

Valorization of Seafood and Poultry By-Products as Gelatin Source and Quality Assessment

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Abstract : Gelatin is a mixture of peptides obtained from collagen by partial thermal hydrolysis. It is an important and useful biopolymer that is used in the food, pharmacy, and photography products. Generally, gelatins are sourced from pig skin and bones, beef bone and hide, but within the last decade, using alternative gelatin resources has attracted some interest. In this study, functional properties of gelatin extracted from seafood and poultry by-products were evaluated. For this purpose, skins of skipjack tuna (*Katsuwonus pelamis*) and frog (*Rana esculata*) were used as seafood by-products and chicken skin as poultry by-product as raw material for gelatin extraction. Following the extraction of gelatin, all samples were lyophilized and stored in plastic bags at room temperature. For comparing gelatins obtained; chemical composition, common quality parameters including bloom value, gel strength, and viscosity in addition to some others like melting and gelling temperatures, hydroxyproline content, and colorimetric parameters were determined. The results showed that the highest protein content obtained in frog gelatin with 90.1% and the highest hydroxyproline content was in chicken gelatin with 7.6% value. Frog gelatin showed a significantly higher ($P < 0.05$) melting point (42.7°C) compared to that of fish (29.7°C) and chicken (29.7°C) gelatins. The bloom value of gelatin from frog skin was found higher (363 g) than chicken and fish gelatins (352 and 336 g, respectively) ($P < 0.05$). While fish gelatin had higher lightness (L^*) value (92.64) compared to chicken and frog gelatins, redness/greenness (a^*) value was significantly higher in frog skin gelatin. Based on the results obtained, it can be concluded that skins of different animals with high commercial value may be utilized as alternative sources to produce gelatin with high yield and desirable functional properties. Functional and quality analysis of gelatin from frog, chicken, and tuna skin showed by-product of poultry and seafood can be used as an alternative gelatine source to mammalian gelatine. The functional properties, including bloom strength, melting points, and viscosity of gelatin from frog skin were more admirable than that of the chicken and tuna skin. Among gelatin groups, significant characteristic differences such as gel strength and physicochemical properties were observed based on not only raw material but also the extraction method.

Keywords : chicken skin, fish skin, food industry, frog skin, gel strength

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