ETHNOBOTANY OF *Ficus exasperata* Vahl IN IJEBU IGBO, OGUN STATE NIGERIA AND THE CONSERVATION IMPLICATIONS

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Abstract: *Ficus exasperata* Vahl is a tree species that provides economic values, ecological support and it delivers high level ecosystem services to several communities. Africa, Asia, and South America are part of the continents where it is widely distributed. In this study an ethnobotanical survey was conducted to determine the different uses of this species and how the uses might result into decline of its population. Local people were interviewed in Ijebu-Igbo, Ogun State Nigeria. Their demographic information and their knowledge of the uses of this species was documented. This study revealed a wide range of local uses of this species which includes uses for timber, medicinal uses, local insecticides etc. But the most mentioned use category was medicinal uses and use for washing pot for households. It is a common plant species within the study area as antimalarial and antihypertensive plant. This study recommend sustainable utilization and regeneration of *Ficus exsperata* so as to keep the continuity of its uses. It is also recommended that intense study on how to process the plant species into pharmaceutical products for diseases locally treated with the plants should be considered.

Keywords: Ethnobotany, Ethnomedicine, Parts harvested, Population decline, Regeneration.

Introduction

In order to prevent intensive uses from perpetuating declining of plant species in the biosphere, regeneration of several plant taxa, especially trees, is necessary (Momoh *et al.,* 2019). Resource utilization and anthropogenic pressure have resulted in scarcity of plant species in the ecosystem (Momoh *et al.,* 2019). Humans have relied on plant species for food, medicine, and other economic purposes that allow people to thrive on the planet from the beginning of times (Shinwari and Gilani, 2023). Additionally, rising of human population impacted the usage of plant species and there is a need for high species regeneration potential to meet the demand for ethnobotanical uses of plants (Obinna *et al*., 2022). There is a global concern on how ethnobotanical uses of tree species are affecting the survival of many tree taxa (Nadaf *et al.,* 2023). Especially due to unsustainable practices of harvesting by the local people. There is need to keep investigating how local uses of species might possibly affect their survival within certain geographical space (Monsarrat *et al.,* 2019). *Ficus* species are always in use hence there is a need to keep investigating how local uses might affect their populations (Monsarrat *et al.,* 2019). *Ficus exasperata* is a member of the family called Moraceae and it belongs to genus *Ficus* which is one of the largest genus in that family with economic and ecological uses. *Ficus exasperata* is very popular for its medicinal and aromatic uses with antioxidant and antimicrobial properties (Adeyemi *et al.,* 2021). We thus assessed the utilization of *Ficus exasperata* within the local communities around Ijebu Igbo, Ogun state Nigeria. This will reveal various human local uses of this species so as to be able to assess the ecosystem services this species provide. The specific objectives of this study are as follows. To determine different uses of *Ficus exasperata* by the local people in Ijebu igbo, Ogun State, Nigeria. To determine the parts of *Ficus exasperata* harvested by the local people for several uses and possible implication of multiple harvest of this plant parts on its decline in population in the wild. To investigate diseases popularly being treated by the local people with this species.

Materials and Methods

In this study, uses of *Ficus exasperata* was investigated using semi-structured questionnaires. The location of this study was Ijebu Igbo, Ogun State. The picture of this specie was taken from Olabisi Onabanjo University, Ago iwoye, Permanent site, in Ogun State. The plant was identified by its local name by the indigenous people and also additional online sources from Scopus, Ebsco and Google Scholar was used to verify the identification of this plant species. The local name of this species which was used in identifying this species is called "Epin" in Yoruba language. Along this online sources, a book title "Vernacular names of Nigerian plants" published by Gbile (1980) which contains the list of Nigerian plants in the local language was also used for further identification of the plant species. Through the use of regional plant names, this ethnobotanical study was carried out in Yoruba, the native language of the indigenous people of Southwest Nigeria. The list of uses provided by the indigenous knowledge holders was documented and the

parts of this plant species being used for these purposes as reported by the respondents was also documented. Microsoft excel was used for the analysis.

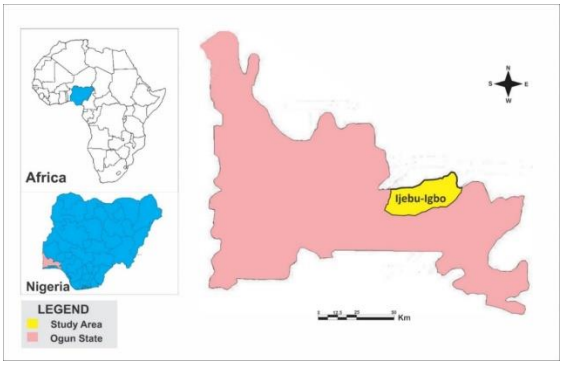

Figure 1: Map of the study area (Ijebu Igbo, Ogun State Nigeria).

Results and Discussion

Tree species are species of high ecological and ethnobotanical importance (Bamigboye *et al.,* 2018). They support humans and their environment in the area of providing food, shelter, clothing, medicine and timber production (Semenya *et al.,* 2013). This study discovered that *Ficus exasperata* has a lot of uses and much reliance on this species will further aggravate their decline and keep reducing their populations (Silvie *et al.,* 2021). This study revealed the leaves and the stem are the most popular parts of this species being harvested by the local people (Figure 3, Table 1). In this study it was discovered *Ficus exasperata* is very popular among the local people interviewed for its medicinal and washing pot uses (Figure 2, Table 1). Studies in the past have supported that harvest of tree species for medicinal uses have been a factor that increase the risk of extinction in tree species in Nigeria (Jimoh *et al.,* 2013). Harvesting of some plants parts are unsustainable practice in using plant species for medicinal purposes (Bamigboye *et al.,* 2018). Example of such part is the root harvest for medicinal uses (Chen *et al.,* 2016). Root harvest was reported in this study which implies this might aggravate population decline of this species (Van Wyk and Prinsloo, 2018).

Intense utilization will further increase the extinction risk in the plant kingdom in decades to come (Gao *et al.,* 2020). With nine use categories discovered in this study, if collection of *Ficus exasperata* in the study area is not done in a sustainable way it will lead to decline of populations of this species in the area (Gao *et al.,* 2020).

Plants are source of biochemical components that produces several ingredients in the body of humans and other animals and these ingredients are antimicrobials, antioxidants, immune boosters and hormone regulators (Abuajah *et al.,* 2015). These vital ingredients of plants are for the wellbeing of humans and animals. Some of these ingredients are pharmaceutically processed medicine while many of them are from plant materials that are traditionally administered by local people for maintaining healthy living, curing and managing certain diseases and to also serve as preventive medicine from some certain ailments (Emre *et al.,* 2021). This study revealed that *Ficus exasperata* is a plant species that has several medicinal uses (Table 1).

Ethnomoedicinal survey can still reveal wealth of information that will enlighten people on certain plant taxa that the local communities have been using for some medicinal purposes that have not been discovered and it can also reinforce the effect of some medicinal plants on handling some diseases (Miara *et al.,* 2018). Traditional way of curing diseases is still a common practice in Africa especially in the rural communities and the knowledge of the indigenous people in these areas cannot be overlooked in researching into several ways diseases can be managed and wellbeing of humans improved (Bamigboye *et al*., 2022). This study revealed wide range of medicinal uses of *Ficus exasperata* but three medicinal uses that were the most reported from the respondents are malaria treatment, hypertension treatment and treatment of ringworm (Figure 4). It is recommended that phytochemical study should be carried out to compare the effect of this species on these three diseases mentioned that stood out in this study (Figure 4) alongside other disease treatments this plant has been reported to be used for.

Table 1: Data collected from the respondent during the ethnobotanical uses of this study on the demographic information of the respondents, the uses of *Ficus exasperata* and part used for different purposes

SN	Gender	Age	Occupation	Uses	Part used
1	Female	53	Accountant	Medicine (Analgesic for body pain, Restore hormone imbalance, treat diabetes, treat high blood pressure), Washing pot,	Leaves, roots
2	Male	52	Fashion designer	Medicine (treat malaria, hypertension, antibiotics)	Leaves
3	Male	60	Unknown	Washing pot	Leaves
4	Female	51	Trader	Washing pot, medicine (treating malaria, antibiotics)	Leaves
5	Female	57	Health worker	Medicine (antibiotics, treat malaria and typhoid fever)	Leaves
6	Male	56	Herbalist	Medicine (control high blood pressure), washing pot	Leaves
7	Female	50	Trader	Washing pot, medicine (treating malaria)	Leaves
8	Female	50	Trader	Natural pesticide (Crush the leaves, mix with water and soap and spray on plants as insecticides)	Leaves
9	Male	48	Driver	Medicine (treating diarrhea)	Leaves, roots

10	Male	65	Farmer	Food (eaten as fruits), Medicine (treatments of wounds, fever treatments)	Leaves, fruits
11	Female	60	Trader	Food wrap, source of wood for carving,	Leaves, stem
12	Male	52	Meat seller	Bark used for making ropes and clothes, Medicine (constipation)	Bark. Leaves, latex
13	Male	50	Driver	Medicine (treat diarrhea, treat ringworm, treat malaria)	Leaves, bark
14	Female	60	Trader	Medicine (treat diarrhea, treat ringworm)	Leaves, bark
15	Female	58	Trader	Use for washing pot	Leaves
16	Female	55	Food vendor	Medicine (treating lice), washing pot	Leaves
17	Female	53	Trader	Washing pot, medicine (treating ringworm and lice)	Leaves
18	Male	60	Retiree	Washing pot, medicine (treating diarrhea and ringworm)	Leaves, bark
19	Male	69	Farmer	Smoothening planks, washing pot	Leaves
20	Female	58	Trader	Washing pot, medicine (treating malaria)	Leaves
21	Female	52	Trader	Medicine (diarrhea treatment)	Leaves
22	Male	59	Farmer	Insect repellant,	Leaves
23	Male	70	Farmer	Medicine (removing dirt from the eyeballs)	Leaves
24	Female	55	Teacher	Medicine (wound healing, treating cough, treat diarrhea) washing pot	Leaves
25	Male	87	Local Chief	Washing calabash, Medicine (treating fever and cough)	Leaves
26	Female	67	Traditionalist	Smoothening furniture, Medicine (ulcer treatment, stroke treatment)	Leaves
27	Male	60	Driver	Washing pot, Medicine (removing dirt from the eye balls, treating skin diseases and ring worm	Leaves
28	Female	72	Trader	Washing pot, medicine (treating ulcer and stomach ache)	Leaves, roots
29	Female	58	Herb seller	Washing pot, medicine (treating hypertension and malaria)	Leaves
30	Female	61	Trader	Medicine (hypertension treatment and malaria)	Leaves
31	Female	60	Trader	Washing pot, medicine (fertility booster)	Leaves
32	Male	66	Meat seller	Medicine (treating ulcer and serve as immune booster)	Leaves
33	Male	72	Farmer	Wash pot, medicine (immune booster)	Leaves
34	Female	63	Trader	Wash pot, medicine (use as detoxifier)	Leaves
35	Female	60	Trader	Medicine (use for treating fever)	Leaves
36	Female	58	Trader	Medicine (treat cough and malaria)	Leaves, bark
37	Male	57	House agent	Medicine (wound healing)	Leaves, bark
38	Male	60	Carpenter	Washing plate, medicine (malaria treatment)	Leaves
39	Female	60	Trader	Medicine (treat fibroid, toothache)	Leaves, bark
40	Female	70	Trader	Medicine (ringworm treatment, hypertension)	Leaves
41	Female	65	Trader	Washing pot	Leaves
42	Male	58	Driver	Washing pot, Medicine (Malaria treatment)	Leaves
43	Male	55	Carpenter	Medicine (treating diabetes)	Leaves
44	Female	52	Trader	Medicine (hypertention)	Leaves
45	Male	50	Technician	Medicine	Leaves, bark
46	Female	55	Teacher	Medicine (Treat ringworm and diarrhea)	Leaves
47	Female	60	Trader	Medicine (Gonorrhea)	Leaves
48	Male	65	Driver	Ceremonial rites, cloth making, food spice	Leaves, bark
49	Female	75	Unknown	Medicine (Treat ringworm and dysentery)	Root
50	Female	55	Trader	Washing pot	Leaves
51	Female	60	Trader	Medicine (ringworm treatment)	Leaves
52	Female	53	Trader	Medicine (malaria treatment)	Leaves
53	Male	57	Driver	Hunting animals, Medicine (treat snake bite and insect bite)	Leaves
54	Female	65	Trader	Washing pot Medicine (wound healing)	Leaves
55	Male	57	Carpenter	Medicine (wound healing)	Leaves, stem
56	Male	63	Religion scholar	Washing pot	Leaves
57	Female	58	Trader	Medicine (ease childbirth)	Leaves
58	Male	72	Farmer	Use as insecticide	Leaves
59	Male	65	Farmer	Medicine (malaria treatment)	Leaves
60	Male	68	Traditional leader	Medicine (treat asthma)	Leaves

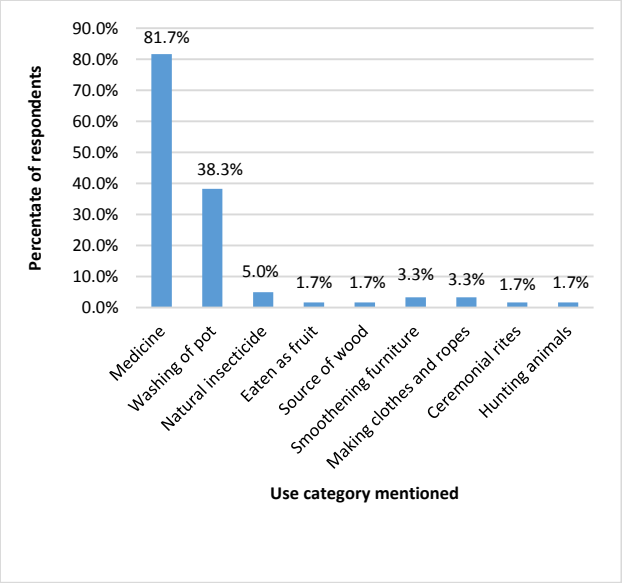

Figure 2: Use category mentioned by the respondents on human uses of *Ficus exasperata*

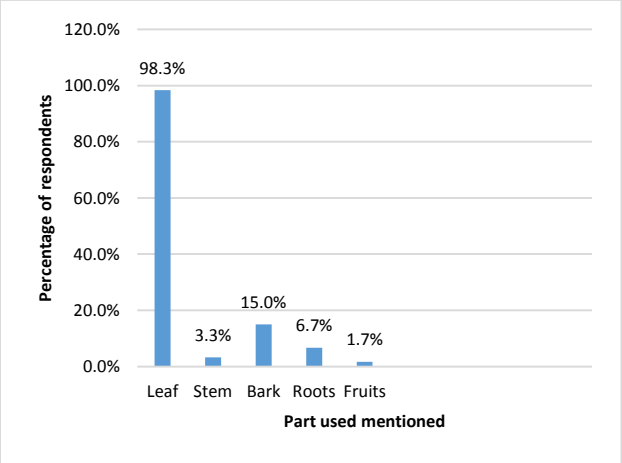

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Figure 3: Plant parts used mentioned by the respondents on the human uses of *Ficus exasperata*

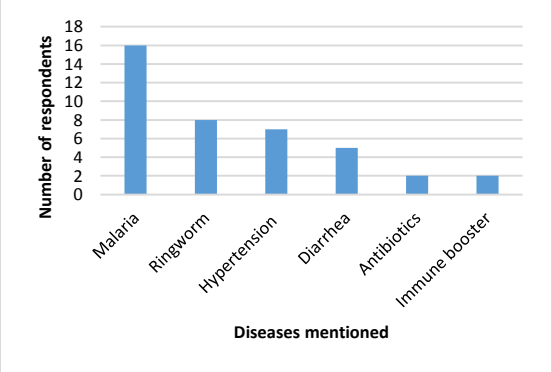

Figure 4: The number of respondents that mentioned different diseases that can be cured and managed with *Ficus exasperata*

Conclusion

In this study it was observed that different parts of *Ficus exasperata* are used for different purposes. Medicinal purpose took the lead among the use categories mentioned by the respondents. Malaria, ringworm and hypertension treatments are the common medicinal uses of this species in Ijebu Igbo where this study was conducted. This study conclude that high uses of *Ficus exasperata* can lead to decline in population of the plant species. To enhance continuity of the ecosystem services that this species offer a sustainable utilization of this specie should be encouraged.

Recommendations

This study recommends the sustainable harvesting practice of *Ficus exasperata* by the indigenous people in a bit to avoid excessive decline of the population of this species in the wild. This study recommends regeneration of *Ficus exasperata* by the conservation authorities in partnership with the indigenous people in a bit to maintain the ecosystem services this species provides to the communities where their populations are located.

References

Abuajah CI, Ogbonna AC, & Osuji CM (2015). Functional components and medicinal properties of food: a review. *Journal of food science and technology.*, 52., 2522-2529.

Adeyemi, AD, Oluigbo CC, Esan AO, Bello MO, Oladoye SO, Emmanuel CP & Effiong E (2021). Chemical Composition and Antimicrobial Activity of the Essential oils of 14 known Ficus species–A Concise. *Biointerface Research in Applied Chemistry.*, 12(6): 8003-8034.

Bamigboye SO, Jimoh MO, Sanni BT & Esther O (2022). Perceptions on plant species that can be used for the management and cure of covid 19 by residence of Ijebu igbo, Ogun state, Nigeria. *FUW Trends in Science & Technology Journal.*, 7(3): 169-174.

Bamigboye SO, Tshisikhawe PM, & Bonta MA (2018). Review of extinction risks in South African cycads used for traditional medicine. *South African Journal of Botany.*, 115:279.

Chen SL, Yu H, Luo HM, Wu Q, Li CF & Steinmetz A (2016). Conservation and sustainable use of medicinal plants: problems, progress, and prospects. *Chinese medicine.*, 11, 1-10.

Emre G, Dogan A, Haznedaroglu MZ, Senkardes I & Can Emmez B (2021). An ethnobotanical study of medicinal plants in Mersin (Turkey). *Frontiers in Pharmacology.*, 12, 664500.

Gao JG, Liu H, Wang N, Yang J & Zhang XL (2020). Plant extinction excels plant speciation in the Anthropocene. *BMC Plant Biology.*, 20:1-1.

Gbile ZO. Vernacular names of Nigerian plants in Hausa and Yoruba. Forest Research Institute of Nigeria. Ibadan, Nigeria; 1980

Jimoh SO, Amusa TO & Azeez, IO (2013). Population distribution and threats to sustainable management of selected non-timber forest products in tropical lowland rainforests of south western Nigeria. *Journal of forestry research.*, 24, 75-82.

Miara MD, Bendif H, Hammou MA & Teixidor-Toneu I (2018). Ethnobotanical survey of medicinal plants used by nomadic peoples in the Algerian steppe. *Journal of ethnopharmacology*., 219, 248-256.

Momoh TB, Hassan AO, Olorunnado GB & Idakwoji PA (2019). Haematinic Effect of Aqueous Leaf Extracts of *Ficus exasperata* and *Jatropha curcas* on Anaemic Wistar Rats. *International Journal of Current Research in Biology and Medicine.*, 4(11):19-24.

Nadaf M, Amiri MS, Joharchi MR, Omidipour R, Moazezi M, Mohaddesi B & Mottaghipisheh J (2023). Ethnobotanical diversity of trees and shrubs of Iran: A comprehensive review. *International Journal of Plant Biology*., 14(1): 120-146.

Obinna CN, Damilola EO & Oziegbe O (2022). Use of *Nicotiana tabacum, Jatropha curcas,* and *Ficus exasperata* for Treatment of Pus-Producing Bacteria. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1054, No. 1, p. 012010). IOP Publishing.

Monsarrat S, Jarvie S & Svenning JC (2019). Anthropocene refugia: integrating history and predictive modelling to assess the space available for biodiversity in a human-dominated world. *Philosophical Transactions of the Royal Society B.*, 374(1788): 201-219.

Semenya SS, Potgieter MJ & Erasmus LJC (2013). Indigenous plant species used by Bapedi healers to treat sexually transmitted infections: Their distribution, harvesting, conservation and threats. *South African Journal of Botany*., 87:66-75.

Shinwari ZK & Gilani SS (2003). Sustainable harvest of medicinal plants at Bulashbar Nullah, Astore (northern Pakistan). *Journal of Ethnopharmacology*., 84(2-3): 289-298.

Silvie PJ, Martin P, Huchard M, Keip P, Gutierrez A, & Sarter S (2021). Prototyping a knowledge-based system to identify botanical extracts for plant health in Sub-Saharan Africa. *Plants.*, 10(5), 896.

Van Wyk AS. & Prinsloo G (2018). Medicinal plant harvesting, sustainability and cultivation in South Africa. *Biological Conservation.*, 227: 335-342.