

MEDICINAL PLANTS USED FOR THE TREATMENT OF TYPHOID FEVER IN TALATA-MAFARA LOCAL GOVERNMENT, ZAMFARA STATE, NIGERIA

YUSUF YAHAYA MIYA¹, IBRAHIM FRIDAY SULE², YUSUF SARKINGOBIR³, ABDULRAHMAN HAMZA³

¹. Kushtia Islamic University Bangladesh. ²Abubakar Tafawa Balewa University Bauchi, Nigeria. ³Department of Environmental Education Shehu Shagari University of Education Sokoto, Nigeria

ABSTRACT

An ethnobotanical study was carried out between January and December 2019 in Talata-mafara, Zamfara State, therewith aimed at enumerating and reporting medicinal plants to treat the typhoid fever in Talata-mafara, Zamfara State. This would give a baseline data for onward screening and anti-salmonella activity study of the plants. Ethnobotanical data were collected with the aid of a tape recorder and supported with a structured questionnaire during the interview interactive session with the Traditional medical practitioners. The results revealed a sum of five different plant species from five families; therewith the most utilized plant was *Terminalia avicennioides*. Therein, that some of the plants are more utilized than the others, thereby confirming their importance. The informants (15.71%) revealed that *Terminalia Avicennioides* is

Introduction:

Typhoid and paratyphoid fevers are serious life-threatening infections caused by genus *Salmonella enterica* Serotype Typhi or Paratyphi (Kakpo *et al.*, 2019), which is contracted through food. Typhoid is one of the most important food-borne diseases which affect humans and animals. Typhoid fever is a widespread disease in many tropical countries with an estimated 212 million cases and 129,000 deaths occurring worldwide every year (Fodouop chengaing *et al.*, 2020). This food-borne disease, apart from nonspecific symptoms, affects various organs including the

most popular, followed by *Calotropis procera* cited by 7 informants (10%). *Carica papaya*, *Eucalyptus camadulensis* and *Azadirachta indica* cited by 6 informants (8.57%) came in third position. And *Mangifera indica* were reported by 5 informants (7.14%). The survey also revealed that the leaves were the major parts used for herbal preparation. The major ways of plants preparation are decoction and infusion. There is need to carry out phytochemical screening for these plants for more comprehension and future use.

Keywords: Typhoid fever, metabolites, traditional medicine, *Carica papaya*, *Magifera indica*

Vital liver (Tsobou *et al.*, 2013). However, despite the permanent progress in pharmacy development and healthcare advancement, there is resurgence of resistance to conventional drugs available in the field has become an increasingly problem in Sub-Saharan Africa where the income of 3/4 of the total population do not afford chemotherapy (Centers for Disease Control and Prevention, 2006; Dikko *et al.*, 2020; Zakariya *et al.*, 2021). Consequently, many people resort to traditional medicine for a most of their healthcare needs, being a comprehensive knowledge system, encompassing the utilization of substances, and practices based on cultural norms and beliefs (Abdullahi *et al.*, 2001; Muhammad *et al.*, 2020). Plants utilized in traditional medicine house a diverse array of chemical substances which are essentials to cure infectious and non-infectious diseases efficiently, accessibly, universally, cheaply and with more added benefits (Tsobou *et al.*, 2013; Kakpo *et al.*, 2019). Plants are natural products based medicines which are nowadays prescribe widely for the treatment of various diseases and disorders because of their effectiveness, less side effects, low cost. They have compounds with better compatibility to human biological system as compared to synthetic drugs (Upadhyay *et al.*, 2021). This justifies collecting information on medicinal plants used by local people to treat typhoid fever in Zamfara.

Greater percentage of Nigerian people including, Traditional Medical Practitioners, rural inhabitants, are into the use of plants preparations for treatment microbial diseases like typhoid and paratyphoid diseases. In turn, they submitted that the locally plants-derived medicines are relatively safer than synthetic drugs; they give therapeutic benefits and more affordable. The capacity

of plants in treating diseases or other ailments as submitted by local people is primarily due to the bioactive compounds/phytochemicals naturally manufactured by the plants. These phytochemicals are to confer protection against microbes such as bacteria, fungi, viruses, protozoans and relations (Doughari *et al*, 2009; Dabai *et al*, 2012). Presently, there is scarce data in the northwest region of Nigeria concerning the traditional medicine used for treatment of typhoid fever; therefore the aim of the study is to perform a survey of plants used to cure typhoid fever in Talata-mafara, Zamfara State, Nigeria.

MATERIAL AND METHODS

Study Area

This Research was carried in Talata-mafara Local Government Area of Zamfara State. It is located in the Sudan savannah of North-West of Nigeria with latitude 13°25'N and longitude 5°27'E of the equator. It has two distinct seasons; wet and dry seasons. The wet (rainy) season lasts from May – October while the dry season last from November – April. Talata-mafara local government area is approximately 120 km south from Sokoto metropolis and is bounded by River Shella to the north and River Rima to the East.

Plant Collection

Parts of plants like stems, leaves, flowers, roots, barks, and relations were collected from Talata-Mafara local government Zamfara state, Nigeria and examined, therewith, the samples were identified and authenticated in the Department of applied Sciences of Abdu Gusau polytechnic Talata-mafara.

Family: Combrelaceae

Botanical Name: *Terminallia avicennoides*

Locality& Habitat: Baushe

Data Collection

The people of that region were ask some oral questions, questionnaire and by interviewing them in using the medical plant and the type of plant parts, so that to get a correct informant ion about the medicinal plant, and how the healing process was noticed. After thorough investigation, then the researchers got some conclusions. It was noted down as a medicinal plant. Some of the plants were identified, pressed, dried on the spot and some were brought to the laboratory.

RESULTS AND DISCUSSION

Demography/personal information of respondents

A total of 70 respondents were interviewed. The respondents were mainly Herbalists/Traditional medical practitioners (TMPs) (50%), Herb sellers (19%), Elders (17%) and others (House wives and Mothers) (14%). The demographic survey results of respondents are presented in Table 3.1.

Table 3.1: Demographic characteristics of respondents on the Medicinal Plants used in treatment of typhoid fever.

Parameter	Specification	Frequency (%)
Practices specification	Herbalist/traditional Medical practitioners	35(50)
	Herbs seller	13(19)
	Elders	12(17)
	Others	10(14)
	Sex	male
	Female	40(57)
Age	1-20	0
	21-40	15(21)
	41-60	31(44)
	>60	24(34)

N = number of respondents; % = percentage of respondents.

Medicinal plants used in the Treatment of typhoid fever in Zamfara state Talata-Mafara Local Government Area

Table 3.2 shows the results of medicinal plants used by locals for treating typhoid fever in Zamfara state, particularly Talata-Mafara Local Government Area, therewith the result revealed a total of 5 medicinal plants species from 5 families. Therein, the table also presents the common and vernacular names of the plants.

Table 3.2: Selected medicinal plants used in the treating typhoid fever in Zamfara State, Talata-Mafara Local Government Area.

Family	Botanical names/Authority	Common Names	Vernacular Name	Voucher No
<i>Anacardiaceae</i>	<i>Mangifera Indica</i>	Mango	<i>Mangoro</i>	1944
<i>Asclepiadaceae</i>	<i>Calotropis procera</i>	Sodom apple	<i>Tumfafiya</i>	900219
<i>Caricaceae</i>	<i>Carica papaya</i>	Paw paw	<i>Gwanda</i>	185

Combretaceae	<i>Terminalia avicennoides</i>		Baushe	0237
Maliaceae	<i>Azadirachta indica</i>	Neem tree	Dagon yaro	900151
Myrtaceae	<i>Eucalyptus Camadulemsis</i>	River redgum	Turare	2510

Medicinal Plants and their parts used for the treatment of typhoid Fever

Table 3.3 shows plant species with their parts used and their habits/habitats. The medicinal plants grow up to the size of a tree as represented by 63.34%, while 22.45% of the plant species are typical shrubs. Others are herbs, grasses and underground stems, as represented by 8.16%, 4.08%, 2.04% respectively. Analysis of the table also showed that the plants obtained from the wild are 53.57% , and those cultivated are up to 46.43%.

Table 3.3: Medicinal Plants and their habits/habitats as determined in Talata Mafara, Zamfara state, Nigeria

Species	Plant Part	Habit / Habitat
<i>Azadirachta Indica</i>	stem, bark and leaf	trees/cultivated
<i>Calotropis procera</i>	leaf	shrubs/cultivated
<i>Carica papaya</i>	leaf	trees/cultivated
<i>Eucalyptus Camadulemsis</i>	leaf	trees/wild/cultivated
<i>Mangifera Indica</i>	stem, and bark	trees/cultivated
<i>Terminalia Avicennoides</i>	leaf	trees /wild

Medicinal plants used for the treatment of typhoid fever mentioned by three or more informants were recorded. The ethnobotanical survey of medicinal plants showed that some of the medicinal plants are more utilized than the others, thereby confirming their importance. The participants (15.71%) submitted that *Terminalia Avicennoides* is most widely used, and then *Calotropis procera* was mentioned by 7 informants (10.0%). *Carica papaya*, *Eucalyptus Camadulemsis* and *Azadirachta indica* are mentioned by 6 informants (8.57%) as the third most frequently used plants. And *Mangifera indica* was enumerated by 5 informants (7.14%).

Some Traditional Recipes used for the Treatment of Typhoid Fever in Zamfara state, Talata-mafara Local Government

Most of the recipes used in the treatment of typhoid fever contain a combination of medicinal plants while some contain a single plant as shown in table 3.4.

Table 3.4: Selected Recipes used for the Treatment of Typhoid Fever in Zamfara state, Talata-mafara local government.

Plant Species	Preparation/ Dosage
<i>Mangifera indica</i>	Grind the dried bark of Mango tree, sieve and macerate with water. 1 cup twice a day
<i>Terminalia avicennioides</i>	Dried leaves are pounded smoothly and a Tablespoonful is taken with pap thrice a day
<i>Calotropisprocera</i>	Aqueous decoction of the leaves. Half cup to be taken thrice a day
<i>Carica papaya</i> ,	The leaves are boiled together and taken twice a day. The patient also baths with it.
<i>Azadirachta indica</i>	The leaves are boiled together and taken twice a day. The patient also baths with it.

Typhoid fever is a common debilitating disease cause by Salmonella Typhi or Salmonella Paratyphi present in food items consumed by humans. It has been rampant in Northwest Nigeria, constantly causing hospitalizations, or sickness leading to alot of losses or healthcare spending, despite the conventional antibiotics available for the management; may be due growing antibiotic resistance trend. Therefore, there is need to surf for local plants against the disease through the scientific approach to analyze the usual behavior of locals for utilization of plants to treat typhoid (Zakariya *et al.*, 2021). Collection of medicine from plants is a sustainable fashion because some parts or leaves have to be left on the plant and industrial pollution have been reduced (Abdussalami *et al.*, 2021).

The use of plants or traditional medicine in treating diseases is widely known phenomenon that has been in practice worldwide and for the time immemorial in human history, however, the accurate knowledge of these plants and their medicinal properties is scarce, confined to only few individuals. Those with this knowledge are mostly elders as reported in table 3.1. Impliedly, the findings has shown that the younger generations show reluctant attitude to collate this

knowledge probably because they view it as a thing only relevant to few people like illiterates, older men, and traditional people. Unfortunately, this demeanor might lead to the loss of valuable traditional knowledge on medicinal plants which can be used as alternative medicines or to synthesize drugs.

However, plants are more easily recognized by their local names in every part of the world. Therefore, local names play a vital role in ethnobotanical study of a specific tribe or region (Singh, 2008). In this study, informants interviewed had given the local names of plants used in treating typhoid fever. Albeit, local names are not recommended directly for scientific accounts of plants due to certain reasons (Singh, 2008), but are invariably regarded as a useful tool for gaining useful information on plants because they are ones known by local individuals. Information collected has revealed an increased attention of people towards traditional plants for healing their illnesses. This is reported by many local and international studies in that respect (Alieru *et al.*, 2009; Upadhyay *et al.*, 2013ab). The 5 medicinal plant species mentioned were represented by all plant forms. Trees were found to be the most used plants followed by, shrubs, herbs, grass and underground stem. Leaves are important ingredients in traditional treatment of typhoid fever as it is the component that featured most in many herbal preparations which were similar to the findings of Adekunle (2008). Additionally, similar reports are seen in (Lawal, 2010; Oni, 2010; Tsobou *et al.*, 2013; Abdussalami *et al.*, 2017; Fodouop Chengaing *et al.*, 2020) underlying the effectiveness of leaves in that purpose, owing to the nature of leaves as sites of photosynthesis, phytochemicals synthesis and other anabolic synthesis of useful chemicals (Dabai *et al.*, 2013; Abdussalami *et al.*, 2017). Phytochemicals either act as antioxidants or modulate gene expression or modulate gene signal transduction pathways. Molecular mechanisms of herb-drug interaction consist of ATP-binding cassette drug transporters (for instance p-glycoprotein, drug metabolizing enzymes). This is probably the way to novel synthetic antibiotics in times of resistance and adverse reactions (Doughari *et al.*, 2009; Zainab *et al.*, 2021).

CONCLUSION

The findings of this study, have reiterated a data collation involving some medicinal plants that are used in treating of typhoid fever in Zamfara State, particularly Talata-mafara local government, Nigeria.

RECOMMENDATIONS

- The development of an integrated traditional and scientific, knowledge base, will help as a mechanism for accessing, benefit-sharing and documenting traditional knowledge for sustainable development and poverty alleviation in the country.
- There is need to carry out phytochemical and toxicity studies on the studied plants to give useful advice to the locals who utilized these plants for their health needs
- There is need to conserve the plants found in this study to avoid extinction for sustainable use

REFERENCES

- Abdullahi, A.L., Agho, M.O., Amos, S., Gamaniel, K.S. and Wambebe, C(2001). Antidiarrhoeal activity of the aqueous extract of Terminalia avicennioides roots. *Journal of Phytotherapy Research* 15, 431-434.
- Abdussalami, H., Agunu, A, Ilyas N., Dangana, M.C., An ethnobotanical survey of medicinal plants used for the treatment of typhoid fever in Minna, Niger state. *Journal of Natural Sciences Research*,7(8):16-21.
- Adekunle, M.F (2008). Indigenous uses of plants leave to treat malaria fever at Omo Forest Reserve (OFR), Ogun State, Nigeria. *Ethiopia Journal of Environmental Studies* 1(1): 31-35.
- Aliero, A. A. and Wara, S. H. (2009). Validating the medicinal potential of *Leptadenia hastata*. *African Journal of Pharmacy and Pharmacology*. 3(6): 335-338.
- Awoyemi, O. K., Ewa, E. E., Abdulkarim, I. A. and Aduloju, A. R. (2012) Ethnobotanical assessment of herbal plants in southwestern Nigeria. *Academic Research International* 2(3) 50-57 107.
- Centers for Disease Control and Prevention (CDC). (2006). Coordinating Centre for Infectious Diseases / Division of Bacteria and Mycotic Diseases. *Bulletin*; Nov 4, 2006. pp 1-108.
- Dabai, Y.U., Kawo, A.H., Aliyu R.M. (2012). Phytochemical screening and antibacterial activity of the leaf and root extracts of *Senna italica*. *African Journal of Pharmacy and Pharmacology*,6(12):914-918.

- Dikko, M., Sarkingobir Y., Umar, A.I. (2020). Effect of tamsulosin administration on oral glucose tolerance (OGT) in normal wistar rats. *Nigerian Journal of Physiological Sciences*, 35(2):187-190.
- Doughari, J.H. Human, I.S., Benmade, S., Ndakidemi, P.A. (2009). Phytochemicals as chemotherapeutic agents and antioxidants: Possible solution to the control of antibiotic resistant Verocytotoxin producing bacteria. *Journal of Medicinal Plants*, 3(11):839-848.
- Fodouop Chengaing, S.P., Yemele Metokou, D., Talom Tongue, B., Sokoudjou, J.B., Telem- Gone Menoudji, S., Tchuente Kamsu, G., Gatsing, D.(2020). Contribution to the ethnobotanical inventory of medicinal plants used for the treatment of typhoid fever in Adamaoua region, Cameroon. *International Journal of Biological and Chemical Sciences*,14(9):3078-3096.
- Kakpo, A.B., Ladekan, E.Y., Dassou, H., Gbagnidi F., Kpoviessi, S., and Gbenou, J.D. (2019). Ethnopharmacological investigation of medicinal plants used to treat typhoid fever in Benin. *Journal of Pharmacognosy and Phytochemistry*,8(6):225-232.
- Iroha, I. R.I., Lang, D. C., Ayogu, T. E., Oji, A. E. and Ugbo, E. C. (2010). Screening for antityphoid activity of some medicinal plants used in traditional medicine in Ebonyi state, Nigeria. *African Journal of Pharmacy and Pharmacology* 4(12): 860 – 864.
- Lawal, I.O, Uzokwe, N.E, Igboanuyo, A.B, Adio, A.F, Awosan, E.A, Nwogwugwu J.O, Faloye, B, Olatunji BP and Adesoya, A.A (2010). Ethnomedicinal information on collation and identification of some medical plants in Research Institutes of Nigeria. *Journal of Pharmacy and Pharmacology*, 4(1): 001-007. 111.
- Muhammad, N.B., Salihu, S., and Umar, A.I. (2020). Comparative of different drying methods on the phytochemical and some nutrient components of scent leaf (*Ocimum gratissimum*). *Asian Journal of Biochemistry, Genetics and Molecular Biology*,5(3):19-23.
- Oni, P.I (2010). Ethnobotanical survey of a fallow plot for medicinal plants diversity in Idena village, Ijebu-Ode, South-Western Nigeria. *Journal of Medicine and Plant Research*, 4(7): 509-516.
- Singh, H (2008). Importance of local names of some useful plants in ethnobotanical study. *Indian Journal of Traditional Knowledge*. 7(2): 365-370.
- Tsobou, R., Mapongmetsem, P.M., and Van Damme, P. (2013). Medicinal plants used against typhoid fever in Bamboutos Division, Western Cameroon. *Ethnobotany Research and Applications*,11:163-174.
- Upadhyay, H.C., Sisodia, B.S., Agrawal, J., Pal, A., Darokar, M.P., and Srivastava, S.K.(2013a). Antimalarial potential of extracts and isolated compounds from four species of genus *Ammania*. *Medicinal Chemistry Research*,22(9):1-9.
- Upadhyay, H.C., Mishra, A., Pandey, J., Sharma, P., Tamrakar, A.K., Srivastava, A.K., Khan, F., and Srivastava, S.K. (2021). Invitro, invivo and in silicon antihyperglycemic activity of semisynthetic phytol derivatives. *Medicinal Chemistry*,17:1-7.
- Upadhyay, H.C., Dwivedi, G.R., Darokar, M.P., Chaturvedi, V., and Srivastava, S.K. (2013b). Bioenhancing and antimycobacterial agents from *Ammania multiflora*. *Planta Medica*,78:79-81.

- Zainab, H.B., Umar, A.I., Adam, S.T. (2021). Proximate analysis and antinutritional factors of water melon seeds (*Citrullus lenatus*). *International Journal of Biochemistry Research and Review*, 30(8):41-47.
- Zakariya, A.M., Adamu, A., Nuhu, A. Sabo, I., and Baita H.U. (2021). Survey of some selected medicinal plants used for the treatment of typhoid fever in Kafin Hausa, Northwest, Nigeria. *Journal of Applied Biological Sciences*, 15(2):169-184.