

قسم: الميكروبيولوجيا وصحة الحيوان.  
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### الأهمية الصحية لبعض الميكروبات المرضية المعزولة من القوارض

حامد سماحة ، محمود عزت

- تم جمع ١٠٠ فأر وجرز وفحصت لوجود بعض الميكروبات المرضية (بكتيريا وفطريات) التي تنتقل للأنسان والحيوان.
- تم عزل البكتريا الاتية: الميكروب العنقودي الذهبي (٨٪) ، الميكروب السبحي الصديدي (٥٪) ، كورائني بكتريم دفتيري (١٪) ، كورائني بكتريم الصديدي (١٢٪) ، الميكروب القولوني (٥٣٪) ، الميكروب السبحي البرازي (٢٥٪) ، بروتيس فالجارس (٢٢٪) ، السيدوموناس ابروجينوزا (٣٠٪) سثيجيلا فلكتييدي (٣٪) والأيرزونا (١٪) .
- تم أيضا عزل الفطريات التالية : أسبرجلس فيوميجاتس (٤٪) ، أسبرجلس فلاف - س (٣٪) ، أسبرجلس نيجر (٥٪) ، كانديديا البيكانس (٧٪) ، كانديديا تروبيكالس (١٢٪) ، كانديديا كروزيا (٩٪) ، بنسلين (٣٥٪) ، ريزويس (١٩٪) ، مبوكر (٢٢٪) ، جيوتركم (١٠٪) ، الترناري (٤٪) ، رودوتوريلا (٥٪) .
- نوقشت الأهمية الصحية لكل ميكروب بالنسبة للأنسان والحيوان .

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Dept. of Microbiology and Animal Hygiene,  
Faculty of Vet. Med., Alex. University,  
Head of Dept. Prof. Dr. H.A. Torkey.

## **SOME PATHOGENIC MICROORGANISMS OF ZOOONOTIC IMPORTANCE ISOLATED FROM RODENTS**

(With 3 Tables)

By

**H. SAMAHA and M. EZZAT**

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### **SUMMARY**

A total of 100 apparently healthy rats and mice were trapped and examined for the presence of microorganisms (bacteria and fungi) of zoonotic importance.

The isolated bacteria were: Staph. aureus (8%), Strep. pyogenes (5%), Coryneb. diphtherae (1%), Coryneb. pyogenes (12%), E.coli (53%), Strept. foecalis (25%), Proteus vulgaris (22%), Pseudomonas aerogenosa (30%), Shigella flexneri (3%) and Arizona (1%).

The isolated fungi were: Aspergillus fumigatus (4%), Aspergillus flavus (3%), Aspergillus niger (5%), Candida albicans (7%), Candida tropicalis (12%), Candida krusei (9%), Penicillium sp. (35%), Rhizopus species (19%), Mucor species (22%), Geotrichum species (10%), Alternaria species (4%) and Rhodotorula species (5%).

The zoonotic importance of each strain was discussed.

### **INTRODUCTION**

Rodents are one of the most important vector and reservoir of infection of some microbial and fungal diseases to man and animals. Many studies have been carried out to detect the pathogenic and potentially pathogenic microbes from the different species of rodents (SELBIE and SIMON, 1951; LOFTON, et al. 1962; SHARMA, et al. 1970; GHONEIM, 1972 and HAMADAN, 1981).

Therefore, this work was planned to demonstrate the incidence of bacterial and fungal species which might be transmitted from rodents to man and animals with the exception of salmonella species since it has been previously studied in the investigated locality by AKEILA and SAMAHA (1986).

### **MATERIAL and METHODS**

#### **A. Collection of rodents:**

A total of 100 apparently healthy rats and mice were trapped by using normal spring traps from different localities in Edfina. The captured rodents were transferred to the laboratory for identification as well as for bacteriological and mycological examinations.

### **B. Preparation for cultivation:**

The rodents were sacrificed and about 2 gm from each of the internal organs as well as the intestinal contents were thoroughly ground and suspended in sterile saline solution.

### **C. Bacteriological and mycological examinations:**

The prepared suspension was aseptically cultured on nutrient, mannitol salt, MacConkey's S.S. and blood agar plates for the isolation of the different types of bacteria. On the other hand, Sabouraud dextrose and Czapek-Dox agar were used for fungi.

Isolation and identification of the isolates were fulfilled according to CRUICKSHANK, *et al.* (1975), BAILY and SCOTT (1978), MOSS and MC QUOWN (1969) and TERRENCE (1971).

## **RESULTS**

Results are presented in tables 1, 2 and 3.

## **DISCUSSION**

The results recorded in Table (1) indicate that *Staph. aureus* was isolated at an incidence of 8% which is lower than that obtained by SEIBIC and SIMONS (1952) and GHONEIM (1972). Occupational abrasions as well as contaminated food and water with staphylococci might predispose to pyogenic lesions and food poisoning in man.

*Streptococcus pyogenes* and *Streptococcus faecalis* were isolated at a rate of 5 and 25% respectively from the examined rats and mice (Table 1). GHONEIM (1972) isolate these two strains from 15% of rodents however, BELL, *et al.* (1952) isolated *Streptococcus pyogenes* at an incidence of 19%. The zoonotic importance of these two types of streptococci lies in the fact that they are incriminated in cases of pyogenic infections, septic sore throat and rheumatic fever in man (CRUICKSHANK, *et al.* 1975).

The incidence of the different species of *Corynebacteria* were presented in Table (1). As shown in this table, they represent 13%. *Corynebacterium pyogenes* was isolated at a lower percentage than that reported by GHONEIM (1972) however, no references mention the isolation of *Corynebacterium diphtheriae* from rodents. Both organisms might be considered as anthropozoonoses met with in lung abscesses and some renal infections in man (PYATKIN, 1967).

*E. coli* was isolated at an incidence of 53% which is higher than that obtained by LOFTON, *et al.* (1962) and GHONEIM (1972). The public health importance of *E. coli* is due to its potential pathogenicity to human beings. *E. coli* was reported as the cause of summer diarrhoea in children, peritonitis, meningitis, enteritis, cystitis, pyelonephritis, appendicitis and otitis in adults. In addition, it has been implicated in outbreaks of food poisoning in man (TOPLEY and WILSON, 1975). *Proteus vulgaris* was also isolated at an incidence of 22% (Table 1) which is much lower than that reported by GHONEIM (1972). *Proteus vulgaris* is considered as a normal intestinal commensal of mammals and sometimes incriminated in cases of human food poisoning (PYATHIN, 1967).

The data illustrated in Table (1) revealed that *Shigella flexneri* and Arizona species were isolated at incidence percentages of 3 and 1 respectively which is lower than the results recorded by GHONEIM (1972). However, SHARMA (1970) isolated Arizona from rodents without

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mentioning its incidence. The isolation of *Shigella* from rodents constitutes a public health hazard in cases human dysentery. Also, it has been found that Arizona produces similar clinical syndromes as Salmonellosis (CRUICKSHANK, et al. 1975).

Table (1)  
Types of bacteria isolated from investigated rats and mice

Organisms	Number
- <i>Staphylococcus aureus</i>	8
- <i>Streptococcus pyogenes</i>	5
- <i>Streptococcus faecalis</i>	25
- <i>Corynebacterium diphtherae</i>	1
- <i>Corynebacterium pyogenes</i>	12
- <i>Shigella flexneri</i>	3
- <i>E.coli</i>	53
- <i>Proteus vulgaris</i>	22
- Arizona species	1
- <i>Pseudomonas aerogenosa</i>	30
Total	160

*Pseudomonas aerogenosa* was isolated from the examined rats and mice at an incidence of 30% (Table 1) which is higher than that obtained by GHONEIM (1972). This organism was incriminated in suppurative conditions in both man and animals accompanied by fever, skin eruptions, diarrhoea, cystitis and pyelitis (PYATKIN, 1967).

On the other hand, *Aspergillus fumigatus*, *flavus* and *niger* were isolated from the examined rodents at an incidence of 4.3 and 5% respectively. CRUICKSHANK, et al. (1975) considered that these species are one of most important agents in mycotic infections of man, birds and some animals. Moreover, STREIFEL, et al. (1983) isolated these species from the air and labours of hospitals.

In the present work, *Candida albicans*, *Tropicalis* and *Krusei* were isolated at incidence percentages of 7, 12 and 9 respectively. These results are lower than HAMADAN (1981) for *C.Krusei*. It is worth mentioning that since fowls are known to contract candidiasis through consumption of infected crops (SOLIMAN and ZAKI, 1960) therefore, rodents might become infected through the consumption of contaminated crops and offals and become excellent reservoir hosts for candida species.

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Table (2)  
Incidence Percentages of Bacteria and Fungi Isolated  
from Different Species of Rats and Mice

Rodents		Bacteria		Fungi	
Species	Number	Number	%	Number	%
RRR	14	30	18.7	35	25.9
RRN	31	15	9.4	18	13.3
RRA	16	20	12.5	22	16.3
AN	13	20	12.5	14	10.4
AC	5	30	18.7	20	14.8
Mm	21	45	28.2	26	19.3
Total	100	160	100	135	100

RRR: *Rattus rattus rattus*AN: *Arvicanthus niloticus*RRN: *Rattus norvegicus*AC: *Acomys Cahirinus*RRA: *Rattus alexandrinus*Mm: *Mus musculus*

*Penicillium*, *Rhizopus* and *Mucor* species were isolated at incidence of 35.19 and 22% respectively. In the available literatures, no references were metwith concerning the isolation of these species from rodents. However, the abovementioned species were isolated from the soil of animal enclosures (SAMAHA, 1983). Anyhow, these fungi are considered significant agents in mycotic affections in man and animals (CRUICKSHANK, *et al.* 1975).

Table (3)  
Types of Fungi Isolated From Captured Rats and Mice

Fungi	Number
- <i>Candida albicans</i>	7
- <i>Candida tropicalis</i>	12
- <i>Candida krusei</i>	9
- <i>Aspergillus fumigatus</i>	4
- <i>Aspergillus flavus</i>	3
- <i>Aspergillus niger</i>	5
- <i>Penicillium</i> species	35
- <i>Rhizopus</i> species	19
- <i>Mucor</i> species	22
- <i>Geotrichum</i> species	10
- <i>Alternaria</i> species	4
- <i>Rhodotorula</i> species	5
Total	135

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The mycological examination of the investigated rodents revealed the isolation of *Geotrichum*, *Alternaria* and *Rhodotorula* species at frequencies of 10.4 and 5% respectively (Table 3). Of the reviewed literatures, HAMADAN (1981) isolated *Rhodotorula* species at an incidence of 2.66%. The isolation of these strains points out the role played by rodents as reservoirs of human and veterinary infections.

The findings obtained from the present study illustrate the role of rodents as reservoirs for a wide variety of bacteria and fungi. Secreta and excreta including faecal matter may contaminate food, water, milk as well as human and animal environment.

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