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Evaluation of biological activities of nine medicinal plants and isolation and identification of antimicrobial compounds from *Pomaria sandersonii* and *Alepidea amatymbica*

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Medicinal plants provides valuable alternative as sources of drugs and drug discovery since many have been used in traditional practices for centuries to manage or cure various forms of ailments. Plants in this research were selected on the basis of an ethno-botanical survey based on questionnaire responses and verbal interviews that was conducted in Mabandla village in KwaZulu-Natal, South Africa. Bioassay guided study involving anti-inflammatory studies measurements of LOX activity effected by a reaction medium containing 15-LOX, linoleic acid in buffer at pH 9 for 30 to 90 seconds after adding plant extract/fraction, free radical scavenging capacity against the $ABTS^{\bullet+}$ radical cation and $DPPH^{\bullet}$ radicals; antimicrobial and bioautography assays against Staphylococcus aureus, ATCC 29213, *Pseudomonas aeruginosa* ATCC 27853, *Enterococcus faecalis* ATCC 29212, *Escherichia Coli,* ATCC25922, *Candida albicans* and A. Fumigatus were carried out on the plants extracts, fractions and pure compounds. Isolation of compounds displaying biological activity was also carried out by use of open column chromatography and preparative TLC. The compounds were characterized by use of Nuclear Magnetic Resonance, Mass Spectra and Infra-Red (IR) spectroscopy. The DPPH sprayed TLC displayed that all the nine plants contain antioxidants most of which are contained in polar fractions of acetone and methanol. Results of the assays displayed a range of biological activities comparable to the positive controls used for each assay. DPPH● scavenging displayed EC50 values ranging between 1.008 and 467mg/L. The highest activity is obtained from methanol fraction of *Berkheya setifera* with EC50 value of 1.008mg/L within 0.5376 to 1.890 at 95% confidence limit followed by crude fraction of *Gunnera perpensa* with EC50 value of 1.069mg/L within 0.5222 to 2.188 at 95% confidence limit. Carissa bispinosa hexane fraction displayed the lowest activity of 467.7mg/L within 264.0 to 828.5 at 95% confidence limit. Highest ABTS●+ radical scavenging was demonstrated by *Pomaria sandersonii* DCM, (1.273mg/L at 0.9439 to 1.719 within 95% confidence limit) for the Ethyl acetate, (5.973 mg/L at 4.722 to 7.555 within 95% confidence limit while the lowest activity was displayed by hexane fraction from *Eucomis autumnalis* (929.4 mg/L at 557.5 to 1550 within 95% confidence limit). The activity of *Pomaria sandersonii* extracts and fractions demonstrated that the plant contains antioxidants that react with both DPPH and ABTS radicals although higher activities were shown by ABTS as displayed by the lower EC50 values. All of the crude fractions and extracts displayed high to moderate anti-bacterial activity (20-625 µg/ml) and anti-fungal activity (20-2500µg/ml). *P. sandersonii* crude and fractions demonstrated highest antimicrobial activity compared to other plants. Some MIC values *P. sandersonii* DCM and ethyl acetate (80µg per ml in each case) compared well with gentamycin (4 µg per ml) same value against S. aureus, E. faecalis, *E. coli* and *P. aeruginosa*. Anti-fungal activities of the DCM, acetone and methanol fractions were also highly active (20µg per ml) for both *Candida albicans* and Aspergillus. fumigatus. Inhibition of pathogen growth demonstrated by the polar fractions indicates that most of the active compounds would be soluble in water. P. prunelloides, crude methanol extract produced 60% sucrose component and G. perpensa, 36% was glucose. Three compounds isolated from *Alepidea amatymbica* and three from *Pomaria sandersonii* which displayed high antimicrobial activities..

Biography

Fanyana Mtunzi has completed his PhD from University of North-West, South Africa. He is the Senior Lecturer and Researcher at Vaal University of Technology. He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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