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ETHNOMEDICINAL AND PHYTOCHEMICAL PROPERTIES OF *UVARIA AFZELII* SC. ELLIOT (PUSS FINGER) AND *UVARIA CHAMAE* P-BEAUV *(*FINGER ROOT*)* IN IBADAN METROPOLIS

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Abstract:
The study investigated the ethno-medicinal and phytochemical properties of Uvaria. chamae and U. afzelii within Ibadan metropolis. The bark of Uvaria species were collected from the wild in Sanu village in Akinyele local Government and air dried at room temperature for fourteen days then milled into uniform powder. Thereafter, phytochemical analysis was carried out on the samples following routine procedures. Also, a questionnaire-guided ethno-medicinal survey was in five markets from four randomly selected Local Government Areas in Ibadan were. Data generated were analyzed using descriptive statistics such as frequencies and percentages. Chi-square test was used to test for significance association between variables. The result of the phytochemical properties from the study indicates that U. afzelii had greater saponin (0.31 mg/g) and flavonoid (0.12 mg/g) than U. chamae (saponin: 0.28 mg/g; flavonoid: 0.11 mg/g). while U. chamae possess more quantity of tannins (0.11gm/g) than U. afzelii (0.04mg/g). It was observed that 52% of the respondents had no-formal education. The study shows a significant association between socio-economic characteristics of the respondents and their ethnomedicinal uses of the plants. The medicinal potentials of U. chamae and U. afzelii as revealed from this study is enough evidence for its importance as one of the alternative remedies to orthodox medicine, hence it is highly important to cultivate the herbs and conserve the ones in the wild.

Keywords: Geo-statistics, Interpolation, Kriging, Variogram, Estimation.

Introduction

The use of medicinal plant as a source of relief from illness is as old as humankind. According to WHO (1991), 80% of the world population uses medicinal plants for treating disease, while 80% of African uses traditional medicine for primary health care (WHO, 2003). Historically, humankind depends on timber mostly more that non-timber forest product (NTFPS) probably because they did not know the usefulness of these products. But today the demand from forestry practice has gone beyond the production of only wood products. The non-timber forest products include food, medicinal plants, herbs, shrubs, oil, resin, tannin, sponge, rope and so on (Omoluabi and Okafor, 1994).

It is believed that for every health disorder, there exist a plant that could cure the ailment (Barbara and Thesis, 1989). At times, some of these medicinal plants are so effective that their application could prevent surgical operation usually prescribe by orthodox medicine. For instance, cancer, fibroid, hernia that may require surgical operation could be cured ethno- botanically without operation (Adebisi, 2008).

The phytochemical constituent of a plant will often determine the physiological action on human body (Ayoola *et al*, 2008). Phytochemical like alkaloid, tannin, saponin, flavonoid, cynogenic glycosides, cardiac glycoside, anthraquinones have various health benefits. They have been found to possess anti-malaria, anti-diabetic, anti-microbial, ant-inflammatory, anti-cancer, and anti-hypertensive effect

(Trease and Evans, 2005). As plant continue to be major source of drugs for the world populations, substances derived from higher plant alone constitute about 25% of prescribed medicine (Hanbugar and Hostettman, 1991). Harbone (1973) reported that approximately half of about 250,000 flowering plant species occurring globally is found in the tropical forests which continue to produce natural products with valuable compound for the development of new drugs.

Uvaria chamae P. Beauv, commonly known as a finger root Eru-iju by the Yoruba. belongs to Annonaceae family, *Uchamae* is an evergreen plant, scandent shrub which grows to a height of 3.6 - 4.5m. Leaves are aromatic, apex, stipulate, alternate, glossy, glabrous and the flower are fragrant, yellowish in colour, fruit are edible, (Bonger *et al*, 2005; Odungbemi 2008). It is a small tree native to the tropical rain forest of West Africa and Central Africa, where it grows in wet coastal shrub land, it is distributed from Guinea, Senegal, Zaire, to Southern Nigeria. (Arbonnier 2004). Burkill (1985) reported that the root has a wide spread reputation, it is taken internally for bronchitis, gonorrhea, catarrhal inflammation in Nigeria. The root (pounded or pulverized) is used for the treatment of nose bleeding, heart diseases (bronchi, lungs etc.) and blood in the urine, pile, and fever (Etukudo, 2003; Iwu 1993; Adam and Moss, 1999). *U. chamae* play antibacterial and antioxidant role in prevention cancer inflammation cardiovascular diseases (Varban *et al*, 2009).
Uvaria afzelii Sc. Elliot are plant species which belong to Annonaceae family. Its' 'common name is "Puss Finger" and it is called "Gbongbonse" by the Yoruba. It is a scrambling shrub or small tree up to 5m high, of secondary shrub, occurring from Guinea southern Nigeria (Burkill 1985; Odugbemi, 2008). Burkill (1985) reported that *Uafzelii* is used for treating gonorrhea, bladder, kidney, stomach ache and the root is used as an antidote against food poison.

Even though most Nigerian depend largely on medicinal plants in their environment more than western drugs, the potential of such plants as source of drugs are yet to be fully exploited. Medicinal plants are resources of new drugs and many of the modern medicines are produced indirectly from plants. (Saleh *et al* 2015).

There is need to gather information on Nigeria ethno-medicinal plants. However, the availability of these medicinal or herbal plants is being threatened due to deforestation, urbanization, and conversion of forest land to Agricultural land, many of these plant species are in wild, semi-cultivated, cultivated domestically, some of these medicinal plants have gone to extinction. Medicinal plant has been used for various ailments such as asthma, blood disorder, cancer, fibroid, and arthritis, to mention but few (Duke, 1987; Adeniji, 2004; Odugbemi, 2008). This study is aimed at determined bio-active constituent presents in *U. afzelii* and *U. chamae* as well as their ethno-medicinal uses.

Materials and Methods

Materials

Root bark of *Uvaria* species, Plastic container, Plain paper, Mortar, and pestle

Methodology

The bark of *Uvaria* species was collected from Sanu village in Akinyele Local Government Area within Ibadan metropolis. The plant sample was then air dried at room temperature for fourteen days and milled into uniform powder. The phytochemical analysis was carryout in Forestry Research Institute of Nigerian, Jericho Ibadan following standard laboratory procedures. Also, oral interview and questionnaire were administred to herbal sellers in each of the markets.

Area of study

The research was carried out in Ibadan, the capital of Oyo State which has dry and wet seasons. The wet season is between April and November and the rainfall is 1,200mm per annum while the dry season is

between November and March. The vegetation is lowland rainforest bounded in the North side by the derived savannah (Adebayo *et al* 2003).

Sampling Techniques

Ethnobotanical survey aspect of the study was carried out in some selected markets within Ibadan metropolis. These include Eleyele, Alesinloye, Oja-oba, Oje, and Bode.

Method of data Collection

A total number of 50 copies (10 per market) of structured questionnaire were administered randomly to respondents in each market that are directly engaged/involved in herb selling. These markets were zone as follows:

Zone 1: Eleyele market – Ibadan North West LGA
Zone 2: Oja Oba market – Ibadan South East LGA
Zone 3: Oje market – Ibadan North East LGA
Zone 4: Bode \Alesinloye market – Ibadan South West LGA

Quantitative and qualitative analysis of phytochemical constituent:

Determination of Tannins

Tanin determination was carried out using the method of Harborne (1984) as described by Sha'a et al, (2019). About 1 g of powdered sample was boiled in 10 mL distilled water, filtered when hot and cooled. The filtrate was adjusted to 10mL with distilled water. Then, a few drops of 1% ferric chloride reagent were added to 1 mL of the filtrate. The mixture was observed for the formation of blue, dark brown, blue black, green, or green-black coloration or precipitate.

Determination of Flavonoid

Flavonoid determination was carried out using the method of Harborne (1984) as described by Sha'a et al, (2019). About 1 g of plant material was boiled with 10 mL of ethanol

a) Two drops of ferric chloride were added to 5mL of the extract. A dusty green color was considered positive.
b) a small quantity of dilute NaOH was added to 5mL of the extract and drops of Conc. HCl were run down the side of the tube. A reddish coloration indicated the presence of flavonoid.

Determination of Cyanogenic Glycosides

Ethanol extract (0.2 g) was dissolved in 1 mL acetic anhydride and then 1 mL of dichloromethane. The solution was transferred into a dry test tube and by the means of pipette, 2 mL of concentrated sulphuric acid was added to the solution. At the contact zone of the two liquids, a brownish-red ring is formed; the supernatant layer became greenish denoting presence of sterols and triterpenes (Cho et al, 2013).

Determination of Cardiac Glycoside

A powdered sample (1 g) was extracted with 10 mL of 80% ethanol for 5 minutes on a water bath. The extract was filtered and diluted with equal volume of distilled water. A few drops of lead acetate solution were added, shaken, and filtered after standing for few minutes. The filtrate was then extracted with aliquots of chloroform, the extract was divided into two portions in evaporating dish and evaporated to dryness on a steam bath (Auwal et al, 2014).

(a) Keller-Killiani Test

(b)Kedde Test

The second portion was mixed with 1 mL of 2% 3, 5-dinitrobenzoic acid in ethanol. The solution was made alkaline with 5% NaOH after mixing. The formation of a transient purple colour, which turned brown on standing, was considered positive (Trease and Evans, 1989).

Determination of Anthraquuineone

Anthraquuineone determination was carried out using the method described by Auwal et al, (2014). Powdered sample (1 g) was boiled with 5 mL of 10% HCl for 5 minutes and filtered while hot. The cooled filtrate was partitioned against equal volumes of Chloroform (2 vols.) avoiding vigorous shaking. A clean pipette was then used to transfer the chloroform layer to a clean tube taking care not to include the aqueous layer. An equal volume of 10% ammonia was added to the chloroform extract. A pink, red or violet colour in the aqueous layer was considered positive.

Data Analysis

Data generated from the study were analyzed using descriptive statistics such as frequency, percentage, statistical mean. Chi-Square Test was used to test for significance relationship between variables. All statistical analysis was carried out using Statistical Package for Social Sciences (SPSS) version 20.

Results and Discussion

Table 1: Mean value of (mg / g) of the phytochemical component of *Uvaria afzelii* and *Uvaria chamae*

Phytochemical	***Uvaria afzelii* (Puss finger)**		***Uvaria chamae* (bush banana)**	
	Mg / g	**Relative % of mean**	**Mg / g**	**Relative % of mean**
Saponin	0.31	67.39	0.28	54.90
Flavonoid	0.11	23.31	0.12	23.53
Tannins	0.04	8.70	0.11	21.57
Anthraquinones	-	-	-	-
Cynogenic glycoside	---	---	---	---
Cardiac glycoside	---	---	---	---
Total	0.46	100	0.51	100

From the table, it was observed that saponin content in both *U. afzelii* (0.31 mg/g) and *U. Chamae* (0.28 mg/g) is considerably high. The identification of abundant presence of saponin in the root of the both plants may be responsible for their haemostatic activity where they arrest bleeding from damage or injured vessel. The presence of saponin in both plants agrees with work of George (1999) who observed that many plants produce saponin had these properties antifungal, antibacterial, diuretic, expectorant, analgesic, and healing characteristics. The results of the phytochemical analysis are like the findngs of Okwu and Iroabuchi (2004) where saponin was reported to be present in *U. chamae*.

Flavonoid was observed to be more in *U. chamae* (0.12 mg/g) than *U. afzelii* (0.11 mg/g). This is line with the report of Selamoglu (2016), who stated that Flavonoids are found ubiquitously in plants as a member of polyphenolic compounds which share diverse chemical structure and properties are known to have potent antioxidant activity due to intracellular free radical scavenging capacities. These protect cell against damage and improve exchange of nutrient and oxygen between the blood tissues, they also reinforce capillary walls. This also agreed with the finding of Amakoha *et al (*2002) who reported that present of flavonoid appear to protect the tiny capillaries that carry oxygen.

Also, from the study, both plants possess tannin in considerable quantity though *U. chamae* possess more quantity of tannins (0.11mg/g) than *U. afzelii* (0.04mg/g). Hassan *et al*, (2012) reported that Tannins are important compounds known to be potent cyclooxygenase-1 inhibitors and with anti-phlogistic activity. The mechanisms of anti-inflammatory activity may be related to the anti-phlogistic action of the tannins. The presence of tannin in both plants may account for their use as anti-inflammatory agents, cure for swelling, ulcer and stomach ache.

Table 2: Socio-Demographic characteristics of the respondents

Variable	Frequency	Percentage
GENDER		
Male	3	6.0
Female	47	94.0
Total	50	100.0
EDUCATIONAL LEVEL		
Non – formal Education	24	48.0
Primary Education	16	32.0
Secondary Education	8	16.0
Tertiary Education	2	4.0
Total	**50**	**100**

From the survey, the demographic characteristics of the respondents such as gender and education level, were considered. From the survey, female respondents (94%) accounts for the highest population and this agrees with the work of Oladeji and Agbelusi (2017) who reported that females engage more in the sales of herbal medicine than males. This may be since herb selling is considered a female job. Findings of the study revealed that 52% of the respondents had non-formal education, 28% had primary education, 16 % had secondary education, while only 2% had tertiary education. This implies that majority are illiterate in the business. According to Yakubu *et al.* (2001) it was observed that illiterates participated more in the business of herb than the literate.

Table 3: Frequency of from of application of *U. chamae* and *U. afzelii* for treatment

Variable	Frequency	Percentages
Powder	13	26.0
Boiling	30	60.0
Soaking	7	14.0
Total	50	100.0

In ethno-medicine, the mode of application of the herbal material is quite important. This study has revealed that in order of greatest importance, herbal sellers use *U. chamae* and *U. afzelii*in form of boiling and powder. This order supports the fact that boiling and powder will have longer shelf–life than either soaking or plant juice according to Sofowora (1993).

Table 4: Chi-square analysis showing relationship between the respondents' level of perception of ethno-medicinal uses of *Uvaria* species and their socio-economics characteristic

Socio-Economic value	Chi-square value	DF	Asymptotic value	Decision
Gender	38.720	1	0.000**	Significant
Educational status	22.000	3	0.000**	Significant

*** Significant and NS - Not Significant at $p < 0.05$*

From the Table chi-square analysis for gender, and education status of the respondents has a significant association with ethnomedicinal uses of both plants in this study. This implies that the ethnomedicinal uses of the plants are based on the socio-economic factors and this agrees with the observation of Adebisi (2008).

The importance of *U. afzelii* and *U. chamae* in curing ailments cannot be overemphasized as important phytochemicals like saponin, flavonoid, and tannin were present in the two plants in considerable

quantity, hence their high medicinal potentials. The result also showed that age, gender, marital status, education status, primary occupation of the respondents has significant association with the ethnomedicinal uses of *U. chamae* and *U. afzelii* in this study The medicinal potential of both plants as revealed from the study will help to preserve our cultural heritage and its impact will help to ameliorate diseases for the future development of our traditional medicine. Therefore, *U. chamae* and *U. afzelii* should be cultivated and be conserved as an alternative remedy to orthodox medicine. There should be an intensive awareness on usage and efficiency of forest trees like *U. chamae* and *U. afzelii* as alternative therapy.

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