

each, with enzyme extraction through use of acetic acid buffer occurring in the interim period. The solid remnants of the fermentation process, as well as unfermented water hyacinth were subjected to FTIR spectroscopy analysis to investigate possible changes in lignocellulose structures.

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#### Effect of calcium and heat setting on gelation and functional properties of surimi obtained from lesser sardine (*Sardinella fimbriata*)

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In the recent years, much attention has been given to dark meat fish species as an alternative raw material for surimi production but these species produce surimi having poor gel forming ability. In this context, effect of calcium and setting on gel characteristics of lesser sardine (*Sardinella fimbriata*) surimi was evaluated. Lesser sardine was processed in order to get minced meat without setting (A1), minced meat with setting (A2), control without calcium addition and without setting (B1), control with calcium addition and with setting (B2), surimi added with calcium and sodium bicarbonate without setting (C1) and surimi added with calcium and with sodium bicarbonate with setting (C2) and refiner meat without addition of calcium and with addition of sodium bicarbonate (D). Surimi treated with calcium and sodium bicarbonate exhibited gel strength value of 329 g.cm (KA Grade) without setting whereas the setting at 35°C for 45 minutes enhanced the gel strength of surimi to 556.2 g.cm (AA Grade). Increased

hardness, chewiness, gumminess and cohesiveness were observed in C2 sample when compared with other samples. Set samples treated with calcium and sodium bicarbonate exhibited significantly higher whiteness values when compared with other treatments ( $p < 0.05$ ). Surimi samples treated with calcium and sodium bicarbonate exhibited reduced TBA values.

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#### Nutritional composition of Hilsa roe

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Roe is an important by-product of fish which have immense importance in fish processing industry as by-product utilization will improve the economic aspects of processing industry. Fish by-products are presently used to produce fish oil, fish meal, fertilizers, fish feed etc. Hilsa enjoys high consumer preference due to its unique flavor and culinary properties and like hilsa meat its roe is also considered a popular delicacy. Nutritional composition on hilsa meat has been extensively studied; however, information on the nutritional attributes of hilsa roe is scanty. In this context, the present study was undertaken, to analyze the nutritional composition of hilsa roe in terms of gross chemical composition (moisture, crude protein, crude fat and ash), amino acid and fatty acid composition. Gross chemical composition was determined as per AOAC (2006) protocol. Amino acid composition was analyzed by HPLC and fatty acid composition was analyzed by GC/MS. Gross chemical composition analysis showed that, hilsa roe contains less moisture (48.2%) but high amount of fat (30.12%) as