Evaluation Biological Activity of Some Chemical Compounds Contain Amide group or Imine group

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Key words : evaluation of amide , imine.

Summary :-

The study was carried out in the Laboratory of public health , directly of health for the period from **3/ 4/ 2016** to **20 / 12 / 2016** on some prepared compounds that contains amide or amine group in concentrations (50, 100, 150) mg / dl .

To detect their inhibitory effect on pathological micro –organism

(Escherichia coli , pseudomonas aeruginosa , proteus spp. And staphylococcus aureus) , using the modified agar diffusion method as a culture media . Some compounds containing amide group in compounds

(2, 8, 9) showed inhibitory effect on pseudomonas aerug:nosa while compound (11) has inhibitory effect against pseudomonas ,This effect was attributed to that the compounds (2 , 8 , 9)contains more than one pyridine ring in addition to containing many amide groups , while the compound (11) contain mercury in addition to pyridine rings and amide groups .

"تقييم الفعالية البيولوجية لبعض المركبات الكيمياوية المحتوية على مجموعة امايد او مجموعة ايمين "

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الخلاصة :

تم أجراء البحث في مختبر الصحة العامة المركزي / دائرة صحة كركوك لمعرفة تأثير بعض المركبات المحضرة والمحتوية على مجاميع الامايد او الايمين وبتراكيز (50 ,100 , 150)

mg /dl على تثبيط بعض الجراثيم المرضية

(Escherichia coli ,pseudomonas aeruginosa , proteus spp. And staphylococcus aureus)

وباستخدام الوسط ألزرعي ***Modified agar diffusion method*** .

بعض المركبات المحتوية على مجموعة امايد المتمثلة في مركب (2), (8), (9) اعطت فعالية تثبيطية ضد

pseudomonas aeruginosa

ويعزى سبب ذلك لكون مركبات (2), (8) , (9) محتوية على اكثر من حلقة بيريدين بالإضافة إلى احتوائها على مجاميع امايد.

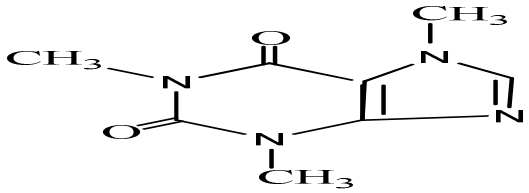
ومركب (11) أعطى فعالية تثبيطية ضد

pseudomonas aeruginosa

ويعزى ذلك بسبب احتوائه على فلز الزئبق بالإضافة الى احتوائه على حلقات بيريدين ومجاميع امايد.

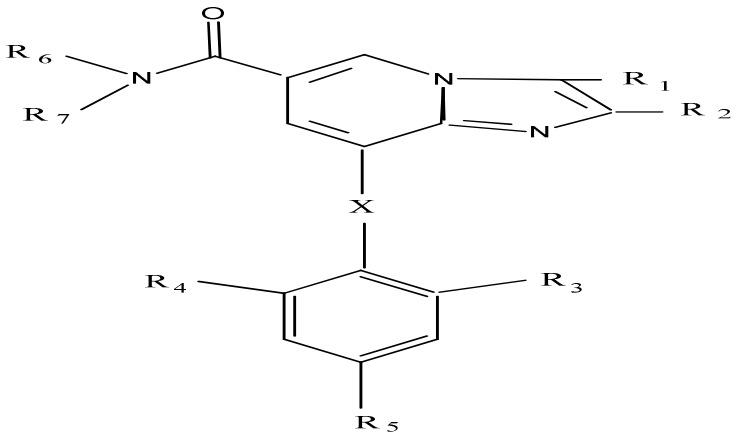
Introduction :

Hetero cyclic compounds are widely distributed in nature essential for life in different forms, most of sugar and their derivatives including vitamins such as vitamin C present as penta compound (furan) or hexa form (pyran) which contain cyclic single atom of oxygen. Most of members of vitamin group (B_6) , pyridoxine is one of pyridine derivatives ,considered essential for dietary metabolism of amino acids in addition to alkaloids , which are nitrogen bases present in plants and many of antibiotics including penicillin containing heterocyclic system. There are great number of heterocyclic compounds possible to obtain through laboratory preparation . they are beneficial as therapeutic , pharmaceutical chemical compounds. The heterocyclic compounds especially nitrogenous are present combined in difference natural compounds in nature of plant origin called alkaloid , which are generally toxic and have medical properties [(1)].ex :



Caffeine

The derivative of imidazo pyridine compounds inhibit gastric internal and external secretions and possible to use for prevention or treatment the inflammatory diseases which effect the stomach and intestine [(2)] .



R_1, R_2, R_3 ..... different alkyl group

The compounds containing nicotine amide are used for industry economic and pharmaceutical fields , for example the compound N- (4- bromophenyl -5,6 – dichloro nicotine amide) , 6 – chloro -5- fluoro – N – (3 – Pyridyl) nicotinamide synthesized compound for eradication of mosquitoes , houseflies and fungus [3].

- They also studied recent complex (*Nicotin acetyl choline receptors*) derivative which are symboled as(*nachre*) which has role in transmission of reflexes and signal from nerve cells and their effect on some diseases such as Alzhymer [4,5]. In addition, there are new alternatives N- substituted (2 – benzhydryl and benzyl sulfinyl) nicotine amides synthetic for stimulation of acid media in cell walls as these compounds are capable to form 2, 3 di hydroxo – 3 – oxoisothiazolo (5,4-b)pyridines which inhibit gastric H^+ / K^+ ATPase [6].

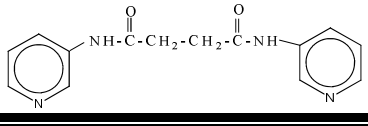
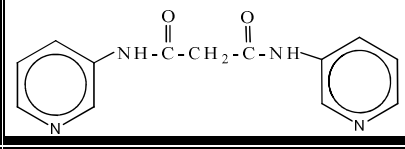
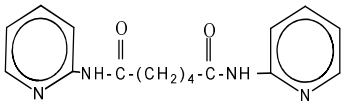
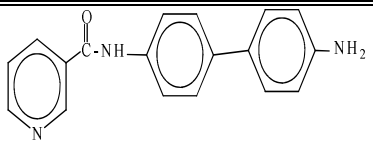
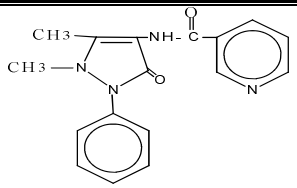
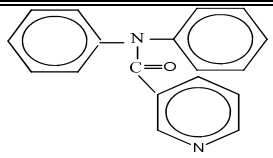
- A study revealed , the possibility of inhibition of absorption of nicotinic acid and nicotine amide through using 3- pyridine aldoxime by *Bordetella pertussis* [7].
- Also the compounds containing iso methane group (- C = N -)
  While is prepared from the reaction of 4 – amino antipyrine with aldehyde has biological activity causing inhibition of bacterial growth and acts as insecticides and antibacterial[8,9].

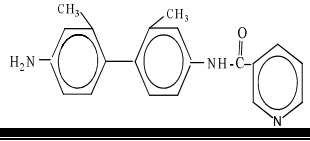
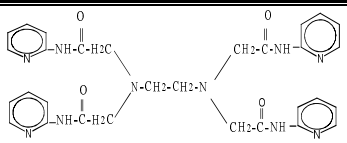
Experimental

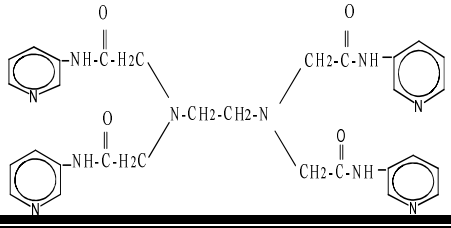
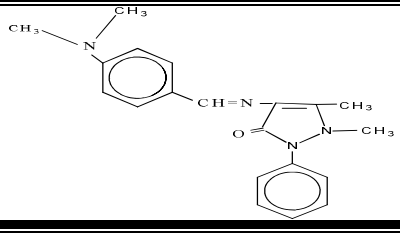
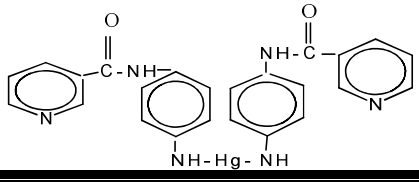
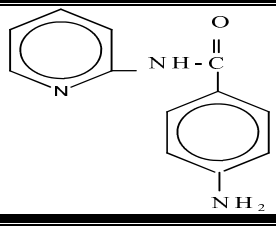
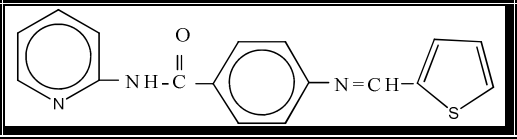
Chemical materials : - all chemicals were purchased from *BDH* and *fluka*,used directly without recrystallization.

The following chemical were prepared as follows according [10] :-

Table (1) : physical properties of compounds (1-13)

Comp. No.	Molecular formula	structure	M.p (^{O}C)	Yield (%)	Colour	R ecryst. Solvent
1	$C_{14}H_{14}N_4O_2$		182-185	55	Pale yellow	DMSO
2	$C_{13}H_{12}N_4O_2$		…….	40	Oily	
3	$C_{16}H_{18}N_4O_2$		112 -115	71	Pale yellow	DMF
4	$C_{18}H_{15}N_3O$		172-175	36	Light brown	DMSO
5	$C_{16}H_{17}N_4O_2$		103 – 106	64	Light brown	DMF
6	$C_{18}H_{15}N_2O$		86 -90	89	Light brown	DMF

7	**$C_{20}H_{23}N_3O$**		**152 -156**	**45**	**Green**	**DMSO**
8	**$C_{30}H_{32}N_{10}O_4$**		**235-238**	**50**	**Pale yellow**	**DMSO**

9	**$C_{30}H_{32}N_{10}O_4$**		**242-245**	**55**	**pink**	**DMSO**
10.	**$C_{20}H_{22}N_4O$**		**217 - 220**	**60**	**Pale yellow**	**$CHCI_3$-ether**
11.	**$C_{24}H_{20}N_6O_2Hg$**		**136-140**	**60**	**Black**	**DMSO**
12	**$C_{12}H_{11}N_3O$**		**280(d.)**	**52**	**Light brown**	**DMSO**
13	**$C_{17}H_{13}N_3OS$**		**200- 204**	**45**	**Light brown**	**DMSO**

The present work was carried out in kirkuk public health laboratory , department of microbiology . the bacteriological samples were collected from the patient admitted to kirkuk general hospital in kirkuk city. four types of pathogenic bacteria were used they were :- ***(Escherichia coli ,pseudomonas aeruginosa , proteus spp. And staphylococcus aureus***) for their medical importance being resistant to antibiotic. the culture media used was nutrient agar (*oxoid – u.k.*) for culture and growth of organisms The modified agar diffusion method was used for sensitivity of chemical compound toward the isolated bacteria (***kerby – bauer method***) [11- 15].the nutrient culture media was prepared and

sterilized by autoclave ; cultured in Petridish to solidify ; the media was incubated at 37 ^{0}C for 24 hours. The Petridisheswere inoculated with isolated organisms , incubated at 37 ^{0}C for 24 hours.the dishes punched with average of 6 punch in each Petridish , the prepared chemical compounds used were

(***1,2,3,4,5,6,7,8,9,10,11,12,13)*** the chemical compounds solutions were prepared using specific solvent(chloroform) at concentration of (50, 100, 150) mg / dl for each of solid extract were added to each dishes, incubated at 37 ^{0}C for 24 hours . the readings were recorded in the second day to show the sensitivity of each extract used ,the inhibition – zones were measured in millimeter.

Results and Discussion:-

Table (1) showed that laboratory prepared compounds
(1,2,3,4,5,6,7,8,9,10,11,12,13) did not give any inhibitory effects against *Escherichia coli* at concentrations of (50, 100 ,150) mg /dl.

The active compounds of (1,3,12) contain mono group representing in compound 1 succinamide compound 3 adipamide compound 12 Benz amide,compound 13 contain agroup of amine inaddition togroup of amide while in testing test compounds against *pseudomonas aeruginosa* it was found that inhibitory values of compound 2had inhibitory values (40,45,52) mm at concentration (50,100,150) mg /dl respectively. Compound 2 contain mono group representing malonamide that is the atomic number of carbon in it is less than succinamide , adipamide and benzamide. It has been reported that the recovery of *pseudomonas aeruginosa* was enhanced by incubating specimens in acetamide broth before subculture on cetrimide agar [16].the compounds (4,5,6,7) contain mono nicotine amide in addition the compound 7 contain amine group . the compound 8 had inhibitory values (45,48,55) mm because compound 8 contains four amide groups representing acetamide each one substituted in amine group of compound 2- amino pyridine.the compound 9 had inhibitory values (42,48,52) mm because the compound 9 contains 4- amide groups represting acetamide each one substitute at amine group of 3- amino pyridine .

- Houlsby etal[17], in their study showed the results indicate that thimerosal – preserved sulfacetamide solutions containing *EDTA* are more effective against *pseudomonas aeruginosa*, serratia marcescens,staphylococcus epidermidis and candida albicaus than similar paraben – preserved solutions.
- While the compound 11 had inhibitory values (5,9,12)mm because the compound 11 contain agroup of nicotinamide in addition to mercury .regarding the effect of compound against proteus species . the compound 8 had inhibitory value 30 mm at concentration 50 mg /dl. And

the compound 9 had inhibitory value 50 mm at concentration 50 mg /dl. Concerning the effect of compounds against staphylococcus aureus infection only compound 10 had inhibitory value 30 mm at concentration 100 mg /dl because the compound 10 contain group of imine in addition to extension on atom O& N and group of acyl are shown in ***fig (1),(2)***. Throughing light in compounds (1,3,4,5,6,7,12,13) had no inhibitory value against any organism at any concentrations.

Table (2) : Inhibitory effect of some prepared compounds on growth of some pathogenic bacteria.

Inhibitory zone (mm).

Comp. No	Conc.	E. coli	Pseudomonas aeruginosa	Proteus sp.	Staphylococcus aureus
2	50	_____	40	_____	_____
	100	_____	45	_____	_____
	150	_____	52	_____	_____
8	50	_____	45	30	_____
	100	_____	48	_____	_____
	150	_____	55	_____	_____
9	50	_____	42	50	_____
	100	_____	48	_____	_____
	150	_____	52	_____	_____
10	50	_____	_____	_____	_____
	100	_____	_____	_____	30
	150	_____	_____	_____	_____
11	50	_____	5	_____	_____
	100	_____	9	_____	_____
	150	_____	12	_____	_____
1,3,4,5,6 7,12,13	50	_____	_____	_____	_____
	100	_____	_____	_____	_____
	150	_____	_____	_____	_____

Cefocaxime (C.C.X10) disc/5mg	**0**	**0**	**34**	**28**	**0**
Chlorampheni col (C.C.30) disc/30mg	**0**	**0**	**28**	**30**	**0**
Cefixime ($C.F.M_5$) disc/10mg	**0**	**0**	**26**	**0**	**0**
Amoxitillin (A.M.C30) disc/30 mg	**0**	**0**	**0**	**15**	**0**
DMSO& $CHCl_3$	**0**	**0**	**0**	**0**	**0**

< 5 mm = No inhibition = inactive

(5-10) mm = slightly active

(11-20) mm = moderately active

> (21 and more) = highly active

Fig (1): Compound 9 inhibition of *Proteus sp*. In the (50) con.

Fig (2): Compound 10 inhibition of *Staphylococcus aurous* In the (100)con.

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