AV OR 14

Indigenous fish preservation technology of northeast India: An overview

RANENDRA K. MAJUMDAR*

College of Fisheries, Lembucherra, Tripura, India;
drrkmcof@gmail.com

The north eastern region of India is known for its vast natural resources and a cauldron of different people and cultures, lie deep in the lap of easternmost Himalayan hills in northeastern part of India. The northeast India is home to varied number of tribal groups (almost 166). Each tribe has their own distinct culture, which gives them a unique cultural identity. The region is a treasure on indigenous knowledge systems pertaining to agriculture, medicine, food and natural resources management. The Northeastern states of India, being the highest rainfall area of the world, do not provide a congenial environment for simple sun drying of fish. Such conditions tempted them to evolve other methods of fish preservation like fermentation and smoking besides simple sun drying. From commercial point of view most important indigenous fermented fish products include 'shidal', 'ngari', 'hentak', 'tungtap' and 'lonailish'. Such processes are normally handed down from generation to generation and product quality primarily depends on the experience of the processor. Proximate analysis of indigenously fermented fish products of the region revealed that pH and total titratable acidity justify their shelf stability at ambient temperature. The DPPH radical scavenging activity was estimated from 40 to 80% in different fermented fish products. Both essential amino acids and fatty acids were detected in those products. Coagulase negative *Staphylococcus* and lactic acid bacteria were identified as dominant group in all the fermented fish products. The Staphylococci were comprised of 8 species, namely, *Staphylococcus piscifermentans*, *S. condiment, S. arlettae, S. sciuri, S. warneri, S. hominis*, *S. nepalensis* and *S. simulans*. Whereas, LAB included species such as *Lactobacillus plantarum*, *Pediococcus pentosaceus*, *Pediococcus acidilactici*, *Enterococcus faecium*, *Enterococcus faecalis*, *Pediococcus lolii*, *Enterococcus hirae* and *Enterococcus lactis*. LAB has shown antimicrobial and antibiotic potential and could be considered as source of probiotics in such products.

AV OR 15

Marine melanin: Antioxidant and radio protective properties

P.K. BINSI*, S.K. PANDA, P. MUHAMED ASHRAF, A.A. ZYNUDHEEN

ICAR-Central Institute of Fisheries Technology, Matsyapuri P.O., Willington Island, Kochi, Kerala, India; *binsipk@yahoo.com

Marine biopolymers are attracting a great deal of attention owing to their distinct bioactive properties. Among marine biopolymers, melanin is unique in several aspects, as it has many functional sites, which makes it suitable for varied types of industrial applications. Melanin was isolated from cuttlefish ink and modified for specific applications. Scanning electron microscopic image of native melanin indicated granules of melanin confined within melanosome vesicles. The solubility profile of purified melanin revealed distinct settling behaviour at acidic pH, colloidal behaviour at neutral pH, and complete solubilisation above pH 8.5. Isolated melanin showed broad spectral absorption in the entire UV range with a narrow and lower absorption at around 800 nm. FTIR spectra showed characteristic

peaks of OH, NH, and antioxidant phenolic groups of melanin pigment. Elemental composition of melanin was found to be identical to human skin melanin. The antioxidant properties of melanin using *in-vitro* model assays indicated higher antioxidant power compared to BHA and BHT. Hence, antioxidant efficacy was further ascertained in a model vegetable oil system (coconut oil), under accelerated storage environment. The results indicted better oxidative protection at 0.5%, as confirmed by fatty acid profile and lower FFA, PV and TBARS values. Oil containing 1% melanin showed similar oxidative progress as that of control samples, during storage. In brief, the results of present study identifies marine melanin as a prospective photoprotective and anti-oxidative moiety suitable for incorporation in cosmetic and food formulations.

AV OR 16

Chilled storage studies of coated products developed from pacific white leg shrimp (*Litopenaeus vannamei*, Boone, 1931) and their shelf life evaluation

M.M. LIJIN NAMBIAR*, A.A. ZYNUDHEEN, S.K. PANDA, GEORGE NINAN

ICAR-Central Institute of Fisheries Technology, Willingdon Island, Kochi, Kerala, India; **lijin141@yahoo.com*

Litopenaeus vannamei is the most commonly cultured shrimp in Southeast Asia and Latin America, standing for over 90 % of total shrimp production. In India, the total production of vannamei shrimp reached 4,06,018 MT in 2015-16 recording an increase of 52,605 MT from the previous year (3,53,413 MT) and contributing about 81% of the total aquaculture production. Shimps are the major export items in the form of raw frozen, cooked frozen, IQF etc. This study is an attempt to reconnoiter the potentials of better utilization of this species by development of battered and breaded products. Quality evaluation and shelf life studies were conducted for the products developed from farm caught *L. vannamei* under chilled storage. Shrimps were cleaned in two styles (butterfly and peeled deveined), and it is battered, breaded, flash fried, packed and stored (2^{o}C). The products were evaluated for the physical, chemical, sensory and microbiological quality attributes. There was a significant decrease in the sensory scores during storage, and levels of other quality indices increased significantly for both the products. The total aerobic plate count did not exceeded 5 log 10 CFU/g during the 15th day of the study. Coated butterfly and coated P.D. shrimps had a good shelf life of 15 days in chilled storage.

AV OR 17

Waste to shelf: A value chain approach for fishery waste management

A.A. ZYNUDHEEN*

ICAR-Central Institute of Fisheries Technology, Kochi, Kerala, India; **zynucift@gmail.com*

Fish used as human food accounts for 78% of the total fish catch in developed and developing countries, leaving about 21% for non-food uses. During processing operations generally the fillets are retained while the bulk of product (upto 70%) is discarded in the form of skins, bones, scales, viscera, head etc. This indicates, a minimum of 4 MT of fishery waste has been generated every year, even though it is scattered in the domestic and industrial sector. Disposal of process discard is a major constraint in seafood industry as these discards are easily perishable and often invites public resistance