


Wooden Kotia under construction

lifted to specially designed lorry and transported to the respective berthing area. With the help of cranes, the boat will be transferred to water. This transportation cost for the lorry and crane will be ₹ 15,000 and 10,000, respectively. Average life of the wooden vessel is estimated as 20-25 years and it depends on the hydrographic conditions and maintenance. FRP trawlers were introduced in fishing sector of Saurashtra region nearly 5-7 years back. Presently, there is no report on steel fishing vessels from Saurashtra coast.

Kotias: Wooden cargoes connecting India to Middle East and North Africa regions

Besides fishing vessels, there is another class of vessels used for cargo purposes. In local parlance, these vessels are known as Kotias, Vaahan etc. These vessels have a total length of 30-40 m and a width of 12-14 m. Similar kind of vessels known as 'Dhow' are constructed in the Middle East countries. The wooden cargo vessels of Kerala are known as *"Uru"*. The construction details are same as that of the fishing vessel. As these are very big vessels, it may take 2-3 years to complete the construction. The cost of construction will be around ₹ 3-4 crores. After construction, vessels are transported to Middle East countries. During this voyage the vessels transport rice, wheat, sugar, cattle, sheep etc. from India. During the journey, there will be 15-18 crews including *Tandal*, *Malam* and one mechanic from the engine side. *Tandal* is considered as the captain and navigational operation is done by the *Malam*. From the respective port, further transportation of various goods will takes place within Arab nations and African countries like Mozambia, Somalia, etc. If the owner gets a good price for the *Kotia*, he will sell the vessel even to the persons outside the country. For this, registration of the vessel need to be cancelled from India, and reregisration should be done in the respective nation. Wooden fishing vessels and Kotias are the symbol of exceptional craftsmanship of the Indian traditional boat builders and these are part of our great culture, history and civilization.

Melanosis inhibition in ice stored *Litopennaeus vannamei* using alternaives to sodium metabisulphite

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Melanosis or black spot formation is a serious but, common quality defect in Crustaceans during post harvest handling and storage. Although melanosis causes no health issues, it diminishes the sensory appeal of the product, ultimately leading to low commercial value. This is being considered as a

major quality/economic problem in the trade of highly priced commodities such as shrimp. Melanosis is caused by the enzymatic oxidation of colourless phenols to quinones which further undergoes oxidation to black or brown melanin. The intensity of melanosis varies among species as it is dependent on substrate and enzyme concentration (Benjakul *et al.*, 2005). Black spot formation is rapid in *L. vannamei*, especially on the carapace, pleopods and telson, making it unacceptable to consumers, but does not necessarily indicate spoilage. Sulphite-based additives have widely been used to control melanosis in shrimp. However, increasing regulatory attention and consumer awareness regarding the safety of sulphite chemicals have generated the necessity of exploring safe chemicals or natural additives for melanosis inhibition. In this context, a study has been carried out to evaluate the efficacy of a blend of reducing agent Sodium citrates (SC) chelating agent (EDTA) and a natural antioxidant, pomegranate peel extract on controlling melanosis development in *L. vannamei* during iced storage.

Fresh shrimp were procured from the farm and brought to the laboratory in iced condition within six hours of harvest. Shrimp was deiced, the specimens which already indicated melanosis formation were removed and the remaining quantity was divided into five lots. Samples were treated in water without any additive (control) for 5 min. (A), solution containing 1.25% Sodium metabisulphite (SMS) (w/v) for 1 min., (B), solution containing 0.5% SMS, 0.5% Sodium citrate (SC) and 200 ppm EDTA for 5 min., (C), solution containing 0.5% SC and 200 ppm EDTA for 5 min. (D) and, solution containing 0.5% pomegranate peel extract (PE) for 5 min. (E). The shrimp after treatment were packed in polyethylene bags and stored in ice in insulated boxes. The melted ice was not replaced at any time during the storage period and the samples were withdrawn at 0, 12, 24, 36, 48 and 54 hrs for evaluation of melanosis score, total volatile base nitrogen (TVB-N), instrumental hardness and total plate count (TPC).

The results of the study revealed a significant effect on controlling the black spot formation by the different alternatives used, in which the treatment with solution containing pomegranate extract and those containing 0.5% Sodium citrate and 200 ppm EDTA was more effective than the treatment with 1.25% Sodium metabisulphite alone (Fig.1). At the end of 54 hrs, melanosis score reached 8, 5.5, 5, 4 and 5, respectively for A, B, C, D and E samples (Fig. 2). TPC of PE treated and combination of SC+EDTA treated samples was significantly lower than that of other treatments and control samples. The TPC at the end of 54 hrs of iced storage was 2.2×10^5 cfu/g, 1.2×10^5 cfu/g, 4.5×10^5 cfu/g, 2.3×10^4 cfu/g and 2.2×10^4 cfu/g, respectively for A, B, C, D and E samples. TVB-N and pH of pomegranate extract treated samples remained lower compared to other samples. In general, the hardness values reduced over the storage period in all samples, but the effect of treatment was not apparent. The result of the

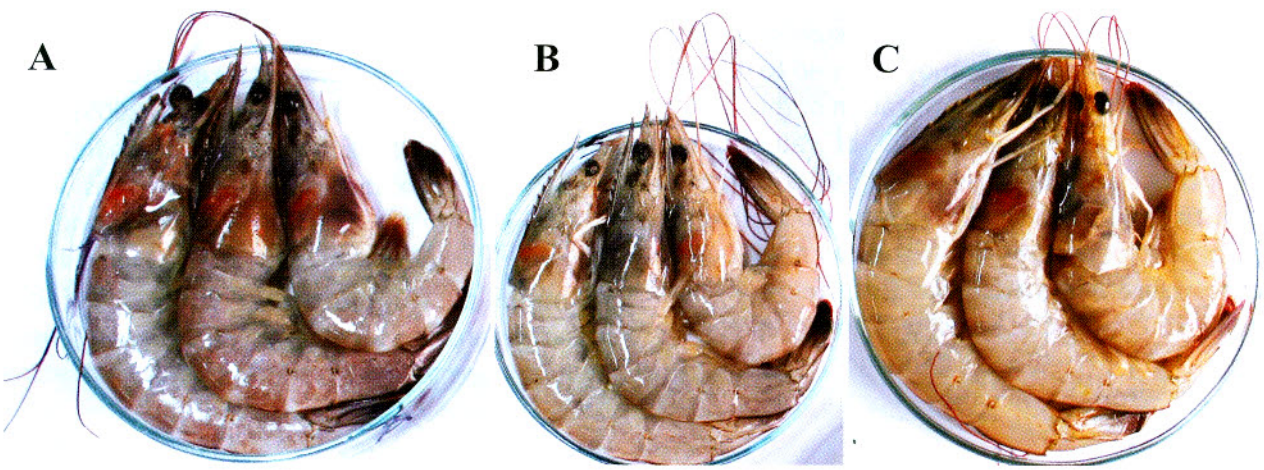

Fig. 1. Melanosis at 48 hr of iced storage (A) Control: Water without any additive (control) for 5 min., (B) Treated with 0.5% SMS for 1 min., and (C) Treated with 0.5% pomegranate peel extract

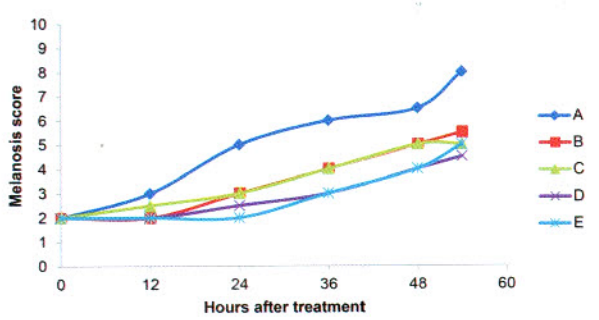

Fig. 2. Melanosis score of *L. vannamei* during iced storage

Melanosis scoring (0-10) (Nirmal and Benjakul, 2009): 0: Absent, 2: Slight (up to 20% of shrimp surface affected), 4: Moderate (20-40% of shrimp surface affected), 6: Notable (40-60% of shrimp surface affected), 8: Severe (60-80% of shrimp surface affected) and 10: Extremely heavy (80-100% of shrimp surface affected)

study indicated that pomegranate peel extract and chemicals like Sodium citrate and EDTA can be used as alternatives to control melanosis development in cultured shrimps. However, the use of proper concentration of the blends of chemicals and use of colourless pomegranate extract has to be further investigated.

References

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Protein isolate from Bombay duck mince: Ideal for value addition

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Bombay duck (*Harpodon nehereus*) is one of the most important pelagic fishery especially along the west coast of India. Due to its high moisture content (90%), it is unsuitable to use as mince for the development value added products. Generally, bulk of Bombay duck catch is consumed in fresh and sundried form. This study is aimed to explore the possibilities of better utilization of this fishery resource for the development of value added products. Fish protein isolate (FPI) is prepared from fish mince or shell waste by using pH-shift technology and it mostly contains myofibrillar proteins extracted from the fish muscle (Hultin *et al.*, 2005). FPI can be used as an ingredient for production of value added and ready-to-eat products based on minced fish or surimi (Shaviklo *et al.*, 2010).

Fresh Bombay duck were procured from Vashi fish market and brought to laboratory under iced condition. The average length and weight of fishes were 24.5 ± 0.5cm, 200 ± 1.5 g, respectively. Fish mince was used as raw material for preparation of protein isolate. Fish protein isolate was prepared by alkali solubilization method. The solubilization can be accomplished by adding 5-10 volumes of water followed by adjusting the pH approximately to 11 (Hultin *et al.*, 2005). The mixture was then centrifuged. This allows the light oil fraction to rise to the top of the suspension. At the same time the lipids of the membrane are removed due to density differences compared to the main protein solution. Other insoluble impurities are also sedimented at this stage. Then, the muscle proteins were precipitated by adjusting the pH to a value near the isoelectric point (pH - 5.5) and collected by a process such as centrifugation. Fish protein isolate (FPI) obtained from this process can be stored in frozen condition