

ISSN 0795 - 0128



NIGERIAN JOURNAL OF BOTANY

VOLUME 19 (1)

JUNE 2006

Published by

THE BOTANICAL SOCIETY OF NIGERIA

Nigerian Journal of Botany, Volume 19 (1), 99-102, June 2006

CHEMOTAXONOMIC STUDY OF *LASIANATHERA AFRICANA* (ICACINACEAE) IN AKWA IBOM STATE OF NIGERIA

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Received 6th April, 2005; accepted 18th January, 2006

ABSTRACT

A phytochemical study of the four ethnovarieties of *Lasianthera africana* P. Beauv. in Akwa Ibom State of Nigeria was carried out. Results show that all the four ethnovarieties contain the following six chemical constituents: alkaloids, anthraquinones, flavonoids, glycosides, phlobatannins, saponins and tannins. However, cardiac glycosides and terpenes are present in three of the ethnovarieties ('afia', 'akai' and 'obubit'), but lacking in only the 'idim' variety. The taxonomic implications of these results are discussed.

Keywords: Chemotaxonomy, *Lasianthera africana*, Icacinaceae

INTRODUCTION

Lasianthera africana P. Beauv. belongs to the family Icacinaceae. It is called "editan" by the Ibibio people of Akwa Ibom State. It is a perennial, glabrous, shrub that reaches a height of 61- 136cm (Hutchinson and Dalziel, 1973). In West Africa, only one species has been recorded for the genus. Among the Ibibios, four (4) local varieties are known. These include the "afia", "idim", "akai" and "obubit" varieties. The "akai" variety, as the name implies, is found in high forests. The "afia" variety, has characteristic light, glossy, green leaves and is used in wound healing. The "obubit" variety has typically dark, glossy, green, leaves and is widely used in laxative preparations for stomach disorders. The "idim" variety occurs in freshwater wetlands in the State. The leaves of all 4 ethnovarieties are eaten by the Ibibios. However, the "idim" and "afia" varieties are preferred and frequently brought into cultivation near family homesteads.

Sofowora (1989), reported that the leaves are highly nutritive and are used in traditional concoctions for the treatment of ailments like constipation and general stomach aches. Inyang (1999) reported that chewing the stem helps in the control of tooth decay. Lewis (1977), stated that it promotes expectoration. Both leaves and stems are suspected to be rich in chemical compounds of nutritional and medicinal importance (Ebana *et al.*, 1996).

Among the Ibibio of Akwa Ibom State of Nigeria the "idim" variety of *L. africana* has been reported by Bassey and Ekpo (2004) as being used as fence posts. The fibers of the decayed wood are also used as a sponge. The plant is largely harvested in the wild though cultivated.

Hayes and Goh (1980), stated that bioactive substances or components in plants vary among different plant species with age and environmental diversity. The complexity and variation of plant bioactive constituents necessitated this study. The objective of this research is to ascertain the taxonomic validity or otherwise of the recognized ethnovarieties.

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MATERIALS AND METHODS

Twigs of the four ethnovarieties were collected from their natural locations during the same period.

The sample areas were Ndiya Ikot Imoh (Ini Local Government Area) Ibiaku Ntok Okpo (Ikono Local Government Area) and Etinan (Etinan Local Government Area). Each variety was identified and voucher specimens deposited in the University of Uyo Herbarium (UUH).

After identification the leaves were washed and destalked. 50g of the leaves were macerated in 96% ethanol using a pestle and a mortar. This was allowed to stand for 72hrs. The extract was thereafter filtered and evaporated to dryness using a rotary evaporator and later, an exhort extraction machine. Residue yield was noted and a portion was used for the phytochemical screening.

Phytochemical screening was done for saponins using the Frothing Test according to Trease and Evans (1989). Fehlings Test and Sodium Bicarbonate Test for saponins were according to Harborne (1973). Tests for tannins, Shinodas Test for flavonoids, test for phlobatannins and confirmatory test for tannins and cyanogenic glycosides were done as reported in Trease and Evans (1989). The Sodium Hydroxide Test for flavonoids, Test for alkaloids, Borntragers Test for anthraquinones, Tests, for cardiac glycosides and terpenes were done according to Harborne (1973).

RESULTS

The result of the preliminary phytochemical screening of the 4 ethnovarieties of *L. africana* found in Akwa Ibom State Nigeria are summarized in Table 1.

The analyses showed that saponins, tannins, phlobotanins, flavonoids, alkaloids, Anthraquinones, cyanogenic glycosides were present in all the ethnovarieties but at varying levels. Cardiac, glycosides and terpenes and gallitanins were lacking only in the "idim" variety. Catechin was completely lacking in all varieties and anthraquinone levels were the same in all the four varieties.

TABLE 1: Summary of Preliminary Phytochemical Test in *L. africana*

CHEMICAL COMPONENT	PHYTOCHEMICAL TEST DONE	ETHNOVARIETIES OF <i>L. AFRICANA</i>			
		'akai'	'afia'	'obubit'	'idim'
SAPONINS	Frothing Test	++	++	+++	+
	Fehlings solution + heat + extract	++	++	+++	+++
	Sodium bicarbonate Test	+	++	+++	++
TANNINS	Aqueous extract + Bromine water	++	++	++	++
	Extract + 5% Ferric Chloride	+	+++	++++	++
	Test for chlorogenic acid	+	++	-	++++
	Test for gallitanins	++++	++	++	-
	Test for catechin	-	-	-	-
PHLOBATANNINS	Extract 1% HCL + heat	++++	+	++	++
	Shinodas Test	+	+	++	+
FLAVONOIDS	Sodium hydroxide Test	+++	+++	+++	++
	Dragendorffs Test	+	+++	++++	+++
ALKALOIDS	Meyers Test	++	+++	+++	++
	Hagers Test	-	++	++	+++
	Borntragers Test	++	++	++	++
ANTHRAQUINONES	Salkowski Test	++	+	+	-
	Keller kiliani Test	+	-	-	-
	Lieberman's test	++++	+	++	-
CARDIAC GLYCOSIDES	Test for cyanogenic glycosides	++	++++	+++	+
	Extract + glacial acetic acid + conc sulphuric acid	++	+	+	-
SPECIFIC TESTS					
TERPENES					
KEY	++++ Very high content	++	Moderate	-	No content
	+++ Moderately high content	+	content		
			Low content		

DISCUSSION

The results of this study indicate that each of the four ethnovarieties of *L. africana* contains alkaloids, anthraquinones, flavonoids, flobatannins, saponins and tannins. The presence of the six compounds in each of the four ethnovarieties seems to justify their being grouped into one species. However, the presence and absence of cardiac glycosides and terpenes in the four ethnovarieties seem to divide them into two groups. One group comprising the 'afia', the 'akai' and the 'obubit' ethnovarieties contains the two chemical compounds, cardiac glycosides and terpenes. The 'idim' ethnovariety, which lacks the two chemical constituents, is alone in the second group. A similar grouping of the four ethnovarieties into two taxa had earlier been carried out by Bassey and Sunday (2002) on anatomical grounds, and by Bassey *et al.* (2004) on morphological grounds.

The ethnovarieties on the other hand, were recognized on the basis of two sets of characters, habitat and colour. Whereas habitat is the basis for the recognition of the forest ('akai') and the riverine ('idim') varieties, colour is responsible for the establishment of the black ('obubit') and the white ('afia') varieties. In taxonomy, no single character, colour or habitat can separate members of the species into four ethnovarieties. This explains why folk taxonomy is unacceptable. From the results of this study, presence and absence of terpenes, alone can separate members of the species into two groups. Based on habitat also, the two recognized groups are ecologically segregated into land ('afia', 'akai' and 'obubit' varieties) and riverine ('idim' variety) dwellers.

CONCLUSION

The results of this study show that two distinct taxa are present in *L. africana*. The taxonomic position and the nomenclatures of these taxa will be considered in a subsequent paper.

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