

Ethno-medicinal Survey of Plants Used for the Treatment of Typhoid Fever in North East, Nigeria

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Abstract

Herbal medicine, sometime also called phytomedicine or botanical medicine, which are used for therapeutic or medicinal purposes. Therefore, the aim of this study was to obtain, identify and documents medicinal plants used in the treatment of typhoid fever in the study area. Ethno-medicinal survey of plants was conducted from January to July 2016 in North East, Nigeria. The survey covered three local governments from the three states of North East Nigeria. Potiskum, Katagum and Bajoga from Yobe, Bauchi and Gombe states respectively and simple random sampling was used in selecting the respondents from which plants sample were collected. Ethno-botanical data was obtained through the use of two hundred and ten structured questionnaires and tape recorder during the interview session with the traditional healers. Descriptive statistics such as frequency table, percentages and chi-square test were employed for the analyses. Thirty nine (39) plants belonging to 25 families were revealed in the survey. The highest medicinal plants parts used reported were leaves (57.7%) followed by (12.9%) roots, (10.9%) stems/bark, (2.9%) fruits, (2.2%) bulb, and (6.4%) flower/seeds and the whole plants (7%). In the mode of preparation of medicinal plants, significant difference was observed ($Z^2=211.86$, $df=4$, $\alpha (a) = 0.05$ and table value = 9.49). The survey provides a basis for further screening and research on these plants.

Keywords: Ethno-medicinal Survey, Typhoid Fever, Medicinal plants, Traditional healers

INTRODUCTION

North Eastern part of Nigeria consists of six states with more than twenty (20) ethnic groups. Traditional medicine is widely popular amongst North Eastern People of Nigeria ((Nnadi and Hung, 1984)). Ethno-medicine is also referred to as traditional medicine, folk medicine, alternative medicine, and indigenous medicine or natural medicine (WHO, 2012). This is the study or comparison of traditional medicine practiced by various ethnic groups, especially indigenous people ((WHO, 2012)). Ethno-medicinal research applies the method of ethnobotany and medical anthropology (Archarya *et al.*, 2008). Recent report showed that 55% of Hausa people use modern western medicine, traditional herbology and Islamic faith healing to treat many ailments (Nnadi and Hung, 1984). Many plants are used in the north eastern part of Nigeria for the treatment of different diseases such as typhoid fever, malaria, cancer, diarrhea, fracture, pneumonia and mental disorder ((Nnadi and Hung, 1984)). Plants used in traditional medicine contain a wide range of ingredients that can be used to treat chronic diseases, acute diseases, and infectious diseases ((Archarya *et al.*, 2008)).

The main objective of ethnobotany research is to record the indigenous knowledge and use of the plants. Folk knowledge on medicinal plants that is extrinsic within folklore is a very

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important source of information that continually provides the present-day herbal remedies (Shahid *et al.*, 2009). The survey carried out in 1984 by World Health Organization showed that developing countries are more interested than ever in making use of traditional indigenous resources in implementing the primary healthcare (Ntiejumokuju and Alemike, 1990). The study of traditional medicine has led to the discovery of numerous new pharmacology active molecules such as artemisinin or even of active extracts. 25% of modern drugs in the United States is derived from plants example as Heron drugs are produced from *opium plant*, and artemiter drugs are manufactured from *Artemisia annua plant*, and more than 50% of new available drugs in the world are still being derived from natural products (Newmand and Cragg, 2007).

In some African and Asian countries up to 80% of the population relies on traditional medicine for their primary healthcare (WHO, 2012). Currently, it is estimated that traditional medicine is the only healthcare resource accessible to the third of all Nigerians (Ogunbodede, 1997). The aim of the present study was to obtain and documents the information from ethnomedicinal practitioners on the plants that are currently employed to treat typhoid fever in northern east, Nigeria.

MATERIALS AND METHODS

Study Area

Ethno-medicinal survey of plants was conducted from January to July 2016 in district areas of Fune-kaye (Gombe State). Bajoga area is approximately located between Latitude 11°51'N 11°26'E and Longitude 10.8°50'N and has a population of 23,608 according to 2006 census. Potiskum (Yobe State) is located on the A3 highway between Latitude 44°22'N and 11°30'N and Longitude 3°30'N and 7°20'E. Katagum (Bauchi State) is located approximately between Latitude 11°27'N and 11°28'E and Longitude 11°30'N and 10.20'E (Google Earth, 2014).

Method of Data Collection

The instruments used for data collection were tape recorder and structured questionnaire. The structured questionnaire was an integration of the one designed by Sofowora (1993) and the information collection data formed by the Ministry of Health in Dar-es-Salaam, Tanzania (Adjanooun, 1991). The interview was conducted in Hausa language in order to obtain the information as the language is well understood and spoken by the respondents.

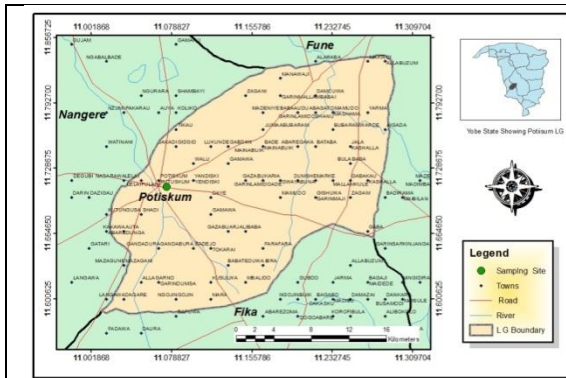


Fig. 1.1: Map of Yobe State Showing Potiskum Area Local Government

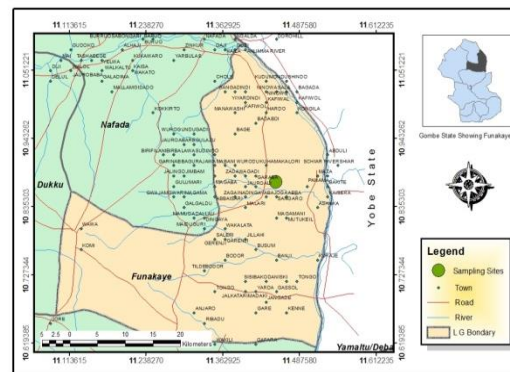


Fig. 1.2: Map of Gombe State Showing Bajoga Local Government Area

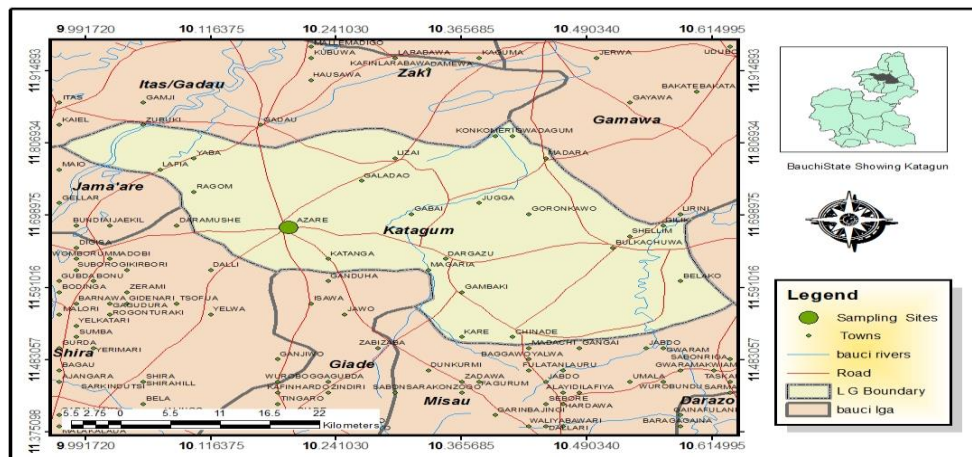


Fig. 1.3: Map of Bauchi State Showing Azare Local Government Area

Source (Google Earth, 2014)

Population and Sample Size

The population of the study covered traditional healers, traditional medicine practitioners, herb sellers, elders with claims of plants knowledge. Three Local Governments from three states were randomly selected in the study area, from which seven (7) ward were randomly selected in each Local Governments. Ten (10) respondents were randomly selected from each and every ward and interviewed. A total of 210 structured questionnaires were administered. Prior to the commencement of the study informed consent was sought from the ward heads (Mai Anguwa) of the selected area as well as the respondents

Plant Identification

Local names of the plants were provided by the herbalists, herb sellers, elders and traditional medicine practitioners. The plants and their names were taken to Department of Plant Biology, Faculty of Science, Bayero University Kano Botanical Garden and herbarium for identification and authentication.

Data Analysis

Descriptive statistics were used to summarize data collected in tables and figures. Chi-square was employed to establish relationship between the degrees of management, mode of preparation, plant parts used and how the plant parts are used (Sani and Aliyu, 2011).

RESULTS

Out of the two hundred and ten (210) respondents within the age range 20–75 years that were selected using simple random sampling in this ethnobotanical survey, 23.8% of them were Herbalist, followed by Herb sellers (26.2%), Traditional Medical Practitioners 25.7%, elders 12.4% while others 11.9%. completed the demographic status of the respondents (Table 1). Thirty nine (39) plants belonging to twenty five (25) families were obtained in the study area (Table 2). Plant parts used, mode of preparation, methods of administration and dosage of plants used for treatment of typhoid fever are summarized in Table 3.

The study revealed that 66.7% of the medicinal plants used in the treatment of typhoid fever are wild, and 21.9% were reported as cultivated plants while a few number of plants (11.4%) were wild/cultivated. There was a significant difference in the degree of management ($Z^2 = 108.44$, $df = 2$, $\alpha (\alpha) = 0.05$, table value = 5.99). Among the plants used in the treatment of typhoid fever, the majority of traditional healers use trees (64.3%) more than the other form of growth habits, followed by shrubs (20.2%), and herbs (15.5%). The highest medicinal plants parts used reported were leaves (57.7%), followed by (12.9%) roots, (10.9%) stems/bark, (2.9%) fruits, (2.2%) bulb, and (6.4%) flower/seeds. However, the whole plants (7%) were reportedly used by the respondents to prepare herbs for the treatment of typhoid fever. The medicinal preparation of plants parts used showed significant difference ($Z^2 = 543.02$, $df = 9$, $\alpha (\alpha) = 0.05$, table value = 16.9). The methods of preparation of the typhoid fever herbs in this study are concoction (51%), decoction (36.2%), infusion (4.8%), and steaming (4.4%). In the mode of preparation of medicinal plants, significant difference was observed ($Z^2=211.86$, $df=4$, $\alpha (\alpha) = 0.05$ and table value = 9.49). The most reported mode of administration by respondents in the study was oral (85%), oral/bath (10%) and inhaling (5%). With regard to the mode of administration, a significant difference was also observed. ($Z^2 = 250.95$, $df = 2$, $\alpha (\alpha) = 0.05$, and table of values = 5.99).

Table 1: Demographic characteristics of respondents

Variable	Frequency	Percentage (%)
Occupation Status		
Herbalists	50	23.8
Herb sellers	55	26.2
Elders	26	12.4
Traditional medical practitioners	54	25.7
Others	25	11.9
Total	210	100
Sex		
Male	202	88
Female	8	12
Total	210	100
Age		
20-29	4	3
30-39	10	5
40-49	21	14
50-59	62	14
60-59	86	30
70 and above	30	15
Total	210	100

Table 2: Medicinal plants used for the treatment of typhoid fever in north east, Nigeria.

S/N	Botanical Names	Family Names	Local Names
1	<i>Adansonia digitata</i>	Malvaceae	Kuka
2	<i>Allium cepa</i>	Amaryllidaceae	Albasa
3	<i>Allium sativa</i>	Amaryllidaceae	Tafarnuwa
4	<i>Annona squamosa</i>	Annonaceae	Fasadabur
5	<i>Azadirachta indica</i>	Maliaceae	Darbejiya
6	<i>Aloe vera</i>	Asphodileae	Alovera
7	<i>Balanites aegyptica</i>	Zygophyllaceae	Aduwa
8	<i>Calotropis procera</i>	Apocynaceae	Tunfafiya
9	<i>Cassia siamea</i>	Fabaceae	Gadilan
10	<i>Cassytha filiformis</i>	Luraceae	Rigar-biri
11	<i>Citrus sinensis</i>	Fabaceae	Lemon zaki
12	<i>Citrus aurantifolia</i>	Luraceae	Lemon tsami
13	<i>Daniellia oliveri</i>	Fabaceae	Maje
14	<i>Dodonaea viscosa</i>	Sapindaceae	Fir-fir
15	<i>Eucalyptus camaldulensis</i>	Myrtaceae	Bishiyar turare
16	<i>Ficus platyphylla</i>	Moraceae	Gamji
17	<i>Ficus thoningii</i>	Moraceae	Cediya
18	<i>Gossypium hirsute</i>	Malvaceae	Auduga
19	<i>Guiera senegalensis</i>	Cambrataceae	Sabara
20	<i>Hibiscus sabdariffa</i>	Malvaceae	Yakuwa
21	<i>Hyphaene thebaica</i>	Arecaceae	Goruba
22	<i>Khaya senegalensis</i>	Meliaceae	Madachi
23	<i>Leptadenia hastata</i>	Asclepiadaceae	Yadiya
24	<i>Mangifera indica</i>	Anarcadiaceae	Mangwaro
25	<i>Moringa oleifera</i>	Moringaceae	Zogale
26	<i>Nauclea diderrichii</i>	Rubiaceae	Tafashiya
27	<i>Ocimum gratissimum</i>	Lamiaceae	Doddoya
28	<i>Phllostigma thoningii</i>	Caesalpinaceae	Kalgo
29	<i>Phoenix dactylifera</i>	Palmaceae	Dabino
30	<i>Psidium guajava</i>	Myrtaceae	Goba
31	<i>Sclerocarya birrea</i>	Anarcadiaceae	Danya
32	<i>Senna occidentalis</i>	Fabaceae	RaiRai
33	<i>Senna tora</i>	Fabaceae	Tafasa
34	<i>Syzygium guineense</i>	Myrtaceae	Malmo
35	<i>Tamarindus indica</i>	Fabaceae	Tsamiya
36	<i>Vernonia amygdalina</i>	Asteraceae	Shuwaka
37	<i>Ziziphus abyssinica</i>	Rhamnaceae	Magarya
38	<i>Ficus sycomorus</i>	Moraceae	Baure
39	<i>Carica papaya</i>	Caricaceae	Gwanda

Table 3: Some recipes used for the treatment of typhoid fever in north east, Nigeria

Plant species	Plant Part	Preparation/ Dosage
<i>Guiera senegalensis</i>	Leaf	Grind the dried leaf of <i>Guiera senegalensis</i> , sieve and then one teaspoon was mix with 25 cl cup of pap. 1 cup twice a day, for five days.
<i>Cassia siamea</i> and <i>Gossypium hirsute</i>	Leaf	The leaves are boiled together and taken twice a day. The patient also baths with it, for four days.
<i>Eucalyptus camaldulensis</i>	Stem and bulbs	Dried leaves are pounded smoothly and a table spoonful is taken with pap thrice a day, for three days.
<i>Aloe Vera</i> and <i>Allium sativa</i>	Leaf	Aqueous concoction of the leaves and bulbs of garlic. 20 cl cup to be taken thrice a day, For one Week

<i>Psidium guajava</i> ,		Fresh leaves are boiled together with potash. One cupful and thrice a day, for four days.
<i>Moringa olifera</i> , <i>Carica papaya</i> and <i>Ficus sycomorus</i>	Leaves	Dried leaves are grinded into powder, three teaspoon are mixed with 10cl cup of Horney and taken twice a day, for three days.
<i>Khaya senegalensis</i>	Leaves	Fresh mahogany leaves are grind into powder, small amount on the tip of finger nail are inhale, for three days.
<i>Azadirachta indica</i>		Fresh leaves are boiled together with honey. One cupful thrice a day, for three days.
<i>Coffea senna</i> and <i>Nauclea diderrichii</i>	Leaves	The leaves are boiled together in the pot of water and taken thrice a day, for four days.
<i>Hibiscus sabdariffa</i>	Calyces	Fresh calyces of Rossele are pounded and infused in cold water. One cupful twice a day for six days.
<i>Tamarindus indica</i> and <i>Vernonia amygdalina</i>	Leaves	The fruits are boiled together with Bitter leaf. Half cup to be taken thrice a day for four days

DISCUSSION

Ethnomedicinal plants are commonly used both in the urban and rural communities for treatment of different diseases but only a few respondents have the knowledge and uses of these plant species. Majority of the traditional healers with this knowledge of plants were (12.4%) old aged instead of the (26%) young adults. The continuation of this trend might lead to the loss of phyto-medicinal knowledge and their uses in the study area. Therefore, documentations of ethno-medicinal plants and their uses are important in primary health care, forest conservation and research in order to prevent the plant species from extinction.

The ages of the respondents ranged between 20 to 80 years and majority of them were (88%) male. This finding might be due to the tribe and faith (Muslim and Hausa) of the respondents as their Islamic faith prevents their female counterpart in this age bracket from interacting with them. This finding coincides with the previous finding of (Ampitan, 2013). Also, most of the medicinal plants used by traditional healers to treat typhoid fever are mostly found in the wild. This finding equally corroborates the previous findings of Sani and Aliyu, 2011 but it is in contrast with the finding of Fadimu *et al.* (2014).

The findings of this study also, revealed that (35%) of the traditional healers are not educated and the majority (55%) of patients that patronized them were local and poor patients. This finding corroborates the previous report of Tsobou *et al.* (2015). The traditional healers claimed to inherit the knowledge of medicinal plants species from their forebears. This finding is in concord with the previous finding of Tsobou *et al.* (2015).

The plant habit and habitat showed that most of plant species used for treatment of typhoid fever is trees instead of shrubs. This might be because the trees are not affected by seasonal variations as described by Albuquerque (2006). In this study, the most reported plant parts used for the herbal preparation were leaves. This corresponds with the previous report of Fadimu *et al.* (2014); Tsobou *et al.* (2015).

The result of the survey revealed that water is the most commonly solvent used for the extraction of the juice from the plant parts either by concoction, decoction, steaming and infusion. This is probably because water is a universal solvent. The main methods of route of administration by herbal practitioners are oral, inhaling and steaming. This finding clearly

corroborates the previous finding of Sani and Aliyu (2011). The dosage and duration of the treatments varied from one traditional healer to another despite the use of same plants to treat typhoid fever. The dosage reportedly used by the respondents ranged between 20 cl and 35 cl; twice to thrice daily and duration of treatments usually range between five (5) and seven (7) days. Traditional healers reportedly used more than one plant species in the preparation of typhoid fever herbs in this study. This finding is in agreement with the report of Fadimu *et al.* (2014) in their study. The traditional healers used both single and combined plants for the treatment of typhoid fever but the combined plants were the most dominantly used in this study. Even though the efficacy and safety of the plants species were not tested and the traditional healers claimed that the plants used in preparing and subsequent administration for the treatment of typhoid fever were safe, efficient and had no side effects except from vomiting.

CONCLUSION

The present study documented the plants used for the treatment of typhoid fever. Most of these plants mentioned by the respondents for the treatment of typhoid fever have a significant antimicrobial activity *in vitro* and *in vivo* based on the present and previous studies. This might served as an evidence for potentials of these plants to be used as novel anti-typhoid therapy in the study area.

Frequent survey on the medicinal plants used for the treatment of typhoid fever and other diseases should be undertaken before the knowledge regarding these plants is lost completely.

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