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Euro Organic Chemistry 2019: Chemical Composition and Radical scavenging (anti-oxidant) efficacy of the Leaf of *Terminalia catappa* Linn

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Abstract

Medicinal plants have been identified and used throughout human history to treat aliment and diseases. Plants have ability to synthesize a wide variety of chemical compound. Many of which are efficacious and contain substances that are potential drugs that require further examinations. Chemical compounds in plants mediate their effects on the human body by binding to receptor molecules present in the body; Terminalia catappa Linn (Indian almond) is a Combretaceae plant (tropical almond family) Fresh leaf of Terminalia catappa was collected from Bolori ward Maiduguri Borno state and it was identified by Professor S. S. Sunusi Department of Biological Science Faculty of Science, University of Maiduguri. One thousand grammes (1000g) of the powdered leaf of Terminalia catappa was extracted with methanol using cold infusion (maceration) method. Eighty three point eight two grammes (83.82g) of the dark green in colour gummy in texture of methanol crude extract was obtained, which was further partitioned with n-hexane, ethyl acetate, n-butanol and water to give n-hexane portion (1.638% W/W), dark green in colour, oily in texture, ethyl acetate portion (0.075% W/W), black in colour, gummy in texture, n-butanol portion (0.777% W/W), brown in colour, oily in texture and finally aqueous portion (2.997% W/W), dark brown in colour, powdered in texture. Preliminary phytochemical screening of the methanol crude extract and partitioned portions revealed the presence of some secondary metabolites such as cardiac glycoside, flavonoids, saponins, terpenoids, tannins and alkaloid. The antioxidant activity was carried out on the methanol extract and partitioned portions. The methanol extract showed the percentage inhibitions of 98.25 at 10ug/ml 97.40 at 20µg/ml 96.94 at 30µg/ml 96.63 at 40µg/ml and 97.10 at 50µg/ml and all the partitioned portions exhibited anti-oxidant activities. The concentration levels of macro-elements (Ca, Mg, Na, K) and micro-elements (Cd, Cu, Ni, Zn, Fe, Mn) were analyzed using Atomic Absorption Spectrophotometer and the anions (Cl-, NO3-, PO43-, and SO42-) were estimated using smart spectrophotometer. The leaf of Terminalia catappa indicated the presence of calcium (19.68µg/ml), cadmium (0.12µg/ml), copper (6.84µg/ml), iron (10.67µg/ml), potassium (18.90µg/ml), magnesium (10.27µg/ml), manganese (1.27µg/ml), sodium (15.30µg/ml) nikkel (1.00µg/ml), zinc (4.17µg/ml), chloride (0.72µg/ml), nitrate (46.00µg/ml), phosphate (70.00µg/ml) and sulphate (227.33µg/ml). However, only phosphate and sulphate exceeded the permissible limit of world health organization (WHO) standard. Purification of compound was done by using column and thin layer chromatography method. After pooling and recombination with different solvent system of the n-butanol extract, three compounds TCA, TCB and TCC were obtained with melting points TCA (286.00-287.00), TCB (278.00-279.00) and TCC (260.00-262.33). All the melting points were shape and uncorrected. The Gas Chromatography-Mass Spectrometry of the compound TCA revealed the presence of fatty acid derivaties such as octadecanoic acid 4-hydroxybutyl ester, tetradecanoic acid 2-hydroxyl, pentanoic acid, 2,2 4-trimethyl-3-carboxy isopropyl, isobutyl ester, octadecanoic acid (2-phenyl 1-3-dioxolan -4-yl) methyl ester cis..The methanol extract showed promising antioxidant activities at various concentrations when compared with the partitioned portions.

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Keywords: Terminalia, extract purification, isolation, elemental

1. Antibacterial activity

Antibacterial examine was directed by Kirby-Bauer strategy . The plant extricate was taken and broken down in DMSO with focuses going from 0.5, 1 and 2.0 mg individually. These strains were immunized in clean supplement stock and brooded at 37oC for overnight. The darkness of the living beings was contrasted with McFarland's turbidity standard 0.5 with make a weakening of 1.5×108 cells . Anti-toxin controls for the tried living beings were additionally tried. Clean supplement agar plates were utilized for antimicrobial test. Utilizing clean q-tips uniform gardens were readied, various groupings of plant separates were stacked with cautious consideration, and plates were left for 30 minutes at room temperature, hatched at 37oC for overnight and the investigations done in triplicates. The zones of hindrance were estimated utilizing a measurement scale.

2. Antimycobacterial activity

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3. Antioxidant Activity

Determination of nitric oxide radical scavenging activity :
Nitric oxide was created from sodium nitroprusside what's more, estimated by Griess response depicted by Green et al., (1982) [25]. Sodium nitroprusside 5 mM in phosphate support arrangement was brooded with diverse fixation (10-500 µg mL-1) of concentrates at 25° C for 5 hours. Control without separate however with equal measure of cradle was treated in a comparative way. Following 5 hours, 0.5 mL of hatching arrangement with 0.5 mL of Griess reagent. The absorbance of the chromophore framed during diazotization of nitrite with sulphanilamide and its resulting coupling with napthylethylene diamine was perused at 546 nm with UVvisible spectrophotometer (Shimadzu UV-2450). The nitric oxide radical rummaging movement was determined utilizing the accompanying recipe:

% Inhibition = [(A0-Ae)/A0]*100

Where Ao is the absorbance without test, and Ae is absorbance with test