

# A survey of medicinal plants used as traditional medicine in Ukum and Ogbadibo Local Government Areas of Benue state, Nigeria

Nahandoo Ichoron\*, Senen Tyoer, Emoche John James and John Ogbaji Igoli

Natural Products Research Group, Department of Chemistry, Federal University of Agriculture, Makurdi, Nigeria

\*Corresponding Author: [nannchoron@gmail.com](mailto:nannchoron@gmail.com)

**Abstract:** This study identified medicinal plants traditionally used to treat human health challenges by the people in Ukum and Ogbadibo Local Government Areas of Benue state, Nigeria. Information was obtained through oral interview of traditional healers using semi-structured questionnaires. Informant consensus factor, use value and fidelity level for each species and use category were calculated. A total of 75 traditional healers were consulted during the study. Fifty eight species from thirty four plant families were identified as being used traditionally to treat one or more ailments. The most frequently encountered ailments were fever, parasitic infections, digestive and reproductive system disorders. The majority of remedies were administered orally; leaves were used the most and decoctions were the most frequently prepared formulation. There is uniformity in the species of plants used by the herbalists to treat specific ailments. Majority of the plants identified in the survey were uncultivated.

**Keywords:** Medicinal plants, Ethnobotany, Traditional healers, Human health.

## INTRODUCTION

The diversity of natural flora provides local communities with cost effective and readily available remedies for ailments. Thus plants have occupied a pivotal position in the socio-cultural, spiritual and medicinal lives of rural communities. In Africa, about 80% of the population use herbal remedies for their primary health care needs (Ladele & Bisi-Amosun, 2014). With the variety of climate and vegetation, African herbal medicine forms an important part of the communal culture (Erinosa & Aworinde, 2018). The knowledge of medicinal plants and their use in traditional medicine is usually transferred from one generation to the next orally, hence, the quality and quantity of information diminishes with time (Igoli *et al.*, 2011).

Ethnobotanical surveys provide a platform for obtaining and documenting information on medicinal plants and how they are used by indigenous people (Yuan *et al.*, 2016). Such surveys are carried out for several reasons including preservation of knowledge for posterity, disseminating of information about possible treatment of diseases and motivation of scientific investigation of plants with acclaimed medicinal activities. Ethnobotanical studies have revealed medicinal plants from which useful bioactive compounds have been isolated. Such surveys have proven to be the most viable method of identifying novel medicinal plants. Several studies that have resulted in the isolation of useful bioactive compounds from plants were initiated and motivated by ethnobotanical studies (Nande & Igoli, 2017). Natural products form the foundation for drug discovery (Gray *et al.*, 2012; Shen, 2015). Today a large number of drugs are developed from plants whose crude extracts showed activity against diseases (Shosan *et al.*, 2014). Plants have been a rich source of inspiration for new drugs and natural products have made great contribution to human health (Newman & Cragg, 2000). They provide a natural blueprint for the development of new drugs or may be used as phytomedicines for the treatment of diseases (Dias *et al.*, 2012). Natural products as sources of drugs and drug leads have certain advantages over other methods of drug discovery because of their structural and chemical diversity that cannot be matched by any synthetic library of small molecules. They possess different structures providing both isomerism and analogy within a structural moiety (Newman & Cragg, 2012; Gray *et al.*, 2012; Shen, 2015).

Ethnobotanical surveys provide the basis for selection and scientific investigation of medicinal plants, since some of these indigenous remedies have successfully been used by the indigenous people over extended periods of time (Weldegerima, 2009). It is difficult to know the existence of a disease unless it is diagnosed and unless there is a reference cure for an ailment, it may not be possible to develop a cure for the disease. Natural products come into play here because of the extensive and continuous use of herbal remedies by indigenous communities; hence, there is always a sparkle of hope that a cure will be out there in nature (Gray *et al.*, 2012). Benue State lies between 6° 35' N to 8° 15' N and 8° 15' E to 10° 00' E around the river Benue in North Central Nigeria. The major tribes in the state are Tiv, Idoma and Igede. Owing to their farm practice and state of development which is mostly rural and low income, they have learned to take advantage of their natural flora for their primary health needs (Tor-Anyiin *et al.*, 2003; Igoli *et al.*,

2011). Traditional healers make use of the medicinal plants in their localities to treat common illnesses however, these have not been well documented. Similarly, the efficacy of several of these remedies has not been confirmed. This survey documents the use of plants in traditional medicine by the people of Ukum and Ogbadibo Local Government Areas which are Tiv and Idoma speaking areas respectively in Benue State.

## MATERIALS AND METHODS

### *Study area*

The study was conducted in Ukum and Ogbadibo Local Government Areas (LGA) of Benue state. Ukum LGA is an agrarian community with headquarters at Sankara. It is located in the north-eastern part of Benue state and shares boundary East-ward with Wukari Local Government Area in Taraba state. In the South-West, it is bounded by Katsina-Ala and Logo Local Government Areas (Kakwagh, 2018).

Ogbadibo is also an agrarian community predominantly inhabited by Idoma people. It is bordered by Okpoku LGA to the East, Olamaboro LGA (Kogi state) to the North, Udenu and Igbo-Eze North LGAs (Enugu state) to the west and Isi-Uzo LGA (Enugu state) to the South (Odeh, 2011). Both Ukum and Ogbadibo LGAs share boundaries with neighbouring states. The population is predominantly rural. The people depend largely on traditional (herbal) medicine for their primary health care needs. The herbalists have assistants who usually take over from them in the event of death or old age. Knowledge is transferred from master or mentor to assistant through apprenticeship. There are no records of their methods. The reservoir of their knowledge is their memory.

The vegetation is typical of Guinea Savanna with open grassland, scattered trees and shrubs. The climate of the area is tropical with distinct dry and wet seasons. On average the wet season lasts from April to October while dry season lasts from November to March annually (Tyowua *et al.*, 2013).

### *Data collection*

Information were collected through the administration of a structured questionnaire and oral interview of traditional medicine practitioners and herbalists. The respondents were practitioners regarded as professionals because they treat patients outside their friends and family and have practiced for at least five years. Information on local names of plants, parts of the plants used, ailments treated, method of preparation, route of administration and duration of administration were freely given by the respondents.

### *Data analysis*

Ethnobotanical indices (Use Value (UV), Fidelity Value (FL) and Information consensus factor (ICF)) were used to analyze the data.

#### *Use value*

A quantitative measure of the relative importance of a plant species in the traditional medicinal system of the study area was determined by a method called use value (UV).

$$UV = \sum \frac{U_i}{N}$$

Where, UV = use value,  $U_i$  is the number of use reports for a particular plant species and N is the total number of informants interviewed.

Use values are high when there are many reports of a plant in medicine implying that the plant is important and low when there are few reports related to its medical use (Appiah *et al.*, 2017).

#### *Fidelity level (FL)*

Fidelity Level was calculated for each of the preferred species to estimate the importance of a species for a given purpose based on respondents who cited them in the treatment of specific ailments. This index is used to identify the most preferred species by the respondents for treating a specific ailment. It is calculated using the formula:

$$FL = \frac{I_p}{I_u} \times 100$$

Where,  $I_p$  is the number of informants who suggested the use of a species for a disease and  $I_u$  is the total number of informants who mentioned the species for any use.

FL values range from 0-100%. High FL values for a species indicate that most of the informants use the plant in the same way for treating a disease. On the other hand, low FL values indicate random use of a species for different purposes (Panyaphu *et al.*, 2011; Appiah *et al.*, 2017).

#### *Informant consensus factor (ICF)*

Informant consensus factor was calculated to determine the extent of agreement among the informants on the plants used for the treatment of particular diseases in the study area. It was calculated using the formula:

$$ICF = \frac{Nur - Nt}{Nur - 1}$$

Where, Nur refers to the number of informants using the plant to treat a particular disease and Nt refers to the number of species used for treatment of that particular disease by all informants. ICF values

The ICF index range 0-1. It is low (near 0) if plants are chosen randomly or if there is no exchange of information about their use among informants, and approach one when there is a well-defined selection criterion in the community and or if information is exchanged between informants (Hudaib *et al.*, 2008, Alsarhan *et al.*, 2012).

## RESULTS

Fifty eight plant species belonging to 34 families were identified as being used in the survey area by traditional medicine practitioners. Seventy-six prescriptions were recorded for 32 ailments or therapeutic indications. The most frequently mentioned indications were fever, parasitic infections, digestive system disorders and reproductive system disorders. The majority of remedies were administered orally, leaves were used the most and decoctions were the most frequently prepared formulation. Some plants were used in both Ukum and Ogbadibo LGA in the same way; indicating that there is some agreement in the use of plants by traditional medicine practitioners in the study area. Annexures I, II & III summarize the plant name, family, local name, ailment or use, part of plant used, use value, method of preparation and route of administration. Table 1 gives the informant consensus factor and fidelity level for the plants.

**Table 1.** Significant informant consensus factor (ICF) and fidelity level (FL) of ethnobotanical information given by the 45 practitioners from Ukum LGA.

Symptom and ailment category	ICF	Preferred species	Application	FL (%)
Psychological disorder	0.79	<i>Ceiba pentandra</i> (L.) Gaertn	Convulsion	62.5
Digestive system disorder	0.91	<i>Ficus sycomorus</i> L.,	Diarrhoea	41.6
		<i>Carica papaya</i> L.,	Diarrhoea	66.6
		<i>Musa sapientum</i> L.	Diarrhoea	16.6
Parasitic infection	0.94	<i>Azadirachta indica</i> A. Juss.,	Malaria fever	50.0
		<i>Khaya senegalensis</i> (Dusr) A. Juss,	Malaria fever	16.6
		<i>Citrus aurantifolia</i> (Christm.) Swingle,	Malaria fever	25.0
		<i>Annona senegalensis</i> Pers.,	Malaria fever	66.6
		<i>Burkea Africana</i> Hook	Malaria fever	69.7
		<i>Lophira lanceolata</i> Teigh. ex Keay.	Malaria fever	40.0
Reproductive system	0.61	<i>Terminalia avicennioides</i> Guill. & Perr.	Male erectile dysfunction	22.5
		<i>Siphonochilus aethiopicus</i> (Schweif.) B.L.	Hernia	25.0
		Burt		
Respiratory system	0.86	<i>Ocimum sanctum</i> L.	Catarrh	66.6
Muscular skeletal system	0.33	<i>Vitellaria paradoxa</i> C.F. Gaertn.	Rheumatism	16.2
Poison	0.89	<i>Adenopus breviflorus</i> Benth	Arrow poison	73.1
		<i>Erythrophleum suaveolens</i> (Guill. & Perr.) Brenan	Arrow poison	66.6
Yellow Fever	0.94	<i>Ficus thonningii</i> Blume	Yellow fever	66.6
		<i>Psidium guajava</i> L.	Yellow fever	15.0
		<i>Maytenus senegalensis</i> (Lam.) Exell,	Yellow fever	42.8
		<i>Imperata cylindrica</i> (L.) P.Beauv.,	Yellow fever	85.7
		<i>Bridelia ferruginea</i> Benth.	Yellow fever	38.4
		<i>Cochlospermum planchonii</i> Hook.f.	Yellow fever	22.5
Skin infection	0.52	<i>Mitracarpus villosus</i> (Sw.) DC.	Eczema	44.4
Endocrine system (diabetes)	0.66	<i>Cocos nucifera</i> L.	Antidiabetes	100.0

## DISCUSSION AND CONCLUSION

This study found that traditional medicine is widely practiced in Ukum and Ogbadibo LGAs of Benue state, Nigeria. The herbal formulations are mostly administered orally. The use value (UV) show that *Ceiba pentandra* (L.) Gaertn, *Mitracarpus villosus* (Sw.) DC., *Ficus exasperata* Valh and *Azadirachta indica* A.Juss., *Gmelina arborea* Roxb are the species most used for treating convulsion, eczema, malaria and as antidote respectively. There is uniformity in the species of plants used by the herbalists to treat specific ailments. The findings of this study reveal that African traditional medicine holds knowledge about plants and their potential to treat ailments. Such knowledge if harnessed can form basis for drug discovery programs.

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**Annexure I:** Plant species identified in Ukum LGA and their use.

S.N.	Plant name	Family	Local name	Ailment or Use	Preparation	Part used	Use value	Nature of plant	Administration
1	<i>Adenopus breviflorus</i> Benth	Cucurbitaceae	<i>Ichegher-me</i>	Arrow- poison	Juice	leaves	0.88	shrub	Oral
2	<i>Annona senegalensis</i> Pers.	Annonaceae	<i>Ahur</i>	Antidote	Juice, decoction, maceration	Leaves/stalk	0.75	Tree	Oral
3	<i>Boerhaavia diffusa</i> L.	Nyctaginaceae	<i>Gbilayongu</i>	Anti-inflammatory	Decoction or Juice	Roots, stem/Leaves	0.83	Shrub	Oral
4	<i>Bridelia ferruginea</i> Benth.	Euphorbiaceae	<i>Ikpine</i>	Yellow fever	Decoction/maceration	Leaves	0.47	Tree	Oral
5	<i>Burkea africana</i> Hook	Caesalpiniaceae	<i>Gbagbongom</i>	Antidote	Poultice powder	Roots	0.75	Tree	Oral
6	<i>Ceiba pentandra</i> (L.) Gaertn	Malvaceae	<i>Vambe</i>	Convulsion	Maceration	Leaves/stem	1.00	Tree	Oral
7	<i>Cochlospermum plachonii</i> Hook.f.	Cochlospermaceae	<i>Kpavande</i>	Yellow fever	Decoction	Leaves/roots	0.90	Herb	Oral
8	<i>Cymbopogon citratus</i> Stapf.	Poaceae	<i>Tohogile</i>	Typhoid fever	Decoction	Leaves	0.60	Shrub	Oral
9	<i>Ficus sycomorus</i> L.	Moraceae	<i>Tur</i>	Anti-diarrhoea	Cooked	Whole plant Leaves	0.90	Tree	Oral
10	<i>Erythrophleum suaveolens</i> (Guill & Perr) Brenan.	Leguminosae	<i>Kor</i>	Arrow poison	Maceration	Leaves, Stem	0.50	Shrub	Oral
11	<i>Ficus thonningii</i> Blume	Moraceae	<i>Akinde</i>	Typhoid fever	Decoction	Leaves	0.85	Tree	Oral
12	<i>Hibiscus rosa-senensis</i> L.	Malvaceae	<i>Ashwe u-nyian</i>	Obesity	Cooking	Leaves/stem	0.60	Herb	Food
13	<i>Imperata cylindrical</i> (Anders.) Hubbard	Poaceae	<i>Ihira</i>	Yellow fever	Decoction	Leaves	0.93	Shrub	Oral
14	<i>Jatropha curcas</i> L.	Euphorbiaceae	<i>Igyadam</i>	Antiseptic	Decoction, maceration or Juice	Leaves/stem	0.31	Herb	Oral
15	<i>Khaya senegalensis</i> (Dusr) A.Juss	Meliaceae	<i>Haa</i>	Antidote	Decoction	Leaves	0.20	Tree	Oral
16	<i>Lophira lanceolata</i> Teigh. ex Key	Ocunaceae	<i>Ikura-nomso</i>	Anti-malaria	Decoction/maceration	Leaves/stem	0.43	Tree	Oral
17	<i>Maytenus senegalensis</i> (Lam.) exell	Celatraceae	<i>Alom</i>	Yellow fever	Cooking	Roots	0.75	Tree	Oral
18	<i>Mitracarpus villosus</i> (Sw.) DC.	Rubiaceae	<i>Antyokpoghloo</i>	Eczema/skin diseases Wounds	Maceration or Juice	Leaves	1.00	Shrub	Oral Topical
19	<i>Moringa oleifera</i> Lam	Moringaceae	<i>Jeregede</i>	Fever/antidote	Maceration/decoction	Stem	0.17	Tree	Oral
20	<i>Musa sapientum</i> L.	Musaceae	<i>Ayaba</i>	Antidote	Maceration	Stalk	0.50	Herb	Oral
21	<i>Nauclea latifolia</i> Sm.	Rubiaceae	<i>Ikura-ukase</i>	Fever	Decoction	Leaves	0.50	Tree	Oral
22	<i>Ocimum sanctum</i> L.	Lamiaceae	<i>Kungureku</i>	Headache, Anti-venom	Cooking	Leaves	0.85	Herb	Oral
23	<i>Parkia biglobosa</i> (Jack) R.Br. ex G.Don	Fabaceae	<i>Nune</i>	Fever/dysentery	Decoction	Leaves	0.55	Tree	Oral
24	<i>Piliostigma thonningii</i> (Schum) Milne-Redh.	Leguminosae	<i>Nyihar</i>	Fever	Decoction	Leaves	0.93	Herb	Oral

25	<i>Psidium guajava</i> L.	Myrtaceae	<i>Guava</i>	Typhoid Fever	Cooking	Stem/leaves	0.24	Tree	Oral
26	<i>Scoparia dulcis</i> L.	Scrophulariaceae	<i>Asange ichi</i>	Antidote	Poultice, maceration or juice	Leaves	0.11	Herb	Oral
27	<i>Siphonochilus aethiopicus</i> (Schweinf.) B.L.Burt	Zingiberaceae	<i>Mondo ikyang</i>	Hernia	Decoction	Leaves, roots/rhizomes	0.14	Shrub	Oral
28	<i>Stereospermum kunthianum</i> Cham.	Bignoniaceae	<i>Umanatumba</i>	Fever	Decoction	Leaves/roots	0.11	Tree	Oral
29	<i>Syzygium guineense</i> (Willd.) DC.	Myrtaceae	<i>Mho upupugh</i>	Antidote	Poultice	Leaves	0.33	Tree	Oral
30	<i>Tapinanthus dodoneifolius</i> (DC) Danser	Loranthaceae	<i>Noonnoon</i>	Antidote	Decoction/maceration	Leaves/stem	0.55	Parasite	Oral
31	<i>Terminalia avicennioids</i> Guill and Perr.	Combretaceae	<i>Kuegh</i>	Male erectile Dysentery	Maceration	Stem	0.90	Tree	Oral
32	<i>Vitellaria paradoxa</i> G.Don	Sapotaceae	<i>Ichamegh</i>	Anti-inflammatory Rheumatism	Maceration	Leaves, stem/roots	0.18	Tree	Oral
33	<i>Withania somnifera</i> (L) Dunal.	Solanaceae	<i>Abemaki</i>	Antidote, Hallucinogen	Maceration or Juice	Leaves or Stem	0.27	Herb	Oral

**Annexure II:** Plant species identified in Ogbadibo LGA and their use.

S.N.	Scientific name	Idoma name	Family	Part used	Use	Preparation	Use value	Administration
1	<i>Acacia nilotica</i> L.	Ee-pha	Leguminosae	Leaves, Stem, spines	Anti-diabetic, Poisons.	Leaves boiled Spines set as traps	0.21	Oral
2	<i>Ficus exasperata</i> Valh.	Ikpi	Moraceae	Leaves	Antidote	Leaves used raw	1.0	Topical
3	<i>Newbouldia laevis</i> Seem.	Ogblichi	Bignoniaceae	Leaves	Convulsion, fever Typhoid	Boiled	0.89	Oral, Bath
4	<i>Cucumis melo</i> L.	Ape	Cucurbitaceae	Root	Poison	Root squeezed to extract fluid	0.23	Oral
5	<i>Chromolaena odorata</i> L.	Enegbagu	Asteraceae	Leaves	Malaria fever and typhoid	Boiled	0.98	Oral
6	<i>Ipomea batata</i> L.	Epogege	Solanaceae	Leaves	Anti-inflammatory	Leaves warmed by heating on fire. Juice extracted from warm leaves	0.78	Topical
7	<i>Gmelina arborea</i> Roxb.	Umelina	Lamiaceae	Leaves	Fever, malaria, catarrh	Concoction; leaves boiled with other leaves	1.0	Oral; inhaling vapour from boiling
7	<i>Senna occidentalis</i> L.	Onipi	Leguminosae	Leaves	Kwashiorkor treatment	Boiled and liquid extracted	0.67	Oral
9	<i>Occimum gratissimum</i> L.	Ayemba	Labiaceae	Leave	Stomach ache, kwashiorkor, fever	Boiled and liquid extracted. leaves cooked as meal	0.76	Oral
10	<i>Indigofera pulchra</i> Wild.	Onglakwu	Fabaceae	Leaves	Swellings, rashes	Leaves are squeezed	0.57	Topical
11	<i>Solanum nigrum</i> L.	Ebee	Solanales	Leaves	Convulsion	Leaves are boiled	0.66	Oral

12	<i>Psidium guajava</i> L.	Uguava	Myrtaaceae	Fruit, leaves	Typhoid ,malaria	Leaves washed and boiled	0.65	Oral
13	<i>Magnifera indica</i> L.	Umangoro	Annonaceae	Leaves	Fever, malaria	Concoction	0.65	Oral
14	<i>Ficus sur</i> Forssk.	Oko-klo-do	Moraceae	Leaves	Sickle cell	Leaves boiled	0.35	Oral
15	<i>Mucuna pruriens</i> L.	Enumajeje	Fabaceae	Seed	Poison	Seed mixed in water	0.38	Oral, Topical
16	<i>Lophira lanceolata</i> Teigh. ex Keay.	Okopi	Ohanacea	Leaves	Fever	Leaves are boiled for 45 minutes	0.77	Oral
17	<i>Amarantus spinosus</i> L.	Ogo (epoogo)	Amaranthaceae	Leaves	Blood deficiency	Leaves squeezed in water, leaves eaten as vegetable	0.68	Oral
18	<i>Uvaria chamae</i> P.Beauv.	Ogbakitu	Annonaceae	Leaves and roots	Typhoid	Root and leaves boiled in water for 45 minutes	0.89	Oral
19	<i>Euphobia hirta</i> L.	Amena	Euphorbiaceae	Leaves	To treat spider poisoning	Leaves squeezed	0.13	
20	<i>Elais guinenisis</i> Jacq.	Arii (Ikpa-arii)	Arecaceae	Nuts	Baby skin protection	Nuts are roasted and oil extracted	0.65	Topical
21	<i>Sorghum bicolor</i> L.	Igwu	Poaceae	Stalk ,stem and leaves	Fever	Stalk is boiled with leaves	0.51	Oral
22	<i>Vernolia amygdalina</i> Del.	Afolo	Asteraceae	Leaves	Diabetes	Leaves are washed and crushed to extract liquid, leaves are cooked and eaten	0.59	Oral
23	<i>Napoleonaea vogelii</i> Hook.	Enemokpichi	Barringtoniaceae	Leaves	Constipation	Leaves are washed and boiled for 45minutes	0.83	Oral
24	<i>Gardenia aqualla</i> Stapf & Hutch.	Iklaga	Rubiaceae	Root, leaves	High fever	Boil	0.75	Oral, Bathing
25	<i>Alchornea cordifolia</i> Schum & Thorn.	Owii	Euphorbiaceae	Leaves	High fever , typhoid	Leaves are boiled for an hour	0.58	Bathing, Oral

**Annexure III:** Plant species identified in both Ukum and Ogbadibo LGAs and their use.

S.N.	Plant name	Family	Local name	Ailment or Use	Preparation	Part used	Use value	Nature of plant	Route of administration
1	<i>Azadirachta indica</i> A.Juss.	Meliaceae	<i>Dogonyaro</i>	Antidote	Decoction/maceration	Leaves, stem/roots	1.00	Tree	Oral
2	<i>Carica papaya</i> L.	Caricaceae	<i>Mbuer</i>	Anti-diarrhoa	Swallowing	Seeds	0.90	Tree	Oral
3	<i>Citrus aurantifolia</i> Christm.) Swingle	Rutaceae	<i>Alum u-angen</i>	Antidote	Decoction/maceration	Leaves	0.20	Tree	Oral
4	<i>Cocos nucifera</i> L.	Arecaceae	<i>Ikyewe</i>	Diabetes	Soaking	Fruit	0.70	Tree	Oral
5	<i>Datura stramonium</i> L.	Solanaceae	<i>Zakami</i>	Sedative	Maceration	Whole plant	0.84	Herb	Oral