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ETHNOBOTANICAL STUDY OF PLANTS USED IN MANAGING ULCER IN ABEOKUTA METROPOLIS, OGUN STATE, NIGERIA

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ABSTRACT

Ethnobotanical survey of plants often used for the management of ulcer in Abeokuta metropolis, Ogun State was carried out. A total of 100 respondents comprising 50 herbal traditional practitioners and 50 ulcer patients were interviewed. Study was carried out on plant parts used, modes of preparation, solvents used and types of preparation. Also, quantitative analysis of phytochemical ingredients of the most frequently used plants; *Occimum basillicum*, *Musa paradisiaca*, *Aloe vera*, *Azadirachta. indica*, *Brassica oleracae* and *Carica papaya* was carried out. Data were subjected to Analysis of variance (ANOVA) with probability set at ($p<0.05$). Results revealed a total of 40 plants belonging to 30 families out of which Zingiberaceae, Apocynaceae, Moraceae, Asteraceae, Liliaceae, Malliacaeae, Arecaceae, and Poaceae were the most frequent families. The most frequently mentioned plants were *Occimum basillicum* (57.5%), *Musa paradisiaca* (55%), *Aloe vera* (50%), *Azadirachta indica* (47.5%), *Brassica oleracae* (25%) and *Carica papaya* (25%). Records from this study revealed that the largest life form of plant was herbs (30%), followed by trees (28%), shrubs or trees (4%) while least plant forms were grasses, flowers, underground stems, climbers and chalk as represented by 1% each. The main methods of preparation were decoction and infusion. The plant parts recorded being used for ulcer management were leaves, barks, fruits, seeds, roots, rhizomes and the whole plant as in *Aloe vera.* The most frequently used plant parts were leaves (45%) while fruits, seeds, roots and rhizomes were the least parts used as represented by 5% each. Water, alcohol palm wine, palm oil and fermented maize water were the medium for ulcer herbal preparations.

Keywords: Ethnobotanical, ulcer, traditional practitioners, plant parts, solvents,

INTRODUCTION

In Nigeria, more than 50,000 plants are been used for medicinal purposes (Schippmann *et al.,* 2002). Despite the serious threat on our ecosystems, herbal medicines are assumed to be of great importance in the primary healthcare of individuals (Sheldon et al., 1997; Mahbubur Rahman, 2013; Lingaiah and Nagaraja, 2013; Awoyemi *at al.,* 2012) and communities in Nigeria as it becomes a recognized tool in search for new sources of drugs **(**Sharma and Mujundar, 2003). Cayenne pepper in moderation has been reported to help in the treatment of ulcer in some cases. It stimulating blood flow to bring healing nutrients to the affected area, this member of the nightshade family is good therapy for ulcers. Cabbage and its juice are also known for their ulcer-healing abilities. Researchers have

found that ulcer patients who drink one quart of raw cabbage juice a day often heal their ulcers in five days.

Garden produce rich in flavonoids may be helpful, too. Studies indicate that some bioflavonoids inhibit the growth of *H. pylori*. These compounds are also useful as anti-inflammatories (Dominic, and Ramanujam, 2012). Eat red- and purple-colored foods, such as plums, berries, and red cabbage. Parsley and onions are also good sources. Garlic and licorice have also been shown to kill *H. pylori* in test tubes. Bilberry is used frequently in Russia to treat ulcers. It reduces inflammation in the stomach and intestines and protects their fragile mucous membranes. Calendula is also good for ulcers due to its wound-healing ability. It is slightly unpleasant to drink as tea; add calendula tincture to a pleasantly flavored beverage (Aqib and Mohib, 2014).

Due to the fact that herbal medicines have been reported to be comparatively safer than the synthetic drugs, (Durmuşkahya, and Öztürk, 2013: Jitin, .2013). Current treatment of ulcers in developing countries has been largely suppression of pain, with little or no strategy aimed at a cure. Herbal medicine is fast emerging as an alternative treatment to available synthetic drugs for treatment of ulcer possibly due to lower costs, availability, and fewer adverse effects and perceived effectiveness. Many tropical herbs have been scientifically reported to possess potent antiulcer activity (Akinlami *et al.,* 2014).

According to Mathews (1993), only around 10 percent of the vast range of plant species have been discovered by man, meaning the potential for more herbal cures is out there waiting to be utilized for management of diseases including ulcer. In Nigeria, many varieties of botanical products have been reported to posses antiulcer activity, but the documented literature has centered primarily on the pharmacological action in experimental animals. Except for a few phytogenic compounds, limited clinical data are available to support the use of herbs as gastroprotective agents and thus, the data on the efficacy and safety are limited. Despite this, there are many botanical products with potential therapeutic application because of their high efficacy and low toxicity. Finally, it is note worthy that substances such as flavonoids, alkaloids, aloe gel and many others, that possess antiulcer activity are of particular therapeutic importance as most of the anti-inflammatory drugs used in modern medicine are allergenic. This study was aimed at collating information about plants used in the treatment of ulcer, parts used, methods of extraction and solvents used by an indigenous people living in Abeokuta.

MATERIALS AND METHODS

The Study Area

The study was carried out in Abeokuta metropolis, Ogun State, South West Nigeria. A total of 10 Markets including Lafenwa, Odeda, Osiele, Kuto, Iberekodo, Elega, Alabata, Olodo, Itoku, Omida, Sapon, Olugbo, Kila, Siun, Ogunmakin and herbal shops in various communities of Abeokuta were visited.

The town is surrounded by the huge masses of Rocks and hence it's called 'ROCK CITY''. It has a population of about one million people. It is predominantly dominated by the Egbas with sizable proportions of Yewas, Ijebu and other Yoruba ethnic groups in Nigeria. There are two main local Government areas in Abeokuta, Abeokuta North and Abeokuta South. The metropolis is bounded by Odeda, Obafemi Owode and Ewekoro on the East and South east. Yewa

North and Imeko- Afon on the North. Abeokuta is in the tropical rain forest zone of South Western Nigeria but the vegetation now is derived savannah. Abeokuta falls within the longitude 3° 21' East and latitude 7° 11'' North. The annual temperature ranges from 22.8° to 34.9°C. The mean annual rainfall is about 107 mm.

Informed consent

The objective of the study was explained to the local physicians and patients in Abeokuta. Approval to conduct the study was given by the community leaders. Informed consent was obtained from each of the participants. An approval for the study was obtained from market and traditional physicians of the communities of the town.

General questionnaire

Well structured 100 questionnaires were administered randomly to Traditional Physicians and ulcer patients, to obtain information on commonly used herbs and parts frequently used as anti-ulcer remedies. Questions on diagnosis of ulcer, names of plants, parts used, usage and dosage were asked.

Methodology

This study was carried out from January, 2012 to June 2012. The questionnaires were administered by systematic random sampling method.

QUANTITATIVE PHYTOCHEMICAL SCREENING

Collection and identification of plant materials

The plant material *Anacardium occidentale, Azadiracta indica, Musa paradisiaca, and Macrosphyra longislyla* were collected in Abeokuta and they were identified using an already documented work. The plants were hand picked and air dried at room temperature. The dried samples were grounded in powder separately using a clean mortar and pestle.

Test for alkaloids

This is a distillation and titrimetric procedure, 2g of finely ground sample was weighed and l00mls of 80% absolute alcohol added to give a smooth paste. The mixture was transferred to a 250ml flask and more alcohol added to make up to l litre and one gram magnesium oxide added. The mixture was digested in a boiling water bath for l5hrs under reflux air condenser with occasional shaking. The mixture was filtered while hot through a small buchner funnel. The residue was returned to the flask and re-digested for 30mins with 50ml alcohol after which the alcohol was evaporated; hot water was added to replace the alcohol lost. When all the alcohol had been removed, 3 drops or 10% HC1 were added. The whole solution was later transferred into a 250ml volumetric flask, 5ml of zinc acetate solution and 5ml of potassium ferrocyanide solution were added, thoroughly mixed to give a homogenous solution. The flask was allowed to stand for a few minute, filtered through a dry Whatman No. 1 filter paper and l0ml of the filterate was transferred into a separatory funnel and the alkaloids present were extracted vigorously by shaking with five successive portions of chloroform. The residue obtained in l0ml hot distilled water and cone. H_2S0_4 and 0.02g Selenium added and digested to colorless solution got converted to total alkaloid by multiplying by a factor of 3.26 i.e. % Total alkaloid %N X 3.26 ALKALOIDS= %N x 3.26

Test for flavonoids

Half gram of finely ground sample was weighed into l00ml beaker and 80rn1 of 95% Ethanol added and stirred with a glass rod to

prevent lumping. The mixture was filtered through a Whatman No. 1. filter paper into a l00ml volumetric flask and made up to mark with Ethanol. 11ml extract was pipetted into 50m1 volumetric flask, four drops of Cone. HCl added via a dropping pipette after which 0.5g of magnesium turnings were added to develop a magenta red coloration. Standard flavonoids solution of range 0-5ppm were prepared from l00ppm stock solution and treated in a similar way with HC1 and magnesium turnings. The absorbance of magenta red coloration of sample and standard solutions were read on a digital Jenway V6300 spectrophotometer at a wavelength of 520nm. The percentage flavonoid was calculated using the formula,

$$\frac{\text{Absorbance of sample X average gradient factor x dilution factor}}{\text{WC Sample x 10,000}}$$

Test for Tannin

0.20g of sample was measured into a 50m1 beaker, 20m1 of 50% methanol were added and covered with paraffin and placed in water bath at 77-80^0 C for l hour. Mixture was shaken thoroughly to ensure a uniform mixing. The extract was quantitatively filtered using a double layered Whatman No 4 filter paper into a l00ml volumetric flask. Twenty mils water added, 2.5m1 folin- ciocalteu Denis reagent and l0mils of 17% Na_2CO_3 were added and mixed thoroughly. The mixture was made up to the mark with water and allowed to stand for 20minutes . Bluish-green colour which developed at the end of range 0-10pp, were treated similarly as l ml standard samples and read after color development on a Spectronic 21D spectrophotometer at a wave length of 760nm. % Tannin was calculated using the formula

$$\%\ \text{TANNIN} = \frac{\text{absorbance of sample x average gradient factor x Dilution factor}}{\text{Wt. of sample x 10,000}}$$

Test for saponin

The spectrophotometric method of Brunner (1984) was used for saponin Analysis. One gram of finely ground sample was weighed into a 250m1 beaker and l00ml of isobutyl alcohol was added. This was shaken on a UDY shaker for 5 hours to ensure uniform mixing. There after the mixture was filtered through a Whatman No 1 filter paper into l00ml beaker and 20ml of 40% saturated solution of magnesium carbonate was added. The mixture obtained was pipetted into 50ml volumetric flask and 2ml of 5% of $FeCI_3$ solution were added and made up to mark with distilled water. The mixture was allowed to stand for 30mins for blood red colour to develop. 0- l0ppm standard saponin solution was prepared from saponin stock solution. The standard solution was treated similarly with 2ml of 5% $FeCl_3$ solution as done for 1ml sample above. The absorbance of the sample as well as standard saponin solutions were read after color development in a Jenway V6300 spectrophotometer at a wavelength of 380mm.

$$\%\text{SAPONIN} = \frac{\text{Absorbance of sample x gradient factor x dilution factor}}{\text{Wt. of sample x 10,000}}$$

Statistical Analysis

The mean and standard deviation of all the data obtained were calculated using the Statistical Package for Social Science (SPSS). Test of significance was conducted by analysis of Variance (ANOVA) and separation of means by Duncan's multiple range Test (DMRT) at 5% probability level.

RESULT

Population of respondents Traditional herbal practitioners (T.H.P) and patients) was characterized by males and female. Results revealed that 29(58%) of the respondents were females while 22(44%) were males. 33(66%) of patients were females while 17(34%) were males.

It was observed that 19 (38%) of the physicians attended primary school, 18 (36%) attended secondary school,2 (4%) attended tertiary institution while 11(22%) of the herbal traditional practitioners had no formal education.

Also, it was observed that 12 (24%) of patients attended primary school, 11 (22%) attended secondary, 20 (40%) tertiary institution while 7 representing 14% of patients had no formal education.

The traditional practitioners were categorized into various age group intervals such as below 30years, 31-40 years, 41-50 years, and 51 years above. It was found that 2(4%) of THP were below 30yeasr, 40% were recorded as age group 31-40 years, and 22 (44%) were recorded as age group 41-50 years while 6 (12%) traditional herbal practitioners were more than 51 years of age.

Also, 24(48%) of patients were below 30 years, 16 (32%) were recorded at age group 31-40years, 16% were recorded at 41-50 while 2 (4%) of the patients were above 51years. The patients were categorized into three ethnic groups (Yoruba, Hausa and Igbo). It was observed that largest number 32 (64%) of respondents were Yoruba, followed by Igbo 24 (28%) while least number of the respondents 4, representing (8%) were Hausa.

Responses of herbal traditional practitioners on effectiveness of herbs in the treatment of ulcer revealed that 16 (32%) of herbal traditional practitioners claimed that herbs were effective remedy in the treatment of ulcer while 34 (68%) claimed that herbs were very effective in the treatment of ulcer. 19 (38%) of patients claimed that the plants collected were effective while 31 representing (62%) claimed that the herbs were very effective on ulcer treatment (Table 1).

The survey identified a total of 40 plants belonging to 30 families out of which Zingiberaceae, Apocynaceae, Moraceae, Asteraceae, Liliaceae, Malliacaeae, Arecaceae , and Poaceae were the most frequent families. The most frequently mentioned plants were *Occimum basillicum* (57.5%), *M. paradisiaca* (55%), *Aloe vera* (50%),*A. indica* (47.5%), *Brassica oleracae* (25%) and *C. papaya* (25%). The life forms of plants covered by this study ranged from trees, shrubs, climbers, grasses, flowers, herbs, underground, Shrub or tree and stems. Findings from this study revealed that the largest population of plant (30%) was herbs, followed by trees (28%), Shrubs or trees (4%) while least plants were grasses, flowers, underground, climbers and chalk represented by 1% each (Table 3).

Herbal remedies can be prepared from either freshly collected or dry plant samples from the field. The plant parts recorded being used for ulcer treatment were leaves, barks, fruits, seeds, roots, rhizomes and the whole plant used as recorded in *Aloe vera.* The most frequently used parts were leaves (45%) while fruits, seeds, roots and rhizomes were the least parts used as represented by 5% each (Table 3).

Table 1: Socio-economic characteristics of the respondents (Traditional herbal practitioners and Patients) sampled in Abeokuta metropolis, Ogun State Nigeria.

Respondents	Characteristic	Frequency	%frequency	Mode
Traditional herbal practitioners	Gender (Sex)			
	Male	22	44	
	Female	29	58	58
Total		50	100.0	
Patients				
	Male	17	34	
	Female	33	66.0	
Total		50	100.0	
Traditional herbal practitioners	Formal Education		100.0	
	None	11	22.0	
	Primary	19	38.0	38.0
	Secondary	18	36.0	
	Tertiary	2	4.0	
Total		50	100.0	
Patients	None	7	14.0	
	Primary	12	24.0	
	Secondary	11	22.0	
	Tertiary	20	40.0	40.0
Total		50	100.0	
Age group	Age interval			
Traditional herbal practitioners	Bellow 30yrs	2	4.0	
	31-40	20	40.0	
	41-50	22	44.0	44
	51 and above	6	12.0	
Total		50	100.0	
Patient	Age interval			
	Bellow 30yrs	24	48.0	48
	31-40	16	32.0	
	41-50	8	16.0	
	51 and above	2	4.0	
Total		50	100.0	
Ethnic group	Tribes			
Traditional herbal practitioners	Yoruba	48	96.0	
	Hausa	1	2.0	
	Igbo	1	2.0	
Total		50	100.0	
Patient	Yoruba	32	64.0	64
	Hausa	4	8.0	
	Igbo	14	28.0	
		50	100	
Responses on the effects of herbs	Responses			
Traditional herbal practitioners	Effective	16	32.0	
Patients	Very effective	34	68.0	68.0
Total		50	100.0	
Patient	Effective	19	38.0	
	Very effective	31	62.0	62.0
Total		50	100.0	

Table 2: Medicinal plants used for the control of ulcer in Abeokuta, Ogun State, Southwest, Nigeria.

Scientific names	Family names	Local names	Common names	Habit	Parts used	(%)Frequency
Aframonium melegueta	Zingiberaceae	Atare	Alligator pepper	Herb	Leaves	3(7.5)
Agerantum conyzoides	Asteraceae	Otili	Goat weed	Herb	leaves	2(5)
Allium sativum	Liliaceae	Ayu	Garlic	Herb	Bulb	4(10)
Aloe vera	Liliaceae	Kumari	Burnt plant	Herb	Whole plant	20(50)
Alstonia boonei	Apocynaceae	Ahun	Stool wood	Tree	Bark	7(17.5)
Anarcadium occidentals	Anarcadaceae	Kaju	Cashew	Tree	Leaves	5(12.5)
Anthocleista nobilis	Gentianaceae	Sapo	Cabbage	Tree	Root, Bark	4(10)
Aspilia Africana	Asteraceae	Yunyun	African marigold	Herb	Leaves	2(5)
Azadirachta indica	Meliaceae	Adongoyaro	Neem	Tree	leaves	19(47.5)
Boerhaavia diffusa	Nyctaginaceae	Teteponla	Hog weed	Flower	Leaves, root	3(7.5)
Brassica oleracea	Brassicaceae	Gbegi	Cabbage	Herb	Leaves	10(25)
Bryophyllum pinnatum	Crassulaceae	Abamoda	Restorection plant	Herb	leaves	2(5)
Caladium bicolor	Aracaceae	Eje- Jesu	Heart of Jesus	Herb	Leaves	2(5)
Carica papaya	Caricaceae	Ibepe	Pawpaw	Herb	Unripe fruit	10(25)
Cassia fistula	Ceasalpinaceae	Aridan tooro	Palm Indian	Tree	Root	2(5)
Cissamplelos mucronata	Menispermaceae	Jokoje	Ivy vine	Shrub	Leaves	5(12.5)
Cochliospermum tinctorium	Cochlospermaceae	Sewuru, Rapo		Shrub	Root	1(2.5)
Crinum glacum	Amaryllidaceae	Isumeri	Spider lily	Herb	Seed	3(7.5)
Curcuma longa	Zingiberaceae	Laali	Turmeric	Shrub	Leaves	6(15)
Cymbopogum citratus	Poaceae	Ewiti	Lemon	Grass	Leaves	9(22.5)
Elaies guineensis	Arecaceae	Ope	African oil palm	Tree	Seed shaft	4(10)
Entadrophragmamacrophylla	Maliaceae	Arunje	Mahogany	Tree	leaves	5(12.5)
Ficus exasperate	Moraceae	Ipin	Sand paper	Tree	leaves	4(10)
Glycyrrhiza glabra	Fabaceae		Licorice	Herbs	Leaves	4(10)
Heliotropium indicum	Boraginaceae	Atapaogberi obuko	Heliotrope	Herb	Root	2(5)
Irvingia grandifolia	Irvingiantiaceae	Odundun	Bush mango	Tree	Leaves	6(15)
Macrosphyra lonistyla	Rubiaceae	Efun	African cascarilla	Chalk	Chalk	1(2.5)
Margaritaria discoidea	Phllanthaceae	Awe arunkuna	Pheasant-berry	Tree	Leaves	5(12.5)
Musa paradisiaca	Musaceae	Ogede	Plantain	Herbs	Fruits	14(35)
Occimum basillicum	Lamiaceae	Mokomoko	Bail	Herb	Leaves	23(57.5)
Oncoba spinosa	Flacourtiaceae	Panisa	Snuff- box tree	Shrub-tree	Bark	2(5)
Parquatina nigrascens	Asclepidiaceae	Ogbo	African	Climber	Leaves	3(7.5)
Persea Americana	Lauraceae	Pia	Avocado pear	Herb	Leaves	7(17.5)
Strophantus hidpidus	Apocynaceae	Sagere	Kombe seed	Tree	Root	4(10)
Syzygium aromaticum	Myrtaceae	Kannafuru	Clove	Tree	Fruit	2(5)
Terminalia macrophylla	Combretaceae	Idigun	Chase miich	Tree	Leaves	2(5)
Treculia Africana	Moraceae	Ifon	African box wood	Tree	Root	5(12.5)
Uravia chamae	Annonaceae	Eruju	Finger root	Shrub or tree	Root	5(12.5)
Zea mays	Poaceae	Agbado	Maize	Shrubs	Cub	3(7.5)
Zingiber officinale	Zingeberaceae	Atale	Ginger	Under-ground	Rhizomes	3(7.5)

Table 3: Habit and part of plants used for ulcer herbal preparation.

Plant life form	Frequency	(%)Frequency
Trees	14	28
Shrubs	3	6
Grasses	1	2
Flowers	1	2
Herbs	15	30
Underground	1	2
Stem	1	2
Shrub or tree	2	4
Climbers	1	2
Chalk	1	2
Plant part used		**(% freq)**
Leaves	18	45
Bark	9	22.5
Fruit	2	5
Seeds	5	12.5
Root	2	5
Rhizome	2	5
Whole plant	2	5

Respondents, however, claimed that either plant material is very effective. When the herbal remedies contained two or more plants parts and recipe of seeds, fruit, stem barks were placed at the bottom of the cooking pots followed by the fragile part, mostly the leaves, on the top. It was also claimed that apart from single application of herbal preparations, the plants can still be combined in twos, threes, and fours (Table 4).

The solvents such as water, alcohol, palm wine, palm oil and fermented maize water were used for herbal preparation (Table 4).

Table 5 showed phytochemical content of *Anacardium occidentale, Musa paradisiaca, Azadirachta indica and Macrospyra longistyla.* Results revealed that there was no significant difference (P>0.05) in the quantity of phytochemical contents of the plant secondary metabolites such as tannins, saponins alkaloid, and flavonoids present in the leaves of *Musa paradisiaca, Azadirachta indica and Macrospyra longistyla* across the board except *Anacardium occidentale* (Table 5). This implied that the plants contained similar amount of phytochemical constituents.

Table 4: Single and combination of plants used for treating ulcer in Abeokuta metropolis.

Botanical Names	Part(s) used	Method of preparation	Source of information
Carica papaya	Unripe fruits	Infusion	PA
Musa paradisiaca	Fruit	Infusion	PA and THP
Aloe vera	Leaves	Decoction	PA
Occimum basillicum	Leaves	Decoction	PA and THP
Agerarum conyzoids	Leaves	Decoction	PA and THP
Macrospyra logistyla	Chalk	Infusion	PH
Astonia boonii	Leaves	Decoction	PH
Persea Americana	Leaves	Decoction	PH
Brassica oleracae	Leaves	Infusion	PH
Curcuma longe	Leaves	Decoction	PH
Zea mays	Fruits	Decoction	PH
Cissampelos mucronata	Leaves	Decoction	PH
Elaies guineensis	Ripe fruits	Decoction	PA and THP
Azadirachta indica	Leaves	Decoction	PA and THP
Plants used in combination of two.			
Boerhaavia diffusa, Bryophylum pinnatum	Leaves	Decoction	THP
Boerhaavia diffusa, Irvingia grandifolia.	Leaves	Decoction	PA and THP
Cassia fistula, Anthocleista nobilis	Root and barks	Decoction	THP
Oncobia spinosa Cochispermum tinctorium	Barks and roots	Decoction	PA and THP
Plants used in combination of three.			
Margaritaria discoidea, Zingiber officinale, Cochlospermu tintorium	Root bulbs leaves	Decoction	PA and THP
Crinum glacum Heliotropium indicum Syzygium aromaticum	Seeds Roots Fruit	Decoction	PA
Plants used in combination of four.			
Zingiber officinale Margaritaria discoidea, Crinum glacum, Oncobia spinosa	Bulbs Seeds Bark or root	Decoction	PA and THP
Macrophylla longistyla Heliotropium indicum, Uravia chamae, Cochlospermu tintorium	Chalks Roots Roots Root	Decoction	PA and THP
Anthocleista nobilis, Cassia fistula Strophantus hispidus Treculia africana	Barks Roots	Decoction	PA and THP

PA = Patients, THP= Traditional Herbal Practitioners.

Table 5: Mean value of phytochemical contents of *Anacardium occidentale, Musa parasidiaca, Azadirachta indica and Macrospyra longistyla* leaves.

Plants / parts	Phytochemicals (mg / g)			
	Tannins	Saponins	Alkaloids	Flavonoids
Anacardium occidentale	11.53±8.16a	3.16±0.01a	2.86±0.01a	1.68±0.01a
Musa para-sidiaca,	4.12±0.01c	5.33±0.01d	3.86±0.01b	2.41±0.01a
Azadirachta indica	1.72±0.01c	1.86±.0.01d	1.68±.0.01b	1.23±.0.01a
Macrospyra longistyla	3.38±0.02c	3.62±0.01d	3.14±0.01b	2.66±0.03a

Means followed by the same letters on the same columns are not significantly different according to Duncan's Multiple Range Test at 5% probability.

DISCUSSION

The respondents (THP and patients) were characterized by males and females. The highest percentage of respondents was made up of male respondents. This suggests that males were more vulnerable to ulcer than females. **78%** of the THP had formal education. This is an indication that unlike in the olden days, herbal practitioners are now educated (Jouad *et al*., 2001). This gave them the necessary skills to document their observations and new findings. Also, majority of patients were literates. This implied that despite the challenges facing herbal medication in the area of dosage and standardization, elites are also taking herbal products not only to treat their ulcer ailments but also to keep their body fit (Kadiri, 2008).

The observation that majority of the THPs were recorded at age 41-50 is an indication that unlike those days when herbal practice was very common among aged people, this study now revealed that young men and women are now practicing traditional medicine. The consumption of herbs according to this study for treatment of ulcer is very high among respondents who were less than 30 years. This may suggest that herbal medication is gaining significant therapeutic effect even among younger generation as its usage responses by THP on ulcer treatment reflected effective actions. The study also revealed that ulcer is more rampant among Yorubas than Hausa and Igbo living in the study area.

The survey identified a total of 40 plants belonging to 30 families out of which Zingiberaceae, Apocynaceae, Moraceae, Asteraceae, Liliaceae, Milliacaeae, Arecaceae, and Poaceae were the most frequent families. The most frequently mentioned plants were *Occimum basillicum* (57.5%), *M. paradisiaca* (55%), *Aloe vera* (50%),*Azadirachta indica* (47.5%), *Brassica oleracae* (25%) and *C. papaya* (25%). Records from this study revealed that the largest population of plants was herbs, (30%), followed by trees (28%), Shrubs or trees (4%) while least plants were grasses, flowers, underground, climbers and chalk represented by 1% each. According to

the respondents, combination of different plants and parts in the preparation of anti-ulcer herbal remedy is common among the respondents as it is believed that some plants catalyze the actions of others (Idowu *et al.,* 2010).

The use of either freshly collected herbal recipe or preserved (dry) plant parts seemed not to make any difference in its perceived efficacy to the respondents. This was confirmed in the study as respondents showed no preference of one over the other.

However, various studies have indicated that there were differences in the quantitative and qualitative secondary plant metabolites composition of fresh and dry plant materials (Marius and Kazhila, 2012). Consequently, dry plant materials might not be as potent as freshly collected herbs. Pharmacological laboratory investigations have also employed the drying of plants parts during the preparation of plant extracts. In the preparation of herbal medicines, the use of clay pot in herbal preparation has not been proven scientifically, but some respondents opined preference to the use of clay pots because it has been in use before the advent of modern technology and is more economical.

The usage of herbs, according to the respondents, varies from raw consumption to infusion, decoction and concoction with no side effects, problems or complaints in the usage. Preference was given to the arrangement of plants parts in cooking pots although no investigation has been carried out on this in relation to the plant. However, respondents claimed that plant parts are soaked better when hard parts of plant such as stems and barks are placed first before soft parts especially when boiling is to be employed. In preparation of herb recipes for ulcer therapy, single plants can be used or in combination of more than one plant (Khan *et al*., 2012). The active principles of these plants were often extracted through infusion, decoction and tincture (Taylor, 2004). Lingaiah and Nagaraja, 2013). However, components of different herbal recipes in this study differ along lineage, class, cultural group, occupation status, and age group suggesting the pluralistic and diverse nature of traditional medicine (Singha, 1998). However, the interest of people in Abeokuta, Ogun State, Nigeria encountered in the course of this study in giving at least herbal prescription for ulcer treatment showed prevalence of the disease.

Majority of these plants when prepared are very bitter in taste. It is believed that each active principle of components parts making up the recipe complement one another in the cure of symptoms of ulcer (Anant, and Jaya, 2013). Preference for solvent of herbal remedy is because of the belief that some solvents are more efficient than others and depending on the plant parts. The respondents affirmed that aqueous extract from fermented maize and water was more preferred to palm oil, palm wine and alcohol, usually prepared by boiling**.** From this study, it was also observed that the dose of the herbal remedy used is dependent on disappearance of symptoms of ulcer. Most respondents believe that herbal remedies can be consumed as much as possible. Several studies have shown that saponins, flavonoids and other plant metabolites possess anti-ulcer, hypotensive, anti-inflammatory and other pharmacological properties **(**Akah and Okafor, 1992; Aqib and Mohib. 2014; Pukraj, and Tabassumyaseen 2013). Also, Olajide *et al* (1999) and Asuzu and Chineme (1990), independently reported *Morinda lucida* leaves to

contain high concentrations of flavonoids, alkaloids, tannins and saponin.) used in the treatment diseases.

However, observation of appreciable quantity of tannins, tannins, saponins alkaloids, and flavonoids in the leaves of *Musa paradisiaca, Azadirachta indica and Macrospyra longistyla* may be responsible for acclaimed therapeutic effect of these plants. This study indicated that the ecosystem of Abeokuta communities is still richly blessed despite the effect of human influence with indigenous medicinal plants that can be exploited for immediate use and for the development of antiulcer drugs.

CONCLUSION

This study has attempted to highlight medicinal plants claimed to be used or associated with ulcer therapy in the indigenous Yoruba community as suggested by individuals in Abeokuta, Southwest, Nigeria. These mentioned plants may probably contain yet undiscovered anti- ulcer properties, which can serve as a reason for a multidisciplinary approach to develop potentially effective drugs while noting dangerous drugs and practices that should be ignored. Based on this study, it is strongly recommended that more work should be done on the listed plants to quantify their phytochemical constituents.

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