Trop J Nat Prod Res, March 2020; 4(3):98-104 **ISSN 2616-0684 (Print)**
ISSN 2616-0692 (Electronic)

Tropical Journal of Natural Product Research

Available online at https://www.tjnpr.org

Original Research Article

Herbal Treatment of Benign Prostatic Hyperplasia: Findings from an Ethnobotanical Survey of Akinyele Local Government Area, Oyo State Nigeria

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ARTICLE INFO

Article history:
Received 26 February 2020
Revised 26 March 2020
Accepted 29 March 2020
Published online 30 March 2020

ABSTRACT

Medicinal plants represent a very important resource in the treatment and cure of diseases in Africa, Nigeria inclusive. Benign prostatic hyperplasia (BPH) is a chronic age-related disease in men that presents with annoying symptoms of the Lower Urinary tract. This study was carried out to identify and document medicinal plants used in Akinyele local Government area of Oyo state, Southwest Nigeria in the treatment of BPH. Use of semi-structured questionnaires and open-ended interviews was deployed to obtain information on the disease and medicinal plants used in managing it. Twenty five plant species from twenty three families were identified and *Chrysophyllum albidum* with a Use-value of 0.33 appeared to be of the highest value to respondents in the treatment of BPH. This study reveals that the use of medicinal plants and the practice of herbalism is an ongoing engagement among residents of an urban area such as Ibadan and its environs. A need to carry out bioactivity and chemical profiling of identified plants is necessary to verify the claim/s of respondents.

Keywords: Benign Prostatic Hyperplasia, Akinyele Local Government, Ethnobotanical survey, Medicinal plants.

Introduction

The practice of Traditional medicine (TM) in different parts of the World is an expression of the tradition and culture of the people residing in those regions. The past few decades have recorded a resurgence of interest in the use of TM in healthcare, particularly in Africa following a decline that dawned at the advent of colonization. The increased attention and patronage is believed to be due to; affordability, ease of access, assumed freedom from side effects, wide acceptability and compatibility with prevailing cultural beliefs and norms of the people.[1] The belief in Africa that certain diseases are of spiritual origin and can only be treated by spiritual means, as well as the suitability of TM in the treatment of certain chronic diseases like hypertension and diabetes, have helped to drive the demand for TM.[2] Generally, the use of medicinal plants (MP) forms the bedrock in the practice of TM.

Medicinal plants also known as herbal medicines, botanical medicines or phytomedicines refer to finished plant products that contain as medicine different parts of a plant, used alone or in combination with other plants, minerals or animal parts.[3] MP serves as a reservoir of chemical compounds from which over 25% of drugs currently in use were sourced.[4] The inherent ability of the Nigerian flora to serve as a veritable source for lead drugs and other therapeutic agents has been documented.[5,6] Over 500 of such MPs have been identified in Nigeria.[7]The average rural populace in Nigeria depends on MPs from the forest as one of the many resources to take care of their health care needs.

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Citation: Ofeimun JO and Temitope F. Herbal Treatment of Benign Prostatic Hyperplasia: Findings from an Ethnobotanical Survey of Akinyele Local Government Area, Oyo State Nigeria. Trop J Nat Prod Res. 2020; 4(3):98-104. doi.org/10.26538/tjnpr/v4i3.7

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Knowledge of MP is usually passed on orally from one generation to the next by the custodian of such knowledge who usually are the elderly, herbal practitioners and women who by reason of being caregivers within the family acquired some knowledge of MP. Traditionally, transmission of knowledge of MPs by herbalists is to the first-born sons or other persons they consider trustworthy to preserve the knowledge. In most cases, such knowledge is transmitted when the father is getting old or just about to die.[8] Knowledge so acquired may be lost or distorted as a result of improper documentation. Out-migration of individuals, loss of life due to diseases and increased armed conflicts, urbanization, modernization and globalization, lack of interest and individual motivation by the younger generation all serve to erode the knowledge base of indigenous medicinal plant use within communities.[9,10] In some instances, traditional medicine practice and the use of MPs are undervalued, considered worthless and the subject of ridicule such that the younger generation don't want to be associated with it.[11]

Environmental degradation, deforestation, bad agricultural practices such as over-harvesting and population growth are some identified factors that may have also contributed to the loss of indigenous knowledge of MPs.[12] These factors ultimately led to the extinction of several medicinal plants and the knowledge base associated with them hence, the need to document indigenous knowledge of MPs used within communities.

Benign Prostatic Hyperplasia (BPH) is the non-cancerous enlargement of the prostate gland in men that is age-related. A worldwide prevalence of 20 – 62% has been reported in men 50 and above.[13] Prevalence in Nigeria varies from 18.1 – 50% depending on the setting and criteria used in establishing the condition.[14] It is characterized by lower urinary tract symptoms (LUTs) of urinary urgency, frequency, incontinence, hesitancy, intermittence, weak stream, incomplete emptying, and dribbling. Other symptoms associated with the condition include frequent urination at night and straining with the passage of urine.[15] Although, not considered a disease in itself, it impacts negatively on the quality of life of men with the condition with associated economic and psychological burden. The burden is expected to increase over the next few decades as the aging population increases worldwide.[16] Next to orthodox drugs that have the potential for side effects

ISSN 2616-0684 (Print)
ISSN 2616-0692 (Electronic)

such as erectile dysfunction, retrograde ejaculation, and decreased libido, surgical intervention represents a line of treatment that is considered invasive, costly, and carries with it an associated burden of psychological trauma. The use of plant-based treatment in the management of BPH represents an attractive option because of the perceived safety and cost-effectiveness of herbal preparations.

Ethnobotanical studies represent an effort to identify and document MPs usage in the management of various ailments, in an attempt to preserve such information from extinction. This study focuses on the identification and documentation of medicinal plants utilized by the indigenous population of Akinyele Local Government Area of Ibadan city in Oyo State, Nigeria, in the treatment of BPH.

Materials and Methods

Sample Area

This survey was carried out in Akinyele Local Government Area of Oyo State, Nigeria (Figure 1) with headquarters located at Moniya. The local government area is located in the South-Eastern part of Oyo State, which itself is located in the Southwestern part of Nigeria. It is one of the eleven local government areas that make up Ibadan metropolis and it is subdivided into 12 wards. The area was created in 1976 and it shares boundaries with Afijio Local government to the north, Lagelu Local government area to the east, Ido Local government area to the west and Ibadan North Local government area to the south. It occupies a land area of 464.892 square kilometers with a population density of 516 persons per square kilometer. Using a 3.2% growth rate from 2006 census figures, the 2010 estimated population for the local government is 239,745. It lies completely within the tropical forest zone but close to the boundary between the forest and the derived savannah zone. The city ranges in elevation from 150 in the valley area, to 275 m. The local government area of Akinyele lies on geographical coordinates of latitude 7° 31' 42" N, longitude 3° 54' 43" E. It is about 20km northwest of Ibadan with an elevation of about 120m above sea level.[17] The people are mostly peasant farmers, artisans, and traders.[18]

Data collection

The survey was carried out between November 2018 and January 2019. Information regarding plants used for traditional management of BPH was gathered by the use of a semi-structured questionnaire obtained from the website of the Ethnobotanical Society,[19] with a slight modification and open-ended conversation. Interview was conducted in English and Yoruba (where respondents expressed difficulty in understanding some English terminologies) following prior documented informed consent. Some of the respondents were financially induced to encourage them to disclose information. The questionnaire was divided into three sections. Section one sought and captured demographic information of respondents such as age, sex, educational qualification, years of practice and practice category. Section two sought and obtained information on knowledge of BPH, its symptoms and, experiential knowledge of respondents in managing the condition. Section three was designed to obtain information on the different plants, their mode of preparation, administration, and duration of treatment.

Plant collection and preparation

Fresh plant samples were majorly collected in Moniya and environs within Akinyele Local Government Area, Oyo State, while others were collected in the neighboring suburb. They were processed according to standard procedures and transported to the Forest Herbarium Ibadan (FHI) at the Forest Research Institute of Nigeria (FRIN), Ibadan, where they were identified authenticated and voucher numbers issued.

Data analysis

The Use value of mentioned species was calculated by the formula;

$$UV = \frac{\sum U}{n}$$

$\sum U$ = Number of citations per specie

n = Number of respondents

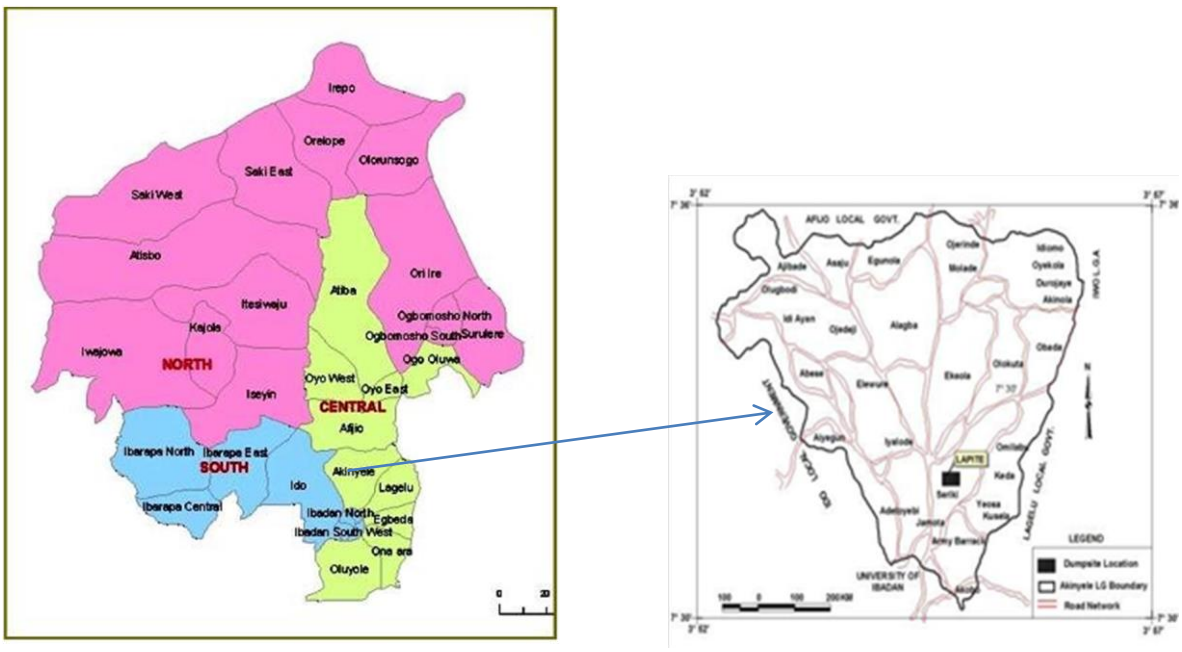

Figure 1: Map of Oyo state, with an arrow pointing to the study area. Sourced,[34]

ISSN 2616-0684 (Print)
ISSN 2616-0692 (Electronic)

Results and Discussion

This study was carried out in Akinyele Local Government area, which is considered as part of the cosmopolitan area of Ibadan city in Oyo state and represents an urban setting, with the intent to know the medicinal plants used by Herbal practitioners, Herb sellers and others in the management of BPH. Previous studies have established that these practitioners/sellers reside in urban cities where dwellers consult them, for their every day to day health needs.[20]

A total of nine respondents were interviewed of which, 44.44% were Herb sellers, herbalist 44.44% and traditional medical practitioners was 11.11%. This shows that the majority of respondents in this survey were traditional healers that rely on the use of herbs to treat people. This is in line with the submission of Oyebola,[21] who reported that herbalists make up the majority of Traditional medicine practitioners in Yoruba land. Respondents in the age bracket 41 – 50 years accounted for 55.56% of respondents, while 44.44% was accounted for by those below age 40. This finding is contrary to the report by Oyebola,[21] who reported that 72.40 % of his study population was 40 years and above. This disparity in the age of respondents could be as a result of the small sample size and/or limited geographic spread in the current study. It could also be that in more recent times, younger persons have taken to the practice of medical herbalism contrary to what obtained two or three decades ago. All the respondents had some form of educational training, as 55.56% had tertiary education, while 44.44% had secondary education, equally 66.60% were male, while the rest were female. According to Taye in 2009,[22] Traditional medicine practice and herbalism in Yoruba land is dominated by males because, it is considered a rugged and energy-demanding vocation as it requires journeys to be made to surrounding bushes and forest to search, collect herbs and prepare them, these males are seen to be best suited for. The practice of transmitting knowledge of herbs from the older generation to males in the younger generation has equally contributed to making the vocation male-dominated.

All but one of the respondents claimed to have treated somebody with the disease before the time of this study. Some of the symptoms of the disease mentioned by the respondents include; dribbling of urine, difficulty in initiating urination, frequent need/urgency to urinate and blood in urine. These are known signs and symptoms associated with BPH, suggesting that the respondents were acquainted with the condition.

A total of 25 plant species from 23 families were identified to be useful in the management of BPH. This reveals that plants used in the management of BPH belong to varied families. It was equally observed that 44% of plants mentioned by respondents are shrubs, 24% trees, herbs 20%, and climbers 8% (Figure 2).

Asteraceae, Arecaceae and Moraceae were represented by two species namely, *Vernonia amygdalina* and *Agarantum conyzoides*, *Cocus nucifera* and *Elaies guineensis* and *Musanga cecropoides* and *Ficus asperifolia* respectively.

Use value (UV) is a mathematical tool that is used to evaluate the level of people's interaction with particular plant species and the best treatment for specific diseases. It is used to determine the relative importance of specific specie and make a decision on how best to engage these plants.[23,24] In this study, *Chrysophylum albidum* with a UV of 0.33 can be said to be the most important and best treatment for BPH by respondents in this study. This was followed by *Boehavia diffusa*, *Citrus aurantifolia*, *Ficus asperifolia*, *Garcina kola* and *Phyllantus amara*, with UV of 0.22 each.

Soladayo *et al*.[25] in a similar study carried out in Ijebu-North Local Government Area of Ogun State, Nigeria, a site with similar cultural, linguistic, traditional and geographic characteristics with our study location, 32 plants species were listed to be useful in the treatment of BPH. Fourteen of the plants mentioned in that study are cited by respondents in this study, they are *Abrus precatorius*, *Adenopus breviflorus*, *Calotropis procera*, *Carica papaya*, *Chrysophylum albidum*, *Citrus aurantifolia*, *Ficus asperifolia*, *Garcina cola*, *Gravia pubescens*, *Musanga cecropoides*, *Senna alata*, *Sida acuta*, *Uvaria chamea*, and *Vernonia amagdalina*. The potential of *Boehavia difusa*, *Citrus aurantifolia*, *Cocus nucifera*, *Garcina kola*, *Phyllantus amarus*, *Agarantum conyzoides*, *Abrus precatorious* and *Vernonia amagdalina* to protect against BPH in test animals have been reported by different workers.[26 – 33]

Recipes of recommended plants for the treatment of BPH in this study are presented as poly-herbal formulation that incorporate other non-plant part/s in their preparation for example the use of bile from the cow. According to Borokini and Lawal,[34] this is a common practice among Practitioners in Yoruba land. It was observed that leaves were the commonest part of plant used in the formulations followed by stem bark, root, juice, seed and fruit in that order (Figure 3). The methods of preparation were as infusion, decoction, powder and juices and administration was mainly through the oral route. This corroborates earlier reports by Borokini and Lawal in 2014[34] and Bhat *et al*., in 1985.[35]

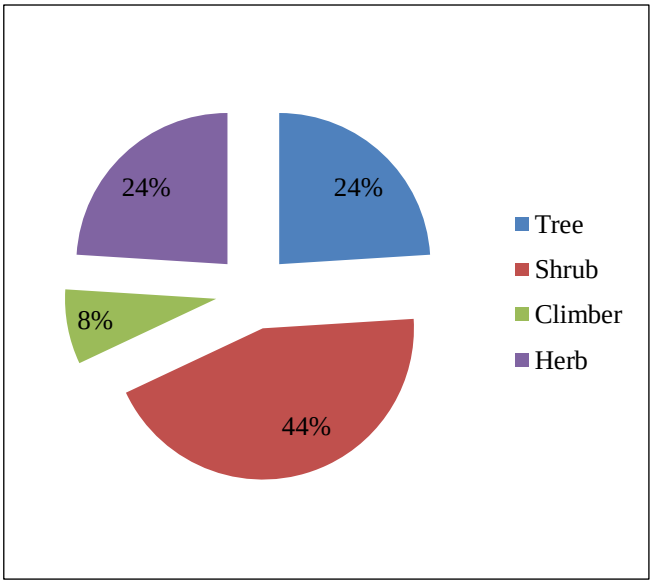

Figure 2: Frequency distribution of plants habitat useful in treating BPH in Akinyele Local Government Area.

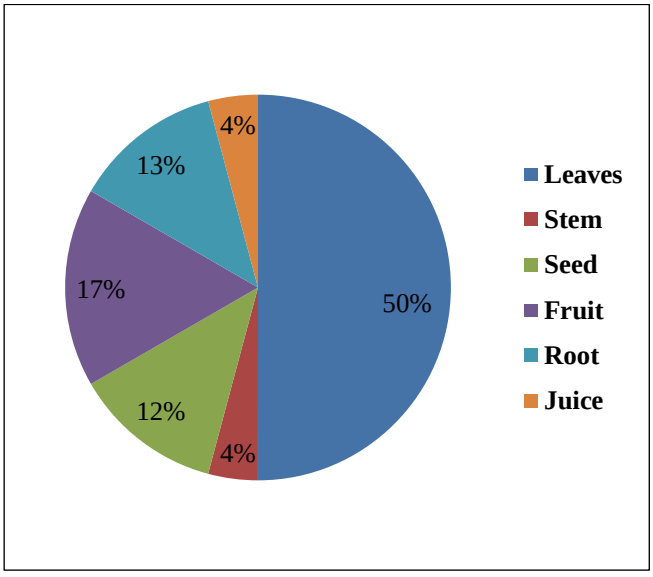

Figure 3: Frequency distribution of plant parts used in the formulation of herbal recipes in the treatment of BPH.

ISSN 2616-0684 (Print)
ISSN 2616-0692 (Electronic)

Table 1: List of plant species used for the traditional management of BPH

S/N	Botanical name of Plant	Family	Local name of Plant	Common name	Habitat	UV	Herbarium number
1	*Abrus precatorius* Linn	Papilionaceae	Mesin-mesin	Crab's eye	*C*	0.11	FHI 112452
2	*Adenopus breviflorus* Benth	Curcubitaceae	Tagiri	Psuedo Colocynth	*C*	0.11	FHI 112794
3	*Aframomum melegueta K.* Schum	Zingibaraceae	Atare	Alligator pepper	*H*	0.11	FHI 112447
4	*Agerantum conyzoides* Sieber ex Steud	Asteraceae	Imi esu	Goat weed	*S*	0.11	FHI 112446
5	*Ananas comosus* L.(Merr)	Bromeliaceae	Ope Oyinbo	Pineapple	*H*	0.11	FHI 112448
6	*Boerhavia diffusa* Linn	Nyctaginaceae	Teteponla	Purnanava	*S*	0.22	FHI 112280
7	*Calotropis procera* Ait.f	Apocyanaceae	Bomu-bomu	Gaint Milk weed	*S*	0.11	FHI 112282
8	*Carica papaya Linn*	Caricaceae	Ibepe	Pawpaw	*S*	0.11	FHI 112279
9	*Citrus aurantifolia* (Christm.) Swingle	Rutaceae	Osan wewe	Lime	*S*	0.22	FHI 112451
10	*Chrysophyllum albidum* G. Don.	Sapotaceae	Agbalumo	Cherry	*T*	0.33	FHI 112278
11	*Cocos nucifera* Linn	Arecaceae	Agbon	Coconut	*T*	0.11	FHI 112275
12	*Dioclea reflexa* Hook.f.	Fabaceae	Agbarin	Bapiana	*S*	0.11	FHI 112253
13	*Elaies guineensis* Jack	Arecaceae	Palm oil	Oil palm tree	*T*	0.11	FHI 112274
14	*Ficus asperifolia* Vaul	Moraceae	Egbo igi ipin	Sand paper tree	*T*	0.22	FHI 112277
15	*Garcina kola* Herkel	Clusiaceae	Orogbo	Bitter kola	*T*	0.22	FHI 112450
16	*Gravia pubescens* P.Beav	Tiliaceae	Afoforo	Raisin	*S*	0.11	FHI 1122447
17	*Mannihot esculenta* Crantz	Euphorbiaceae	Ege	Cassava	*S*	0.11	FHI 112449
18	*Morinda lucida Benth*	Rubiaceae	Oruwo	Brimstone tree	*S*	0.11	FHI 112441
19	*Myrianthus arboreus* P.Beauv	Urticaceae	Erin-mado	Monkey fruit	*T*	0.11	FHI 112795
20	*Nicotiana tabacum* Linn	Solanaceae	Ewe taba	Tobacco	*H*	0.11	FHI 112272
21	*Phyllantus amarus* Linn	Phyllanthaceae	Eyin olobe	Stone breaker	*H*	0.22	FHI 112283
22	*Senna alata* (L.*)* Roxb	Leguminoseae	Ewe asuwon pupa	Ringworm bush	*H*	0.11	FHI 112281
23	*Sida acuta* Burm- F	Malvaceae	Isokotu	Wire weed	*S*	0.11	FHI 112276
24	*Uvaria chamae* P. Beav	Anonnaceae	Eruju	Finger root	*S*	0.11	FHI 112793
25	*Vernonia amygdalina* Linn	Asteraceae	Ewuro	Bitter leaf	*H*	0.11	FHI 112273

H = Herb, C = Climber, S = Shrub, T = Tree

ISSN 2616-0684 (Print)
ISSN 2616-0692 (Electronic)

Table 2: List of plant recipes used in the management of BPH and method of administration

S/NO	Plant	Part used	How prepared	Dose
1	*Morinda lucida* *Boerhavia difusa*	Leaves Leaves	Dry or Fresh leaves of both plants are soaked with fruit juice of *Citrus aurantifolia*	Three cups is taken daily
2	*Senna alata*	Leaves	Dry leaves, grind and soak with dry gin (alcohol)	Three cups is taken daily
3	*Calotropis procera* *Dioclera reflexa* *Elaeis Guinensis*	Leaves Leaves Stem bark	Dry and grind all plant parts into fine powder	Teaspoon of preparation is taken three times daily with water, pap or tea
4	*Chrysophyllum albidum* *Myrianthus arboreus*	Seed Leaves	Dry and ground seed of *C.albidum* into fine powder and dissolve in juice from leaves of *M. arboreus*.	One cup to be taken daily
5	*Garcina kola*	Seed	Grind dried seed and add to fruit juice of *C.aurantifolia*.	Two small glasses to be taken daily
6	*Nicotiana tabacum*	Leaves	Cook leaves with bile from Cow and sieve.	A cup of sieved portion is taken daily
7	*Adenopus breviflorus* *Abrus precatorius*	Fruit Leaves	Dry and grind both to fine powder and dissolve in the seed liquid of *Cocus nucifera*.	Half glass of preparation is taken daily
8	*Adenopus breviflora* *Calotropis procera* *Aframomun melegueta*	Seed Seed Fruit	Burn all ingredients to ashes and dissolve in juice from the seed of *Cocus nucifera*.	Half glass is taken daily
9	*Carica papaya* *Ananas comosus*	Fruit (Ripe) Fruit	Peel off back of both fruits, cut into pieces and boil together for one hour	Half glass to be taken daily
10	*Uvaria chamae*	Root	Boil the root with palm wine and small amount of water for forty minutes.	Half glass to be taken daily.
11	*Grewia pubsecens* *Vernonia amygdalina*	Leaves Leaves	Boil the leaves of *G.pubescens* after wash for thirty minutes and add juice squeezed out from leaves of *V.amygdalina*.	A glass cup is taken daily
12	*Phyllantus amarus*	Leaves	Squeeze leaves to obtain juice	A glass cup is taken daily
13	*Manihot esculenta* *Ficus asperifolia*	Root Root	Root of both plants is cut and soaked in water for three hours	A cup is taken daily
14	*Ageratum conyzoides* *Sida acuta*	Leaves Leaves	Cook leaves together with water or pap water for 30 minutes	A cup is taken three times daily.

Conclusion

Before now, the body of knowledge about traditional plants used in the treatment of BPH can best be described as intuitive, disparate and privately held, with limited accessibility to the public or even young practitioners. This study has identified and documented plants of relevance and value used by the people of Ibadan to treat BPH. It equally reveals that there is a high diversity of medicinal plants and traditional knowledge about the use, preparation, and application of this knowledge in an urban and modernized community like Ibadan. Twenty five plants species from twenty three families are listed as useful in the management of the condition. Recipes are prepared as polyherbal formulations that are mainly administered orally. With the increasing rate of urbanization and tree felling, there is a strong need to come up with a policy that seeks to preserve these plants and prevent them from going into extinction. There is also a need to carry out bioactivity and chemical profiling of the identified plants to either substantiate or debunk the claim made about their activity.

Limitation of the study

The study was limited by the low number of participants that were recruited for it. This was because many would-be participants were very uncooperative and required monetary compensation before they will divulge information, such that the researchers could not afford. Also, the study location incorporated only one Local Government Area, It is advocated that future study of this nature will benefit from the involvement of a larger site location and population size.

Conflict of interest

The authors declare no conflict of interest.

Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

References

1. Okigbo RN and Mmeka EC. An Appraisal of Phytomedicine in Africa. KMITL Science and people of Nigeria: A historical perspective. J Med Plants Studies. 2006; 6(2):22-33.
2. Izugbara CO, Etukudoh IW, Brown AS. Transethnic Itineraries for Ethnomedical Therapies in Nigeria: Igbo Women Seeking Ibibio Cures'. Health and Place. 2005; 11:1–14.
3. World Health Organization (WHO). Review of Traditional Medicine Programme (TRM). WHO Document No AFR/RC 42/19, 1992; Brazzaville, World Health Organization.
4. Farnsworth NR. Screening Plants for New Medicines In: Wilson EO, Peter FM (Eds). Biodiversity. National Academies Press (US), Washington (DC). 1988; Available from: https://www.ncbi.nlm.nih.gov/books/NBK219315/
5. Sofowora EA. Medicinal Plants and Traditional Medicine in West Africa. Second Edition, 1993. John Willey and Sons Ltd. New York. 289 p.
6. Weintritt J. The Use of Plants in Traditional Medicine in Nigeria. Africana Bulletin, Warszawa. 2007; 55:119- 131.
7. Ogunshe AA, Lawal OA, Iheakanwa CI. Effects of Simulated preparations of plants used in Nigerian Traditional Medicine on Candida spp. Associated with Vaginal Candidiasis. Ethnobot Res Appl. 2008; 6:373 – 383.
8. Kakwaro JO. Medicinal plants of East Africa. (2nd Edition). Keayan Literature Bureau, Nairobi. 1993; 197p.
9. Mathez-Stiefel S and Vandebroek I. Distribution and Transmission of Medicinal plant Knowledge in the Andean Highlands: A case study from Peru and Bolivia. Evid – Based Complement Altern Med. 2012; DOI:10.1155/2012/959285
10. Igberease PO, Ogbole OO. Ethnobotanical Survey of Plants used in the Treatment of Typhoid and its Complication(s) in Esan North East Local Government Area, Uromi, Edo State. Nig. J. Pharm. Res. 2018; 14: 175-188.
11. Fokunang CN, Ndikum V, Tabi OY, Jiofack RB, B Ngameni B, Guedje NM, Tembe-Fokunang EA, Tomkins P, Barkwan S, Kechia F, Asongalem E, Ngoupayou J, Torimiro KH, Gonsu NJ, Sielinou V, Ngadjui BT, Angwafor F, Nkongmeneck A, Abena OM , Ngogang J, Asonganyi T, Colizzi V, Lohoue J, Kamsu-Kom S. Traditional Medicine: Past, Present and Future Research and Development Prospects and Integration in the National Health System of Cameroon. Afr J Tradit Complement Altern Med. 2011; 8:284–295.
12. Chatora R. An Overview of the Traditional Medicine Situation in the African Region'. Afri Health Monit. 2011; 4:4-7.
13. Yeboah ED. Prevalence of Benign prostatic hyperplasia and Prostate cancer in Africa and Africans in the diaspora. J West Afr Coll Surg. 2016; 6:1-30.
14. Ojewola RW, Oridota ES, Balogun OS, Alabi TO, Ajayi AI, Olajide OA, Tijani KH, Jeje EA, Ogunjimi MA, Ogundare EO. Prevalence of clinical benign prostatic hyperplasia amongst community-dwelling men in a South-Western Nigerian rural setting: A cross-sectional study**.** Afr J Urol. 2017; 23:109–115.
15. Kapoor A. Benign prostatic hyperplasia (BPH) management in primary setting. Can J Urol. 2012; 12:10-17.
16. Lee SWH, Chan EMC, Lai YK. The global burden of Lower Urinary tract symptoms suggestive of Benign prostatic hyperplasia: A systemic review and meta-analysis. Sci Rep. 2017; (7)1 DOI: 10.1038/s41598-017-066288.
17. Akangbe HO, Adeola OO, Ajayi AO. The effectiveness of microfinance banks in reducing the Poverty level of men and women in Akinyele Local Government, Oyo State Nigeria. J Develop Agric Econs. 2012; 4(5):132 – 140.
18. Ogunwale OG, Olayemi OO, Oyewole OO, Abegerein OO. Attitude of rural woman farmers towards Enterpreneuship information in Akinyele Local Government of Oyo state Nigeria. J Res Forest Wildlife Environ. 2016; 11(14):48 – 57.
19. The Ethnobotanical Society: http//www.the ethnobotanical Society.Org. Assessed 03/10/2018.
20. Bamidele JO, Adebimpe WO, Oladele EA. Knowledge, Attitude and Use of Alternative Medical Therapy amongst Urban Residents of Osun State, South-western Nigeria. Afr J Trad Compl Altern Med. 2009; 6:281–288.
21. Oyebola DDO. Some aspect of Yoruba Traditional Healers and their practice. Transac Roy Soc Trop Med Hyg.1980; 74:318-325.
22. Taye RO. Yoruba traditional medicine and the challenge of integration. J Pan Afri Studies. 2009; 3 (3):73 – 90.
23. Jaradat NA, Zaid AN, Al-Ramahi R, Alqub MA, Hussein F, Hamdan Z, Mustafa M, Qneibi M, Ali I. Ethnopharmacological survey of Medicinal plants practiced by traditional healers and herbalists for treatment of some urological diseases in the West Bank/Palestine. BMC Complement Altern Med. 2017; 17:255.
24. Zenderland J, Hart R, Bussmann RW, Paniagua NY, Zambrana SS, Kikvidze Z, Kikodze D, Tchelidze D, Khutsishvili M, Batsatsashvili K. The use of "Use Value": Quantifying importance in Ethnobotany. Econo Bot. 2019; 73:293 – 303.
25. Soladoye MO, Chukwuma EC, Mustapfa AI. Ethnobotanical survey of plants used in the management of benign prostatic hyperplasia in Ijebu – North Local Government Area, Ogun State, Nigeria. Phytolo Balcan. 2018; 24:149–154.
26. Vyas VA, Desai NY, Patel PK, Joshi SV & Shah DR. Effect of *Boerhaavia diffusa* in experimental prostatic hyperplasia in rats. Ind J Pharmacol. 2013; 45:264–269.
27. Acheampong DO, Barffour KI, Boye A, Asiamah EA, Armah FA, Adokoh CK, Adrah JF, Opoku R, Adakudugu E. Histoprotective Effect of Essential Oil from *Citrus aurantifolia* in Testosterone Induced Benign Prostatic Hyperplasia in rat Adv Urol 2019; DOI:10.1155/2019/3031609.
28. de Lourdes AM, Molina V, Más R, Carbajal D, Marrero D, González V, Rodríguez E. Effects of coconut oil on testosterone-induced prostatic hyperplasia in Sprague-Dawley rats. J Pharm Pharmacol. 2007; 59(7):995-999.
29. Kalu W, Okafor PN, Ijeh II, Eleazu C. Effect of kolaviron, a biflavanoid complex from *Garcinia kola* on some biochemical parameters in experimentally induced benign prostatic hyperplasic rats. Biomed Pharmaco. 2016; 83:1436-1443.
30. Umar MS, Jaiprakash B & Hukkeri VI (2006). Preventive effect of *Phyllanthus amarus* on prostatic hyperplasia. Hamdard Medicus (Pakistan) 2006; 49:114 – 117.
31. Detering MS, Koyyalamudi ES, Allifranchini S, Bocchietto E, Vitetta E, Luis E. *Ageratum conyzoides* L. inhibits 5-alpha-reductase gene expression in human prostate cells and reduces symptoms of benign prostatic hypertrophy in otherwise healthy men in a double blind randomized placebo controlled clinical study: *A. conyzoides* is a 5 alpha reductase inhibitor and reduces BPH. BioFactors. 2017; 43 (6): 789 – 800.
32. Bello I, Kunle-Alabi OT, Abraham TF, Raji Y. Effect of Ethanol Extract of *Abrus precatorious* Seed on Testosterone-Induced Benign Prostatic Hyperplasia in Adult Male Wistar Rats. J Cancer Tumor Inter. 2017; 6: 1-11.
33. Asuk AA, Ugwu MN. Nephrotoprotective Effect of *Vernonia amygdalina* (Bitter Leaf) Extract on Benign Prostatic Hyperplasia in Adult Male Rats. Inter J Biochem Biotechnol 2018; 22(4):1-9.

ISSN 2616-0684 (Print)
ISSN 2616-0692 (Electronic)

34. Borokini TI, Lawal IO. Traditional medicine practices among the Yoruba. J Med Plants Studies. 2014; 2:20 – 33.

35. Bhat RB, Adeloye AA, Etejere EO. Some Medicinal Plants of Nigeria. J Econ Taxon Bot. 1985; 6(1):161 – 165.