

Study on the biological activity from the fish roe protein hydrolysates

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Outline

- I. Introduction
- II. Amino acid composition, antioxidant and functional properties of protein hydrolysates from the roe of rainbow trout (*Oncorhynchus mykiss*)
- III. Evaluating in vitro dipeptidyl peptidase IV inhibition by peptides from common carp (*Cyprinus carpio*) roe in cell culture models
- IV. Conclusion

Abstract

The fish processing industry generates huge quantities of roe. Most roe is discarded or spoiled due to lack of preservation and processing methods. This causes a significant waste of protein resources. Enzymatic cleavage of roe protein sources has been used to produce peptides with a wide variety of biological activity. The purpose of the study was to study on the Biological activity from the fish roe protein hydrolysates. A fish roe protein hydrolysate from rainbow trout (*Oncorhynchus mykiss*) trout roe protein hydrolysates (TRH) was produced by Pepsin and Alcalase. The degree of hydrolysis was found to be 44.08% and 27.62% (Pepsin and Alcalase, respectively). The two hydrolysates contained a high amount of essential amino acids (33.53% Alcalase–29.39% Pepsin). The hydrolysates represented excellent antioxidant activities in various concentrations and showed a good foaming and emulsification properties. And next we studied the DPP-IV inhibitory activity of protein hydrolysates from common carp (*Cyprinus carpio*) roe. Papain-generated hydrolysate showed the highest DPP-IV inhibition and effective gastrointestinal stability. The bioactivity of IPNVAVD, which was identified from Papain hydrolysate (IC₅₀ value of $777.35 \pm 5.50 \mu\text{M}$), We found that the DPP-IV inhibition by Papain hydrolysate was not attenuated after simulated gastrointestinal digestion. In addition, IPNVAVD significantly inhibited the DPP-IV secreted by Caco-2 cells with no cytotoxicity. It also promoted glucose uptake in insulin-resistant HepG2 cells. Transport experiments showed that IPNVAVD could be absorbed intactly by the Caco-2 cell monolayer. Studies have shown that fish roe protein hydrolysates could be used as food additives possessing essential amino acids, antioxidant activity and inhibited DPP-IV effectively.