Characterisation of gelatin extracted from buffalo (Bubalus bubalis) bone using papain pre-treatment

ABSTRACT

This study was carried out to extract gelatin from the bone of Buffalo (Bubalus bubalis) by incorporating enzymatic pre-treatment. Papain-aided extraction (PE) (9.1 ppm of papain at 50 °C water) was employed in the pre-treatment step, in which non-enzymatic extraction (NE) was carried out for comparison. The gelatin obtained were next evaluated for their physicochemical properties such as moisture, protein, and ash content, colour, and UV-vis absorption. Functional properties of the gelatin which included emulsifying and foaming properties were also determined. Four-fold increments in yield (wet basis) were obtained for PE (29.92 %) as compared to NE (7.5 %). Moreover, no significance difference ($p > 0.05$) in moisture content was observed for both PE and NE, although the protein content of the gelatin was observed in the range between 70-90 %. The resulting gelatin from both extractions was generally yellowish in appearance and was confirmed by the colourimetry data where no significant difference ($p > 0.05$) was observed for both samples. The maximum absorption peak for both PE and NE were observed at 210 nm, which was in the range commonly reported for gelatin. In addition, the emulsifying and foaming capacity of PE and NE had no significant difference ($p > 0.05$), although emulsion stability for PE was shown to be significantly higher ($p < 0.05$) compared to NE. The present study was an attempt to evaluate the potential use of local buffalo bone as raw material for gelatin production, which found that extractability could be improved with enzymatic pre-treatment in obtaining acceptable gelatin qualities.