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Physical and chemical properties of gelatine extracted from the skin of scavenger fish (Pterygoplichthys spp.)

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The scavenger fish (Pterygoplichthys spp.) is an invasive species which has a significant impact on commercial fishery in reservoirs due to its higher population and low consumer acceptability. If a potential use of this species could be examined, this negative impact would be minimized on inland fisheries. Since there is an increasing demand for non-mammalian gelatine, this study was carried out to extract gelatine from the skin of the scavenger fish and to characterize the gelatine according to its physical and chemical properties.

For the extraction of gelatine the fresh skin was initially treated with 0.23% (weight (w)/volume (v)) sodium hydroxide with a ratio of 1:10 (biomass (b)/v) followed by 0.2% (w/v) sulphuric acid with a ratio of 1: 6 (b/v) and then 1% (w/v) citric acid with a ratio of 1:3 (b/v). Each treatment was carried out for 2 h. Following each treatment the skin was washed with water. Then the skin was heated at 54 ^{o}C with water (1:5 (b/v)) for 12h to extract the gelatine into the solution. The solution was filtered and the filtrate was dried in an oven at 60 ^{o}C until a thin dried layer of gelatine was obtained. The average yield of gelatine from fish skin was 4.22 ± 0.39%. The proximate composition of the extracted gelatine showed 83.16 ± 2.08% protein, 2.97 ± 2.04% fat, and 6.52 ± 2.66% ash on wet basis. The pH of the gelatine was 5.40 ± 0.01 and the isoelectric point was 7.0 - 9.0; therefore it can be considered as type A gelatine. Fat binding capacity of extracted gelatine was 182.86 ± 2.03% and water holding capacity was 12.39 ± 0.23 mL/g. The gelling temperature, melting temperature and melting points of extracted gelatine were 12.5 ± 0.5 ^{o}C, 25.83 ± 0.29 ^{o}C, and 26 ± 1 ^{o}C, respectively. The results obtained in this study suggested scavenger fish skin as a prospective source for gelatine production and the possibility of using extracted gelatine in different food applications in the food industry.

Keywords: Acid base extraction, Fish gelatine, isoelectric point, scavenger fish skin, Type A gelatine

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