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Synthesis, Characterization and Antimicrobial Activity of Garcinol Iron Complex

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Garcinia quaesita Pierre (Rath Goraka) is a commonly used spice in Sri Lanka which contains garcinol, a polyisoprenylated benzophenone derivative. It has shown a wide range of biological properties. The effectiveness of garcinol can be improved by coordination with appropriate metal ions. The objectives of this study were to synthesize, characterize and determine the antimicrobial activity of garcinol iron complex (G-Fe). Garcinol was characterized by UV-visible, Nuclear Magnetic Resonance (NMR) and Fourier transform infrared (FTIR) spectroscopic methods. G-Fe complex was characterized by UV-visible and FTIR spectra. Antimicrobial activity was tested against five microbial species including *Staphylococcus aureus* (ATCC 25623), *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 25922), *Candida albicans* (ATCC 10231) and clinical isolates of Methicillin resistant *Staphylococcus aureus* (MRSA), by well diffusion and Broth micro-dilution assays. Spectroscopic data of isolated garcinol were conformed to the literature. UV-visible spectrum of G-Fe complex indicated an absorption peak at 365 nm wavelength. FTIR spectral data revealed some distinct differences between garcinol and G-Fe complex. Mean zones of inhibition for 500 µg/ml concentrated G-Fe complex against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Candida albicans* and MRSA were 16.0±0.0, 20.0±0.0, 20.0±0.0, 20.0±0.0 and 15.3±0.5 mm and minimum inhibition concentrations of G-Fe complex were 125-250, 31.2-62.5, 62.5-125, 62.5-125 and 31.2-62.5 µg/ml, respectively. Well established antibiotics, Gentamicin and Vancomycin, were used as positive controls. G-Fe complex has shown a significant antimicrobial activity against selected gram positive, gram negative bacterial and *Candida* yeast species.

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