Protein powder from red toothed Triggerfish (*Odonus Niger*): An ingredient for food application

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The demand and awareness on fish protein has encouraged the food industry for developing value added /functional food products. Fish protein powder (FPP) finds application in the food industry for developing formulated food products with high quality and nutritional value. FPP is actually a dried, concentrated and stable fish based product and serves as a valuable protein supplement for the vulnerable populations. Protein content of the FPP depends on the raw materials, additives used and moisture content, but contains at least 65% proteins and can be used in the food industry for developing re-structured and ready-to-eat food products.

The red toothed triggerfish (*Odonus niger*), locally called as "klathi" was used for the preparation of fish protein powder by different extraction processes like hot and cold extraction. Trigger fishes are deep sea fishes belonging to balistidae family with deep body, large scales, small mouths, and high-set eyes. Red toothed triggerfish is also known as leatherjacket due to its thick and hard skin, constituting about 25% of the total body weight which makes it less prone to predators. These fishes are caught in abundance from the Kerala coast and huge landing of this less valued fish at times creates less demand and pose environmental problems in fishing harbours. A large proportion of these fishes are often used for making fertilizer or animal feed.

Compositional analysis showed that the fish contains about 75% moisture, 14.12% protein, 1.47 % fat and 9.51% ash on an average and the deskinned mince constitute about 79-80% moisture, 15.5% protein, 1.75% fat and 3.68% ash content. Protein powder was prepared from the fish mince is extracted by two different processes, cold extraction (T1and T2) and hot extraction (T3 and T4) with water and with and without ginger (0% and 1% ginger extract). The washed mince was oven dried at a temperature of 60-70˚C, powdered and sieved through a stainless-steel sieve (mesh size, 500 micron). The protein powder was packed in laminated pouches and vacuum sealed before storing.

Fig. 1 *Red Toothed Tigger fish (Odonus niger)*

Fig. 2 *Fish Protein Powder*

The nutrient composition of the powders revealed 75-80% protein, 0.8-1.78% fat, 12.8-17.9% ash content with a moisture content of below 10% and a water activity value of 0.53. The protein quality was high and rich in all essential amino acids. Also, it contains a high mineral content that encompasses all essential minerals like Ca, K, Mg, P, Cu and Se, with a very high content of Ca and Phosphorus.

The functional characteristics of the protein power extracted by cold methods were superior compared with that by hot method. A higher solubility in water was observed in T4 (78.13%) sample which was enhanced by the addition of ginger extract during the process of extractions. Both water absorption capacity and oil absorption capacity were higher in cold extracted samples. The powders observed a whiter (L*71.71 – 75.45) and less hygroscopic nature (0.2-0.28%). The bulk density (0.71) and tapped density (0.85) were higher for hot extracted samples. Hence the Carrs index value and Hausner ratio which indicates the cohesiveness of the powder was low (1.25) in hot extracted sample. The cohesiveness of powders determines their consistency and flow properties. Lower the cohesiveness, better the flowability and the hot extracted powders showed better flow properties. Both powders showed less oxidation indices value and have a good sensory acceptance.

The difference in the properties can be made use in formulating different food products such as extruded snacks, nutrient mixes, smoothies, pasta, noodles, cookies, ice- creams etc. which in turn enhances nutritional and functional value of the product. The utilization of this unconventional fish species has been one of the most important challenges in recent years. Developing functional FPP can be a viable option through which convenience, novelty and marketability can be added for a commercially low valued fish. FPP could also possibly used as a functional ingredient for many formulated/ ready-to-eat products having good functionality, stability and sensory quality.

Effect of house hold pressure cooking on shrimp allergic protein, tropomyosin

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Seafood associated food allergy, particularly due to shrimp consumption, is showing an increasing trend in recent times. Allergic or hypersensitivity reactions are inappropriate responses of the immune system to a normally harmless substance. Seafood allergy comes under type I immediate hypersensitivity reaction, mediated through immunoglobulin E (IgE). Tropomyosin, a major shrimp allergen, is a myofibrillar protein with molecular weight ranging from 34 to 38 kDa and linked with regulation of muscle contraction along with actin and myosin. It is a heat stable protein which can elicit allergenicity in sensitive individuals through the binding of IgE specific epitopes (Motoyama et al., 2006).

Flower tail shrimp (*Metapenaeus dobsoni*) is