OCCURRENCE OF STAPHYLOCOCCUS IN ROHU, LABEO ROHITA, COLLECTED FROM PATNA FISH MARKET

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ABSTRACT

Altogether 80 samples, 40 gills and 40 intestines from 40 Rohu fishes were collected from different fish markets of Patna for isolation of staphylococci. The samples were inoculated first in nutrient broth and subculture was made on blood agar and Baird & Parker agar plates and incubated at 37°C for 24 hrs. Typical shiny black colonies with narrow white margin surrounded by a zone of clearing were procured and subjected to coagulase test. Gills and intestines revealed Staphylococci spp. in the percentage of 62.50 and 50.00 with an overall prevalence of 56.25 per cent. Out of these, Staph. aureus (coagulase positive) was obtained from gills (27.50%) and intestines (20.00%). Public health significance of this organism has been discussed.

INTRODUCTION

Fish is a common dish in Bihar for non-vegetarian population as an important source of animal protein. Generally the most of the vital organs of healthy and freshly caught fishes are bacteriologically sterile except the alimentary canal. However, it may get contaminated during harvesting, transportation and storage. The consumption of contaminated fish may cause clinical disorders in human beings and zoo animals. Staphylococcus food poisoning has been one of the major types of food born illness even in the countries with good environmental sanitation and thus has a great public health importance (Sinha et al., 1992 and Beri et al., 1989). Thus the present investigation was undertaken to find out the status of Staph. aureus in market fish of Patna.

MATERIAL AND METHODS

Altogether 80 samples, 40 gills and 40 intestines from 40 rohu (Labeo rohita) fishes were collected aseptically from different fish markets of Patna in sterilized polythene bags. Two grams of gills and intestines each was first inoculated in a test tube containing about 10 ml. Nutrient broth separately and incubated at 37°C for 24 hrs. Subculture was done on blood agar and Baird & Parker agar plates and incubated at 37°C for 24 hrs. After incubation all these plates were examined for the growth of any colony. Colony resembling Staphylococci and showing cluster on Gram's staining were subjected to coagulase test. Typical black colonies with narrow white margin surrounded by a zone of clearing on BPA was also subjected to coagulase test. Colonies having coagulase activities were designated as Staph. aureus whereas coagulase negative strains were designated as Staph. epidermidis. On the basis of morphology, different biochemical reactions and sugar fermentation tests, organisms were characterised as per the method described by Cruickshank et al. (1975).

RESULTS AND DISCUSSION

In the present investigation Staph. spp. was detected both in gills 25 (62.50%) and intestine (50.00%) with an overall prevalence rate as 45 (56.25%). The different species of Staphylococcus in gills were Staph. aureus and Staph. epidermidis in the percentage of 27.50 and 35.00 respectively. In the intestine, these organisms were detected in the percentage of 20.00 and 30.00 respectively. Statistically non-significant findings of Staph. aureus and Staph. epidermidis of gills and intestines denote no specific predilection site for these organisms (Table-I).
These findings are also in conformity with the findings of Sokari (1991). Observations made by Shimizu et al. (1991) and Sinha et al. (1992), seem to be closely agreeing with the findings of present study. Other workers have also reported the prevalence *Staph. spp.* in fish which ranged from 1.1 to 72.72% (Foster et al., 1977; Sanjeev et al., 1985; Ferrer et al., 1992; Mugula and Lyimo, 1992; Singh and Kulshrestha, 1993 and Khehra et al., 1996).

The difference in the prevalence reported by these authors could be due to frequent handling of products, the hygienic status of fish handlers, number of samples examined and types of water used. It is recognised that 40.00% of human population has coagulase positive *Staphylococcus* in their nose and throat (Ortel, 1958) and thus serve as an important source of contamination.

Toxigenic strains of *Staph. aureus* has been found to be commonly associated with foodborne infections in several countries *Staph. spp.* can be present in raw food of animal origin or in those handled by man. *Staph. aureus* is the most important pathogen among the staphylococci (Jay, 1986). During growth many strains of this species produce enterotoxin which can cause staphylococcal food poisoning.

In the present investigation, both coagulase positive and coagulase negative staphylococci were isolated from gills and intestine of rohu fish. Coagulase positive strains were isolated in the percentage of 27.50 and 20.00 from gills and intestines respectively, whereas coagulase negative staphylococci were 35.00% and 30.00% from gills and intestines respectively (Table-1).

**Table-1.** Showing coagulase positive staphylococci from market fish of Patna.

<table>
<thead>
<tr>
<th>Sample</th>
<th>No. of samples examined</th>
<th>No. of samples positive</th>
<th>X² at 1 df</th>
<th>No. of coagulase positive Isolates <em>Staphylococcus aureus</em></th>
<th>X² at 1 df</th>
<th>No. of coagulase negative Isolates <em>Staphylococcus Epidermidis</em></th>
<th>X² at 1 df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gills</td>
<td>40</td>
<td>25 (62.50)</td>
<td>1.270 NS</td>
<td>11 (27.50)</td>
<td>0.622 NS</td>
<td>14 (35.00)</td>
<td>0.144 NS</td>
</tr>
<tr>
<td>Intestine</td>
<td>40</td>
<td>20 (50.00)</td>
<td></td>
<td>8 (20.00)</td>
<td></td>
<td>12 (30.00)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>45 (56.25)</td>
<td></td>
<td></td>
<td></td>
<td>19 (23.75)</td>
<td></td>
</tr>
</tbody>
</table>

NS-Non-Significant

Figures in parenthesis denotes percentage.

Mostly *Staph. aureus* produces coagulase and thermonuclease (Bergdoll, 1990), hence the presence of coagulase or thermonuclease positive *Staph. aureus* in fish is of public health importance in view of their ability of enterotoxin production by coagulase positive strain of *Staph. aureus*.

The presence of coagulase positive staphylococci in the processed product indicate contamination by fish handlers. Thus, the organism is useful indicator of hygiene in a process involving human handling (Liston, 1980). Contamination of food with coagulase positive staphylococci could cause gastroenteritis as the organism growing in food materials in considerable numbers secrete an exotoxin (Jay, 1986).

Isolation of *Staph. epidermidis* is not of much significance as they did not cause disease under normal circumstances except in immunocompromised host. However, coagulase negative strain of staphylococci producing enterotoxin and resulting into food poisoning has been reported by Nanu (1988).
REFERENCES


