

# Statistical Studying of Biochemical Compounds on Microbes

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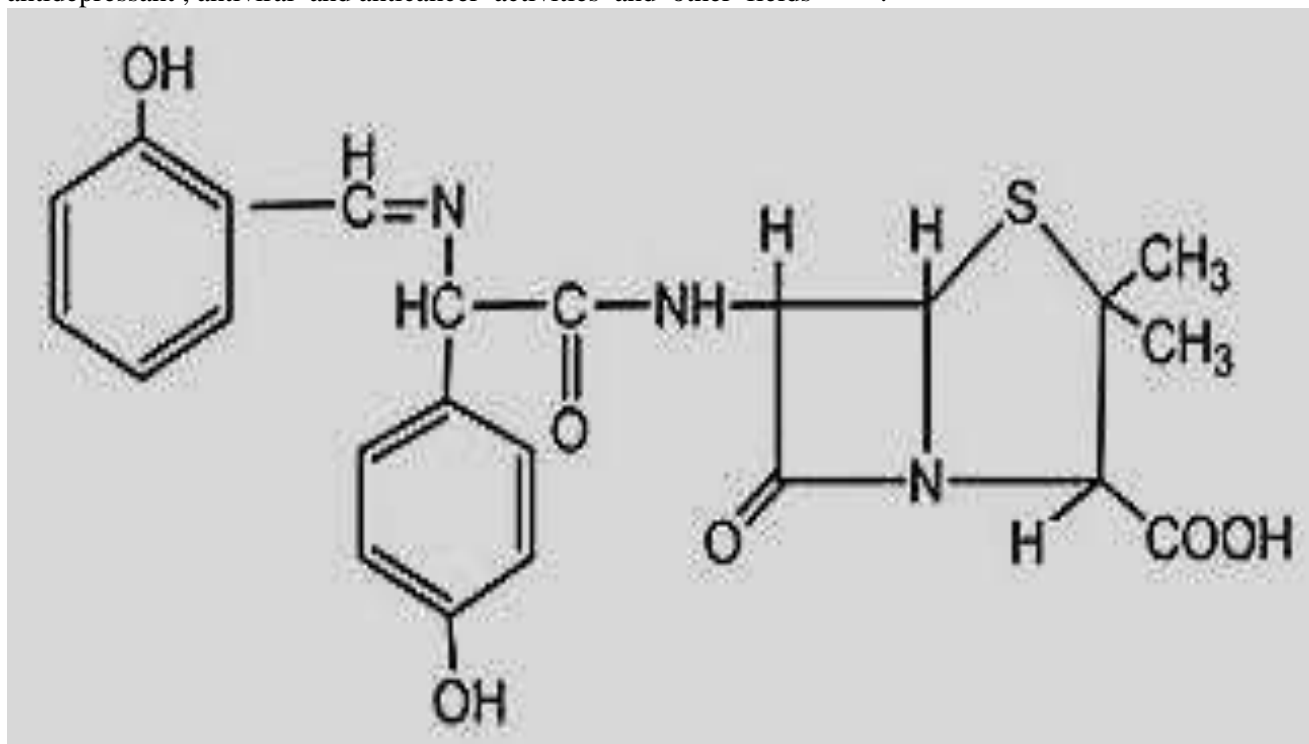
**ABSTRACT:** The statistical studying in our work to complete first work (first paper- in first reference), which includes statistical calculations for studying of microbial behavior on many bacteria and effect of our biochemical compounds against resistant of bacteria, effect of imine derivatives on DNA and wall of bacteria cell through diameter of inhibition (mm) as parameter of activity, effect of types of substitution which linked with ether, nitro, amide, imine, carboxyl, ketone groups in structures of compounds on bacteria.

**Keywords:** statistical, table, antibacterial, biological.

## INTRODUCTION

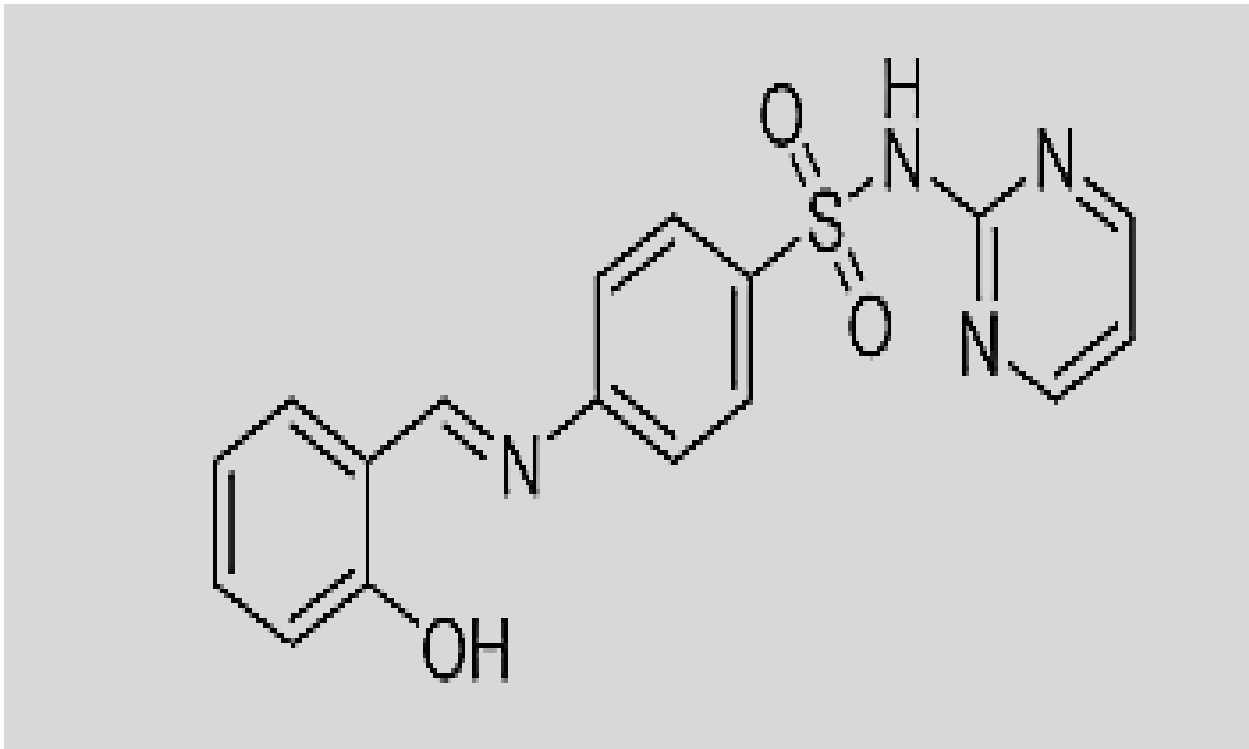
The occurrence of new diseases and concomitant acquisition of microbial resistance to currently medical antibiotics and a drugs, therefore it becomes necessary to discover new pharmaceutical drugs and antimicrobial compounds<sup>(1-7)</sup>. The microbial effects of anil or imine compounds are quite different and have been identified in several studies<sup>(8-14)</sup>. Imine are widely known as active group in any chemical compounds which give more bio - effects on their activity<sup>(15-31)</sup>.

The nature structure of imine (CH=N) group gave good properties for any chemical compounds which containing its derivatives medical properties as antimicrobial, anti-inflammatory, antihypertensive, antidepressant, antiviral and anticancer activities and other fields<sup>(32-40)</sup>.



Fig(1): Imin group in Compound as A drug

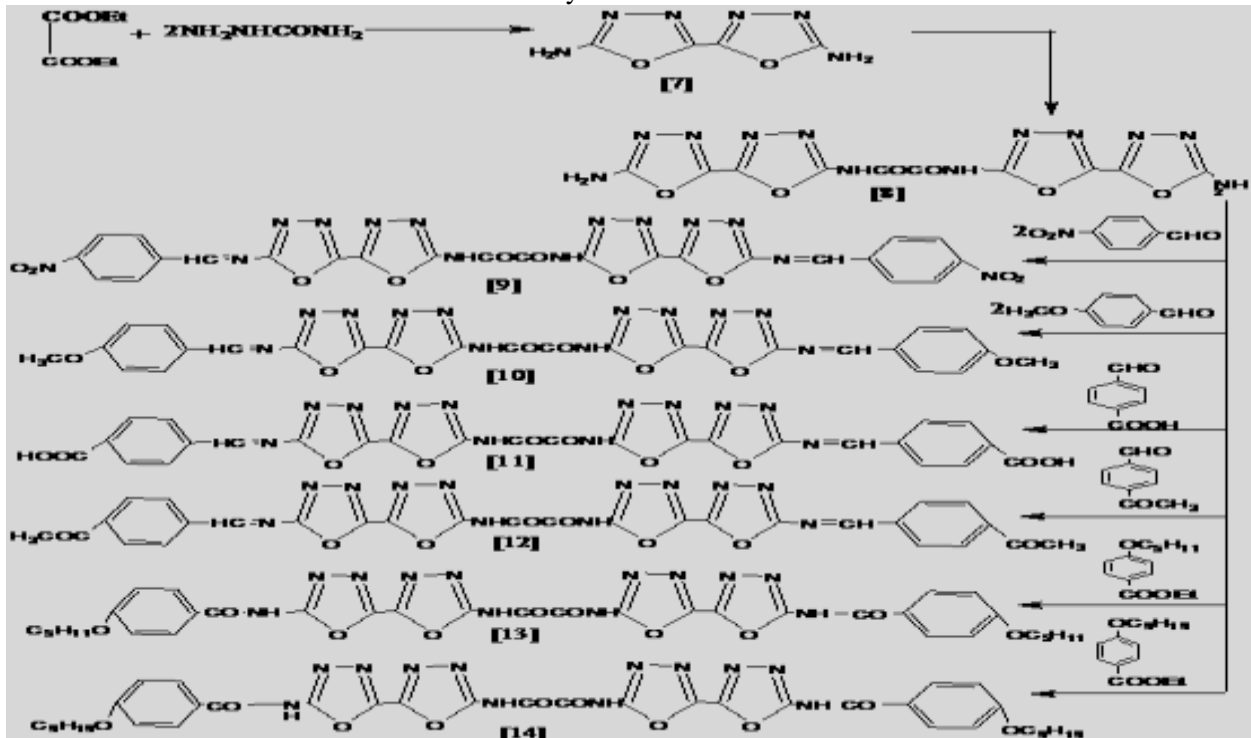
Most of imine compounds have a wide spectrum of medical, industrial application in various fields<sup>(31-40)</sup>, it used also as a starting materials in many chemical reactions<sup>(41-51)</sup>.



Fig(2): Imin group in Compound as antimicrobial

#### EXPERIMENTAL PART :

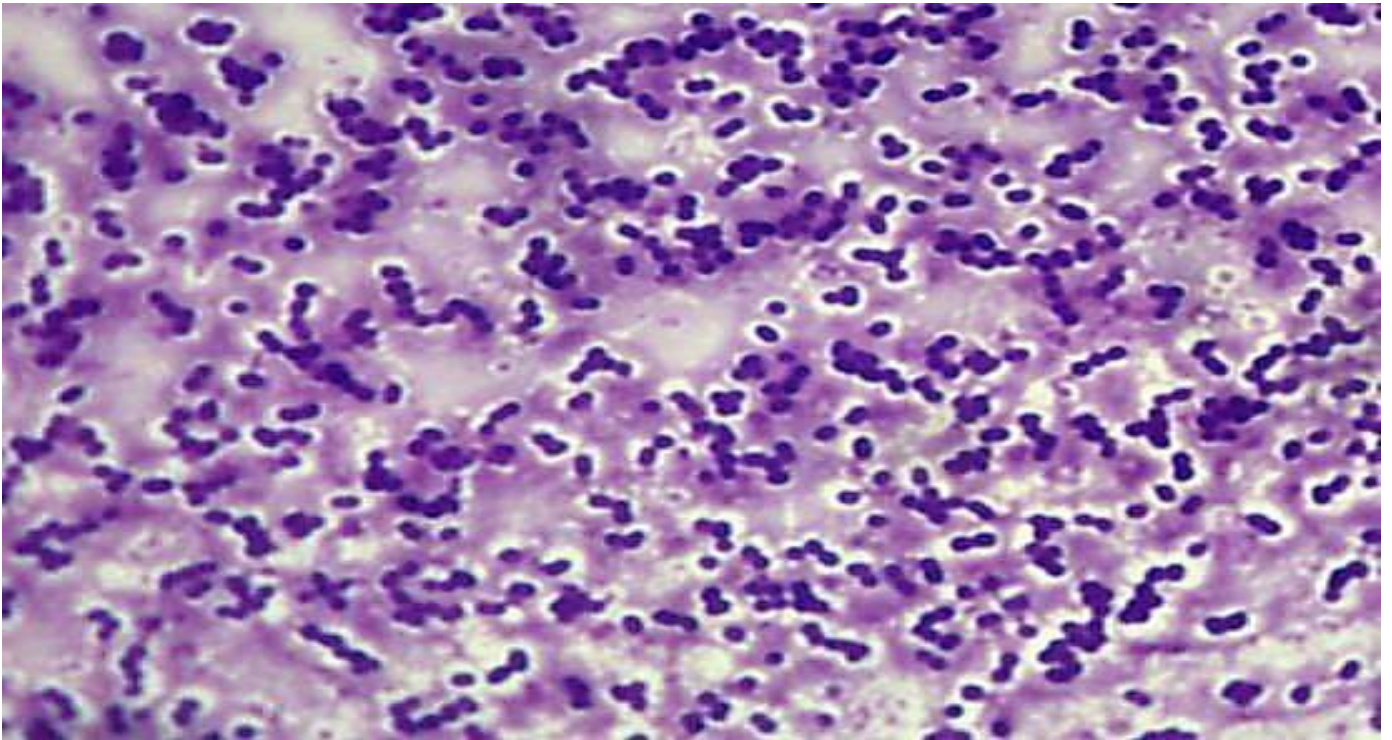
In the previously work<sup>(1)</sup> series of imine derivatives were prepared, now in this work we studied effect of our imine compounds on three types of bacteria represented by scanning via three concentrations, then all data of inhibition diameters calculated by statistical



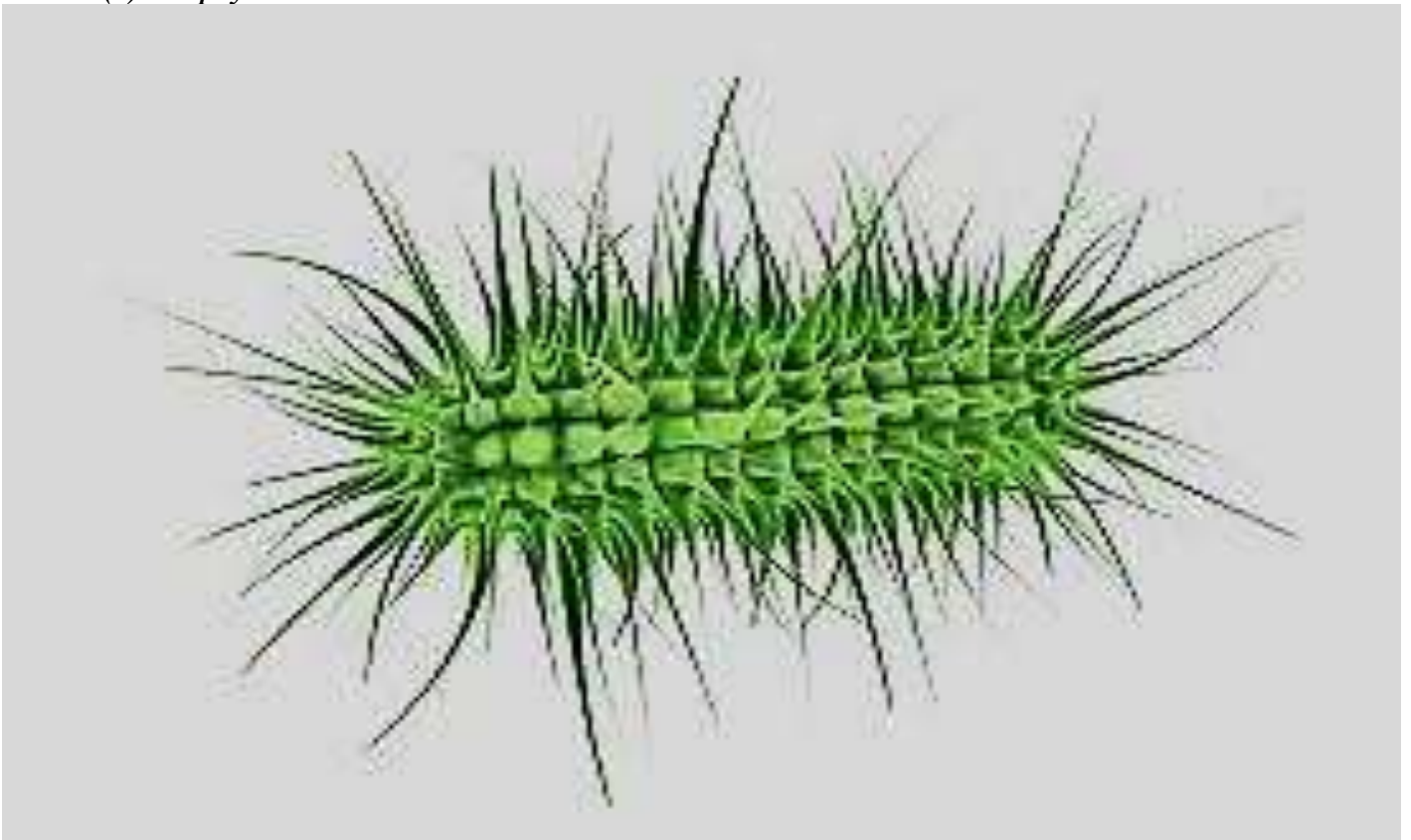
Scheme.1: Prepared Compounds - Imine

**Biological Procedure:**

Assay of activity for prepared derivatives have been screened for their antibacterial activities by agar through biological procedures<sup>16-19</sup>. The antimicrobial activities were done at three concentrations (1, 3, 5 micro gram) concentrations in (DMSO) solvent with types of bacteria (*Staphylococcus aureus*), (*bacteria K. Pneumona*) and (*E- Coli*). These bacterial strains were incubated for 24 hr at 37°C.



*Picture. (1) : Staphylococcus aureus*



*Picture. (2) : E- Coli*



Picture .(3); *K. Pneumonia*

## RESULTS AND DISCUSSION

In past work<sup>1</sup>, we formatted imine derivatives while now completed the second part from this work, we will study Activity against three types of microbes.

### Bio – Experiments:

The test of the sensitivity of the bacterial isolates were positive for gram, which included work on two types of bacteria to measure the biological activity<sup>(9-51)</sup> of certain compounds which bacteria positive for the dye Gram (bacteria *Staphylococcus aureu*) and negative gram (bacteria *K. Pneumonia*), and (*E- Coli*) Tables (1- 7) show the diameter of inhibition zone for vehicles chemical measured in mm towards the species bacterial.

### Statistical Calculations :

All statistical tables of bacterial inhibition were carried out by using (Statistical package social sciences)program :

**Table.1:** Statistical Calculations of Biological Activity (Inhibition Zone in ((mm)) in (Concentrations (1 , 3 , 5  $\mu$  gm) for Compound [ 8 ]

Bactria	(1) $\mu$ gm	(3) $\mu$ gm	(5) $\mu$ gm
<i>Staphylococcus aureus</i>	7.44 $\pm$ 0.32b	12.33 $\pm$ 0.32a	14.22 $\pm$ 2.15a
<i>K. Pneumona</i>	5.43 $\pm$ 0.45b	14.01 $\pm$ 1.12a	11.13 $\pm$ 0.31a
<i>E- Coli</i>	5.19 $\pm$ 0.35b	13.11 $\pm$ 1.23a	13.44 $\pm$ 2.22a

**Table.2:** Statistical Calculations of Biological Activity (Inhibition Zone in ((mm)) in (Concentrations (1 , 3 , 5  $\mu$  gm) for Compound [9 ]

Bactria	(1) $\mu$ gm	(3) $\mu$ gm	(5) $\mu$ gm
<i>Staphylococcus aureus</i>	18.14 $\pm$ 2.15 <sup>o*</sup> b	19.71 $\pm$ 1.07 <sup>o*</sup> a	28.66 $\pm$ 2.789 <sup>o*</sup> a
<i>Bacillus subtilis</i>	20.87 $\pm$ 1.12 <sup>o*</sup> b	24.16 $\pm$ 2.91 <sup>o*</sup> a	29.91 $\pm$ 2.87 <sup>o*</sup> a
<i>Streptococcus pyogenes</i>	20.18 $\pm$ 2.44 <sup>o*</sup> b	24.86 $\pm$ 1.71 <sup>o*</sup> a	28.76 $\pm$ 2.31 <sup>o*</sup> a

**Table.3:** Statistical Calculations of Biological Activity (Inhibition Zone in ((mm)) in (Concentrations (1 , 3 , 5  $\mu$  gm) for Compound[ 10 ]

Bactria	(1) $\mu$ gm	(3) $\mu$ gm	(5) $\mu$ gm
<i>Staphylococcus aureus</i>	11.09 $\pm$ 1.16b	11.09 $\pm$ 1.51a	12.14 $\pm$ 1.07a
<i>K. Pneumona</i>	10.31 $\pm$ 1.18b	10.11 $\pm$ 1.03a	13.13 $\pm$ 1.10a
<i>E- Coli</i>	7.23 $\pm$ 1.22b	10.10 $\pm$ 1.31a	11.19 $\pm$ 1.17a

**Table.4:** Statistical Calculations of Biological Activity (Inhibition Zone in ((mm)) in (Concentrations (1 , 3 , 5  $\mu$  gm) for Compound [ 11 ]

Bactria	(1) $\mu$ gm	(3) $\mu$ gm	(5) $\mu$ gm
<i>Staphylococcus aureus</i>	24.11 $\pm$ 1.19 <sup>o*</sup> b	28.41 $\pm$ 3.10 <sup>o*</sup> a	28.97 $\pm$ 2.02 <sup>o*</sup> a
<i>Bacillus subtilis</i>	20.31 $\pm$ 1.11 <sup>o*</sup> b	24.14 $\pm$ 2.73 <sup>o*</sup> a	28.93 $\pm$ 1.17 <sup>o*</sup> a
<i>Streptococcus pyogenes</i>	24.12 $\pm$ 2.21 <sup>o*</sup> b	30.54 $\pm$ 3.8 <sup>o*</sup> a	30.68 $\pm$ 2.31 <sup>o*</sup> a

**Table.5:** Statistical Calculations of Biological Activity (Inhibition Zone in ((mm)) in (Concentrations (1 , 3 , 5  $\mu$  gm) for Compound [ 12 ]

Bactria	(1) $\mu$ gm	(3) $\mu$ gm	(5) $\mu$ gm
<i>Staphylococcus aureus</i>	16.65 $\pm$ 2.37 <sup>o*</sup> b	18.13 $\pm$ 2.90 <sup>o*</sup> a	22.02 $\pm$ 2.10 <sup>o*</sup> a
<i>Bacillus subtilis</i>	19.00 $\pm$ 2.30 <sup>o*</sup> b	20.013 $\pm$ 3.11 <sup>o*</sup> a	27.05 $\pm$ 1.09 <sup>o*</sup> a
<i>Streptococcus pyogenes</i>	19.44 $\pm$ 1.82 <sup>o*</sup> b	21.01 $\pm$ 2.26 <sup>o*</sup> a	27.13 $\pm$ 2.89 <sup>o*</sup> a

**Table.6:** Statistical Calculations of Biological Activity (Inhibition Zone in ((mm)) in (Concentrations (1 , 3 , 5  $\mu$  gm)for Compound [ 13 ]

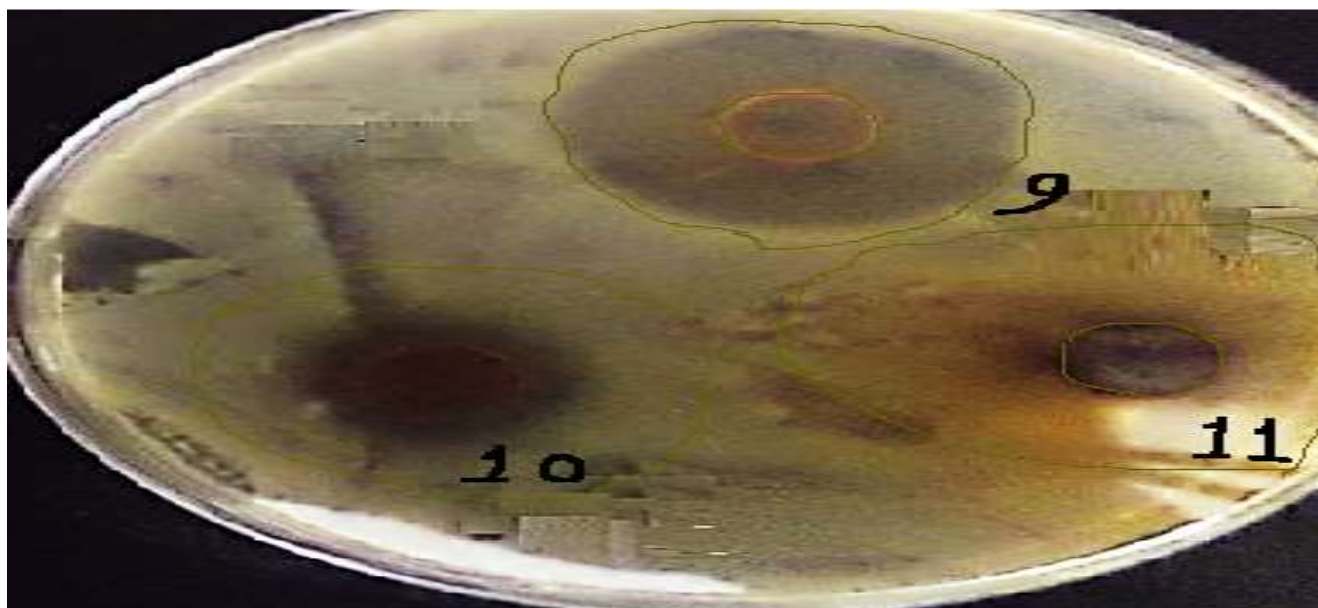
Bactria	(1) $\mu$ gm	(3) $\mu$ gm	(5) $\mu$ gm
<i>Staphylococcus aureus</i>	12.31 $\pm$ 1.01b	15.3 $\pm$ 1.73a	17 $\pm$ 2.1a
<i>K. Pneumona</i>	14.21 $\pm$ 1.03b	13.11 $\pm$ 1.83a	16.4 $\pm$ 1.17a
<i>E- Coli</i>	14.13 $\pm$ 2.31b	12.11 $\pm$ 2.01a	16.9 $\pm$ 1.34a

**Table.7:** Statistical Calculations of Biological Activity (Inhibition Zone in ((mm)) in (Concentrations (1 , 3 , 5  $\mu$  gm) for Compound [ 14 ]

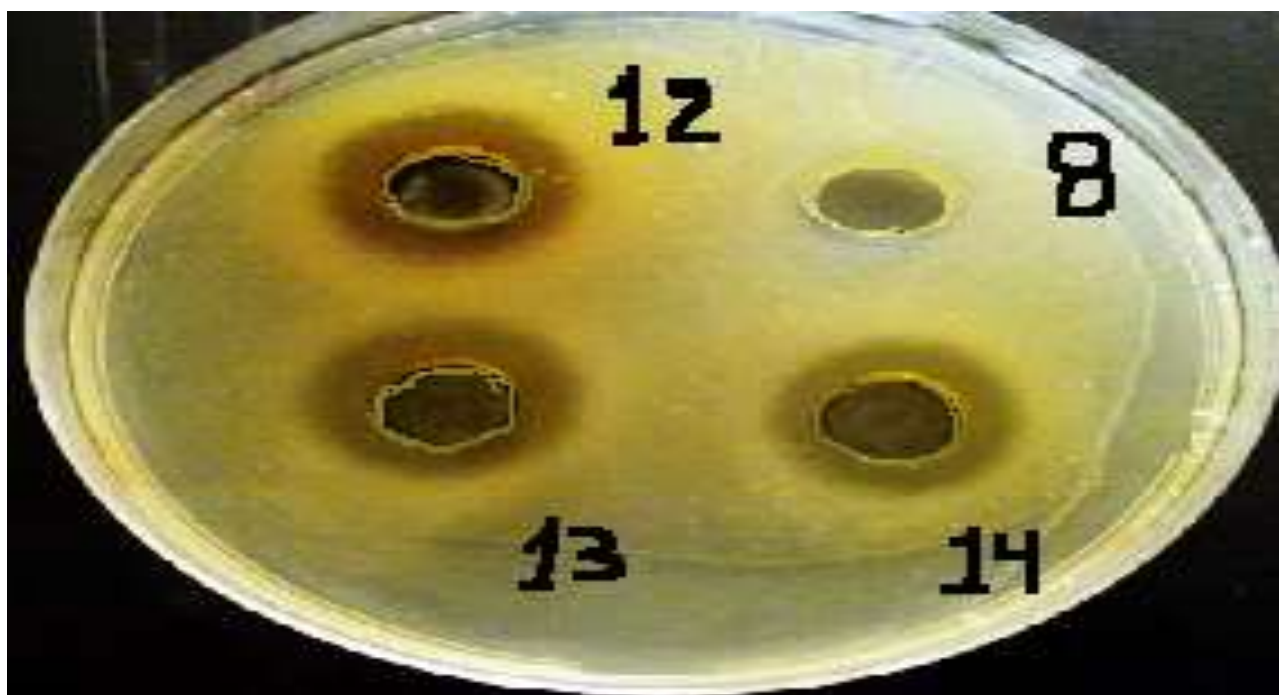
Bactria	(1) $\mu$ gm	(3) $\mu$ gm	(5) $\mu$ gm
<i>Staphylococcus aureus</i>	8.16 $\pm$ 1.10b	11.13 $\pm$ 1.00a	12.00 $\pm$ 2.00a
<i>K. Pneumona</i>	9.12 $\pm$ 1.09b	14.21 $\pm$ 1.18 a	12.41 $\pm$ 1.39a
<i>E- Coli</i>	9.14 $\pm$ 2.06b	11.14 $\pm$ 1.05a	11.69 $\pm$ 1.17a

The results of statistical tables appeared data of inhibition for the three types of bacteria on imine derivatives that the Activity of imine compounds which bearing active groups as ( nitro group , carboxyl

group) have good activity toward microbes .



**Photo. 1:**The inhibition of the compounds( 9 , 10 , 11 ) on *Staphylococcus Aureu*



**Photo. 2:**The inhibition of compounds(8, 12 , 13 , 14 ) on *Staphylococcus Aureu*

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