

RESEARCH PAPER

Shelf-life study of ready - to- cook fresh fish pieces stored at ambient temperature

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ABSTRACT

The shelf-life of fish pieces from different resources such as rohu, *Labeo rohita* (fresh water), mugil, *Mugil cephalus* (brackish water) and lesser sardine, *Sardinella fimbriata* (marine water) using low cost commonly used preservatives mixture comprising of common salt, turmeric powder, chilly powder and tamarind pulp has been studied during the month of December at ambient temperature (average temperature and relative humidity of $19 \pm 4^\circ\text{C}$ and $64 \pm 5\%$, respectively). Biochemical, microbiological and organoleptic characteristics of the raw fish with and without preservative mixture were carried out. An increasing trend in TVBN, TMAN, PV, FFA and TPC was noticed in all the samples stored at ambient temperature ($p = 0.05$), whereas the moisture, pH and AAN content decreased during the storage period ($p = 0.05$). From the statistical analysis for correlation between overall acceptability (OAA) scores and chemical scores it was observed that rohu, mugil and sardine fish pieces were acceptable upto 108h, 112h and 88h, respectively. The chemical score for acceptability were found to be $=32 \text{ mg\%}$, $=29 \text{ mg\%}$, $=24 \text{ mg\%}$ for TVBN and $=3.22 \text{ mg\%}$, $=3.25 \text{ mg\%}$, $=2.65 \text{ mg\%}$ for TMAN for rohu, mugil and lesser sardine, respectively.

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Key words : Shelf-life, Ambient temperature, Rohu, Mugil, Lesser sardine.

Most of the tropical fishes become inedible after exposure to ambient tropical temperature for 8–12 h. Shelf-life may be extended upto 2 weeks by storing in ice. Many consumers prefer uniced fish as it has better flavour and texture. Melting ice is known to leach out water soluble nutrients and flavour bearing components of a fish. Thus, a process capable of extending shelf-life of fish at ambient temperature is definitely a step forward in the efficient distribution of fish for human consumption in the tropics. Nair *et al.* (1990) had tried with calcium propionate as a preservative for ready to cook fresh fish portions during storage at ambient temperature of $19 \pm 4^\circ\text{C}$. Tamarind having the active component, tartaric acid, occurs naturally and is generally used in food as preservative (Swisher and Swisher, 1967). It has a unique property that it does not get metabolized when ingested unlike other principal food acids such as citric acid and malic acid. When added to fish, it lowers pH sufficiently to limit or prevent the growth of spoilage organisms (Dunn, 1957). Mishra and Nanda (1991) used turmeric and chilly powder at 0.2% and 3%, respectively for preservation of prawn during storage at ambient temperature. With this backdrop, the present study was undertaken to find out the effect of a preservative mixtures (salt, turmeric powder, chilly powder and tamarind pulp) on the shelf-life of the ready to cook fresh fish portions (rohu, mugil and lesser sardine) at ambient temperature of $19 \pm 4^\circ\text{C}$.

MATERIALS AND METHODS

Fresh fish rohu, *Labeo rohita* of fresh water origin, grey mullet, *Mugil cephalus* of brackish water origin from local market and lesser sandine, *Sardinella fimbriata* of marine origin from Gopalpur landing centre were used in this study. The fishes were collected during the winter season (December). Average temperature and relative humidity were recorded to be $19 \pm 4^\circ\text{C}$ and $64 \pm 5\%$, respectively. The average weight of three species i.e. rohu, mugil and sardine were 900g, 500g and 15g, respectively which were recorded to be optimum Table size. The fishes were scaled, gilled and deheaded. Rohu and mugil fishes were cut into pieces of 30-50g each. But the sardine fishes were used as a whole because of their small size. The cut fish portions were washed and drained. The preservative mixture was prepared as follows. Tamarind paste was prepared by soaking tamarind in water in the ratio of 1:1. All other ingredients were added to the tamarind paste and the preservative paste thus prepared was applied on the cut fish portions.

Each species of fish was divided into two lots. One lot was stored in white enamel tray as such without preservative (control 'C') while the other lot was mixed properly with preservative paste in the proportion of fish to paste as shown in Table 1 (treated sample 'T'). Both the trays (fish lot with and without preservative) were covered with a nylon screen in the laboratory. Samples