

Ethnobotanical Studies of Plants Used For Preservation of Plant Products in Ikere Ekiti, Ekiti State, Nigeria

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Abstract: The study aimed at the examination of botanicals used for preservation in Ikere-Ekiti, Ekiti-State. The study was carried out by interviewing the respondents using a well-structured, open-ended questionnaire and guided techniques. A total number of 25 species belonging to 18 families were collected and identified. There were more female respondents (64%) than male (36%). The respondents' indigenous technical knowledge revealed that most of the botanicals were single-components preparation while few involved the combination of more than one plants in a single usage.

Identified samples of the plant species used for preservation of plant produce were collected; their sources and method of application were defined. In addition, the folk medicinal values of the plants were also documented. Voucher specimens were deposited at the herbarium of Plant Science Department of Ekiti State University. However, some plants were found to be endangered, thus, strategies that could help in conserving them were proposed.

I. Introduction

Food crops and plant products need to be protected against biodegrading agents such as pest, fungi, bacteria and nematodes e.t.c. Preservation of plant products is important in order to increase the shelf life of the plants. Most plants and plant products are easily infected by pest, some easily break up and this leads to their destruction which makes them unfit for human use. Thus, the use of preservatives is highly imperative. Plants like *Capsicum frutesan*, *Vernona amygdalina* and *Azadirachta indica* were promising examples of plants used for pest control and as a source of insecticide (NRC, 1992).

Preservatives are chemical or natural ingredients usually added to plant products to protect against decay or decomposition (Rosenthal et al, 1999) or to prevent spoilage (Pandey, 2002). The use of plants as preservatives over synthetic preservation is receiving more attention nowadays, this is because plants were found to be natural, cheaper, they are holistic in nature, easy to get and does not need the presence of skilled personnel before administration. (Rees and Banks, 2001; Olanipekun, 2011)

Incidentally, in Nigeria, the preservative potentials of many plants have been known for a long time by the rural dwellers and the natural pesticides found embedded in plants have been used for pest control in rural areas. (Akinwumiet al, 2006) reported that the use of plant materials as preservatives shown that treated fish do not exhibit adverse evidence of smell or change in taste, texture or flavor.

Consequent on the above, it is therefore important to identify different plants used as preservatives and to propose sustainable strategies for the conservation of endangered species.

II. Materials and Method

The Study Area

The study was carried out in five villages in Ikere Local Government Area. The villages are Ogbese, Ayeye, Para, Oke-Eniju and Igbo-Oka in Ikere-Ekiti, Ekiti South Senatorial District, Ekiti-State. Ikere is an agricultural Centre and is located between Ado-Ekiti (the capital of Ekiti State) and Akure (the capital of Ondo State). The town enjoys tropical climate with two distinct seasons. These are the rainy season (April-October) and the dry season (October- March). Temperature ranges between 21⁰ C and 28⁰C with high humidity. The land has favorable climatic conditions which makes the land enjoys luxuriant vegetation of timber. The inhabitants of this place practice agriculture, trading and rearing of livestock as the principal economic activities.

Method

A well-structured, open-ended questionnaire and guided dialogue techniques were used to interview farmers and the indigenous people of the areas. The questionnaire was designed based on the needed information on the various plants used as preservatives and interview was conducted in English Language, Yoruba Language and Ekiti dialect as situations demanded.

The respondents who chose to participate in the survey were asked to share their knowledge and experiences in the plants used in their communities as preservatives. In each community, twenty (20) individuals who had each maintained stable residence in the village for fifteen (15) years and above were selected and

interviewed. Information were received and documented on the parts of the plants used and method of application. The plants were collected, identified and the voucher specimens were prepared and deposited at the Herbarium of Plant Science Department of Ekiti State University.

III. Results and Discussion

The result revealed a total of 25 plants species belonging to 18 families. They were identified and valued as been used as preservatives in the study area (Table1). Plantparts such as leaves, stem, fruits and bulbs were found used as preservatives. This confirms the assertion of Ramana (2008) that in India the leaves formed the bulk of the part of the plant used.

Table 2 revealed that respondents in the study areas were all familiar with the use of plants as preservatives. There were more female (64%) than male (36%). Most of the respondents were illiterate (70 people). The economic status of the respondents shows the rate at which the inhabitant accepted the use of plants. Thus, respondents of high status were 18, medium economic status ranked 32 while low economic status was 50 respondents. However, the result revealed that these features were not prerequisite to the consciousness of the respondents to the use of ethno-botanical plants.

Table1. List of identified botanicals used for preservation in Ikere-Ekiti

S/N NAME	PLANTS NAME	FAMILY USED	LOCAL	PART	SPECIEES
1.	Alchornea laxiflora	Euphorbiaceae	Iya		Leaves
2.	Allium cepa	Amaryllidaceae	Alubosa		Whole plant and Bulb
3.	Azadirachta indica	Meliaceae	Dogoyaro		Leaves, Seed and Kernel
4.	Capsicum frutescens	Solanaceae	Ata		Dried fruit
5.	Citrus aurantifolia	Rutaceae	Osanwewe		Fruit& fruit epicarp
6.	Colocasia esculentus	Araceae	Koko		Leaves
7.	Chrysophyllum albidum	Sapotaceae	Agbalumo		Leaves
8.	Cymbopogon citratus	Poaceae	Ewe tea		Leaves
9.	Cyperus esculentus	Cyperaceae	Omu		Leaves
10.	Dennettia tripetala	Annonaceae	Ata		Fruit
11.	Elaeis guineensis	Arecaceae	Ope		Leaves
12.	Ficus exasperata	Moraceae	Epipin		Leaves
13.	Jatropha curcas	Euphorbiaceae	Lapalapa		Leaves
14.	Megaphrynium	Maranthaceae	Gbodogi	Leaves	macrostachum
15.	Musa paradisiaca	Musaceae	Ogede		Leaves
16.	Mondora myristica	Annonaceae	Ehura		Fruits
17.	Myrianthus	Moraceae	Ewe ade		Leaves arboreous
18.	Nicotiana tabacum	Piperaceae	Taba		Dry leaves
19.	Piper guineense	Piperaceae	Ata iyere		Fruit
20.	Raphia hookeri	Arecaceae	Iyo		Branches
21.	Spondias mombin	Anacardiaceae	Iyeye		Leaves
22.	Telfaria occidentalis	Cucurbitaceae	Kale		Leaves
23.	Theobroma cacao	Sterculiaceae	Koko		Leaves
24.	Vernonia amygdalina	Asteraceae	Ewuro		Leaves and stem
25.	Zea may	Poaceae	Agbado		Dried fruit

Table2. Ethnobotanical acceptability by the rural dwellers.

Features	Description	Proportion (%) Respondents					Average Total (%)	
		1	2	3	4	5		
				N=20	n=20	n=20	n=20	n=20
Sex	Male	5	7	10	6	8		36
	Female	15	13	10	4	12	64	
Age	15-50	10	8	6	7	8		39
	50-90	10	12	14	13	12	61	
Literacy status	Illiterate	15	13	16	12	14	70	
	Literate	5	7	4	8	6	30	
Economic status	High	4	2	6	2	4	18	
	Medium	8	6	6	6	6	32	
	Low	8	12	8	12	10	50	

Key

- 1— Ogbese village
- 2— Ayeye village
- 3— Para village
- 4— Oke-Eniju village
- 5— Igbo-Oka village
- N— No of respondents

Table 3 revealed the respondents indigenous technical knowledge on the plants used as preservatives. Most of the botanicals were single-component preparation while few involved the combination of more than one plant in a single usage. The multiple components preparation includes the leaves of *Megaphrynium macrostachum* and *Musa paradisiaca* were used to preserve kolanuts while *Theobroma cacao* with *Cyperus esculentus*, were used to preserve locust beans from spoilage. Single-component preparation includes *Alchornea laxiflora* for preservation of kolanut and *Azadirachta indica* for the preservation of cowpea against weevil infestation among others. The usefulness of the botanicals as preservatives could be attributed to the present of bioactive components presents in them. This confirmed the assertion of (Stoll, 2000), Amusan and Okorie (2002) that plants is composed of bioactive agents or chemical substances that was found to be effective in the prevention of growth and development of *Dermestes maculatus* and *Callosobrochus maculatus* (Been weevil) and also aiding in repelling or killing some harmful insects. It was evident that the application of these various identified plants will protect the food produce from spoilage and unwholesomeness during storage and this will eventually accept usage by the customers.

Table 3. Respondent's indigenous technical knowledge on uses and method of application of plants used as preservatives in Ikere-Ekiti.

S/N	Plant species	Uses	Method of application
1.	<i>Alchornea laxiflora</i>	For preservation of kolanut against insect	Spread the leaves inside a basket then cover it with the leaves.
2.	<i>Allium cepa</i>	For preservation and protection of tomatoes against moth.	Plant the onion around tomato tree, the odour will create resistance to pest.
		Preservation of cowpea	Put bulb in cowpea
3.	<i>Azadirachta indica</i>	For preservation of cowpea against weevil	Spread leaves throughout the cowpea
		For preservation of tomatoes tree against infection	Put the leaves in a bowl
		For preservation of crop against weevil	Soak powdered kernel
		For preservation of and sprinkle water on crop	
4.	<i>Capsicum frutesan</i>	For preservation of cowpea against weevil	Pour the cowpea inside a basket or container and spread the fruit throughout the cowpea (2) grind the dried fruit and sprinkle on cowpea.
5.	<i>Citrus aurantifolia</i>	For preservation of cowpea against weevil;	Pour the cowpea inside the basket and pour the fruit on it.
		For preservation of fruit and add a little quantity of juice on the mixed flour.	Cut the fruit, squeeze the
		For preservation of kolanut against insect. full of kolanut but remove before it turn brown.	Put the fruit in basket
6.	<i>Colocasia esculentus</i>	For preservation of okro	Spread the leaves inside a basket and pour the okro inside and cover with leaves.
7.	<i>Chrysophyllum albidum</i>	For preservation of fresh and dry kolanut in order not to break	Put the leaves inside a basket and pour the kolanut.
8.	<i>Cymbopogon citratus</i>	For preservation of local concoction;	Add the leaves to the ingredient and steam together.
		For preservation of basket full of kolanut.	Slice the fresh leaves on kolanut
9.	<i>Dennettia</i>	For preservation of	Grind the dried fruit and

tripetala	smoked fish against beetle	sprinkle on the smoke fish	
10. Elaeis guineensis	To prevent the penetration of sun light on yam tuber.		Spread leaves on yam tuber.
11. Ficus exasperata	beans against weevil	For storage of wich in beans	Pluck leaves and sand-
12. Jatropha curcas	For preservation of kolanut against weevil	pour the sap on kolanut.	Squeeze the leaves and
13. Megaphyrium macrostachum	Both are used for the preservation of kolanut	to prevent it from spoiling.	leaf. Firstly put kolanut in a withered M.paradisiaca leaf, then wrap it with a freshM.macrostachum
14. Musa paradisiaca	harvested sweet orange by preventing sunlight penetration	For preservation of it from drying.	Spread the leaves on the orange to prevent
15. Mondora myristica	For preservation of smoked fish/meat against pest/beetle		Sprinkle the powdered fruit on meat/fish
16. Myrianthus arboreus	To preserve kolanut in order to bring out its color.		Place leaves in a basket and put kolanut in leaves
17. Nicotiana tabacum	For protection of unhatched egg against insect	resistance to pest	Burn leaves near the egg, the odor will create
18. Piper guineense	For preservation of smoked/fried fish/meat against pest/bettles		Sprinkle powdered fruit on meat/fish.
(2) For preservation of rice and cowpea against weevil	Grind the dried fruit and sprinkle on rice and cowpea grain.		
(3) For preservation of maize grain against weevil	and sprinkle on maize grain	grind the dried fruit	
19. Raphia hookeri	For the storage of broken kolanut		Tie around the kolanut
20. Spondia mombin	For preservation of bitter kola to avoid it from spoiling.	the leaves.	Pour the bitter kola inside basket containing
21. Telfaria Occidentalis	For preservation of fresh pepper to avoid it from spoiling		Pluck two leaves and place on the pepper.
22. Theobroma cacao&Cyperus esculentus	Both are used for the preservation of locust beans	Using a calabash, firstly spread the leaves of C. esculentus inside and	spread the leaves of T. cacao, then pour the locust beans and wrap with T.cacao leaf.
Theobroma cacao	For preservation Of dried kolanut		Wrap the leaves around kolanut
(2) For preservation of locust beans against maggot	Wrap locust beans, add little salt.		
Vernonia amygdalina	For preservation of cooked okro		Cook the okro with the leaf
of pap	(1) For preservation add water.	place it on the pap and	Cut a little stem and
(2) For preservation of ground beans	Scatter dried maize inside the kolanut		
23. Zea may	For preservation of fresh and dried kolanut	inside the kolanut	Scatter dried maize

IV. Conclusion and Recommendations

The result obtained in this study shown the potential of botanicals in preserving the quality and quantity of food and plants produce. Hence, current knowledge and new findings about this promising plant products used for preservation needs to be transformed into practical applications which are acceptable by the users. Neglecting this can leads to a negative setback from the farmers which result in a decreasing interest to the use of natural preservatives.

From the result gotten from this study, the following recommendations should be considered:

1. Government should make funds available for the researchers so as to encourage them in their field.
2. Seminars should be organized by government officials so as to educate people on the importance and efficacy of these botanicals.
3. Enlightenment on the dangers of extinction of most of these species should be made.
4. There is need to revive and encourage the traditional practices of conserving forest such as the dedication of forest to deities.

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