

Extraction Methods for Marine Fish Collagen in Southeast Asia: A Comprehensive Review

Nur Sahirah Roslan & Fatma Nadiah Abd Hamid*

Structured Abstract

Background: Collagen plays a vital role in maintaining the structure and functionality of various tissues throughout the human body. As a result, there is growing demand for collagen across pharmaceutical, cosmetics, and food industries. This has created an urgent need to identify effective and sustainable sources of collagen. In this study, marine fish have been chosen as a new source for collagen extraction instead of plant sources such as fruits and vegetables or bovine source such as cow. Collagen extracted from marine fish is considered safer for consumers from various backgrounds such as for dietary purpose compared to collagen extracted from bovine sources as it may potentially transmit diseases. Meanwhile, fruits and vegetables do not naturally produce collagen, however, it contributes to collagen production in the human body by supplying amino acids, vitamin C, and antioxidants. Furthermore, marine fish produce more collagen compared to freshwater fish due to difference in their environment and physiology. Fish by-products such as scales, skin, and bones contain high collagen.

Methods: The purpose of this review is to present a comprehensive review of the three extraction methods that can be used to extract collagen from the marine fish. The three extraction methods are acid-solubilized collagen (ASC) extraction, enzyme-soluble collagen (ESC) extraction, and supercritical fluid extraction (SFE). From this review article, a total of 45 articles were reviewed. The articles were primarily retrieved using Google Search and Google Scholar.

Results: Enzyme-soluble collagen (ESC) extraction is the most effective for high-quality, functional collagen, while acid-solubilized collagen (ASC) extraction is simpler and better suited for small-to-medium-scale production. This study also determines the marine fish species that contain high collagen such as *Yellowfin tuna*, *Seer fish* and *Asian sea bass* that can be used as the alternative source for collagen extraction.

Conclusion: The benefit that will be gained from this article review is to provide a thorough study and overview of the different methods of collagen extraction from marine fish. This helps to understand the advantages and disadvantages of each extraction method such as the yield of the collagen extraction, purity of the collagen extracted, and cost effectiveness of the extraction methods.

Keywords: Collagen, Marine Fish, Acid-Solubilized Collagen (ASC) Extraction, Enzyme-Soluble Collagen (ESC) Extraction, Supercritical Fluid Extraction (SFE)

*Correspondence: fatma@uitm.edu.my

^a School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia