel (*Modiolus philippinarum*) and Charru Mussel (*Mytella charruana*)

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Abstract : The antioxidant and anti-inflammatory potentials of *Perna Viridis*, *Modiolus philippinarum*, and *Mytella charruana* found in the Philippines were assessed. Mussel protein samples were hydrolyzed using trypsin, maturase, alcalase and pepsin at 1% and 2% concentrations and then fractionated through membrane filtration (<10 kDa and <30 kDa). Antioxidant assays showed that pepsin hydrolysate at 2% enzyme concentration exhibited the maximum activities for both 2,2-Diphenyl-1-picrylhydrazyl (DPPH) Radical Scavenging Activity (155-176 $\mu\text{M TE/mg protein}$) and 2,2-azinobis-(3-ethylbenzthiazoline-6-sulfonic acid) (ABTS) radical scavenging (67-68 $\mu\text{M TE/mg protein}$) assays while trypsin hydrolysate dominated the Ferric Reducing Antioxidant Power (FRAP) for the three mussel species. Lower molecular weight peptide fractions at <10 kDa exhibited better antioxidant activities than the higher molecular weight fractions. The anti-inflammatory activities of *M. philippinarum* and *M. charruana* showed comparable protein denaturation inhibition potentials with the highest in *P. Viridis* samples (98.93%). The 5-Lipoxygenase (5-LOX) inhibitory activities of mussel samples showed no significant difference with inhibition exceeding 70%. *P. Viridis* demonstrated the highest inhibition against Cyclooxygenase-2 (COX-2) at 56.19%, while the rest showed comparable activities. This study showed that the three mussel species are potential sources of bioactive peptides and lipids with antioxidant and anti-inflammatory properties.

Keywords : anti-inflammatory, antioxidant, bioactive properties, mussel

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