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ETHNOMEDICINAL SURVEY OF ANTI-TYPHOID PLANTS IN IJEBU ODE LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA

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ABSTRACT
This study investigated the ethnomedicinal survey of plants used for the treatment of typhoid fever in Ijebu Ode Local Government Area of Ogun State Nigeria. A total of 450 respondents (herbalists, herb sellers, farmers and traditional medical practitioners) were interviewed from various notable markets and communities within Ijebu Ode environs. Descriptive analysis such as frequency tables and percentages were used for the analysis. Forty plants belonging to twenty –six different families were collected. The plants' families represented in the collection include Annonaceae, Asteraceae, Apocynaceae, Bromeliaceae, Combretaceae, Caesalpinaceae, Euphorbiaceae, Liliaceae, Rutaceae, Zingibaraceae and others. Most of the recipes are used in combination for proper treatment of the typhoid fever. Methods of the administration of the phytomedicines were concoction, decoction, infusions and powdered residue. Therefore more pharmaceutical research work should be financed by the Federal Government on the active ingredients of these plant species to determine their dosage level and to conserve and improve their genetic constituents.

KEYWORDS: Typhoid fever, ethnomedicinal survey, phytomedicines, Ijebu Ode Nigeria.

INTRODUCTION

The main objective of ethnobotanical research is to record the indigenous knowledge about plants. Reviews of ethnobotanical studies have reflected that it is widely accepted field of sciences and a lot of work has been reported (Sarkiyayi, *et al.,* 2011; Sonibare and Gbile, 2008; Ogundare, *et al.,* 2006; Sofowara, 2003; Isaac *et al.,* 2002). Infectious diseases account for a high proportion of health problems in Africa. Many plants are used in African continent for the treatment of different diseases such as fever, dysentery, cholera, diarrhoea *etc.* and others which are typical disease of a tropical country (Ayogu and Amadi, 2009; Ajayi and Akintola, 2010).Typhoid fever is an infectious disease caused by bacterial of *Salmonella group-salmonella typhi* and S*almonella paratyphi* A, B or C. the organisms are gram-negative, flagellated, non encapsulated, non-sporulating and facultative anaerobic bacillus. *Salmonella typhi* causes typhoid (enteric) fever, the bacteria pass from the small intestine into blood through the lymphatic system. The reticular endothelial system becomes infected as well as the gall bladder and kidneys. From the gall bladder, the organisms invade the intestine causing inflammation and ulceration (Cook, 1998). According to Ivanoff, *et al.* (1997) symptoms of infection includes fever with low pulse rate, headache, toxemia, enlargement of the spleen and partly or mental confusion. *Salmonella typhi* also causes neutrotyphoid in those with urinary schistomiasis. The condition is an immune complex disorder of the kidney and is characterized by fever oedema, marked albuminuria and haematuria. It also causes osteomyetitis (inflammation of the bone marrow) especially in children with sickle cell disease and thalassaemia typhoid nodules can be found in the bone marrow. Inflamation of the joints (typhoid arthritis) may also occur. It causes abscesses of the spleen, meningitis and rarely pneumonia and endocarditis (Hornick *et al.,* 1999). *Salmonella paratyphi* A and B causes paratyphoid (enteric) fever. The disease is generally mild with *Salmonella paratyphi* A and B being less invasive than *Salmonella typhi*. These are usually characterized with diarrhea and especially in S*almonella paratyphi B* infection. In tropical and other developing countries paratyphoid is more commonly caused by *Salmonella paratyphi* A than *Salmonella paratyphi* B (WHO, 2000). Mortality rates associated with typhoid fever vary from region to region, with highest reported from Indonesia, Nigeria and India (Miller *et al.,* 1994). According to World Health Organization (WHO) more than 80% of the world's population relies on traditional medicine for their primary healthcare, majority of which use plants or their active principles (Gupta *et al.,* 2005). Plants used in traditional medicine contain a wide range of ingredients that can be used to treat chronic as well as infectious diseases. The objective of the present investigations is to document available local remedies for typhoid fever and also presents the method of preparation and administration of the phytomedicines in Ijebu-Ode Local Government Area of Ogun State. This work will serve as baseline information for carrying out detailed survey in future.

MATERIALS & METHODS

Ijebu Ode where this study was carried out is a Local Government Area in Ogun State. Geographically, Ijebu-Ode Local Government is bounded in the North by Ijebu-North Local Government and Ijebu-East Local Government in the East by North Local Government in the South by Lagos State and in the West is Odogbolu Local Government. Ijebu-Ode Local Government is one of the smallest in the state in terms of landmass which covers

about 130,000 acres of land. It is located within the tropics as it lies along latitude 6.47' North and longitude 3.58' East and possesses a warm tropical climate. With an estimated population of 222,653 (2007), it is the second largest city in Ogun State after Abeokuta. Ijebu Ode is made up of three parts - Iwade, Ijasi and Porogun. A total of 450 respondents (herbalists, herb sellers, farmers and traditional medical practitioners) were interviewed from various notable markets and communities within Ijebu Ode environs. They include New market, Oke-Aje market,Italowajoda, Italupe, Imepe, Molipa, Itamapako, Porogun, Isoku-Ososa, Imodi-Mosan, Oliworo, Ita-Ogbin and Isiwo community areas. Data were collected with the use of a well structured questionnaire and personal interview based on those willing to give genuine information. The questionnaires were divided into three (3) sections (A, B and C). Section A examined bio-data of the respondents, Section B identify plants and parts used for treating typhoid fever infection while Section C sourced for knowledge on the treatment, herbal preparation methods and administration of the herbal concoction. Frequency distribution, table and percentages were used for the data analysis. The vernacular names of the local herbs samples (plants and parts) given by the respondents were collected for identification and authentication at the Forest Herbarium Ibadan (FHI) and University of Ibadan Botanical Garden by comparing with the herbarium collection.

RESULTS

The demographic survey of respondents is presented in Table 1. It showed that from the four hundred and fifty respondents interviewed in Ijebu Ode Local Government Areas of Ogun State Nigeria, 31.8% were herb sellers, followed by traditional medical practitioners (29.1%), herbalists (20.9%) and farmers (18.2%). The distribution indicated that majority of the respondents were married (51.3%), followed by widow (er) 18.4%, divorced (17.6%) and single (12.7%). Also, 68% of the respondents are female while 32% are male. The result of the survey of the respondents indicated that a total of 41 medicinal plant species from 24 families were in use in Ijebu Ode Local Government Area of Ogun State Nigeria by the different categories of practitioners. Botanical names, family, local / vernacular names, and plant part (s) of plants mentioned are presented in Table 2 while Table 3 shows recipes, methods of preparation and administration.

TABLE 1: Demographic characteristics of respondents

Variables	Frequency	Percentage (%)
Occupation status		
Herbalists	94	20.9
Herb sellers	143	31.8
Farmers	82	18.2
Traditional medical practitioners	131	29.1
Total	450	100
Marital status		
Single	57	12.7
Married	231	51.3
Divorced	79	17.6
Widow (er)	83	18.4
Total	450	100
Sex		
Male	144	32
Female	306	68
Total	450	100
Age		
20 – 30	44	9.8
31 – 40	68	15.1
41 – 50	94	20.9
51 – 60	139	30.9
61 – 70	72	16
> 70	33	7.3
Total	450	100

TABLE 2: Medicinal plants used for the treatment of typhoid fever in Ijebu-Ode LGA Ogun State, Nigeria

S/N	Botanical names	Family	Local names	Plant part used
1	*Acanthospermum hispidium*	Asteraceae	Dagunro	Whole plant
2	*Albizia ferruginea*	Fabaceae	Ayinre ogo	Leaves
3	*Allium sativum* Linn	Liliaceae	Ayuu	Bulb
4	*Alstonia boonei* De Wild.	Apocynaceae	Ahun	Bark
5	*Ananas comosus*	Bromeliaceae	Ope-oyinbo	Whole plant
6	*Anogeissus leocarpus* Guill. & Perr.	Combretaceae	Ayin	Stem and bark
7	*Bambusa vulgaris* L.	Poaceae	Ewe Oparun	Leaves
8	*Calotropis procera* (Ait.) Ait. F.	Asleipiadaceae	Bomubomu	Leaves
9	*Carica papaya*	Caricaceae	Ibepe	Leaves and

				unripe fruits
10	*Cassia tora*	Caesalpinaceae	Ifo	Leaves
11	*Citrullus lanatus*	Cucurbitaceae	Baara	Bark and fruits
12	*Citrus aurantifolia*	Rutaceae	Orombo	Fruits and leaves
13	*Citrus medica*	Rutaceae	Ijaganyin	Fruits and leaves
14	*Citrus limon*	Rutaceae	Ewe osan	Leaves
15	*Citrus sinensis*	Rutaceae	Osan mimu	Leaves and fruits
16	*Cymbopogon giganteus*	Poaceae	Koriko oba	Whole plant
17	*Cymbopogon citratus*	Poaceae	-	Fruits and leaves
18	*Daniellia oliveri* Hutch. & Dalz.	Caesalpinaceae	Iya	Leaves and bark
19	*Enantia polycarpa* Engl. & Diels	Annonaceae	Oso-pupa	Bark and whole plant
20	*Ficus abutilifolia* Miq.	Moraceae	Ogbagba	Fruits
21	*Ficus capensis* Thunb.	Moraceae	Opoto	Fleshy bark
22	*Ficus thonningii* Blume.	Moraceae	Odan	Leaves
23	*Guiera senegalensis* Gmel.	Combretaceae	-	Leaves
24	*Isoberlinia doka* Craif & Stapf	Caesalpinaceae	Idoka, Doka	Leaves
25	*Khaya senegalensis* Hochst.	Mimosaceae	Oganwo	Leaves and bark
26	*Mangifera indica* Linn.	Anarcardiaceae	Mongoro	Matured bark and leaves
27	*Moringa oleifera* Lam.	Moringaceae	Ewe-Igbale	Leaves
28	*Olax subscorpioidea* Oliv.	Olacaceae	Ifon	Root
29	*Parkia biglobosa* Jacq.	Mimosaceae	Igba	Fruits and bark
30	*Phyllanthus amarus* Schum & Thonn	Euphorbiaceae	Eyin-olobe	Whole plant
31	*Piliostigma reticulatum*	Leguminosae	Abafe	Fruits and leaves
32	*Saccharum officinarum* L.	Gramineae	Ireke	Matured stem
33	*Stachystarpheta jamaicensis* Vahl.	Verbenaceae	Otoro	Leaves
34	*Tectona grandis* Linn.	Verbenaceae	Ewe-tiiki	Leaves
35	*Terminalia glaucescens* Planch.	Combretaceae	Idi-odan	Leaves
36	*Thoningia sanguinea* Vahl.	Balanophoraceae	Oyaile	Flower
37	*Vernonia amygdalina* Del.	Poaceae	Ewuro	Whole plant
38	*Vitex doniana* Sweet	Verbanaceae	Oori	Bark and root
39	*Xylopia aethiopica* Linn	Annonaceae	Eeru, Erunje	Fruits
40	*Zingiber officinale* Rosc.	Zingibaraceae	Atale	Rhizome

TABLE 3: Enumeration of the recipes, methods of preparations and administration

1	*Ananas comosus, Cymbopogon citratus, Citrus medica Citrus sinensis, Mangifera indica and Vitex doniana:* These herbs are boiled in water or aqueous extract from fermented maize. Take a full cup 3 times daily.
2	*Cymbopogon citratus, Citrus medica and Ananas comosus*: Freshly extracted juices from their fruits should be taken orally.
3	*Carica papaya, Allium sativum, Anogeissus leocarpus, Alstonia boonei and Guiera senegalensis*: The ingredients are cut into pieces and boiled in water for an hour. A full tumbler should be taken twice daily
4	*Olax subscorpioidea, Piliostigma reticulatum, Vitex doniana, Zingiber officinale, Allium sativum, Citrus limon and Ananas comosus*: Boiling in water for 2 hours. Half tumbler of the concoction should be taken morning and night for 7 days.
5	*Carica papaya and Zingiber officinale*: Unriped fruits of *Carica papaya* and grinded portion of the *Zingiber officinale* (rhizome) should be soaked in small quantity of water for 24 hours. Full tumbler of the extract taken twice daily for 7 days.
6	*Khaya senegalensis, Citrus limon, Citrus sinensis and Anogeissus leocarpus*: These herbs are boiled in water and half tumbler of concoction taken twice daily for 5 days.
7	*Parkia biglobosa, Vitex doniana and Khaya senegalensis*: Boil in water for 30 mins and drink twice daily for 10 days.
8	*Vernonia amygdalina, Citrus medica, Citrus aurantifolia*: Squeezing of the vernonia leaf in water and mixing extracts with juices of the Citrus fruits. Half tumbler taken 3 times daily for 7 days.
9	*Ficus Thonnigii, Moringa olifera, Ficus sur, Isobelina doka, Allium sativum, Ananas comosus, Citrus limon*: Boil the herbs in water or aqueous extract from fermented maize. Half tumbler taken twice daily for 14 days.
10	*Citrus limon, Carica papaya, Mangifera indica*: Boiled with aqueous extract from fermented maize. Half tumbler taken twice daily.
11	*Olax subscorpioidea, Albizia ferruginea, Thoningia sanguinea*: The barks of these herbs soaked in water for 2 days and half tumbler of the concoction taken once daily for 10 days.
12	*Albizia ferruginea, Daniellia oliveri, Ananas comosus, Thoningia sanguinea, Citrus medica*: Boil herbs using water or aqueous extract from fermented maize for 2 hours. Concoction taken 3 times daily for 7 days.

13	*Xylopia aethiopica, Tectona grandis, Terminalia glaucescens, Saccharum officinarum, Albizia ferruginea and Citrus medica*: Boil the herbs in water for an hour. Half tumbler taken twice daily for 14 days.
14	*Stachystarpheta jamaicensis, Phyllanthus amarus, Albizia ferruginea, Cymbopogon giganteus, Citrus medica, Citrus limon*: Boil the herbs in water for an hour. Half tumbler taken twice daily for 10 days.
15	*Acanthospermum hispidium, Cassia tora, Enantia polycarpa, Ficus abutilifolia, Ficus capensis: Soak the ingredients in water for 3days or boiling in water for 6 hours. Then drinking half tumbler twice daily.*
16	*Citrullus lanatus, Bambusa vulgaris, Calotropis procera, Daniellia oliveri: Boiling of these herbs in an earth pot with water for 15 hours and bath with the extracts after cooling on a daily basis for 3 days.*

DISCUSSION

According to World Health Organization (WHO) more than 80% of the world's population relies on traditional medicine for their primary healthcare, majority of which use plants or their active principles (Gupta *et al.,* 2005). In recent past, attention has been directed towards medicinal plant research to substantiate the claims of cure made by traditional healers thus providing scientific basis for their efficacy (Olukoya *et al.,* 1993). Use of plant resources mainly for herbal medicine, food, forage etc in Nigeria represents a long history of human interaction with the environment and their *in vitro* and *in vivo* properties to microbial pathogens have been widely reported (Okafor, 2001; Iwalokun *et al.,* 2004; Hashish and Gomaa, 2003). This study shows that majority of the respondents are female (68%) and adult (93%) (Table 1). This justifies the findings of Faleyimu *et al.,* (2010) and Rathmans *et al.,* (2002) who opined that age bracket is the economically active age and such will respond positively to any intervention aimed at improving their productive capacities and well being. Majority of the respondents are married, and either herb sellers, traditional medical practitioners and herbalists with little interest in farming. This shows that families were being supported with the income realised from the sale and administration of the herbs. This agreed with the findings of Faleyimu *et al.,* (2010); Faleyimu *et al.,* (2009) and Adekunle and Sam-wobo, (2004) that medicinal plants, apart from providing substantive medicine, are also items of trade providing employment and income to indigenous people in Nigeria. Table 2 showed that 24 families of plants were discovered for the treatment typhoid fever in the study area. The medicinal plants discovered from this survey include *Albizia ferruginea, Ananas comosus, Cymbopogon citratus, Citrus medica, Citrus sinensis, Mangifera indica, Vitex doniana, Olax subscorpioidea, Piliostigma reticulatum, Vitex doniana, Zingiber officinale, Allium sativum, Citrus limon, Khaya senegalensis, Vernonia amygdalina, Parkia biglobosa, Ficus Thonnigii, Moringa olifera, Citrus auranifolia, Bambusa vulgaris, Ficus sur, Isobelina doka, Carica papaya, Anogeissus leocarpus, Alstonia boonei, Guiera senegalensis, Xylopia aethiopica, Tectona grandis, Terminalia glaucescens, Saccharum officinarum, Stachystarpheta jamaicensis, Phyllanthus amarus, Daniellia oliveri, Thoningia sanguinea, Cymbopogon giganteus, Cassia tora* and others (Table 2). Different medicinal plant species has been shown to be biologically active against various illnesses (Olajide *et al.,* 2013; Erinoso and Aworinde, 2012; Borokini and Omotayo, 2012; Sarkiyayi *et al.,* 2011; Faleyimu *et al.,* 2010; Sonibare and Gbile, 2008; Abena *et al*., 2007). Medicinal plants contain biologically active chemical substances such as saponins, tannins, essential oils, flavonoids, alkaloids and other chemical compounds which have curative properties (Sofowora, 1993). These complex chemical substances of different compositions are found as secondary plant metabolites in these plants. Chemical constituents of the various plant specimens collected must have enhanced the efficacy of the plants for the treatments of the typhoid fever among the Ijebu Ode populace. This led to the way it was embraced because respondents believed that modern scientific medicines have seriously evolved from traditional medicines. To be candid, the major criticisms of herbal medicines are the dosage difficulty as a result of the differences in the measurement of the concoctions during administration.

CONCLUSION & RECOMMENDATION

In conclusion, the results of this study indicate a wide diversity in the distribution of the secondary metabolites among the forty plants used for this study. Furthermore, it could be said that the ethnomedicinal significance of the plants samples collected for this study corresponds to the pharmacological actions of the secondary metabolites they contain. It is therefore, pertinent that further studies be carried out on the quantitative analysis of the phytochemicals in the plant samples. From that point, the specific metabolites can be screened and separated to undergo pharmacological processes and become a potent drug.

REFERENCES

Abena, A.A., Gbenou, J.D., Yayi E., Moudachirou. M., Ongoka. R.P., Ouamba, J.M. and Silou, T. (2007) Comparative chemical and analgesic properties of essential oils of Cymbopogon nardus (L) Rendle of Benin and Congo. *Afr. J. Trad. CAM*, 4 (2), 267-272.

Adekunle MF and Sam-wobo (2004) Ethnobotany and prioritization of forest plants in traditional treatment of guinea worm in Ogun State, Nigeria. *The Nigeria Journal of Forestry*, 34(1-2), 71-80.

Ajayi, A.O and Akintola, T.A. (2010) Evaluation of antibacterial activity of some medicinal plants on common enteric food-borne pathogens. *Afr. J.Microbiol. Res.,* 4(4), 314-316.

Ayogu, T.E. and Amadi, E.S. (2009) Studies on the antibacterial activities of medicinal plants on typhoid fever organism. *Int. J. Third World Med.,* 7(2), 1-4.

Borokini, T.I. and Omotayo, F.O. (2012) Phytochemical and ethnobotanical study of some selected medicinal plants from Nigeria. *Journal of Medicinal Plants Research,* 6(7), 1106-1118. Available online at http:// www.academicjournals.org/JMPR.

Cook, G.C., (1998) Communicable and tropical diseases, mainstream medicine Heinmann Medical Book, London.

Erinoso, S.M. and Aworinde, D.O. (2012) Ethnobotany survey of some medicinal plants used in traditional health care in Abeokuta areas of Ogun State, Nigeria. *African Journal of Pharmacy and Pharmacology*, 6(18), 1352-1362

Faleyimu, O.I., Akinyemi, O and Idris, Y.M. (2010) Survey of forest plants used in traditional treatment of typhoid fever in Chikun Local Government, Kaduna State. *International Journal of Biomedical and Health Sciences*, 6(1), 75-81.

Faleyimu, O.I., Adamu, Y. and Akinyemi, O. (2009) Survey of forest plants used in traditional treatment of tuberculosis in Kaduna South Local Government, Kaduna State. *Biological Environmental Sciences Journal for the tropics*, 6(4), 1-4.

Gupta, M.P., Solis, P.N., Calderon, A.I., Guionneau, Sinclair, F., Correa, C., Galdames, C., Guerra, C., Espinosa, A., Alvenda, G.I., Robles, G. and Ocampo, R. (2005) Medical ethnobotany of the Teribes of Bocas del Toro, Panama. *J. Ethanopharmacol.*, 96, 389-401.

Hashish, M.N. and Gomaa, N.F. (2003) The inhibitory effects of garlic (*Allium sativa*) on growth of some microorganisms, *J. Egyt. Pub. Health Assoc.*, 78(5-6), 361-72.

Hornick, H.A.J., Boehm, M.J., Kareru, P.G., Kenji, G.M. and Gachanja, A.N. (1999) Biocontrol within the context of soil microbial communities: a substrate-dependent phenomenon. *Ann. Rev. Phytopathol.*, 37, 427–446.

Iwalokun, B.A., Ogunledun, A., Ogbolu, D.O., Bamiro, S.B. and JIMI-Omojola, J. (2004) *In-vitro* antimicrobial properties of aqueous garlic extract multi-drug resistant bacteria and *Candida* species from Nigeria. *J. Med. Food*, 7(3), 327-333.

Miller, S.I., Hohmann, E.L. and Pegues, D.A. (1994) *Salmonella* (including *Salmonella typhi*). In principles and practice of infectious diseases Vol. 2, 4th ed. Edited by: Mandell GL, Bennet JR, Dolin R. New York: Livingstone, pp. 2013-2033.

Isaac, G.M., Gachanja, A.N., Keriko, J.M. and Mungai (2002) Screening of Plants from Biological Active Substance in Africa Medical Plant. Pp 119-127.

Ivanoff, B.N. and Levinc, M.M. (1997) Typhoid Fever Contineuing Challenge from a Resilient foe. Bull Lust. *Pasteur*. 95, 129-142.

Ogundare, A. O., Adetuyi, F. C. and Akinyosoye, F. A. (2006) Antimicrobial activities of *Vernonia tenoreana. Afr. J. Biotech.* 5 (18), 1663-1668.

Okafor, G.C. (2001) Predictive values of plants taxonomy in ethnomedicine: a paper presented at a workshop on medicinal plants of Nigeria organized by the Association for Conservation, Utilization and Preservation of medicinal plants of Nigeria (ASICUMPON), Enugu May.

Olajide, O.B., Fadimu, O.Y., Osaguona, P.O. and Saliman, M.I. (2013) Ethnobotanical and phytochemical studies of some selected species of leguminoseae of Northern Nigeria: A study of Borgu Local Government Area, Niger State. Nigeria. *International Journal of Science and Nature (IJSN)* 4 (3), 546 – 551.

Olukoya, D.K., Idika, N. and Odugbemi, T. (1993) Antibacterial activity of some medicinal plants from Nigeria. *J. Ethanopharmacol.*, 39, 69-72.

Rathmans, S.A., Ogungbile, A.O. and Tabo, R.O. (2002) Factors affecting adoption of ICSV VIII and ICSV 400 sorghum varieties in Guinea and Sudan of Nigeria. *Journal of Crops Research, Agroforestry and Environment.* 1(1), 21-35.

Sarkiyayi, S., Karago, J. and Hassan, R. (2011) Studies on Anti Typhoid Properties of Aqueous Methanol Leaves Extract of *Albizia ferruginea* (Musase). *International Journal of Biochemistry Research & Review* 1(1), *24-30, 2011*.

Sofowara, A.E. (2003) Phytochemical Screening of Nigerian Medicinal Plants Part 11. *Lyodia*, 44, 234 - 246.
Sonibare, M.A. and Gbile, Z.O. (2008) Ethnobotanical survey of anti-asthmatic plants in South Western Nigeria. *Afr. J. Trad. CAM* 5 (4), 340 – 345.
WHO 2000 *http://www.herb* species info.com. Assessed 13th March, 2009.