

Abstract

The main goal of present study was isolation of protein from low value fish in poly-culture system of warm-water fish by isoelectric solubilization and precipitation (ISP) method and investigation of functional, nutritional, color and texture characteristics of isolate proteins. Acidic and alkaline solubilization and precipitation was used for protein isolate. By ISP method, Crucian carp protein was extracted in two steps: - solubilization of proteins in acidic and alkaline pH and – precipitation in isoelectric pH. Results showed that acidic treatment caused higher protein extraction from Crucian carp comparing with alkaline treatment. Investigation on functional characteristics of protein isolates from Crucian carp mince by ISP methods showed that there was not difference ($P>0.05$) in water holding capacity between acidic and alkaline treatments. Protein isolate by alkaline treatment showed higher emulsifying activity index (EAI) and emulsion stability (ES) than acidic treatment. By considering of ES and results of creaming index, it was resulted that in days 3, 6 and 9 higher percent of emulsion was changed to creaming in acidic treatment. Total content of essential amino acid in alkaline treatment was slightly higher than acidic treatment. Results showed that identified amino acids in Crucian carp protein isolate could meet all needs of an adult, but for child a supplementary protein must be used. Limiting amino acids in both acidic and alkaline treatment were methionine and cysteine. 19 fatty acids of saturated (SFA), monounsaturated (MUFA) and polyunsaturated (PUFA) groups were identified. Total of PUFA in alkaline treatment was noticeably higher than acidic treatment. N-6/n-3 ratio in alkaline treatment was also higher than acidic treatment. Texture of prepared gel from alkaline treated protein isolate had more hardness comparing with acidic treated protein isolate. According to gel color analysis, acidic treated gel had more whiteness and L^* comparing to alkaline treated gel.

Keywords: Crucian carp, Isoelectric solubilization and precipitation, Protein isolate, Amino acid profile, Functional characteristics.



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**Functional and nutritional quality of
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carp (*Carassius carassius*) by acidic and
basic precipitation**

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