



ETHNO-MEDICINAL SURVEY OF CHEWING STICKS IN IDANRE FOREST RESERVE, ONDO STATE, NIGERIA

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Abstract

Chewing sticks possess the ability to clean the teeth due to its antimicrobial activities disinfect the mouth, strengthen dental and specifically serve as medicinal values to human health. Ethno-medicinal survey of chewing sticks species was conducted in Idanre forest reserve, Ondo State, Nigeria. Specifically, the study identifies the chewing sticks plant species used and their abundance, their medicinal uses and socio-economic contributions to the livelihood of the people. Three (3) communities were purposively selected in Idanre forest reserve. The communities were Arun, Owena-Egbeda and Fayomi-Bolorunduro. Semi-structured questionnaire was administered to elicit information from the respondents in the area. Descriptive statistics was used to analyze the data collected from the respondents. The results obtained indicated that stem, stem branches, root and bark of some plants were the parts used as chewing sticks by people for orodental hygiene and medicinal purposes. A total of 37 plant species belonging to 22 families were discovered to be used as chewing sticks. The relative abundance of chewing sticks plants revealed that 37.8%, 32.4% and 29.8% of the chewing stick species were very abundant, moderately abundant and rare respectively. The results further revealed that almost everybody had access to various species of plants used as chewing sticks for oral hygiene and medicinal purposes. The very few people collected chewing sticks for sale generated below N5,000.00/annum. This contributes little to their livelihood sustainability. These are the plants used as chewing sticks; Pako-ijeju (*Massularia acuminata*), Otupe (*Carpolobia lutea*), Igi Orogbo (*Garcinia kola*), Epora (*Bridelia ferruginea*), Atori (*Glypheae brevis*) and Osopupa (*Enantia chlorantha*). Some of the sicknesses cured by the use of chewing sticks are; tooth ache, mouth wound, sore gum, sore throat, cough, stomach ache and black tongue. Our findings revealed that some of the plant species used for chewing stick are currently endangered and as such require urgent conservative measure. Therefore, concerted effort should be put in place to address the challenges of conservation of plants used as chewing sticks.

Keywords: Chewing stick, Ethno-medicine, Socio-economic contribution, Livelihood

Introduction

The importance of chewing stick cannot be over emphasized. Chewing stick serves dual purposes (cleaning of teeth and medicinal purpose). Chewing stick due to its antimicrobial activities is highly beneficial to prevention of diseases, maintenance of healthy teeth, and treatment to some sicknesses. When chewing stick is properly used, it can be as efficient as tooth brush in removing dental plaque due to the combine effect of mechanical cleaning and enhanced salivation (Olsson, 2008). Apart from their mechanical effect, chewing sticks have been identified to have significant antimicrobial activities against broad spectrum of microorganisms (Almas and Al-Zeid, 2004). Chewing stick has revealed parallel and at times greater mechanical and chemical cleansing of oral tissues as compared to toothbrush (Aeeza *et al.*, 2014). According to Omotoyinbo and Kayode, (2008), these plant species contain valuable

natural plant products, phytochemicals, antioxidants and microbial activities that are potentially useful to consumers contrary to the chemical toothpastes. Some of the plant species are believed to contain ascorbic acid, trimethylamine, chloride, fluoride, silica, resins, and salvadorine, which have proved potency to heal the inflamed and bleeding gums. It re-mineralizes dental hard tissue, whiten teeth, provide enamel barrier and increase salivary flow. In addition, some chewing sticks also contain volatile oils, tannic acid, sulphur and sterols which attribute to antiseptic plaque formation, provides anti-cariou effects, eliminates bad odor, improves the sense of taste and cure many systemic diseases (Darout *et al.*, 2000; Almas and Al-Zeid, 2004; Aeeza *et al.*, 2014).

The uses of chewing sticks have been encouraged by World Health Organization (WHO). The uses of effective and safe chewing sticks have expanded drastically and vary from

country to country and from culture to culture (Darout *et al.*, 2000; Almas and Al-Zeid, 2004). The increasing awareness of the dangers inherent in the uses of industrially produced chemical toothpaste as well as the high cost of the toothpaste has further led to the uses of chewing sticks. Standard Organization of Nigeria (SON) in 2004 destroyed fake and substandard toothpastes (All Africa Global Media 2004). National Agency for Drugs Administration and Control (NAFDAC) in 2007 and 2009 banned importation of some toothpaste into Nigeria due to the allegation that they contained toxic substances called di-ethylene glycol suspected to cause liver and lung diseases (Omotoyinbo and Kayode, 2008). Despite the significant contributions of chewing sticks to livelihood of the rural dwellers in Ondo

State, there is a dearth of information on the plant species used for this purpose and their abundance. Therefore, survey of chewing sticks plant species was carried to ensure sustainable utilization and conservation of chewing sticks plants in the study area.

Methodology

Description of the Study Area

The study was carried out in Idanre forest reserve, Ondo State (Fig 1). Idanre forest reserve is one of the 16 forest reserves in Ondo State with land area of 540.53sqkm (Adetula, 2008). It is located in the tropical rainforest of Ondo State. It has many communities and forest dwellers whose primary occupation was predominantly farming. The area is naturally endowed with different medicinal plants both indigenous and exotic species.

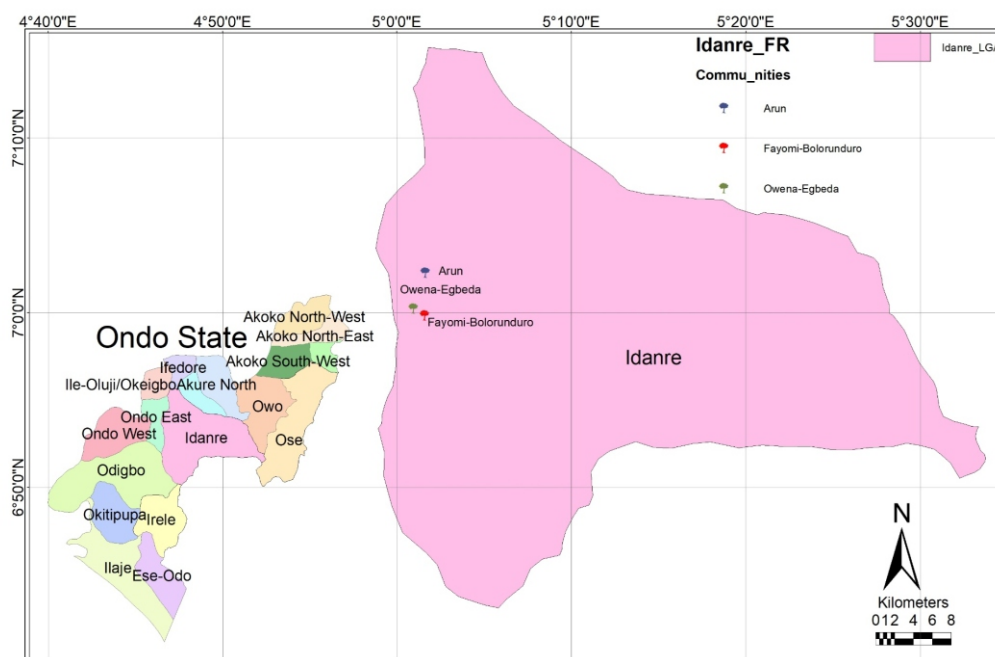


Figure 1: Map of Ondo State Showing Idanre Forest Reserve and the selected Communities

Sampling Procedure and Sample Size

Three (3) communities were randomly selected for the study. The communities were Arun, Owena-Egbeda and Fayomi-Bolorunduro. Forty (40) respondents were

subsequently selected from each community for questionnaire administration. A total of one hundred and twenty (120) respondents were interviewed for the study, using semi-structured questionnaire.

Table 1: Socio-economic Contributions of Chewing Sticks to the Livelihood of Respondents

Characteristics	Frequency (N=120)	Percentage (%)
Age Distribution (in Years)		
<30	18	15.0
31-40	20	16.7
41-50	22	18.3
51-60	35	29.2
>60	25	20.8
Sex		
Male	68	56.7
Female	52	43.3
Religion		
Christian	78	65.0
Muslim	32	26.7
Traditional	10	8.3
Educational Qualification		
No Formal Education	15	12.5
Primary Education	35	29.2
Secondary Education	58	48.3
Tertiary Education	12	10.0
Total Income Realized/Annum (₦)		
<250,000	64	53.3
250,000-500,000	28	23.3
500,000-750,000	16	13.3
750,000-1,000,000	10	8.3
>1,000,000	2	1.7
Collection of Chewing Sticks		
Yes	117	97.5
No	3	2.5
Purpose of Collection		
Sale Only	0	0.0
Personal Use Only	102	85.0
Both Sale & Personal	18	15.0
Annual Income Realized from the Sale of Chewing Sticks (₦)		
<5,000	90	75.0
5,000-10,000	30	25.0
10,000-15,000	0	0.0
15,000-20,000	0	0.0
>20,000	0	0.0

Source: Field survey, 2019.

Table 2: List of ten most Preferred Chewing Sticks and their Ethno-medicinal Values in the Study Area by the Respondents

S/N	Local Name	Botanical Name	Family	Abundance	Part Used	Medicinal value
1.	Poko-jebu	<i>Mussaenda acuminata</i> (G. Don)	Rubiaceae	Rare	Stem, branch	Aphrodisiac, oral hygiene, cough, gum sore, body pain, child birth, fever
2.	Atod	<i>Gyneros brevifolia</i> (Spreng.) Moench	Liliaceae	VA	Stem	Oral hygiene, cough, fever, body pain
3.	Egunnu, Eja	<i>Phyllanthus muellerianus</i> (O Kuntze) Exell.	Euphorbiaceae	MA	Stem	Oral hygiene, stomach pain, constipation, dysentery
4.	Otupe	<i>Carpodakis lutea</i> G. Don.	Polygalaceae	Rare	Stem	Oral hygiene, aphrodisiac, headache pains, rheumatism, venereal disease, promote child birth, diarrhea
5.	Alawefin	<i>Sterculia tragacantha</i> Lindl.	Steculiaceae	MA	Stem	Diarrhea, fever, gonorrhoea, snake bite, syphilis, deworming
6.	Eru	<i>Gnetum africanum</i> Welw.	Gnetaceae	MA	Stem	Anticancer, diabetes, measles, sore throats, reduce pain after birth, menstrual pain, wound, stomachache
7.	Ata-eye	<i>Capsicum annuum</i> L.	Solanaceae	VA	Stem, Branch	Convulsion, fever, cold, fracture, leprosy, tooth decay, epilepsy, heart disease
8.	Oogbo	<i>Garcinia kola</i> Heckel.	Guttiferaceae	Rare	Branch, root	Liver disorder, hepatitis, cough, gonorrhoea, white tongue
9.	Wonderful kola	<i>Borbonia cordata</i> Engl.	Capparaeae	Rare	Branch, root	Memory loss, diabetes, blood cleanser, high blood pressure, migraine
10.	Akumma	<i>Pterocarpus indicus</i> Stapf Th. & H. Dur.	Apocynaceae	MA	Stem, root	Malaria, chest pain, yellow fever

Source: Field Survey, 2019.

Key on abundance: VA= very abundant, MA= moderately abundance, R= rare

Discussion

The study discovered that many plant species were used by respondents as chewing sticks in the study area. Stems, branches, roots and barks were the parts used. The moderately abundant chewing stick species were wildlings in the forest reserves and free areas. They include *Phyllanthus muellerianus*, *Sterculia tragacantha*, *Gnetum africanum*, *Pterocarpus nitida* and *Bridelia micrantha*. Others are *Mallotus oppositifolia*, *Rothmannia longiflora*, *Deinbollia pinnata*

and *Baphia nitida*. Some of the very abundant plants used for chewing stick were cultivated fruit trees and domesticated leafy vegetables. This finding was corroborated by Etukudo, (2000); Falade *et al.*, (2014) that edible wild plants, cultivated and domesticated species are used as chewing sticks. According to this study, plants in this category include: *Vernonia amygdalina*, *Ocimum gratissimum*, *Capsicum annum*, *Dacryodes edulis*, *Psidium gaujawa*, *Jatropha curcas*, *Azadirachta indica* and *Sennasiamea*.

However, eleven out of the 37 preferred plants used for chewing sticks were rare. They include *Massularia acuminata*, *Carpolobia lutea*, *Buchholzia coriacea*, *Garcinia kola*, *Dialium guineense*, *Bridelia ferruginea*, *Terminalia ivorensis*, *Enantia chlorantha*, *Baphia pubescens*, *Jatropha gossypifolia* and *Jatropha multifida*. The current status of these plants in the study area is not unconnected with indiscriminate bush burning and destructive collections of the plant products. One of the destructive practices is ring debarking of *Garcinia kola*, *Buchholzia coriacea*, *Bridelia ferruginea*, *Terminalia ivorensis* and *Enantia chlorantha* causing the eventual death of the plants (Shi-Lin *et al.*, 2016).

The medicinal values of chewing sticks were the reasons for their uses apart from teeth cleanness. The result of this study indicated that chewing sticks have direct dental benefits as well as making the mouth healthy and general health of the body. Chewing and swallowing the extracted liquid is a form of utilizing medicinal plants in curing some health problems. This was in line with the findings of Etukudo, (2000) and Aeeza *et al.*, (2014) that chewing sticks have curative properties. The result of the findings revealed that some medicinal plants were chewed to cure sicknesses such as; teeth ache, mouth wound, sore gum, gum infection, fever, cough, diabetes, stimulants, typhoid, asthma and stomachache. Others include aphrodisiac, pile, fibroid, constipation, fatigue, cold, dysentery, headache, gonorrhoea, high blood pressure, malaria, sore throat, cancer, chest pain, sickle cell anemia and black tongue.

The study revealed that usage of chewing sticks cut across age, sex, religion, education and economic status. People between age 51–60years had the highest percentage (29.2%) of using chewing sticks in the study area. It was also discovered that male (56.7%) depend on chewing sticks than their female counterpart (43.3%). However, the study discovered that people with secondary leaving certificate (48.3%) mostly collected and used chewing sticks, followed by people with

primary school leaving certificate (29.2%), (Table 2). This is not unconnected with the fact that respondents in this study have formal education. This supports the findings of Falade *et al.*, (2014) that rural dwellers collect and use chewing sticks regardless of age, religion and sex. Chi-square test ($p>0.05$) shows that very few people (15.0%) collected chewing sticks for both sale and personal use while majorities of the respondents (85.5%) collected chewing sticks for only personal use. This is the major practice as respondents have unhindered access to various species of plants used as chewing sticks for oral hygiene and medicinal purposes. According to the respondents, few sellers generated more than N5,000.00 per annum from the sale of chewing sticks.

The results of hypotheses test conducted on the association between uses and the aforementioned socio-economic characteristics indicated that there was no significant association between age and uses, sex and uses, religion and uses, and education and uses. This implies that old and young; male and female; Muslim, Christian and traditional; and literate and illiterate make use of chewing sticks. The income generated by the rural dwellers determines their economic status. It means that the more their income, the higher their economic status. So, only the rural poor who could not easily afford toothpastes use chewing sticks.

Conclusion and Recommendation

Medicinal values and socio-economic contributions of chewing sticks to the rural dwellers cannot be over accentuated. The preferred chewing sticks have direct dental benefits as well as general body health benefits because of their antimicrobial activities and curative properties. Though, non-significant incomes were realized from collection and sales of chewing sticks in the study area due to its availability. But, the rural people have free access to them. The available plants species used as chewing sticks in the study area include *Massularia*

acuminata, *Carpolobia lutea*, *Buchholzia coriacea*, *Garcinia kola*, *Dialium guineense*, *Bridelia ferruginea*, *Terminalia ivorensis*, *Enantia chlorantha*, *Baphia pubescens*, *Jatropha gossypifolia* and *Vernonia amygdalina*. Others include *Ocimum gratissimum*, *Dacryodes edulis*, *Psidium gaujava*, *Gnetum africanum*, *Picralima nitida*, *Bridelia micrantha* and *Baphia nitida*. Some of the sicknesses cured by chewing stick plant species in the study area include tooth ache, mouth wound, sore gum, gum infection, fever, cough, diabetes, stimulants, typhoid, asthma and stomachache. Others include aphrodisiac, pile, fibroid, constipation, fatigue, cold, dysentery, headache, gonorrhoea, high blood pressure, malaria, sore throat and black tongue. However, the presently endangered chewing stick species need urgent attention for domestication. Sustainable utilization, *in situ* and *ex situ* methods of conservation of the said species should be practiced. Indiscriminate bush burning should be prevented. And lastly, collectors and the general populace should be enlightened on the inherent dangers in the loss of species diversity now and for generations yet unborn.

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