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Effective and sustainable management of fish waste produced in markets and processing industries, is a major challenge faced by the coastal communities. Composting is an environment friendly method for fish waste disposal, and for the production of valuable organic fertilizers. However, quality of compost depends on the use of proficient microbes to mediate the bioconversion processes. Accordingly, as a first step in developing a competent fish waste composting strategy, suitability of a commercial organic waste composting consortium was tested through microbiological profiling. For this, various selective media were used for isolation of microbes involved in waste degrading activities such as producers of hydrolytic enzymes viz. amylase, cellulase, chitinase, lipase and protease, ammonia oxidizing bacteria (AOB), organic and inorganic phosphate solubilisation bacteria (PSB), nitrite oxidising bacteria (NOB) and sulphur oxidizing bacteria (SOB). Representative isolates were quantitatively evaluated for each activity. The order of relative abundance of enzyme producers was protease>lipase>chitinase>cellulase>amylase. There were potential producers for all enzymes with highest enzymatic index as 1.8, 2.9, 1.5, 1.8 and 1.0 respectively. Four isolates were efficient for denitrification. Highest organic and inorganic phosphate solubilisation efficiency was 2 and 7 respectively, evidencing the presence of highly efficient inorganic PSB and medium efficient organic PSB. Despite the presence of some AOB, NOB and SOB, their efficacy was less. Potential isolates were characterized as *Lysinibacillus xylanilyticus*,

Halotalea sp., *Bacillus oryzaecorticis*, *Cronobacter condimenti* and *Bacillus megaterium*. As fish waste is rich in nitrogen, sulphur and organic phosphorus, presence of efficient AOB, NOB and organic PSB can improve the quality of final compost. Similarly, exclusion of denitrifiers can avoid the loss of nitrogen during composting. Consequently, while there were efficient organic matter degrading enzyme producers, absence of efficient AOB, NOB, organic PSB and presence of denitrifiers recommends an improvisation of the evaluated consortium before application in fish waste composting.

AV OR 23

Shelf life studies of seaweed based extruded snacks coated with different flavour-oil combinations at different storage environments

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Three different flavours (chat masala, tomato and pudina flavours) were coated at 15% (w/w) to the brown seaweed (*Sargassum wightii*) enriched rice-corn based extruded snack which were prepared under optimized extrusion conditions. The respective flavours were coated by dusting to dried extruded snacks along with sunflower oil spray at 3 levels (5%, 10% and 15% (v/w)). The coated products were packed in metalized polyester-polyethylene laminated pouches with nitrogen gas flushing. A storage study was conducted at ambient (27°C, 64% RH) and accelerated (37°C, 97% RH) storage conditions. The samples were analyzed on 0th, 30th, 60th and 90th days. Among the nine different flavour-oil combinations, brown seaweed based extruded snack coated using 15% chat

masala flavour dusted along with 10% sunflower oil was found to have maximum storage stability at ambient and accelerated storage environments. The chat masala flavour coating was found to mask the undesirable seaweed flavor at the end of storage study. The quality as well as sensory attributes of the product after 90 days of storage at ambient environment was satisfactory. The moisture content, free fatty acid content and peroxide value of the product at the end of 90 days storage period in ambient conditions were 4.3%, 0.9 as % oleic acid and 0.3 meqO₂ respectively. There was a significant increase in hardness and moisture content in the products stored in accelerated conditions after 60 days.

AV OR 24

Impact of commonly used antimicrobials on the protein content and shelf-life of fish steaks under freezing condition

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Fish is an integral part of the diet of 95-100% population of the different states of the NE Region. Good quality fish is however not available throughout the year in the Region to meet the demand of people. Processing of raw fish to make it pan-ready is also time-consuming and not convenient for consumers particularly for the urban areas where the people are leading a very fast paced life. The present investigation was carried out to study the impact of commonly used antimicrobials on the protein content as well as the shelf life of fish steak developed from Catla fish. The work was conducted at

Fisheries Research Center and Department of Biochemistry and Agricultural Chemistry, Assam Agricultural University, Jorhat, during 2016-2017. Catla fish steaks were treated with salt, turmeric and vinegar in different combinations viz. dry salt (T1), vinegar (T2), salt + turmeric (T3), salt+ turmeric+ vinegar (T4) vacuum packed, sealed and stored for a period of 21 days at -18°C. A control set was kept without any preservative under vacuum packed and freezing condition. Out of the different treatments, T4 was found the best treatment on the basis of protein content ranging from 19.78±0.60% to 20.58±0.99% at different days interval i.e. 1st day, 7th day, 14th day and 21st day of storage. From the findings of the study a technically viable protocol for commercial production of 'ready-to-cook' protein rich fish steaks by treating with commonly used antimicrobial agents, that is marketable and usable up to 21 days of storage, can be developed for commercial production and development of entrepreneurship.

AV OR 25

Effect of severing skeletal muscle at different stages of rigor on physical and chemical quality of white shrimp *Litopenaeus vannamei* during frozen storage

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In this study effect of severing skeletal muscle by beheading at different stages of rigor on the quality of pacific white shrimp *Litopenaeus vannamei* during frozen storage for a period of six months was investigated