

Ethnobotanical Survey of Plants used in Treatment of Haemorrhoids in North-Central Nigeria

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Abstract— An ethnobotanical survey was conducted to identify and document the plants used in the treatment of haemorrhoids in North-Central, Nigeria. A total of three hundred (300) respondents among whom were herb sellers, herbalists, and traditional medicinal practitioners were consulted and interviewed with the help of structured questionnaires to collect data on the plant species from them. Data were represented tables, bar and pie charts and analyzed using descriptive statistics (frequencies and percentages). A total of forty-eight (48) plant species from twenty-seven (27) families were found to be useful in treatment of haemorrhoids in the area under the study. The most prominent among these being members of the family Euphorbiaceae with 4 species, indicating the utmost importance of this family in the cure of haemorrhoids. Followed by families Amaranthaceae, Compositae, Fabaceae and Meliaceae with 3 species each. The plants were identified using botanical, and common names, and the parts of the plant used were also identified. The study revealed that traditional medicinal practices were widely accepted among the people in the study area, probably because they believed in their effectiveness. The plant parts used ranged from root (8.30%), whole plants (8.30%), leaves (43.80%), stem bark (4.24%), bark (10.43%), stem (6.25%) to fruits, young leaves, stem bark leaves, bulb, fruit cub, juice, leaves and juice, shaft of seeds, and bark and leaves at 2.08% each. Further research should be carried out to identify more plant species in the area that can be used to treat haemorrhoids.

Keywords—haemorrhoids, Ethnobotany herbalists, traditional medicinal practitioners, accepted, effectiveness.

I. INTRODUCTION

Plants are of immense importance to man. Their uses include consumption as food, ornamentals and in curation of diseases. Ethnobotany deals on how plant species and their parts are used in treatment of various diseases in humans [1-2]. According to World Health Organization (WHO), about

80% population of most developing countries primary healthcare depends on herbal medicines. [3].

Indigenous medicinal plants contribute immensely to Nigerian's economy. Many indigenous plant species have been used from time immemorial for treating various diseases [4-6]. Several indigenous plant species have also contributed and will continue to add to the health care of the developing countries [7-12].

Areca catechu L. and *Cordyline fruticosa* L. had been shown to have some anti-inflammatory effects in vitro and in vivo [13-14]. Similarly, the antibacterial effects of *Sida cordifolia* L., *Cordyline fruticosa* leaf extracts, and *Areca catechu* L. leaf extracts had also been documented [15-17].

Haemorrhoids in native pallet, is also known as piles, which are normal parts the large intestine of human anatomy. It is present in all humans whether young or old. It is caused by increased pressure in the veins of the rectum as a result of straining one's self through strenuous activities [5]. Normally, hemorrhoids are not dangerous except when they cause discomfort to the individual, which could be as a result of the enlargement and inflammation of the hemorrhoidal cushion; which is common among the elderlies [18]. Study shows that that about 50% to 85% of the World's population could be suffering from hemorrhoids at one point or the other in their life time [5].

Ethnomedicine preparations from medicinal plant species have long been used for the treatment of hemorrhoids because most people dread the possible side effects of surgery [5, 18]. The objective of this study is to identify and document the indigenous medicinal plant species used as an alternative in treatment of hemorrhoids in North-Central Nigeria.

II. MATERIALS AND METHODS

A. Study area



There are six geopolitical zones in Nigeria, namely North-Central, North-East, North-West, South-East, South-South, and South-West. The North-Central zone comprises of six states; Benue, Kwara, Kogi, Nasarawa, Niger, Plateau, and the Federal Capital Territory, Abuja. It is bounded by Cameroon and Benin. The dominant vegetations there are Guinean forest-savanna, and West Sudan savanna. The population is about 20 million people, comprising about 11% of the country's total population (Figure 1).

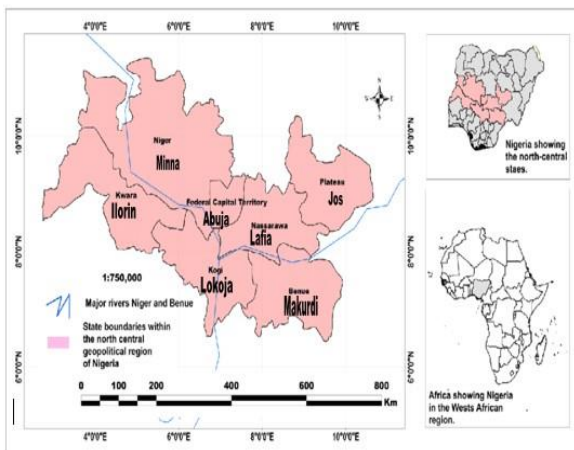


Fig. 1: Map of North-Central Nigeria showing the study areas.

B. Research design

Descriptive survey was carried out to collect information on medicinal plants used in treatment of haemorrhoids in Abuja, Ilorin, Jos, Lokoja, Makurdi, and Minna, being major cities in North-Central Nigeria. A total of three hundred (300) respondents being representative sample of the populations were utilized, among these were herb sellers, herbalists and traditional medicinal practitioners and they were consulted and interviewed with the help of a structured questionnaire.

C. Research Instrument

The research instrument, the questionnaire was divided into two sections; the respondents' socio-economic characteristics section and the items designed to obtain ethnobotanical information on medicinal plants used in the treatment of haemorrhoids in North-Central, Nigeria in the second section. The questionnaire was validated to improve its quality before administrating it. However, the test-retest reliability scale yielded reliability coefficient of 0.85.

D. Data Analysis

Data were presented in tables, bar and pie charts. Descriptive statistics such as Frequency and percentages at 5% level of significance was utilized in computing and analyzing data collected.

Rating Scale goes thus; strongly agreed, agreed, disagreed, and strongly disagreed representing 4, 3, 2 and 1 respectively. The mean score was found to be 2.50. Using

the interval score of 0.05, the upper limit cut-off was $2.50 + 0.05 = 2.55$ and the lower limit; $2.50 - 0.05 = 2.45$. Based on this, that mean score (MS) below 2.45 (< 2.45) were considered 'low', those between 2.45 and 2.54 ($2.45 \leq MS < 2.54$) were ranked 'medium', while those greater than or equal to 2.55 ($MS \geq 2.55$) were seen as 'high'.

III. RESULTS AND DISCUSSION

A. The respondents' Socio-economic Characteristics.

The selected socio-economic characteristics of the respondents are summarized in Table 1. Half of the respondents were males and half were females. The results on religious affiliation in this study indicate that Christians constituted 70%, followed by Muslims 26%, and then traditional religion partitioners 4%. Similar findings were made by [19] in Abuja Municipal area Council (AMAC) of the Federal Capital territory, Nigeria. This is an indication that the religious believe of some people influences their choice of the use of conventional medicines in the treatment of diseases in contrast to the use of medicinal plants which they considered as a traditional way of life. The age group 41-50 had the highest percentage (26.0%), followed by age group 31-40 with 25.0%, age group 21-30 had 22.0%, 61 – 70 (17%) and the least respondents were of age group 51-60 with 10.0% (Figure 2). The education background of the respondents revealed that primary level 40.0% was the mostly attended level of education by the respondents, secondary level; constituted 32.0% of the respondents, only 20.0% attained tertiary level of education, and 8.02% never attended formal education. Similar observations were made by [19] in Abuja Municipal area Council (AMAC) of the Federal Capital territory, Nigeria.

Table1: Socio-economic characteristics of the respondents

Characteristics	Respondents	Frequency (%)	Percentage
Gender	Male	150	50.0
	Female	150	50.0
Religion	Christians	210	70.0
	Muslims	78	26.0
	Traditional	12	4.0
Age	21 – 30 years	66	22.0
	31 – 40 years	75	25.0
	41 – 50 years	78	26.0
	51 – 60 years	30	10.0
	61 – 70 years	51	17.0
Educational attainment	No formal Education	24	8.0
	Primary	120	40.0
	Secondary	96	32.0
	Tertiary	60	20.0

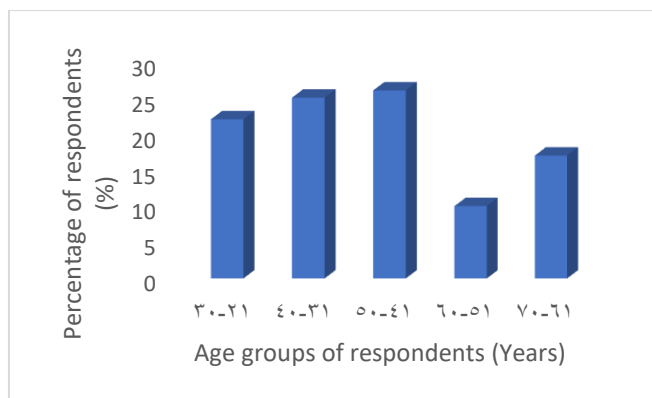


Figure 2: The age distribution of the respondents

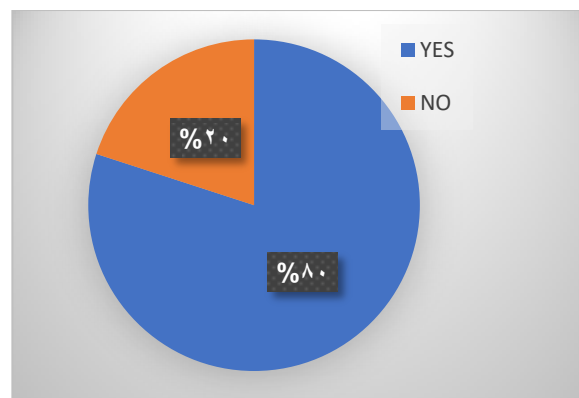


Figure 3: level of awareness of haemorrhoids by the respondent

B. Level of awareness of haemorrhoids by the respondents

Displayed in Figure 3 is the level of awareness of haemorrhoids by the respondents is displayed here. Majority of the respondents (80%) attested that they were aware of the ailment, while 20% were not.

Table 2 showed the list of forty-eight plant species from twenty-seven families identified in the area as being useful in the treatment of internal and external haemorrhoids. This includes their botanical and common names, and the part of the plant used.

C. List of plant species identified in the area as being useful in the treatment of haemorrhoids.

Table 2: Inventories of plants used for treatment of haemorrhoids in the area

S/N	FAMILY	BOTANICAL NAME	COMMON NAME	PLANT PARTS USED
1	Aloaceae	<i>Aloe vera L.</i>	Aloe vera	Root
2	Amaranthaceae	<i>Amaranthus spinosus L.</i>	Spiny pigweed	Root
3	Amaranthaceae	<i>Amaranthus viridis L.</i>	Pig weed	Whole plant
4	Amaranthaceae	<i>Celosia argentea L.</i>	Plumed cockscomb	Leaves
5	Anacardiaceae	<i>Mangifera indica L.</i>	Mango	Stem bark
6	Anacardiaceae	<i>Spondias mombin L.</i>	Hug plum	Bark
7	Annonaceae	<i>Monodora myristica (Geatn) Dunal</i>	African nutmeg	Fruit
8	Asteraceae	<i>Achillea millefolium</i>	Yarrow	Leaves
9	Asteraceae	<i>Eupatorium odoratum L.</i>	Siam weed	Leaves
10	Boraginaceae	<i>Heliotropium indicum L.</i>	Indian heliotrope	Whole plant
11	Caricaceae	<i>Carica papaya L.</i>	Pawpaw	Leaves
12	Compositae	<i>Aspilia africana (Pers.)</i>	wild sunflower	Leaves
13	Compositae	<i>Chromolaena odorata (L.) K.R.</i>	Siam weed	Leaves
14	Compositae	<i>Vernonia amygdalina L.</i>	Bitter leaf	Leaves
15	Crassulaceae	<i>Kalanchoe ceratophylla</i>	Leaf of life	Leaves
16	Euphorbiaceae	<i>Alchornea cardofolia Muel.</i>	Christmas bush	Leaves
17	Euphorbiaceae	<i>Croton zambesicus L.</i>	Lavender fever berry	Leaves
18	Euphorbiaceae	<i>Manihot esculenta Crantz.</i>	Bitter Cassava	Leaves
19	Euphorbiaceae	<i>Ricinus communis</i>	Castor oil plant	Leaves
20	Fabaceae	<i>Acacia Senegal</i>	Gum	Stem

21	Fabaceae	<i>Azelia africana</i>	African mahogany	Bark and leaves
22	Fabaceae	<i>Cassia sieberiana D.C</i>	Drumstick tree	Stem bark
23	Labiatae (Lamiaceae)	<i>Ocimum basilicum L.</i>	Sweet basil	Leaves
24	Labiatae (Lamiaceae)	<i>Ocimum gratissimum L.</i>	Scent leaf	Leaves
25	Leguminosae	<i>Senna fistula L.</i>	Indian laburnum	bark
26	Leguminosae	<i>Senna occidentalis L.</i>	Ant bush	Leaves
27	Leguminosae - Mimosoideae	<i>Mimosa pudica L.</i>	Sleeping grass	Leaves
28	Liliaceae	<i>Allium sativum L.</i>	Garlic	Bulb
29	Malvaceae	<i>Gossypium barbadense L.</i>	Tree cotton	Root
30	Malvaceae	<i>Hibiscus sabdariffa L.</i>	Roselle	Leaves
31	Malvaceae	<i>Khaya grandifoliola C.D.C</i>	African mahogany	Bark
32	Moringaceae	<i>Moringa oleifera Lam.</i>	Moringa tree	Leaves
33	Musaceae	<i>Musa acuminata</i>	Banana tree	Stem
34	Myrtaceae	<i>Psidium guajava</i>	Guava	Young leaves
35	Nyctaginaceae	<i>Boerhavia diffusa L.</i>	punarnava	Whole plant
36	Olacaceae	<i>Olax subscorpiodea Oliv.</i>	Upper Volta: Manding	Root
37	Palmae (Araceae)	<i>Cocos nucifera L.</i>	Coconut tree	Leaves and Juice
38	Palmae (Araceae)	<i>Elaeis guineensis Jacq.</i>	Oil palm	Shaft of seeds
39	Phyllanthaceae	<i>Hymenocardia acida</i>	Heart fruit	Stem bark and leaves
40	Poaceae	<i>Bambusa vulgaris L.</i>	Common bamboo	Leaves
41	Poaceae	<i>Cynodon dactylon (L.) Pers.</i>	Bermuda grass	Whole plant
42	Poaceae	<i>Zea mays L.</i>	Maize	Fruit cub
43	Rosaceae	<i>Ladies mantle</i>	Okro	Leaves
44	Rutaceae	<i>Citrus aurantifolia (Christm.) Swingle.</i>	Lime	Juice
45	Sapotaceae	<i>Chrysophyllum albidum L.</i>	African star apple	Bark
46	Solanaceae	<i>Capsicum annum L.</i>	Red pepper	Fruits
47	Solanaceae	<i>Nicotiana tabacum L.</i>	Cultivated tobacco	Leaves
48	Solanaceae	<i>Solanum melongena</i>	Garden egg	Bark

D. Plant species and composition.

Plants identified in this study have been tested by the herbalists and confirmed efficacious. The plants were identified using botanical, and common names. In all 48 plant species belonging to 27 families were collected from the farms and in the wild in the study area and documented for the treatment of haemorrhoids (Figure 4). The plant species was from the family Euphorbiaceae with 4 species recorded the highest number, showing the utmost importance of this family in the cure of haemorrhoids. This was seconded by families Amaranthaceae, Compositae, Fabaceae, Leguminosae, Malvaceae, Poaceae, and Solanaceae with 3 species each, Anacardiaceae, Asteraceae, Labiatae (Lamiaceae) and Palmae (Araceae) with 2 species each. The remaining 15 families contributed only one species each. The families with single species should be well conserved. This is in contrast with the findings of [1] in southwestern Nigeria where 143 plants belonging to 58 families were identified, the Leguminosae (118 species) being more dominant than the Euphorbiaceae (8 species), probably according to the indigenous people's acceptance of medicinal plants according to their beliefs that they are more beneficial.

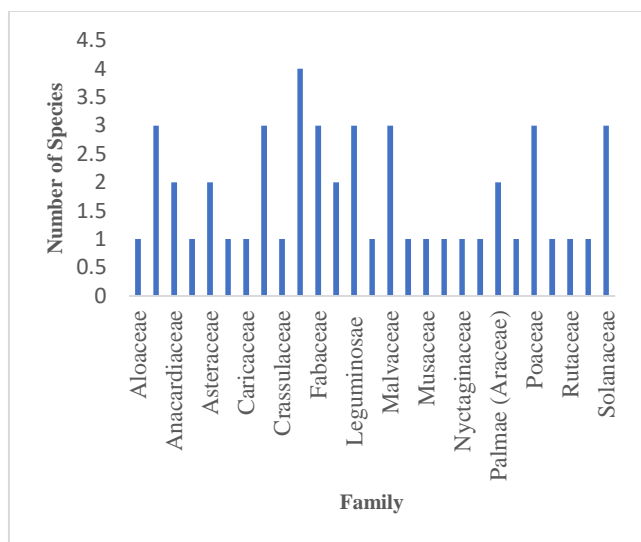


Figure 4: The distributions of the reported plant species according to their Family

D. Parts of plants used for treatment

Table 3 summarizes parts of plants used for the treatment of internal and external haemorrhoids. It was discovered that in quite a number of the plant's parts; the roots, leaves, bark, stem, fruits, seeds.

Bulbs and juice of the plants have been found to be efficient in the treatment of haemorrhoids. Leaves of plants were found to be the most frequently used plant part (43.80%) in preparation of remedies seconded by the bark (10.43%), root, whole plants (8.30% respectively), stem (6.25%) and stem bark (4.20%). Fruit, young leaves, stem bark and leaves, bulb, fruit cub, juice, leaves and juice, shaft of seeds, and bark and leaves were less frequently used in the treatment (2.08% each).

IV. CONCLUSION

In the study, Forty-eight (48) plant species belonging to twenty-seven (27) families were identified and documented as ethnomedicines used in the treatment of haemorrhoids in North-Central Nigeria. The family Euphorbiaceae was found to be the most dominant species. The common parts of plants used were the leaves (43.80%), bark (10.43%), root (8.30%) and whole plant (6.25%). It is of interest to note that ethnomedicine were widely accepted in the area, even by the educated class, and most of them were cultivated.

It is therefore recommended that:

1. The problem of poor finance and the maintenance of medicinal plants should be addressed.
2. Measures to protect our rich flora including medicinal plants should be in place as to prevent plant species from going into extinction through development of forest reserves.
3. There should be proper documentation of information on medicinal plant species to avoid their being lost with time.
4. Further research is required to discover and document more of such plant species.

Table 3: Summary of parts of plants used

S/N	Plant Part Used	Frequency	Percentage
1	Root	4	8.3
2	Whole plant	4	8.3
3	Leaves	21	43.8
4	Stem bark	2	4.2
5	Bark	5	10.43
6	Fruit	1	2.08
7	Stem	3	6.25
8	Young leaves	1	2.08
9	Stem bark and leaves	1	2.08
10	Bulb	1	2.08
11	Fruit cub	1	2.08
12	Juice	1	2.08
13	Leaves and Juice	1	2.08
14	Shaft of seeds	1	2.08
15	Bark and leaves	1	2.08
	Total	48	100

CONFLICT OF INTEREST

Authors declare that they have no conflict of interest.

REFERENCES

- [1] M. O. Soladoye, M. O. Adetayo, E. C. Chukwuma and A. N. Adetunji “Ethnobotanical Survey of Plants Used in the Treatment of Haemorrhoids in South-Western Nigeria”, *Annals of Biological Research*, vol. 1 (4), pp. 1-15, 2010.
- [2] E. N. Sholikhah, “Indonesian Medicinal Plants as Sources of Secondary Metabolites for Pharmaceutical Industry”, *J. Med. Sci.*, vol. 48, pp. 226–39, 2016.
- [3] World Health Organization (WHO) 2013 *WHO traditional medicine strategy: 2014-2023* (World Health Organisation)
- [4] M. Bolson, S. R. Hefler, C. E. I. Dall’Oglio, J. A. Gasparotto, J. E. L. Cardozo, “Ethno-medicinal study of plants used for the treatment of human ailments, with residents of the surrounding region of forest fragments of Paraná”, *Brazil J. Ethnopharmacol*, vol. 161, pp. 1–10, 2015.
- [5] P. R. W. Astana, U. Nisa, “Analysis of Traditional Medicine Formula for Hemorrhoid In Java Island; Ethnopharmacology Study”, *RISTOJA J. Ilmufarmasian Indones*, vol. 16, pp. 115–23, 2018.
- [6] M. D. C. Surboyo, I. Arundina, R. P. Rahayu, D. Mansur, T. Bramantoro, “Potential of Distilled Liquid Smoke Derived from Coconut (*Cocos nucifera* L) Shell for Traumatic Ulcer Healing in Diabetic Rats”, *Eur. J. Dent.*, vol. 13, pp. 271–9, 2019.
- [7] P. Singh, R. L. Khosa, G. J. K. Mishra, “Pharmacognostical evaluation of aerial parts of *Graptophyllum pictum* (L.) Griff. (Syn: *Justicia picta* Linn.): A well-known folklore medicinal plant”, *Anc. Sci. Life J.*, vol. 34, pp. 223–9, 2015.
- [8] O. A. Akande, A. Buochuama, S. A. Alaye, A. B. Shuaib, A. M. Mohammed, “Ethnobotanical Survey of Medicinal Plants amongst Kanti Community in Mashegu Local Government Area of Niger State, Nigeria”, *International Journal of Innovative Biosciences Research*, vol. 6 (1), pp. 20-27 2018.
- [9] M. Budiarti, A. Maruzy, R. Mujahid, A. N. Sari, W. Jokopriyambodo, T. Widayat, S. Wahyono, “The use of antimalarial plants as traditional treatment in Papua Island”, *Indonesia Heliyon*, vol. 6, pp. 1–10, 2020.
- [10] G. Demie, M. Negash, T. Awas, “Ethnobotanical study of medicinal plants used by indigenous people in and around Dirre Sheikh Hussein heritage site of South-eastern Ethiopia”, *Journal of Ethnopharmacology*, vol. 220, pp. 87-93, 2018.
- [11] M. O. Faruque, S. B. Uddin, J. W. Barlow, S. Hu, S. Dong, Q. Cai, X. Li, X. Hu, “Quantitative Ethnobotany of Medicinal Plants Used by Indigenous Communities in the Bandarban District of Bangladesh. *Frontiers in Pharmacology*. Vol. 9, pp.40, 2018.
- [12] M. D. Miara, H. Bendif, M. A. Hammou, I. Teixidor-Toneu, Ethnobotanical survey of medicinal plants used by nomadic peoples in the Algerian steppe. *Journal of Ethnopharmacology*, vol. 219, pp. 248-256, 2018.
- [13] K. P. Lee, G. W. Sudjarwo, J. S. Kim, S. Dirgantara, W. J. Maeng, H. Hong, “The anti-inflammatory effect of Indonesian Areca catechu leaf extract in vitro and in vivo.” *Nutr. Res. Pract.*, vol. 8, pp. 267–71, 2014.
- [14] S. Naher, M. I. Akter, S. M. M. Rahman, S. R. Sajon, MA. Aziz, “Analgesic, anti-inflammatory and anti-pyretic activities of methanolic extract of *Cordyline fruticosa* (L.) A. Chev. Leaves”, *J. Res.Pharm.*, vol. 23, pp. 198–207, 2019.
- [15] A. Kalaiarasan, S. Ahmed John, “Phytochemical screening and Antibacterial activity of *Sida cordifolia* L. (Malvaceae) leaf extract”, *Int J Med Res.*, vol. 1(2), pp. 94-98, 2010.
- [16] Elfita, Mardiyanto, Fitrya, J. E. Larasati, Julinar, H. Widjajanti and Muharni, “Antibacterial activity of *Cordyline fruticosa* leaf extracts and its endophytic fungi extracts”, *Biodiversitas*, vol. 20, pp. 3804–12, 2019.
- [17] M. S. Khan and M. S. Akhter, “Antibacterial and cytotoxic activities of Areca catechu L. (betel nut)”, *To Chem. J.*, vol. 5, pp. 55–68, 2020.
- [18] R. Rahimi, M. Abdollahi, “Evidence-based Review of Medicinal Plants Used for the Treatment of Hemorrhoids”, *International Journal of Pharmacology*, vol. 9 (1), pp. 1-11, 2013.
- [19] M. N. Chukwu, M. S. Ayodele and U. P. Udeozor, “Ethnobotanical Survey of Medicinal plants used in treatment of Haemorrhage in Abuja Municipal area Council (AMAC) of the Federal Capital territory”, *Confluence Journal of Environmental Studies*, Vol. 13 (1), pp. 60 – 69, 2019.