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PHYTOCHEMICAL ANALYSES OF ETHANOL AND WATER EXTRACTS OF MILLETTIA ABOENSIS, CUSCUTA REFLEXA, DANIELLA OLIVERI AND SYNCLISIA SCABRIDA

ADONU CYRIL C*, UGWUEZE MERCY E, AND OZIOKO CHIZOBA A

Department of Pharmaceutics, Universiy of Nigeria,Nsukka, Enugu state, Nigeria.

***Corresponding Author Email:** *adonucyril@gmail.com and +2348063889880*

ABSTRACT

Phytochemical constituents are responsible for medicinal effects produced by plants. The aim of this study is to evaluate the phytochemical components in ethanol and water extracts of Millettia aboensis, Cuscuta reflexa, Daniella oliveri and Synclisia scabrida. The roots of Millettia aboensis and Synclisia scabrida ,aerial parts of Cuscuta reflexa, and leaves of Daniella oliveri were shade dried, pulverized and extracted with alcohol (90% v/v) and sterile distilled water. The phytochemical analyses of these extracts were carried out using standard procedures. The results of phytochemical analysis of both extracts of Millettia aboensis root show that the aqueous extract contained high amount of saponnins, resins, proteins and amino acid and carbohydrate while ethanolic extract has high amount of flavonoids, alkaloids, steroids, and terpenoids. The ethanolic extracts of Cuscuta reflexa, Daniella oliveri and Synclisia scabrida contain copious amount of flavonoids,alkaloids and steroids.

KEY WORDS

Phytochemical, Millettia aboensis, Cuscuta reflexa, Daniella oliveria Synclisia scabrida flavonoids,alkaloids.

INTRODUCTION

Phytochemicals are non-nutritive chemicals that have protective or disease preventive property. It refers to every naturally occurring chemical presents in plants. Plants are also the source for many modern pharmaceuticals (drugs). The most important of these phytochemicals are alkaloids, flavonoids, tannins and phenolic compounds [1]. Many of these indigenous plants are used as spices and food plants. Current research has shown that polyphenols contribute to the prevention of cardiovascular diseases, cancers, osteoporosis and antioxidant character with potential health benefits [2-4]. They are known to have beneficial effects on cardio vascular system [5-7]. and have a role in the prevention of neurodegenerative diseases and diabetes mellitu.

Medicinal plants such as *Millettia aboensis* Cuscuta reflexa, Daniella oliveri and Synclisia scabrida are of great importance to the health of individuals and communities.

Millettia aboensis are small trees of 30–40 feet high and up to 2 feet in girth but usually 12 m high with reddish-brown pubescence on the petioles, branches, inflorescence and fruits. They are found commonly in low land rain forest. The flowers are purple in erect woody racemes up to 18 in. long. It has conspicuously rusty-hairy leaves and handsome purple flowers in erect terminal racemes at branch .Almost all the part of Millettia aboensis (uturuekpa) has medicinal properties. The leaf is used by traditional herbalist for general healing including ulcer healing and laxatives while the root is used in treating gastro intestinal disturbances and liver

disease. Also the leaf, stem and roots mixed with other plant materials (herbs) is used to cure veneral diseases such as gonorrhoea, syphilis etc. Cuscuta reflexa is identified by its thin stems appearing leafless, with the leaves reduced to minute scale. It has very low levels of chlorophyll and can photosynthesize slightly. It belongs to the morning glory family, Convolvulaceae, on the basis of the work of the Angiosperm Phylogeny Group.[8] It is found throughout the temperate to tropical regions of the world, with the greatest species diversity in subtropical and tropical regions .It has common names as devil's ringlet, goldthread, hailweed, airweed, hellbine, love vine, devil's guts, devil's hair, angel hair, and witch's hair.

The petroleum ether extract of *C. reflexa* may be useful in treatment of androgen induced alopecia by inhibiting the enzyme 5alpha-reductase. [9]. The Cuscuta reflexa has been investigated to have the following medicinal effects-bradycardiac [10], antisteroidogenic [11], antihypertensive, psychopharmacological [12] antiviral and anticonvulsant [13] effects. Daniella oliveri is a deciduous tree up to 25-35m tall; bole straight and cylindrical up to 200m in diameter,without buttresses; bark surface smooth. Daniella oliveri is a fast growing tree which occur in tree savanna, bush savanna and in more open grassland on any type of soil, its gum and bark and to a lesser extent the root and the leaves, are widely used in traditional medicine. It has many vernacular names- West African copal tree, Africa copaiba balsam, ilorin balsam, Accra copal, Benin gum copal. Synclisia scabrida Miers(family MENISPERMACEAE) is aslender liane of the rainforest , occurring in Southern Nigeria and Western camerouns to Angola. The root is used in Southeast Nigeria to treat malaria and in some other parts of Nigeria, by local doctors for mental disorders. The study was conducted to analyse ethanol and water extracts of Millettia aboensis, Cuscuta reflexa, Daniella oliveri and Synclisia scabrida.

MATERIALS AND METHODS

Plant Material

The roots of *Millettia aboensis and* Synclisia scabrida were harvested from Ehandiagu, while the aerial parts of Cuscuta reflexa, and leaves of Daniella oliveri were got from uzouwani, both in Nsukka, Enugu State, Nigeria. The plants materials were authenticated by Mr. A. Ozioko of Bioresource Development and Conservative Programme (BDCP) Nsukka, Enugu State.

Chemicals: The chemicals used in this study were of analytical grade products of BDH, England nd Sigma Aldrich, Germany.

Extraction of plant materials: The plants parts were shade - dried and pulverized to coarse powder using an electrically operated mill. They were all extracted with 90 % ethanol in soxhlet extractor, concentrated under vacuum. The aqueous extraction was done by 24 h maceration, then filtered and dried.

Phytochemicals analysis

The phytochemical analyses of all the plants parts were carried out using standard procedures [14, 15].

Determination of yield of the extracts

The percentage yield of the extracts were determined by weighing the coarse plants parts before extraction and after concentration and calculated using the formula

$$\text{Percentage yield (\%)} = \frac{\text{Weight (g) of the concentrated extracts}}{\text{Weight (g) of the ground}} \times 100$$

RESULTS

Percentage Yield of the Extracts

Table 1: Results of Percentage Yield of all the Extracts Studied.

Plant	Part	Percentage yield of the extracts (%)	Percentage yield of the extract (%)
		Ethanol	Water
Millettia aboensis	Root	45.93	49.02
Synclisia Scarbrida	Root	14.87	19.60
Cascuta reflexa	Aerial Parts	6.03	11.33
Daniella oliveri	Leaves	17.64	28.94

The percentage yields of all the water extracts are greater than those of the ethanol extracts. The yields of the root extracts of Millettia aboensis are the greatest compared with all other extracts.

PHYTOCHEMICAL ANALYSIS

Preliminary phytochemical investigation-

The preliminary phytochemical investigation of the extracts revealed the phytoconstituents presented in **Tables 2 & 3**

Table 2: Result of Phytochemical Composition of the Roots Extracts of Millettia aboensis and Synclisia scarbrida.

Phytoconstituent	Millettia aboensia		Synclisis scarbrida	
	EM	AM	ES	AS
Flavonoids	+++	+	+++	++
Saponins	+	+++	+	+++
Glycosides	+++	+++	—	++
Tannins	—	—	++	—
Carbohydrates	++	+++	—	++
Steroids	++	+	+	+
Proteins	+	+++	++	+
Acidic Compounds	—	—	—	—
Alkaloids	+++		++	+++
Resins	—	—	—	+
Terpenoids	+++	++	—	+

KEY:

E.M = Ethanol extracts of Millettia aboensis
AM = Aqueous Extract of Millettia aboensis
ES = Ethanol extracts of Synclisia scarbrida
AS = Aqueous extract of Synclisia scarbrida.

Table 3: Results of Phytochemical Composition of Leaf Extracts of Daniella Oliveri and Aerial Parts of Cuscuta Reflexa.

Phytoconstituent	Daniella oliveri		Cuscuta reflexa	
	ED	AD	EC	AC
Flavonoids	+	+	++	++
Saponins	+++	+++	++	++
Glycosides	—	—	—	—
Tannins	+++	—	—	—
Carbohydrates	+	++	—	+
Steroids	+	+	+	—
Proteins	—	++	+	+
Acidic Compound	—	+	+	—
Alkaloids	++	++	+	+
Resins	+	++	—	—
Terpenoids	+	+	++	++

KEY:

E.D = Ethanol extracts of Daniella oliveri
A.D = Aqueous extract of Daniella oliveri
EC = Ethanol extracts of Cuscuta reflexa
AC = Aqueous extracts of Cuscuta reflexa

DISCUSSION

The results of phytochemical analyses of all the extracts are shown in **Tables 2 & 3.** The aqueous root extract of Millettia aboensis contained high amount of saponnins, resins, proteins and amino acid and carbohydrate while ethanolic extract has high amount of flavonoids, alkaloids, steroids, and terpenoids. Both extracts have equal amount of glycosides and reducing sugar and absence of tannins, acid compounds and fats and oil. The presence of these aforementioned phyto-components bestow high medicinal importance on Millettia aboensis.

Daniella oliveri leaf water extract revealed the presense of saponins, terpenoids proteins carbohydrates, acidic and lipids components while the ethanol extracts reveals the presence of alkaloids, steroids, and tannins in copious amounts, saponins and flavonoids in moderate amounts and terpenoids, reducing sugars, resins, lipids and carbohydrate in slight amounts. Proteins and glycosides were not found in the ethanol extracts. The good medicinal qualities possessed by Daniella oliveri leaves are accounted for by the presence of such

phytochemicals as alkaloids, terpenoids flavonoids saponins and steroids.

The aqueous and ethanolic extracts of aerial parts of Cuscuta reflexa revealed the presence of steroids, saponins, terpenoids and flavonoids. The presence of these phytochemicals in Cuscuta reflexa accounts for the diuretic [16], antispasmodic [9] and many pharmacologic activities found with this plant.

The aqueous and ethanolic root extracts of Synclisia scabrida showed the presence of copious amount of alkaloids, flavonoids and tannins. The ethanolic extracts,in addition, showed the presence of proteins, saponins and lipids in moderate to slight amounts.

Many researchers have discovered plants to be rich in secondary metabolites like tannins, alkaloids, flavonoids, phenols, steroids, and volatile oils, which are responsible for their therapeutic activities [17,18]. Most natural alkaloids and their derivatives are used as basic medicinal agents for their analgesic and antibacterial effects. They exibit marked physiological activity when administered to animals. Flavonoids are potent water soluble antioxidants and free radical scavengers which prevent oxidative cell damage [19]. Flavonoids in the intestinal tract lower the risk of diseases associated with oxidation (heart disease) [19]. Reports have indicated that flavonoids contributed to the hepatoprotective effect of the plant extracts.

CONCLUSION

Both the ethanol and aqueous extracts of Millettia aboensis, Cuscuta reflexa, Daniella oliveri and Synclisia scabrida revealed the presence many phytconstituents with good medicinal qualities. The medicinal value of these plants lies in those components t produce a definite physiological action on the human body.

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***Corresponding Author:**
ADONU CYRIL C*
Department of Pharmaceutics,
Universiy of Nigeria,Nsukka, Enugu state, Nigeria.