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**RESEARCH ARTICLE**

# Isolation and Diagnosis of Some Contaminated Bacteria that Isolated From Different Halls in the Faculty of Science, University of Al-Qadisiyah, Iraq

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**ABSTRACT**

This study was conducted in order to take an idea about some bacteria that presented in some halls of the college of Science, University of Al-Qadisiyah. 60 samples of the halls of the Departments of Biology, Chemistry and Environment. The Isolates of *Escherichia coli* were highest in the in the department of Biology (14%), followed by *Pseudomonas aeruginosa* (10%) in the environmental sciences department, followed by *Staphylococcus aureus*(6%) in both the Chemistry and Biology department and only one isolates of *Enterobacteria* in the halls of Biology and also one isolates *of Streptococci* ssp in the Department of Chemistry.

**Key words:** *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Streptococci*, Contaminated, Iraq.

## INTRODUCTION

*Streptococci ssp, Escherichia.coli Pseudomonas aeruginosa*considered as opportunistic pathogens, some of which are aerobic or aerobic, cause disease in healthy but highly virulent people in patients with mild bacteremia or eye injury Ear infection, skin infection, wound injury, central nervous system infection, heart attack, and joint infections [1][2]. Therefore, contamination in some hall areas due to these pathogens has an impact on transmission of the infection From some places contaminated with bacterial pathogens where infections are considered These pollutants are

common in some places, where many diseases and local invasions caused by the disease, which leads to the reduction of the defenses of the body where the disease has a reciprocal relationship between the situation and microbial contaminants and it is a common causes of the infections acquired by some students due to lack of hygiene and the presence of microbes in some places, especially when there is moisture and spread from person to person or by the staff at the college.

*Pseudomonas aeruginosa, Streptococci ssp* possesses a number of different enzymes such as Lipase enzymes, Coagulase, Elastass, Alkaline protease, Al kaline phosphatase – Danes, gelatinase – hemolysin, Leukocidin. Lecithenase as well as iron carriers and intestinal flares [3][4].

There are several changes behind the emergence of kidney infection due to lack of cleanness or transmission of bacteria by people infected by air or high density of the proportion of students in the same stage[5][6].
Some microorganisms are able to move from person to person by passing through the air by inhaling those particles of these organisms (bacteria, fungus, viruses)[7][8].

In the absence of previous studies on this subject, the aim of this study is to take indoor swabs from the ground, walls, ventilation and culture the examination samples to investigate the existence of microbiology and diagnosis [9][10][11].

## MATERIALS AND METHODS

### Samples Collection

The Samples were collected during the November 2017 till February 2018 and the samples randomly took about 50 samples from the halls of the Faculty of Science, including Biology, Environment and Chemistry, in University of Al-Qadisiyah from different places (walls, floors, chairs, air fresheners, and blackboard eraser).

### Samples Cultured

The samples were cultured on the Macconkey agar, Blood agar and Mannitol agar. We plotted the sample taken from the site by a sterile swab on the culture media near the burning of the benzne lamp. This swab was then spoiled and the sample was incubated in the incubator for 24 hours and 37 ° C Inverted and the growth was monitored. Non-growth dishes were incubated for another 24 hours before being treated as a negative result [12][13].

### Diagnosis of Bacterial Isolates

The isolates were diagnosis through the following:

### Morphological and Cultural Characteristic

The morphological characteristics of the growth colonies in their shapes and colors, the surface of the colonies, their strength and transparency, were observed as a pattern of glycolysis and fermentation of sugars in the middle of the triple sugar icon.

### Microscopical Characteristics

Wipes from the pure colonies were made on glass slides and dyed Gram and examined under the microscope by force of the central optical microscope. The forms of the cells, their type of composition, and their response to the negative or positive gram stain.

### Biochemical Tests

### Gram Negative Bacteria

Pepton Water was fertilized with bacteria to be tested and incubated at 37 ° C for 48 hours. Add 0.5 kovaus reagent to the fertilized tube and shacked, the appearance of a red ring indicates the positive of the test [13] [14].

### Methyl Red Test

The center of MR-VP was incubated with bacteria and incubated at 37 ° C. For 48 hours, 5 drops of red reagent were added to the medium and change to the red indicated complete decomposition of sugar and acid production. If the color changed to yellow, this indicates a negative test result.

### Motility Test

The sterilized loop is taken by one drop of water and placed in the lid of the glass slide. The carrier loop is then sterilized by a benzene lamp and cooled. Very few bacteria are taken in the samples. The bacteria to be tested are mixed with distilled water and carefully placed on the sterile motion test strip. If the motion is observed, the test is positive. If the motion is not observed, it is a negative test.

### Gram Positive Bacteria

### Mannitol Salt Agar

Gram positive samples were recultured on the salted Mantle media (M.S.A) to distinguish between *staphylococcus aureus* and fermented mantles from those non-fermented; they grow without any change in the media.

### Catalase Test

A 24-hour bacterial cultured was set up by a sterile agricultural carrier on a clean glass slide near a benzene lamp and a drop of hydrogen peroxide was placed. 30% the appearance of the gas bubbles indicates the positive result of the test.

### Slide Coagulant Test

A drop of the package on a clean glass slide placed a drop of distilled water on the other end of the slice as a control and by a carrier that took a number of colonies and mixed with each drop after the reaction was positive if there was coagulation within twenty seconds. This test is used to detect the coagulation enzyme (Ceagulasex).

**Hemolysis**

Vaccination between the blood agarcultured with pure bacteria and incubation at 37 ° C for 24 hours transparent areas around the colonies emerging bacteria demonstrate the susceptibility of bacteria to the secretion of hemolysin [11].

## RESULTS AND DISCUSSION

The results of this study in the table (1) shows the distribution of isolates according to the source of isolation. Hall No. (1) of the Biology Department contained (5) isolates of *Escherichia coli*(10%), which is the highest recorded percentage. While *Staphylococcus aureus* had 2 in the percentage of (4%).

The table below shows the distribution of isolates according to the source of isolation. It was found that Hall No. (4) of the biology department contained two isolation and 4% the highest percentage recorded in *Escherichia coli*, and the *Staphylococcu*s bacteria contains only one isolates with 2%, while the *Enterobacteriaiceae* also contain the same isolated with the same percentage of the previous one Table (3) shows the distribution of isolates according to the source of isolation. It shows that Hall No. (1) of the halls of the Department of Chemistry contains 3 isolates (6%) of *Staphylococcus aureus* bacteria. *Pseudomonas aeruginosa* contain one isolate with (2%) and *Streptococci* ssp with the one isolate by (2%).

Table (4) shows the distribution of isolates according to the source of the isolation, where Hall No. (2) of the Chemistry Department contained one isolate by 2% of the *Escherichia coli* bacteria and *Pseudomonas aeruginosa* contains one isolate 2% in equal proportions. Table (5) shows the distribution of isolates according to the source of isolation, where Hall No. (1) in the Environment science Department contained 3 isolates (6%) of *Pseudomonas aeruginosa*, the highest percentage of bacteria and *Escherichicoli*, one isolate with % 2. Table (6) shows the distribution of isolates according to the source of the isolation, where Hall No. (2) in the Environment department contained two isolates (4%) of *Pseudomonas aeruginosa*, the highest percentage of bacteria and *Staphylococcus aureus*, one isolates with (% 2).

60 samples of the halls of the Faculty of Sciences in all departments (environment - Biology and chemistry), where the growth of a number of bacterial species were observed, according to the tables shown earlier in the research, table No.1 and 2 shows the percentages of bacteria that isolated from the halls of the Faculty of Science in the department of Biology and showed *E-coli* with (14%), the highest rates in all sections and the Department of Chemistry in table (3) and (4) *Staphylococcus* with (6%), the highest proportion in the Department of Chemistry and Table (5) And (6) in the halls of environmental department *Pseudomonas aeruginosa* with (6%), which is the highest percentage in the Department of Environmental Sciences. Table (1) and (2) refer to the distribution of isolates according to the sources of isolation and show that the halls of the Faculty of Biology constituted the highest percentage.

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**Table 1. Isolated Bacteria form Hall No. (1) of the Department of Biology**

| Total | Ventilation | Wall | stage | Ground | Chair | Isolates Location / Bacteria types |
|---|---|---|---|---|---|---|
| (%10)(5) | (%2)1 | (%2)1 | (%2)1 | (%2)1 | (%2)1 | *Escherichia coli* |
| (%4) (2) | ----- | ----- | ----- | (%2)1 | (%2)1 | *Staphylococcusaureus* |

**Table 2. Isolated Bacteria from Hall No. (4) of the Department of Biology**

| Total | Ventilation | Wall | Stage | Ground | Chair | Isolates Location / Bacteria types |
|---|---|---|---|---|---|---|
| (%4)(2) | ------ | ----- | (%2)1 | (%2)1 | ----- | *Escherichia coli* |
| (%2) (1) | ----- | ----- | ---- | ----- | (%2)1 | *Staphylococcus aureus* |
| (%2) (1) | ----- | ----- | ----- | (%2)1 | ----- | *Enterobacteriaiceae* |

**Table 3. Isolated Bacteria from Hall No. 1 in the Chemistry Department.**

| Total | Ground | Stage | Chair | Eraser | walls | Isolates Location / Bacteria types |
|---|---|---|---|---|---|---|
| (%6) (3) | ----- | (%2)1 | (%2)1 | (%2)1 | ----- | *Staphylococcus aureus* |
| (%2) (1) | ----- | ----- | (%2)1 | ----- | ----- | *Pseudomonas aeruginosa* |
| (%2) (1) | ---- | ----- | ----- | (%2)1 | ----- | *Streptococci ssp* |

**Table 4. Isolated Bacteria from Hall No. 2 of the Chemistry Department**

| **Total** | **Chairs** | **Ground** | **Wall** | **Isolates Location / Bacteria types** |
|---|---|---|---|---|
| (%2)1 | ---- | (%2)1 | ---- | *Escherichia.coli* |
| (%2)1 | (%2)1 | ----- | ---- | *Pseudomonas aeruginosa* |

**Table 5. Isolated Bacteria from Hall No. (1) of the Department of Environment**

| **Total** | **Stage** | **Walls** | **Ground** | **Chair** | **Isolates Location / Bacteria types** |
|---|---|---|---|---|---|
| (%6)3 | (%2)1 | ---- | ------ | (%4)2 | *Pseudomonas aeruginosa* |
| (%2)1 | ----- | ---- | (%2)1 | ---- | *Escherichia.coli* |

**Table 6. Isolated Bacteria from Hall No. (2) of the Department of Environment**

| **Total** | **Stage** | **Ground** | **Chair** | **Isolates Location / Bacteria types** |
|---|---|---|---|---|
| (%4)2 | (%2)1 | ------ | (%2)1 | *Pseudomonas aeruginosa* |
| (%2)1 | ----- | ---- | (%2)1 | *Staphylococcus uergines* |