Ethnobotanical study of plants used for treating intestinal worms in Ibadan, Nigeria

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Abstract

Poverty and poor sanitation in sub-Saharan Africa are the main reasons for parasitic infection prevalence. Medicinal herbs have been sources of natural and cheaper remedies for the treatment of many parasitic infections, including intestinal parasites. The study aimed to document medicinal herbs used in treating intestinal worm infections in the Ibadan metropolis through an ethnobotanical survey. The three main traditional herb markets, Oje, Oja Oba and Iwo Road, in Ibadan city, were purposively selected for the survey. The respondents, who were mainly herb sellers, were interviewed using structured questionnaires. The information obtained included demographic information, names of plants used in the treatment of worms, plant parts, dosage and method of preparation. The data collected was analysed using descriptive statistics and the Relative Frequency Citation (RFC), Use Value (UV) and Informant Consensus Factor (ICF) of the mentioned plants were calculated. The survey revealed 45 plants that are used in the treatment of intestinal worms in Ibadan. These plants belong to 31 families. The most frequently mentioned plants with their RFCs were *Cryptolepis sanguinoleta* (Lindl.) Schltr (0.39) *and Aristolochia albida* Duch (0.39) while most of the plants belong to the Families Apocynaceae and Euphorbiaceae. The roots (25%) and the leaves (18.75%) were the most commonly used plant parts. Most of the plants were indicated to be used singly while some were used in combinations of two or more. The study has revealed the medicinal plants that are used against intestinal parasites. Thus, bioassay studies to confirm the claims should be carried out to establish the activities of these plants.

Keywords: Intestinal Worm, Ethnobotanical survey, Medicinal plants, Ibadan.

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Introduction

Medicinal plants are ancient heritage of global significance. Native medicinal plants have provided enormous benefits for indigenes in the area; many have been used for health and medicinal purposes (Treasure *et al* 2020). A plant is referred to as a medicinal plant when the entire plant, parts, metabolites or phytocompounds can restore the health of the sick or reduce complications caused by a disease (Ezzat *et al* 2019).

The role that medicinal plants and traditions play in the health system of developing countries cannot be overemphasized (Tuo *et al* 2020). The World Health Organization (WHO) defines traditional medicine as "the total knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness" (WHO 2008).

In developing countries, 80% of the population depend on traditional medicine as their primary health system. These traditional medicines are cost-effective, safe and affordable as compared to conventional medicines, which may be expensive and often inaccessible to disadvantaged populations (Treasure *et al* 2020; Tuo *et al* 2020).

In Nigeria, there has been a positive shift from orthodox medicine to traditional medicine. More than 90% and 40% of Nigerians in rural and urban areas, respectively, depend partially or entirely on traditional medicine (Ariyo and Ariyo 2018). Many indigenous plants have been used for treating and curing various diseases and infections. (Ariyo *et al* 2020). Plants such as *Asysasia calyciana* have been used for treating skin diseases and weak erection; *Anacardium occidentale* for malaria, elephantiasis and ringworms; *Isolana campanulate* for bronchial infections; *Enantia chlorantha* for typhoid fever, hepatitis and fever; *Crinum jagus* for tuberculosis; *Alstonia boonei* for breast development; *Boswellia sp.* as anti-snake venom; *Connarus africanus* as an anthelminthic (Abd El-Ghani 2016).

Intestinal worm infection is a global health concern, majorly prevalent in tropical and subtropical countries. These countries are characterized by poverty and poor sanitation. Soil-transmitted helminth (STH) infections

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form the most important group of intestinal worms with, about two billion people affected worldwide. *Ascaris lumbricoides* (roundworms), *Trichuris trichiura*, (whipworms) *Necator americanus* and *Ancylostoma duodenale* (hookworms) form the major species that cause these infections (Kumar *et al* 2014).

Over the years, control of these worms has been mainly by the use of these three classes of anthelmintics-benzimidazoles, macrocyclic lactones and cholinergic agonists, but with the dramatic and serious level of anthelmintic resistance in animals, a new approach needs to be devised (Fissiha and Kinde 2021). The increasing shift towards the use of medicinal plants and traditional medicine for health purposes presents a possible means for new drugs; hence, the reason for this study.

This study aimed to document information on medicinal plants used for the treatment of intestinal worms in Ibadan, Nigeria, for further use in molecular and therapeutic studies. To achieve this goal, an ethnobotanical survey was conducted in three traditional markets in Ibadan, which are the Oje market (Ibadan Northeast), Oja Oba market (Ibadan Southwest) and Iwo Road market (Ibadan Northeast). The study ascertained the types of plants used for the treatment of these worms; those used both singly and in combination.

Materials and methods

Study area

The study was carried out in Ibadan the capital and most populous city of Oyo State, which is situated in the Southwestern part of Nigeria. It is the third-largest city by population in Nigeria, after Lagos and Kano. The population is about 5,719,853 from the 2006 census. Ibadan lies within the tropical forest zone but close to the boundary between the forest and the derived savanna. This study covered three markets, which are Oja-Oba (7.3765ºN, 3.8951ºE), Oje (7.3886ºN, 3.9087ºE) and Iwo Road markets (7.4038ºN, 3.9351ºE). The selection of the markets was purposeful because these were among the main markets that are involved in traditional herbs selling. The study was conducted among traditional herb sellers and practitioners through a series of ethnobotanical surveys. The survey was carried out within two weeks in January, 2022.

Data collection

A structured questionnaire (written both in English and Yoruba Languages) was used to obtain information from the respondents. The set of questions contained the names of plants used to treat intestinal worms, parts of the plants used, methods of preparation, adverse effects (if any), dosage and other uses of the plants. The study population consisteds of people who have knowledge about medicinal plants. The individuals were asked for their consent before administering the questionnaire. Respondents were not coerced to participate and were informed about the purpose of the study. Respondents provided the local names of plants, which were used for literature searches to interpret them into scientific names and common names. The World floral online (www.worldfloraonline.org) database was used to validate the names.

Statistical analysis

The demographic information of the respondents was analysed by descriptive statistics, while the information gathered on the plants was subjected to quantitative indices such as Relative Frequency Citation (RFC), Information Consensus Factor (ICF) and Use Value (UV) as reported by Faruque *et al* (2018). This was used to determine the relative importance of a particular species.

Relative Frequency Citation (RFC) was calculated using the formula:

$$RFC = \frac{FC}{N}$$

Where FC (Frequency of Citation) = No of times a particular species was mentioned ÷ total number of species mentioned × 100 and N was the total number of informants that participated in the survey.

Use Value (UV) was calculated using the formula:

$$UV = \sum U/N$$

Where U is the number of uses mentioned by each informant per species and N is the total number of informants.

The documented plants were grouped into 7 different categories of ailment for the calculation of Informant Consensus Factor (ICF) value using the formula below:

$$FIC = Nur - Nt/(Nur - 1)$$

Where Nur refers to the total number of use reports for each disease cluster and Nt refers to the total number of species used for that cluster.

Results

Thirty-two respondents consented to participate in the survey, of which 6 (18.75%) were males, while 26 (81.25%) were females. In respect to occupations, 20 (62.50%) respondents were herb sellers, 5 (15.63%) respondents were traditional medical practitioners, and 7 (21.88%) respondents were entrepreneurs. The largest percentage (50.00%) of the respondents were secondary school certificate holders, 8 (25.00%) respondents were primary school certificate holders, only 3.13% respondent had no formal education. Twenty-eight (87.50%) respondents were Muslims, while 4 (12.50%) respondents were Christians. A summary of the demographic information is given in Table 1.

A total of 45 plants that belong to 31 families were collected as plants used in the treatment of intestinal worms, out of which 4 were unidentified to their scientific names (Table 2). The relative frequency of citation for all the plant species revealed in this study ranged from 0.03-0.39, the most frequently mentioned plants with their relative frequency of citations were *Cryptolepis sanguinoleta* (Lindl.) Schltr (0.39) *and Aristolochia albida* Duch (0.39) while most of the plants belong to the family of Apocynaceae (4%), Euphorbiaceae (3%) as presented in Table 2 and Figure 2, respectively. Table 2 shows a representation of the

family, scientific and local names of the plant, the part of the plant used, and their habits.

Table 1: Socio-demographical data of respondents

Variables	Categories	Frequency	(%)
Gender	Male	6	18.75
	Female	26	81.25
Age (years)	20-29	7	21.87
	30-39	3	9.37
	40-49	12	37.5
	50-59	7	21.87
	60-69	3	9.37
Occupation	Herb seller	20	62.5
	Traditional medical practitioner	5	15.62
	Entrepreneur	7	21.87
Education	No formal	1	3.12
	Primary	8	25
	Secondary	16	50
	Tertiary	7	21.87
Religion	Islam	28	87.5
	Christianity	4	12.5

In this study, the UV ranged between 0.03 and 0.15. Based on the data presented in Table 2, the plant that has the most use was *Khaya ivorensis* A. Chev. (0.15). The ICF value ranged from 0-0.58, the highest value was recorded for parasitic infection predominantly the worms (Table 3).

The mode of administration of the herbs mentioned was oral ingestion (drinking and licking). The methods of preparation were mostly infusion and decoction. The most frequently used plant part was the root (25%), followed by leaves (18.75%) and other plant parts as indicated in Figure 1. Table 4 shows 7 plants used singly to treat intestinal worms, while the plants that were used in combination of two or more are listed in Table 5. Plants such as *Carica papaya*, *Khaya ivorensis* A. Chev are used singly in preparing the herbal mixture, while *Cryptolepis sanguinioleta* and *Aristolochia albida* were used together. A combination of plants used for the preparation of herbs against intestinal worms, their mode of preparation, dosage, precautions and other uses of the plants are summarized in Table 6.

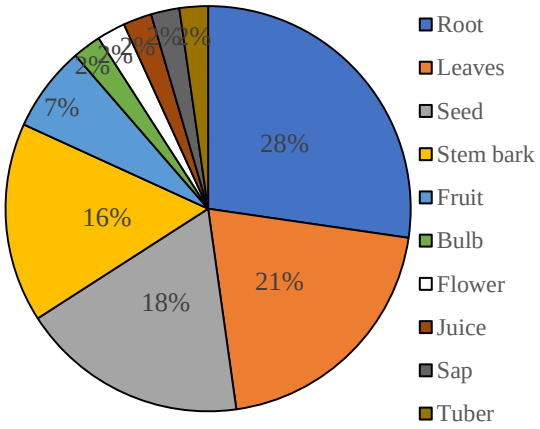

Figure 1. Percentage of the plant parts used in the preparation of herbal remedy

Table 2: Profile of plants claimed by the respondents in the treatment of intestinal Worms

No	Family	Scientific names	Local name	Common names	Habit	Plant part used	RFC	UV
1	Amaryllidaceae	*Allium sativum L.*	Ayu	Garlic	Herb	Bulb	0.09	0.09
2	Asteraceae	*Ageratum conyzoides* (L.)	Imi esu	Goat weed	Shrub	Leaves	0.06	0.06
3		*Vernonia amygdalina* Del.	Ewuro	Bitterleaf	Shrub	Leaves	0.06	0.09
4	Meliaceae	*Khaya ivorensis* A.Chev.	Oganwo	Mahogany	Tree	Bark	0.12	0.15
5		*Azadirachta indica* A. Juss	Dogoyaro	Neem	Tree	Leaves	0.03	0.06
6	Arecacae	*Elaeis guineensis* Jacq.	Adi dudu	Palm kernel oil	Tree	Seed	0.03	0.03
7		*Cocos nucifera* L.	Agbon	Coconut	Tree	Juice	0.06	0.03
8	Aristolochiaceae	*Aristolochia albida Duch.*	Paron funfun	Savannah Bamboo	Herb	Root, bark	0.39	0.06
9		*Aristolochia repens* Mill.	Akogun	Dutchmans pipe	Climber	Stem, seed	0.15	0.03
10	Asclepiadaceae	*Cryptolepis sanguinoleta* (Lindl.) Schltr	Paron pupa	Savannah Bamboo	Herb	Root, bark	0.39	0.06
11		*Gongronema latifolium* Benth.	Madunmaro	Bush buck	Shrub	Steam	0.06	0.06
12	Apocynaceae	*Hunteria umbellate* (K.Schum) Hallier f.	Erin	Akuamma plant	Tree	Bark	0.06	0.03
13		*Picralima nitida* T. Durand & H. Durand	Abeere	Spanish needle	Tree	Seed	0.15	0.03
14		*Tylophora sylvatica* Decne	Isigun	White ginger	Climber	Bark	0.03	0.03
15		*Rauvolfia vomitoria* Wennberg	Orira	Poison devil's pepper	Tree	Leaves	0.03	0.03
16		*Funtumia elastica* (Preuss) Stapf.	Epo ire	Bush rubber tree	Tree	Bark	0.03	0.03
17	Liliaceae	*Allium ascalonicum* L.	Alubosa elewe	Spring onion	Herb	Leaves	0.15	0.03

No	Family	Scientific names	Local name	Common names	Habit	Plant part used	RFC	UV
18	Piperaceae	*Piper guineense* Thonn	Iyere	Ashanti pepper	Climber	Seed	0.03	0.03
19	Myrtaceae	*Eugenia aromatica* O.Ber	Kanafuru	Clove tree	Tree	Flower (dried)	0.06	0.06
20	Iridaceae	*Gladiolus ferrugineus* Goldblatt & J.C.Manning	Baka	Sword Lily	Shrub	Leaves	0.03	0.03
21	Cucurbitaceae	*Citrullus colocynthis* (L.) Schrad.	Baka	Kalahari melon, watermelon	Shrub	Seed	0.09	0.03
22		*Telfairia occidentalis* Hook. F.	Elegede	Fluted Pumpkin	Shrub	Seed	0.03	0.06
23	Zingiberaceae	*Curcuma longa* L.	Atale pupa	Tumeric	Shrub	Tuber	0.03	0.03
24		*Zingiber officinale* Roscoe	Atale funfun	Ginger	Herb	Rhizome	0.03	0.03
25	Laganaria	*Laganaria breviflorus* Benth	Tangiri	Christmas melon	Climber	Fruit	0.03	0.03
26	Fabaceae	*Acacia nilotica* (L.) Delile	Booni	Gum arabic	Shrub	Seed	0.03	0.03
27	Casesalpinaceae	*Curculigo pilosa* Schumach & Thorn	Epa ikun	Golden eye grass	Herb	Rhizome	0.03	0.03
28	Polygalaceae	*Securidiata longepedunculata* Fresen	Ipeta	Violet tree	Tree	Root	0.09	0.03
29	Loganiaceae	*Anthocleista djalonensis* A. Chev.	Sapo	Cabbage tree	Tree	Root	0.06	0.03
30	Euphorbiaceae	*Mallotus oppositifolius* Mull. Arg.	Orokoro	Fruiting branch	Shrub	Leave	0.06	0.03
31		*Bakerella Poissonii* (Lecomte) Balle	Oro adete	Spurge	Shrub	Sap	0.06	0.03
32		*Euphorbia laterfolia* Schumach & Thorn	Enu opiri	Little cactus	Shrub	Root	0.06	0.03
33	Rutaceae	*Citrus aurantiifolia* (Christm.) Swingle	Osan wewe	Lime	Tree	Fruit	0.06	0.06
34	Combretaceae	*Anogeissus schimperi* Hochst. Ex Hutch & Dalziel	Ayin	NA	Tree	Root	0.03	0.03
35	Olacaceae	*Olax subscorpidea* Oliv	Ifon tutu	Olax	Shrub	Root	0.03	0.03
36	Annonaceae	*Uvaria chamae* P. Beauv	Eruju	Finger root	Tree	Root	0.03	0.03
37	Plumbaginaceae	*Plumbago zeylanica* L.	Inabiri	Doctor bush	Shrub	Root	0.03	0.03
38	Cactaceae	*Opuntia dillenii* (Ken Gawl.) Haw.	Oro agogo	Prickly pear	Shrub	Root	0.03	0.03
39	Leguminosae	*Calliandra portoricensis* (Jacq.) Benth	Tude	Corpse awakener	Shrub	Root	0.06	0.06
40		*Lonchocarpus sericeus* (Poir.) DC.	Ipapo	Lilac tree	Tree	Bark	0.03	0.03
41	Ulmaceae	*Celtis mildbraedii* Engl.	Ewon agogo	African celtis	Tree	Root	0.03	0.03
42	Caricaceae	*Carica papaya* L.	Ibepe	pawpaw	Tree	Seed	0.06	0.06
43	Anacardiaceae	*Spondias mombin* L.	Yeye	Hogplum	Tree	Leaves	0.03	0.03
44	Lamiaceae	*Ocimum gratissimum* L.	Efirin	Scent leaf	Shrub	Leaves	0.03	0.03
45	Solanaceae	*Capsicum annum* L.	Ata ijosi	Chilli, Bird pepper	Herb	Fruit	0.03	0.03

Table 3: Informant Consensus Factor (ICF) by category of ailment with the study

S/N	Category of ailment	Number of use reports	Number of species	ICF Value
1	**Parasitic infection**: Worms, Malaria, Loasis	106	45	0.58
2	**Purifier**: Detoxification	3	2	0.5
3.	**Dermatological**-Skin Infection, Skin Diseases	3	2	0.5
4.	**Sexual and related disorder**: Infertility, Staphylococcus infection, Toilet disease	5	4	0.25
5	**Digestive System** Disorder: Stomach ache, Ulcer, Constipation, Diarrhea, Typhoid	1	1	0
6	**Circulatory**: Hypertension	1	1	0
7	**Inflammatory**: Nose bleeding	1	1	0

Table 4: Plants that are used singly in the treatment of intestinal worms in the study area.

S/N	Scientific name
1	*Carica papaya*
2	*Khaya ivorensis*
3	*Vernonia amygdalina*
4	*Ocimum gratissimum*
5	*Telfairia occidentalis*
6	*Mallotus oppostifolius*
7	*Azadirachta indica*

Table 5: Plants that are used in combinations for intestinal worm treatment in the study area

S/N	Groups of plants
	Groups of two plants
1	*Spondias mombin* L., *Capsicum annum* L.
2	*Cocos nucifera, Eugenia aromatica* O.Ber
3	*Aristolochia albida, Cryptolepis sanguinoleta*
	Group of three plants
4	*Aristolochia albida, Cryptolepis sanguinoleta, Aristolochia repens* Mill.
5	*Aristolochia repens* Mill., *Acacia nilotica, Tylophora sylvatica* Decne
6	*Aristolochia repens* Mill., *Cryptolepis sanguinoleta, Aristolochia albida*
7	*Vernonia amygdalina, Cocos nucifera, Allium sativum* L.
	Group of four plants
7	*Aristolochia albida, Cryptolepis sanguinoleta, Allium ascalonicum, Picralima nitida*
8	*Aristolochia albida, Cryptolepis sanguinoleta, Picralima nitida, Hunteria umbellate*
9	*Curculigo pilosa, Citrullus colocynthis* (L.) *Schrad., Securidiata longepedunculata, Anthocleista djalonensis* A. Chev.
	Group of five plants
10	*Euphorbia poissonii, Khaya ivorensis* A. Chev., *Allium sativum* L., *Ageratum conyzoides* (L.) L., *Elaeis guineensis* Jacq.
11	*Aristolochia albida, Cryptolepis sanguinoleta, Hunteria umbellate, Allium ascalonicum, Picralima nitida*
12	*Gongronema latifolium* Benth., *Cryptolepis sanguinoleta, Aristolochia albida, Mallotus oppostifolius, Citrus aurantiifolia (Christm.)* Swingle
	Group of six or more Plants
13	*Gladiolus ferrugineus* Goldblatt and J.C.Manning, *Citrullus colocynthis* (L.) Schrad., *Ageratum conyzoides* (L.) L., *Allium sativum* L., *Curcuma longa* L., *Zingiber officinale* Roscoe, *Laganaria breviflorus*
14	*Aristolochia albida, Cryptolepis sanguinoleta, Funtumia elastica* (Preuss) Stapf., *Anogeissus schimperi, Gongronema latifolium* Benth., *Citrus aurantiifolia* (Christm.) Swingle,
15	*Aristolochia albida, Cryptolepis sanguinoleta, Olax subscorpidea, Securidiata longepedunculata, Allium ascalonicum, Mallotus oppostifolius,*
16	*Aristolochia albida, Cryptolepis sanguinoleta, Uvaria chamae, Celtis mildbraedii, calliandra portoricensis, Plumbago zeylanica* L., *Lonchocarpus sericeus* (Poir.) DC., *Allium ascalonicum*
17	*Securidiata longepedunculata, Uvaria chamae, Plumbago zeylanica* L., *Khaya ivorensis* A. Chev., *Euphorbia laterfolia, Opuntia dilleni, Calliandra portoricensis*

Discussion

Many of the respondents reported having earned their knowledge from their parents or grandparents. A major constraint during data collection was the unwillingness of traditional herb sellers to cooperate in terms of responding to the questionnaires and sharing their knowledge. Many claimed their knowledge cannot be exploited for free or for scientific use unless we sign up for an apprenticeship, hence the low turnout.

Cryptolepis sanguinoleta (Lindl.) Schltr and *Aristolochia albida* Duch had the highest RFC value, signifying their relative importance in the treatment of intestinal diseases. Both plants were mentioned to be used in combination for the treatment of intestinal diseases as well as with other plants. *Cryptolepis sanguinoleta* (Lindl.) Schltr is a shrub that has been reported in the treatment of diseases such as malaria, bacterial respiratory disease, hypertension and diarrhea (Osafo *et al* 2017). The infusion of the root of this plant has been reported in the treatment of stomach and intestinal disorders in Zaria and Senegal (Barku *et al* 2012). The method of preparation of these plants reported by these studies also validates the method as mentioned by our respondents.

The species of Aristolochia has been commonly reported to be used in the treatment of gastrointestinal complaints. Aside from treating the gastrointestinal disorder, its uses extend to treating snakebites, poisoning, sexually transmitted diseases, cardiovascular and respiratory conditions (Heinrich *et al* 2009). Infusion of dried leaves and roots is used by Hausas and Fulani in the Northern part of Nigeria as an anthelminthic, which corroborates our study of the use of roots against intestinal worms (Khan *et al* 2011).

Some of the members of Apocynaceae family with the highest occurrence in this survey have equally been reported by Islam and Lucky (2019) as useful plants in the treatment of gastrointestinal disorders. Members of

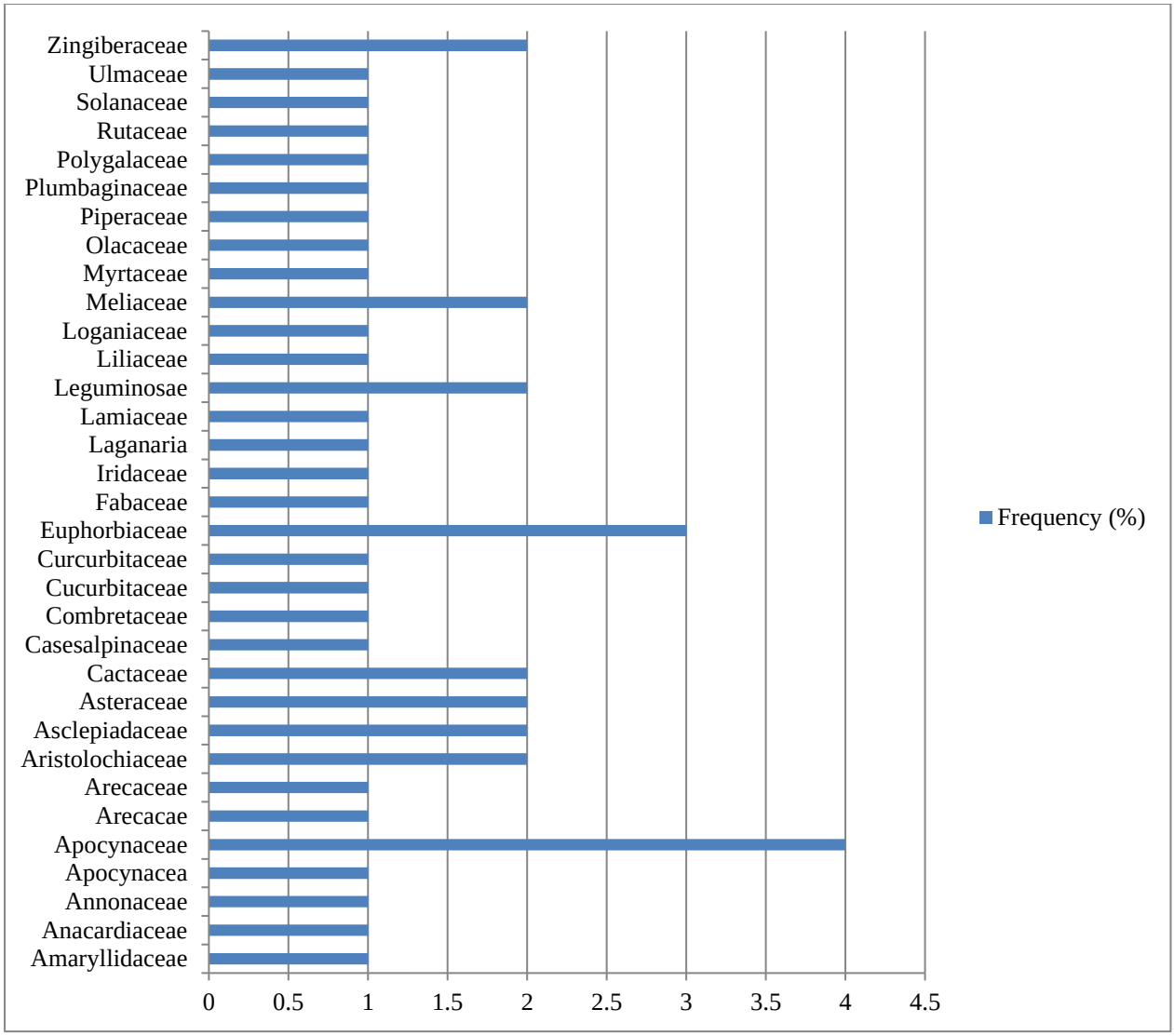

Figure 2. Distribution of plant species across families

this family are rich in alkaloids, flavonoids, terpenes, glycosides, and sterols and they possess many pharmacological properties (Bhadane *et al* 2017). This study also shows that many members of Euphorbiaceae family are used by many respondents to treat worms and pile. Studies have revealed that several members of Euphorbiaceae family are effective remedies for treating stomach disorder, diarrhoea, oxidative stress, cancer, infertility and neurosis (Bijekar and Gayatri 2014).

The most commonly used plant parts in this study were the roots, followed closely by the leaves. Roots are traditionally considered strong medicine as they hold the plant firmly and nutrients are transported from them to other parts of the plant. The report by Mahwasane *et al* (2013) also shows a similar trend. Several reports have confirmed leaves as one of the most commonly used parts of a plant for medicinal purposes (Garedew and Abebe 2018). The abundance of chemical groups in the leaves may explain their frequent use in traditional medicines, as they are also the location for most of the synthesis of secondary metabolites.

Decoction and infusion are the most commonly used methods of preparation. This supports the report by Ouachinou that showed decoction as the most used method in traditional medicine (Ouachinou *et al* 2017). Decoction provides the most active ingredients, reduces the toxic effect of some recipes and has the strongest action of all types of preparation as it gets absorbed quickly (Degla *et al* 2021).

Oral administration (drinking and licking) was the main mode of administration from this study. It has been reported that the oral route is the most frequently used route of administration of herbal medicine (Oladunmoye and Kehinde 2011; Garedew and Abebe 2018; Ariyo *et al* 2020).

This study shows that *Vernonia amygdalina*, *Carica papaya* and *Azadirachta indica* were plants used singly in the treatment of intestinal worms. This corroborates the study of Ouachinou *et al* (2017) that reported these three medicinal plants for the treatment of intestinal parasitosis. The combination of two, three, four, five and more plants were more commonly reported in this study, and according to the respondents, using mixtures of different plants or plant parts increases the potency of the herbs as compared to using a single plant to treat or cure a disease.

Table 6: Some local preparation of plant extracts used in treating intestinal worms in Ibadan, Oyo State, Nigeria

S/N	Medicinal plant	Other plants	Recipe and Dosage	Method of preparation	Other uses
1	*Gladiolus ferrugineus* Goldblatt & J.C.Manning	*Citrullus colocynthis* (L.) Schrad., *Ageratum conyzoides* (L.) L., *Allium sativum* L., *Curcuma longa L., Zingiber officinale Roscoe, Laganaria breviflorus*	The seeds of *Gladiolus ferrugineus* Goldblatt & J.C. Manning, *and Citrullus colocynthis* (L.) *Schrad., the rhizome of Curcuma longa* L., *Zingiber officinale Roscoe, some Allium sativum L. , Ageratum conyzoides (L.) L. are properly rinsed and soaked in a bottle of water for 30 minutes. This can also be boiled.* *Dosage- 1 shot for adults, 4 tablespoons for children., use until relieved twice daily*	Infusion	Infections-Staphylococcus, Toilet disease
2	*Citrullus colocynthis* (L.) Schrad.	*Laganaria breviflorus, Curculigo Pilosa, Securidiata longepedunculata, Anthocleista djalonensis* A. Chev.	#. The seeds *of Citrullus colocynthis* (L.) Schrad. together with diced *Laganaria breviflorus is properly rinsed and boiled for 30 minutes* ## The roots of *Securidiata longepedunculata, Anthocleista djalonensis* A. Chev., the bark of *Curculigo pilosa* and the seeds of *Citrullus colocynthis* (L.) Schrad. are rinsed thoroughly and cooked Dosage: Only for adults. 1 shot every day	Decoction	Toilet disease
3	*Euphorbia poissonii*	*Khaya ivorensis A.Chev., Elaeis guineensis* Jacq.	The sap of *Euphorbia poissonii* is freshly collected and mixed with the juice from the seed of *Elaeis guineensis* Jacq. *This is then pounded with the bark of Khaya ivorensis* A. Chev., *Dosage- 2 spoons for adults, a teaspoon for children* ***Note: Euphorbia poissonii is toxic so it should be used in moderation***	Pounding	N/M
4	*Allium sativum* L.	N/A	The seeds of *Allium sativum L*. is removed from their covering, rinsed and chewed for adult. It can be soaked in water for children	Chewing	Loasis, Detoxification, Cough
5	*Ageratum conyzoides* (L.) L.	N/A	The leaves of *Ageratum conyzoides* (L.) L. is rinsed from dirt and squeezed with salt. The extract is mixed with alcohol. Dosage: 5ml for children,	Squeezing	Stomach upset Ulcer
6	*Mallotus oppostifolius*		# The leaves of *Mallotus oppostifolius* are properly washed, then it is squeezed or boiled for about 20 minutes. **Precaution: The herb must be prepared by someone else** Sugar is licked 20 minutes before taking the content Dosage: 1 small glass cup for adults, 2 tablespoons for children. # The extract of the leaves can also be added to the juice of *Citrus aurantiifolia* (Christm.) Swingle.	Decoction	Pile
7	*Aristolochia albida and Cryptolepis sanguinoleta*	*Picralima nitida (abeere), Allium ascalonicum (alubosa elewe), Hunteria umbellate (epo erin), Aristolochia repens* Mill. *(Akogun)*	# The roots of *Aristolochia albida* and *Cryptolepis sanguinoleta*,the seeds of *Picralima nitida*, the leaves of *Allium ascalonicum* and the bark of *Hunteria umbellate* are soaked in water with 2 kafra and 2 Camphor for a day. Alum can be used instead of Kafra and Camphor Dosage: 2 spoons for adults and 1 spoon for children ## The roots of *Aristolochia albida* and *Cryptolepis sanguinoleta*, the seeds of *Aristolochia repens Mill*., soak in water for 24 hours Dosage: A teaspoon for children, 2 spoons for adult ### The roots of *Aristolochia albida* and *Cryptolepis sanguinoleta* can be soaked alone in the water	Infusion	Toilet diseases

8	*Vernonia amygdalina*	N/A	The leaves of the bitter leaf are plucked early in the morning, and the juice extracted is mixed with coconut water. The extract of the bitter leaf can be taken alone daily Dosage: No dosage	Squeezing	Detoxification, skin infection
9	*Gongronema latifolium Benth.*	*Aristolochia albida, Cryptolepis sanguinoleta,*	The stem of *Gongronema latifolium* Benth. is properly rinsed and cooked with potash for 20-30 minutes	Decoction	N/M
10	*Ocimum gratissimum*	N/A	Pluck the leaves and rinse properly after which the juice is squeezed and taken	Squeezing	Nose bleeding
11	*Spondias mombin* L.	*Capsicum annum*	Pluck the leaves of this plant, rinse and soak in gin or lime water together with *Capsicum annum* Dosage: A small glass cup in the morning and night for adults, 2 spoons for children	Infusion	
12	*Carica papaya*	N/A	Cut ripe paw paw and take out 2 teaspoons and chew it morning and night for 3 days		Typhoid, Skin glow
13	*Azadirachta indica*	N/A	Cut the leaves and grind them to a fine paste and take a half spoon with a glass of water every morning on empty stomach.	Grinding	Malaria, Typhoid
14	*Khaya ivorensis* A.Chev.	*Securidiata longepedunculata, Uvaria chamae, Plumbago zeylanica* L., *Opuntia dilleni, calliandra portoricensis*	# Boil the bark in water for 30 minutes and drink when cooled Dosage- 8 tablespoons for adults, 4 tablespoons for children # Boil the roots of these plants together with the bark of *Khaya ivorensis* A. Chev.	Decoction	Hypertension, typhoid, infertility
15	*Aristolochia repens* Mill.	*Acacia nilotica, Tylophora sylvatica Decne*	The bark of *Tylophora sylvatica Decne*, the seed of *Acacia nilotic*a and the seed of *Aristolochia repens* Mill, thoroughly rinse and soak in water for 3 days Dosage: Teaspoon for children, 2 tablespoons for an adult	Infusion	Skin diseases

Legend: N/A – Not Applicable, N/M – Not mentioned

Conclusion

This study compiled medicinal plants claimed to be effective against intestinal worms by respondents, which included traditional herb sellers, traditional medicinal practitioners, and users in three markets in Ibadan, Oyo State Southwest Nigeria. The result of this study points to the fact that medicinal plants are also relied on for treating ailments like intestinal infections.

Further research should be carried out on these plants to determine the efficacy of these medicinal plants against intestinal worms. This can provide new insight into new drugs as well as modifications of the existing ones to curb the ongoing resistance to anthelminthics.

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