

composition of the formulated diet fed to the cultured fish differed greatly from that of the diet consumed by the fish in wild.

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Development of nutraceuticals from marine sources in India: Current scenario and future trends

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Globally marine resources have been utilized extensively for the development of drugs, novel foods, high value compounds and nutraceuticals for the promotion of human health and nutrition. Despite vast marine resources in India, these still remain underutilized. Besides, fish processing activity generates huge amount of waste. The utilization of waste from fish processing industries for the production of value added products has attracted substantial attention. Discards from fish processing industries are a mixture of head, viscera, skin and bone. The waste biomass can be a valuable source of bioactive lipids, proteins, peptides, amino acids and carbohydrate polymers. In India, annually 18,650 tonnes of shrimp waste is available for chitin production with a production potential of 3500 tonnes. Majority of fisheries biomass is presently employed to produce fish oil, fish meal, fertilizer, pet food and fish silage. These recycled products possess low economic value. Recent studies have isolated a number of bioactive compounds from fish muscle proteins, fish oil, fish bone, viscera and from crustacean shells. Development of new technologies for extraction of novel bioactive compounds from processing waste will bring more value out of what is today considered as waste. Attempts to

develop nutraceutical products from marine sources and also from fishery waste by our research group are briefly discussed. The mechanism of action of marine biomolecules in elevating health status in albino rats is highlighted. Scope and innovations in development of nutraceutical industry from marine sources in India are summarized.

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Characterization and expression of insulin like growth factor binding protein 1 (IGFBP 1) gene in *Labeo rohita* fingerlings fed with graded levels of carbohydrate

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Growth in fish is endocrine system dependent, especially through growth hormone (GH) - IGF axis. Insulin like growth factor-binding proteins (IGFBPs) play a vital role in regulating the biological activities of IGFs. In this study, the partial segment (478 bp) IGFBP-1 gene of rohu, *Labeo rohita* (Hamilton, 1822) was cloned and characterized. A 60-day feeding trial was conducted to study the effect of graded level of digestible carbohydrate on IGFBP gene expression in rohu fingerlings. Three isonitrogenous (34.75%) and isolipidic (7%) diets with varying digestible carbohydrate level i.e. 20% (T1), 30% (T2) and 40% (T3) were prepared. One hundred and eight fish were randomly distributed to three treatments in triplicates following a complete randomized design. Temporal expression of IGFBP-1 mRNA was monitored at different time intervals (15th, 30th, 45th and 60th day) in different