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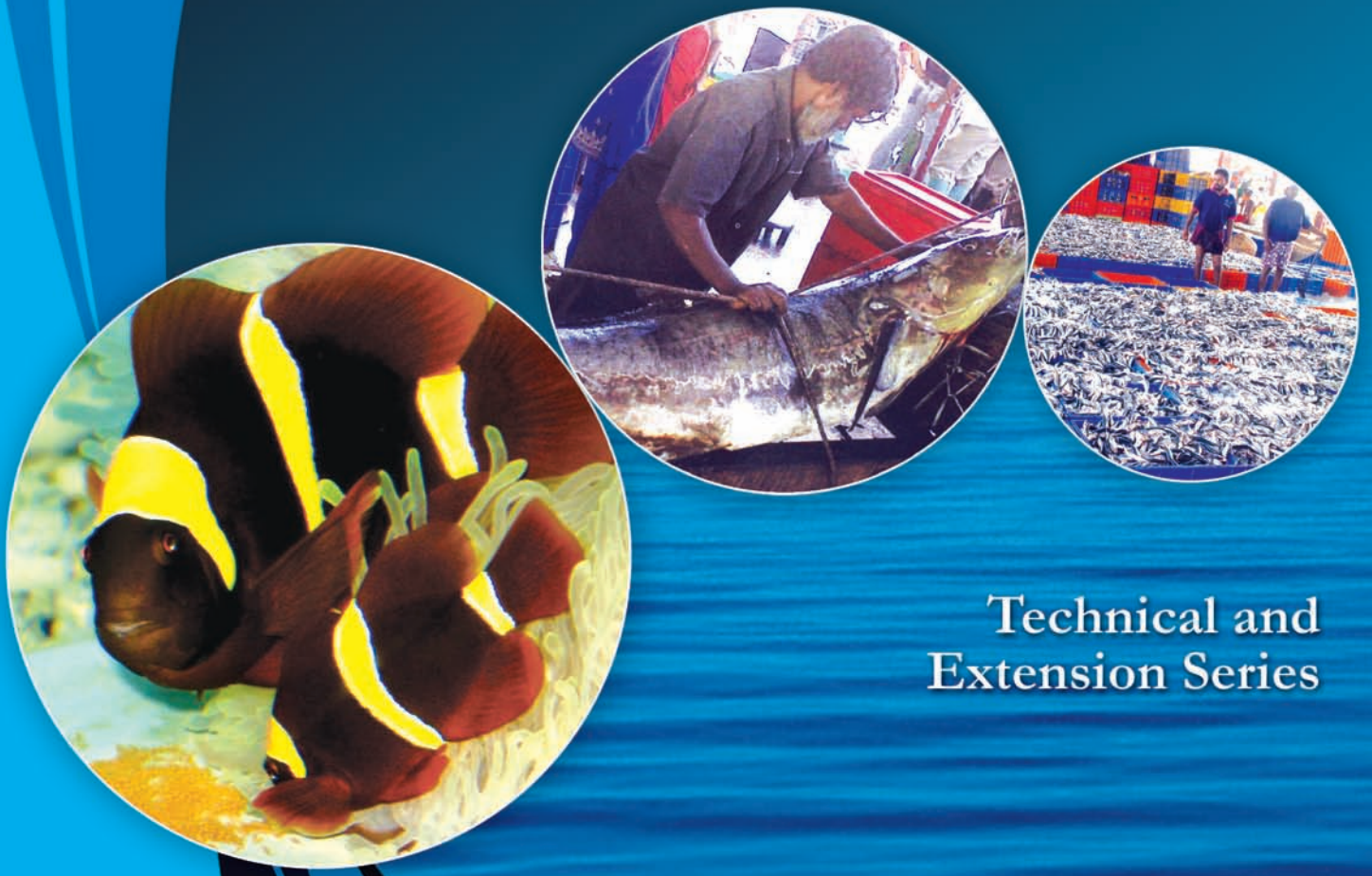

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Visual quality testing method used in the field for grading yellowfin tuna

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The yellowfin tuna (*Thunnus albacares*) popularly known as the 'chicken of the sea' is harvested along the Indian coast mainly with an eye on the export market. Though the fish meat both in fresh and canned form has a demand in domestic markets in some states, the higher value it fetches in the export market prompts the fishermen to mainly aim at exports. However, certain minimal conditions of fish quality have to be ascertained and certified before it is accepted for export. The south-east Asian countries are the main market for tunas and tuna meat is consumed both in raw as well as processed forms (canned, fish fingers, fish powder, fish sauce *etc.*)

Visakhapatnam in Andhra Pradesh is an important tuna landing centre along the east coast of India. A number of small indigenous units operating the hooks and line, especially from Lawsons Bay, Pudimadaka and Mukkam villages, fish exclusively for large sized yellowfin tuna. On an average, each unit gets three to four yellowfin tunas per trip. The fishermen who are actually engaged in the fishing activity generally do not follow any quality control measures and get the tunas to the shore as such. The local fish merchants buy the fish from the fishermen and supply the same to the processors. It is the processors who arrange for some kind of quality testing and take up immediate steps to prevent further deterioration of the tunas brought ashore.

All the tunas brought ashore are not taken up by the processor as all of them will not meet the basic standards fixed by them. The selection of fish for procurement by the processor is done by a simple visual quality testing method. The processors cum exporters here, have engaged personnel, specialized in visually testing the quality of the yellowfin tuna meat and grade them accordingly. The instrument used by these quality testers consist of a simple steel corer with a piston attached to it (Fig. 1). It is also known as 'meat browser' locally. The corer has a length of 50 cm and an inner core diameter of 2.5 mm. Fishes are graded purely on the visual appearance of the meat drawn up by the corer. The corer is plunged rapidly into the body of the yellowfin tuna at the base of the first dorsal fin (Fig. 2) and a meat strip of about 15 cm long is drawn. The quality tester then places the meat strip on his palm (Fig. 3) and based on the overall visual appearance like colour, firmness and smoothness of the meat strip, grades the fish as 'a', 'b' and 'c'.

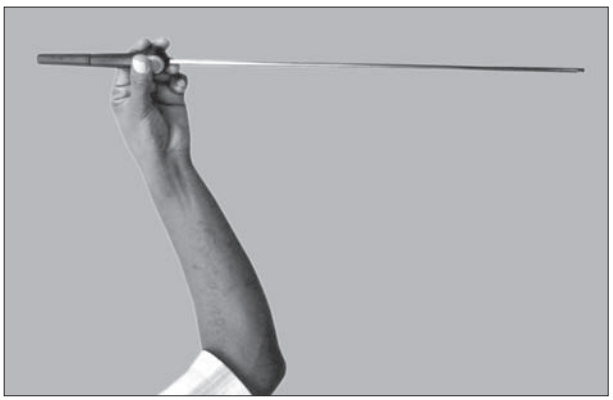

Fig. 1. Steel corer used for testing the quality of yellowfin tuna meat

Fig. 2. Corer being plunged at the base of the first dorsal fin of yellowfin tuna

Fig. 3. Thin stip of yellow fin tuna meat drawn by the corer

Tuna meat graded as 'a' are supposed to be of the most superior quality and the meat can be used for 'sashimi'. The meat strip here is smooth, firm, unbroken and has fresh pale pinkish white colour. Tuna meat graded as 'b' and 'c' too are of good quality but does not meet the standards for consumption as 'sashimi'. The sampled meat strips here too are unbroken but has a little bit of discoloration tinged with blood at times. The colour too is a darker pink shade compared to grade 'a'. If the sampled meat is broken, not firm and bloody, the fish is rejected by the quality tester.

Fishing for yellowfin tuna at Visakhapatnam is mainly carried out by the indigenous sector. The traditional non-mechanized catamarans with huge sails mounted on them go fishing beyond the territorial waters to fish for these oceanic tunas. The tunas caught mainly by hooks and lines are just kept on the available small deck space till they return back to the landing centre in the evening. The fish is neither bled nor iced till they are brought back to the shore. At the landing centre, the buyers take charge of the fish and they supply it to the processors. The processors are interested only in the export quality fishes and employ quality testers to certify the quality of the tuna meat to assure that the fish purchased by them is of high grade. As very little quality control measures are taken up by the local fishermen, less than 0.5% of the tunas landed are given 'a' grade and 20-40% graded 'b' and 'c'. The rest of the catch is not taken by the processors. The fishes meant for export are immediately gutted, chilled and sent under chilled condition to Chennai from where they are sent to the identified country. The fishes for domestic markets are iced whole and transported by road to their respective destinations. The 'a' grade tuna are mostly exported to Japan and other south-east Asian countries. The 'b' and 'c' grades are mostly sent to the United States of America, Spain, Italy and Gulf countries. Tunas which have failed the quality test for export are used within the country. They are sent to domestic fresh fish market or processed for canning and pickling.

A few mechanized longliners have been introduced at Visakhapatnam to harvest the stock of yellowfin tunas occurring in this region. These units are well equipped and 100% of the catch is exported. The tunas are bled as soon as they are hauled onboard and chilled as per the standards laid down for export. The quality tester does not play an important role here, though random checks are performed to assure that a minimum export standard is maintained. Very few such mechanized longliner units are presently operating off Visakhapatnam and it is still the prerogative of the non-mechanized units to harvest the stock of yellowfin tunas of this region. The role of the quality tester as of now thus is very crucial in certifying and grading the tunas for export. Tunas graded for export fetch three to four times more rate than fixed for the domestic market. The fishermen should be trained in the basics of bleeding the fish soon after capture and advised to adopt some techniques to preserve the quality of the fish. This will greatly benefit the fishermen who really take great risks to travel far off into the deep sea in their small sparsely equipped crafts to catch these high value fish.