

Characteristics of gelatin from skin and bone of snakehead (Channa striata) extracted with different temperature and time

ABSTRACT

This study aimed to determine the physicochemical properties of the skin and bone of snakehead fish as a potential source of gelatin through extraction at different temperatures and times compared to commercial gelatin. Extraction of skin and bones of wild snakehead fish (*Channa striata*) at different temperatures (50, 60, 70 °C) and time (12,18, 24 hours). The pre-treatment process used a 0.1 M Ca (OH) 2 (1:6 w/v) immersion solution for 1 h and continued with 0.05 M citric acid (1:6 b/v) for 5 h. Before pre-treatment, the minerals of bones were degreased with 3% HCL solution for 24 hours. The results of the analysis showed that the differences in raw materials, temperature, and extraction time had a significant effect ($p < 0.05$), as well as interactions among treatments ($p < 0.05$) on the yield and gel strength. The yield of skin and bone tended to increase with extending extraction temperature and time, while the highest gelatin strength was found at 60 °C for 12 hours on the skin and 24 hours for the bone. The best gelatin was accomplished based on the highest performance of gel strength on skin and bones and compared to bovine commercial gelatin. The amino acids of the three types of gelatin showed higher levels of glycine and proline than other types of amino acids. Based on the total residues of each amino acid, skin gelatin and bone gelatin showed more dominant hydrophobic properties than hydrophilic properties, in contrast to bovine commercial gelatin. The three types of gelatin showed diverse chemical compositions, emulsion activity index, emulsion stability, water resistance, and fat binding capacity, which was reflected to be closely related to the source of the raw material and its amino acid content. The FTIR results showed that the extracted snakehead fish skin and bones have the potentiality to be used as gelatin equivalent to a commercial one.