Antimicrobial Effects and Phytochemical Analysis of Chrysophyllum Albidum Plant Parts (Leaves, Roots and Seeds) Extracts on Bacterial Isolates from Urinary Catheters

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Abstract : The occurrence of multidrug resistance patterns that have been developed by bacteria has made it difficult to properly treat infections using standard clinical medications. Hence, the use of herbs as an alternative source of therapy is considered cheap and easily accessible to locals. This research explored the antimicrobial effects of aqueous and ethanolic extracts obtained from Chrysophyllum albidum (commonly called 'Agbalumo' in southwest Nigeria and 'Udara' in the eastern and southern parts of Nigeria) plant parts (leaves, roots and seeds) against bacteria isolated from urinary catheter tips. The following isolates were obtained; Pseudomonas aeruginosa, Staphylococcus aureus, Escherichia coli, Proteus mirabilis, and Klebsiella aerogenes. The agar well diffusion method was used. The average percentages of antimicrobial resistance of the isolates to gentamycin were 45.5% for P. aeruginosa, 42.1% for E. coli, 46.9% for K. aerogenes, and ˃90% for other isolates. Qualitative phytochemical screening of the plant parts extracts was done using chemical test for the screening and identification of bioactive chemical constituents. The ethanolic extract mixtures (leaf, root and seed) had the greatest effect on all the isolates, with inhibition zones (IZs) ranging from 8-26 mm and MICs ranging from <16-32 mg/ml. The Potencies of the C. albidum extracts based on the IZ and MIC values were greater in the extract mixtures, followed by those in the roots. Phytochemical screening revealed that all the extracts contained phenol except for the seeds while tannins were present in all the extracts except the leaves. The activity of the ethanolic extracts of each part at high and low concentrations was greater than that of the aqueous extracts at the same concentrations ($p<0.05$). The acute toxicity results showed that the LD50 of the extracts was ˃5000 mg/body weight, indicating no toxicity. The antibacterial activities of the extract mixtures and roots on the isolates confirmed the use of C. albidum in folk medicine for the treatment of CAUTIs, hence indicating its antibacterial potential for use in novel antibiotic production.

Keywords : antimicrobials, susceptibility, minimum inhibitory concentration, extracts
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