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Synthesis, characterization and antibacterial activity of some new ferrocenyl selenazoles and 3,5-diferrocenyl-1,2,4-selenadiazole

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ABSTRACT

New ferrocenyl containing selenazole derivatives were synthesized from reactions of aryl selenocarboxamide (*i.e.* Ar–C(=Se)NH$_2$; Ar = C$_6$H$_5$ (1), 4-Br-C$_6$H$_4$ (2), 4-PhC$_6$H$_4$ (3), 4-CH$_3$OC$_6$H$_4$ (4), 4-CH$_3$SC$_6$H$_4$ (5), 6-MeO–naphthyl (6), 4-MeO–naphthyl (7), 4-C$_5$H$_5$OC$_6$H$_4$ (8), 3,4-(CH$_3$O)$_2$C$_6$H$_3$ (9), and 3,5-(CH$_3$O)$_2$C$_6$H$_3$ (10)) with (2-bromoacetyl)ferrocene. The structures of the new compounds were determined by elemental analyses, IR, ^{1}H and ^{13}C NMR and mass spectroscopic data.

Reaction of 1-cyanoferrocene with sodium hydrogen selenide (NaHSe) in methanol gave the new ferrocenyl selenocarboxamide (11) in 27% yield. Treatment of compound 11 with acatalytic amount of Na$_2$[PdCl$_4$] gave 3,5-diferrocenyl-1,2,4-selenadiazole in 35% yield. Both compounds were characterized elemental analyses and spectroscopic techniques.

Compounds 1–10 and 12 were screened as antibacterial agents against *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa* and showed promising properties.