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Synthesis and antimicrobial evaluation of new derivatives of 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-substitutedphenyl) oxazolidin-2-ones

Omprakash Pendem, Dr. Naveen Kumar Podila*
*Department of Chemistry, Shri Jagdishprasad Jhabarmal Tibrewala University Jhunjhunu, Churu Road, Vidyanagari, Churela, Rajasthan 333001, India.**

Abstract: *A number of new derivatives of 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-substituted phenyl) oxazolidin-2-ones(**6a-I**) are prepared by the reaction of 2,3-Dichloroquinoxaline(**4**) with 5-(aminomethyl)-3-(3,4-substitutedphenyl)oxazolidin-2-ones (**5a-I**).The antibacterial and antifungal activity of all the new derivatives of 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-substituted phenyl) oxazolidin-2-ones were evaluated against some bacterial and fungal strains and showed promising results. The structures of the resulted compounds were identified and confirmed by elemental analysis and IR, Mass, ^{1}HNMR and ^{13}CNMR spectroscopies.*

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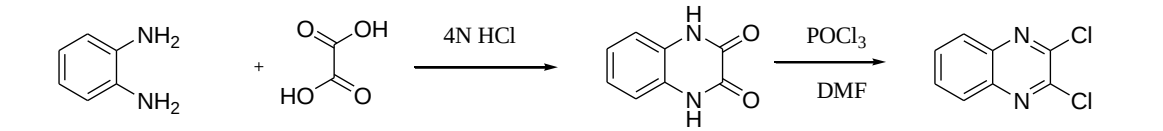
I. Introduction

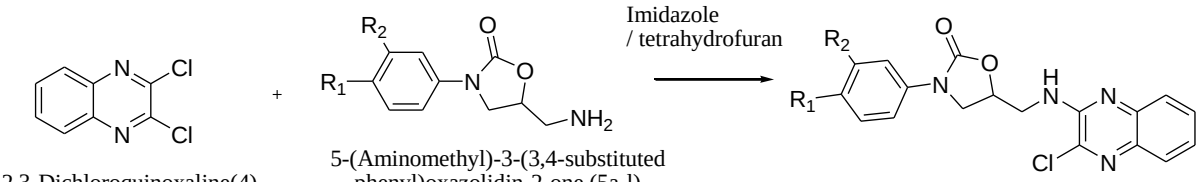
Quinoxaline and its derivatives are mostly found in bioactive natural and synthetic products, were found to have different applications in medicinal field as antimicrobial[1,2], antioxidant[3], anticancer[4,5],antihypertensive[6], anti-HIV[7], anticonvulsant[8], antitumor[9], and antiviral activities[10]. The oxazolidinones are a new class of antimicrobial agents which have a unique structure and good activity against gram-positive pathogenic bacteria. Oxazolidinones are a class of compounds containing 2-oxazolidine in the structure. The C-2 and C-4 positions of the oxazolidinone are crucial for their various biological activities. N-substituted oxazolidinones also participated in variety of intermolecular reactions. Certain natural and synthetic oxazolidinone derivatives possess important biological activities such as anticancer[11-13], antibacterial[14,15], antifungal[16], anticonvulsant[17], antiinflammatory[18,19], antituberculosis[20,21], cardiotonic[22], anti-HIV[23], antidiabetic[24] and anti angiogenic activity[25]. The present work aimed to synthesize and antimicrobial evaluation of new derivatives of 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-substitutedphenyl)oxazolidin-2-ones**.**

II. Results and discussion

Synthesis: New derivatives of 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-substitutedphenyl) oxazolidin-2-ones (**6a-l**) were synthesized from 1,2–diaminobenzene. 1,2-diaminobenzene(1) is treated with oxalic acid(2) followed by reaction with phosphorous oxychloride yields 2,3-dichloroquinoxaline(4). 2,3-Dichloroquinoxaline(4) is treated with 5-(aminomethyl)-3-(3,4-substitutedphenyl)oxazolidin-2-ones(5) gave the 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-substitutedphenyl) oxazolidin-2-ones (**6a-l**). The structures of final derivatives were confirmed by IR, ^{1}HNMR, ^{13}CNMR and Mass spectral analysis.



Benzene-1,2-diamine(1) Oxalalicacid(2) Quinoxaline-2,3(1*H*,4*H*)-dione(3) 2,3-Dichloroquinoxaline(4)



2,3-Dichloroquinoxaline(4) 5-(Aminomethyl)-3-(3,4-substituted phenyl)oxazolidin-2-one (5a-l)

5-((2-Chloroquinoxalin-3-ylamino) methyl)-3-(3,4-substitutedphenyl) oxazolidin-2-one(6a-l)

Table no 1:

Compound	R_1	R_2
6a	$-C_4H_8NO$	F
6b	$-C_4H_6NO_2$	F
6c	-Cl	-Cl
6d	$-OCH_3$	$-NO_2$
6e	$-CH_3$	$-CH_3$
6f	$-CH_3$	$-NO_2$
6g	-Br	$-CH_3$
6h	-OH	$-NO_2$
6i	-CN	$-CF_3$
6j	-F	-F
6k	$-OCH_3$	$-OCH_3$
6l	$-CH_3$	-Br

Antibacterial activity: The antibacterial activity of 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-substitutedphenyl) oxazolidin-2-ones (**6a-l**) was carried out by testing all the synthesized compounds against Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus and bacillus subtilis. Almost all the compounds showed promising activity that could be attributed to the presence of quinoxaline and is oxazolidin-2-one heterocyclic ring systems with their high potency. The compound **6a, 6e, 6h and 6l** shows high activity with all strains of bacteria. The remaining compounds were showed moderately to high activity.

Table no 2

S.No	Compound	R1	R2	B.subtilis	S.aureus	P.aeruginosa	E.coli
1	6a	$-C_4H_8NO$	F	17	16	14	18
2	6b	$-C_4H_6NO_2$	F	13	14	12	15
3	6c	-Cl	-Cl	14	13	16	17
4	6d	$-OCH_3$	$-NO_2$	12	14	15	16
5	6e	$-CH_3$	$-CH_3$	14	15	17	16
6	6f	$-CH_3$	$-NO_2$	12	16	10	16
7	6g	-Br	$-CH_3$	16	15	11	14
8	6h	-OH	$-NO_2$	18	17	15	19
9	6i	-CN	$-CF_3$	15	13	12	17
10	6j	-F	-F	16	14	13	18
11	6k	$-OCH_3$	$-OCH_3$	14	15	11	17
12	6l	$-CH_3$	-Br	17	16	18	20
12	Ampicillin			24	26	22	25

Key to symbols: - inactive (inhibition zone < 6 mm); slightly active = + (inhibition zone 7–9 mm); moderately active = + +(inhibition zone 10-13 mm); highly active = + + + (inhibition zone > 14 mm).

Antifungal activity. The antifungal activity of the synthesized compounds **6a-l** against Aspergillous niger and Candida albicans , using fluconazole as standard (Table-3). Compounds **6d, 6f, 6g** and **6l** were showed slightly active. The remaining compounds were moderately active against both strains.

Table no 3. Antifungal activity of the test compounds 6a-l

S.No	Compound	Aspergillus niger	Candida albicans
1	6a	10(++)	11(++)
2	6b	12(++)	11(++)
3	6c	11(++)	10(++)
4	6d	08(+)	09(+)
5	6e	11(++)	11(++)
6	6f	07(+)	09(+)
7	6g	09(+)	09(+)
8	6h	10(++)	11(++)
9	6i	11(++)	11(++)
10	6j	13(++)	11(++)
11	6k	17(+++)	15(+++)
12	6l	08(+)	08(+)
13	Fluconazole	22(+++)	19(+++)

Key to symbols: - inactive (inhibition zone < 6 mm); slightly active = + (inhibition zone 7–9 mm); moderately active = + + (inhibition zone 10-13 mm); highly active = + + + (inhibition zone > 14 mm).

III. Experimenta procedure

All the melting points are uncorrected. The purity was checked by thin layer chromatography with silica gel 60 GF254 E.Merck precoated plates (0.25 mm) was visualized using UV. 0.1 for flash chromatography on silica gel (particle size 100-200 mesh). and characterized by spectral studies. The IR spectra were recorded on shimadzu FTIR model 8010 spectrophotometer and are given in cm^{-1} in KBr. The ^{1}HNMR & ^{13}CNMRspectra were recorded on Bruker AM-400 NMR spectrometers in deuterated chloroform and deuterated DMSO. The chemical shifts are reported in δ (ppm) relative to tetramethylsilane as internal standard. Mass spectra analyses performed with an Agilent 6400 Series equipped with an electro spray ionization source (capillary voltage at 4000V, nebulizing gas temperature at 300 °C, nebulizing gas flow at 12 L/ min).

Synthesis of 1,4-Dihydroquinoxaline-2,3-dione(3):

A mixture of 1,2-diaminobenzene (1 mol), Oxalicacid(1 m.eq) and 4N HCl (4 vol) were added in flask at room temperature. Reaction was heated to 95-100^{0}C and stirred at this temperature for 4 hours. Progress of reaction was considered by using TLC. After completion of reaction, Reaction mixture cooled to room temperature. Stir the reaction mixture for 2 hours at 25-30^{o}C. Filtered the solid and washed with water, obtained off-white to ash color solid was obtained.

Yield : 71%, M.P : 300-302^{0}C , IR(cm^{-1}) :3160 (NH (tautomeric) stretching), 3047, 2966, 2880(aromatic C-H stretching), 1680 (C=O stretching) and 1612 (C=C stretching); ^{1}H-NMR (δ) : 6.93-6.95 (2H, dd, Ar-H), 7.12-7.14 (2H, dd, Ar-H), 9.43 (2H, s, -NH), ^{13}C-NMR: 118.6, 122.4, 127.3, 155.8.FAB Mass: m/z 163.04 (M +1), CHN Analysis : Found C(58.98%), H (3.75%), N (17.30%), Calc : C (59.26%), H (3.73%), N (17.28%)

Synthesis of 2, 3-Dichloro quinoxaline (4) :

Charge 1,4-dihydroquinoxaline-2,3-dione (1 mol) in round bottom flask. Add Phosphorus oxy chloride (3 vol) and DMF (1 vol) at room temperature. Stirred the reaction mixture at 25-30^{o}C for 4 hours, after completion of reaction, reaction mixture quenched in to ice and stir for 10 minutes. Filtered the solid and wash with water (2 Vol) and recrystalized in acetone- water.

Yield : 65%, M.P : 152-154^{0}C: IR(cm^{-1}) : 750 (C-Cl Streching), ^{1}H-NMR (δ) : 7.68-7.69 (2H,dd, Ar-H), 7.81-7.84 (2H,dd, Ar-H), ^{13}C-NMR : 128.3, 131.3, 138.8, 150.7. FAB Mass: m/z 198.98 (M+1), CHN Analysis : Found C(47.98%), H (2.13%), N (14.27) , Calc : C (48.28%), H (2.03%), N (14.07)

General procedure of 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-disubstituted phenyl) oxazolidin-2-ones 6(a-l) :

A mixture of 2.3-dichloro quinoxaline (4) (1.00 m.eq), 5-(aminomethyl)-3-(3,4-disubstitutedphenyl)oxazolidin-2-ones 5(a-l) (1.00 mol), Imidazole (1 mol) and THF as a solvent were added in flask at room temperature. RM heated to reflux for 18-24 hours. Progress of reaction was considered by using TLC. After completion of reaction RM cool to RT and stir for 30 minutes. Add H_2O (5 vol) and ethylacetate (5 vol) at RT and stir for 10 minutes, separated organic layer and distill off organic layer and purified with Hexane. Yield : 54-58%

Compound -6a; 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3-fluoro-4-morpholinophenyl) oxazolidin-2-one:

Yield : 54%, M.P :240-242^{0}C , IR(cm^{-1}) : 760, 3210, 1680: ^{1}H-NMR (δ) : 3.16-3.7(6H, m, -CH_2 & morpholine-CH_2), 3.73-3.94 (6H,m,oxazolidinone-CH_2 & morpholine-CH_2), 5.25-5.30(1H, m, oxazolidinone-CH), 6.79-6.83(2H, m, -Ar-H), 7.52(1H, s, Ar-H), 7.66-7.70(2H,dd,-Ar-H), 7.81-7.70(2H,dd,-Ar-H), 9.13(1H,s,-NH). ^{13}C-NMR(δ) : 47.0, 48.2, 54.0, 66.4, 85.3, 110.8, 116.2, 126.1, 126.8, 127.1, 128.8, 130.3, 132.7, 133.2, 135.4, 142.3, 152.8, 155.4, 163.2. FAB Mass: m/z 458.13(M + 1), CHN Analysis : Found C(56.93%), H (4.72%), N (15.65%), Calc : C (57.71%), H (4.62%), N (15.30%)

Compound II-6b; 4-(4-(5-(((2-chloroquinoxalin-3-yl)amino)methyl)-2-oxooxazolidin-3-yl)-2-fiuorophenyl)morpholin-3-one:

Yield : 51%, M.P :185-187^{o}C, IR(cm-^{1}): 3345, 1725(C=O), 1650(N-C=O); ^{1}H-NMR (δ) : 3.183.21(1H, q, -NH-CH_2), 3.24-3.28(1H, q, -NH-CH_2), 3.49-3.52(4H,m,morpholin-3-one-CH_2), 3.72-3.97(2H, m, oxazolidinone-CH_2), 4.31(2H, s, morpholine-3-one-CH_2), 5.21-5.24(1H, m, oxazolidinone-CH), 7.21-7.23(1H, d, Ar-H), 7.36-7.39(1H, d, Ar-H), 7.64-7.70(2H, m, Ar-H), 7.82-7.90(3H, m, Ar-H), 9.21(1H, s, NH). ^{13}C-NMR : 46.8, 48.2, 55.2, 66.2, 73.8, 84.1, 110.6, 123.6, 123.8, 125.7, 125.9, 126.7, 127.1, 128.8, 133.2, 135.1, 136.4, 141.7, 153.1, 162.5, 163.5, 164.9. FAB Mass: m/z 472.11(M+1), CHN Analysis : Found C(55.96%), H (4.05%), N (14.86%), Calc : C (56.00%), H (4.06%), N (14.84%).

Compound II-6c: 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-dichlorophenyl) oxazolidin-2-one

Yield : 62%, M.P : 153-155^{0}C, IR(cm^{-1}): 3338, 1660(N-C=O), 770 (C-Cl); ^{1}H-NMR (δ) : 3.18-3.22(1H,m,-CH_2), 3.42-3.45(1H,m,-CH_2), 3.76-3.78(1H,m,oxazolidinone-CH_2), 3.75-3.81(1H,m,oxazolidinone-CH_2), 5.25-5.27(1H,m,oxazolidinone-CH), 7.52-7.53(1H,d,-Ar-H), 7.64-7.67(3H,m,-Ar-H), 7.82-7.85(3H,m,-Ar-H), 8.29(1H,s,-NH). ^{13}C-NMR : 47.1, 48.9, 84.8, 123.6, 123.5, 125.2, 125.7, 126.3, 128.2, 128.5, 129.1, 131.3, 133.4, 135.5, 138.8, 141.7, 153.1, 162.5. FAB Mass: m/z 422.01(M+1); CHN Analysis : Found C(51.00%), H (3.09%), N (13.24%). Calc : C (51.03%), H (3.09%), N (13.22%).

Compound II-6d: 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(4-methoxy-3-nitrophenyl) oxazolidin-2-one

Yield : 52%, M.P :^{0}C:148-150^{o}C, IR : 765, 3250, 1680, 1650; ^{1}H-NMR (δ) : 3.15-3.18(1H,m,-CH_2), 3.4-3.45(1H,m,-CH_2), 3.73-3.78(1H,m,-CH_2), 3.98-4.02(4H,m,-CH_2 & -OCH_3), 5.24-5.30(1H,m,oxazolidinone-CH), 7.34(1H,d,-Ar-H), 7.64-7.69(2H,m,-Ar-H), 7.8-7.86(2H,m,-Ar-H), 8.25-8.3(1H,s,-NH), 8.32-8.34(1H,d,-Ar-H), 8.59(1H,s,-Ar-H). ^{13}C-NMR : 47.1, 48.7, 54.5, 84.9, 115.3, 115.4, 125.8, 125.10, 126.5, 128.9, 128.9, 132.5, 133.6, 135.3, 135.7, 141.3, 148.3, 153.1, 162.4; FAB Mass: m/z 430.08(M$^+$); CHN Analysis : Found C(52.86%), H (3.78%), N (16.49%). Calc : C (53.09%), H (3.75%), N (16.29%).

Compound II-6e : 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-dimethylphenyl) oxazolidin-2-one

Yield : 59%, M.P :152-153^{0}C, IR(cm-1) : 3353, 1645; ^{1}H-NMR (δ) : 2.20-2.22(6H,d,-CH_3), 3.17-3.22(1H,m,-CH_2), 3.42-3.46(1H,m,-CH_2), 3.72.3.78(1H,m,oxazolidinone-CH_2), 3.93-3.98(1H,m,oxazolidinone-CH_2), 5.23(1H,m,oxazolidinone-CH), 7.12-7.14(1H,d,-Ar-H), 7.32-7.35(1H,d,-Ar-H), 7.88-7.90(2H,m,-Ar-H), 7.92-7.96(2H,m,-Ar-H), 8.37(1H,s,-NH). ^{13}C-NMR : 18.8, 18.8, 47.1, 48.3, 84.8, 120.2, 121.3, 125.6, 125.9, 128.4, 129.2, 130.7, 132.5, 133.6, 135.1, 135.3, 136.1, 141.8, 153.4, 162.5. FAB Mass: m/z 383.12(M+1), CHN Analysis : Found C(62.75%), H (4.99%), N (14.61%). Calc : C (62.75%), H (5.00%), N (14.63%).

Compound II-6f: 5-(((2-Chloroquinoxalin-3-yl)amino)methyl)-3-(4-methyl-3-nitrophenyl) oxazolidin-2-one

Yield : 52%, M.P :230-232^{0}C, IR(cm^{-1}) : 1357, 1536 (N-O Streching), 1662(C=O stretching) ^{1}H-NMR (δ) :2.55(3H,s,-CH_3), 2.58-2.62(1H,m,-CH_2), 3.41-3.46(1H,m,-CH_2), 3.78-3.83(1H,m,oxazolidinone-CH_2), 3.88-3.93(1H,m,oxazolidinone-CH_2), 5.25-5.29(1H,m, oxazolidinone-CH), 7.71-7.74(3H,m,-Ar-H), 7.75-7.7(3H,m,-Ar-H), 8.28(1H,s,-NH), 8.52(1H,s,-Ar-H). ^{13}C-NMR : 18.8, 47.1, 48.8, 84.8, 114.2, 125.7, 125.8, 126.4, 128.4, 129.2, 130.2, 133.6, 135.2, 137.1, 139.9, 141.2, 149.4, 153.2, 162.5. FAB Mass: m/z 414.09(M+1) CHN Analysis : Found C(55.23%), H (3.90%), N (16.84%), Calc : C (55.15%), H (3.90%), N (16.92%).

Compound II-6g: 3-(4-Bromo-3-methylphenyl)-5-(((2-chloroquinoxalin-3-yl)amino)methyl) oxazolidin-2-one

Yield : 54%, M.P :166-168^{0}C, IR(cm^{-1}) : 3325(-NH stretching),1650(C=O stretching),690(C-Br stretching), ^{1}H-NMR (δ) : 2.19(3H,s,-CH_3), 3.10-3.15(1H,m,-CH_2), 3.2-3.27(1H,m,-CH_2), 3.69-3.73(1H,m,oxazolidinone-CH_2), 3.94-3.99(1H,m,oxazolidinone-CH_2), 5.25-5.9(1H,m, oxazolidinone-CH), 7.58-7.62(2H,tm-Ar-H), 7.68-7.72(2H,m,-Ar-H), 7.82-7.85(2H,m,-Ar-H), 8.26(1H,s,-NH), 8.44-8.49(1H,d,-Ar-H).^{13}C-NMR : 23.4, 47.1, 48.5, 84.8, 120.4, 123.6, 125.7, 125.8, 126.7, 128.2, 131.4, 133.6, 133.7, 135.3, 138.2, 138.4, 141.5, 153.2, 162.5. FAB Mass: m/z 447.01(M$^+$) CHN Analysis : Found C(51.02%), H (3.61%), N (12.49% Calc : C (50.97%), H (3.60%), N (12.51%),

Compound II-6h: 5-(((2-Chloroquinoxalin-3-yl)amino)methyl)-3-(4-hydroxy-3-nitrophenyl) oxazolidin-2-one

Yield : 56%, M.P :171-173^{0}C, IR(cm^{-1}): 3540 (O-H), 1498(N-O asymmetric stretching), 1321(N-O symmetric stretching), 1654 (C=O stretching);^{1}H-NMR (δ) : 3.18-3.22(1H,m,-CH_2), 3.39-3.43(1H,m,-CH_2), 3.68-3.69(1H,m,oxazolidinone-CH_2), 3.92-3.95(1H,m,oxazolidinone-CH_2), 5.25-5.31(1H,m,oxazolidinone-CH), 7.18-7.2(1H,d,-Ar-H), 7.61-7.66(2H,m,-Ar-H), 7.85-7.9(2H,m,-Ar-H), 8.2-8.24(1H,d,-Ar-H), 8.26(1H,s,-NH), 8.39(1H,s,-Ar-H),14.41(1H,s,-OH). ^{13}C-NMR : 47.1, 48.3, 84.8, 115.6, 119.3, 125.2, 125.1, 126.7, 128.4, 129.1, 132.5, 133.2, 135.5, 135.8, 141.1, 148.9, 153.7, 162.5. FAB Mass: m/z 416.07(M^+) CHN Analysis : Found C(52.12%), H (3.40%), N (16.72%), O(19.22%), Calc : C (52.00%), H (3.39%), N (16.84%), O (19.24%),

Compound II-6i: 4-(5-(((2-Chloroquinoxalin-3-yl)amino)methyl)-2-oxooxazolidin-3-yl)-2-(trifluoromethyl)benzonitrile

Yield : 55%, M.P : 114-117^{0}C, IR (cm-1): 3353, 2248 (CN Streching), 958 (C-F Sreching), ^{1}H-NMR (δ) : 3.18-3.22(1H,m,-CH_2), 3.3-3.35(1H,m,-CH_2), 3.71-3.76(1H,m,oxazolidine-CH_2), 3.92-3.96(1H,m,oxazolidine-CH_2), 5.25-5.27(1H,m, oxazolidine-CH), 7.64-7.68(3H,m,-Ar-H), 7.81-7.84(3H,m,-Ar-H), 8.23-8.24(2H,d,-Ar-H & -NH);^{13}C-NMR : 47.1, 48.3, 84.8, 105.2, 115.1, 118.2, 119.8, 125.2, 125.6, 125.8, 126.6, 128.7, 132.5, 133.6, 134.6, 135.3, 141.4, 143.3, 153.1, 162.5.FAB Mass: m/z 447.07(M^+)CHN Analysis : Found C(53.71%), H (2.94%), N (15.66%). Calc : C (53.64%), H (2.93%), N (15.64%).

Compound II-6j: 5-(((2-Chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-difluorophenyl) oxazolidin-2-one

Yield : 58%, M.P :256-258^{0}C, IR(cm^{-1}): 3346, 1668, 1000(C-F Streching); ^{1}H-NMR (δ) : 3.16-3.18(1H,m,-CH_2), 3.42-3.47(1H,m,-CH_2), 3.75-3.89(1H,m,oxazolidine-CH_2), 3.99-4.03(1H,m,oxazolidine-CH_2), 5.26-5.31(1H,m,oxazolidine-CH), 7.42-70.46(1H,d,-Ar-H), 7.57-7.79(6H,m,-Ar-H), 8.21(1H,s,-NH).^{13}C-NMR : 47.1, 48.6, 84.8, 110.4, 111.9, 118.6, 125.2, 125.5, 126.7, 128.2, 133.5, 135.1, 136.4, 141.7, 145.2, 147.3, 153.2, 162.4.FAB Mass: m/z 391.7(M^+)CHN Analysis : Found C(55.35%), H (3.34%), N (14.35%). Calc : C (55.53%), H (3.35%), N (14.34%).

Compound II-6k: 5-(((2-chloroquinoxalin-3-yl)amino)methyl)-3-(3,4-dimethoxyphenyl) oxazolidin-2-one

Yield : 53%, M.P :223-225^{0}C, IR(cm^{-1}):3342, 1673, 1020(C-O sretching); ^{1}H-NMR (δ) : 3.19-3.23(1H,m,-CH_2), 3.42-3.46(1H,m,-CH_2), 3.69-3.71(4H,m,oxazolidine-CH_2 & -OCH_3), 3.73(3H,s,-OCH_3), 3.97-4.02(1H,m,oxazolidine-CH_2), 5.25-5.9(1H,m,oxazolidine-CH), 6.81-6.83(1H,d,-Ar-H), 7.31(1H,s,-Ar-H), 7.62-7.65(3H,m,-Ar-H), 7.82-7.86(2H,m,-Ar-H), 8.45(1H,s,-NH). ^{13}C-NMR : 47.1, 48.3, 56.2, 56.2, 84.8, 109.6, 112.4, 114.2, 125.4, 125.8, 126.3, 128.7, 132.4, 133.5, 135.3, 141.6, 145.2, 150.1, 153.3.162.5. FAB Mass: m/z 414.11(M^+) CHN Analysis : Found C(57.88%), H (4.67%), N (13.48%), Calc : C (57.91%), H (4.62%), N (13.51%),

Compound II-6l: 3-(3-bromo-4-methylphenyl)-5-(((2-chloroquinoxalin-3-yl)amino)methyl)oxazolidin-2-one

Yield : 65%, M.P :182-184^{0}C, IR(cm^{-1}):3362, 1657, 860(C-Br); ^{1}H-NMR (δ) : 2.35(3H,s,-CH_3), 3.17-3.22(1H,m,-CH_2), 3.6-3.65(1H,m,-CH_2), 3.81-3.87(1H,m,CH_2), 3.94-3.99(1H,m,-CH_2), 5.25-5.29(1H,m,oxazolidine-CH), 7.25-7.27(1H,d,-Ar-H), 7.29-7.32(1H,d,-Ar-H), 7.70-7.75(2H,m,-Ar-H), 7.81-7.86(2H,m,-Ar-H), 8.24(1H,s,-NH).^{13}C-NMR : 23.6, 47.1, 48.3, 84.8, 120.3, 124.4, 125.3, 125.8, 126.5, 128.9, 131.2, 132.5, 133.1, 133.6, 135.3, 138.5, 141.5, 153.2, 162.5. FAB Mass: m/z 447.01(M^+), CHN Analysis : Found C(50.97%), H (3.60%), N (12.52%), O(7.14%), Cl (7.93%), Br(17.84%), Calc : C (50.97%), H (3.60%), N (12.51%), O (7.15%), Cl (7.92%), Br (17.85%)

Antibacterial Activity: The antibacterial activity was assayed by agar plate disc diffusion method [26] at the concentration of 50 µg per disk. All the synthesized compounds were tested in vitro for their antibacterial activity against microorganisms such as Staphylococcus aureus, Bacillus subtilis (gram positive), Escherichia coli, and Pseudomonas aerugenosa (gram negative) strains. Each test compounds were dissolved in dimethylsulfoxide (DMSO) to get a concentration of 100 µg/ml. The disc (6 mm in diameter) was impregnated with 5 µL of each test solution to get 50 µg/disc, air dried and placed on the agar medium, previously seeded with 0.2 ml of broth culture of each organism for 18 hours. The plates were incubated at 37 °C for 24 hours and the inhibition zones measured in mm. Discs impregnated with DMSO were used as a control and ampicillin discs as antibacterial reference standard.

Antifungal activity: The antifungal activity[27] was assayed by the Sabouraud dextrose agar media plate disc diffusion method at a concentration of 50 µg per disk. All the synthesized compounds were tested in vitro for their antifungal activity against microorganisms such as Aspergillus niger and Candida albicans. Each test compound was dissolved in dimethylsulfoxide (DMSO) to get a concentration of 10 mg/ml. The disc (6 mm in diameter) was impregnated with 5 µL of each test solution to get 50 µg/disc, air dried and placed on the Sabouraud dextrose agar media, previously seeded with 0.2 ml of broth culture of each organism for 18 hours. The plates were incubated at 22 °C for 48 hours and the inhibition zones measured in mm. Discs impregnated with DMSO were used as a negative control and fluconazole discs as antifungal reference standard.

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