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Synthesizing, Characterizing and Studying the Biological Activity of Some New Schiff-Bases Derivatives Containing the Monosaccharide Moiety

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Abstract:

A new series of α-D-glucose as Schiff bases derivatives is synthesized and characterized with studying their bioactivity. Hydroxyl groups at C (1,2&5,6) sugar moiety are converted into acetal form through a reaction with dry acetone using phosphoric acid and anhydrous zinc chloride as catalysts producing 1,2:5,6-di-O-isopropyledine α-D-glucofuranose(I). The five memberd ring acetal of C(5,6) is hydrolyzed with acetic acid (65%)and a reaction of the new product with sodium periodate is carried on to get an aldehyde moiety which is used to produce a new series of Schiff bases through reacting with different amino compounds such as 4-amino antipyrene .

The suggested chemical structures of the prepared compounds are confirmed by using UV., FT-IR and ^{1} H-NMR spectra .Most of the prepared compounds show antibacterial activity.

Key words: Synthesis, Biological Activity, Schiff Bases.

Introduction:

Many sugar analogs containing nitrogen [1] sulfur [2(a,b,c)] or phosphorus [3]as a ring heteroatom have been prepared because of the wide interest in their chemical and biochemical properties. Heteroatom-in-the-ring sugar analogs of 2-amino- and 2-acetamido-2- deoxyhexo pyranoses, which widely occur as a component of many natural products, have also attracted considerable interest [4].

Acylated D-glucofuranose and D-glucopyranose derivatives are prepared and another study of *in vitro* antimicrobial activities of furanose monosaccharides pluse pyranose monosaccharide acylates has been don as a comparative study. While the (SAR) structure activity relationship study show that the acyl derivatives in six-membered pyranose form are more effective by antimicrobial functionality than that of the corresponding acyl derivatives in five-membered furanose form [5].

Schiff bases are widely used as useful organic compounds. They are used "as intermediates in organic synthesis, dyes,

pigments, polymer stabilizers, and catalysts" [6,7].

Glucosamine "Schiff bases", although known since 1922, have received relatively less attention in the literature. For the compounds that consist of the Schiff's base and glucose sub-units a possibility of tautomeric and anomeric equilibria has to be taken into consideration [8]. The study of some glucosamine Schiff bases structures by means of an initio calculations and the anomeric and tautomeric equilibria in a DMSO solution by spectroscopic methods is reported [9].

Schiff bases or imines are easily generated by condensate carbonyl groups and primary amines. In carbohydrate chemistry, a large number of imines have been reported, both by reaction of sugar aldehydes with amines and by the reaction of aminosugars with aldehydes [10-13]. Helmoz R. reports the synthesis of a series of D-glucosamine derivatives and evaluated their antimicrobial activity. Some of the investigated compounds have a significant antimicrobial activity against positive and negative germ bacterial strains as the fungal strains, so the sugar moiety is necessary due to final results, to increase the biological activity of these compounds [14].

The aim of this work is to synthesize and characterize a new series of Schiff bases and investigate their bioactivity.

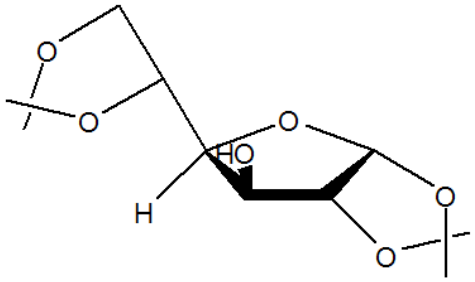
Materials and Methods:

All chemicals in this work are from BDH., Fluka, Merk and Aldrich Chemicals Co. and used as received.

Instrumentations:

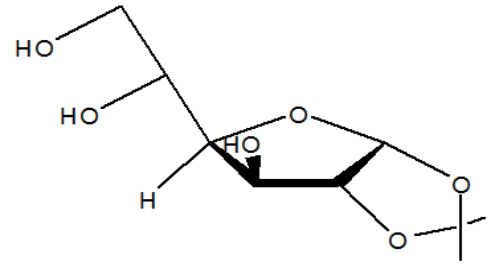
Melting point is evaluated by (Stuart /Melting Point /smp30) apparatus and is uncorrected. FT- IR spectra are recorded by using KBR disc on (a Shimadzu FT-IR 8400S) Fourier Transform Infrared Spectro-photometer. UV. spectra are recorded by using a Shimadzu (UV.-160A) UV-Vis recording Spectrophotometer. C.H.N. analysis is performed via (Euro vector EA 3000A Elemental Analyzer) in AL-al-Bayt University- Jordan. The ^{1}HNMR spectra (DMSO) are obtained on (a Brucker -300 MHZ Ultra Shield) with (TMS) as an internal standard in University of AL-al-Bayt- Jordan. Thin Layer Chromatography (TLC) is carried out, and the plates are developed with iodine vapor. The results of biological activity are performed in College of Science – University of Baghdad.

"Synthesis of 1,2:5,6-Di-O-Isopropyledene -α-D-Glucofuranose" (I) [15]:-



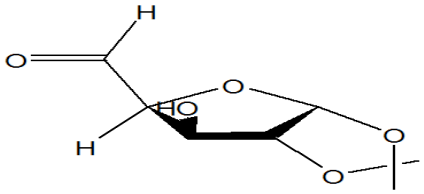
To an efficiently stirred suspension of anhydrous glucose (30gm ; 0.166 mol.) in acetone (200mL) anhydrous pulverized zinc chloride (24gm ; 0.182 mol.) is added , followed by phosphoric acid (85%;0.8 mL). This mixture is stirred at R.T. for 30 hrs., an dissolved glucose (12.4gm) is collected and washed with acetone . The washings & filtrate are cooled , resulting alkaline with a solution of sodium hydroxide (17 gm, in 17mL; H_2O) , the inorganic material is removed by filtration ; colorless filtrate is concentrated ; the residue diluted with (50 mL; H_2O).The organic layer is extracted by (3x50 mL ;$CHCL_3$) and dried under reduced pressure to give a white precipitate of crude di-isopropylidene glucose .The product is recrystallized from chloroform : n-hexane (1:10) (m. p.=104 -106^0 C ; yield = 73%),(R_f =0.64 ; benzene : methanol ; 8:2).

"Synthesis of 1,2-O-Isopropylidene-α-D-Glucofuranose" (II) :-



Compound (I) (20g,0.09mole) is dissolved in a mixture of acetic acid (65%,50mL) and methanol absolute (15mL),and stirred at room temperature for 72 hrs. [16]. The resulting solution is mixed with benzene (50mL)and then evaporated (This process was repeated for 4-times) [17].The resulting residue is washed with ethanol ,chloroform and then with diethyl ether to get off white a semi solid product (compound II). (Yield 79.5%,) (R_f=0.36 benzene :methanol; 8:2).

"Synthesis of 1,2-O-Isopropylidene-α-D-Xylo-Pentodialdo-1,4-Furanose" (III):-



Compound (II) (5g ,22.7mmol) dissolved in ethanol absolute (60mL) is added to a stirred aqueous solution of sodium period ate (4.9g ,22.7mmol, in distilled water 60mL) at 0^0 C,for 15min. Then ethylene glycol (0.5mL) is added, the mixture kept stirring at R.T. for 60min. then filtered and (40mL; H_2O) is added. The product is extracted with (3x50 mL; ethyl acetate), the extracts dried over (Mg SO4), filtered off, to get a brown gummy product (compound III) after evaporating the solvent [R_f = 0.78; yield = 60%].

"Synthesis of Schiff's Bases Derivatives" (IV a – e) .

A mixture of compound (III) (1.0g ; 5.3 mmole) with appropriate amino compounds (5.3 mmole)in absolute ethanol (20ml) and 3drops of glacial acetic acid is refluxed for 24hrs . The completion of the reaction is followed by T.L.C. (benzene: methanol ; 8:2) and by evaporating the solvent, the residue should be recrystallized with absolute ethanol, and the characteristic physical properties of compounds (IV a – e) are shown in Table 1 .

Table (1) Physical Properties of Compounds (Iva – e) :-

Compound No.	Amino group	Molecular formula	Molecular weight	M . p C^0	R_f	Yield %	color
IV_a	4-amino antipyrine	$C_{19}H_{23}N_3O_5$	373	188 – 190	0.76	85	Deep brown
IV_b	4-Toulidine	$C_{15}H_{19}NO_4$	277	118 – 120	0.70	78	Deep brown
IV_c	4-amino benzoic acid	$C_{15}H_{17}NO_6$	307	128 – 130	0.58	74	Brown
IV_d	4-Nitro aniline	$C_{14}H_{16}N_2O_6$	308	124 – 126	0.72	69	Orange
IV_e	3-amino phenol	$C_{14}H_{17}NO_5$	279	225 – 227	0.66	79	Brown

Results and Discussion:

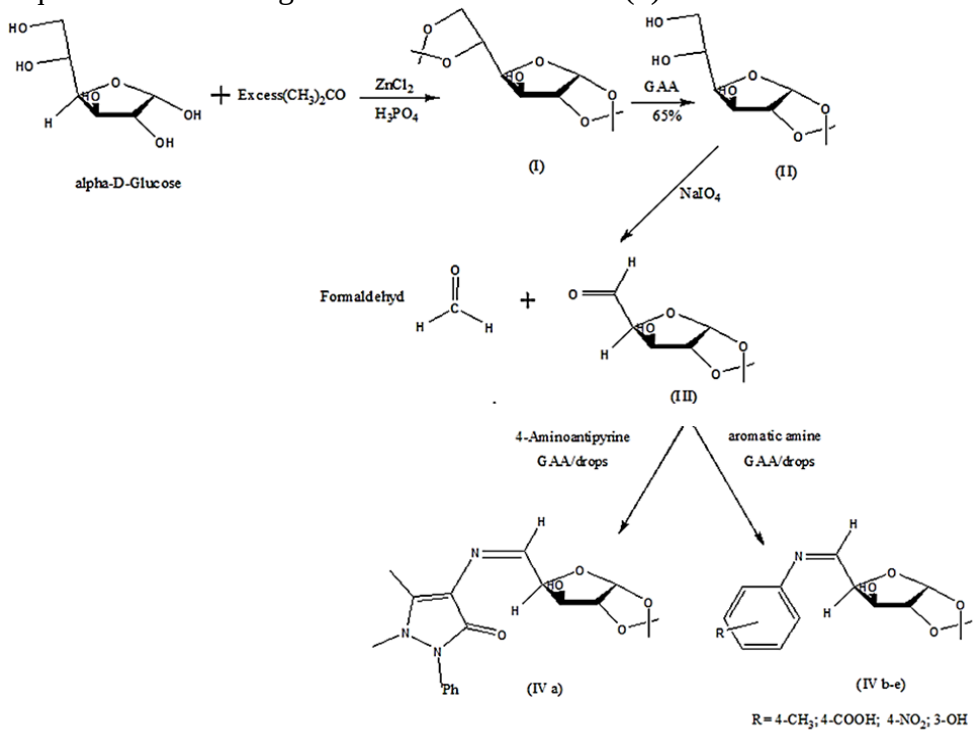
D. Glucose in furanoid form (D. Glucofuranose) has five hydroxyl groups, and all these groups are active for classical reactions and modifications, D. Glucofuranose has been chosen as a starting material since it is readily available and comparatively in expensive compound. The synthesis of Schiff bases derivatives (IV_{a-e}) needs first conversion of D – glucose into 1, 2: 5 , 6 – isopropylidene derivative (I).

The acetal group is stable toward alkaline conditions but is readily hydrolyzed by dilute acids [18], thus it is very useful as a blocking agent , and

as used in this work for protecting of hydroxyl groups at C – 1, C – 2 , C – 5 and C – 6.

A number of procedures using different acid catalysts are available for the acetonation of D- glucose but, generally, they are time-consuming and require large quantities of reagents. These methods include the use of mineral acids such as sulphuric acid [19] and Lewis acids such as ferric chloride [20] and Zinc chloride as catalyst .

The 1,2 : 5,6 – di – O – isopropyliden – α – D – glucofuranose (I) is synthesized by using $ZnCl_2$ catalyst [15],as shown in scheme (1):



Scheme (1)

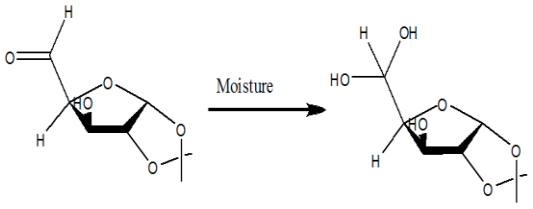
The Compound (I) is characterized by FT – IR spectrum which shows a strong band at(3431) cm^{-1} for (OH) group in C – 3; a strong band at(2985) cm^{-1} to 4(CH3) di–isopropylidene methyl groups; (C–H) bending for CH_2 and CH_3 groups appearance at (1458 and 1375) cm^{-1} and the acetal (C –O – C)shows the bands(1247–1070) cm^{-1} .The H^{-1} – NMR spectrum exhibits the signals in δ ppm. at: (1.229–1.374) (4S.,12H, isopropylidene protons); 2.10(S.,1H,OH group); 2.5 (S.,6H, protons of solvent DMSO); 3.382 (d.,2H, H–6);3.856 (t.,1H, H–3); 4.086 (t.;1H, H–4); 4.220(t.,1H, H– 5); 4.288 (t.,1H, H – 2); and 5.103 (d., 1H, H –1).

The 1,2 – O – isopropylidene – α – D – glucofuranose (II) is synthesized by using 65% GAA; an isopropylidene ring may be hydrolyzed in acidic media easily as mentioned in the introduction , as shown in scheme (1).

The FT – IR spectrum of compound (II) shows a broad band at (3487–3228)cm^{-1} for 3(OH) groups; and (2937)cm^{-1} for 2(CH3) isopropylidene methyl group and H^1 – NMR spectrum appearance the signals at (1.229–1.374) (2S., 6H, isopropylidene protons);and 2.004 (S., 3H, 3OH group).

1,2 – O – isopropylidene – α – D – Xylo –pentodialdo–1,4–furanose (III), is prepared by using $NaIO_4$. Glycols (compounds contain two vicinal (OH) groups oxidized by periodate, which cleaves the carbon–carbon (bearing OH groups) bond and formation of two compounds containing carbonyl groups [21], show that in scheme(1).

The FT–IR spectrum of (III) give (3442 –3388)cm^{-1} a broad band for 3(OH) groups shows that some of the prepared aldehyde may exist in the hydrate form [22], as shown below:



The band at (2794)cm^{-1} is due to (C–H) aldehydic, and the band at (1716) cm^{-1} is due to aldehydic carbonyl group. The H^{-1}–NMR spectrum (III), shows the signals at: 2.008 (S., 3H, 3OH group). The data from the FT – IR and H^{-1} – NMR spectra agree with the investigation about hydrate form of compound (III). The electronic (UV–Vis) spectrum displays an intense peak at λ max (DMSO) =302.0 nm; Abs.=2.386(DMSO) related to the (n→π*) and (π → π*) transitions of carbonyl group.

The final step in this work attempts to prepare the goal Schiff's bases derivatives (IV_{a-e}) derived from the prepared aldehydic derivative (III) with appropriate amino compounds in equimolar dissolved in absolute alcohol in the presence of drops of glacial acetic acid [23] .

Schiff base (IV_a) can be prepared from the reaction between compound (III) and 4 – amino antipyrine as shown in scheme(1).

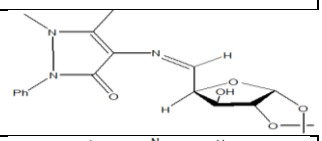
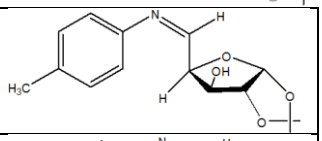
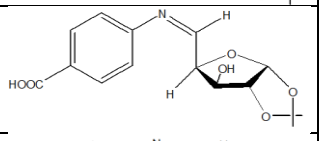
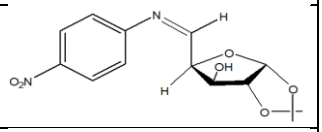
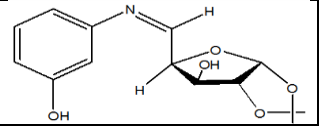
The FT – IR spectrum of (IV_a) disblay the bands at (3398)cm^{-1} for (OH)sugar group; (3064)cm^{-1} for (C – H) aromatic ring; (2929)cm^{-1} to aliphatic 4(CH_3) groups (2 for sugar moiety and 2 for antipyrine compound); 1737 cm^{-1} to (C=O) carbonyl group for cyclic acetamide; (1651)cm^{-1} for (C=N) (azomethane group); (1633)$cm^{-1}$for (C=C) vinylic of antipyrine, (1593)cm^{-1} for the (C=C) aromatic ring; and (758 + 698)cm^{-1} to (C–H) bending vibration for mono substituted aromatic ring.

The H^1–NMR spectrum of (IV_a) displays the signals at: 1.759 (S., 3H, =C– CH_3, methyl in antipyrine moiety); 2.377 (S., 3H, N – CH_3, methyl to anti pyrine moiety); [6.691–7.367] (multiplet, 5H, protons for benzene ring); and 7.478 (d., 1H, imine or azomethane group).

The (UV– Vis) spectrum of (IV_a), shows an intense peak at λ max (DMSO) = 278.0 nm; Abs. = 2.023 (DMSO) due to the electronic transition (n→π*) and (π – π*) for azomethane group.

Another series of Schiff 's Bases (IV_{b-e}) can be prepared from the reaction between the synthesis of aldehydic compound (III) with aromatic amines as follows in scheme (1). The goal of the new series of Schiff's bases (IV_{a-e}) synthesized are listed in Table 2.

Table (2): The Molecular and Structural Formula of Schiff's Bases (IV_{a-e})

Compound No.	Molecular formula	Structural formula
IVa	$C_{19}H_{23}N_3O_5$	
IVb	$C_{15}H_{19}NO_4$	
IVc	$C_{15}H_{17}NO_6$	
IVd	$C_{14}H_{16}N_2O_6$	
IVe	$C_{14}H_{17}NO_5$	

The FT – IR of these derivatives (IV_{a-e}) show the disappearance of (C=O) (aldehydic in 1716cm^{-1}) for compound (III) and formation the (C=N) at frequencies range between (1683 –

1600)cm^{-1}. These data are shown in Table 3 which display the (n→π*) and (π→π*) electronic transitions of the formed (C=N-) group in azomethane and imine moiety of the formed derivatives.

Table (3) The UV – Vis , and FT – IR Data for Compounds (IV_{b-e})

Comp.no,	R	λmax nm.	Abs.	υ(C=N) cm^{-1}	υ(C=C)cm^{-1} Aromatic	υ(C-H)cm^{-1} Aromatic	Other (υ) cm^{-1}
IV_b	4-CH_3	266.0	3.9	1683	1616;1516	3030	———
IV_c	4-COOH	296.0	0.807	1604	1523;1490	3059	$\frac{(OH);(C=O)Acid}{3377;1685}$
IV_d	4-NO_2	388.0	1.580	1600	1529;1481	3089	$\frac{N-O}{1506.1309}$
IV_e	3-OH	212.0	2.18	1624	1614;1508	3039	$\frac{OH}{3375}$

The H^1.NMR spectrum for (IV_b); R= 4-CH_3; exhibits the new signals in δppm. at: (7.155–6.953) (multiplete, 4H, benzene ring protons); 7.500 (d., 1H, to imine proton or azomethane group) and to (IV_d); R=4-NO_2; show the new signals at:7.602 (multiplet., 4H, aromatic protons); 8.195 (d.,1H, imine proton).

All of the prepared derivatives (Schiff's bases) are characterized by (C.H.N) micro elemental analysis and the obtained results show a very good agreement between the found and the calculated percentages. The elemental analysis of the obtained results are shown in Table 4.

Table (4) The C.H.N Data of the Prepared Derivative (IV_{a-e}), Schiff 's Bases.

Comp. No	Molecular Formula.	R	calculated			Found.		
			C%	H%	N%	C%	H%	N%
IV_a	$C_{19}H_{23}N_3O_5$	—	61.12	6.16	11.26	60.54	6.56	12.00
IV_b	$C_{15}H_{19}NO_4$	-CH_3	64.981	6.859	5.054	63.985	6.597	5.054
IV_C	$C_{15}H_{17}NO_6$	-COOH	58.631	5.537	4.560	57.934	5.506	4.231
IV_d	$C_{14}H_{16}N_2O_6$	-NO_2	54.545	5.194	9.0909	53.693	5.141	9.978
IV_e	$C_{14}H_{17}NO_5$	-OH	60.21	6.09	5.01	59.26	6.20	5.66

Biological Activity:-

Organic compounds that contain heterocyclic moiety can be considered as important classes of compound having a wide range of biological activity. The synthesized derivatives such as (III and IV_{a-e}) in this work are expected to possess a biological activity since they have an active moiety like Schiff 's base. When we use the antibiotics tested with concentration equal to that of the chemical tested, no inhibition of growth for any microorganism is noted so we have to use a concentration fraction of antibiotics (standard) higher than that of the tested chemicals to ensure inhibition.

In this work, the performance of antibacterial test has been achieved as in the disc diffusion method [24]. (III and IV_{a-e}) derivatives are assayed for their antimicrobial activity *in vitro* against two of each strain of negative and positive grams bacteria like (*Escherichia coli, pseudomonas aeroginosa, staphylococcus aureus, Bacillus subtilis*) and fungi like *candida*. The previous bacteria are activated in nutrient growth medium at 37^oC for 24 hour.

All the synthesized compounds (III and IV_{a-e}) are evaluated for their antimicrobial and anti fungi activities. The activity of compounds is determined by measuring the diameter

of the empty region around the well (Inhibition zone). The results show that most of the tested compounds possess a good antibacterial activity as listed in Table 5:

Table (5) Anti – Bacterial and Fungi Activity for some of the Synthesized Compounds.

Comp. No.	*E coli*	*pseudomonas*	*Staphylococcus aureus*	*Bacillus*	*candida*
Control.	—	—	—	—	—
III	10mm	12mm	10mm	16	—
IV_a	11	11	11	9	—
IV_b	—	14mm	16	—	10
IV_c	10	12	13	12	—
IV_d	11	9	11	10	—
IV_e	—	12	—	—	—

Key of symbols :-

Inactive = inhibition zone = 5mm
Slightly active = (6 – 9 mm)
Moderately active = (9 – 12 mm)
Highly active = (13 – 17 mm)

The results of bioactivity, obtained from the general lab. Biology Department, College of Science- University of Baghdad, show the following data :

1. Compound III shows the highest antimicrobial against *Bacillus* and moderately activity towards *(E.coli, pseudomonas, staphylococcus aureus).*
2. Compounds (IV_{a-d}) display the appearances of the moderately against *E. coli* bacteria, but the IV_e do not show any biological activity towards the same bacteria.
3. compound IV_b show a high activity toward the *Pseudomonas* and the others ($IV_{a,c,d,e}$) show moderately activity toward the same bacteria.
4. Compounds ($IV_{b, c}$) show the highest antimicrobial activity toward *staphylococcus* equal to (16+13) respectively, while the others ($IV_{a, d}$) show moderately activate, but the IV_e does not show any bioactive result to the same.
5. Compounds ($IV_{a, c, d}$) shows the moderately bioactivity against *Bacillus*, but ($IV_{b, e}$) do not show any activity toward the same bacteria.
6. Finally only compound (IV_b) shows moderate bioactive action to the fungi (*candida*), but the others prepareded in this work, do not show any bioactivity toward *candida*.

Conclusions:

1. In a previous study, a new series of Schiff bases containing sugar moiety is synthesized by the reaction of aldehyde prepared (III) and amino compound like 4-amino antipyrine and some of primary aromatic amino compounds in ethanol absolute.
2. The physical properties, spectral data, and C.H.N analysis give a good information of the suggested structures for the new goal compounds.
3. The antimicrobial activity of the prepared compounds (III and IV_{a-e}) is tested against four bacterial and one fungi strains.
4. The bioactivity shows differs inhibition zone depending upon the amino compounds that joined with the monosaccharide moiety.

References:

[1](a) Paulsen, H. 1966. *Angew. Chem., Int. Ed. Engl.*,5, 495.
(b) Legler, G.; and Jülich, E. 1984. *Carbohydr. Res.*, 128, 61.
(c) Niwa, T.; Tsuruoka, T.; Gori, H.; Kodama, Y.; Itoh, J.; Inoue, S.; Yamada, Y.Y.; Niida, T.; Nobe, M.; and Ogawa, Y.,1984. *J. Antibiot.*, 37:1579.

[2](a) Hellman, B.; Lernmark, A.; Sehlin, J.; Taljedal, I. B. and Whistler, R. L. 1973. *Biochem. Pharmacol*.,22, 29.
(b) Pitts, M. J.; Chmielewski, M.; Chen, M. S.; Abd El-Rahman, M. M. A.; and Whistler, R. L. 1975. *Arch. Biochem. Biophys.*,169, 384.
(c) Yuasa, H.; Izumi, M.; and Hashimoto, H. 2002. *Yuki Gosei Kagaku Kyokai Shi*., 60, 774.

[3](a) Hanaya, T.; and Yamamoto, H. 2003. *Trends in Heterocyclic Chemistry*, 9, 1.
(b)Yamamoto, H.; and Hanaya, T.,1990. *Studies in Natural Products Chemistry*, ed. by Atta- ur- Rahman; Elsevier: Amsterdam ,6, 351–384.
(c) Hanaya, T.; and Yamamoto, H. 1993. *Yuki Gosei KagakuKyokai Shi*.,51: 377.

[4]Tadashi, H.; Masahiro, K.; Masakazu, S.; Kazuo, M.; Keiko, T. and Hiroshi, Y. 2013. Synthesis of 2-aetamido- 2,5- dideoxy -5-phosphoryl- D-glucopyranose derivatives: New Phospha-Sugar Analogs of *N*-acetyl-D-Glucosamine. ©The Japan Institute of Heterocyc. Chem., 086 (2):1147-1165.

[5] Mohammed, M. M.; Bhuiyanl, M. M. H.; Dulal, C. D.; and Manchur, M. A. 2013. Synthesis and comparative antimicrobial studies of some acylated- D- glucofuranose and D-glucopyranose derivatives. Int. J. of Biosci. | IJB | 3(8):279-287.

[6] Dhar, D. N. and Taploo, C.L. 1982. Schiff bases and their applications, J. Sci. Ind. Res., 41:501-506.

[7]Selvana, A. Y. 2013. Synthesis of Substituted (Oxazepine, Diazepine, Tetrazde) via Schiff Bases for 2-Aminobenzo Thaizole Derivatives. J .Baghdad for Sci.,10(3):736 -748.

[8] Fathi, S. 2014. Novel Synthesis of Schiff bases Bearing Glucosamine Moiety Research, J. Chem. Sci. 4(2): 25-28.

[9]Kołodziej, B.; Grech, E.; Schilf, W.; Kamienski, B.; Makowski, M.; Rozwadowski, Z. and Dziembowska, T., 2007. Anomeric and tautomeric equilibria in d-2-glucosamine Schiff bases, J. Mol. Struct., 844: 32-37.

[10] Bedekar, A. N.; Naik, A. N. and Pise, A C. 2009. Schiff base derivatives of 2-amino-2-deoxy-1, 3, 4,6-tetra-O-acetyl-β-D-glucopyranose, Asian.J. Chem., 21(9): 6661–6666.

[11] Pérez, E.M.S.; Ávalos, M.; and Babiano, R., 2010. Schiff bases from d-glucosamine and aliphatic ketones, Carbohydrate Res., 345:23–32.

[12] Costamagna, J.; Lillo, L.E.; Matsuhiro, B.; Noseda, M.D.; and Villagrán, M., 2003. Ni(II) complexes with Schiff bases derived from aminosugars, Carbohydrate Res., 338(15): 1535–1542.

[13] Costamagna, J.; Barroso, N.P.; Matsuhiro, B.; and Villagrán, M. 1998. Copper(II) complexes with aminosugar derived Schiff bases as ligands , Inorganica Chimica Acta, 273(1-2):191–195.

[14] Helmoz, A.R.;[1] Julieta O. S.;[2] Roberto S. C.V.;[3] Oscar R. E.D.;[4] Maura S. Z.;[3] Elisiane H. F.;[3] and Líria R. C.;[3]. 2013.Synthesis and Antimicrobial Activity of Carbohydrate Based Schiff Bases: Importance of Sugar Moiety Int. J.Carbohy. Chem. Article ID 2013), 320892, 5.

[15] Gen, W. L.; Myers, G. S. and Grant, G. A., J. Chem. Soc., 1951. 2569.

[16] Urquiza, P. M., Martinez, D. M. and O'Dowd, T. S. 1968. Rev. Soc. Quim. Mex.,12 (2):58A.

[17] Mukhlis, A. J. A.; Sarhan, A. M. and Rumez, R. M. 2011. Ibn Al-Haithem Journal for pure & applied sciences SCI.,VOL. 24(1).

[18] Guthrie, R. D. 1974. Introduction to carbohydrate

chemistry, 4th Ed., clarendon press oxford, 25 – 26.
[19] Schmidt, O. T. 1963. Methods carbonhyd. Chem. 2:318.
[20] Singh, P. P.; Charia, M. M.; Dasgupta, F. and Srivastava, H. C. 1977. Tetrahedrone Lett., 5:439.
[21] Burckner, R. 2002. Advanced organic chemistry: Reaction, Mechanisms, Harcourt, Academic Press, pp.564.
[22] AL – Aboudi, M. J. 1998. 1, 3-Cycloaddition Reaction of L-Xylose Schiff Bases with Phenyl Azide. *M.Sc.* Thesis, University of Baghdad, College of Education-Ibn AL-Haitham, Chemistry Department.
[23] Smith, G. W.; Gardlung, G. R. and Cutis, R.T.; 1973. Mol. Cryst. Liq.,19, 327.
[24] Macfaddin, J. F. 2000. Biochemical test for identification of medical bacteria, William and Wilkins. Baltimor. USA, 3rd Ed., 175.

تحضير وتشخيص ودراسة الفعالية البايولوجية لبعض المشتقات الجديدة من قواعد شف المحتوية على مكونة السكريات الاحادية

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الخلاصة:

يتضمن البحث تحضير سلسلة جديدة من مشتقات قواعد شف لسكر (α-D-glucose) ولقد تم تشخيصها مع دراسة فعاليتها البايولوجية. مجاميع الهيدروكسيل على ذرات الكاربون (1,2&5,6) الموجودة على مكونة السكر تم تحويلها الى شكل الاسيتال من خلال التفاعل مع الاسيتون الجاف وحامض الفوسفوريك وكلوريد الخارصين اللامائي كعوامل مساعدة لإنتاج المشتق رقم (I). حلقة الاسيتال الخماسية للكاربون(5,6) تم تحليلها بأستخدام حامض الخليك الثلجي(65%) والتفاعل للناتج الجديد مع بيرأيودات الصوديوم تم إنجازه ليعطي مكونة الالديهايد والتي تم استخدامها لإنتاج سلسلة جديدة من قواعد شف من خلال التفاعل مع مركبات أمينية مختلفة ومنها 4-أمينو أنتي بايرين.

التراكيب الكيمائية المقترحة للمركبات المحضرة تم التثبت منها بأستخدام أطياف الأشعة فوق البنفسجية، الاشعة تحت الحمراء والرنين النووي المغناطيسي ألبروتوني (H-NMR)وتحليل العناصر(C.H.N). وأن معظم المركبات المحضرة أظهرت فعالية كمضادات للبكتريا.

الكلمات المفتاحية: تحضير، الفعالية البايولوجية، قواعد شف.