SYNTHESIS AND ANTIBACTERIAL ACTIVITY OF ISOXAZOLYL AZETIDIN-2-ONES AND THIAZOLIDIN-4-ONES

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ABSTRACT
A series of novel isoxazolyl azetidin-2-ones, 4a-h and thiazolidin-4-ones, 5a-h were synthesized from (E)-3-(methylimino)-N-(5-methylisoxazol-3-yl)butanamides, 3a-h. The four-membered β-lactam ring was built by adding chloroacetyl chloride to butanamides, 3a-h in the presence of triethylamine to give 4a-h. Cyclocondensation of mercapto acetic acid with, 3a-h in presence of anhydrous ZnCl₂ resulted in the formation of thiazolidin-4-ones, 5a-h. The newly synthesized compounds, 4a-h and 5a-h were confirmed using IR, ¹HNMR, ¹³CNMR and mass spectral data and were evaluated for in vitro antibacterial activity. From the results, it is evident that the compounds 4d and 5d are showing exceptional antibacterial activity. In silico ADME studies were performed and the results highlighted the designed compounds are safe to be considered as drug like molecules.

Keywords: isoxazolyl thiazolidin-4-ones, isoxazolyl azetidin-2-ones, Schiff’s bases, antibacterial activity.

INTRODUCTION
Medicinal chemists have paid much attention for the synthesis of heterocyclic compounds like isoxazoles, thiazolidinones and azetidin-2-ones, mainly due to their broad spectrum of biological activities. Amino isoxazole derivatives constitute an important class of heterocycles that possesses anticancer¹, antibacterial², anticonvulsant³, analgesic⁴, and antifungal activity⁵. Thiazolidin-4-ones is a key pharmacophore in medicinal chemistry and is responsible for broad range of biological activities including antimicrobial⁶,⁷, antioxidant⁸, anti-inflammatory⁹, analgesic¹⁰, antitumor¹¹, anticonvulsant¹² and antitubercular¹³, on the other hand, it is evident from the literature survey, that the 2-azetidinones are also associated with various pharmacological activities. 3-chloro monocyclic β-lactams derivatives having substitutions at 1 and 4 positions displayed antimicrobial¹⁴,¹⁵, anti-inflammatory¹⁶, antitubercular¹⁷ and antitumor¹⁸ activities. In view of the broad pharmacological activities of the isoxazoles, thiazolidin-4-ones and azetidin-2-ones, we envisioned the synthesis of hybrids of isoxazoles with thiazolidin-4-ones and azetidin-2-ones. Our quest in search of new biologically active molecules²⁰,²² herein we report the synthesis and antibacterial activity of isoxazolyl azetidin-2-ones and thiazolidin-4-ones.

EXPERIMENTAL
Materials and Methods
Cintex melting point apparatus was used to record the melting points and are uncorrected. Merck precoated 60F 254 silica gel plates were used for TLC analysis and visualized under U.V. Light. IR Spectra (Kbr Pellet) was recorded on a Perkin-Elmer BX series FT-IR Spectrometer. Proton and Carbon NMR spectra were recorded on a Brucker spectrometer (300 and 75 MHz, respectively) in the dueterated...
The cultures were diluted with 0.9% saline and the final volume was made with concentration approximately 105–106 CFU/mL. The synthesized compounds were dissolved in DMSO. For agar disc diffusion method, Luria Bertani media was prepared, autoclaved and poured into sterilized Petri plates and then plates were spread separately with both two Gram positives and two Gram-negative bacterial strains. The synthesized compounds were added to the disc and plates were incubated at 37°C for 24 h. Inhibition Zones were measured (mm) and all experiments were repeated 3 times.

**ADME Profiling**
In our present study, the ADME properties of the synthesized compounds (4a-h and 5a-h) were determined by using Chemsketch ACD/I-Lab Version 8.0 software and results are summarized in Table-2.

**RESULTS AND DISCUSSION**
Synthesis of title compounds, 4a-h and 5a-h were accomplished as depicted in Scheme-1. Synthesis of isoxazolyl Schiff’s bases 3a-h was achieved by condensation of N-(5-methylisoxazol-3-yl)-3-
oxobutanamide with different primary amines, 2a-h. These Schiff’s base derivatives, 3a-h underwent smooth cycloaddition reaction with chloroacetyl chloride in presence of triethyl amine to give 4a-h. Isoxazolyl thiazolidin-4-ones were obtained by the cyclocondensation of 3a-h with mercapto acetic acid in the presence of anhy. ZnCl₂ in 1,4-dioxane.

The synthesized compounds, 4a-h and 5a-h were confirmed by using IR, ¹H NMR, ¹³C NMR and Mass spectral data. Spectral data of all the synthesized compounds are in full agreement with proposed structures. The formation of compounds, 4a-h was confirmed by newly observed ¹H NMR signal at δ 5.20 ppm and it is due to β-lactam -CHCl proton. ¹³C NMR of compound 4a displayed -CHCl & -NCO carbon signals at δ 40.2 ppm and δ 168.3 ppm respectively. The observed signal at δ 3.82 ppm as a singlet in ¹H NMR of compound 5a confirms the -SCH₂- of thiazolidine ring and ¹³C NMR of compound 5a displayed peaks at δ 33.0 ppm and 170.0 ppm respectively due to the carbon of -SCH₂ and CO of the thiazolidine ring.

**Spectroscopic Data for the Derivatives 4(a-h) and 5(a-h)**

2-(3-Chloro-1,2-dimethyl-4-oxazetidin-2-yl)-(5-methylisoxazol-3-yl)acetamide (4a)

Yield (79%) M.P. 160-162°C M.F. C₁₁H₁₄N₂O₂Cl Elemental Analysis: Calculated C, 48.63; H, 5.19; N, 15.47; Found C, 48.65; H, 5.18; Cl, N, 15.46. IR (KBr): 3225, 1712, 1672 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.61 (s, 3H, Aze-CH₃), 2.31 (s, 3H, isoxazole-CH₃), 3.02 (s, 3H, N-CH₃), 3.61 (s, 2H, CH₂), 5.21 (s, 1H, -CHCl), 6.21 (s, 1H, isoxazole-H), 9.31 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.1, 20.1, 39.2, 58.5, 66.3, 95.3, 124.3, 128.2, 129.0, 138.3, 159.2, 169.0, 169.9, 171.2; ESI-MS: m/z 286 [M + H]+.

2-(3-Chloro-1-ethyl-2-methyl-4-oxazetidin-2-yl)-(5-methylisoxazol-3-yl)acetamide (4b)

Yield (75%) M.P. 168-169°C M.F. C₁₂H₁₈ClN₂O₂ Elemental Analysis: Calculated C, 50.44; H, 5.64; N, 14.71; Found C, 50.47; H, 5.62; N, 14.69. IR (KBr): 3251, 1708, 1662 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.20 (t, J = 7.2 Hz, 3H, N-CH₂-CH₃), 1.60 (t, 3H, Aze-CH₃), 2.28 (s, 3H, isoxazole-CH₃), 3.22 (q, J = 7.2 Hz, 2H, N-CH₂-CH₃), 3.50 (s, 2H, CH₂), 5.22 (s, 1H, -CHCl), 6.31 (s, 1H, isoxazole-H), 9.21 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.0, 12.2, 20.4, 40.9, 42.1, 58.9, 66.1, 95.1, 158.0, 169.0, 169.9, 171.2; ESI-MS: m/z 286 [M + H]+.

2-(3-Chloro-2-methyl-4-oxo-1-phenylazetidin-2-yl)-(5-methylisoxazol-3-yl)acetamide (4c)

Yield (76%) M.P. 178-179°C M.F. C₁₂H₁₄ClN₂O₂ Elemental Analysis: Calculated C, 57.58; H, 4.83; N, 12.59; Found C, 57.57; H, 4.81; N, 12.58 IR (KBr): 3265, 1718, 1675 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.56 (s, 3H, Aze-CH₃), 2.31 (s, 3H, isoxazole-CH₃), 3.61 (s, 2H, CH₂), 5.30 (s, 1H, -CHCl), 6.29 (s, 1H, isoxazole-H), 7.18 (m, 2H, Ar-H), (m, 3H, Ar-H), 9.41 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.0, 20.9, 41.0, 59.0, 66.8, 95.0, 122.1, 122.3, 125.2, 130.0, 130.1, 142.3, 158.6, 168.8, 170.0, 171.1; ESI-MS: m/z 334 [M + H]+.

2-(3-Chloro-1-Chloro-2-methyl-4-oxo-azetidin-2-yl)-(5-methylisoxazol-3-yl) acetamide (4d)

Yield (80%) M.P. 184-186°C; M.F. C₁₂H₁₄Cl₂N₂O₂ Elemental Analysis: Calculated C, 52.19; H, 4.11; N, 11.41; Found C, 52.21; H, 4.10; N, 11.40. IR (KBr): 3230, 1720, 1681 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.58 (s, 3H, Aze-CH₃), 2.34 (s, 3H, isoxazole-CH₃), 3.58 (s, 2H, CH₂), 5.29 (s, 1H, -CHCl), 6.20 (s, 1H, isoxazole-H), 7.21 (d, J = 8.0 Hz, 2H, Ar-H), 7.51 (d, J = 8.0 Hz, 2H, Ar-H), 9.15 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.2, 21.1, 39.2, 58.5, 66.3, 95.3, 124.3, 128.2, 129.0, 138.3, 159.2, 168.9, 170.0, 171.3; ESI-MS: m/z 368 [M + H]+.

**Chloro-1-(4-methoxyphenyl)-2-methyl-4-oxazetidin-2-yl)-(5-methylisoxazol-3-yl) acetamide (4e)**

Yield (79%) M.P. 190-191°C; M.F. C₁₇H₁₅ClN₂O₂ Elemental Analysis: Calculated C, 56.13; H, 4.99; N, 11.55; Found C, 56.12; H, 4.98; N, 11.56. IR (KBr): 3281, 1721, 1679 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.59 (s, 3H, Aze-CH₃), 2.32 (s, 3H, isoxazole-CH₃), 3.52 (s, 2H, CH₂), 3.79 (s, 3H, OCH₃), 5.19 (s, 1H, -CHCl), 6.30 (s, 1H, isoxazole-H), 9.69 (d, J = 8.0 Hz, 2H, Ar-H), 7.18 (d, J = 8.0 Hz, 2H, Ar-H),
2-(1-Benzyl-3-chloro-2-methyl-4-oxoazetidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (4f)

Yield (75%) M.P. 199-201°C; M.F. C_17H_{17}ClN_2O_3; Elemental Analysis: Calculated C, 58.71; H, 5.22; N, 12.08; Found C, 58.70; H, 5.23; N, 12.10. IR (KBr): 3282, 1728, 1669 cm⁻¹; ¹HNM R (300 MHz, CDCl_3 δ ppm): 1.52 (s, 3H, Aze-CH₃), 2.30 (s, 3H, isoxazole-CH₃), 3.49 (s, 2H, CH₂), 4.51 (s, 2H, Ph-CH₂), 5.18 (s, 1H, -CHCL), 6.22 (s, 1H, isoxazole-H), 7.11-7.30 (m, 5H, Ar-H), 9.81 (s, 1H, NH); ¹³CNMR (75 MHz, CDCl_3 δ ppm): 12.1, 22.0, 40.1, 46.2, 58.7, 66.9, 95.1, 126.0, 127.0, 127.1, 127.9, 128.0, 134.0, 158.1, 169.0, 171.0, 171.2; ESI-MS: m/z 348 [M + H]^+.

2-(1-(4-Chlorobenzyl)-3-chloro-2-methyl-4-oxoazetidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (4g)

Yield (78%) M.P. 207-209°C; M.F. C_17H_{17}ClN_2O_3; Elemental Analysis: Calculated C, 53.42; H, 4.48; N, 10.99; Found C, 53.45; H, 4.50; N, 10.98. IR (KBr): 3243, 1722, 1659 cm⁻¹; ¹HNM R (300 MHz, CDCl_3 δ ppm): 1.55 (s, 3H, Aze-CH₃), 2.29 (s, 3H, isoxazole-CH₃), 3.52 (s, 2H, CH₂), 4.50 (s, 2H, Ph-CH₂), 5.09 (s, 1H, -CHCL), 6.28 (s, 1H, isoxazole-H), 7.20 (d, J = 8.0 Hz, 2H, Ar-H), 7.30 (d, J = 8.0 Hz, 2H, Ar-H), 9.38 (s, 1H, NH); ¹³CNMR (75 MHz, CDCl_3 δ ppm): 12.2, 22.2, 41.0, 48.3, 57.9, 67.0, 95.2, 129.8, 131.0, 133.0, 135.1, 158.7, 169.0, 170.2, 171.2; ESI-MS: m/z 382 [M + H]^+.

2-(1-(4-Methoxybenzyl)-3-chloro-2-methyl-4-oxoazetidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (4h)

Yield (76%) M.P. 215-216°C; M.F. C_18H_{20}ClN_2O_4; Elemental Analysis: Calculated C, 57.22; H, 5.34; N, 11.12; Found C, 57.24; H, 5.36; N, 11.13. IR (KBr): 3298, 1712, 1680 cm⁻¹; ¹HNM R (300 MHz, CDCl_3 δ ppm): 1.56 (s, 3H, Aze-CH₃), 2.29 (s, 3H, isoxazole-CH₃), 3.52 (s, 2H, CH₂), 3.80 (s, 2H, OCH₃), 4.50 (s, 2H, Ph-CH₂), 5.09 (s, 1H, -CHCL), 6.28 (s, 1H, isoxazole-H), 6.78 (d, J = 8.0 Hz, 2H, Ar-H), 7.09 (d, J = 8.0 Hz, 2H, Ar-H), 9.38 (s, 1H, NH); ¹³CNMR (75 MHz, CDCl_3 δ ppm): 12.2, 23.0, 40.7, 48.7, 56.9, 57.9, 67.0, 95.2, 129.8, 131.0, 133.0, 135.1, 158.7, 169.0, 170.2, 171.2; ESI-MS: m/z 378 [M + H]^+.

2-(2,3-Dimethyl-4-oxothiazolidin-2-yl)-N-(5-methylisoxazol-3-yl)acetamide (5a)

Yield (71%) M.P. 91-93°C; M.F. C_{17}H_{17}ClN_2O_3; Elemental Analysis: Calculated C, 49.06; H, 5.61; N, 15.60; Found C, 49.09; H, 5.62; N, 15.62. IR (KBr): 3312, 1701, 1678, 1220 cm⁻¹; ¹HNM R (300 MHz, CDCl_3 δ ppm): 1.62 (s, 3H, CH₃), 2.21 (s, 3H, isoxazole-CH₃), 2.94 (s, 3H, N-CH₃), 3.60 (s, 2H, CH₂), 3.82 (s, 2H, thiazolidine-CH₂), 6.21 (s, 1H, isoxazole-H), 9.08 (s, 1H, NH); ¹³CNMR (75 MHz, CDCl_3 δ ppm): 11.9, 25.0, 33.0, 35.0, 48.1, 94.1, 63.3, 158.2, 168.0, 170.0, 170.2; ESI-MS: m/z 270[M + H]^+.

2-(3-Ethyl-2-methyl-4-oxothiazolidin-2-yl)-N-(5-methylisoxazol-3-yl)acetamide (5b)

Yield (75%) M.P. 108-110°C; M.F. C_{16}H_{16}N_2O_3S; Elemental Analysis: Calculated C, 57.99; H, 5.17; N, 12.68; Found C, 57.98; H, 5.18; N, 12.68. IR (KBr): 3315, 1710,1662, 1280 cm⁻¹; ¹HNM R (300 MHz, CDCl_3 δ ppm): 1.60 (s, 3H, CH₃), 2.31 (s, 3H, isoxazole-CH₃), 3.59 (s, 2H, CH₂), 3.84 (s, 2H, thiazolidine-CH₂), 6.02 (s, 1H, isoxazole-H), 7.30 (m, 5H, Ar-H), 9.05 (s, 1H, NH); ¹³CNMR (75 MHz, CDCl_3 δ ppm): 12.2, 26.8, 33.0, 48.2, 63.8, 94.8, 123.2, 123.3, 126.7, 131.0, 131.1,145.1, 158.3, 168.4, 170.2, 170.9; ESI-MS: m/z 332 [M + H]^+.

SYNTHESIS AND ANTIBACTERIAL ACTIVITY OF ISOXAZOLYL

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2-(3-(4-Chlorophenyl)-2-methyl-4-oxothiazolidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (5d)

Yield (70%) M.P. 99-100°C; M.F. C_{18}H_{16}ClN_{2}O_{s}S Elemental Analysis: Calculated C, 52.53; H, 4.41; N, 11.49; Found C, 52.56; H, 4.40; N, 11.47. IR (KBr): 3298, 1712, 1678, 1238 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.62 (s, 3H, CH₃), 2.33 (s, 3H, isoxazole-CH₂), 3.60 (s, 2H, CH₂), 3.90 (s, 2H, thiazolidine-CH₂), 6.12 (s, 1H, isoxazole-H), 7.18-7.32 (m, 4H, Ar-H), 8.91 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.1, 26.9, 33.0, 48.8, 63.0, 95.2, 128.1, 128.2, 124.0, 138.0, 158.9, 169.1, 170.0, 171.0; ESI-MS: m/z 366 [M + H]⁺.

2-(3-(4-Methoxyphenyl)-2-methyl-4-oxothiazolidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (5e)

Yield (71%) M.P. 114-115°C; M.F. C_{17}H_{18}NO_{s}S Elemental Analysis: Calculated C, 56.50; H, 5.30; N, 11.63; Found 56.52; H, 5.31; N, 11.61. IR (KBr): 3329, 1722, 1697, 1245 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.65 (s, 3H, CH₃), 2.33 (s, 3H, isoxazole-CH₂), 3.62 (s, 2H, CH₂), 3.80 (s, 3H, OCH₃), 3.90 (s, 2H, thiazolidine-CH₂), 6.05 (s, 1H, isoxazole-H), 6.78-6.92 (m, 4H, Ar-H), 9.25 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.0, 26.7, 33.0, 48.7, 64.0, 56.8, 94.6, 113.2, 121.2, 135.1, 157.3, 158.3, 169.2, 170.4, 171.2; ESI-MS: m/z 362 [M + H]⁺.

2-(3-Benzyl-2-methyl-4-oxothiazolidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (5f)

Yield (69%) M.P. 122-123°C; M.F. C_{17}H_{18}NO_{s}S Elemental Analysis: Calculated C, 59.11; H, 5.54; N, 12.17; Found C, 59.13; H, 5.55; N, 12.16. IR (KBr): 3309, 1718, 1661, 1218 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.66 (s, 3H, CH₃), 2.30 (s, 3H, isoxazole-CH₂), 3.61 (s, 2H, CH₂), 3.96 (s, 2H, thiazolidine-CH₂), 4.52 (s, 2H, Ph-CH₂), 6.19 (s, 1H, isoxazole-H), 7.18-7.32 (m, 5H, Ar-H), 9.51 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.3, 26.7, 33.0, 46.1, 48.2, 64.0, 94.6, 126.8, 127.0, 128.0, 128.8, 128.3, 140.3, 158.3, 169.8, 170.0, 171.1; ESI-MS: m/z 346 [M + H]⁺.

2-(3-(4-Chlorobenzyl)-2-methyl-4-oxothiazolidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (5g)

Yield (69%) M.P. 128-129°C; M.F. C_{17}H_{18}ClN_{2}O_{s}S Elemental Analysis: Calculated C, 53.75; H, 4.78; N, 11.06; Found 53.78; H, 4.79; N, 11.08. IR (KBr): 3311, 1703, 1679, 1227 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.68 (s, 3H, CH₃), 2.28 (s, 3H, isoxazole-CH₂), 3.60 (s, 2H, CH₂), 4.01 (s, 2H, thiazolidine-CH₂), 4.51 (s, 2H, Ph-CH₂), 6.25 (s, 1H, isoxazole-H), 6.72 (d, 2H, J = 8.0 Hz, Ar-H), 6.99 (d, 2H, J = 8.0 Hz, Ar-H), 9.14 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.2, 27.0, 33.0, 46.0, 48.0, 63.9, 96.0, 126.8, 128.0, 134.3, 135.3, 158.0, 169.0, 170.2, 171.0; ESI-MS: m/z 380 [M + H]⁺.

2-(3-(4-Methoxybenzyl)-2-methyl-4-oxothiazolidin-2-yl)-N-(5-methylisoxazol-3-yl) acetamide (5h)

Yield (78%) M.P. 115-116°C; M.F. C_{18}H_{21}NO_{s}S Elemental Analysis: Calculated C, 57.58; H, 5.64; N, 11.19; Found C, 57.57; H, 5.65; N, 11.21. IR (KBr): 3301, 1703, 1699, 1225 cm⁻¹; ¹H NMR (300 MHz, CDCl₃ δ ppm): 1.65 (s, 3H, CH₃), 2.30 (s, 3H, isoxazole-CH₂), 3.65 (s, 2H, CH₂), 3.79 (s, 3H, OCH₃) 3.99 (s, 2H, thiazolidine-CH₂), 4.54 (s, 2H, Ph-CH₂), 6.19 (s, 1H, isoxazole-H), 6.62 (d, 2H, J = 8.0 Hz, Ar-H), 7.02 (d, 2H, J = 8.0 Hz, Ar-H), 9.51 (s, 1H, NH); ¹³C NMR (75 MHz, CDCl₃ δ ppm): 12.2, 27.0, 33.0, 46.4, 48.0, 57.0, 63.9, 95.0, 116.2, 128.0, 130.2, 154.0, 158.0, 169.0, 170.2, 171.0; ESI-MS: m/z 376 [M + H]⁺.

Antibacterial Activity

The synthesized compounds, 4a–h and 5a–h were tested for antibacterial activity against Gram-positive organisms Staphylococcus aureus (MTCC 96), Bacillus subtilis (MTCC 121) and two Gram-negative organisms Escherichia coli (MTCC 43) and Klebsiella pneumoniae (MTCC 530). The compounds were tested in concentrations of 10μg/mL and 20μg/mL and the zones of inhibition were measured (mm) with Gatifloxacin as the standard drug. The results are presented in Table-1 and all the tested compounds (4a-h and 5a-h) showed good to excellent antibacterial activity. The results indicate that the compounds 4a-h are more potent than compounds 5a-h in the series and this may be attributed to the presence of the β-lactam ring. N-alkyl substituted (N-methyl and N-ethyl) compounds 4a, 4b, 5a and 5b are less potent.
when compared to all other compounds. Among the tested compounds, compounds 4d and 5d found to be the most effective against strains at higher concentration (20 µg/mL), with zone of inhibition (ZOI) values for 4d are 24±0.22, 27±0.37, 21±0.19, 22±0.17 respectively against MTCC 96, MTCC 121, MTCC 43 and MTCC 530 strains, followed by compound 5d with ZOI values of 23±0.31, 24±0.24, 20±0.29, 20±0.17 (Table-1). Rest of the compounds exhibited moderate to good antibacterial activity against different bacterial stains and are not selective. The enhanced activity of 4d and 5d may be attributed to the chloro substituent on the benzene ring.

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Gatifloxacin 18 28 17 30 18 25 18 26

ADME Profiling

The results indicate that all the test compounds obey and are within the range of ADME parameters\textsuperscript{25,26}. The most potent compounds 4d showed excellent absorption of 82.97% and 5d showed 72.80% of absorption.

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In conclusion, we have prepared the isoxazolyl azetidin-2-ones (4a-h) and isoxazolyl thiazolidin-4-ones (5a-h) and the compounds were evaluated for their antibacterial activity. Compounds 4d, and 5d have shown excellent antibacterial activity, and they can be exploited as potential bactericides after detailed study.

ACKNOWLEDGMENT

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REFERENCES


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