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(71)**Name of Applicant :**
1)Dr. Vishnu Dev Gupta
Address of Applicant :Professor, Department of Chemistry and Pharmaceutical Chemistry, Shri Jagdishprasad Jhabarmal Tibrewala University, Jhunjhunu-333010, Rajasthan, India. Rajasthan India
2)Dr. Jyoti Nanda Sharma
3)Ms. Aditi Srivastava
4)Dr. Divaker Shukla
5)Dr. Shalini Sharma
6)Ms. Ayesha Nisar Shaikh
7)Ms. Shyalu Gajbhiye
8)Ms. Varsha Devi Sahu

(72)**Name of Inventor :**
1)Dr. Vishnu Dev Gupta
2)Dr. Jyoti Nanda Sharma
3)Ms. Aditi Srivastava
4)Dr. Divaker Shukla
5)Dr. Shalini Sharma
6)Ms. Ayesha Nisar Shaikh
7)Ms. Shyalu Gajbhiye
8)Ms. Varsha Devi Sahu

(57) Abstract :
The present invention relates to the synthesis and antimicrobial evaluation of novel quinoxaline-based heterocyclic derivatives containing thiazolo and dihydrotriazino moieties. A multistep synthetic strategy involving condensation, chlorination, cyclization, Schiff base formation, and thiocyanate-mediated ring closure was employed to obtain a series of structurally diverse quinoxaline derivatives. The synthesized compounds were characterized by melting point analysis and evaluated for antimicrobial activity using an in vitro agar diffusion method. The compounds were tested against Staphylococcus aureus, Escherichia coli, and Candida albicans. Several derivatives exhibited notable antibacterial and antifungal activity, with one compound showing activity comparable to standard antimicrobial drugs. The disclosed quinoxaline derivatives represent promising lead molecules for the development of new antimicrobial agents to address emerging microbial resistance.

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