QUANTITATIVE INVESTIGATION OF THE METABOLITES OF *Curculigo pilosa* RHIZOMES

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ABSTRACT

Phytochemical screening of the Curculigo pilosa rhizomes using standard methods revealed the presence of flavonoids, terpenoid, saponins, tannins, alkaloid, cardiac glycosides and steroid, anthraquinone was partially present while reducing sugar was absent. The metabolites that analyzed were alkaloids (12.80±0.49), saponins (54.49±0.33), flavonoids (44.88±0.36), tannins (69.49±0.65), phenols (50.40±0.34), oxalates (10.95±0.63), cyanides (44.87±0.70) and phytate (15.00±0.05). These results confirm that the metabolites obtained from this plant is lower in toxicity levels according to World Health Organization safe limits except for tannins, saponins which are slightly above the permissible limit.

Keywords: Phytochemical screening, *Curculigo pilosa*, rhizomes, anti-nutritional parameters

INTRODUCTION

Ever since the dawn of civilization, man has used plants for his food and shelter. Plants were also used for curative purposes and these plants are designated as medicinal plants [1]. Currently 80% of the world population depends on traditional medicine for the primary health care for human alleviation. These medicinal components in the plants help in health benefits beyond basic nutrition [2]. Plants used in the treatment of disease are said to contain active principles which are phytochemicals with biological activity, some of which are responsible for the characteristic odours, pungencies and colours of plants while others give a particular plant its culinary, medicinal or poisonous virtues [3]. The most important of these plants bioactive chemical constituents are alkaloids, saponins, tannins, flavonoids, and phenolic compounds [4]. It is important to study the chemical constituents, safety and efficacy of these complementary and alternative medicine, as well as quality control [5]. Understanding the overall composition and constituents of the medicinal plants is required to optimize its potential as a source of medicine. *Curculigo pilosa* is a medicinal herb that has a wide range of ethnomedical application in Nupe traditional medicine especially for the treatment of venereal diseases.

MATERIALS AND METHODS

Collection of plant sample

Fresh rhizomes of *C. pilosa* were collected from Edozhigi forest along Bida-wuya road, Niger State, Nigeria. The sample was collected in month of June, 2012 and was identified at NIPRD, Idu-Abuja.

Study Area

The present investigation was carried out in Nupeland of the North Central Nigeria. The plant was collected in Edozhigi forest along Bida-wuya road, Niger State, Nigeria. Niger State is located at the North Central region of Nigeria between latitudes 8° 20' N and 11° 20' N and longitude 3° 30' E and 7° 20' E [6].

Preparation of samples

The fresh rhizomes of *C. pilosa* collected from the farm were prepared according to methods described by Edeoga and others [7]. The fresh rhizomes of *C. pilosa* were thoroughly washed with distilled water, air dried at room temperature. These were then ground into uniform powder manually.

Extraction of the plant extract

100g of the pulverized C. *pilosa* rhizome was packed into a thimble before it was placed inside a soxhlet extractor and extracted with methanol for 48h. Resulting solution was then concentrated using a rotary evaporator and evaporated to dryness on a water bath. Extract was weighed and labeled crude methanol extract. The defatted residue material was air-dried and then weighed to calculate percentage recovering.

Partitioning of crude methanol extract

The crude methanol extract was partitioned between two immiscible solvents in a separating funnels. The compounds have a "choice" of two solvents that they can dissolve in. Some compounds dissolve in one solvent and some compounds dissolve in the other solvent. The compounds in the mixture become separated into two groups depending on solubility of the compounds in the solvents used. The solvents used where *n*-hexane, chloroform, ethyl acetate, n-butanol and methanol which

show two layers. The partitioned fractions were concentrated using a rotary evaporator and evaporated to dryness on a water bath.

Phytochemical Screening of the Extracts

Standard methods were used to screen crude methanol extract for their phytoconstiteunts as described by Edeoga *et al.* [7].

Quantitative analysis of the crude methanolic extract

Standard methods were used according to the method of Association of Official Analytical Chemists [8].

RESULTS AND DISCUSSION

Table 1: Qualitative analysis of the Crude Methanolic Extract of *Curculigo pilosa*

Chemical constituent	Test	Observation	Result
Flavonoid	Sodium hydroxide Test	Yellow colouration	+ + +
	Shinoda test	Red orange colour	+ + +
Anthraquinone	Ammonia + filtrate	Violent colouration	+
Tannins	Ferric chloride	Blue-black colouration	+ + +
Alkaloid	Mayer's reagent	Cream colouration	+ +
	Wagner's reagent	Yellow colouration	+
	Marquis reagent	Black precipitate	+
Cardiac glycoside	Lieberman's Burchard test	Reddish precipitate	+ + +
Steroid	Salkowskii's test	Reddish brown ring	+ + +
Saponins	Frothing test	persistence frothing	+ + +
Reducing sugar	Molish test	milky colouration	-
Terpenoid			+ + +

KEY: +++ = High concentration; ++ = Moderate; + = Trace; - = Absent

Table 2: Quantitative analysis of Crude Methanolic Extract of *Curculigo pilosa*

Phytoconstituents	mg/100g
Alkaloids	12.80±0.49
Saponins	54.49±0.33
Flavonoids	44.88±0.36
Tannins	69.49±0.65
Phenols	50.40±0.34
Oxalates	10.95 ±0.63
Cyanides	44.87±0.70
Phytate	15.00± 0.05

Analyses were mean of three replicates ± standard deviations.

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