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Survey and Phytochemical Analyses of Plants Use for the Treatment of Childhood Diseases in Ojo Lga, Lagos State.

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ABSTRACT

The local use and phytochemical analyses of plants used for the treatments of some children's diseases were conducted in Ojo local government in Lagos state, the area is predominantly of Awori stock. The information was gathered via unstructured questionnaires; the information gathered was used to prepare decoctions with liquid remains of processed grind maize (Omi Idun) for the treatment of diseases in children. The decoctions were later screened and determined for phytochemical constituents. The survey of the plants indicated forty four species of plants belonging to twenty eight families used for the treatment of impetigo, convulsion, shortage of blood, typhoid fever and haemorrhoids in children. The prepared decoctions showed the presence of phenol having the highest quantity among the constituents for the treatment of impetigo, flavonoid in blood supplement, tannin in typhoid, cardiac glycosides in measles and alkaloid in haemorrhoid. Roots, barks and leaves were the parts used for the preparation of different decoctions based on this study. The information gathered from the survey depicts the largely dependence of the indigent's parents on medicinal plants to meet the need of the primary health care of their children and the phytoconstituents quantified might be responsible for the activity of the decoctions against the causal organisms of the diseases mentioned.

Keywords: Ethnobotany, Decoction, Childhood, Diseases, Phytoconstituents, Ojo.

1. Introduction

Medicinal plant is any plant in which one or more of its organs contain substances that can be used for therapeutic purposes or which are precursors for the synthesis of useful plants [1]. Medicinal plants have been used by humans from time immemorial [2]. Many drugs have plant origin and several plants are currently undergoing investigation to ascertain their therapeutic efficacies [2]. It is estimated that there are 400,000 species of tropical plants that have medicinal properties [3]. Medicinal plant knowledge is like all local knowledge, a social product that is part of the specific cultural system. Local knowledge is not always evenly distributed and it is not every member of the group that is necessarily with the same knowledge [4]. This is certainly true for medicinal plant knowledge, where usually a distinction can be drawn between specialists (traditional healers) who possess more in depth knowledge and lay persons [4].

The availability of medicinal plants has made traditional medicine relatively cheaper than modern medicine. Traditional herbal medicine is an important component of healthcare in sub-Saharan Africa [5]. This is largely due to poverty, inadequacy of health services and shortage of health workers. Even when the facilities exist, there is high shortage of drugs and equipment [6, 7]. The World Health Organization (WHO) estimates that up to 80% of the population in some developing countries use traditional medicine [8].

In Africa, Traditional medicine practitioners keep no accurate record and information was usually passed orally from one generation to another within the clan as a heritage. Since oral information can never be accurate as was told by the previous recipients of the information and progeny of some clans might not be interested in the practise of traditional medicine; it brings to fore the dearth of information due to the demise of the progenitors of the information [4, 5]. In Cameroun, the knowledge of medicinal plants is considered secretive and healers claim to have learnt it from a host of relatives. Some Locals in Zambia usually pass the knowledge to others based on families' ties while some do learn through ancestral spirits [4]. In other countries like Benin, Ghana and Togo, healers have assistants who are apprentices in training but in countries such as Tanzania, many healers reported receiving information on new,

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potentially useful medicinal plants during their sleep [4]. They also communicate sometimes with other healers about the plants they use and how to administer them. In Nigeria, Medicinal plants knowledge are acquire based on ancestral lineage and mostly kept within the lineage and pass on from one generation to another [4, 5].

Lagos state in Nigeria with coordinates: 6°27'11''N 3°23'45''/6.45306°N 3.39583°E is basically known for her industrial and infrastructural development, basically surrounded by riverine areas which are rural settlements, among them is "Ojo" settlement in Ojo Local Government which is inhabited majorly by the 'Awori' people. The access of this people mostly children to modern healthcare services is of little significance, so the practise of traditional method of medicine is highly prominent and this is due to non-availability of equipped healthcare centres; education and poverty. The survey was conducted to ascertain the people's usage of the plants and the phytochemical compounds present in the plants.

2. Materials and Method

2.1. Collection of the Plant Samples

The survey was conducted through interviews with the aid of unstructured questionnaires; the interviews were carried out in various locations within the local government. The information was obtained by asking the local herb sellers and traditional medicine practitioners what they use in treating children's diseases: the plant parts use, mode of combination and method of preparation. The local government consists of many villages which are generally classified as rural and poor. During the survey some of the plants used in the treatment of children's diseases were obtained directly from the traditional medicine practitioners while others were collected during the walk through the area accompanied by some dwellers.

2.2. Identification of the Plants

The plants were initially identified by their local names (Yoruba) through consultations with the local people. The information obtained included local names, the parts of the plant used and methods of preparation. They were later identified scientifically and authenticated at the Lagos University Herbarium (LSH) [9, 10].

2.3. Pressing and Drying of Plant Specimens

Voucher specimens were prepared with the leaves of the plants; they were pressed in a plant press to remove moisture.

2.4. Method of Preparation and Concentration of the Decoction

The decoctions were prepared by combining all the plant parts identified for the treatment of the disease and they were prepared with the liquid remains from preparation of locally made staple food ('Omi Idun') from maize as a solvent and boiled for 30 minutes. The boiled decoctions were concentrated using heating mantle at 50 °C [11, 12, 13].

2.5. Phytochemical Analyses of the Decoctions

The decoctions were screened and quantified for their phytochemical constituents [5, 14, 15].

2.6. Statistical Analysis

All the grouped data were statistically evaluated with SPSS 19.0 software. Hypothesis testing methods included one-way analysis of variance followed by least significance difference least via Duncan Multiple Range Test (DMRT). A test value of $p < 0.05$ was considered to indicate statistical significance. All results were expressed as mean \pm standard error of the mean (SEM) for the phytochemicals analysed.

3. Results and Discussion

The survey conducted revealed 44 plant species belonging to 28 families that were frequently used for the treatment of children's diseases in Ojo Local Government; they were prepared as decoctions and administered orally with a teacup of the decoction taken three times daily: morning, afternoon and evening. Tables 1-11 show the names of the medicinal plants, their families, parts and their local names. The tables also show that the leaves, barks and the roots were the most prominent parts used to prepare the decoction for the treatment of children's diseases. The Anacardiaceae family had the highest number with 5 species follow by Fabaceae with 4 species while Apocynaceae had 4, Euphorbiaceae with 2 and other family were represented with one species each. Table 12 and Table 13 show the results of the qualitative and quantitative phytochemicals analyses of some of the prepared concoctions used for the treatment of ailments in children. Figure 2 shows the comparative quantitative analysis of the constituents in different decoctions, Phenol (57.2mg/100g) had the highest quantity of the constituents present in decoction prepared for the treatment of Impetigo (Ela Wuwu) while Tannin (42.3mg/100g) was the lowest. Flavonoid (33.2mg/100g) presence was the highest while the Tannin (32.4mg/100g) was the lowest for decoction prepared for the supplement of blood (Ogun Eje). Alkaloid (115.8mg/100g) had the highest quantity of the constituents present in decoction prepared for the treatment of Impetigo (Ela Omode) while Saponin (32.9mg/100g) was the lowest. The Alkaloid (37.9mg/100g) had the highest quantity of all the constituents present in the decoction prepared for the treatment of Convulsion (Giri) while the Tannin was the lowest (21.4mg/100g). Athraquinone (13mg/100g) presence was the highest while the Phenol (7.9mg/100g) was the lowest for decoction prepared for the treatment of Typhoid (Iba Aponju). The Cardiac Glycoside (113.3mg/100g) was the highest constituent available in the decoction prepared for the treatment of Measles (Ita) while Saponin (70.5mg/100g) was the lowest. The Cardiac Glycoside (2.5mg/100g) was the lowest constituent in the decoction prepared for the treatment of Haemorrhoids (Jedi Jedi) while the Alkaloid (6.2mg/100g) had the highest quantity of all the constituents present in the decoction for the treatment of Haemorrhoids. The presence of this identified phytochemicals seems to be responsible for the pharmacologically activeness of the decoctions [16, 17]. It has been widely reported that the activities of secondary metabolites like alkaloids, saponins, tannins and cardiac glycosides might be responsible for the treatment of diseases such as impetigo, typhoid, haemorrhoids and malaria [13, 18]. Flavonoid present in plant is to help in response to microbial infection, they have been found in-vitro to be effective antimicrobial substances against wide array of microorganisms; they break the bacterial cell walls [19, 20]. Phenol is widely distributed in plants and has been reported to be toxic to micro-organisms [19, 21].



Fig 1: Map showing the study area.

Table 1: Impetigo (Ela Omode)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Khaya ivorensis</i>	Meliaceae	Oganwo	Stem Bark
<i>Bombax buonopozense</i>	Malvaceae	Ponpola	Stem Bark
<i>Rauvolfia vomitoria</i>	Apocynaceae	Asofeyejo	Root
<i>Lannea welwitschii</i>	Anacardiaceae	Opon	Root
<i>Magnifera indica</i>	Anacardiaceae	Mungoro	Stem bark
<i>Avicennia germinans</i>	Acanthaceae	Ofun	Stem bark
<i>Ficus capensis</i>	Moraceae	Opoto	Stem bark
<i>Echinops longifolius</i>	Compositae	Iregbe Agbe	Fruit

Table 2: Typhoid Fever (Iba Aponju)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Sarcocephalus latifolius</i>	Rubiaceae	Egbesi (Yoruba)	Root, Stem Bark
<i>Alstonia congensis</i>	Apocynaceae	Awopa	Stem Bark
<i>Citrus medica</i>	Rutaceae	Oronbo nla	Fruit
<i>Citrus paradise</i>	Rutaceae	Oronbo nla	Fruit

Table 3: Blood Supplement (Ogun Eje)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Sorghum bicolor</i>	Poaceae	Poroporo okababa	Fruit
<i>Magnifera indica</i>	Anacardiaceae	Mungoro	Stem Bark
<i>Theobroma cacao</i>	Malvaceae	Koko	Stem Bark
<i>Staudtia stipitata</i>	Myristicaceae	Amuje	Stem Bark
<i>Khaya ivorensis</i>	Meliaceae	Oganwo	Stem Bark

Table 4: Convulsion (Giri)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Cranum jagus</i>	Amaryllidaceae	Ogede odo	Shoot
<i>Allium ascalonicum</i>	Liliaceae	Alubosa elewe	Shoot
<i>Tetrapleura tetraptera</i>	Fabaceae	Aidan	Fruit
<i>Croton lobatus</i>	Euphorbiaceae	Eru	Seed
<i>Securidaca longepedunculata</i>	Polygalaceae	Ipeta	Root

Table 5: Measles (Ita)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Aframomum sceptrum</i>	Zingiberaceae	Oburo	Leaves
<i>Markamia tomentosa</i>	Bignoniaceae	Okoko	Leaves
<i>Uraria picta</i>	Fabaceae	Alupayida	Leaves
<i>Aframomum melegueta</i>	Zingiberaceae	Atare	Leaves

Table 6: Hemorrhoids (Jedi Jedi)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Lamnea welwitshii</i>	Anacardiaceae	Orira	Stem bark
<i>Terminalia avicennioides</i>	Combretaceae	Idi	Stem bark
<i>Aristolochia repens</i>	Aristolochiaceae	Akogun	Root
<i>Piper guineense</i>	Piperaceae	Iyere	Seed
<i>Eugenia aromatic</i>	Myrtaceae	Kanufuru	Seed
<i>Allium sativum</i>	Amaryllidaceae	Ayuu	Fruit
<i>Senna fistula</i>	Fabaceae	Aridantoro	Root
<i>Gongronema latifolium</i>	Asclepiadaceae	Madumaro	Root

Table 7: Impetigo (Ela Wuwu)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Tetrapleura tetraptera</i>	Fabaceae	Aidan	Fruit
<i>Croton lobatus</i>	Euphorbiaceae	Eru	Seed
<i>Ancistrophyllum secundiflorum</i>	Arecaceae	Okuku	Root
<i>Detarium senegalense</i>	Cesalpiniaceae	Ogbogbo	Root
<i>Anthocleista adjalonensi</i>	Loganiaceae	Sapo	Root
<i>Anacardium occidentale</i>	Anacardiaceae	Kaju	Stem bark
<i>Entandrophragma utile</i>	Meliaceae	Jebo	Stem bark

Table 8: Impetigo (Ela Omode)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Scherebra arborea</i>	Oleaceae	Opele	Fruit
<i>Rhaphiostylis beninensis</i>	Icacinaceae	Itanpara	Root

Table 9: Hemorrhoids (Jedi Jedi)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Parinari sp</i>	Chrysobalanaceae	Abeere	Seed
<i>Aristolochia repens</i>	Aristolochiaceae	Akogun	Root

Table 10: Malaria (Iba)

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Alstonia congensis</i>	Apocynaceae	Awopa	Stem bark
<i>Sarcocephalus latifolius</i>	Rubiaceae	Egbesi	Root, Stem bark
<i>Vernonia amygdalina</i>	Compositae	Ewuro	Leaves
<i>Alstonia boonei</i>	Apocynaceae	Ahun	Bark, Leaf and Root

Table 11: Cough (Iko)

The *Citrus medica* fruit were cut and squeezed into a jar already with honey and the mixtures were shook vigorously.

Botanical name	Family	Local name (Yoruba)	Part Used
<i>Citrus medica</i>	Rutaceae	Oronbo wewe	Fruit

Table 12: Qualitative Phytochemical Screening of the Decoctions Prepared

Decoctions	Tannin	Flavonoid	Phloba-tannin	Cardiac Glycoside	Sugar	Sapo-nin	Terper-noid	Steriod	Phenol	Alkaloid	Anthraq uinone
Impetigo (Ela Wuwu)	+	+	+	+	+	+	+	+	+	+	+
Blood Supplement (Ogun Eje)	+	+	+	+	+	+	+	+	+	-	+
Impetigo (Ela Omode)	+	+	-	+	+	+	+	+	+	-	+
Convulsion (Giri)	-	-	-	-	+	+	+	+	+	+	-
Typhoid Fever (Iba Aponju)	-	-	-	-	-	+	+	+	-	-	+
Measles (Ita)	-	-	-	-	-	+	-	-	+	-	-
Hemorrhoids (Jedi Jedi)	+	-	-	+	+	+	-	-	+	+	+

+ = Presence - = Negative

Table 13: Determined Quantitative Analysis of the Decoctions prepared.

Decoction	Tannin (mg/100 g)	Alkaloid (mg/100 g)	Phenol (mg/100 g)	Flavonoid (mg/100 g)	Cardiac Glycoside (mg/100 g)	Saponin (mg/100 g)	Anthraquinone (mg/100 g)
Impetigo (Ela wuwu)	42.2±0.1 ^b	52.5±.0.5 ^d	57.2±0.4 ^a	0.0±0.0 ^a	0.0±0.0 ^a	0.0±0.0 ^a	48.9±0.2 ^c
Blood Supplement (Ogun Eje)	32.4±0.4 ^b	0.0±0.0 ^a	0.0±0 ^a	33.2±0.2 ^c	0.0±0.0 ^a	0.0±0.0 ^a	0.0±0.0 ^a
Impetigo (Ela Omode)	75.9±0.3 ^d	1.2±0.7 ^f	81.9±0.9 ^c	54.9±0.4 ^b	59.6±0.4 ^c	32.9±0.6 ^a	61.4±1.4 ^c
Convulsion (Giri)	21.4±0.4 ^b	37.9±0.6 ^d	33.2±0.8 ^c	0.0±0.0 ^a	0.0±0.0 ^a	0.0±0.0 ^a	0.0±0.0 ^a
Typhoid Fever (Iba Aponju)	10.4±0.1 ^d	9.1±0.3 ^c	7.9±0.2 ^b	0.0±0.0 ^a	9.4±0.1 ^c	0.0±0.0 ^a	13±0.2 ^c
Measles (Ita)	84.7±0.8 ^b	89.6±0.5 ^c	99.5±0.2 ^d	86.1±0.6 ^b	1.1±0.4 ^f	70.5±0.9 ^a	1.0±0.7 ^e
Hemorrhoids (Jedi Jedi)	5.0±0.3 ^d	6.2±0.2 ^e	3.6±0.2 ^c	0.0±0.0 ^a	2.3±0.1 ^b	0.0±0.0 ^a	3.5±0.2 ^c

Values are expressed as Mean ± SE. mean with the same letter within a column are not significantly different at P<0.05

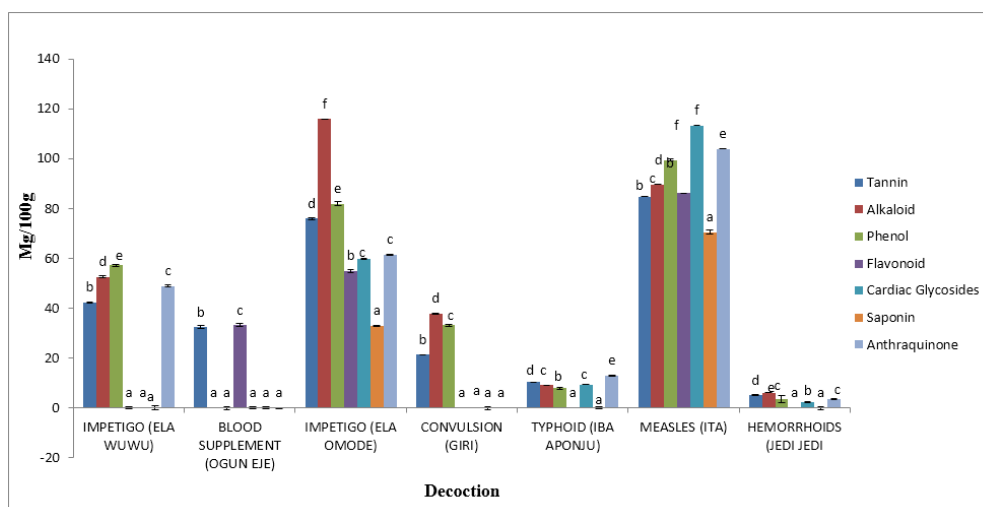


Fig 2: The Comparative Quantitative analysis of the Constituents in different Decoctions.

4. Conclusion

The results of this study provide information that medicinal plants still play a major role in the primary health care of the people of this area, which helps with the incapability of most parents affording the services of established orthodox hospitals for the treatment of diseases affecting their wards. The study documented the collected plant samples at the herbarium. The study also provides information on the regular usage of medicinal plants by the people in the area to treat various children's ailments in their community.

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