

FREE RADICAL SCAVENGING ACTIVITY OF THE ROOTS AND STEM BARKS OF *Ceiba pentandra* and *Anogeissus* *Leiocarpus*

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ABSTRACTS: The antioxidant activities of the plants extracts were determined using modified 2, 2, diphenyl-2-picrylhydrazyl (DPPH) Scavenging method. 0.1ml of the (DPPH) Solution was prepared in 95% methanol and each extract solution (100 µg/cm³) was also prepared in 95% methanol. 3 cm³ of each extract was added to 1 cm³ of the (DPPH) solution and the absorbance measured at 517 nm after 30 minutes using the Jenway 6305 spectrophotometre. The absorbance of the blank 3cm³ 95% methanol added to 1 cm³ DPPH solution was also measured. The free radical Scavenging activity of each of the extracts was expressed in percentage ratio of lowering of the absorption of (DPPH) by the extracts solution relative to the absorption of the (DPPH). Ascorbic acid was used as the standard.

KEYWORDS: Antioxidant, 2, 2, diphenyl-2-picrylhydrazyl DPPH, blank, Jenway.

INTRODUCTION

Medicinal plants which forms the back bone of traditional medicine have in the last few decades been subjected to intense of pharmacological studies. This has been brought about by the acknowledgement of the values of medicinal plants as potential sources of led compound in drug development (Olukoya, 1993).

Over the years man has used natural product in diverse ways as herbs for basic preventive and curative purposes as repellent to insects and other organisms and as stimulants. A significant portions of drugs, herbs and insecticides in use are of plant origin. Organic compounds of natural origin that are synthesized by living organisms (plants and fungi) have been identified as the principal source of these products (Sofowora, 1993). Some of the microbial infections have developed resistance to some of the existing drugs coupled with high cost of the drugs and are not even readily available. These has led to the search for alternative sources of treatment.

A number of such plants have been used in traditional medicine for many years such plants according to (Sofowora, 1993) should qualify as medicinal plants even when effective users or some of them may not have been proven scientifically. It should be maintained that through etho-medical uses a lot of medicinal plants are now used in the orthodox medicine (Karthikumar *et al.*,2007)

MATERIALS AND METHODS

2.0 COLLECTION AND PREPARATION OF THE SAMPLE

The fresh roots and stem bark of *Ceiba pentandra* and *Anogeissus leiocarpus* was collected at Bayara a suburb of Bauchi town. Identification of the plants material was carried out immediately after collection in Botany unit of Biological sciences Department of A.T.B.U Bauchi. They were air dried under shade at room temperature for two to three weeks as recommended by Sofowora (1993). They were grounded into fine powder and stored for further use.

2.1 DESCRIPTION OF *CEIBA PENTANDRA*

Ceiba pentandra is an emergent tree of the tropical rain forest and savannah, it is often described as majestic trees. It can grow to the height of 150ft or more towering over trees in rainforest. The straight trunk are cylindrical, smooth and gray in colour and can reach the diameter of 9ft. the branches grow in horizontal tiers are spread widely. The leaves are palmate with 5-9 leaflets and 1-3.5cm wide. The genus *Ceiba* consists of 10

species of large tropical trees in the family of malvacea formally in bombacea meaning their large umbrella shaped canopies

2.2 CLASSIFICATION OF *CEIBA PENTANDRA*

Ceiba pentandra is known as Rimi among the Hausas of the Northern Nigeria while the Yoruba's of the west call it Erim mado and Igbo's of the east call it Okwe;

Kingdom	Plantae
Phyllum	Angiosperm
Class	Eudicots
Order	Malvacea
Family	Ceiba
Genus	Malvacea
Species	<i>Ceiba pentandra</i>

2.3 ETHNO MEDICAL USES OF *CEIBA PENTANDRA*

Ceiba pentandra stem bark been used as a diuretic, aphrodisiac and to treat head ache as well as a type II diabetis. It is used as an additive to some to hersins of the hallucinogenic drinks (Audu.,1999).

The *ceiba pentandra* is a tree considered to be sacred. It is widely used in textiles and leader as well as in the traditional treatment of many diseases. The decoction and maceration of the stem bark are used against anorexia, constipation, malaria, Jaundice, Itching, wounds Eczema, boils and various forms of ulcers (Khalaf, 2008).

2.4 DESCRIPTION AND *ANOGEISSUS LEIOCARPUS*

Anogeissus leiocarpus is a tall ever green native to savannah of the tropical forest. It is the sole west Africa species of genus distributed from tropical, central and East Africa. *Angogeissus Leiocarpus* germinate in a new soil by a several wet land and along the bank forming a gallery forest. *Anogeissus leiocarpus* is known as 'Marke' or Farin gamji in Hausa Language.

Kingdom	Plantae
Unranked	Angiosperm
Unranked	Rosids
Order	Myrtates
Family	Combretacea
Genius	Angiosperm
Species	<i>Anogeissus leiocarpus</i>

2.5 ETHNO MEDICAL USES OF *ANOGEISSUS LEIOCARPUS*

Anogeissus leiocarpus is closely associated with the spirits, the pricklets are placed over doors and windows as protection against black magic. The inner bark of the tree is used as a human and livestock and antithelmitic for

treating worms and for the treatments of couple of protozoan's diseases in animals. Stembark is used as the chewing sticks and also the extracts show antibacterial properties (Mishra, 2007).

2.6 EXTRACTION

The extraction was carried out using the soxhlet with n-hexane, ethyl acetate, acetone, methanol and water in increasing order of their polarity sequentially.

Eighty grams (80g) of powdered sample was weighed accurately and introduced into the porous thimble made up of filter paper and placed in the inner tube of the soxhlet extractor. The loaded extractor will then be fitted into a 500cm³ round bottom flask containing about 250 cm³ of the solvent and boiling chips and to a reflux condenser. The setup was mounted on a hot or heating mantle and held in a place with a retort stand and clamps. The extraction process was rounded for about eight hours (8hrs) until colorless liquid was observed for some time in the sample chamber of the extractor. This process was repeated using sample. Each was kept in a desiccators at least three days before further use.

2.7 ANTIOXIDANT ACTIVITY TEST

The sample of the plants extracts (1.0g) was dissolved in 95% methanol each. The dilute solution of each test was added to a 2,2 diphenyl-1- picrylhydrazyl radical (DPPH). 2.0ml of the mixture was incubated in the dark for 30minutes. The absorbance of the mixture will be recorded against the blank. (Methanol+DPPH) at the wavelength of 517nm. The same was applied to ascorbic acid which was used as the standard (chen, 1999) absorbance values will be measured at 517nm and converted in percentage antioxidant using the following formula.

$$AA\% = 100 - \left(\frac{Abs_{sample} - Abs_{blank}}{Abs_{sample}} \right) \times 100$$

Ascorbic acid was used as the black.

RESULTS AND DISCUSSION

Table 1. Free radical scavenging actions of the root extracts of *Ceiba pentandra*.

Extracts	Percentage (%) DPPH Scavenged	Blank
Ethylacetate	29.7	0.00
Acetone	34.5	0.00
Methanol	50.9	0.00
Water	54.6	0.00

Table 2. Free radical scavenging actions of the stem barks of *Ceiba pentandra*.

Extracts	Percentage (%) DPPH Scavenged	Blank
Ethylacetate	38.3	0.00
Acetone	45.4	0.00
Methanol	76.4	0.00
Water	72.1	0.00

Table 3. Free radical scavenging actions of the roots of *Anogeissus leiocarpus*.

Extracts	Percentage (%) DPPH Scavenged	Blank
Ethylacetate	43.5	0.00

Acetone	49.2	0.00
Methanol	69.8	0.00
Water	70.0	0.00

Table 4. Free radical scavenging actions of the stem barks of *Anogeissus Leiocarpus*

Extracts	Percentage (%) DPPH Scavenged	Blank
Ethylacetate	31.2	0.00
Acetone	46.8	0.00
Methanol	66.3	0.00
Water	67.5	0.00

DISCUSSION

The free radical scavenging ability of all the ethyl acetate, acetone, methanol and water crude extracts and their corresponding solvent fractions showed all to have antioxidant property (Table 1-4). Methanol stem of *Ceiba pentandra* extracts had the highest free radical (DPPH) scavenging ability of 76.4% (100 μ /cm³) Table 2. Followed by the stem extracts of *Anogeissus leiocarpus* with 72.1% and 70.0% respectively Table 2 and Table 3. Ethylacetate roots of *Ceiba pentandra* had the least free radical scavenging action of 29.7% followed by Acetone roots of *Ceiba pentandra* with 31.2% and 34.5% respectively Table 1 and Table 4.

This results is in consonant with the findings of Odugbemi *et al* (2007) on the effects of extraction solvent technique on the antioxidant activity of selected medicinal plants extracts. In the study it was found that extracts

of higher polar solvents has higher free radical scavenging activity. They also stated that resulting antioxidants activities of the plants materials are strongly dependants on the nature of extracting solvent due to the presence of different antioxidant compounds of varied chemical characteristics and polarities that may or may not be soluble in a particular solvent. (Goyal.,2010)

The methanol stem of *Ceiba pentandra* extracts fractions of the crude extracts was found to have the highest DPPH scavenging power of 76.4% (100µg/ml) this shows the extracts to have a very good antioxidant property as the standard, Ascorbic acid shows 93.8% DPPH Scavenging ability (Plate 1).

The DPPH scavenging ability range of 29.7% - 93.8% to that of Ascorbic acid a standard for acetone methanol and water extracts shows that the extracts can be used to manage stress and again in humans. The ethyl acetate roots of *Ceiba pentandra* of the crude extracts showed the least DPPH scavenging ability of 29.7% all the extracts (Table 1). All the solvents fractions of methanol and water extracts show DPPH scavenging ability of up to 50% at the same concentration. The ethyl acetate extracts and acetone being the least polar had the scavenging ability below 50%.

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