

ETHNOBOTANICAL STUDIES ON FLORAS USED FOR STORAGE IN BAYELSA STATE, NIGERIA

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Abstract: Ethnobotanical study on the plant species used for storage was carried out within forty communities in Bayelsa State. Eight plant species belonged to six different families were identified as botanicals valued for storage and preservative purposes, most of which are herbs. The result revealed that the plant species identified were alleged to be safe, available and exhibit different growth habits. However, two of the species (*Braschystegia nigerica* and *Xylopia aethiopica*) are trees, and are rare as they served other primary uses. Different sections of the plant species were extracted for storage purposes, and members of *Marantaceae* were the most exploited for storage. As the pattern of plants use among locals becomes ecologically unsustainable, there is a need to document the floras use for storage purposes and determine their abundant status in the State.

Keywords: storage, preservation, plant materials, postharvest, Bayelsa State

I. Introduction

Ethnobotany, the study of the relationship between man and his ambient vegetation (Schultes, 1941) is an important aspect of plant conservation; particularly the preservation of undocumented indigenous knowledge of plant used by tribal communities (EDB, 2015), for various purposes such as oral care, shelter, storage, medicine and craft (Obute and Ekiye, 2008; Ihinmikaiye and Tanee, 2014; Sejabaledi, 2016). Plants are essentially useful to tribal people. The knowledge of plant used for storage is a strategy that can be linked to the conservation of biodiversity and the preservation of postharvest food stuff. It has been reported that regions rich in biological diversity are usually inhabited by cultural group who have manage to hold traditional ecological knowledge of their bioregions (Turner *et al.*, 2002; Serge, 2003). Such is the case in Bayelsa, a State rich in cultural diversity, whose indigenes depends

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mostly on subsistence harvests of non-timber forest products (NTFPs) and fishery for their livelihood, they rely on oral knowledge gained by generations of interaction with nature and vegetation, for the preservation and storages of postharvest products. Storage of harvested produce of any kind is important for food conservation and management (Yallappa *et al.*, 2011). It has been recognized that plant species play an important role in the preservation of harvested produce by exerting pesticidal properties and or biological activity against a wide range of pests (Khatun, 2011; Ogbaji and Osuman (2011). Neem (*Azadirachta indica*) materials among others have been well reported by many researchers as grain protectants against grain storage insects (Jilani and Su, 1983; Yadar, *et al.*, 2007; Khatun *et al.*, 2011). A number of plant species has been used as important tools for storage and wrapping of food among the indigenous people Bayelsa State. This study evaluates the botanicals used for storage and preservation of food in the Bayelsa State, it also seeks to know their abundant status, and the acceptability level among the indigenous people.

II. Materials and Methods

Ihinmikaiye *et al.* (2016) had provided the detailed description of the study area, and the delineation of the State into three districts (on the basis of the existing senatorial coordination of Nigeria) was maintained in the study. Social survey and direct field observation was used in the study (after kayode, 2005). The districts are Bayelsa East (BE), Bayelsa West (BW) and Bayelsa Central (BC). In each district, five villages each relatively free from urban influence were randomly selected from each local government area (LGA) that makes up the senatorial districts in the State. In all forty villages were selected from the State for the study, and five indigenous people that have maintain continuous domicile in the villages for a period not less than ten years were selected and interviewed with the aid of semi-structured question matrix. Group consensus on the floras use for storage was determined in each of the community by way of coordinated group interviews. The voucher specimens of the floras were collected, identified and relevant information gathered on them was documented. Subsequently, the abundant of the plant species was determined within a kilometer range from the center of each village sampled, by using the time taken to physically encounter the plant species. Species encountered in < 1 hour were considered as abundant, those encountered between 1- 23 hours; between 24 hours – 3days and between 4days – 1weeks were considered as frequent, occasional and rare respectively.

III. Results and Discussion

Interview conducted with the respondents showed that they were all aware of one form of botanical or another used for storage purposes irrespective of their sex, age, occupation, economic status and religion affiliate (Table 1).

Table1: Socio-economic Factors of Respondents in the Study Area

Feature		Bayelsa West	Bayelsa Central	Bayelsa East
Sex	Male	15	28	39
	Female	35	47	36
Age	<20	13	10	9
	20 – 65	22	52	43
	>60	15	13	22
Occupation	Agriculture	39	67	61
	Non-Agriculture	11	8	14
Economic Status	Small	16	31	28
	Medium	29	29	38
	Large	5	15	9
Religion	Christian	41	68	71
	Moslem	-	1	-
	Others	9	6	4

However, they are unwary of the ecological implications of unsustainable use of the plant species. Eight (8) plant species belonged to six (6) different families were used for storage purpose in the study area. Two of the plant species accessed for storage are trees, and were rare. The species exhibited different growth habits and the perceptions of the respondents with respect to the species' abundant status are presented in the Table 2.

Table 2: Name and Status of Plants Used for Storage Among Indigenous People of the Study Area

Botanical name	Voucher number	Ijaw name	Family	Abundant Status	Habit
<i>Braschystegia nigerica</i> (Hoyle & J.)	UHAE2019-628	okolodo	Fabaceae	rare	tree
<i>Calamus deerratus</i> (G. Mann. & H. W.)	UHAE2019-633	apie	Arecaceae	frequent	liana
<i>Marantochloa leucantha</i> K.Schum	UHAE2019-718	abelebei	Marantaceae	"	herb
<i>Marantochloa purpurea</i> (Ridl.) Milne-R.	UHAE2019-719	"	"	"	herb
<i>Musa sapientum</i> var. <i>paradisiaca</i> (L.)	UHAE2019-728	beriba	Musaceae	abundant	herb
<i>Occimum gratissimum</i> (L.)	UHAE2019-733	furukana	Lamiaceae	"	shrub
<i>Thaumatococcus daniellii</i> (Benn.)	UHAE2019-784	bibi belemo	Marantaceae	occasional	herb
<i>Xylophia aethiopica</i> (Dunal) A. Rich.	UHAE2019-795	enge	Annonaceae	rare	tree

Species that were relatively abundant were mostly cultivated and their uses as medium of storage were secondary: this validates the previous claims of Azige (2015) who reported that plants are cultivated primarily for their economic values. The abundant scale suggested that *B. nigerica* (used for preserving palm wine) was rare. The tree was a highly valued timber species and it is one of the species sorted by lumberjack. Similarly, *X. aethiopica* which doubled as spice and medicinal plant is fast becoming rare. Its primary uses were largely unsustainable for ecological stability. Ihinmikaiye *et al.* (2018) affirmed that most of the methods employed in harvesting the species in the study area were inhibitory and annihilative. Members of *Marantaceae* were the most utilized for storage purposes in the area, perhaps a result of their leaves size and phytochemicals (Ukwubile *et al.*, 2017).

Different sections of the plants were used for storage and preservation purposes, and the methods of their applications vary significantly. These methods ranges from steeping to wrapping, and from dispersing to synergistic blend with undisclosed local ingredients (Table 3): all these methods gear toward enhancing preservation, and discouragement of pests from harvested produce.

Table 3: Features of the plant species used among the indigenous people of the study area

Botanical name	Part used	Method of Application	produce stored	Reasons for choice
<i>B. nigerica</i>	bark	steeping	palm wine	prevents fermentation
<i>C. deerratus</i>	fibre	stocking	fish/crayfish	enhances preservation
<i>M. leucantha</i>	leaf	wrapping	food items	"
<i>M. purpurea</i>	"	"	"	"
<i>M. sapientum var.</i>	"	"	"	"
<i>O. gratissimum</i>	"	combined with other undisclosed ingredients	fish	"
<i>T. danielii</i>	"	wrapping	food items	"
<i>X. aethiopica</i>	fruit	squashed & spreading	grains	discourages pests

Most of the plants literally used for discouraging pests have repulsive smell due to the phytochemicals and essential oils embedded (MacMillian, 1984). These phytochemicals from evolutionary view are used to warn-off predators, and the plants materials provide preservative option for the indigenous people, being relatively non harmful to health and less detrimental to the environment (Mollah *et al.*, 2017; Karunataran and Arulnandhy, 2018). Thus these botanicals could proffer solution for the problem of storage and preservation of food stuff locally or on a large scale. Yet it important that available information on the plants, especially the rare species are documented as this could ensure their conservation.

IV. Conclusion

This study has revealed the plant species employed for farm produce conservation and also suggest that conservation of farm produce among the indigenous people is a long standing course that relied on harnessing botanicals in the natural habitat. Although most of

these plants serves other purposes considered as primary use, it is therefore important to enlighten the local people on the need to ensure conservation activities in the wild, and in the extraction process so as to forestall the peril of species diversity loss.

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