
Marination of fish for establishing safety against *Yersinia enterocolitica*

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Fish marination is an old age technique which is practiced around the world including India even at household level. Marinades include sugar, spices, oil and vinegar or fruit juice, which are used to improve the tenderness, juiciness, flavor and aroma (Cadun *et al.*, 2008). The process of marinating slows down the bacterial and enzymatic activity extending the shelf life of the product (Sallam *et al.*, 2007). Initial reduction in viable bacterial counts are reported after marination which extends the shelf life in the pre-cooking stage (Maktabi *et al.*, 2015). However, reports on the effect of marination against emerging pathogens like *Yersinia enterocolitica* are scanty. *Y. enterocolitica* infection results in diarrhoea (the most common clinical manifestation), acute mesenteric lymphadenitis

(may mimic appendicitis), vomiting, low-grade fever and abdominal pain. *Y. enterocolitica* is transmitted *via* the fecal-oral route by the consumption of contaminated food or water. In recent years, low to moderate prevalence of *Y. enterocolitica* has been reported in Indian fishery products, particularly at primary production centres and fish market environments. Hence a study was undertaken to assess the suitability of fish marination against *Y. enterocolitica*. Fish marination base prepared using turmeric powder, garlic, red chilly powder, salt and Basa fillets (*Pangasionodon hypophthalmus*) were marinated at different time intervals (45, 90 and 120 min.). The overnight grown culture of *Y. enterocolitica* (ATCC 23715) at room temperature (30 °C) was inoculated into 50 g fillets at a constant inoculum

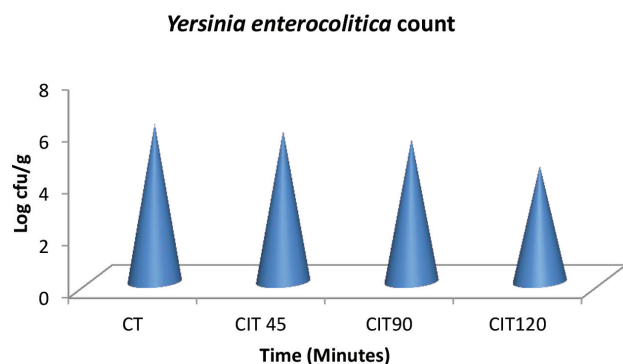


Fig. 1. *Y. enterocolitica* count with respect to time in marinated fish

level of 4.1×10^8 cfu/ml. The prepared marination base was evenly spread on the fish and held at ambient temperature of 45, 90 and 120 min. Uninoculated marinated sample was taken as control. After stipulated time interval, 450 ml of maximum recovery diluent (MRD) was used to homogenize sample at 200 rpm for 60 seconds. Subsequent dilutions were made in the same diluent for plating on CIN agar plates. Characteristic colonies were identified by biochemical methods and enumerated. The initial count of *Y. enterocolitica* was 6.08 log CFU/g which marginally reduced to 5.81 and 5.49 log cfu/g in 45 and 90 min. respectively (Fig. 1). A two log reduction of this pathogen was observed

in 120 min. of marination, indicating efficacy of this process with higher contact time.

In conclusion, the marination of fish masala is an easy and reliable way to control and reduce emerging pathogens responsible for enteric diseases in humans. Apart from inhibition of pathogens, developed marination base may help to enhance the sensory attribute of fishes. However, marination composition and treatment time need to be established separately for each variety of fish and pathogens in question and consumer preference.

References

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