

Evaluation of Microbial Load of Inland Table Aquatic Fish in Relation to Public Health

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Introduction

The processing of fish meat has to deal initially with a live animal carrying large numbers of many different organisms on the skin, among the fish and in the alimentary tract (Walker & Ayres 1956, 1959). In principle, the hygiene problems of fish processing are similar to other meat animals. In developing countries, raw meat acts as the commonest source of infection (WHO 1962). India, being a developing menace to the public. Hence, intermittent analysis of food is necessary so as to produce hygienic and wholesome rest safeguarding human health. Therefore the present study was undertaken in order to determine the incidence and distribution of various type of microorganisms associated with inland fish meat offered for sale through retailing outlets of orathanadu taluk in a district headquarters of Tamilnadu.

Materials and Methods

Thirty bacteriological fish meat samples were obtained from retail shops located at different parts of Orathanadu. They were collected aseptically and brought to the laboratory in sterile containers. Ten grams of fish meat

samples were homogenized in 90ml of 0.1% peptone water in a sterile blender for 5 minutes and tenfold serial dilutions of homogenate were made in peptone water. The total plate count, coliform count and total yeast and mould load were performed in the Plate count Agar, Mac Conkey's Agar and Sabouraud's Dextross Agar using Standard plate count technique.

For identification of different types of organisms pure cultures were made and the bacterial isolates were identified on the basis of morphological, cultural and biochemical characters as per Bergey's Manual of Determinative Bacteriology (1994) and Cruickshank et, al.. (1975). The fungal isolates were identified based on their colony morphology and microscopic appearance. Antibiotic sensitivity tests were conducted for selected bacterial isolates using disc diffusion method to study their antibiotic sensitivity pattern against seventeen different antibiotics (Bauer et, al.. 1966).

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Results and Discussion

The average total bacterial count, coliform count and yeast and mould count per gram of fish meat was found to be Log₁₀ 5.43, Log₁₀ 5.19 and Log₁₀ 1.90. These figures indicated that the hygienic and sanitary are conditions on which the fish processed were poor and inadequate. According to Murray(1969) the total plate count and coliform count of meat was found to be 3.2 x 10⁴/sq.cm and 90/sq.cm respectively.

Enteropathogenic organisms like E. Coli predominated and they were present in a higher proportion adding the contamination. The sources of contamination may be attributed to faulty handling of carcasses, washing with contaminated water during evisceration and dressing of fish. According to Nicerson et al.(1959) the microbial limit in dressed poultry should not go beyond 5*10³ / sq.cm.

These organisms were isolated from dressed fish awaiting sale in shops and other retailing units where they supply them immediately after dressing. Inside their premises after the bargain deal is over by the consumer on live weight basis.

It was concluded that E.coli (33.35) and clostridial group of organisms (26.7%) predominate followed by bacillus spp (13.35), staphylococcus aureus(10%), salmonella spp.(10%), streptococcus spp.(3.3%) and pseudomonas spp.(3.3%). The findings are in agreement with Panda(1971) and Manickam et al. (1995) Of the five fungal isolates penicillium was found to be predominant one (35%) followed by Aspergillus flavus(25%),

A.Niger (25%) and A.parasiticus (15%) and shown in the table II. Unhygienic sanitary measures practiced in the slaughter house accompanied with dusty environment would have predisposed the contamination.

The result of in vitro drug sensitivity of the isolates indicated that E.coli, clostridium spp., S.aureus, P.aeruginosa and Streptococcus spp. were highly sensitive to the third generation antibiotics like ciprofloxacin, norfloxacin and pefloxacin whereas they were moderately resistant to gentamicin and streptomycin and completely resistant to ampicillin-clavulanic acid combination, neomycin and oxytetracycline.

From the above study, it was concluded that the screening of meat samples for microorganisms are essential for maintaining hygienic and sanitary status of the fish meat. Cleanliness of the slaughtering areas and the butchers who handle the meat needs to be maintained. The consumers should be made aware of this grave problem. In public point of view, there should be close co-operation and collaboration between the veterinarians, physicians and sanitarians so that strict sanitary measures in processing units can be maintained.

Summary

Microbial load analysis of fish meat was performed in this study. Thirty fish meat samples from different retail outlets in Orathanadu were studied for microbial load. Total aerobic plate count, coliform count and yeast and mould counts

were found to be log₁₀ 5.47, log₁₀ 5.19 and log₁₀ 1.90 respectively.

Various bacterial isolates include *Staphylococcus aureus*, *Escherichia coli*, *Clostridium* spp., *Bacillus* spp., *Streptococcus* spp., *Pseudomonas* spp., and *Salmonella* spp., The fungal isolates were identified as various species of *Aspergillus* and *Penicillium*. In vitro drug sensitivity tests conducted against five bacterial species indicated ciprofloxacin and norfloxacin to be the most effective drugs.

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