

Extended Abstract

In Silico Analysis of the Formation of Bioactive Peptides from Silver Carp (*Hypophthalmichthys molitrix*) Collagen [†]

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Due to its unique properties, the study of collagen represents a new trend in medical, pharmaceutical, and food sciences [1]. Recently, marine organisms have been considered as potential sources of collagen, as they are not classified as potential spreaders of communicable diseases [2]. This study explored the potential of silver carp collagen protein as a precursor of bioactive peptides using an in silico approach.

A series of in silico approaches (using the BIOPEP, PeptideRanker, peptide calculator [PepCalc], and toxin prediction [ToxinPred] databases) were employed to evaluate collagen from silver carp as a potential source of bioactive peptides [3,4]. Furthermore, a number of physicochemical properties and sensory and toxicity characteristics of the most bioactive peptides with antihypertensive and antioxidant activities were predicted (Figure 1).

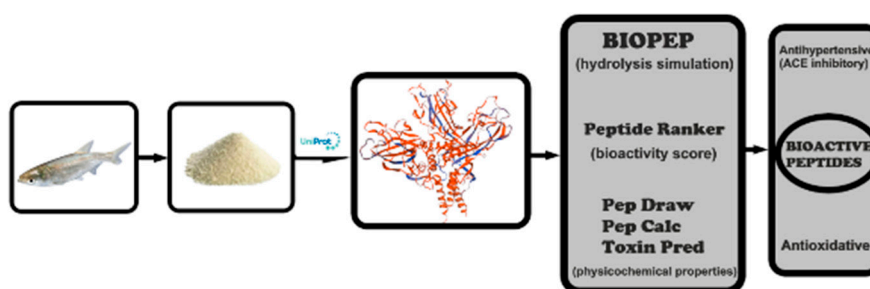


Figure 1. representation of the identification of bioactive peptides from silver carp.

Analysis of the profile of the biological activity of silver carp collagen showed possible peptides with antihypertensive and antioxidant activities. Based on the in silico hydrolysis simulation of collagen, pepsin and papain proteases can cleave the collagen protein effectively compared to subtilisin to release ACE-inhibitory peptides. The antioxidant activity was higher for subtilisin-cleaved peptides. PeptideRanker identified the peptides with the best bioactivity scores from the three enzymes analyzed. Several peptides showed good solubility in water, and all the peptides analyzed were classified as non-toxic.

Overall, this study highlights that the silver carp collagen could be a potential source of bioactive peptides with antihypertensive and antioxidant effects, and the in silico approach is a

quick and cost-effective method for analyzing these predicted structures with health-promoting effects.

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