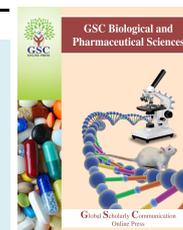


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(RESEARCH ARTICLE)



Homestead horticultural crops: Alternative sources to alternative medicines/therapies in Ebonyi State, Southeastern Nigeria

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Abstract

The prehistoric discovery that certain plants harm and others have curative powers is the origin of the healing professions and its practitioners as well as professions devoted to plants (botany and horticulture). The description of plants and their properties and virtues (termed herbals) became invaluable resources for the physician and apothecary. The horticultural plants with medicinal values used in the traditional medicine of Ebonyi State, Southeast Nigeria were surveyed, aimed at identifying and documenting the plants used amongst the indigenes of Ebonyi State. Semi-structured interviews were conducted during a field trip to gather information from traditional medicinal practitioners (TMPs) and community elders. Results obtained indicated that horticultural plants species with medicinal values were 44 species representing 32 genera and 30 families; used in the ethno medicine of the people of Ebonyi State. The most represented genera were *Cucurbitaceae* and *Rutaceae* providing five and four species, respectively. The most used plant parts recorded was the leaves representing (52.27%), followed by fruits (27.27%), and while decoction was the main method of drug preparation with (38.67%) followed by infusion (21.33%). The result of the survey shows that more than half of the horticultural plants with medicinal values gathered in Ebonyi State are also used in other states in Nigeria as well as in other countries for various ailments. The most frequently treated diseases represents 67.09% of the medicinal applications and the most treated diseases was Fungal /Bacterial diseases with 27.45% followed by Malaria/Fever and other related diseases with (22.55%). These medicinal plants gathered may bring about drug discovery and may also be incorporated into the healthcare delivery system of the country.

Keywords: Homestead; Horticultural crops; Alternative medicine; Traditional medicine practitioners; Ailments

1. Introduction

The early humans empirically determined the potential uses of the plants that surrounded them. Through trials and error, they found plants that were agreeable or distasteful, edible or poisonous, that could cure or kill, could induce sleep, visions or euphoria and relieve symptoms of discomfort from constipation to anxiety. Plants with strong tastes and aromas (herbs and spices) were seized upon to alleviate illness and to enhance food [1].

The prehistoric discovery that, certain plants are edible or have curative powers and others are inedible or cause harm is the origin of the healing professions and its practitioners (Priest, Physician and Apothecary) and plant sciences (botany and horticulture) [1].

Throughout the ages, people have turned to herbal medicine for healing. All cultures have folk medicines that include the use of plants and plant products. Traditional medicine is becoming the mainstream as improvement in analysis and

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quality control alongside advances in clinical research showing the value of traditional medicine in the treatment and prevention of disease [2]. Alternative medicine emphasizes therapies that improve quality of life, prevent diseases, and address conditions that modern medicine has limited success in curing [3].

Traditional systems of medicine both organized (e.g. Ayurveda and Chinese traditional medicine) and unorganized (herbalism), using medicinal plants as the raw material is crucial to indigenous people in the developing countries of the World [4,5].

The World Health Organization [6] estimated that, about 80% of people worldwide rely on herbal medicine for some part of their primary healthcare. A similar percentage of the Nigerian population was reported to employ traditional medicine for their primary healthcare [7]. Traditional medicine is gaining prominence in view of new or resistant and challenging ailment which modern medicine has not been able to address, and the total care approach of the traditional medicine [8]. This is achieved through the use of horticultural plants and horticultural plant products.

It is estimated that about 75% of useful bioactive compounds are derived from horticultural plants with medicinal values [9]. Bioactive compounds used globally are discovered by systemic investigations of traditional medicines [9]. The important bioactive constituents of plants are alkaloids, tannins, flavonoids, essential oil and phenolic compounds [10, 11]. These compounds found in horticultural plants either act on different systems of animals including man, and/or act through interfering in the metabolism of microbes; which may be pathogenic or symbiotic. In either way, the bioactive compounds from medicinal plants play a vital role in regulating host microbe interaction in favour of the host.

In the most developing countries, the knowledge on the use of these plant resources for medicinal is vast disappearing due to lack of information and scanty documentation of this invaluable biological resources. Though several research workers have documented some medicinal plants from the Southeastern Nigeria, the information remain scanty [12, 13, 14]. Traditional medicine is generally transmitted orally through individuals, family or community and such knowledge on the use of horticultural plant with medicinal value is scanty and scarcely documented in the Southeastern Nigeria, and this may result in distortion or loss of this entire knowledge. Against this background, this study aimed at identifying and documenting some horticultural plants with medicinal values used in traditional medicines in Ebonyi State, Southeastern Nigeria.

2. Material and methods

2.1. Study area

Ebonyi State is inhabited and populated by the Igbo speaking people. It is bounded on the north by Benue State, to the West by Enugu State, to the South by Abia and Imo States and to the East by Cross River State [15]. The State covers a total land area of 5,533km² and lies between latitude 6^o15¹N and longitude 8^o05¹E. The State lies within the humid region of the derived savanna zone of Southeastern Nigeria [16].

Ebonyi State consists of thirteen local government area with a population of 2,176,947. The people of Ebonyi are predominantly farmers and traders of various crops (including root and tuber crops, cereals (rice as the major crop), fruits and vegetables etc.) and commodity, respectively. Fishing is also carried out in Afikpo. Abakaliki and Afikpo are the major city in Ebonyi State. There are several Igbo dialects spoken in the State and the most prominent being the Izi-Ezza-Mgbo-Ikwo dialect cluster, Ehugbo, Akpoha, Edda, Okposi, Onicha, Uburu and Afikpo [17].

2.2. Mode of Information Collection

The ethno-medicinal of horticultural plants survey was undertaken in March, June, September and December in 2017, representing the four quarters of the year. Information on data such as local names, plant parts used, therapeutic effect, diseases treated, method of preparation and method of administration was gathered through semi-structured questionnaires amidst informal conversation [18].

Interviews were also administered individually on traditional medical practitioners (TMPs) or sometimes called herbalist or traditional healers and community elders in all the local government areas of Ebonyi State, on the use of horticultural plants with medicinal values (Fig.1 A and B).



Figure 1 A Map of Ebonyi State showing the Local Government Area Surveyed



Figure 1 B Map of Nigeria (Shaded portion) showing Ebonyi State

The basic method used was a guided field interview [19, 20]. The informants were conducted on a field trips to areas where they often collected plants while survey interviews which included questions such as what ailment(s) were treated, by what plant species were simultaneously asked and information taken.

A total of 13 informants comprising of 9 males and 4 females were identified between the ages of 40 and 70, each representing local government area. Interviews were conducted with the aid of an interpreter throughout the survey in all the local government area.

Horticultural plants with medicinal values mentioned were collected, identified and subsequently preserved and stored in mini-herbarium used. The plants were identified by the use of flora of Nigeria and West Africa, and their taxonomy was further established by the use of International plant names index database and African plants Database [21, 22, 23], as well as by the use of other publications on medicinal plants [24, 25, 26, 27].

During sample collection, biodiversity rights of the indigenes were protected. Aerial parts of the plants were collected on a sustainable basis so as to preserve the lives of the plants, but where collection of roots was involved, new plants were cultivated for sustenance of biodiversity.

3. Results and discussion

3.1. Knowledge of informants and horticultural plants with medicinal values

Thirteen informants provided information on remedies used in treating 53 ailments (Table 1) in Ebonyi State, of which 70% were male and 30% female. Their mean age was 65 years. A total of 44 horticultural plants species distributed into 32 genera and belonging to 30 families were encountered during the surveying and sampling period (Table 1). The plants were arranged in the alphabetical order of their families. Local names were provided in the major ethnic language and in the surrounding states' languages.

The most important and commonly used horticultural plants with medicinal value is observed in the families of *Cucurbitaceae* (5), *Rutaceae* (4), *Liliaceae* (3), *Lamiaceae* (3), *Palmae* (2), *Sapotaceae* (2), *Anacardiaceae* (2), *Piperaceae* (2) and *Zingiberaceae*(2). The highest number of plant species employed to treat diseases belong to the family *Cucurbitaceae*, suggesting that it is the most important family in the traditional medicine of the state in particular and Southeast in general. The other important families in terms of number of taxa with medicinal uses in the state were *Rutaceae*, *Lamiaceae*, *Liliaceae*, *Sapotaceae*, *Anacardiaceae*, *Piperaceae*, *Palmaceae* and *Zingiberaceae*. These families features saliently in the traditional medicines of other parts of the Southeast and are reported in the flora and pharmacopoeia of the country [28, 29, 30, 31]. These families are usually considered during ethno botanical approaches to drug discovery due to their rich content of secondary metabolites such as steroids, terpenes and alkaloids [32].

Cucurbitaceae is of particular importance to the area. Five species were cited for medicinal use by the informants. The plant species of the family were indicated in the treatment of virtually all the diseases of the most important categories recorded either singly or combined.

3.2. Plant parts used

Results of the survey revealed that, the most frequently used plant parts was the leaves representing (52.27%) followed by fruits (27.27%), seeds (18%), bark and others (15.91%), and stem and roots (13.64%), respectively. Flower representing (11.36%), whole plant (9.09%) and rhizome (4.54 %) were also observed as being used. In this study, leaves were the most common used plant part followed by fruits, seeds, bark, stem and root, flowers, whole plants and rhizomes. The reason for the widespread use of leaves may be due to the ease of obtaining them and probably method of preparation. The leaves remain lush and abundant for most part of the year since most part of the Southeast receives enough rainfall. Leaves have been observed as the most widely used plant part in many ethno botanical studies [33, 34, 35, 35, 37]. Also, the use of leaves ensures the plant survival unlike the roots that may threaten it continuity. This was also observed by Lulekal *et al* [38], unless a sustainable harvesting strategy has been developed [39].

3.3. Methods of preparation and administration

Plant remedies were prepared mainly by decoction (38.67%), followed by infusion (21.33%), juice (16.00%), poultice (10.67%), Chewing and others (6.67%), respectively. The internal method of administration which was largely oral was more common (61.19%) than the external method which was usually topical or bathing (31.34%). Other method of administration included chewing and rubbing, eye and ear drop, representing (7.46%), respectively. Umeobi [40] had earlier reported that, the methods of preparing plants drugs by traditional healers are uniform involving crushing or pounding, boiling, soaking in cold or hot water, burning, roasting or heating and chewing; while the mode of administration is mostly oral, inter rectal and external application.

Result of the survey also agrees with the findings of Focho *et al* [41], who stated that most of the plant extract are prepared from a combination of different plant parts while few others prepared singly. In this study, the most common method of preparation was decoction followed by infusion, juice, poultice and chewing. Decoction was also reported as the most prevalent method of preparation in Rivers state [8]. Medicines were administered mainly orally through internal use. This may be related to the prevalent use of decoction since it is usually administered orally. However, this result follows the pattern of medicinal plant use in Nigeria in particular and in Africa in general [42, 43]. This finding agrees with the work of Taylor [44] and Rahmatullah *et al* [45], who indicated that decoction was a common method of herbal preparation. About 15 combinations of horticultural plants with medicinal values were utilized to treat various internal and external ailments (Table1). However, of this multiple plant treatments, 46.67% contained leaves and were prepared by mixing the ingredients in different proportions.

Table 1 Horticultural plants with medicinal values

Scientific name	Family name	Common name	Local name	Plant Parts used	Method of Preparation	Ailment treated	Administration
<i>Wildfieldia lateritia</i>	Accanthaceae	Blood booster	Ogwe obara* Nkong iyip**	Leaves	Decoction	Blood builder	Internal
<i>Mangifera indica</i>	Anacardiaceae	Mango	Mankoro* Manko**	Leaves, bark	Infusion, juice	Malaria, headache, jaundice, skin disease	Internal and External
<i>Anacardium occidentale</i>	Anacardiaceae	Cashew	Kashu* Kashiu**	Bark, Twigs, leaves	Decoction, chewing stick, poultice	Malaria, ringworm, toothache,	Internal and External
<i>Annona muricata</i>	Annonaceae	Soursop	Sawa sawa	Leaves	Decoction	Malaria, diarrhoea, dysentery, hypertension, heart failure	Internal
<i>Daucus carota</i>	Apiaceae	Carrot	Karoti* Karod**	Root	Decoction	Eye infection	Internal
<i>Pergularia dermia</i>	Asclepiadaceae	-	Utazi* Utasi**	Leaves, stem, whole plant	Poultice, decoction of leaves with <i>Carica papaya</i> , <i>Vernonia amygdalina</i> and <i>Ananas comosus</i>	Boil, Typhoid, Malaria, Cough, Fever, Catarrh, Arthritis, stomach ache, diarrhoea	Internal and External
<i>Vernonia amygdalina</i>	Asteraceae	Bitter leaf	Olugbu* Etidot**	Leaves, bark, stem	Decoction with <i>Carica papaya</i> , <i>Ananas comosus</i> and <i>Pergularia dermia</i> . Infusion	Malaria, typhoid, Diabetes, Laxative, Rheumatism, Stomach ache, skin disease, Prostate cancer, Stroke, Insomnia, Pneumonia, weakness	Internal and External
<i>Ananas comosus</i>	Bromeliaceae	Pineapple	Akwuchu kwu* Eyop mbakara* *	Fruit	Decoction with <i>Carica papaya</i> , <i>Vernonia amygdalina</i> and <i>Pergularia dermia</i> . Fruit decoction with <i>Carica papaya</i> , <i>Citrus limon</i> , <i>Citrus sinensis</i>	Typhoid, Malaria, Menstrual disorders, Waist pain	Internal

<i>Dacryodes eludis</i>	<i>Bursaceae</i>	Native pear	Ube* Eben**	Leaves	Decoction	Skin disease, hypertension, cough	Internal and External
<i>Carica papaya</i>	<i>Caricaceae</i>	Pawpaw	Okwurub eke* Bobo**	Sap, leaves, fruit, root	Decoction with <i>Anonia comosus</i> , <i>Vernonia amygdalina</i> , <i>Citrus limon</i> , <i>Citrus sinensis</i> . Infusion	Malaria, Typhoid, Diabetes, Waist pain, Convulsion, syphilis diarrhoea, dysentery, potency in men.	Internal
<i>Terminalia catappa</i>	<i>Combretaceae</i>	Terminalia	-	Leaves, stem, root	Juice infusion, decoction	Eye infection, skin disease, diarrhoea, dysentery	Internal and External
<i>Citrullus colocynthis</i>	<i>Cucurbitaceae</i>	Melon	Egusi* Ikon**	Fruit, leaves, seed shell	Decoction, powder mixed with palm oil	Skin disease, syphilis, laxative, stomach-ache	Internal and External
<i>Telfairia occidentalis</i>	<i>Curcubitaceae</i>	Fluted pumpkin	Ukwu* Ikong ubong**	Leaves, flowers	Decoction, poultice	Headache, Anaemia, burns	Internal and External
<i>Cucurbita pepo</i>	<i>Cucurbitaceae</i>	Pumpkin	Ugbogulu * Ndise**	Fruit pulp, seeds	Decoction, Infusion	Prostate disease, benign tumor, urinary infection, cystitis.	Internal
<i>Citrillus lantana</i>	<i>Cucurbitaceae</i>	-	-	Fruit, seeds	Decoction, poultice	Snake bites, scorpion sting, Vermifuge	External
<i>Glycine max</i>	<i>Fabaceae</i>	Soybean	Soya beans* Okoti soya**	Seeds	Extraction of oil, Decoction	Eye infection, Anaemia, Measles	Internal and External
<i>Irvingia gabonensis</i>	<i>Irvingiaceae</i>	Bush mango	Ugiji* Uyo**	Leaves, bark, seed	Decoction, Poultice	Stomach ache, Worm, Skin disease, Infertility	Internal and External
<i>Ocimum gratissimum</i>	<i>Lamiaceae</i>	Basil plant	Nchanu* Ntong**	Leaves, whole plant	Infusion	Haemorrhoid, Typhoid, Stomach ache Cough, Cold, Catarrh, Fever, Baby cord, Chest pain, diarrhoea, Anti-bacterial, Anti-fungal	Internal
<i>Salvia officinalis</i>	<i>Lamiaceae</i>	Golden chia	Uzi*	Leaves, Stem	Juice mixed with <i>Zingiber officinale</i> , Infusion	Diabetes, Cough, Ear infection, Stomach ache	Internal
<i>Thyme vulgaris</i>	<i>Lamiaceae</i>	Thyme	-	Leaves	Infusion	Laxative	Internal

<i>Persia Americana</i>	<i>Lauraceae</i>	Avocado	Ube bekee* Ebenmba kara**	Leaves, Fruits	Decoction, Infusion	Hypertension, Menstrual disorders	Internal
<i>Allium cepa</i>	<i>Liliaceae</i>	Onion	Ayo* Oyim**	Bulb	Infusion, Poultice	Diarrhoea, Haemorrhoid, Infertility, Ear infection, Scorpion sting, Hypertension	Internal and External
<i>Allium sativum</i>	<i>Liliaceae</i>	Garlic	Ayo odi* Oyimison g**	Clove	Chew, Macerated in honey or vinegar, juice mixed with <i>Aloe vera</i> gel and honey	Hypertension, Diabetes, Asthma, Cough, Haemorrhoid, Burns, Skin disease, Fever, Nerves disorder, Toothache, Ulcer, Lower cholesterol, Intestinal and Urinary infections, Genital inflammation, Tuberculosis, Pneumonia, Worm	Internal and External
<i>Aloe vera</i>	<i>Liliaceae</i>	Aloe	Akparata /Anyamumu* Okok afid udongo**	Leaves	Gel mixed with juice of <i>Allium sativum</i> , honey and water	Skin disease, Burns, Haemorrhoid, Diabetes, menstrual disorders, Wounds, Irritation, Ulcer, Asthma, Fungal infection, Cancer, Impotence	Internal and External
<i>Tetrapleura tetraptera</i>	<i>Leguminosae</i>	Tetrapleura	Nkporon wa* Uyayak**	Pod	Infusion, Decoction	For newly delivered woman, Rheumatism	Internal
<i>Hibiscus rosasinensis</i>	<i>Malvaceae</i>	-	Zobo* Sobo**	Leaves, Flowers	Juice	Stomach ache, Urinary tract infection, Menstrual disorders	Internal
<i>Musa paradisisca</i>	<i>Musaceae</i>	Plantain	Une* Ukom**	Root, Stem, Leaves	Infusion, Juice	Impotence, Aphrodisiac menstrual disorders, Urinary tract infection, Hypertension, Snake bite, Measles	Internal and External

<i>Psidium guajava</i>	<i>Myrtaceae</i>	Guava	Gova* Wofa**	Leaves	Decoction with <i>Cymbopogon citrilus</i> . Infusion	Malaria, Typhoid, Stomach ache, Laxative, Infertility, Cough, Diarrhoea	Internal
<i>Moringaoleifera</i>	<i>Moringaceae</i>	Moringa	Etouwem**	Leaves, Flower, Seeds	Decoction, Oil extract	Anaemia, Ulcer, Food supplement, Milk flow	Internal
<i>Elaeis guineensis</i>	<i>Palmae</i>	Oil palm	Nkwu* Eyop**	Fruits pericarp	Peeled applied	Boil	External
<i>Cocos nucifera</i>	<i>Palmae</i>	Coconut	Aki bekee* Isip mbakara/ Isipeyop*	Fruits, Bark, Roots	Oil extraction	Rashes, Black spot, Scabies, Measles, Toothache, Fibroid, Bronchitis, Hepatitis	Internal and External
<i>Piper guineensis</i>	<i>Piperaceae</i>	Climbing black pepper	Uziza* Oduša**	Leaves. Seeds	Infusion	Gonorrhoea, GIT disorders	Internal
<i>Piper nigrum</i>	<i>Piperaceae</i>	Black pepper	Njamnja* Ntuenibok**	Fruits and Seeds	Infusion	Rheumatism, Dyspepsia, Diarrhoea, Cholera, Pile	Internal
<i>Cymbopogon citrilus</i>	<i>Poaceae</i>	Lemon grass	Nsanaewa**	Leaves	Decoction with <i>Psidium guajava</i> or with <i>A. indica</i>	Malaria, Typhoid, Cough	Internal
<i>Talinum triangulare</i>	<i>Portulacaceae</i>	Water leaf	Nahianwu* Mmng mmng ikong**	Whole plant	Poultice, Decoction, Infusion	Inflammation, Laxative, malaria	Internal and External
<i>Citrus sinensis</i>	<i>Rubifaceae</i>	Sweet orange	Aroma* Sokoro**	Fruits	Juice, Decoction with <i>Citrus limon</i> , <i>A. comosus</i> , <i>C. papaya</i>	Laxative, Waist pain	Internal
<i>Citrus limon</i>	<i>Rubifaceae</i>	Lemon	Udokaya*	Fruits	Juice, Juice mixed with a pinch of salt, Decoction or decoction with <i>C. sinensis</i> , <i>A. comosus</i> , <i>C. papaya</i>	Rheumatism, Laxative, Kidney disease, Malaria, Cough, Waist pain, Remedy of appetite, Haemorrhoid, Heart problem, Stroke, Hypertension	Internal

<i>Citrus aurantium</i>	<i>Rubiaceae</i>	Sour orange		Fruits	Decoction, Juice/juice mixed with ficus exasperate leaf juice. Juice mixed with <i>Gongronema latifolium</i> leaf	Eye infection, Cough, Diabetes, Hypertension, Anaemia	Internal
<i>Citrus paradise</i>	<i>Rubiaceae</i>	Grape	Grabe**	Bark, Root	Chewing stick, Decoction, Poultice	Toothache, Gonorrhoea, Haemorrhoid, Boil	Internal and External
<i>Chrysophyllum malbidium</i>	<i>Sapotaceae</i>	Star apple	Udara* Udara**	Stem, Whole plant, Seeds	Decoction, Powder	Malaria, Urinary tract infection, Impotence	Internal
<i>Solanum nigrum</i>	<i>Solanaceae</i>	Egg plant	Anara* Nya**	Leaves	Juice	Eye infection, Jaundice, Convulsion	Eye drop, Internal
<i>Cola nitida</i>	<i>Sterculiaceae</i>	Kola	Oji* Ibong**	Bark	Infusion, Powder	Stomach ache, Wounds, Inflammation	Internal and External
<i>Zingiber officinale</i>	<i>Zingiberaceae</i>	Ginger	Jinger* Yinger**	Rhizome	Chew, juice mixed with <i>Salvia officinale</i>	Hypertension, Laxative, Cough, Catarrh, Stomach ache	Internal
<i>Aframomum melegueta</i>	<i>Zingiberaceae</i>	Alligator pepper	Oseoji* Ntuen ibok**	Rhizome, Leaves, Fruits, Seeds	Decoction, Juice mixed with lime, lemon-grass, mango leaves, chew	Cough, Liver problems, Worm, Catarrh, Fractures, Bacterial infection	Internal and External

*Igbo; **Ibibio

The use of single plant in preparing herbal remedies predominates over the multiple plant preparation in this study. This offers the advantage of a relatively safer potion over mixture of plants that may be ill-matched and dangerous to human health systems. This was also observed in other countries such as Peru and Bangladesh which single plant preparation to treat single or multiple ailments was used [46]. All the remedies in the study were prepared in crude form, thus, lacking standardized dosage and quality control [8].

3.4. Ailments treated with Horticultural Plants

Diseases relating to the dermal system, digestive system, fever/malaria, parasitic, viral and bacterial diseases and musculoskeletal and reticular diseases were among the most frequently treated diseases with horticultural plants with medicinal values, representing (67.09%) of all the medicinal applications. However, cold, cough, headache, diarrhea, fertility problems, toothache, hypertension, stomachache, worms, diabetes, rheumatism, asthma, dysentery, hair loss, snake bites or poison and stroke are also the most frequently treated ailments, representing (32.91%). Of this, the largest number of remedies was employed to treat diseases relating to fungal/bacterial diseases (27.45%), followed by fever/malaria (22.55%), dermal (20.55%), digestive problems (17.65%) and other diseases (11.76%).

The most frequent categories of diseases treated with horticultural plants in the area based on medicinal use reports were bacterial and fungal problems, followed by fever/malaria, dermatological problems, digestive problems and other related diseases. This could be attributed to the swampy nature of the area, lack of good drinking water and poor sanitation of the rural farmers. These categories of diseases were also prevalent in the ethno botanical studies undertaken among indigenous people of Rivers State, Nigeria [8], India, Kenya and Peru [47]. This means that, these categories of diseases treated in Ebonyi State and Southeast in general with medicinal plants are similar to those encountered by the majority of the rural people of the developing countries.

4. Conclusion

The majority of the people in developing countries rely on traditional medicine practitioners (TMPs) and community elders for the treatment of various diseases. Collectively, they possess a vast knowledge of medicinal plant uses. Thus, it is important to collate information on horticultural plants with medicinal values used as treatment for various diseases. This survey therefore provides a useful source of information for practitioners of traditional medicines and medicinal plants researchers. It is concluded that there are vast arrays of horticultural plants used as both culinary and medicinal purposes in Ebonyi State, Southeastern Nigeria. These plants provide a basis for investigation by modern scientific methods for possible discovery of novel drugs which may be incorporated into the healthcare system of the country.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflict of interest.

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