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Phytochemical and antioxidant assessments of three fractions from methanol extract of Spathodea campanulata Beauv. leaves

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Methanol extract of *Spathodea campanulata* leaves was obtained by cold extraction, and partitioned into hexane, ethyl acetate and methanol fractions. Phytochemical screenings of the fractions were carried out using standard procedures to identify the class of constituents present in each of them. Ethyl acetate fraction was subjected to column chromatographic separations by gradient elution, and isolates were TMS (Trimethylsilyl) derivatized and characterized by GC-MS (Gas chromatography-mass spectrometry). Antioxidant content was also evaluated on the three fractions using 2,2-diphenyl-picrylhydrazyl (DPPH) free radical scavenging method. Percentage of inhibition and IC50 values were obtained for each fraction. Phytochemical screenings revealed presence of alkaloids, tannins, saponin, resins, phenol, cardiac glycosides, steroids, flavonoids, anthraquinones and terpenoids in the three fractions in varying concentrations. Alkaloids, resins, phenol and cardiac glycosides were found to be intense in the three fractions while phlobatannin was found to be absent in all the three fractions. Three compounds isolated from the ethyl acetate fraction were characterized based on MS and IR spectral interpretations as palmitic acid, ethylamine and caffeic acid. Percentage of inhibition of the three fractions indicates that they have substantial antioxidant activity with the standards at high concentration of 250 to 1000 µg/mL. The hexane fraction has the highest antioxidant activity with an IC50 of 178.46 µg/mL when compared to other fractions. This paper reports phytochemical constituents and high antioxidant activity (at concentrations of 250 µg/mL and above) of the African tulip tree (*Spathodea campanulata*) when compared to the standards. This has not been earlier reported in literature, our results support its wide ethno-medicinal applications.

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Ultrasound assisted sustainable one-pot synthesis of heterocycles and bis-heterocycles via IMCRs

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Bis-heterocycles are structural complex compounds having two linked, fused, merged or bound heterocyclic frameworks, which have more attention of synthetic community due to their potential applications in Agrochemistry, Optics, Material Science, and in Medicinal Chemistry. Particullarly, 1,5-disubstituted-tetrazoles (1,5-DS-T's) are known as resistant bioisosters of the cis-amide bond of peptides, which are present in numerous valuable drugs like the third-generation cephalosporin antibiotic Latamoxeb. Besides, 1,5-DS-T's are suitable precursors of a plethora of prime ligands and chelating agents. Thus, according to our ongoing program, to develop efficient and sustainable solvent and catalyst-free IMCR based methodologies towards a variety of heterocycles and bis-heterocycles containing the 1,5-DS-T, we herein disclose our most recent published results. Recently, we reported the ultrasound accelerated, environmentally benign Ugi-azide based method towards the synthesis of 1,5-DS-T heterocycles under solvent and catalyst-free conditions (Green Chem., 2017, 19, 1259). In the same context, we were interested to design and develop the sustainable strategies towards the bis-heterocycles containing 1,5-DS-T with privileged molecules previously reported for their biological activities. Thus, recently, we have submitted our results of green one-pot solvent and catalyst-free IMCR/post-transformation strategy towards fused 1,5-DS-T with imidazopyridine bis-heterocycles. The developed strategies have many advantages in comparison with traditional methods reported for their synthesis.

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