الحالة البكتريولوجية للاسمات الطازجة

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تم جمع 15 عينة من الأسماك النيلية الطازجة، 6 من بقري، 5 كرم، 5 ألوما، 5 شال - من مدينة أسوان، وقد تم فحصها بكتريولوجيًا. وقد وجد أن العدد الكلي للميكروبات 7878008560977710000. وقد تم تصنيف الميكروبات المعزولة للحص الظاهرى للحكم على صلاحية الأسماك للاستهلاك الآدمي.

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MICROBIAL QUALITY OF FRESH WATER FISH  
(with 4 Tables)  

By  
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SUMMARY  

A total of 51 samples of fresh water fishes (26 Tilapia nilotica, 5 Clarias lazera, 5 Mormyrus caschive, and Synodontis membraneous) were collected from Assiut City markets and examined. The average number of viable count per gram muscle of Tilapia nilotica (Tn), Clarias lazera (Cl), Mormyrus caschive (Mc) and Synodontis membraneous (Sm) were 78.7 x 10^2, 85.6 x 10^2, 76.8 x 10^2 and 50.4 x 10^2 respectively. 42 isolates could be isolated from the total specimens examined and identified as follows: 1.98% Enteropathogenic Escherichia coli (E.P,E,C) O44/K74, 1.98% Serratia rubidaea, 1.98% Edwardsiella, 3.92% Enterobacter cloacae, 5.88% Strept. faecalis, 7.84% Aeromonas punctata, 11.76% Enterobacter aerogenes, 11.76% proteus morganii, 11.76% Ps. diminuta and 23.53% Ps. aeruginosa.  

INTRODUCTION  

The fish muscle are generally considered sterile (KAYSER, 1937 and SCHONBERG, 1950). On the other hand MALTSCHWESKY and PARTMANN (1951) and SEDIK (1971) could isolate a number of bacteria from fish muscles.  

The flora of fish is related to its aquatic environment WOOD (1953) and YOUSSEF et al. (1981). Salmonellae, Shigelae, E.P,E,C, perfringens welchii, Proteus spp., Alcaligenes spp., Micrococcus, Paracolon bacteria and Providencia could be isolated from fresh water fishes, BROWNE (1917), FLOYD and JOHNES (1954), LOTFI et al. (1972), FARID et al. (1979) and YOUSSEF et al. (1981).  

With respect to bacterial population SARUTANI (1932), NIKERSON and PROCTOR (1935) recorded that the critical value of edibility of fish is 10 to 10 organisms/gm. Besides, WITTFOLG (1956) and BRUMULER (1958), reported that a number of 0.8 million bacteria/gm could be a limited for changes in quality, beginning decomposition or for its fitness for human consumption. SEDIK (1971) could be recorded 2.9 x 10^4/gm muscle of fish.  

This investigation was planned to study the bacteriological quality of some fresh water fishes in Assiut City.  

MATERIAL and METHODS  

51 samples of fresh water fishes (26 Tn, 5 CI, 5 Mc, and 5 Sm) were collected from Assiut markets.  

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The muscle sample was taken under aseptic condition and prepared as follow: The skin was first wiped with gauze to remove mucus and then rubbed thoroughly with cotton wool soaked in absolute alcohol, followed by rapidly flaming of the surface to ensure complete sterilization. A small piece of skin was carefully removed avoiding opening the belly cavity or reaching the gills.

**Enumeration of aerobic plate count:** was carried out according to the standard plate count. Colonies were counted according to A.P.H.A. (1972).

**Isolation and identification of enteric pathogens** were carried out according to BUCHANAN and GIBBONS (1974), THATHER and CLARK, (1975).

**Detection of C. perfringens:** The method adopted in this work was carried out according to BEERNES et al. (1980).

**RESULTS**

Results are tabulated in table 1, 2, 3, and 4.

**DISCUSSION**

The results obtained and recorded in table (1) show that the frequency distribution of the examined samples based on organoleptic tests, its relation to the skin, scales, eyes, fresh odour and firm flesh, the frequency distribution of the examined samples pointed out that all the samples were fresh (100%).

Table (2) showed the summarised results of viable count/gm fish muscle. The results revealed that, in Tn, the mean count/gm was 7.87x10^5 with 2x10^6 as a minimum and 39x10^5 as a maximum, in case of Cl the average count/gm muscle was 8.56x10^6 with 2x10^6 as a minimum and 40x10^5 as a maximum, while in Mc, the mean count/gm muscle was 76.8x10^5 with 11x10^5 as a minimum and 2x10^6 as a maximum, moreover, in Sm the mean count/gm muscle was 50.4x10^5 with 38x10^5 as minimum and 84x10^5 as a maximum. Nearly similar findings were reported by EL-NAHDI (1964) and SEDIK (1971). The high load of bacteria may be attributed to excessive handling between fishing and marketing. Although the viable count of the fish muscle was to some extent high, the organoleptic tests pointed-out that the examined samples were in fresh state, accordingly bacteriologically examination must be associated with organoleptic examination to give the accurate judgement (BRAUMULLER, 1958).

Table (3) showed the frequency of isolated micro-organisms from the examined samples. E.P.E.C. O4, K74, Serratia rubidaea and Edwardsiella each were isolated with 2.78% from muscle of Tn, 20% Enterobacter cloacae from each muscle of M and Sm, 5.56 and 20% Strept. faecalis from Tn and Cl respectively. 11.11% Aeromonas panctica from Tn, while Enterobacter aerogenes could be isolated 5.56, 40, 20 and 20% from Tn, Cl, M and Sm respectively, on the other hand, Proteus morgani could be isolated 5.56, 20, 40 and 20% respectively. Pseudomonas diminuta could be isolated from muscles of Tn and Sm 13.89 and 20% respectively, Moreover, Pseudomonas aeruginosa could be isolated from the four species 22.22, 40, 20 and 20% respectively.

Table (4) showed the total results of 42 isolates from the muscle of the examined samples: 1.98% E.P.E.C. O4, K74, 1.98% Serratia rubidaea, 1.98% Edwardsiella, 3.92% Enterobacter cloacae, 3.88% Strept. faecalis, 7.84% Aeromonas panctica, 11.76% of each Enterobacter aerogenes, Proteus morgani and Ps. diminuta, while Ps. aeruginosa was 23.53%. Nearly similar findings were recorded by many researchers SCHEWAN (1962), SEDIK, (1971), LOTFI et al. (1972), FARID et al. (1979) and YOUSSEF et al. (1981). Salmonellae, Shigella and C. perfringens failed to be detected in the examined samples.
MICROBIAL QUALITY OF FRESH WATER FISH

E. coli is considered an organism could be recorded in the intestinal tract of fish live in polluted water (JOHNSON, 1904 and YOUSSEF et al., 1981). E. coli strain to been shown to produce food poisoning symptoms (JUNE et al., 1953). In the present study, the incidence of E. coli in fresh water fishes was 1.98%. the source of contamination may be water as well as the human carrier (HALL and HAUSER, 1966. YOUSSEF et al., 1981).

Proteus spp. have been found to be involved in the spoilage of sea foods and sometimes give putrefactive odour, on the other hand, member of enterococci group of microorganisms is considered an indicative of faecal contamination. Moreover, certain species have been isolated in large numbers from cases of food poisoning organisms. With respect to Pseudomonadaceae, Ps. spp. are important spoilage microorganisms, can cause food spoilage and characterised by their ability to grow at low refrigeration temperature. Pseudomonas are usually added to food mainly through water and soil and their presence is undesirable (FRAZIER, 1958).

The data recorded in this work proved that fresh-water fish can be a vehicle for many types of microorganisms, the chief source of fish contamination are water, soil and handlers (FLOYED and JOHNS, 1954, EL-MOSSALMI and WASSER, 1971 and YOUSSEF et al. 1981). Environmental conditions may be a great factor for growth and multiplications of various microorganisms, consequently fish can be a public health hazard as well as deteriorate rapidly. Strict hygienic measures should be carried out during the different steps between fishing and marketing, minimize fish handling and storage at a low temperature as far as possible.

REFERENCES


Johnson, G. (1904): Isolation of Bacillus coli communis from the alimentary tract of fish and significance there of. J. Infectious Diseases 1, 348 - 354.


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TABLE (1)

Frequency distribution of the examined samples of fresh-water fishes based on organoleptic tests (colour of skin, scales, eyes, odours, body cavity & cut surface, gills... etc.).

<table>
<thead>
<tr>
<th>Organoleptic Test</th>
<th>Th</th>
<th>Cl</th>
<th>Mc</th>
<th>Sm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of samples</td>
<td>%</td>
<td>No. of samples</td>
<td>%</td>
</tr>
<tr>
<td>Fresh fish</td>
<td>36</td>
<td>100</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Stale fish</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>100</td>
<td>5</td>
<td>100</td>
</tr>
</tbody>
</table>

TABLE (2)

Summarised results of viable count gm muscles of some fresh water fishes.

<table>
<thead>
<tr>
<th>Species</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tn</td>
<td>$2 \times 10^5$</td>
<td>$39 \times 10^6$</td>
<td>$78.7 \times 10^5$</td>
</tr>
<tr>
<td>Cl</td>
<td>$2 \times 10^5$</td>
<td>$40 \times 10^6$</td>
<td>$85.6 \times 10^5$</td>
</tr>
<tr>
<td>Mc</td>
<td>$11 \times 10^5$</td>
<td>$28 \times 10^6$</td>
<td>$76.8 \times 10^5$</td>
</tr>
<tr>
<td>Sm</td>
<td>$38 \times 10^5$</td>
<td>$84 \times 10^5$</td>
<td>$50.4 \times 10^5$</td>
</tr>
</tbody>
</table>

TABLE (3): Frequency of isolated microorganisms from the muscle of Tn, Cl, Mc and Sm.

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Tn</th>
<th>Cl</th>
<th>Mc</th>
<th>Sm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>E.P.E.C. 044/K74</td>
<td>1</td>
<td>2.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serratia rubidea</td>
<td>1</td>
<td>2.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edwardsiella</td>
<td>1</td>
<td>2.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strept. faecalis</td>
<td>2</td>
<td>5.56</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Aeromonas Panctata</td>
<td>4</td>
<td>11.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>2</td>
<td>5.56</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Proteus morganii</td>
<td>2</td>
<td>5.56</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Ps. diminuta</td>
<td>5</td>
<td>13.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ps. aeruginosa</td>
<td>8</td>
<td>22.22</td>
<td>2</td>
<td>40</td>
</tr>
</tbody>
</table>

TABLE (4): Total results of isolated microorganisms is 51 specimens from the muscle of some fresh water fishes.

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Serotype</th>
<th>No. of isolates</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.P.E.C.</td>
<td>044/K74</td>
<td>1</td>
<td>1.98</td>
</tr>
<tr>
<td>Serratia rubidaea</td>
<td></td>
<td>1</td>
<td>1.98</td>
</tr>
<tr>
<td>Edwardsiella</td>
<td></td>
<td>1</td>
<td>1.98</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td></td>
<td>2</td>
<td>3.92</td>
</tr>
<tr>
<td>Strept. faecalis</td>
<td></td>
<td>3</td>
<td>5.88</td>
</tr>
<tr>
<td>Aeromonas panctata</td>
<td></td>
<td>4</td>
<td>7.84</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td></td>
<td>6</td>
<td>11.76</td>
</tr>
<tr>
<td>Proteus morganii</td>
<td></td>
<td>6</td>
<td>11.76</td>
</tr>
<tr>
<td>Ps. diminuta</td>
<td></td>
<td>6</td>
<td>11.76</td>
</tr>
<tr>
<td>Ps. aeruginosa</td>
<td></td>
<td>12</td>
<td>23.53</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>