Biochemical analysis of collagens from the bone of lizardfish (Saurida *tumbil* Bloch, 1795) extracted with different acids

ABSTRACT

Background. Lizardfish (Saurida tumbil Bloch, 1795) bone is a fish by-product generated during industrial surimi processing. This by-product is an important source of collagen production since the use of terrestrial animal-based collagens no longer sought due to concern regarding the transfer of infectious diseases and religious issues. Hence, this study was carried out to determine the biochemical analysis of collagens from the bone of lizardfish extracted with different acids. Methods. Lizardfish bone collagens were extracted with various acids (i.e., acetic, lactic and citric acids). All extraction processes were conducted in a chiller room (4 ◦C). The extracted collagens were biochemically characterized, such as hydroxyproline content, Ultraviolet (UV) absorption, X-ray diffraction (XRD), Fourier transform infrared spectroscopy spectra (FTIR), Differential scanning calorimetry (DSC) and solubility in different pH values and NaCl concentrations. Results. The yield of extracted collagens ranged between 1.73% and 2.59%, with the highest ($p < 0.05$) observed in citric acid-extracted collagen (CaEC). Protein patterns confirmed that all-collagen samples had two identical subunits, α1 and α2, representing type I collagen. The highest whiteness value was found in acetic acid-extracted collagen (AaEC), but there was no significant difference ($p \geq 0.05$) compared to lactic acid extracted collagen (LaEC). UV absorption and XRD analysis reflected the characteristics of the collagen, as reported in the literature. For the FTIR, all acid-extracted collagen samples presented a triple helical structure. The thermal transition temperature (T max = 77.92–89.04 ◦C) was in accordance with collagen extracted from other fish species. All extracted collagens were highly soluble in acidic pH and low concentrations of NaCl (0–20 g/L). In conclusion, collagens extracted from lizardfish bone may be used as alternative sources of collagen in industrial settings, and AaEC would be considered superior in terms of the characteristics evaluated in this study