Ethno-Botanical Survey of Plants Used for the Treatment of Sexually Transmitted Diseases in the Sudan savannah region of Nigeria

ABSTRACT

This project reports an ethno-botanical study that focused on the traditional medicinal plants used by local communities to treat Sexual Transmitting Diseases. Ethno-botanical study of medicinal plants was carried out from January 2022 to March 5, 2022 at Dutse, Local Government Dutse, Jigawa State, Nigeria. The study focused on documentation of medicinal plants used to treat various human sexual diseases in the study area. Purposive random sampling technique was used and fifty (50) structured questionnaire was administered to the respondents. Two major markets sampled were: Tsilliya (Kiyawa) and Shuwarin market (Dutse). Descriptive statistics was used such as table, frequency and percentage. Results showed that majority of the respondents (32%) were within the age brackets of 21-30 and 32% were married, 40% had non-formal education while 54% of the respondents' occupation was herb sellers. The prominent religious in the study area was Muslims. A total of 26 medicinal plants species, distributed into 15 families used in the management of eight (8) diseases. Combreataceae (4 species) and Legumenaceae (4 species) had the highest medicinal plants in the study area used for various diseases treatment. *Jatropha curcas* (8) had the highest frequency followed by *Securidaca longepedunculata* (6). Gonorrhea is the most prominent disease (8) followed by viginal discharge (6) respectively. Result also showed that maceration had the highest percentage with the total of 68% followed by decoction method which contains 20% followed by infusion techniques which was 8%. Liquid extract had the least with the total of 4%. Barks was mostly used (37.50%), roots (18.51%), whole plant (18.51%) and leaf (11.11%). It is therefore, necessary to recommend the preservation of the local knowledge of traditional medicines by proper documentation, identification of plant species used, and herbal preparation.

Keywords: Ethno-Botanical, Survey, Plants, Sexually Transmitted Diseases, and Sudan savannah

Introduction

Sub-Saharan Africa ranks first in STD yearly incidence compared to other world regions Sexually Transmitted Disease (STD) are the major public health problem including infertility Gerbase and Mertens (1998). The world health organization has estimated that every year in Africa there are 3.5 million cases of syphilis, 15 million cases chlamydial disease, 16 million cases of gonorrhea and 30 million cases trichomoniasis STD are a high public health priority especially because of their widespread prevalence and treatability Gerbase and Mertens (1998). Herpes simplex various and human papilloma virus infection are growing problem in sub-saharan Africa while STDs are cause by more than 20 microorganisms, they present themselves mainly in 4 syndromically Wasserheit *et al.,* (1996). Africa must implement effective and comprehensive integrated activities against the STD epidemic. Elements of such a strategy will include disease prevention, screening and case finding, and the early diagnosis and treatment of cases. The African continent has a long history with the use of plants for medicinal purposes, up to 80% of the population use herbal medicine for primary healthcare World Health Organisation, (2018). In Nigeria, ethno-botanical investigations have shown that substantial numbers of people utilize traditional medicine for a variety of diseases associated with reproductive health. These includes, abortion, low sperm count, menstrual disorders, loss of libido and erectile dysfunction, menstrual pain, gonorrhea, bleeding during pregnancy, contraception and breast problems (Okoli *et al.*, 2007; Ajibesin *et al.*, 2011). Traditional medicine, through several trado-medical scientists is now patronized by all segments of the society, the rich, the poor, educated and the uneducated. This clearly signifies that traditional medicine which has long been taken for granted and rejected for decades has a crucial role to play in making affordable health care delivery system of people (Soladaye *et al*., 2012 ; Aslan *et al*; 2010; Inanc; 2007; Onal *et al*., 2005; Ozbek *et al.*, 2004). Therapy with conventional drugs typically becomes less effective over time. Also, the few conventional drugs are characterized by appreciable level of toxicity, high cost and unavailability to the people in the rural area. Therapeutic use of local plant resources for healing has been an age long practice and its roots traced to ancient civilizations Singh, (2007). Tropical regions globally are endowed with rich source of medicinal plants which have been used in history for health care particularly in the rural areas.

Sexually related diseases have been observed to be second most prevalent diseases World Health Organization, (2013). Many sexually related ailments are being treated with locally available

medicinal plants among rural populations in Africa, such as menstrual disorders, fertility problems, leucorrhoea and womb problems de Wet and Ngubane, (2004). In a survey conducted in Nigeria, more than 54% of males with STDs were observed to contact traditional healers for treatment Hegde *et al.,* (2007); Hossan, *et al.,* (2010). Majority of patients are not treated well because current treatments have many shortcomings, including safety and tolerability issues and inconvenience of the dose of medicine given. As such, the issue of STD has is one of the most important in human health that need to be studied. As a result of these, many patients seek relief from traditional healing which provides measures for the treatments of the disease (Farnsworth *et al.,* 1985). There an approximate 320, 000 medicinal species in the world. Herbal medicine is used by more than 50% of world population. Gonorrhea is the most prevalent sexually transmitted disease (STD). In Nigeria, in fact in 1963, WHO found Lagos to have the highest Gonorrhea rate in the world. Recent survey report Gonorrhea prevalence to be as high as 28.1%. Use of traditional medicine for disease treatment is most common in Africa, Asia and Latin America. In India, 65% of population has used traditional medicine. 90% of herbal raw material is used in Ayurvedic, Siddha, Unini, homeopathy medicine and those mainly collected from wild state (Pratul, 2011). Natural forests (home of these important resources) are also disappearing at an alarming rate in Africa due to overexploitation of wild populations and lack of well - coordinated conservation programmes Oladele *et al.,* (2011). Medicinal plants are at increasing risk from destruction of their habitats (agricultural expansion, fire, construction, overgrazing, and urbanization) and over harvesting of known medicinal species Cunningham, (1992). According to Roberson, (2008) about 15,000 medicinal plant species may be threatened with extinction world widely due to habitat loss and over harvesting and it is estimated that the earth is losing one potential major drug every two years The main objective of the present study was to identify and characterized some Trado-medical plant used in the treatment of (STD) Sexual Transmitted Disease. The main objective of the study is to assess the ethno- botanical survey of forest plants used for the treatment of Sexual Transmitted Diseases in Dutse and Kiyawa local government Jigawa state.

Specific objectives are to:

i. identify the trado-medical forest plant used for the treatment STD.
ii. determine the method of application and preparation

iii. establish the prominence of ethno-botanicals forest plant for the treatment STD

METHODOLOGY

The study was carried out in Dutse Local Government of Jigawa State. Dutse Local Government is geographically located on Latitude 11.00^0N to 13.00^0N and longitude 8.00^oE to $10.15\ ^0$E at an elevation of 435m above sea level (Salami *et al.*, 2021; Ilu *et al.*, 2020; Salami and Lawal, 2018). Some of the settlements in the studied location include; Fagoji, Kaci, Limawa, Gidadubi, Danmasara, Madobi, Zai, Kude, Takur, And Jigawar Tsada, which are made up of Hausa, Fulani, and Mangawa (a Kanuri dialect). The larger percentage of the local people engaged mostly in farming and rearing of livestock (herdsmen) such as cattle, guinea fowl, sheep, short and long legged goat. The rainy season lasts from May to September with average rainfall of between 600 to 1000 mm while high temperatures are normally recorded between the months of April and September. The southern part of the state has a higher rainfall percentage than the northern part. The area has a total population of 153,000 (NPC, 2006). Kiyawa Local Government is situated in Jigawa state, Northwest Nigeria and has its headquarters in the town of Kiyawa. The towns and villages that make up Kiyawa LGA include Andaza, Gurchiba, Katanga, Turho, Maje, Kiyawa, Karfawa, and Fake. The Estimated population of Kiyawa LGA is put at 200,845 inhabitants with the area majority population by member of the Hausa and the Fulani ethnic groups. The religion of slam is widely practiced in Kiyawa LGA while the Hausa Language is extensively spoken in the area (Salami *et al.*, 2022; JARDA, 2016).

Figure 1: showing the map of Dutse

Adapted: Garba *et al.*, (2021).

Data collection

The studied was carried out in the following stages:

Stage 1: collection and reviewed of published and unpublished literatures on ethno botanical survey of forest plant used for the treatment and cure of sexually transmitted disease (S.T.D) in Dutse and Kiyawa Local Government areas, Jigawa state, Nigeria.

STAGE 2: Questionnaire Administration

Sampling procedure

A three stage design was adopted to collect data during this study.

STAGE 1 Selection of the two local government areas to represent primary collection unit; Dutse and Kiyawa Local Government

STAGE 2 purposive selection of 3 markets in each local government area

i. To determine the method of application

STAGE 3: Random selection of 5 respondents (Herbal practitioners comprising herbal seller and herbal traditional healers) in each specific market of each local government. A total of 50 questionnaires were administered (table 1)

Data analysis

Descriptive statistics was used to get frequency distribution tables for better understanding and percentages to determine the proportions of the variables. Data collected were subjected to descriptive statistics in form of frequency and percentage distribution, tables and bar chat.

RESULTS

Table 1: Demographic nd Social Cultural Characteristics

S/N	VARIABLES	CATEGORIES	Frequency	Percentage (%)
1.	**Gender**	Male	38	76
		Female	12	24
			50	**100**
2.	**Age**	21-30	16	32
		31-40	14	28
		41-50	12	24
		51-60	08	16
		Total	**50**	**100**
3.	**Educational Background**	Non formal Education	32	64
		Primary education	01	04
		Secondary education	04	08
		Tertiary education	13	26
		Total	**50**	**100**
4.	**Religion**	Christianity	02	04
		Islam	46	92
		Traditional	02	04
		Total	**50**	**100**
5.	**Marital status**	Married	32	64
		Single	08	16
		Divorce	04	08
		Widowed	03	06
		widower	03	06
		Total	**50**	**100**
6.	**Primary Occupation**	Livestock farming	03	06
		Crop husbandry	01	02
		Civil servant	04	08
		Business personnel	15	30
		Herb seller	27	54
		Total	**50**	**100**

Source: Field survey, (2022)

Table 2: Showing the Species, Diseases Curing, Part used and Mode of application

S/N	Scientific name	Family	Freq	Disease curing	Part use	Mode of application	Life form
1	*Prosopis africana*	Fabaceae	01	Gonorrhea	Root	Decoction	Tree
2	*Ficus thonnigi*	Mullberry	02	Viginal discharge	Bark	Infusion	Shrub
3	*Securidaca longipedunculata*	Polygalaceae	06	Antiseptic and serve as vasolidator	Leaf	Maceration	Tree
4	*Jatropha curcas*	Euphorbiaceae	08	Gonorrhea	Root	Decoction	Shrub
5	*Buruku*		01	pelvic inflammatory disease	Whole plant	Infusion	Small shrub
6	*Mitagyna inernia*	Rubiaceae	02	Chlamydia	Root	Decoction	Shrub
7	*Combretum micrathan*	Combretaceae	01	Anti inflammatory	Whole plant	Infusion	Shrub
8	*Anogeisus leocarpus*	Combretaceae	03	Anti septic	Bark	Maceration	Shrub
9	*Moringa oleifera*	Moringaceae	05	Gonorrhea	Root	Decoction	Shrub
10	*Plilostigma reticulates*	Cercidoideae	03	Syphilis	Bark	Infusion	Shrub
11	*Water lily*	Nymphaeaceae	01	Virginal itching	Root	Decoction	Acuatic Plant
12	*Vitellaria paradoxa*	Sapotaceae	01	Gonorrhea	Bark	Decoction	Tree
13	*Cassia occidentale*	Legumeneac	02	Virginal	Whole seed	Infusion	Small

		eae		discharge			shrub
14	*Cassia anglofolia*	Legumenaceae	01	Skin disease caused by STD	Whole plant	Ointment	Small erect shrub
15	*Ficus anglofolia*	Moraceae	01	Syphilis	Bark	Infusion	Tree
16	*Termilania indica*	Combretaceae	01	Pelvic inflammatory disease	Seed/bark	Infusion	Tree
17	*Andiva inermia*	Legumeneaceae	02	Pelvic inflammatory disease	Bark	Decoction	Tree
18	*Acacia nilotica*	Legumenaceae	04	Virginal discharge	Seed	Ointment/INfusion	Shrub
19	*Guiera senegalensis*	Combretaceae	02	Anti septic	Whole plant	Infusion	Shrub
20	*Ficus pohita*	Moraceae	02	Gonorrhea	Bark	Infusion	Tree
21	*Mangifera indica*	Anarchadiacae	02	common infection	Bark	Infusion	Tree
22	*Lepitadermis hestata*	Apolynaceae	02	Skin disease caused by STD	leaf	Ointment	Creeping Plant
23	*Parkia biglobosa*	Fabaceae	01	pelvic inflammatory disease	Bark	Maceration	Tree
24	*Senna spp*	Fabacae	01	Gonorrhea	Whole plant	Infusion	Shrub
25	*Vernonia species*	Asteraceae	01	Gonorrihea	Leaf	Infusion	Shrub

26	*Citrus aurantifolia*	Rutaceae	01	virginal discharge	Fruit	Infusion	Shrub

Source: Field survey, (2022)

Table 3: Basic techniques of herbal preparation and mode of application

SN	Form	Frequency	Percentage (%)
1.	Powdering	00	00
2.	Liquid	02	04
3.	Maceration	34	68
4.	Infusion	04	08
5.	Decoction	10	20
Total		**50**	**100**

Source: Field survey, (2022)

Table 4: Showing the causes of the loss of medicinal plants

SN	Causes	Frequency	Percentage (%)
1.	Deforestation	**05**	**02**
2.	Urbanization	**08**	**16**
3.	Farming	**14**	**28**
4.	Legislation	**23**	**46**
	Total	**50**	**100**

Source: Field survey, (2022)

Table 5: Showing the percentage parts of the plant

SN	Part of plant use	Frequency	Percentage (%)
1.	**Root**	5	18.51
2.	**Bark**	9	37.50
3.	**Whole plant**	5	18.51
4.	**Leaf**	3	11.11
5.	**Seeds**	3	11.11
6.	**Fruits**	1	3.70
	Total	**27**	**100**

Source: Field survey, (2022)

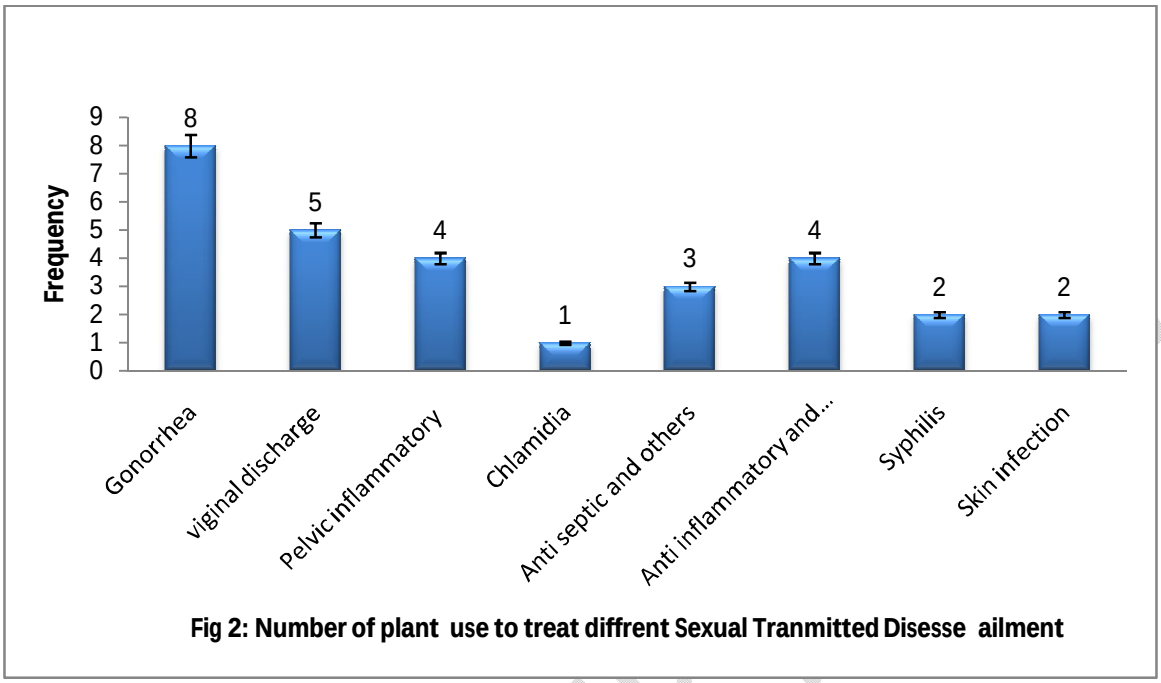

Fig 2: Number of plant use to treat diffrent Sexual Tranmitted Disesse ailment

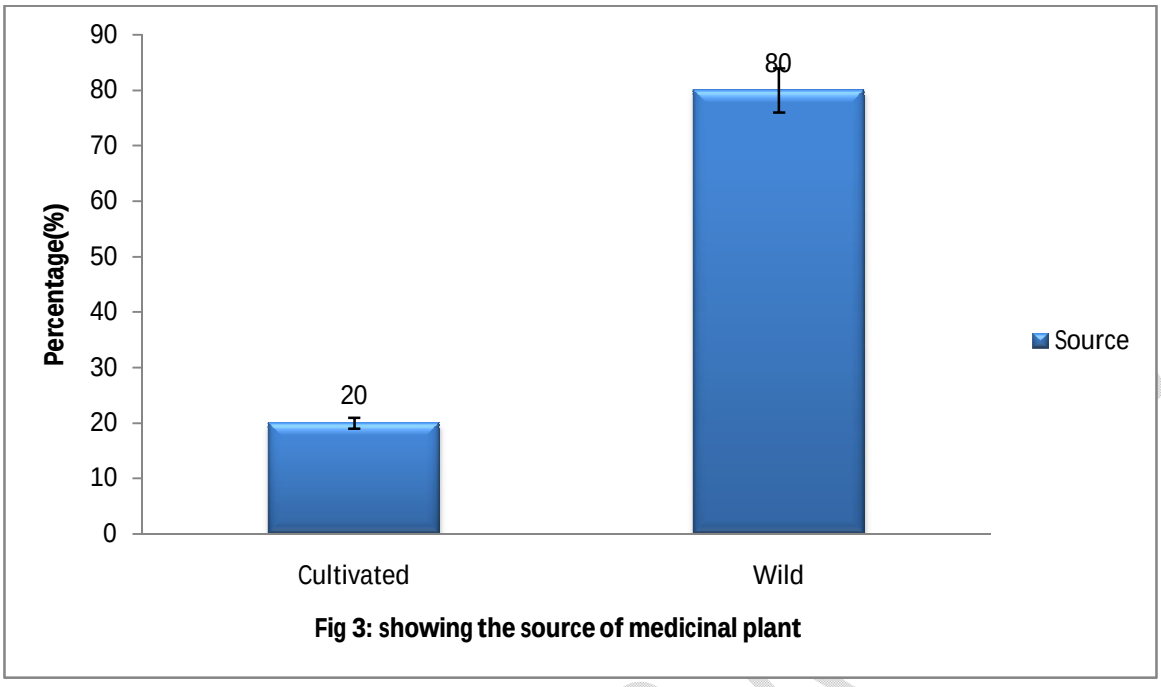

Fig 3: showing the source of medicinal plant

4.2 DISCUSSION

Demographic and social cultural characteristics

Data on demographic characteristics of the respondents are presented in Table 1. The table revealed that the age bracket of 21-30 had the highest frequency of respondents while a better percentage of respondents had least non formal education (64%). Gender distribution of respondents indicated that 76% of the respondents were male while 24% were female. Distribution of respondents' marital status showed that 3% were widow, while 32% were married. The prominent religious faith in the study area was Muslims (92%).

Identified plant use for treatment of STD

The result from table 2 showed that 26 species of plant were identified and used for treating eight (8) different types of Sexually Transmitted Diseases. *Jatropha curcas* (8) had the highest frequency followed by *Securidaca longepedunculata* (6). *Moringa olifera* is also commonly used (5) other important plants used with their frequency are *Acacia nilotica* (4), *Phliostigma reticulatum*(3), *Anogeisus leocarpus*(3), the least plant used are lime (1) *Velonia* species (1),

*Senna italic*a(1), *Cassia anglofolia*(1), Water lily(1), Buuruukuu(1), *Combretum micranthum* (1), and *Vitellaria paradoxa*(1).

Basic techniques of herbal preparation and mode of application

Result showed that maceration had the highest percentage with the total of 68 followed by decoction method which contain 20% followed by infusion techniques which contain 8% liquid show the least percentage with the total of 4%. The least method was powder without any percentage.

Taxonomic Distribution and Growth Forms of the Medicinal Plant Species

The diversity of medicinal plant species used by Dutse/Kiyawa to treat Sexual Transmitted Diseases comprised of 26 species distributed into 15 families used in the management of 8 ailments. Most cited plant families includes; Combreataceae (4 species), Legumenaceae (4 species), Fabaceae (3 species) Moracea (2 species) and Euphobiacea (2 species). This is in contrast to Malvaceae and Fabaceae recorded in this work among the Ogba/Egbema/Ndoni ethnics in Nigeria. Also, similar studies have reported 156 plants used for gynecological conditions in South Africa, 42 plant species in Trinidad and Tobago for reproductive problems, 17 plants used for treating infertility, gynecological and obstetric problems by the Esan people of Nigeria

Plant Parts Used in Medicine

A wide variety of plant parts are used for herbal medicines and reports of the dominant parts varied with cultural backgrounds. In this study, all the plant parts are employed in herbal remedies such as leaves, roots, stem barks, fruit and seeds. Barks constitute the most used (37.50%), roots (18.51%), whole plant (18.51%) and leaf (11.11%) among the Dutse and environs people studied (Table 5). Some studies have found leaves as the most frequently plant parts used in remedy preparations Giday, (2003). Other workers reported that usually the stem bark is preferred for medicinal use in the Caatinga (Brazil) due to its continuous temporal availability Silva and Albuquerque (2005). However, Poffenberger *et al.,* Poffenberger *et al*., (1992) observed that the use of bark and roots could threaten the existence of individual plants as compared to leaves. Also, Togola *et al*., (2005) noted that the need for the use of stem bark will

increase when leaves and fruits are out of season. In another study of plants used for wound healing in Dogonland (Mali), Inngjerdingen *et al*., (2004) found that the roots and leaves were the most frequently used plant parts. Nonetheless, the practice of exploiting perennial plant parts, such as roots and stem barks can result in a population decline of important medicinal plant species Dhillion *et al.*, (2000).

Conclusion and recommendations

Medicinal plants play a vital role in the maintenance of human health throughout the world and notably in the developing country like Nigeria. Traditional medicine has remained the most affordable and easily accessible source of treatment in the primary healthcare system of the rural people in Nigeria. The study has confirmed the fact that herbal medicine presents an alternative source of healthcare for most rural dwellers. A rich heritage of indigenous medicinal plant use and knowledge was represented with a sample of 26 medicinal plants (trees, shrubs, climbers and herbs) recorded in the 2 communities of Dutse-Kiyawa for the treatment of a range of sexual and reproductive conditions. It could be deduced from this study that Combretaceae, Legumenaceae and Fabaceae were the most important ethno-botanic families used in the treatment of sexual ailments in the study area. Results from this study indicate that rural people in Jigawa state of Nigeria still patronize traditional herbal medicine solely or alongside modern medicine for their health care needs. Cultivation of wild medicinal plants in mixed cultures and agroforestry systems need be encouraged among the rural farming population for conservation and sustainable supply. Ethno-pharmacological studies on the reported surveyed medicinal plant species in this study could lead to development of useful drugs.

NOTE:

The study highlights the efficacy of "ayurveda" which is an ancient tradition, used in some parts of India. This ancient concept should be carefully evaluated in the light of modern medical science and can be utilized partially if found suitable.

REFERENCES

Aslan, M., Orhan, N., D. D and Ergub, F. (2010). Hypoglycemic activity and antioxidant potencial of some medicinal plants traditionally used in turkey for diabetes. *Journal Ethno pharmacology*128:384-389.

Cunningham, A. B. (1992). "Wild plant use and resource management," in *The Center for Biodiversity*, L. A. Bennun, R. A. Aman, and S. A. Crafer, Eds., pp. 109–126, National Museums of Kenya, Nairobi, Kenya,

de Wet, H and Ngubane S.C, *South African Journal of Botany* 94 (2014) 129-139

Dhillion, S. S. and Amundsen, C, Responding to Bioprospecting: From Biodiversity in the South to Medicines in the North. (eds. Savrstad, H. and Dhillion, S. S.). Spartacus Forlag, As, Oslo, Norway, (2000), p. 144.

Garba, A. Salami, K. D. and Akanbi, W. B. (2021). Assessment of Endangered Economic Tree species and Conservation Techniques in Jigawa State, Nigeria. *FUDMA Journal of Agriculture and Agricultural Technology* 7 (2), 116-123

Gerbase, A. C. and Mertens, T. E. (1998) Sexually transmitted diseases in Africa: time for action Afr Health Mar; 20(3):10-2.

Hegde, H. V, Hedge G.R and Kholkute S. D, (2007) *Compliment Ther Clin Pract*. 13 38- 45.

Hossan M.S, Hanif A, Agarwala B, Sarwar M.S, Karim M, Rahman M.T-U, Jahan R and Rahmatullah M, *Ethnobotanical Research and Application* 8 (2010) 61-74.

Ilu, K. J., Salami, K.D., Gidado, A. H., Muhammad, Y. K. and Bello Ahmed (2020) Household's Responses to the Roles Of Trees As Wind Breaker in Dutse Local Government Area of

Jigawa State, Nigeria *Fudma Journal of Sciences* (FJS) Vol. 4 No. 3, March, 2020, Pp 162-169

Inanc, N., cicek, B. and Sahin, H.(2007) used of herbs by the patients with in kayseri, turkey. Pakistan journal of Nutrition 6:310:312.

Inngjerdingen, K., Nergard, C. S., Diallo, D., Mounkoro, P. P. and Paulsen, B. S, *Ethnopharmacology,* 92 (2004) 233-244.

Jigawa Agricultural Rural Development Agency [JARDA] (2016). Climatic Data. pp112 Khan, T. I., Dullalle A. K, and Solomon, D. M., (2003). Biodiversity conservation in the desert with Emphasis, on endemic and medicinal plants. The environmentalist, 23: 137-144

National Population Commission 2006.Projected data on national population.Retrieved on 2/5/2018. Available at *https//census.jigawa.dutse.ndb*

Ogbe F.M.D., Eruogun O.L. and Uwagboe M, *Scientific Research and Essay,* 4(3) (2009) 120-130.

Okoli R.I, Aigbe, O, Ohaju-Obodo J.O. and Mensah J.K, *Pakistan Journal of Nutrition* 6 (5) (2007) 490-496.

Oladele A.T, G.O Alade, and O.R Omobuwajo, *Agriculture and Biology Journal of North America,* 2(3) (2011) 476-487

Olajuyigbe, O.O. and Afolayan, A.J. (2012). Ethnobotanical survey of medicinal plants used in the treatment of gastrointestinal disorders in the Eastern Cape Province, South Africa, *Journal of Medicinal Plants Research,* 6(18): 3415-3424.

Onal, S., okutucu, B.&Zihnioglu, f. 2005. Inhibition of alpha-glucosidase by aqueous extracts of some potent medical herbs. Preparative biochemistry and biotechnology 35: 29-36.

Pratul, C. S. 2011.Ethno Antidiabetic plant of Assam.International journal of applied biology and pharmaceutical technology. 246-251.

Roberson, E. (2008) "Medicinal plants at risk. A native plant conservation campaign report," Tech. Rep., Center for Biological Diversity, , http://www.scribd.com/doc/75492242/ Medicinal-Plants-at—Risk.

Salami K.D., Aminu M., Lawal A.A., Ilu K.J. and Folorunsho W.O (2022): Evaluation of Stem Volume, Litterfall, and Soil Fertility of *Azadirachta indica* A. Juss and *Eucalyptus camaldulensis* Dehnh at Shelterbelts in Kiyawa, Jigawa State Nigeria. *International*

Journal of Agricultural Research, Sustainability, and Food Sufficiency (IJARSFS)V9(1):550-569

Salami, K. D and Lawal, A. A (2018). Tree species Diversity and Composition in the Orchard of Federal University Dutse, Jigawa State. *Journal of Forestry Research and Managemen*t. ISSN 0189-8418, *www.jfrm.org.ng* ,Vol 15(2):112-122

Salami, K. D., Jibo, A. U., Lawal, A. A. Ahmad, U. and Harisu, S. (2021). Assessment of Pre-Sowing Treatments on the Seed Germination of *Adansonia Digitata* Linn (Baobab) in the Savannah Region of Nigeria. A proceeding of the 7th Biennial Conference of the Forest Production and Products in a Diversifying Economy for Sustainable Livelihood. April 26th-30th , 2021, Pp 226-271

Soladaye, M. O.,Chukumma , E. C. and Owa, F. P. 2012 An `Avalanche` of plant species for the traditional cure in south-western Nigeria. J. Nat. Prod plant.

Togola, A. T. Diallo, D., S. Barsett, H. and Paulsen, B. S, *Ethnobiology and Ethnomedicine*, 1 (2005) 7-10.

Wasserheit J. N. and Aral, S. O. (1996) The Dynamic Topology of Sexually Transmitted Disease Epidemics: Implications for Prevention Strategies. *Journal of Infectious Diseases*. 1996;174(Suppl. 2):S201–13. [PubMed]

World Health Organisation, *who.int/medicinedoes/en/jh2943e/432/html,* (2012). Accessed Jan. 2018

World Health Organization (2013) pp-64. Accessed January, 2018 from: http://apps.who.int/iris/bitstream/10665/112922/1/9789241507400_eng.pdf