

Medicinal and Cultural Utilization of *Spondias mombin* and *Rauvolfia vomitoria* in Ejigbo Nigeria

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Abstract: Plants are crucial in human health and welfare especially in the developing African countries. Medicinal and cultural importance of *Spondias mombin* and *Rauvolfia vomitoria* were investigated in this study. A pre-tested questionnaire was used to extract information from Ninety nine (99) purposively selected informants in six communities. Resulting data was analyzed using simple frequency, utilization tables, charts and Pearson correlation analysis on SPSS package. Results showed that 93.9% and 97.0% of the respondents have lived in the area for more than five years and are familiar with the study plants respectively. Ethno-medicinal citations revealed stomach disorder (11) and Malaria (9) as the main uses of *S. mombin* while Malaria (18) and Hemorrhoid (10) are the main ailments managed with *R. vomitoria*. Non-medicinal uses include; live fences, shade for artisans, edible fruits, carving farm implements handles, local building construction and dye production. There is a significant positive correlation (0.637) in the utilization awareness of *S. mombin* and *R. vomitoria*. The plants are perceived to be scarce in the wild while roots were mostly used for local medicine. The two plant species have potentials for development of affordable drugs to stem prevalent malaria infections. Domestication, sustainable harvesting and further research into conservation of the plant species are recommended.

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INTRODUCTION

Plants play significant roles in human health and welfare; they yields foods, fibre, wood for shelter, medicine, raw materials for industries, environmental amelioration, religious, socio-cultural and ceremonial functions. Utilization of plants for medicinal purpose had been a major aspect of socio-cultural heritage in Africa for centuries before the introduction of orthodox medicine in the region (Elujoba *et al.*, 2005). There is increased interest in the use of traditional botanic knowledge as instrument in bio-prospecting of useful plants for human and animal medicine globally. This results in ethno-medicinal research methods and techniques which contribute to the validation and development of new plant based drugs (Slikkerveer, 2001; Quah, 2003; Majali *et al.*, 2015). Important local medicinal plants have been surveyed and documented in different cultures with the aim of developing novel drugs to treat debilitating diseases such as cancer, diabetes mellitus and hypertension amongst others (Ajibesin *et al.*, 2008). Up till now, large percentage of populations in developing countries relies on local medicinal plants for health care delivery (Kamboj, 2000; Etukudo, 2003). Gureje *et al.*, (2015) and Bent (2008) observed that complementary and alternative medicine enjoy about 50% and 20% patronage in Australia and USA respectively while

in Nigeria, traditional bone setters (TBS) provide about 70%–90% of primary fracture care (Omololu *et al.*, 2008). WHO (2002) opined that about 80% of persons in developing African countries visit herbal medicine practitioners for treatment of certain diseases such as sexually related diseases and other chronic ailments after consulting orthodox hospitals. Use of plant for medicine is usually associated with cultural beliefs and heritages especially in sub-Sahara West Africa. Generally, use of plants is not restricted to medicine, plants and plant products are utilized in numerous ways such as shelter, domestic utensils and instruments, souvenirs, decorations, religious and ceremonial functions locally.

Spondias mombin Linn (Anacardiaceae) commonly known as Hog plum grows well in secondary or disturbed rain forests and coastal areas of Nigeria. *S. mombin* is found in most tropical regions of the world. Among the Yoruba folks it is known as Iyeye, Ekika or Okika in south west Nigeria and Uvuru or Ichikara among the Igbos of south east Nigeria. Mature tree usually possess massive branches and can reach a height of 15 – 22m; trunk has deep incisions in the bark, which often produces a brown resinous substance. Adedokun *et al.*, (2010) reported that *Spondias mombin* is commonly planted for shade, live fences, fruits and shelter by artisans. The fruits are edible and

sometimes called monkey-plum, but the wood is of low quality and used to make huts, garden poles, axe and hoe handles (Uchendu and Thomas, 2008). The plant can be propagated by seeds and stem cuttings while the leaves and roots are used as medicine locally to treat diarrhoea, dysentery and athlete's foot in Edo state, Nigeria (Ayoka *et al.*, 2008).

Rauvolfia vomitoria Afzel. (Apocynaceae) is widely distributed in the rain forest especially in secondary forests and prolonged fallow lands. It is commonly known as serpent wood, swizzle stick (English) and locally called Asofeyeje (Yoruba), Akanta (Igbo) and Wada (Hausa) (Ekutudo, 2003). *Rauvolfia vomitoria* is a shrub or small tree up to 8m. Flowers are minute, sweet-scented; branches of inflorescences are distinctly superfluous with hardly any free corolla lobes. Fruits are fleshly, green when young and red in maturity (Blumenthal *et al.*, 1998). Locally *R. vomitoria* is used in the management of several ailments such as psychiatric problems, diabetics, Jaundice, malaria, and venereal diseases (Bisong *et al.*, 2011; Odugbemi *et al.*, 2007; Campbell *et al.*, 2006).

This study focused on cultural utilization of *S. monbin* and *R. vomitoria* in Ejigbo, Osun state, Nigeria with aim of documenting their importance in traditional health care and socio-cultural heritage of the people.

METHODOLOGY

STUDY AREA

The study was conducted in Ejigbo Local Government Area in Osun State. There is a projected population of 132, 641 people according to the 2006 census figure. Ejigbo Local Government lies between latitude 7°54' 0"N and longitude 4°18'54"E. It has an area of 373 square kilometres and an average annual rainfall of 52.35 inches (1,330mm). The main ethnic group is Yoruba, with subordinate of other ethnic through trading such as Hausa, Igbira, Fulanis and Igbo.

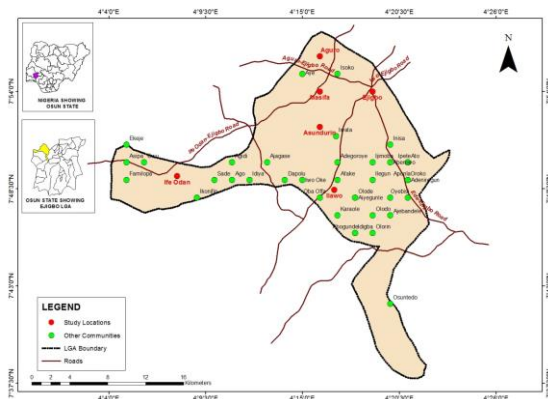


Fig. 1: Map of Ejigbo Local Government Area State of Osun

Data Collection and Analysis

The study was conducted between January and August 2016 in which ninety nine (99) respondents

were interviewed to obtain useful information through oral interview guided by pre-tested well-structured questionnaires. Respondents were purposively selected based on their knowledge on the cultural and medicinal utilization of the two plants either for self-medication or for treating others. Six communities were visited for questionnaire administration viz; Ilawo (04), Ejigbo (45), Ife-odan (23), Aguro (10), Masifa (02) and Asundunrin (15). Individuals below 20 years in age are not included in the data collection. Resulting data from the survey was analysed using simple frequency and utilization tables, charts and Pearson correlation analysis on SPSS package.

RESULTS

Males constitute 55.6% of the respondents while females make up 44.4%, majority of the informants were aged above 40 years and married. Education status showed that 47.5% and 29.3% had primary school and secondary education respectively. Occupations of respondents are mainly farming (22.2%), petty trading (34.3%), herb vendors (13.1%) and herbalist (10.1%) as revealed in Table 1. Average monthly income was less than N60,000 among the respondents.

Table 1: Demographic characteristics of respondents in Ejigbo

Demographic character	Frequency	Percentage (%)	
Sex	Male	55	55.6
	Female	44	44.4
Age	20-30	5	5.1
	31-40	14	14.1
	41-50	29	29.3
	51-60	27	27.3
	above 60	24	24.2
Marital status	Single	8	8.1
	Married	77	77.8
	Separated	12	12.1
	Widow(er)	2	2.0
Education qualification	No formal education	6	6.1
	Primary school	47	47.5
	Secondary school	29	29.3
Occupation	Tertiary	17	17.2
	Artisan	4	4.0
	Petty trading	34	34.3
	Civil servant	8	8.1
	Retired	2	2.0
	Farming	22	22.2
	Unemployed	6	6.1
Income (Naira -N)	Herb vendors	13	13.1
	Herbalist (TMP)	10	10.1
Income (Naira -N)	Below N20,000	43	43.4
	N21,000-40,000	33	33.3
	N41,000-60,000	16	16.2
	N61,000-80,000	1	1.0
	N81,000-100,000	4	4.0
	Above N100,000	2	2.0

Table 2: Respondents Residency and Familiarity with *Spondias mombin* and *R.vomitorea* in Ejigbo

	Residency			Familiarity			
	Frequency	Percentage (%)		<i>S.mombin</i>		<i>R.vomitorea</i>	
				Freq.	Percent (%)	Freq.	Percent (%)
Below 5 years	6	6.1	Yes	97	98.0	96	97.0
5-10 years	33	33.3	No	2	2.0	3	3.0
Above 10 years	60	60.6					
Total	99	100.0	Total	99	100.0	99	100.0

Residency and respondents familiarity with the two plant species were shown in Table 2, large number of them lived in the study area for relatively long period, 5-10years (33.3%) and above 10years (60.6%). Long residency predispose the informants to the societal values and uses of the plants in the area over time, most of the respondents were indigenes and also live in the local community.

Ethno-medicinal utilization of *S. mombin* and *R. vomitoria* (Table 3) showed several disease conditions managed with different plant parts, these include; Malaria, abdominal pain, stomach problems, diarrhoea, pile, diabetes, memory enhancement, dysentery and dental issues. Stomach disorder (11) and Malaria (9) are the main uses of *S. mombin* while Malaria (18) and Hemorrhoid (10) are the main ailments managed with *R. vomitoria* as reflected in

citations (Table 3). Non-medicinal uses include; live fences, shade for artisans, edible fruits as refreshments, carving of farm implements handles, local building construction and dye production from wood ashes (Table 4). There was a significant positive correlation (0.637) in the utilization awareness of *S. mombin* and *R. vomitoria* among the respondents using Pearson correlation analysis in SPSS package (Table 5). This showed that most of the informants that utilize *S. mombin* are also involved in utilizing *R. vomitoria* for a particular purpose or another in the study site. Significant positive correlation (0.451) was also observed between age and residency of respondents, which indicates that old persons have lived in the area for higher numbers of years than the young individuals interviewed.

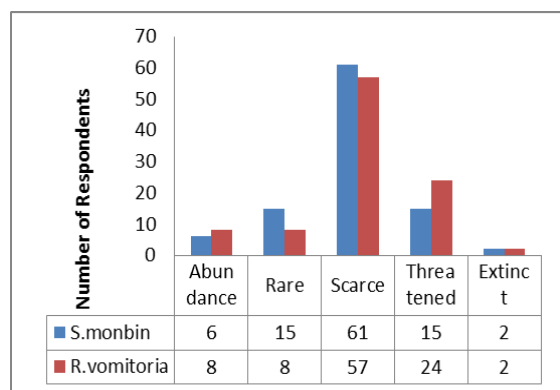
Table 3: Ethno-medicinal Utilization of *Spondias mombin* and *Rauvolfia vomitoria* in Ejigbo LGA

Plant Name	Local Name	Uses	Part Used	Preparation	Mode of Administration	Citation
<i>Spondias mombin</i>	Iyeye, Ekika, Okika	Abdominal pain	Fruits and twigs	Twigs are soaked in water.	Fruits are eaten, 20cl aqueous extract of twigs taken once daily	4
			Bark	Bark is soaked in water for three days	Two cups (20cl) once daily	
		Gonorrhoea	Bark	Bark is boiled for two hours with water	20cl cup twice daily	1
		Malaria	Root	Root, <i>Xylopiya aethiopica</i> fruit, and orange is boiled in water for two hours	20cl cup twice daily (Morning and evening before meal)	9
			Bark	Leaf is soaked in water for three days	20cl cup twice daily	
		Stomach disorder	Leaf	Leaf decoction	20cl cup twice daily	
			Leaves	Leaves dried, ground and extracted with hot water	20cl cup Taken once daily	11
			Bark	Bark is soaked in water for two days	20cl cup daily before meal in the morning	
		Diarrhea	Bark	Decoction of bark	10cl cup twice daily	3
			Leaves	Decoction of leaves	10cl cup twice daily	
		Pile (Hemorrhoid)	Leaves	Leaves and <i>Xylopiya</i> fruit are boiled for about two hours	25cl is drank every night	4
			Bark and root	Bark and root are boiled together	25cl Drank once daily	
		Tooth ache	Seed	Seed is soaked in alcohol	5-10cl to gaggles daily	1
		Diabetes	Bark	bark and <i>Xylopiya</i> fruit boiled for about two hours	25cl taken twice daily	2
		Pancreas disease	Root and bark	Root and bark are boiled together	20cl Drank once daily	1
Bacterial/fungal infections	Root	Dry root, <i>Xylopiya</i> , and orange are boiled	Two cups (20cl) twice daily	1		
Memory Enhancement	Fruit and stem bark	Ripe fruits and leaves are burn into ashes	Ashes rubbed on the incisions (6 for female, 9 for males). Leaf decoction is also taken to prevent memory loss	5		
<i>Rauvolfia vomitoria</i>	Asofeyeje	Pile (Hemorrhoid)	Root	Root is boiled in water	Drink twice daily (20cl)	2
		Malaria	Root	Root is boiled in water	Drink twice daily (20cl)	10
			Bark	Bark is boiled for one hour	Two cups daily (20cl)	18
		Dysentery	Bark	Soak in water and lime (<i>Citrus limon</i>)	5cl taken before meal in the morning	1
		Diabetes	Bark and root	Soak root, bark and <i>Xylopiya aethiopica</i> fruit for two hours	Two cups daily (5-10cl)	4
		Strong teeth	Twigs	Chewing the twigs daily as mouth wash	Chew twigs before meal daily	1
		Gonorrhoea	Leaves and roots	Boil together	Decoction taken orally 2 times daily (20cl)	2
		Stomach disorder	Root	Soak root in water for three days	5-10cl taken orally before meal daily	1

Table 4: Uses of *S.mombin* and *R.vomitorea* Parts in Ejigbo

Plant parts	<i>Spondias mombin</i>		<i>Rauvolfia vomitoria</i>		Uses
	Freq.	Percentage (%)	Freq.	Percentage (%)	
Fruits	99	100	-	-	Edible and lick as snack
Leaves	23	23.2	22	22.2	Medicine
Stem bark	32	32.3	19	19.2	Medicine
Root	28	28.3	46	46.5	Medicine
Stem/wood	11	11.1	6	6.1	Wood for buildings, local beds, chairs, poles as live fences
Branches/twigs	5	5.1	6	6.1	Yam stakes, chewing sticks and carving handles for hoes, cutlasses, axe, knife
Live tree	2	2.02	1	1.01	Shade trees for artisans such as carpenters workshop, automobile mechanics and associated outfits.
Wood ashes	1	1.01	-	-	Production of indigo dye locally

Majority of respondents (61 and 57 for *S. mombin* and *R. vomitoria* respectively) perceived that the two plant species have become scarce in the study area (Fig. 2) while 15 and 24 informants perceived *S. mombin* and *R. vomitoria* are threatened respectively. Few respondents perceived no problems in their conservation status hence claimed the plant species are abundant in the wild.

**Fig. 2: Perceived conservation status of *S. mombin* and *R. vomitoria* by respondents in Ejigbo**

DISCUSSION

The result showed that 80.2% of the respondents were aged above 40 years while 19.2% were aged below 40 years (Table 1). This implies that repository of knowledge on plants utilization for cultural and ethno-medicine rest largely with relatively old people in the study area. This is in tandem with the result of Faleyimu and Oluwalana (2008) who reported that, the older the people, the more active and experienced they are in the utilization of medicinal plants in Nigeria. Older individuals that have resided in the area for long period possess relevant experience on the use of plants for the management of different illness mentioned in Table 3. *Spondias mombin* and *Rauvolfia vomitoria* are used in the management of many ailments in the study area, such as malaria, gonorrhoea, diarrhoea, stomach disorder and diabetes (Table 3). This finding corroborates the reports of Fapojuwomi and Asinwa (2013), Ayoka *et al.*, (2008), Kutalek and Prinz (2007) and Sharma (2004) that these plants are widely used in the management of diseases in tropical Africa. Malaria (18) and pile (10) had the highest citations

in the use of *R. vomitoria* root/stem bark for their treatments, while *S. mombin* is well known for the treatment of stomach disorder and malaria with 11 and nine (9) citations respectively. *R. vomitoria* roots (46.5%) are mostly used for medicine while *S. mombin* stem bark (32.3%) is mostly utilized. Studies have reported roots as the most frequently used plant parts in the preparation of herbal remedies (Maurya *et al.*, 2015; Inngjerdingen *et al.*, 2004). Unsustainable harvesting and utilization of roots and stem barks for medicine may be implicated for scarcity/threatened status of the plant species in the study area (Fig. 2). Constant root and stem bark harvesting could lead to mortality of individual plants and subsequent reduction in the natural population. *S. mombin* and *R. vomitoria* are not cultivated by local subsistence farmers; rather they are usually killed by fire to pave way for small scale arable farming. Preparation of remedies was generally in the form of infusions or decoctions (by boiling or soaking in hot water); extracts or juice (by crushing the fresh plant parts with water). Few preparations include chewing of the plant parts and burning into ashes then rub ashes on incisions especially in the use of *S. mombin* to enhance memory. The preparations were mainly taken orally or by incision and bathing (Table 3).

Despite reports of Lorenzi (2002) that *S. mombin* wood is durable, light weight and exhibit low resistant to attack by fungi and insects; the two plants species are not choice species for sawn wood in the study area hence, they are less known in building works except as poles for huts and temporary structures. However, *S. mombin* was found to be widely used as shade trees in artisan workshops (carpentry and roadside automobile) in Ejigbo. Utilization of *S. mombin* as shade tree and edible fruit in Ejigbo is in consonance with the report of Faleyimu (2014), Standley and Steyermark (1976) in Nigera and Guatemala respectively. Other cultural uses include; handles for farm implements, kitchen utensils, yam stakes and live fences around homesteads.

This study highlights the cultural values and medicinal potentials of *Spondias mombin* and *Rauvolfia vomitoria* in Ejigbo and by extension the

Yoruba folk of south west Nigeria. Malaria is a prevalent disease in tropical Africa and utilization of these species in the management of malaria qualifies them as candidate plants for evaluation in the development of affordable malaria drugs especially in low income countries of sub Saharan West Africa.

It is therefore recommended that sustainable management and domestication of these species be encouraged for continuity and posterity. Further

research into utilization of leaves rather than stem bark and roots will promote conservation of these important ethno-botanical species.

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Table 5: Pearson Correlation of respondents' demography and utilization of *S.mombin* and *R.vomitorea*

		Education	Age	Income	Residency in years	Occupation	Awareness of <i>S.mombin</i> utilization	Awareness of <i>R.vomitorea</i> utilization
Educational	Pearson Correlation	1	-.316**	.370**	-.176	-.398**	.114	.041
	Sig. (2-tailed)		.001	.000	.081	.000	.260	.690
	N	99	99	99	99	99	99	99
Age	Pearson Correlation	-.316**	1	-.240*	.451**	.086	.013	.178
	Sig. (2-tailed)	.001		.017	.000	.396	.899	.077
	N	99	99	99	99	99	99	99
Income	Pearson Correlation	.370**	-.240*	1	-.047	-.027	-.012	-.142
	Sig. (2-tailed)	.000	.017		.642	.792	.910	.162
	N	99	99	99	99	99	99	99
Residency in years	Pearson Correlation	-.176	.451**	-.047	1	-.050	.073	.008
	Sig. (2-tailed)	.081	.000	.642		.622	.470	.937
	N	99	99	99	99	99	99	99
Occupation	Pearson Correlation	-.398**	.086	-.027	-.050	1	-.105	-.046
	Sig. (2-tailed)	.000	.396	.792	.622		.302	.653
	N	99	99	99	99	99	99	99
Awareness of <i>S.mombin</i> utilization	Pearson Correlation	.114	.013	-.012	.073	-.105	1	.637**
	Sig. (2-tailed)	.260	.899	.910	.470	.302		.000
	N	99	99	99	99	99	99	99
Awareness of <i>R.vomitorea</i> utilization	Pearson Correlation	.041	.178	-.142	.008	-.046	.637**	1
	Sig. (2-tailed)	.690	.077	.162	.937	.653	.000	
	N	99	99	99	99	99	99	99

** Correlation is significant at 0.01 level (2-tailed). * Correlation is significant at 0.05 level (2-tailed).

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