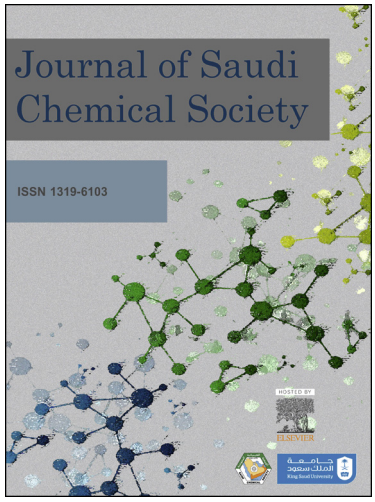

Original article

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Catalyst-free synthesis of pyrazole-aniline linked coumarin derivatives and their antimicrobial evaluation

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Abstract

Catalyst-free one-pot C-N and C-C bond formation is described as a simple and ecofriendly method for the synthesis of pyrazole-aniline linked coumarin derivatives. Employing this protocol, a series of derivatives were synthesized in good to excellent yields and tested against different bacterial strains as well as fungal strains. Most of the compounds exhibited potential antimicrobial activity against both Gram-positive and Gram-negative bacterial strains. Among them, the compounds **4b**, **4e**, **4h, 4i** and **4k** exhibited promising activity on all the tested bacterial strains with values ranging between 1.9 to 7.8 µg/mL. In addition, these compounds were tested against various fungal strains and were found to exhibit potential antifungal activity. Fascinatingly, among the tested derivatives, the compounds **4e**, **4h** and **4i** were found to be equipotent to miconazole (positive control) against some of the tested fungal strains. Moreover, these compounds showed promising bactericidal, *Candida*-cidal and biofilm inhibition activities. Further, mechanistic study was carried out with the most active derivative **4i** indicated that these compounds inhibit the ergosterol biosynthesis pathway.

Keywords: 4-Hydroxycoumarin, pyrazole, catalyst-free, antimicrobial, ergosterol, biofilm.

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