Title Extraction and characterization of fish skin collagen from the Nile tilapia (*Oreochromis niloticus*) and the farmed Giant catfish (*Pangasianodon gigas*) for cosmetic application.

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Abstract

This study aimed to investigate the extraction and characterization of fish skin collagen from the Nile tilapia (NT; *Oreochromis niloticus*) and the farmed Giant catfish (GC; *Pangasianodon gigas*) for cosmetic application and also to prepare the hydrolyzed collagen from these NT and GC collagens. The results showed that collagen could be extracted from NT and GC skins by using acid solubilization process. The yields of collagen from NT and GC skin were 26.5% and 5.96%, respectively (wet weight basis). Electrophoretic patterns of these collagens showed high band intensity for the major compositions, especially α- and ß-components as the type I collagen without disulfide bond. Moreover, both NT and GC collagens mainly composed of Glycine and Proline, but the GC collagen had the higher hydroxyproline content than those of NT collagen. The temperature, at which the change in viscosity was half completed in the collagen solution (T_d), was about 30^{o}C and 17^{o}C for NT and GC, respectively. UV-visible spectra of both collagens showed the same peak at around 230 nm. Collagen hydrolysates (CH) were hydrolyzed by using 4 proteases (bromelain, papain, trypsin, and protease from *Calotropic procera* latex) (ratio of collagen to enzyme, 1:1000 g/unit) at 37^{o}C for 0.5, 1, 2 and 3 hours. The hydrolysates obtained by using these enzymes showed the disappearance of the three major protein bands of collagen. DPPH radical-scavenging activity of NT and GC collagen hydrolysates was significantly difference among the hydrolysis conditions (p<0.05). The significantly highest activity was found on bromelain-treated CH at 2 hours for NT collagen (12.38 mg TEAC g/dry weight) whereas, for GC collagen, occurred with protease from *Calatropic procera* latex-treated CH at 1 hour (7.46 mg TEAC g/ dry weight). The results suggested that the NT and GC fish skins could be used as an alternative source for collagen extraction and it is possible for obtaining bioactive peptides from these collagens hydrolyzed with the proteolytic enzymes.

Keywords: Collagen, Collagen hydrolysates, Farmed Giant catfish, Fish skin, Nile tilapia