



Use of medicinal plants for the treatment of measles in Nigeria

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ABSTRACT

Aim of the study: The present study was an ethnobotanical survey of three Local Government areas of the Ijebu area of Ogun State in southwest Nigeria for plants used in the treatment of measles.

Materials and methods: Unstructured interviews were conducted among both urban and rural dwellers of three major groups of Ijebu people inhabiting the area (Ijebu North, Ijebu northeast and Ijebu Ode Local Governments).

Results: A total of 20 respondents constituted by herbalists, herbersellers and old people that have privileged information on the plants used in the treatment of measles among children were encountered during the survey. Twenty-three plant species belonging to 18 Angiosperm families were said to possess curative properties for the cure of measles among the local populace. Amongst the most frequently used plants are *Elytraria marginata* Vahl, *Peperomia pellucida* (L.) Humb. & Kunth, *Vernonia amygdalina* Del., *Momordica charantia* L., *Newbouldia laevis* (P. Beauv.) Seem. ex Bureau, and *Ocimum gratissimum* L.

Conclusion: The most frequently mentioned family is Cucurbitaceae. The mode of preparation and recommended dosages are enumerated in this paper. The results of the study call for an urgent need of the introduction of a strategy for the conservation of indigenous medicinal plants in the area.

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1. Introduction

Measles is a deadly viral disease that impacts vulnerable children around the world, many of who do not have access to healthcare. The World Health Organization estimated that more than 20 million individuals are affected each year by the measles worldwide, out of which children are about 17 million (WHO, 2003). Tragically it has been reported that more than 600 children die daily as a result of measles infection. This leaves measles as a leading cause of death among young children, especially in the developing countries of the world (Strebel et al., 2003). In 2006 alone an estimated 242,000 died from the disease, often from secondary complications related to pneumonia, diarrhea and encephalitis (Dover et al., 1975; Dabbag et al., 2007). The measles disease begins with a fever that lasts for a couple of days, followed by a cough, runny nose, and conjunctivitis (pink eyes). A rash starts in the face and upper neck, spreads down and trunk then extends to the arms and hands, as well as the legs and feet. Although measles may be said to have the capacity to disappear the same way it came, the risk of the complications resulting from certain cases of measles are far worse and unimaginable to be left unattended to. There

is no specific treatment or cure for measles (Oguz et al., 2002). Children are advised to stay at home and out of school until they are cleared to return to school by their health provider. From the foregoing, it is particularly rewarding to search for known medicinal plant species with potencies against the disease. Humans have always used plants in one capacity or another. They contain numerous biologically active ingredients, most of which have medicinal activity (Magbagbeola and Akinwande, 2006). Traditionally, usage of plants in curing illnesses has deep roots in humankind history (Grabley and Thiericke, 1999). The potential of the Nigerian flora as a veritable source for pharmaceuticals and other therapeutics have variously been expressed (Oliver-Bever, 1960; Sofowora, 1982; Sonibare et al., 2007; Sonibare and Gbile, 2008).

Previous ethnobotanical studies of medicinal plants confirm the rational use of recipes by different people group from different communities for various illnesses ranging from common fever to complex illnesses such as asthma, psychosis and even epilepsy (Oyedepo et al., 1997; Ayyanar and Ignacimuthu, 2005; Gilani et al., 2006; Ogundiya et al., 2006; Sonibare and Gbile, 2008). The usage of plants as medicine still presents a very important phenomenon in the traditional medicine which is imbedded in the culture of inhabitants of developing countries (Kloucek et al., 2005; Duraipandiyani et al., 2006). In recent time, there has been a renewed interest in complementary and alternative medicine, in which drugs of plants origin have been growing steadily (Nayak et al., 2003; Park, 2005; Nuzzi, 2008). The need for the primary, secondary and tertiary healthcare to complement one another

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cannot be over emphasized. The importance of the useful aspects of traditional medicine and practices being incorporated to health-care delivery at primary healthcare level has been the subject of many studies (Gbile et al., 1990; WHO, 2000).

The survey was carried out because of the prevalence of measles among children found in this area and acclaimed belief in traditional medical intervention practiced by the Ijebus. The study was based on information gathered on the medicinal plant recipes used in the treatment of measles. This further aims at stimulating chemical and biological screening of the identified plants that are most frequently used with a view to sourcing for effective drug to compliment the existing ones used in the treatment and proper management of measles and its complications.

2. Materials and methods

Survey was conducted in Ijebu-North, Ijebu-NorthEast and Ijebu-Ode local government areas of Ogun state, Nigeria. The study area lies in the rain forest zone of Nigeria within latitude 6°15' and 6°50'N, and longitude 3°40' and 4°45'N. The area is occupied by the Ijebus who live in major towns such as Ijebu-Ode, Ijebu igbo, Ago-Iwoye, Oru, Awa, and Ilaporu. There are several markets and traditional medical practitioners in the area. This area was chosen because of the prevalence of the disease among children in this area during the dry season of the year and the acclaimed cure by traditional healers and vendors. Recipes were collected from 20 respondents, 17 were notable specialists and herbal plant vendors. Ethnobotanical data such as vernacular names, plant part used, and dosages were collected from informants on site while collecting plant specimens. Information was later supplemented by questioning the informants showing dried botanical specimens. Confirmation of all plant species identified was done in the Forest Herbarium, Ibadan (FHI) of the Forestry Research Institute of Nigeria, Ibadan, Oyo State where the voucher specimens were also deposited.

3. Results

Twenty-three plant species (Table 1) in 18 families were identified to be plants used in treatment of measles. Some recipes were identified as commonly used in treatment of measles. Table 1 shows the list of identified plant species, family, local names, common

Table 1
Medicinal plants used in the treatment of measles.

S/N	Botanical name	Family	Local name	Plant part used
1.	<i>Aframomum melegueta</i> K. Schum.	Zingiberaceae	Ataare	Seeds
2.	<i>Argemone mexicana</i> L.	Papaveraceae	Mafowokanmomi	Whole plant
3.	<i>Bambusa vulgaris</i> Schrad. ex J.C. Wendl.	Poaceae	Oparun	Leaves
4.	<i>Butyrospermum paradoxum</i> (C. F. Gaertn.) Hepper	Sapotaceae	Ori	Fruits
5.	<i>Caesalpinia bonduc</i> (L.) Roxb.	Leguminosae	Ayoo	Leaves
6.	<i>Capsicum frutescens</i> L.	Solanaceae	Ata wewe	Seeds
7.	<i>Citrullus colocynthis</i> (L.) Schrad.	Cucurbitaceae	Tagiri	Seeds
8.	<i>Corchorus olitorius</i> L.	Tiliaceae	Ewedu	Whole plant
9.	<i>Deinbollia pinnata</i> (Poir.) Schumach. & Thonn.	Sapindaceae	Ogiri	Seeds
10.	<i>Dioscorea rotunda</i> Poir.	Dioscoreaceae	Isu-igo	Leaves
11.	<i>Elaeis guineensis</i> Jacq.	Palmae	Eyin	
12.	<i>Elytraria marginata</i> Vahl	Acanthaceae	Eso	Leaves
13.	<i>Loranthus</i> L. spp.	Loranthaceae	Etu	Leaves
14.	<i>Momordica augustisepala</i> L.	Cucurbitaceae	Kankan	Bark
15.	<i>Momordica charantia</i> L.	Cucurbitaceae	Ejinrin	Whole plant
16.	<i>Newbouldia laevis</i> (P. Beauv.) Seem. ex Bureau	Bignoniaceae	Akoko	Leaves
17.	<i>Ocimum gratissimum</i> L.	Labiatae	Efinrin	Leaves
18.	<i>Peperomia pellucida</i> (L.) Humb., Bonpl. & Kunth	Piperaceae	Renren	Whole plant
19.	<i>Piper guineensis</i> Schumach & Thonn	Piperaceae	Iyere	Seeds
20.	<i>Raphia hookeri</i> P. Beauv.	Palmae	Oguro	Latex
21.	<i>Secamone afzelli</i> (Schult.) K. Schum	Asclepiadaceae	Ailu	Leaves
22.	<i>Senna occidentalis</i> (L.) Link	Leguminosae	Rere	Leaves
23.	<i>Vernonia amygdalina</i> Del.	Asteraceae	Ewuro	Leaves

Table 2

Species distribution according to the ethnobotanical survey.

Species	Number of occurrences
<i>Aframomum melegueta</i> K. Schum.	1
<i>Argemone mexicana</i> L.	1
<i>Bambusa vulgaris</i> Schrad. ex J.C. Wendl.	2
<i>Butyrospermum paradoxum</i> (C. F. Gaertn.) Hepper	1
<i>Caesalpinia bonduc</i> (L.) Roxb.	1
<i>Capsicum frutescens</i> L.	2
<i>Citrullus colocynthis</i> (L.) Schrad.	1
<i>Corchorus olitorius</i> L.	1
<i>Deinbollia pinnata</i> (Poir.) Schumach. & Thonn.	1
<i>Dioscorea rotunda</i> Poir.	1
<i>Elaeis guineensis</i> Jacq.	2
<i>Elytraria marginata</i> Vahl	8
<i>Loranthus</i> L. spp.	1
<i>Momordica augustisepala</i> L.	1
<i>Momordica charantia</i> L.	3
<i>Newbouldia laevis</i> (P. Beauv.) Seem. ex Bureau	3
<i>Ocimum gratissimum</i> L.	3
<i>Peperomia pellucida</i> (L.) Humb., Bonpl. & Kunth	6
<i>Piper guineensis</i> Schumach & Thonn.	3
<i>Raphia hookeri</i> P. Beauv.	2
<i>Secamone afzelli</i> (Schult.) K. Schum	1
<i>Senna occidentalis</i> (L.) Link	1
<i>Vernonia amygdalina</i> Del.	5

names and plant parts used. Number of occurrence of different species in the survey is shown in Table 2 while species distribution according to family is shown in Table 3. The most prominent plant species in the recipes were *Elytraria marginata* Vahl, *Peperomia pellucida* (L.) Humb., Bonpl. & Kunth, *Vernonia amygdalina* Del., *Momordica charantia* L., *Newbouldia laevis* (P. Beauv.) Seem. ex Bureau, and *Ocimum gratissimum* L. The enumeration of recipes gives the ingredients per prescription, method of preparation, mode of administration and dosage.

3.1. Enumeration of recipes

1. The leaves of *Vernonia amygdalina*, and *Elytraria marginata*, whole plant of *Peperomia pellucida* with the seeds *Piper guineensis* were made into soup, three tablespoonfuls to be taken twice daily.
2. The fresh leaves of *Momordica charantia* are washed and the juice is squeezed. Two tablespoonfuls of the juice are to be

Table 3
Species distribution according to family.

Family	Number of species
Acanthaceae	1
Asclepiadaceae	1
Asteraceae	1
Bignoniaceae	1
Cucurbitaceae	3
Dioscoreaceae	1
Labiatae	1
Leguminosae	2
Loranthaceae	1
Palmae	2
Papaveraceae	1
Piperaceae	2
Poaceae	1
Sapindaceae	1
Sapotaceae	1
Solanaceae	1
Tiliaceae	1
Zingiberaceae	1

taken orally thrice daily and also used in bathing morning and evening.

- Peperomia pellucida* and *Elytraria marginata* leaves are cooked with seeds of *Piper guineensis* into a soup which is taken thrice daily, two tablespoonfuls.
- The leaves of *Bambusa vulgaris* and *Caesalpinia bonduc* are soaked in hot water with the leaves of *Dioscorea rotundata* and then allowed to cool. Two tablespoonfuls of the extract are taken twice daily.
- Peperomia pellucida* and *Elytraria marginata* leaves with dried seed of *Aframomum melegueta* are milled together and the mixture cooked into soup using fish (*Clarias gariepinus*) and palm oil (*Elaeis guineensis*) with the addition of a little salt. A small bowl of soup is taken twice daily.
- Fresh leaves of *Vernonia amygdalina* and *Ocimum gratissimum* juice are squeezed out and made into ointment by mixing with *Butyrospermum paradoxum*. This is applied topically on the skin twice daily after bathing.
- The leaves of *Peperomia pellucida*, *Elytraria marginata*, *Bambusa vulgaris*, seeds of *Aframomum melegueta*, and the whole plant of *Corchorus olitorius* are washed and boiled with a little potash using plenty water. It is allowed to cool and a teacupful of extract is taken thrice daily after meal.
- Fresh leaves of *Elytraria marginata* and *Peperomia pellucida* are boiled with seeds of *Piper guineensis*. One tablespoonful is to be taken three times daily but dosage can be tripled depending on extend of infection.
- Seeds of *Citrullus colocynthis* and *Piper guineensis* are milled and boiled in plenty of water. A teacupful of the extract is to be taken warm many times a day.
- The leaves of *Peperomia pellucida* and *Elytraria marginata* with seeds of *Capsicum frutescens* and *Deinbollia pinnata* are cooked with fish (*Clarias gariepinus*) and taken as soup.
- The leaves of *Newbouldia laevis*, *Momordica charantia*, *Vernonia amygdalina* and *Ocimum gratissimum* are boiled together. The extract is allowed to cool and a glassful is taken thrice daily.
- The dried leaves of *Vernonia amygdalina* are soaked in alcohol (local wine—*Raphia hookeri*). The supernatant is decanted; one teaspoonful is taken once daily.
- The whole plant of *Argemone mexicana* is boiled and taken as water during infection in a severe case. Two teacupfuls twice daily if the infection is mild.
- Dried root and leaves of *Senna occidentalis* are milled and mixed with black soap and used to bathe twice daily.
- Dried leaves of *Secamone afzelli* are milled and mixed with black soap and bathe with the mixture twice daily.

- Dried leaves of *Loranthus* spp. are milled and then mixed with black soap. The mixture is use to bathe morning and evening using the local sponge (*Momordica augustisepala*).
- The leaves of *Elytraria marginata* and seeds of *Capsicum frutescens* are cooked with *Elaeis guineensis* with salt to taste. The concoction is to be taken as soup twice daily.
- Extract from fresh leaves of *Momordica charantia* and *Newbouldia laevis* mixed with water is used to bathe. Two tablespoonfuls of the juice are also taken orally twice daily.
- Dried leaves of *Newbouldia laevis* and *Elytraria marginata* are milled into powder and mixed with oil from *Elaeis guineensis* which is applied on the skin after bathing.
- Fresh leaves of *Vernonia amygdalina* and *Ocimum gratissimum* are soaked into palm wine for 24 h after which a teacupful is taken twice daily until infection subsides.

4. Discussion and conclusion

The Ijebu people inhabit the south-central part of Yorubaland—a territory that is bounded in the north by Ibadan, in the east by Ondo, Okitipupa and the West by Egband. The southern fringe is open to the sea with the coastlines of Epe, Ejinrin and Ikorodu. The people of these three towns (Epe, Ejinrin and Ikorodu) although being part of Lagos State, have always regarded themselves as one entity with the Ijebus of Ogun State. The recipes for the preparation of medicines for the treatment of measles among the Ijebus in the three local government areas visited were made up of plant parts such as leaves, seed, bark and fruits. Some non-plant components encountered in the prescriptions included fish: *Clarias gariepinus*, native black soap, potash. Leaves formed the major plant part used in most of the prescriptions which were rarely mono-prescriptions. Recipes were prepared as decoction, concoction or as extracts of individual ingredients of the recipes. Mode of administration included oral and topical application as well as bathing with the extracts of the plant recipes. *Elytraria marginata*, *Peperomia pellucida*, *Vernonia amygdalina*, *Momordica charantia*, *Newbouldia laevis* and *Ocimum gratissimum* were prominent in the prescriptions given by different respondents for treating measles. Previous reports on the folk medicinal applications of many of the plants mentioned could be found in literature. For instance, *Elytraria marginata* is reported by Jiofack et al. (2008) as having a therapeutic indication for skin and cutaneous diseases. *Peperomia pellucida* has a rich history of medicinal uses. Ethnomedical data in Bolivia from Altonos Indians document that the whole plant is crushed, mixed with water, heated and then orally administered to stop haemorrhage (Munoz et al., 2000). The Folk medicinal use of *Vernonia amygdalina* is well documented. Antimicrobial results from the work of Erasto et al. (2006) correspond positively with the claimed ethnomedical use of the leaves. Investigation of the traditional uses of *Momordica charantia* in Togo showed that it is one of the most important local medicinal plants (Beloin et al., 2005). *Momordica charantia* extracts showed high antiviral activity against Sindbis and Herpes simplex type 1 viruses and antihelminthic activity against *Caenorhabditis elegans*. Pharmacological studies on *Newbouldia laevis* stem bark indicates its potential to inhibit the Carrageen-induced oedema in rat hind paw in a dose-related fashion. It also produced a reduction of yeast-induced pyrexia in mice (Olajide et al., 1997). Various species of *Ocimum* have been reported as having medicinal application which includes skin diseases, headache and fever (Ilori et al., 1996; Mshana et al., 2000). The various medicinal applications of many of the plants collected on the survey for anti-measles medicines cannot be over emphasized. The family Cucurbitaceae has a comparatively high incidence in the list which suggests that the family contains useful species that can be further explored as sources of anti-measles drugs. The potential of these plant species in the treatment of measles and other viral

diseases are of great value in a continent like Africa where the majority of the populace are still very far away from the reach of the expensive orthodox medicines. Medicinal plants therefore play an important role in healthcare systems of developing countries as typified by the Ijebus in southwestern Nigeria majorly because of the easy accessibility. The people claimed to rely on the use of these plants in treating measles or their complications because they are very cheap. However, a greater concern is the issue of sustainability. The use of medicinal plants in preventive and curative disease conditions is not new (Joshi and Edington, 1990; Eddouk et al., 2002; Tapsoba and Deschamps, 2006; Atherton et al., 2008), but the fact that these plants are being over collected and also irrationally, is of a major concern worthy of attention. There are many reports of unsustainable harvesting of various medicinal plants in different communities in Africa and other continents of the world (Hamilton, 2004; Soladoye et al., 2005). The experience in parts of the Ijebu area visited was not different. This was evidenced by the responses of certain indigenous users of these plants and herb sellers who indicated the problem they encounter in finding some of the herbs at localities where they previously existed. This might be an indication of the fast disappearance of these plants which may lead to the eventual extinction of these important species if there is no drastic measure in place to check this.

In order to have a considerable long-term effect on the environment, healthcare and economy, the use of important medicinal plants in a way and a rate that does not threaten or endanger the plants must be ensured (Wong et al., 2001). The utilization and conservation of important medicinal species must be the focus of all plant users (Sheldon et al., 1997). Different plants have been exploited over the years without adequate replacement, hence it is important to promote and educate the local populace who are by far the greatest users of medicinal plants on effective means of sustainable harvesting and conservative measures (Akerle et al., 1991). If we will have some of these plants to fall back on in the nearest future, then this plea requires the urgent attention of all the stakeholders. The collection, identification and documentation of medicinal plants species are one of the primary steps in their conservation (Harnischfeger, 2000; Hamilton et al., 2000). Subsequent isolation of biologically active compounds from the plants is void without the information on the local uses of medicinal plants. The present work is therefore providing a basis for the continued effort geared at future drug discovery from indigenous medicinal species and emphasizes the need for conservation policy of indigenous medicinal plants in Ijebu land.

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