



## Detection of Isolated Bacteria from Students' Water Cycle in the College of Science, Babylon University, Iraq

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### ABSTRACT

Samples of male and female students' toilets were collected from department of Physics and Biology in January to April 2018. The results shows the *Escherichia coli* was isolated by the highest percentage (11%) in the male baths of the Department of Biology, followed by *Streptococci ssp* and *Staphylococcus ssp* with the highest percentage in female baths for the Department of Physics, while *Pseudomonas aeruginosa* was highest in male and female baths (7%).

**Keywords:** *Streptococci ssp*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus ssp*.

### INTRODUCTION

There are many microbes scattered in the environment surrounding the human and there are many types of pathogenic and the universities are one of the sources of external microbes from the bathrooms, halls, laboratories and others [1]. All types of bacteria do not cause injuries in normal cases, but some occur once they are located in a place called the pathogenic bacteria and sometimes the infection occurs if the body's defenses, called opportunistic bacteria. Where bacterial contamination in universities is one of the main problems experienced by workers in this field [2]. Many bacteria are considered (*Pseudomonas aeruginosa* - *Streptococci ssp* – *Escherichia coli* and *Staphylococcus ssp*) One of these pollutants and the most dangerous because it has the natural resistance to many disinfectants as well as the characteristics of spread in bathrooms and may be the cause of this is the most intrusive places (workers, students, professors), which is the transition from outside to inside and from the inside out. It is therefore necessary to sterilize and sterilize periodically because of the presence of these germs [3].

Infection acquired by students in universities is one of the most serious infections, especially if the disease is chronic or a disease that causes immunity. This type of infection also affects university workers, service workers and



**Ghaidaa Raheem Lateef Al-Awsi and Ali A. Al-Sudani**

laboratory technicians directly or indirectly. Many people are unaware of the nature of this infection, how it is transmitted and how to prevent it [4]. The infection acquired in universities is one of the most serious problems that result from the contamination of university baths with different types of microbes that may affect students, teachers and workers, especially the elderly and those with limited immunity [5]. The negligence in following the medical basics in the application of treatment techniques are important factors that may help to identify students, staff or professors to infection from within the university, which opens the way to other types of microbes are often more dangerous [6]. First bacteria that founded during this survey is *E. coli* or *Escherichia coli* is a type of Gram-negative bacteria found in the human intestines naturally without causing any symptoms or health problems, but if these species turned into strains carrying genes that can penetrate or destroy cells or secretion of toxins within the body Health problems begin to appear. The infection occurs as a result of eating foods or drinks contaminated especially vegetables and non-cooked meat. Such conditions of the pathology and the nature of symptoms experienced by the patient are diagnosed, and the diagnosis is confirmed by a procedure for the implantation of faeces to confirm the presence of these types of bacteria [7]. Prevention of *E. Coli* can be done by many methods like treatment of pasteurized milk, juices and sterilized beverages is one of the most important points that must be met and emphasized, since it is of utmost importance in preventing the transmission of these pathogenic bacteria and reduce their spread. It is worth mentioning is the modification of lifestyle and domestic relations within the family and in society at large, The ideal health education in the home, school and workplace is important to prevent the risk of infection, so people are accustomed to constantly washing hands before and after eating and attention to clean kitchens in homes and restaurants and fast food stores because they have a wide spread in the Popular markets and regions, as well as washing and cooking utensils always wash raw foods carefully [8].

The second bacteria that investigated in this study are *Pseudomonas aeruginosa* is defined as a type of aerobic and gram-negative bacteria that can grow in difficult environments. These bacteria are abundant in soils and swampy water and can be transmitted to plants and humans. In general, pseudo-pals are not strong enough for healthy people, and they only have opportunities to attack vulnerable people, such as hospital patients, pregnant women, preterm infants, infants born underweight, older infants and children with poor bowel defenses [9]. While the last bacteria that founded in this study is *Streptococcus spp.* are the main bacterial cause of pharyngitis and cellular tissue. They are also the catalyst for immunosuppressive diseases: rheumatic fever, acute hepatitis and kidney disease. *Streptococcus spp.* are positive spherical forms of chromium forming in chains or pairs. All swimming pools are negative for catalysis. Non-aerated, pneumatic (optional pneumatic) and no air-conditioning, not assembled for spurts [10]. These bacteria return to the group of lactic acid, which has been described as environmentally friendly, called biobiotic probiotics. These bacteria help in the preparation and recycling of nutrients and the destruction of organic matter, which in turn makes the environment clean and free of contaminants. *Streptococcus ssp.* contains bacteria It is widely used in this field and has a long history in its safe use in the yoghurt industry. Bio-enhancers are known as microbial cells and their derivatives, which have a beneficial effect on host health. They produce lactic acid bacteria, including *Streptococcus ssp.* Many substances inhibitory microbiological growth and the effect of the activation of the growth of pathogenic microbes and those that cause food damage and those substances lactic acid and acetic acid and formic acid and ethanol and hydrogen peroxide and dill acid and bacteriocene and fatty acid. These bacteria are effective in preventing and treating many diseases [11,12].

## MATERIALS AND METHODS

### Collection of Samples

Samples randomly collected about 20 samples of the faculty of science - Babylon University in Hilla governorate from different places (ie, from the Faculty of Science, Physics Department and Biology Department) and from both sexes, male and female.





## Cultured of Samples

The samples were cultured on the center of MacCon keq and Blood agar, Mannitol agar. We plotted the sample taken from the site by a sterile swab on the center of the plant near the burning of the benzene lamp. This swab was then damaged and the sample was incubated in the incubator for 24 hours and 37 ° C o Inverted and monitoring growth [13][14].

## Diagnosis of Bacterial Isolates

Isolations are diagnosed by Morphological and Cultural Characteristic: The morphological characteristics of the developing 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.

## Microscopic Properties

Wipes from the pure colonies were made on glass slides and dyed Gram and examined under the microscope with the greatest force in the central optical microscope. The forms of the cells were observed, their type of composition was observed and their response to the negative or positive chromium was observed.

## RESULTS

The result of this study shows that table.1 shows the distribution of isolates according to the source of isolation [15]. The male salinity of the Biology department contained 7 isolates (11%), the highest percentage recorded for *Escherichia coli*. *Streptococci ssp.* contains 3 (6%) while the *Pseudomonas aeruginosa* contains 2 (4%) and *Staphylococcus ssp.* contains 2 (4%). Table. 2 show the distribution of isolates according to the source of the isolation. The female baths for the Biology department contained 5 isolates (10%, the highest percentage recorded by *Escherichia coli*). *Streptococcus ssp.* contains 2% (4%). *Pseudomonas aeruginosa* contains (1%) (2%). Table.3 shows the distribution of isolates according to the source of isolation. The male baths of the Physics Department included (4 isolates) (8%), the highest percentage recorded by the bacteria *Escherichia coli*. And *Streptococcus ssp.* (3%) (6%). and *Pseudomonas aeruginosa* (1) by (2%). Table. 4 show the distribution of isolates according to the source of the isolation. The female baths of the Department of Physics included 4 isolates (8%) for *Escherichia coli*. *Streptococci ssp.* had 3% (6%). *Pseudomonas aeruginosa* contained (3%) (6%).

## DISCUSSION

*Escherichia coli*, Bacteria are present naturally in our bodies, but if increased in quantity they are harmful and cause some gastrointestinal disorders such as diarrhea. These bacteria are transmitted to humans by eating contaminated foods such as meat products, meat and dairy products and can grow at temperatures between (50 - 17 m) and ideal (37 m). These bacteria cause diarrhea, abdominal pain, fever and can lead to intestinal diarrhea, dryness or renal failure. *Streptococci ssp* and *Staphylococcus spp*, It is a highly contagious bacteria transmitted from one person to another through the air carrying bacteria disease, coughing and sneezing infected person or surfaces contaminated with bacteria and then put the hands on the nose and mouth Kitchen tools and bathrooms are common means of transmission Similarly infection can be infected with *Streptococcus* bacteria at any time of the year. These bacteria are not considered dangerous but the risk comes from complications that follow the injury if not treated. These complications are inflammation of the tonsils, sinuses, kidney inflammation and others. *Pseudomonas aeruginosa*, It is an organic bacterium that is commonly found in water and has the ability to produce dyes colored in yellowish or reddish color that have no special growth requirements or ideal growth temperature (37 m) and are resistant to antibiotics [15].





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Table 1. Species Bacteria isolated from male baths for the Department of Biology

Total	Ground	Tap	Wall	Washbasin	Isolates location
					Bacteria Sp
(%10) (5)	(%4) 2	----		(%2) 1	<i>Escherichia.coli</i>
(%4) (2)	----	----	(%4) 2	----	<i>Streptococci ssp</i>
(%2) (1)	----	----	----	(%2) 1	<i>Pseudomonas aeruginosa</i>
(2%) (1)	----	2 (4%)	----	2 (4%).	<i>Staphylococcus ssp</i>





**Ghaidaa Raheem Lateef Al-Awsi and Ali A. Al-Sudani**

**Table 2. Species Bacteria isolated from female baths for the Department of Biology**

Total	Ground	Tap	Wall	Washbasin	Isolates location
					Bacteria Sp
(%10)(5)	(%2)1	-----	-----	(%4)2	<i>Escherichia.coli</i>
(%4) (2)	-----	(%4)2	-----	-----	<i>Streptococci ssp</i>
(%2) (1)	-----	(%2)1	-----	-----	<i>Pseudomonas aeruginosa</i>
(2%) (1)	-----	1 (2%)	-----	-----	<i>Staphylococcus ssp</i>

**Table 3. Species Bacteria isolated from male baths for the Department of Biology**

Total	Ground	Tap	Wall	Washbasin	Isolates location
					Bacteria Sp
(%8) (4)	(%4)2	-----	-----	-----	<i>Escherichia.coli</i>
(%2) (1)	-----	(%2)1	-----	-----	<i>Streptococci ssp</i>
(%6) (3)	(%4)2	-----	(%2)1	-----	<i>Pseudomonas aeruginosa</i>
(2%) (1)	-----	-----	1 (2%)	-----	<i>Staphylococcus ssp</i>

**Table 4. Species Bacteria isolated from female baths for the Department of Physics**

Total	Ground	Tap	Wall	Washbasin	Isolates location
					Bacteria Sp
(%8) (4)	(%4)2	-----	-----	(%2)1	<i>Escherichia.coli</i>
(%6) (3)	-----	-----	(%4)2	(%2)1	<i>Streptococci ssp</i>
(%6) (3)	-----	(%2)1	-----	(%4)2	<i>Pseudomonas aeruginosa</i>
(2%) (1)	-----	-----	1 (2%)	-----	<i>Staphylococcus ssp</i>

