International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 03 | March - 2024 SJIF Rating: 8.176 ISSN: 2582-3930

Medicinal Uses of Whole Plant Extract of Phyllanthus Amarus Schum and Thonn

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Abstract:

Medicinal plants represent essential elements of traditional medicine. They have been used to treat various ailments. Drug derived from plants have been utilized customarily to treat malaria. In this manner, assurance of the harmfulness and antimalarial capacity of plant derived drugs can demonstrate to be the source of novel lead compound to control malaria.Phyllantus amarus has been exploited in different parts of the world because of its pharmacological value. This value is known to be as a result of the phytochemical constituents found in different parts of the plants.The Phyllanthus plant extracts shown anti-inflammatory, anti-diabetepatoprotective, and iic, anti-cancer, anti-oxidant, antibacterial, nephroprotective, hmmunomodulatory properties. It is believed that traditional plants, such as Phyllanthus amarus, have a variety of phytochemicals that give rise to their noteworthy biological activity.Using established techniques, this study assesses the phytochemical components, acute oral toxicity, and in vivo antiplasmodial efficacy of methanol extract and its solvent fractions.

Keywords- Medicinal plants, Antioxidant, immunomodulatory nephroprotective, diabetepatoprotect

Introduction

Many countries have employed medicinal plants as nutritional and therapeutic agents. The plant Phyllanthus amarus Schumach. The herb thonn is frequently used in traditional medicine because of itsantibacterial, hepatoprotective, antihypertensive, anti-diabetic, and analgesic qualities. Traditional medical practices involve the use of herb decoctions to treat conditions such as cancer, diabetes, hypertension, hepatic, urinary, and STDs. As far as we are aware, no ethnobotanical research on diabetes has been documented or published in this region of Burkina Faso. The objectives of this study are to evaluate the antioxidant potential of particular medicinal plants and to record the traditional knowledge of the locals on the usage of these plants to treat diabetes

Using the procedure outlined by the total phenolic contents were determined.To get a final concentration of 100 µg/mL, the 10 mg/mL stock solution of the crude extracts of each sample and fraction was diluted with distilled water to the tenth. Add 625 µL of foling-c to 125 µL of the diluted solution of each extract or fraction. considering thscientific papers.

Many nations have utilized medicinal plants as dietary and therapeutic aids. It's possible that the mixture of the plant's components—rather than a single ingredient—is what gives these plants their efficiency.

The broad genus Phyllanthus (Euphorbiaceae) is found in tropical and subtropical areas. According to Sarin et al. , the genus has around 1000 species, including shrubs and trees. Herbs are scarce in this genus.

It is recognized that the phytochemical components present in various plant sections are responsible for this value. In this work, we evaluated the antibacterial activity of P. amarus leaves against certain pathogenic bacteria in addition to qualitatively and quantitatively examining the phytochemicals present in the leaves. Phyllanthus plants showed benefits that were immunomodulatory, nephroprotective, hepatoprotective, anti-inflammatory, anti-diabetic, antioxidant, and antibacterial. Because of their widespread distribution, Phyllanthus species have been the subject of several biological and phytochemical investigations in recent years.

Morphology of Amarus Schum and Thonn:

Synonyms: phyllanthus,Bhui amla,Bhumi amalaki

Biological Source: it consist of all aerial parts of the plants, phyllanthus niruri belonging to **family: Euphorbiaceae** Indian veriety avilable is phyllanthus fraternus and phyllanthus Amarus .

Microscopical characteristics:

a) Colour: green to yellowish green in colour
b) Test: Bitter
c) Odour: Aromatic
d) Stems: 1-1.5 cm in length and 1.4 cm in diameter stems are stout
e) Leaves: short stalked, oblong in shape and about 5x3mm in size.

MATERIALS AND METHODS

Materials and Reagents Solvents used were of analytical grade, and when necessary, solvents were redistilled before use. Freshly prepared phytochemical screening reagents were used. Thin layer chromatography was performed on aluminum sheet 20 x 20 cm already pre-coated with silica get 60-120 mesh with a thickness of 200 µm Merck, Germany and spots were viewed under UV lamp model SAFE Germany. The organisms used for the antimicrobial testing were clinical bacterial and fungal isolates from the Medical Laboratory of the Microbiology and Parasitology Unit of the University of Ilorin Teaching Hospital, Ilorin, Nigeria.

Sample Collection and Preparation:

Leaves collection:

Fresh leaves of P. amarus were collected in the month of September, 2014 from Tanke-Bubu in Ilorin South Local Government Area of Kwara State, Nigeria. The plant was identified and authenticated at Herbarium of the Department of Plant Biology University of Ilorin, Nigeria, with the voucher number UIH002/884. The fresh leaves collected were air-dried for two weeks and thereafter pulverized to powder using a mortar and pestle and kept in a cellophane bag in a cool place until further work.

Extraction of Plant Material

Air-dried pulverized leaves sample of P. amarus (150 g) was cold extracted in distilled n-hexane, ethylacetate and methanol separately for 3 days each by agitating and decanting for three successive extractions. The extracts were filtered using Whatman No. 2 filter paper. The filtrate was evaporated to

dryness using rotatory evaporator. The obtained crude extracts were stored in a screw cap glass vials in refrigerator below 10oC for further analysi.

Phytochemical Screening

Phytochemical tests were carried out on the crude nhexane and methanol extracts of the leaves using standard procedures to identify the constituents (Trease and Evans, 1988; Harbone, 1998; Sofowora, 1993a and 1993b).

Gas Chromatography - Mass Spectrometry (GCMS):

The crude extract of the leaves of P. amarus (n-hexane and methanol) were subjected to GC-MS analysis using Agilent 19091S-433 equipped with column of 30 m long (0.25 µm x 250 µm). The carrier gas was helium with a flow rate of 4oC/min using a split less injector mode (at 250oC). About 1 µL of the sample was injected by anauto sampler, over the oven temperature programme: from 40 to 300oC and a total run-time of 95 minutes. The relative percentage constituents were evaluated based on an estimate of the depicted area of the peak in the total ion chromatogram. Identification of the compounds was done by comparing the mass spectra fragmentation pattern with NIST database (NIST,2009; Adams, 1995).

Antimicrobial Test

For the antibacterial experiment, two human pathogenic bacteria cultures were employed. These were Staphylococcus aureus and Pseudomonas aeruginosa, and two fungi—Candida albicans and Aspergillus flavus—were also used in the antifungal test.

All of the microorganisms used were clinical strains that were screened in the University of Ilorin Microbiology Department Laboratory after being obtained from the Medical Microbiology Department of the University Teaching Hospital.

Nutrient agar, Sabouraud dextrose agar, nutrient broth and tryptone soya agar were utilized in this investigation.

N-hexane and methanol were also utilized in solubilizing the extracts and as negative controls in the experiments.

The study used oxacillin, an antibiotic, and griseofluvin, an antifungal, as standard reference medications.

Lower Limit of Inhibition (MIC)

The process of producing a solution of the samples at different concentrations of 12.5, 25, 50, 100, and 125 mg/ml allowed researchers to calculate the minimum inhibitory concentration (MIC) of n-hexane and methanol extracts with typical antimicrobial medications such as griseofulvin (antifungal) and oxacillin (antibacterial). One milliliter of each extract at various concentrations was added and stirred in a test tube after precisely nine milliliters of sterile peptone water were poured into each test tube. Each tube received 0.1 ml of inocula. For 24 hours for bacteria and 48 hours for fungus, the tubes were incubated aerobically at 37 °C. The turbidity or cloudiness of the broth and the lowest concentration of the extract, which restricted the growth of the inoculum in the broth, are indicators of the inoculum's growth. By using GC-MS studies, the chemical contents of P. amarus's hexane and methanol leaf extracts were determined. By marching each compound's corresponding mass spectrum with the library, the compounds were identified. By using GC-MS studies, the chemical contents of P. amarus's hexane and methanol leaf extracts were determined. By marching each compound's corresponding mass spectrum with the library, the compounds were identified.

Quantification of total polyphenol content

Using the procedure outlined by [36], the total phenolic contents were determined.

To get a final concentration of 100 µg/mL, the 10 mg/mL stock solution of the crude extracts of each sample and fraction was diluted with distilled water to the tenth. 625 µL of the foling-ciocalteu reagent (FCR; 0.2N) was added to a volume of 125 µL of the diluted solution of each extract or fraction. 500 µL of sodium carbonate at 75 g/L was added after the mixture had been incubated for 5 minutes, and it was then left in the dark for a further 2 hours. At 760 nm, absorbances and concentrations are measured using a spectrophotometer against a blank that solely contains distilled water. Every extract is given three readings in total.

Analytical statistics:

The mean ± SD of three parallel measurements constitutes the experiment findings. The map was plotted using QGIS 3.22 software. Using quercetin as a reference, the program Statat 13.0 conducted a Pearson test to compare the means of each plant extract or fraction. Significant p-values ($p<0.05$) were used.

Antibiotic sensitivity test:

In compliance with the Kirby-Bauer antibiotic protocol, this test was conducted. Antibiotic-impregnated wafers were used in the experiment to ascertain the bacterial isolates' pattern of antibiotic sensitivity.

Medicinal uses of Amarus Schum and Thonn:

amarus have been used for treating multi-faceted diseases like hepatitis B, jaundice, diarrhoea, dysentery, dropsy, intermittent fevers, Herpes Simplex virus, inflammation, oxidative stress, hypotensive, urinary disorders,etc.

It is bitter, astringent, stomachic, diuretic, febrifuge and antiseptic. The whole plant is used in gonorrhea, menorrhagia and other genital affections. It is useful in gastropathy, diarrhoea, dysentery, intermittent fevers, ophthalmopathy, scabies, ulcers and wounds.

Conclusion:

Since water produced the maximum crude extract, it was often the best solvent to utilize for Phyllanthus amarus crude extraction. Of the 13 crude extracts of P. amarus, ethanol had the second-highest yield according to There is no correlation between the yields of the crude plant produced by varying the ratios of water to ethanol. The ratio of water to ethanol (1:1) produced the smallest output.

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