A convenient synthesis, reactions and biological studies of some novel selenolo[2,3-c]pyrazole compounds as antimicrobial and anti-inflammatory agents

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Abstract:

5-Chloro-3-methyl-1-phenylpyrazole-4-carbonitrile 3 was reacted with selenium in the presence of sodium borohydride and chloroacetamide to afford selanyl acetamide 5, which underwent Thorpe-Ziegler cyclization upon heating with sodium ethoxide to give the novel synthesized 4-amino-3-methyl-1-phenyl-1H-selenolo[2,3-c]pyrazole-5-carboxamide compound (6). The latter compound was used as a versatile precursor for synthesis of other heterocyclic rings, namely pyrimidine, imidazopyrimidine and thiadiazinopyrimidine fused to selenolo[2,3-c]pyrazole moiety. The newly synthesized compounds and their derivatives were characterized by elemental and spectral analysis (IR, 1H NMR, 13C NMR and mass spectrometric analyses). Furthermore, some of these synthesized compounds were screened against various pathogenic bacterial and fungal strains. The results demonstrate that most of the synthesized compounds possess a significant antibacterial activity against gram-positive and gram-negative bacteria. Also, some of these compounds showed a remarkable antifungal activity, especially Candida albicans. On the other hand, some of the synthesized compounds possess high anti-inflammatory activity using carrageenan-induced rat paw edema assay compared with indomethacin. Graphical Abstract The present work discussed synthesis of new selenolo[2,3-c]pyrazoles fused to other heterocyclic rings, namely pyrimidine, imidazopyrimidine and thiadiazinopyrimidine. Some of the synthesized compounds showed remarkable antibacterial, antifungal and anti-inflammatory activities.

Keywords:

Synthesis · Reactions · Selenolopyrazole · Pyrimidine · Antimicrobial activity · Anti-inflammatory activity

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