



One-pot two-step facile synthesis of new 2-Arylamino-5-(2-methylquinazol-4-yl)-thio 1,3,4-thiadiazole hybrids as antimicrobial agents

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ABSTRACT

Quinazoline derivatives of thiadiazoles refers to a class of chemical compounds where a thiadiazole ring attached to a quinoline ring, creating a molecule with potential biological activity often studied for its potential applications in medicines, including anti-inflammatory, anti-cancer, and antimicrobial properties (both anti-fungal and anti-bacterial) due to combined characteristics of both the quinazoline and thiadiazole moieties. These compounds consist of a quinazoline ring (a bicyclic aromatic ring) with a thiadiazole ring attached at a specific position, allowing for further modifications with different substituents with fine-tune biological activities. These derivatives exhibit diverse pharmacological activity including anti-leishmanial, anti-bacterial, anti-fungal, anti-cancer, etc. Keeping these views in mind I also have synthesized Quinazoline derivatives of thiadiazoles to enhance the uses of these derivatives. A one-pot, efficient and high-atom economic protocol involving the reaction between 2-Aryl-5-mercapto-1,3,4-thiadiazole with 2-methylamino-4-chloro quinazoline in Dimethyl formamide (DMF) as a solvent on a steam bath for 3 hrs, 2-Arylamino-5-(2-methylquinazol-4-yl)-thio 1,3,4-thiadiazole was developed. The final compounds were screened for their antimicrobial activities against *Phytophthora infestans* and *Collicotricum falcatum* and antitubercular activity against mycobacterium tuberculosis strain H₃₇Ra. The melting points were observed in open capillary tube and are uncorrected. The structures of the newly synthesized compounds were confirmed by IR on Perkin-Elmer 881 in KBr, and NMR spectroscopy (¹H NMR), and (¹³C NMR) spectral data and elemental analysis. The results were compared with standard drugs tested under similar conditions. Some of these compounds showed promising antimicrobial activities.

Keywords: Quinazoline, Thiadiazoles, Dimethyl Formamide (DMF), Antifungal and antitubercular activities, NMR and IR data.