قسم : المراقبة الصحيه للأغذيـــة .
كليـة : الطب البيطرى ـ جامعة أسيوط .
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الحالة البكتريولوجيه للاسماك الطازجة

حســـــين يوسف ، عبد الخالق الطماوى*، يحيى حفناوى

تم جمع ١٥ عينة من الاسماك النيلية الطازجة ، ١٦ بلطي ، ٥ قرموط ، ٥ أنوما ، ٥ شال ـ من مدينة أسيوط ، وقد تم فحصها ظاهريا وبكتريولوجيـا ، وقد وجد أن العدد الكلي للميكروبات ٧ر٧٨ × ١٠^٥ ، ٦ر٥٨ × ١٠^٥ ، ٨ر٧٦ × ١٠^٥ ، ٤ر٥٠ × ١٠^٥ على التوالي . وقد تم تصنيف الميكروبات المعزولـــة وقد اتضح من البحث أنه يجب أن يكون الفحص البكتريولوجي مصاحبا للفحص الظاهرى للحكم على صلاحية الاسماك للاستهلاك الآدمي .

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MICROBIAL QUALITY OF FRESH WATER FISH

(with 4 Tables)

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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 membranaceus) 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 membranaceus (Sm) were 78.7×10^7, 85.6×10^5, 76.8×10^5 and 50.4×10^7 respectively. 42 isolates could be isolated from the total specimens examined and identified as follows: 1.98% Enteropathogenic Escn. coli (E.P.E.C.) 044/K74, 1.98% Serratia rubidaea, 1.98% Edwardsiella, 3.92% Enterobacter cloacae, 5.88% Strept. faecalis, 7.84% Aeromonas panctata, 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, Shigellae, E.P.E.C., perfringens welchii, Proteus spp., Alcaligenes spp., Micrococcus, Parcolon 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 ediblity of fish is 10 to 10 organism/gm. Besides, WITTFOGEL (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 fittness for human consumption. SEDIK (1971) could be recorded 2.9×10 /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 Cl, 5 Mc, and 5 Sm) were cvollected 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 mucous and then rubbed thoroughly with cotton wool soaked in absolute alchol, 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 $78.7x10^5$ with $2x10^5$ as a minimum and $39x10^6$ as a mixmum, in case of Cl the average count/gm muscle was $85.6x10^6$ with $2x10^5$ as a minimum and $40x10^6$ as a maximum, while in Mc, the mean count/gm muscle was $76.8x10^5$. with $11x10^5$ as a minimum and $28x10^5$ 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-AFIFI (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. 044/K74, Serratia rubidaea and Edwardsiella each were isolated with 2.78% from muscle of Tn. 20% Enterobacter cloacae from each muscle of Mc and Sm, 5.56 and 20% Strept. faecalis from Tn anc Cl respectively, 11.11% Aeromonas panctata from Tn, while Enterobacter aerogenes could be isolated 5.56, 40, 20 and 20% from Tn, Cl, Mc and Sm respectively, on the other hand. Proteus morganii 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. 044/K74, 1.98% Serratia rubidaea, 1.98% Edardsiella, 3.92% Enterobacter cloacae.5.88% Strept. faecalis, 7.84% Aeromonas panctata, 11.76% of each Enterobacter aerogenes. Proteus morganii 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. perfringen failed to be detected in the examined samples.

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.P.E.C. strain to been shown to produce food poisoning syptomps (JUNE et al., 1953). In the present study, the incidence of E.P.E.C. 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 contmination. moreover, certain species have been isolated in large numbers from cases of food poisoning organisms. With respect to Pseudomonadae, 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 undersirable (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 JOHNES, 1954, EL-MOSSALMI and WASSEF, 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 temperautre as far as possible.

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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.).

Organoloptic test	Th		Cl		Mc		Sm	
	No. of samples	%	No.of samples	%	No.of samples	%	No.of samples	%
Fresh fish	36	100	5	100	5	100	5	100
Stale fish	-	—	-	-	-	-	-	-
Total	36	100	5	100	5	100	5	100

TABLE (2)

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

Species	Minimum	Maximum	Average
Tn	2×10^5	39×10^6	78.7×10^5
Cl	2×10^5	40×10^6	85.6×10^5
Mc	11×10^5	28×10^6	76.8×10^5
Sm	38×10^5	84×10^5	50.4×10^5

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

Organisms	Tn		Cl		Mc		Sm	
	No.	%	No.	%	No.	%	No.	%
E.P.E.C. 044/k74	1	2.78	-	-	-	-	-	-
Serratia rubidea	1	2.78	-	-	-	-	-	-
Edwardsiella	1	2.78	-	-	-	-	-	-
Enterobacter cloacase	-	-	-	-	1	20	1	20
Strept. faecalis	2	5.56	1	20	-	-	-	-
Aeromonas Panctata	4	11.11	-	-	-	-	-	-
Enterobacter aerogenes	2	5.56	2	40	1	20	1	20
Proteus morganii	2	5.56	1	20	2	40	1	20
Ps. diminuta	5	13.89	-	-	-	-	1	20
Ps. aeruginosa	8	22.22	2	40	1	20	1	20

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

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