Eastern Journal of Agricultural and Biological Sciences (EJABS)
ISSN: 2753-3247
Website: https://qabasjournals.com/index.php/ejabs

Ethnobotanical Survey of Medicinal Plants in Seven Local Government Areas of Zone A, Yobe State, Nigeria

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ARTICLE INFO

Received: February 10, 2023
Accepted: March 22, 2023
Volume: 3
Issue: 2

KEYWORDS

Ethnobotany
Medicinal Plant
Traditional Medicine
Ailments

ABSTRACT

An Ethnobotanical Survey of Medicine Plants in seven Local Government Area of zone A, Yobe State was carried out, with a view to document the indigenous knowledge of some medicinal plant species found in the area. Questionnaire instrument was designed; for information on demographic data, the most common ailments and plants species used in managing these ailments from seventy (70) respondents. The plant species were identified, authenticated and herbarium specimens prepared. Standard quantitative phytochemical screening protocols were adopted to determine major phytochemicals in the most commonly used plants species. From the survey, a total of Fifty four (54) plant species belonging to (29) different families were found to be useful in the treatment of common ailments. The family Fabaceae has the highest number of (12 species).Trees were mostly used and the parts of the plants used most frequently applied were the leaves and barks. Medications were mainly prepared in powdered forms and decoctions and taken orally. The questionnaires revealed that the most common ailments were pile, malaria, jaundice, typhoid, diarrhoea and ulcer in that order, and the most frequently used plant species were Acacia nilotica, Guiera senegalensis, Mitragyna innermis and Senna occidentalis respectively. Phytochemical profiles demonstrated that flavonoids, polyphenols, nitric oxide and DPPH scavenging activities in the leaves of A. nilotica, G. senegalensis, S. occidentalis and Bark of M. innermis. It is concluded that herbal medicine will continue to be a major component for health care delivery system in the community due to their biologically active compounds, availability and affordability.

1. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Traditional medicine known as (folk medicine) is a cultural of different communities in the world and encompasses all kinds of traditional medicine, unconventional folk medicine and indeed any kind of therapeutic method that was recorded down by the tradition of a community or ethnic group (Adesina, 2008). Traditional medicine (also known as indigenous medicine) includes knowledge of a systems that developed over generations within various community before the era of alternative medicine (Wikipedia, 2012). According to (WHO, 2003) its , defined as the health practices, knowledge, approaches, and beliefs using plant, animal and mineral for medicines, spiritual therapies, among others. It can be applied singularly or in combination to manage, diagnose and protect ailment or maintain well-being. It can be also be defined as the practices and skills based on the beliefs and experiences of different cultures, for the management of various physical and mental illness.

Traditional medicine (T.M) has been used for many of years ago with the effort contributions made by traditional practitioners to cure human ailment, which serve as primary health care providers within the community stage. Additionally traditional folklore medicine has maintained its popularity nationwide. Since 1990s it's used in many developed countries (WHO, 2012).

In Asia, Latin America and Africa use herbal therapies to meet their primary health care services needs. In Africa, up to 80 % of the population use traditional herb medicine for primary health care services (Africa STI, 2011; Wikipedia, 2012; WHO, 2012). In our country (Nigeria) herbal theraphy is the first line of management for 60% of children with high malaria, fever, while 85% of Nigerians use and consult plant for health care, social and psychological values.

Folklore medicine is the knowledge, skills and based on practices, theories, experiences indigenous and beliefs to different cultures that are used to managing and improve health, as well as to diagnose, prevent, and treat mental and physical illnesses (W.H.O,2008). In Africa, as a case study folklore medicine is still the major source of health care services in spite of the growth of religious enlightenment and western civilization in the areas of orthodox medicine and modern technology. World Health Organization reported that 80% of the total populations of Latin-America, Asia and Africa use traditional medicine for their primary health care service. (Ekeopara *et al.,* 2017).Majority of the people in Nigeria live in rural areas, several kilometres from health centres and a huge among of the population continues to depend on traditional ways of treatment.

Phytochemicals are chemical substance naturally found in plants, that provide medicinal ingredients and nutrients for human health benefit (Hasler and Blumberg , 1999).They are found in various plants part, such as in the roots, stems, leaves, flowers, fruits or seeds (Coasta *et al.,*1999).The medicinal use of plants is presence of particular chemical compound that have a definite physiological action on the biological system (Aslam *et al.,* 2009).

2. LiteratureReview

Kankara *et al*. (2020), documented medicinal plants used for complementary and alternative cancer therapy in Katsina State, North western Nigeria, a total of fifty six (56) medicinal plants distributed in 22 families were documented. Most of the species belong to Fabaceae family with 21 representatives and *Diospyros mespiliformis* had the highest Relative Frequency Citation (RFC) and UCV of 0.15 and 0.30, respectively, while the least RFC and UCV were seen in *Tamarindus indica* with 0.09 and 0.18, respectively. of the 57 species, 46 (81 %) were trees and 11 (19 %) shrubs. most of the medications (63 %) are prepared as decoction and powder.

Daskum (2020) carried out research on Ethnobotanical survey and *in vivo* assessment of the Antimalarial activities used of medicinal plant result shows that *Senna occidentalis* is therefore, considered a good candidate source for development of novel Antimalarial drugs in Potiskum and Nangere of Yobe State.

Ajayi (2020), carried out an ethnobotanical survey of medicinal plants used in the management of diabetes in Ibadan North-East and Ibadan South-East, Oyo State, Nigeria. Results revealed 60 plants species belonging to 35 different families and 57 genera were cited by the respondents which they use in the management of diabetes. Fabaceae (23 %) has the highest number of plants species followed by Apocynaceae (17 %), Annonaceae (11 %), Curcurbitaceae (11 %) and Liliaceae (8 %) and the leaves (25 %) were the most commonly used plant parts for the management of diabetes followed by fruits (22 %) and bark (13 %) in that order.

According to the survey conducted by Ukwuani *et al.* (2021) in Gwandu emirate of Kebbi State, surveyed 16 medicinal plants used in antiulcer, with high frequency index include *Mangifera indica* (37.04 %), *Moringa oliefera* (37.04 %), *Acacia nilotica* (33.30 %), and *Azadirachta indica* (29.63 %). The plant parts mostly used in antiulcer herbal preparations are the roots, leaves and seeds and are usually administered orally.

The result obtained by Taiwo *et al.* (2020) showed that, the leaf extract of *Anacardium occidentale* against cancer therapy generation of reactive oxygen species at high concentrations of pentagalloylglucose to induce oxidative stress in cancer cells was identified as a mechanistic event that led to or resulted from its cytotoxicity.

Daskum *et al.* (2020) carried out study on ethnobotanical survey of plants in folklore medicine in selected communities of Yobe State, North-East Nigeria. A total of 60 medicinal plants belonging to 28 botanical families were identified and their medicinal values recorded. Out of the 28 botanical families recorded, Fabaceae was the most common family with nine (9) species of medicinal plants followed by Asteraceae and Moraceae families, with four (4) medicinal plant species each. Similarly, leaves are the most common parts used followed by stem bark and roots/root bark. Their result also revealed that the common ailments affecting the communities are fever, malaria, pile, common cold, cough, anaemia, jaundice among others.

Abdallah *et al.* (2020) conducted an ethnobotanical knowledge in the management of gastrointestinal ailments in Yobe State, results shows that the major family among the surveyed plants, were Fabaceae (dominant), followed by *Anacardiaceae* and *Combretaceae.* Moreover, out of 97 respondents, 81 were male (83.5 %) and 16 were female (16.5 %). it was observed that respondents that were 41-50 years were many into practice ($p = 0.13$. the majority of the respondents as compared using chi-square across the parameters, were illiterates ($p = 0.06$), and very few had a formal training or exposed to workshops ($p = 0.02$), while the majority inherited and utilized herbal medicine practice as their main sources of income ($p = 0.04$). the ailments were in the range of 0.69 – 0.75 factors of informant consensus.

Ethnobotanical survey was conducted by *Maigandi et al*. (2020) on medicinal plants commonly used in snakebites in Sokoto, Kebbi and Zamfara States. The result obtained showed that 25 medicinal plants were in use by different categories of practitioners.

3. Methodology

Study area

Yobe state is among of the one state that forms the North East geopolitical Zone in Nigeria. Yobe was ranked 6th out of the 36 states in Nigeria, in terms of size [*Ministry of Health Yobe State,* 2010]. It shares interstate with Borno to the east, Jigawa and Gombe state in the South, and Bauchi states to the west. Yobe State occupying land mass of 47,153 square kilometers and a

population of 2,757,322 [*NPC 2006]*. The state consists of seventeen local governments and divides into three different zones, A, B, and C. Zone A has seven local government areas namely: Bursari, Damaturu, Gujba, Gulani, Geidam, Tarmua, and Yunusari.

Data collection

Ethnobotanical survey was carried out between June – August of 2021. Data was collected from selected herbal practitioners residing the seven local government area of zone A of yobe state. The herbal practitioner were comprised of local herbalists, traditional birth attendants, herb sellers, farmers and old people of who have practiced and used of medicinal plants. Information was obtained from herbal practitioners through oral interview and by administration of questionnaire (appendix A), factoring the method of Kankara *et al.,* (2015).

Oral interview with the respondents were organised and facilitated by the chief of the herbalist in each local government headquarters. The questionnaire has two part A and B. In part A, the data information of the respondents was recorded. Information on plants that are used traditionally in the management of common ailments was recorded in part B. Five (5) respondents were selected from each local government headquarter. The interviews were conducted in Hausa and Kanuri, These were later translated to English for proper documentation.

Collection and identification of plants species

A sequence of field trips were conducted in the seven (7) local government of the study area. A total of fifty four (54) plant species were collected from the study site. The colloquial identification of the collected plants and their medicinal uses was done with the aid of local herbalists. The fresh plants collected were prepared for herbarium specimen and taken to the Department of Biological Sciences, Nigerian Defence Academy Kaduna for authentication and documentation. The phytochemical analysis was carried out in biochemistry laboratory in the department of biochemistry Kaduna state university.

Phytochemical Investigation Of Plant Extraction and Analysis

The bark and leaves of four most frequently used plant species namely: *Mitragyna innermis, Acacia nilotica, Guiera senegalensis and Senna occidentalis* used in the management of the common ailments (Ulcer, Pile, Dysentery, Diarrhoea, Rheumatism, Join pain, Malaria and common cold) in the study area, were collected, cleaned, washed and air dried at room temperature (28±2^{o}C). The dried leaves were ground into powder separately using a clean mortar and pestle.

Methanolic solvent was used for the extraction (cold extraction), 30g of each of the dry leaves of *M. innermis, A. Nilotica, G. senegalensis and S. occidentalis* were soaked in 580ml of methanol in clean bottles for seven days at room temperature these were shaken for about 30 minutes every day. The plant extracts were filtered using Whatman No. 42 filter paper. The extracts were evaporated into dryness by leaving it in open plastic container for a week (Banu and Cathrine, 2015).

Statistical analysis

A frequencies and percentages was use to analyse the socio-demographic data of the people and Relative Frequency of Citation (RFC) was analyzed the Ethnobotanical information (Kankara *etal.,*2015).

Relative Frequency of Citation (RFC)

This was measure calculated by determination of the relative importance of a particular species by using the relation RFC = Fc /N (Kankara et al.,2015), where frequency citation (FC) is the total number of respondents who cited a particular species and N is the total number of the respondents.

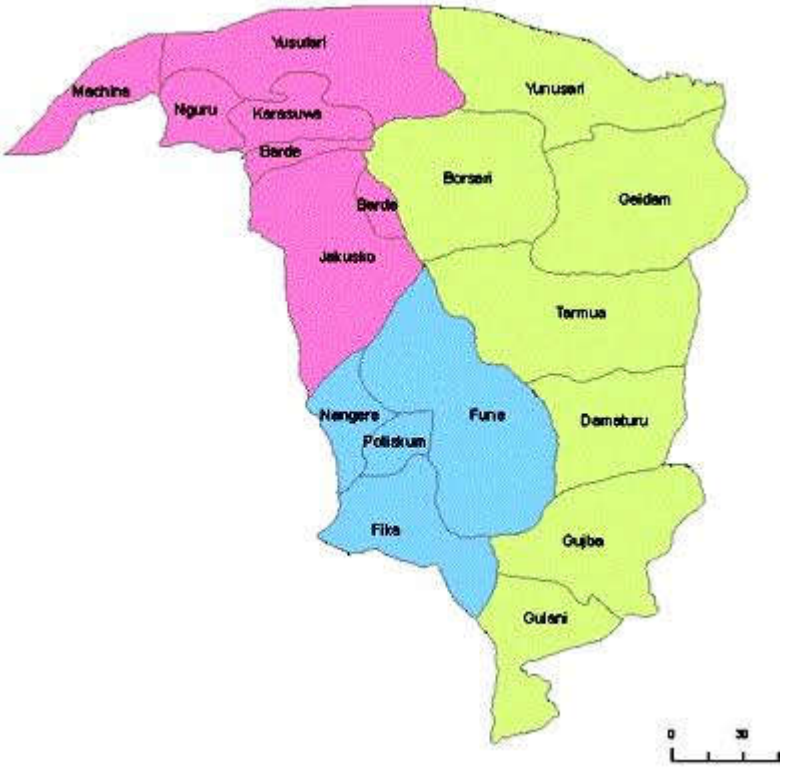

Fig 1. Map of Yobe state. Yellow color showing the study area Zone A.(Sources; Google)

4. Results and Discussion

The demographic data in table 4.1 shows that the sample is predominantly male (88.57%) and females (11.43%). Average age range was 1 to 50 years with majority of respondents in that age bracket. Nevertheless respondents 51- 60 were also sizeable (27.14%). The level of education of respondents was generally high, with 42.83% having secondary education to junior secondary school and more than a quarter (30%) with tertiary education. In terms of occupation, the most of the respondents were farmers (30%) and 25.71% were herbalists or in a related profession. Overall the respondents were generally matured, enlightened, traditional and close to the grassroots.

Table 4.2 showed the medicinal plants species found in the survey area, Scientific name, family, local name (in Hausa Language), habitat and their relative frequency of citation with respect to their used. Majority of the plant were trees with (64.8%), very few were shrubs(16.6%) and herbs with (12.9%) and four were climbers (7.4%). *A. nilotica, M. innermis, G. senegalensis and S. occidentalis* have a highest relative frequency citation of 0.27, 0.14, 0.11 and 0. 11 respectively.

Table 4.3 Recorded the information of the survey plants. The result showed that the people in the study area mostly used leaves and barks in various forms of preparations to cure various ailments with lesser use of other parts of the plants such as seeds, roots In term of mode of preparation and administration,

Table 4.4 indicates the most common ailments of the study area, which are pile, malaria, typhoid and ulcer and the traditional healers used various species of plants in treating the ailments. Some species are used singly in treating an ailment while some in combination of two or more species depending on the experience of the traditional healers.

Table 4.5 shows the quantitative Phytochemicals screening of commonly used plant species in the study area, namely; *A. nilotica, G. senegalensis, M. innermis* and *S. occidentalis.* The bark of Mitragyna innermis and leaves of other plant contain the following Phytochemicals; flavonoids, polyphenols, Nitric oxide and DPPH scavenging activities.

Table 1 Data of the respondents in zone A of yobe state.

Biodata	**Frequency (n)**	**Percentage (%)**
Sex		
Male	62	88.57%
Female	08	11.43%
Age		
20-30	09	12.86%
31-40	10	14.3%
41-50	19	27.14%
51-60	18	25.71%
Above 61	14	20%
Education		
None	5	7.14%
Basic	14	20%
Secondary	30	42.86%
Tertiary	21	30%

Occupation		
Local herbalists	11	15.71%
TBAs	14	20%
Herb sellers	18	25.71%
Farmers	21	30%
Others	06	8.57

TBAs = Traditional Birth Attendants

Table 4.2. Identification of Some Medicinal Plants Survey Collected From the Study Area Zone A of yobe state.

S/N	Scientific Name	Family Name	Local Name	Habit	RFC
1.	*Adansonia digitata* L.	Anacardiaceae	Kuka	Tree	0.03
2.	*Acacia nilotica*(L.) Del	Fabaceae	Bagaruwa	tree	0.27
3.	*Acacia seiberiana DC*	Fabaceae	Farin kaya	tree	0.01
4.	*Anacardium occidentale Linn.*	Anacardiaceae	Kashu	Tree	0.03
5.	*Anogeissus leocarpa*(D.C)(Guill & Perr.)	Combretaceae	Marke	Tree	0.01
6.	*Artemisia annua*L.	Asteraceae	Tazargade	Tree	0.04
7.	*Azadirachta indica A juss.*	Meliaceae	Maina	tree	0.04
8.	*Annona senegalensis*Pers.	Annonaceae	Gwandan daji	tree	0.01
9.	*Balanite aegyptiaca(L)Delile*	Balanitaceae	Aduwa	tree	0.05
10.	*Bauhinia rufescens*L.	Fabaceae	Runhu	shrub	0.08
11.	*Bauhinia ruticulata*DC	Fabaceae	Kargo	herb	0.03
12.	*Borassus aethiopum* Mart.	Arecaceae	Giginya	tree	0.01
13.	*Boswellia delziellii* Hutch	Burseraceae	Ararrabi	tree	0.10
14.	*Carica papaya* L.	Caricaceae	Gwanda	shrub	0.03
15.	*Calotropis procera*(Aiton) W.T. Aiton	Apocynaceae	Tumfafiya	shrub	0.01
16.	*Ceiba pentandra*Gaetin	Malvaceae	Rimi	tree	0.01
17.	*Citrus aurantifolia* Roxb.	Rutaceae	Lemon tsami	tree	0.03
18.	*Cucumis melon Thumb.*	*Cucurbitaceae*	*Guna*	*climber*	*0.01*

19.	*Detarium microcarpum* Guill ex Perr.	Fabaceae	Taura	tree	0.05
20.	*Diospyros mespiliformis* Hochst. Ex A.DC.	Ebenaceae	Kanya	tree	0.01
21.	*Eugenea jambolana*	Myrtaceae	Malmo	tree	0.01
22.	*Euphobia hirta*	Euphobiaceae	Nonon kurciya	herb	0.03
23.	*Eucalyptus camaldulensis* Dehnh	Myrtaceae	Turare	tree	0.04

Table 4.2 Continued….

24.	*Ficus polata* Vahl.	Moraceae	Durimi	Tree	0.01
25.	*Ficus thonningii* Flickr	Moraceae	Cediya	Tree	0.01
26.	*Ficus platyphylla* Pers	Moraceae	Gamji	tree	0.01
27.	*Ficus trichopoda* Baker	Moraceae	Baure	tree	0.01
28.	*Guiera senegalensis*	Combretaceae	*Sabara*	*shrub*	*0.11*
29.	*Gossypium arboretum*	Malvaceae	*Auduga*	*shrub*	*0.01*
30.	*Hibiscus sabdariffa L.*	*Malvaceae*	*Soborodo*	*herb*	*0.01*
31.	*Hygrophila ciuriculata*	Acanthaceae	Kayan rakumi	herb	0.01
32.	*Hyphaene thebaica(L.)Mart*	Aracaceae	Goruba	tree	0.05
33.	*Ipoemoea batatas*	Convulvulaceae	*Dankali*	*climber*	*0.01*
33.	*Jatropha curcas*L.	Euphorbiaceae	Bita da zubi	shrub	0.01
34.	*Khaya senegalensis* (Desr.)	Meliaceae	Madaci	tree	0.07
35.	*Lawsonia innermis*L.	Lythraceae	Lalle	shrub	0.03
36.	*Leptadenia hastate* (Pers.)	Asclepiadaceae	Yadiya	climber	0.01
37.	*Mangifera indica*L.	Anacardiaceae	Mangoro	tree	0.04
38.	*Mitragyna innermis* (willd) kuntze	Rubiaceae	Giyayya	tree	0.14
39.	*Momordica balsamina L.*	Cucurbitaceae	Garahunu	climber	0.03
40.	*Moringa oleifera* Lam.	Moringaceae	Zogale	shrub	0.05
41.	*Nymphaea lotus*	Nymphaeaceae	Bado	herb	0.03
42.	*Parkia biglobosa* Jack	Fabaceae	Dorowa	tree	0.04
43.	*Piliostigma reticulata*	*Fabaceae*	*Kargo*	*shrub*	*0.03*

44.	*Phoenix dactylifera*L.	Arecaceae	Dabino	tree	0.05
45.	*Prosopis africana*	Fabaceae	Lulu	tree	0.01
46.	*Psidium guajava*L.	Myrtaceae	Gwaiba	tree	0.03

Table 4.2 Continued….

47.	*Senna siamea*	cesalpiniodeae	Dr jalo	tree	0.05
48.	*Senna singueana (Delile) Lock*	Fabaceae	Runhu	herb	0.01
49.	*Senna occidentalis*L.	Fabaceae	Majanfari	herb	0.11
50.	*Tamarindus indica*L.	Fabaceae	Tsamiya	tree	0.03
51.	*Terminalia catappa*L.	Combretaceae	Umbrella	tree	0.01
52.	*Vitex doniana* L.	Verbenaceae	Dinya	tree	0.01
53.	*Vitellaria paradoxa Gaertn. F.*	Sapotaceae	Kadanya	tree	0.01
54.	*Ziziphus mauritiana* Lam.	Rhamnaceae	Magarya	tree	0.03

Table 4:3 Identification, preparation& Administration of medicinal plants used in the study area (zone A)

SN	Botanical Name	Common Name	Type Of Ailment Cured	Parts Used	Preparation	Administration
1.	*Adansonia digitata* L.	Boabob tree	Asthma, ulcer, cough	Leaves	Pounded mixed with honey for ulcer.	Orally
2.	*Acacia nilotica*(L.) Del	Arabic gum	Ulcer, pile dysentry, diarrhoea, bleeding	Pod, bark leaves, stem	Decoction And Concoction	Orally Topical
3.	*Acacia seiberiana DC*	Paperbark thorn	Body weakness, pile	Root and stem	Maceration	Orally
4.	*Anacardium occidentale linn.*	Cashew	Jaundice,typhoid fever, malaria	Stem bark, leaves	Decoction	Orally
5.	*Anogeissus leocarpa*(D.C) (Guill & Perr.)	African birch	Cough	Bark	Decoction mixed with red potash	Orally
6.	*Artemisia annua*L.	Leaving sweet annie	Malaria , headache ,stomached ache	Whole plant	Decoction	Orally /infusion

7.	*Azadirachta indica* A. Juss	Neem tree	Typhoid, malaria	Fruit, leaves	Decoction	Orally
8.	*Annona senegalensis*Pers.	Wild custard apple	Cancer	Leaves	Decoction	Orally
9.	*Balanite aegyptiaca(L) Delile*	Desert date	Diabetes	Fruits	Boiling	Orally
	Table 4.3 continued..					
10.	*Bauhinia rufescens*L.	Silver butterfly tree	Yellow fever, stomach ache	Leaves	Powder mixed with	Orally
11.	*Bauhinia ruticulata*DC	Camel's	Ulcer	Seed		
12.	*Boswellia delziellii* Hutch	Frankincense tree	Pile	Bark	Infusion	Orally
13.	*Carica papaya* L.	Papaya	Asthma, typhoid, stomach pain	Leaves	Decoction/ Infusion	Orally
15.	*Calotropis procera*(Aiton) W.T. Aiton	Apple of Sodom	Spiritual and diabetes	Flowers and leaves	Maceration	Steam bath and Orally
16.	*Ceiba pentandra*Gaetin	Silk cotton tree	Dysentery	Barks	Infusion	Orally
17.	*Citrus aurantifolia* Roxb.	Lime orange	Malaria, diarrhoea, dysentery and Mouth rashes	Leaves and fruit	Decoction of leaves and Squeezing	Orally, Apply to the affected area in the mouth
18.	*Cucumis melon Thumb.*	Bitter cucumber	Pile , chiken pox	Fruits	Maceration	Orally
19.	*Detarium microcarpum* Guill ex Perr.	Sweet dattock	Pile	Bark	Concoction	Orally
20.	*Diospyros mespiliformis* Hochst. Ex A.DC.	West Africa ebony	Leprosy	Leaves,stem, bark,root	Decoction	Orally
21.	*Euphobia hirta*	Asthma herb	Asthma , Ulcer and Eczema	Leaves	Infusion	Orally while for Eczema: Scratch affected area with leaves
22.	*Eucalyptus camaldulensis* Dehnh.	River red gum	Fever and Colds	Leaves	Infusion	Orally
23.	*Ficus polata* Vahl.	Heart leave fig	Diarrhoea	Bark	Concoction	Orally

24.	*Ficus thonningii* Flickr	Strangler fig	Jaundice	Stem bark and leaves	Decoction	Orally

Table 4.3 continued

25.	*Ficus platyphylla* Pers	Guttapercha tree	Blood tonic, pile, stomach disorder	Bark	Decoction	Orally
26.	*Ficus trichopoda* Baker	Fig plant	Ulcer , Cancer	Bark and fruit	Infusion	Orally
27.	*Guiera senegalensis(J.F. Gme)*	Senegal tree	Pile, skin rash, diarrhoea	Leaves	Direct / Maceration	Topically / Orally
28.	*Gossypium arboretum L.*	Cotton plant	Blood regulation	Leaves	Decoction	Orally
29.	*Hibiscus sabdariffa L.*	Rosele	Blood regulation and ulcer	Flower and Calyx	Infusion	Orally
30.	*Hyphaene thebaica(L.)Mart.*	Dump palm	Hypertension and diabetes	Fruits	Infusion	Orally
31.	*Ipoemoea batatas*	Potatoes	*Ipoemoea batatas*	Leaves and tubers	Squeeze in water, add milk	Orally
32.	*Jatropha curcas*L.	Barbados nut	Skin diseases	Latex and leaves	Infusion	Extract from leaves and stem and apply to affected area.
33.	*Khaya senegalensis*(Desr.)	Mahogany	Stomached ache skin rash	Stem bark	Direct , Infusion	Topically / orally
34.	*Lawsonia innrmis*L.	Henna	Whitlow and skin diseases	Leaves	Grinding	Apply paste to affected area or wound
35.	*Leptadenia hastata*(Pers.)	Yadiya	Jaundice, nosily infection	Leaves	Maceration	Orally
36.	*Mangifera indica*L.	Mango	Asthma, jaundice , malaria, hepatitis	Stem bark, leaves	Decoction	Orally
37.	*Mitragyna innermis(Willd) Kuntze*	Giyayya	Rheumatism , common cold	Bark	Concoction	Orally
38.	*Momordica balsamina L.*	Balsam apple	Jaundice	Leaves ,stem	Maceration	Orally
39.	*Moringa oleifera* Lam.	Moringa	Ulcer,	Leaves, flower	Grinding	Orally
40.	*Nymphaea lotus*	Water lilly	Female discharge , gonorrhea, bilharzias, jaundice and pile	Whole	Grinding in to powder	Orally
41.	*Parkia biglobosa* Jack	Africa locust beens	Urinary tract infection	Stem bark	Maceration	Orally
42.	*Piliostigma reticulata*	Wild bauhinia	Ulcer,measles	Seed, root	Decoction	Orally

43.	*Phoenix dactylifera*L.	Date palm	Stomach disorder	Fruits	Concoction	Orally

Table 4.3 Continued

44.	*Prosopis Africana*	Iron wood	Jaundice	Stem bark	Pulp	Orally
45.	*Psidium guajava*L.	Guava	Malaria,typhoid ,stomach disorder	Leaves	Decoction	Steem bath and orally
46.	Senna siamea (Lam) Irwin & Barneby	Cassod	Fever , malaria	Stem, leaves	Concoction	Steam bath
47.	*Senna singueana* (Delile) Lock	Wild cassia Runhu	Stomach ache	Leaves	Boil pound leaves add potash	Orally
48.	*Senna occidentalis*L.	Coffee senna	Erectile dysfunction, joint pain, malaria,	Whole plant	Infusion Decoction	Orally
49.	*Tamarindus indica*L.	Tamarind	Haemostatic agent, Toothache	Leaves and bark	Powder	Paste to affected tooth
50.	*Terminalia catappa*L.	Almond	Diarrhoea	Root bark	Decoction	Orally
51.	*Vitex doniana* L.	Black plum	Anemia, jaundice , leprosy, dysentery and improved fertility	Leaves and fruits	Infusion	Orally
52.	*Vitellaria paradoxa* Gaertn. F.	Shea butter tree	Abdominal pain	Leaves	Direct	Orally
53.	*Ziziphus mauritiana* Lam.	Indian jujube	Menstrual pain Burns, and Toothache	Leaves and fruit	Pound, boil with potash Pounding	Orally And Topically

Table 4.4: Common ailment and plants used for their treatments.

Ailment	Plant species used for the treatment	Part used	Mode of administration
Diarrhoea	*Acacia nilotica*	Leaves	Orally
	Citrus auranfolia	Leaves	Orally
	Ficus polata	Bark	Orally
	Guiera senegalensis	Leaves	Orally
	Parkia biglobosa	Pap	Orally
	Terminalia catappa	Leaves	Orally

Jaundice	*Annacadium occidentalis*	Bark	Orally
	Ficus thonningii	Stembark and leaves	Orally
	Leptadenia hastate	Leaves	Orally
	Mangifera indica	Barks	Orally
	Momordica balsamina	Stem	Orally
	Nymphaea lotus	Whole	Orally
	Prosopis Africana	Stem bark	Orally
	Vitex doniana	Leaves	Orally
Malaria	*Anacardium occidentalis*	Stem	Orally
	Artemisia annua	Whole	Orally
	Azadirachta indica	Leaves	Infusion
	Citrus aurantifolia	Leaves	Orally
	Ipoemoea batatas	Leaves	Orally
	Mangifera indica	Barks	Orally
	Psidium gaujava	Leaves	Steem bath
	Senna siamea	Leaves	Steem bath
	Senna occidentalis	Whole	Orally
Pile	*Acacia nilotica*	Leaves	Topical
	Acacia seiberiana	Stem	Orally
	Boswellia delziellii	Bark	Orally
	Cucumis melon	Fruit	Topical
	Detarium microcarpum	Bark of fruit	Orally
	Ficus platyphylla	Bark	Orally
	Guiera senegalensis	Leaves	Orally
	Nymphaea lotus	Whole	Orally
Typhoid			Orally
	Anacardium occidentalis	Steem bark	
	Azadirachta indica	Leaves	Orally
	Carica papaya	Leaves	Orally
	Psidium gaujava	Leaves	Orally
Rheumatism	*Adonsonia digitata*	Leaves	Orally
	Anogeissus leocarpa	Bark	Orally
	Eucalyptus camaldulensis	Leaves	Orally
	Mitragyna innermis	Bark	Orally

Table 4.4 Continued

Ulcer	*Adonsonia digitata*	Leaves	Orally
	Acacia nilotica	Pop	Orally
	Bauhinia reticulata	Seed	Orally
	Ficus trichopoda	Bark	Orally
	Hibiscus sabdariffa	Flower and calyx	Orally
	Moringa oliefera	Leaves	Orally
	Piliostigma reticulata	Seed	Orally

Table 4.5; phytochemical composition of four commonly used medicinal plant species.

Sn	Plant species	Type of ailment cured	DPPH (2,2-diphenyl-1-picrylhydrazyl) Assay	Flavonoid	Nitric oxide Scavenging Assay	Polyphenols estimate
1.	*Acacia nilotica*	Ulcer, pile, dysentery, diarrhoea and bleeding	77.40±3.39	11.26±0.52	34.78±0.64	76.07±0.38
2.	*Guiera senegalensis*	Pile, skin rash and diarrhoea	74.85±3.46	9.10±0.17	51.30±0.35	74.73±0.52
3.	*Mitragyna innermis*	Rheumatism and common cold	77.25±3.46	11.87±0.21	34.29±0.11	63.50±1.29
4.	*Senna occidentalis*	Erectile, dysfunction, joint pain and malaria.	75.50±3.39	6.92±0.21	38.83±0.99	40.40±0.35

5. DISCUSSION

Herbal remedies from plant have been used by mankind to cured all types of ailment. The current study surveyed on ethnobotanical species of medicinal plant used in Sevent Local Government areas of Yobe State, with a view to the collection, identification, pressing and documentation of the indigenous knowledge for future use as well as phytochemicals screening of the most commonly used of parts plant.

Most of the respondents, according to Demographic information were males (88.6%), this may be because in northern Nigeria, males most commonly participate in the outdoors activities like farming, traveling, trading among others. This agrees to the findings of abdallah et al. (2020) who found that the majority of the traditional medicinal practitioners (83.5%) were male in Yobe state. Majority of the respondents are fairly educated which may have been a contributing factor to the loss of important traditional healing systems, because majority of them don't bother to keep written document. Similarly, aged may have been factors too, because the respondents showed improvement by documenting information on herbal practice. Passing oral information was a common practice among the oldest people. This has led to a dirth of information on medicinal plants in the area.

Fifty four (54) species of medicinal plants were surveyed and identified, majority of the plants were trees and their traditional uses were provided by the traditional healers interviewed. Majority of the plants species belong to the family of Fabaceae with eleven (11) species from twenty nine (29) families. This is the same with the findings of Kankara *et al.* (2020) where

they found out that the family Fabaceae was the frequent family with twenty one (21) species from fifty six (56) families used in the management of common disease and cancer theraphy by the people of Katsina State, Nigeria.

Acacia nilotica and Mitragyna innermis leaves and barks were reported to have the highest Relative Frequency of Citation (RFC) of 0.27, 0.14, while *Guiera senegalensis and Senna occidentalis,* both have 0.11, which serve as an indicator of their significance to the people of the study area in treating some kind of ailments. The respondents reported that the plant species have being used from many generation to the other and have been found which very effective in the prevention and management of the common ailments.

Some of the identified plant species have been cited in ethnomedicinal survey of some plants found in Potiskum and Nangere Local Government areas, Yobe State by Daskum (2020), and in the ethnomedicinal study of some medicinal plants used for the management of various ailments in Zaria local government , Kaduna State by Sodimu *et al*. (2020). Suleiman. (2017) also carry out in Gombe metropolis of the various plants used to cure different ailments. Ethnobotanical study of species of plants used by three indigenous tribes in zone B of Yobe state was carry out by Umar and Babalola (2014),the plant was not the same for the treatment of same ailment in zone A. and Ethnobotanical study of medicinal plants species used in the management of many disease in Kano state by Ali *et al*. (2017) also differed. This shows that even within a state, there are some differences in plants species that are found in the various areas of the State. Almost all of the plants species of the survey were mentioned in the research conducted by Daskum (2020) and Negbenebor. (2017).

The species of *Acacia nilotica, Balanites aegyptiaca and Guiera senegalensis* are more abundant in Bursari, Damaturu, Geidam, Tarmuwa and Yunusari local government while *Deterium microcarpum* are fund only in Gulani and Gujba Local Government Areas of Yobe State. Some of the important species of plants in the survey area such as *Adansonia digitata, Acacia seiberiana*, *Boswellia delziellii*, *piliostigma reticulatum, Parkia biglobosa,* and *Ziziphus mauritiana* were very scarce due to their high demand by people most especially traditional healers.

The most common ailments reported during the survey affecting the people of the study area were; pile, malaria, jaundice, typhoid, diarrhoea and ulcer. This also corresponds to the findings of Daskum (2020) in which they found that fever, pile, cold, malaria, Anemia, jaundice, among others were the ailments affecting the people of Nangere and Potiskum local government , Yobe State.

It can be seen from the result that the leaves and barks were recorded as the most used plant parts in the management of many disease in the study area. Other parts of the plants used include roots, seed/fruits and the whole plant. This corresponds

to the findings of Olatokunboand Akinjagunla. (2020) and Mudansiru *et al.* (2016) in which they found that leaves and stem barks are the most reported species of plant used in the preparation of various sickness in indigenous people of Bayelsa and Gumel town of Jigawa State. This may be because, they are easily obtained and processed into a desired medicaments and may also be used in any mode of administration. The plant leaves and root are the important ingredient in traditional treatment of various diseases as it features as a component in many herbal preparations (Ukwuani *et al.,*2021).

The study revealed that some species of the plants are used in combination of more than one plant for the treatment of a particular ailment in order to be very effective in the body and for fast relief. This also corresponds to the finding of Shosan *et al.* (2014).

The results indicated that most of the medicinal plants parts are commonly prepared in two forms which are decoction and Infusion form and taken with water or food substance. This corresponds to the findings of Cletus et al. (2020) and Mudansiru *et al*. (2016) in which they found that most of the plants parts used in some LGA of Taraba state, and in Gumel town of Jigawa state are predominantly either decocted or ground in to powdery form and then taken in a watery formulation. Most of the local traditional healers prefer oral administration, this may be because of its fast effectiveness in the body when taken orally. Majority of the respondents opined that there is no side effect in taking herbal recipes this claim hes, however, not been authenticated.

First, the amount of phenol and flavonoid in the seed extractwas determined. The amount of phenol obtained from the samples were relatively high. This amount shows that the leaves of *A. nilotica* has rich source of polyphenolics. Polyphenolics are strong antioxidant compounds with antitumor, antibacterial and anti-inflammatory activities (Obakiro *et al.,* 2020). Even though, the flavonoid content in the selected plants extract were lower than the polyphenolic content, it is believed that the flavonoid compounds contribute to the therapeutic strength of the extract. Several studies have reported the use of flavonoid compounds in the treatment of bacteria disease. (Musa *et al.,* 2018).

The antioxidant assay reveals that the extract of *A. nilotica, G. senegalensis, S. occidentalis and bark of M. innermis* are good antioxidants. Strong antioxidants are known to inhibit the production of nitrogen derived ions (nitrite, nitrate, peroxinitrite etc.) the amount of polyphenol and flavonoid of the extract is more evidence to the antioxidant capacity of the extract observed in this study

The antioxidant properties of the plants were also ascertained using DPPH scavenging assay. From the DPPH scavenging assay, *A. nilotica, G. senegalensis, S. occidentalis and Bark of M. innermis* were both found to inhibit DPPH. These scavenging activities of both plants are justifiable from their polyphenol and flavonoid contents estimated.

The problems confronting the traditional healers of the area understanding include; travelling to a long distance looking for some of the cut down medicinal plants, lack of keeping records, inability to use modern processing method as well as prescribed dosage, (no quantities specification), massive deforestation of the medicinal plants and presence ssome fake local herbalists.

5. Conclusion

The ethnobotanical survey was successfully conducted in seven local government areas of zone A in Yobe state. The study affirmed that the most common ailments affecting the people of the study area are Pile, Rheumatism, Malaria, jaundice, typhoid, diarrhoea and ulcer. *Acacia nilotica, Guiera senegalensis, Mitragyna innermis* and *Senna occidentalis* were the most frequently used plants in the area management of these ailments were also been written. The indigenous knowledge of the medicinal plants was store properly documented for future use of some important medicinal plants species were identified, collected, pressed and mounted. Their quantitative phytochemical investigation revealed the presence of Flavonoid, Polyphenols, Nitric oxide and DPPH scavenging. It's worth considered

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgments:

I hereby express my heartfelt gratitude to Allah (SWT) and my sincere gratitude and special thanks goes to Dr. Mrs. V.M.Y. Dan and Prof. G.A. Ajibade, for their effort. In spite of academic pressure, May almighty God reward you abundantly. Finally, we want to appreciate the traditional practitioners for giving us information freely.

Conflicts of Interest:

The authors have not declared any conflict of interests.

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