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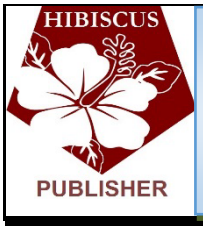

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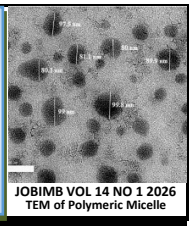

Survey and Identification of Medicinal Plants in Ibrahim Badamasi Babangida University Lapai, Niger State

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Abstract

The aim of this study was to undertake a survey of medicinal plants diversity in the campus of Ibrahim Badamasi Babangida University, Lapai, Niger State to document the indigenous knowledge and promote conservation. A total of 30 species of medicinal plants across 18 botanical families were identified using a systematic approach comprising three transects, each 1 km long, and stratified random sampling in the botanical gardens, woodlands, and uncultivated lands. Identification was done by direct field identification, consultation with two of the local herbal practitioners, and by checking with the standard taxonomic key. The most common species with high frequency were *Terminalia mantaly* (15.4%), *Mangifera indica* (7.5%), and Anacardium occidentale (6.5%), and these are used mainly to treat fever, malaria, and gastrointestinal diseases. Results show that the IBBUL has a high ethnobotanical potential with a wide variety of flora. A special medicinal plant garden is suggested, and integration of these findings in pharmacological research and conservation strategies is suggested to prevent the loss of biodiversity.

INTRODUCTION

Medicinal plants have been at the heart of healthcare systems for thousands of years, especially in areas where the availability of modern medicines is limited due to geographical or economic reasons [1]. In Africa, traditional medicine is one of the main sources of healthcare, and a wide array of species have been used to treat ailments from the common cold to diabetic and cancerous diseases [2-4]. Traditional knowledge of the medical value of plants in Nigeria is well entrenched in cultures but poorly documented or scientifically tested [5, 6].

Ethnobotanical surveys in the recent past, for instance those done with indigenous groups in Lagos State, show that local plants are still being used and that there is a need for local documentation to maintain these traditional resources [7]. Moreover, the new research directions (2022–2025) confirm the need for systematic documentation of local flora to ensure adequate protection of biodiversity and traditional knowledge in the context of rapid urbanization and the effects of climate change [8-10]. The Ibrahim Babagide Babangida University (IBBUL), located in Niger State, has a unique ecological niche that can be described as a semi-arid landscape where woodland and open grasslands are predominant. Several ethnobotanical surveys have been undertaken on the campus of IBBUL, but the complete list of flora and the uses of traditional plants on this campus have not been recorded thus far [11]. The present research aims to fill this gap by a systematic survey of the medicinal flora of the University. The novelty of this research is the documentation of the unique set of medicinal plants at the IBBUL campus as a baseline for future medicinal plant studies. Despite the fact that Nigeria is known to have bioactive compounds with high pharmacological activities, many of these resources are not well documented for their use in specific locations in the country [13].

Their conservation is an urgent matter, in addition to their therapeutic uses. Numerous indigenous species are endangered by urbanization and unsustainable harvesting [14,15]. Medicinal plants diversity and conservation in tropical Africa has been emphasized in recent studies as being very important for ecosystem services and for future drug discovery [16]. Botanical diversity in academic settings is very important for research and conservation purposes as a "living laboratory" for the community

[17]. The purpose of this study is to make a bridge between traditional indigenous knowledge and modern botanical science for drug discovery and sustainable exploitation. The overall objective of this research is to identify and count such plants that will provide a reference baseline for further pharmacological evaluation; and to enrich the indigenous knowledge system, particularly for the IBBUL community [18-20].

MATERIALS AND METHODS

Study Area

The research was done in Ibrahim Badamasi Babangida University, Lapai, in Niger State, Nigeria. IBBUL is located in a dry climate with a variety of vegetation, such as gardens, open grasslands, and natural forests. The university ecosystem is home to various plant species and this makes the university a perfect place to survey the medicinal plants.

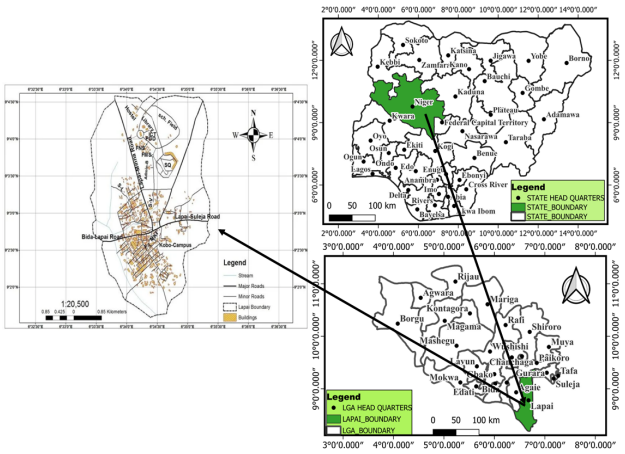

Fig. 1. Geographical location of Ibrahim Badamasi Babangida University Lapai, Niger State, Nigeria.

The selected study areas included:
1. Botanical gardens – which house cultivated plants which are source of research and conservation.
2. Greens and wooden set places - where naturally growing medicinal plants were found.
3. Uncultivated lands - these are plants of various kinds that grow freely and freely on various landscapes.

These were the regions where the study offered rich diversity of plants to study which has made it possible to conduct a comprehensive survey of cultivated and wild medicinal species.

Sampling Techniques

To ensure a comprehensive inventory of medicinal plants within Ibrahim Badamasi Babangida University, Lapai (IBBUL), a multi-stage sampling approach was employed, combining stratified sampling and the line transect method across the campus.

1. Identification of Ecological Zones: Key locations across the campus, including woodlands and grasslands, were mapped.
2. Transect Method: Three 1-km transects were established across 100 hectares in the campus. The researchers walked a set path and documented all the plant species which have medicinal properties.
3. Plant Identification: Morphological characteristics and botanical keys were used to identify the specimens in the field. Samples were taken, pressed, and subsequently matched with the herbarium specimens at the Department of Biology, IBB University, Lapai, for species that needed further validation.

Data Collection Methods

Information on the medicinal uses of the identified plants was collected by two-step validation:

1. Consultation with Practitioners: The consultation with Practitioners involved semi-structured interviews and field walks with 2 local herbal practitioners and traditional healers from the nearby Lapai community. Such consultants were chosen because they are recognized for their knowledge of local flora.
2. Criteria for Medicinal Classification: For this study, a plant was considered as "medicinal" when it had at least two of the following characteristics: (i) mentioned by the practitioners consulted as used for therapeutic purposes; (ii) mentioned in standard African pharmacopoeias or ethnobotanical literature (Sofowora, 2013); and (iii) observed to be collected by the local population for medicinal purposes.
3. Informant Consensus: Species with multiple independent mentions of a therapeutic use received high priority.

Data Analysis and Statistical Justification

Descriptive statistics like frequencies, percentages, and Informant Consensus Factor (ICF) (when applicable) were used to process the collected data. Descriptive statistics were the only statistics used in this study because it was an exploratory baseline survey to give a comprehensive qualitative and quantitative inventory, while in experimental trials, inferential statistics such as ANOVA or t-tests are commonly used. Documenting species richness and distribution patterns was the primary objective, and this was more suitable and transparent for this type of ethnobotanical documentation than a specific comparative hypothesis.

RESULTS

Table 1 presents the demographic characteristics of respondents. The data show that a majority (66%) of the respondents fall within the 18–25 years age range, indicating that most participants are young adults. This is in line with the prevailing occupation group, with 82 percent being students due to the academic nature of IBB University. Females represent a greater percentage (76) as compared to males (24), which might indicate female involvement in the study. In the aspect of educational background, the vast number of respondents (98) have tertiary education as opposed to 2% who lack formal education. This indicates that the majority of respondents have an educational background, and it may have an impact on their perception and knowledge regarding medicinal plants. Overall, the table indicates that the sample is largely composed of young, educated female students.

Table 1. Demographic Characteristics of Respondents.

Demographic Variable	Response Category	Frequency	Percentage (%)
Age	Under 18 years	5	10.0
	18–25 years	33	66.0
	26–40 years	7	14.0
	Above 40 years	5	10.0
Gender	Male	12	24.0
	Female	38	76.0
Educational Level	No formal education	1	2.0
	Primary	0	0.0
	Secondary	0	0.0
	Tertiary	49	98.0
Occupation	Student	41	82.0
	Academic staff	3	6.0
	Non-academic staff	4	8.0
	Local herbalist	2	4.0

Source: Field Survey, 2025.

Table 2 highlights respondents' awareness and use of medicinal plants. Most respondents (86%) reported awareness of medicinal plants, with 64% having used them for health challenges such as malaria, fever, wounds, and cough, showing that respondents commonly rely on medicinal plants for everyday health challenges. The family/traditional (60) is still the most common way of learning about medicinal plants, in line with WHO, which recognizes traditional medicine as a nature-based, experience-based medicine, and the Nigerian government policy promoting the incorporation of indigenous practices in the national health system. Minor roles are played by formal education (8%), as well as personal research (6%). Additionally, the majority of the respondents (76) stated that they were aware of the local or scientific names of the plants, which indicates that there was a strong level of cultural and experiential knowledge of herbal medicine among the university population.

Table 2. Awareness and use of medicinal plants.

Variable	Response Category	Frequency	Percentage (%)
Aware of Medicinal Plants	Yes	43	86.0
	No	7	14.0
Used Medicinal Plants in IBBUL	Yes	32	64.0
	No	18	36.0
Purpose of Use	Malaria	15	30.0
	Fever	12	24.0
	Stomach ache	4	8.0
	Wound healing	5	10.0
	Cough	5	10.0
Source of Knowledge	Family/Tradition	30	60.0
	Formal education	4	8.0
	Friends/Community	8	16.0
	Personal research	3	6.0
Knowledge of Local or Scientific Name	Yes	38	76.0
	No	12	24.0

Source: Field Survey, 2025.

Identified Medicinal Plants within IBBUL

In the study area, there were 30 medicinal plant species which are found in various families. This vegetation is abundant and distributed in diversity, which is a sign of ecological diversity and the impact of human beings within the university setting. **Table 3** below presents the identified species, their frequencies, and percentage representation.

Table 3. Identified medicinal plants in Ibrahim Badamasi Babangida University, Lapai.

Plant Name	Scientific Name	Voucher Number	Frequency	(%)
Mango	*Mangifera indica*	IBBU2105213	64	10.6
Sour Orange	*Citrus aurantium* L.	IBBU2105327	4	0.7
Eggplant	*Solanum aethiopicum*	IBBU210544	3	0.5
Baobab	*Adansonia digitata*	IBBU2105224	1	0.2
Lemon Grass	*Cymbopogon citratus*	IBBUL2105342	15	2.5
Neem	*Azadirachta indica*	IBBU2105272	18	3.0
Shea Tree	*Vitellaria paradoxa*	IBBU2105233	28	4.7
Bitter Leaf	*Vernonia amygdalina*	IBBU210535	3	0.5
Banana	*Musa acuminata*	IBBU2105214	15	2.5
Tropical Almond	*Terminalia catappa*	IBBU210524	24	4.0
Apple of Sodom	*Calotropis procera*	IBBU210577	11	1.8
Elephant Grass	*Pennisetum purpureum*	*IBBU2105337*	*45*	7.5
Sisal	*Agave sisalana*	IBBU2105333	14	2.3
Moringa	*Moringa oleifera*	IBBU210534	9	1.5
Pawpaw	*Carica papaya*	IBBU2105217	4	0.7
Cashew	*Anacardium occidentale*	IBBU2105219	55	9.1
Roselle (Zobo)	*Hibiscus sabdariffa*	IBBU210511	3	0.5
Physic Nut	*Jatropha curcas*	IBBU2105312	5	0.8
Date Palm	*Phoenix dactylifera*	IBBU2105235	5	0.8
Sunflower	*Helianthus annuus*	IBBU2105261	8	1.3
Guava	*Psidium guajava* L.	IBBUL2105216	2	0.3
Hospital Too Far	*Jatropha tanjorensis*	IBBUL2105306	3	0.5
African Locust Bean	*Parkia biglobosa*	IBBUL2105268	17	2.8
White Teak	*Gmelina arborea*	IBBUL2105313	53	8.8
African Mahogany	*Khaya senegalensis*	IBBUL2105308	36	6.0
Tamarind	*Tamarindus indica*	IBBUL2105345	5	0.8
Bush Mint	*Mesosphaerum suaveolens*	IBBUL2105342	16	2.7
Cucumber	*Cucumis sativus* L.	IBBUL2105274	2	0.3
Umbrella Tree	*Terminalia mantaly*	IBBUL2105305	131	21.8
Weeping Fig	*Ficus abyssinica*	IBBUL2105360	3	0.5
			602	100%

Source: Field Survey, 2025.

Diversity of Medicinal Plants Identified in IBBUL

Table 4 shows the variety of medicinal plants found in Ibrahim Badamasi Babangida University, Lapai. The different species were identified by their morphological features, conventional uses, and the parts that were utilized as medicine. It was found that the university environment has many diverse plant families, most of which are known to have pharmacological value in traditional medicine.

Grouping of Medicinal Plants According to Habit

The medicinal plants identified within Ibrahim Badamasi Babangida University, Lapai, were grouped according to their habits — trees, shrubs, and herbs. This classification helps to better understand the structural diversity of medicinal flora and their ecological distribution across the campus. The results are presented in **Tables 5, 6**, and **7**. **Table 5** shows that trees make up the largest portion of the medicinal and economically useful plants found within IBBUL. The most frequent were the Umbrella Tree, which had 131 counts; the Mango, which had 64 counts; the Cashew, which had 55 counts; and the White Teak, which had 53 counts, providing an indication that the vegetation structure is occupied by tall, woody plants. Such trees are also valued on account of their usefulness in pharmacology and also for shade, timber, and fruit, which are in tandem with ethnobotanical surveys carried out in Nigeria, which indicate that they have an ecological and economic significance. This is because they are numerous due to the preference for species that give both ecological and economic value to the institution and embrace a balanced landscape.

Table 4. Diversity of medicinal plants identified in Ibrahim Badamasi Babangida University, Lapai.

Scientific Name	Medicinal Uses	Part Used	Family
Mangifera indica	Diabetes, vitamin source, inflammation	Leaves, bark, fruit	Anacardiaceae
Citrus aurantium	Respiratory and digestive issues	Leaves, peels, fruit	Rutaceae
Solanum aethiopicum	Cholesterol management, heart health	Fruit, leaves	Solanaceae
Adansonia digitata	Anti-inflammatory, anti-microbial	Leaves, bark, roots	Malvaceae
Cymbopogon citratus	Pain relief, fever reduction, anti-fungal	Leaves	Poaceae
Azadirachta indica	Skin care, immune support, ulcers	Leaves, bark, seeds	Meliaceae
Vitellaria paradoxa	Joint pain, skin soothing, antioxidant	Bark, roots, seeds	Sapotaceae
Vernonia amygdalina	Malaria, fever, diabetes	Leaves, roots	Asteraceae
Musa acuminata	Respiratory and digestive conditions	Leaves, fruit, peels	Musaceae
Terminalia catappa	Fever, diarrhea, inflammation	Leaves, fruit, bark	Combretaceae
Calotropis procera	Skin and respiratory conditions	Leaves, latex, roots	Apocynaceae
Pennisetum purpureum	*Wounds, diure*tic, livestock medicine	Leaves	Poaceae
Agave sisalana	Wound healing, anti-microbial	Leaves, sap	Asparagaceae
Moringa oleifera	Hypertension, anemia, nutrition	Leaves, bark	Moringaceae
Carica papaya	Malaria, fever, vitamin source	Leaves, fruit, latex	Caricaceae
Anacardium occidentale	Diarrhea, dysentery, sore throat	Leaves, bark, fruit	Anacardiaceae
Hibiscus sabdariffa	Cholesterol, menstrual pain, antioxidant	Leaves, calyces	Malvaceae
Jatropha curcas	Fever, malaria, inflammation	Leaves, seeds, bark	Euphorbiaceae
Phoenix dactylifera	Energy booster, digestive health	Fruits, seeds	Arecaceae
Helianthus annuus	Fever, wound healing, cholesterol	Seeds, leaves	Asteraceae
Psidium guajava	Diarrhea, dysentery, wounds, cough	Leaves, bark, fruit	Myrtaceae
Jatropha tanjorensis	Blood tonic, diabetes, immune support	Leaves	Euphorbiaceae
Parkia biglobosa	Hypertension, wounds, diarrhea	Seeds, bark, leaves	Fabaceae
Gmelina arborea	Anti-inflammatory, anti-bacterial	Leaves, bark, wood	Lamiaceae
Khaya senegalensis	Malaria, fever, gastrointestinal issues	Bark, leaves	Meliaceae
Tamarindus indica	Digestive problems, fever, wounds	Fruit pulp, bark	Fabaceae
Mesosphaerum suaveolens	Fever, cold, digestive issues	Leaves	Lamiaceae
Cucumis sativus	Hydration, skin care, swelling	Fruit, seeds	Cucurbitaceae
Terminalia mantaly	Antimicrobial, antioxidant, wounds	Leaves, bark	Combretaceae
Ficus abyssinica	Respiratory problems, wound healing	Bark, leaves	Moraceae

Source: Field Survey, 2025.

The abundance of the shrubs in **Table 6** indicates the presence of a moderately high population of shrubs in the IBBUL plant population, with species like Apple of Sodom, Physic Nut, and Bitter Leaf recording relatively high percentages of presence. Such shrubs are not as abundant as trees, but will still be useful to local traditional medicine and can form convenient sources of herbalized treatments of minor conditions, as has been identified in ethnobotanical research in Nigeria as an important indication of their therapeutic potential. They also help in diversifying the flora, especially in the open areas and walks where smaller vegetation can be easily managed.

Table 5. Medicinal Trees Identified in IBBUL.

Plant Name	Scientific Name	Frequency
Mango	*Mangifera indica*	64
Baobab	*Adansonia digitata*	1
Neem	*Azadirachta indica*	18
Shea Tree	*Vitellaria paradoxa*	28
Tropical Almond	*Terminalia catappa*	24
African Locust Bean	*Parkia biglobosa (Jacq.) R.*	17
White Teak	*Gmelina arborea*	53
African Mahogany	*Khaya senegalensis*	36
Umbrella Tree	*Terminalia mentalla H.*	131
Weeping Fig	*Ficus albissinia*	3
Cashew	*Anacardium occidentale*	55
Guava	*Psidium guajava L.*	2
Tamarind	*Tamarindus indica*	5
Sour Orange	*Citrus aurantium L.*	4
Pawpaw	*Carica papaya*	4
Moringa	*Moringa oleifera*	9
Date Palm	*Phoenix dactylifera*	5
Total		459

Source: Field Survey, 2025.

Table 6. Medicinal Shrubs Identified in IBBUL.

Plant Name	Scientific Name	Frequency
Physic Nut	*Jatropha curcas*	5
Hospital Too Far	*Jatropha tanjorensis*	3
Roselle (Zobo)	*Hibiscus sabdariffa*	3
Apple of Sodom	*Calotropis procera*	11
Bitter Leaf	*Vernonia amygdalina*	3
Total		25

Source: Field Survey, 2025.

Table 7 indicates that herbs form a significant part of IBBUL's medicinal and useful plant resources. The most common ones were species of Elephant Grass, Bush Mint, Lemon Grass, and Banana, which demonstrates that herbaceous plants are generally cultivated or are natural occurrences in the region. These are the herbs that are well known for their medicinal benefits and their use for household purposes such as the preparation of food, medicines, and decoration. Their ecological balance offers sustainability and a sustainable foundation of health practices as well as daily economic practices in the institution.

Table 7. Medicinal Herbs Identified in IBBUL

Plant Name	Scientific Name	Frequency
Lemon Grass	*Cymbopogon citratus*	15
Banana	*Musa acuminata*	15
Sunflower	*Helianthus annuus*	8
Elephant Grass	*Pennisetum purpureum*	*45*
Sisal	*Agave sisalana*	14
Bush Mint	*Mesophearum suaveolens*	16
Eggplant	*Solanum aethiopicum*	3
Cucumber	*Cucumis sativus L.*	2
Total		118

Source: Field Survey, 2025.

Distribution and Conservation Awareness of Medicinal Plants

Besides it was also used to identify plants species, medicinal plants distribution, the level of knowledge of university students and staff and perceptions concerning the risk of extinction or overharvesting. These results shed more light into the ecological and cultural processes that determine the conservation of medicinal plants in Ibrahim Badamasi Babangida University, Lapai.

Location and Distribution of Medicinal Plants

Table 8 shows the ecological distribution of medicinal plants across the university environment. The survey established that the most common plants were found in forest trees (23 species), footpaths (15 species), cultivated gardens (7 species), and water puddle areas (2 species). This distribution pattern suggests that forest regions are the biggest reserve of medicinal plant diversity, which has also been observed in Maiduguri and Osun State, where the forests and community lands have the greatest number of species richness. On the same note, medicinal vegetation cover paths and gardens indicate deliberate planting and adjustment to the disturbed habitat, which is also observed in Borno State and East Africa.

Table 8. Locations where medicinal plants were found.

Location	Frequency	Percentage (%)
Forest trees	23	46
Along footpaths	15	30
Cultivated gardens	7	14
Near water puddles	5	10
Total	50	100

Source: Field Survey, 2025.

Knowledge and Identification of Medicinal Plants

The study also assessed the respondents' ability to recognize medicinal plants. As shown in **Table 9**, 39 respondents (78%) were able to identify medicinal plants unaided, 8 (16%) required assistance, while 3 (6%) could not identify any medicinal plants. From these findings, it can be concluded that a lot of the university population have traditional or observational information regarding the use of medicinal plants. But the reality that some of them needed assistance qualifies as a knowledge gap which can be fulfilled via awareness activities and botany education.

Table 9. Ability to identify medicinal plants.

Response	Frequency	Percentage (%)
Yes	39	78
No	3	6
With assistance	8	16
Total	50	100

Source: Field Survey, 2025.

Awareness of Medicinal Plant Knowledge among Students and Staff

Table 10 presents the level of knowledge among students and staff about medicinal plants. Only 11 respondents (22%) indicated adequate knowledge, 13 (26%) said they lacked knowledge, while 26 (52%) were unsure. The results indicate a low to moderate level of awareness, which indicates that educational interventions should be introduced to increase the level of knowledge regarding the role of medicinal plants in healthcare and the sustainability of the environment.

Table 10. Knowledge level about medicinal plants.

Response	Frequency	Percentage (%)
Yes	11	22
No	13	26
Not sure	26	52
Total	50	100

Source: Field Survey, 2025.

Perceived Risk of Extinction or Overharvesting

Respondents' perceptions regarding the threat of extinction or overharvesting of medicinal plants are summarized in **Table 11**. While 7 (14%) believed that there is a risk of extinction, 25 (50%) disagreed, and 18 (36%) were uncertain. The fact that the majority of the respondents were not sure or disagreed is an indicator that there is little awareness on the ecological issues affecting the existence of these plants. This highlights that conservation education is required and a university botanical garden should be instituted to conserve the endangered species.

Table 11. Perception of extinction or overharvesting risk.

Response	Frequency	Percentage (%)
Yes	7	14
No	25	50
Not sure	18	36
Total	50	100

Source: Field Survey, 2025

DISCUSSION

This study reveals that the Ibrahim Babangida University, Lapai (IBBUL) is one of the important bio geocentric hotspots for medicinal plant diversity, with the presence of 30 different species in various botanical families. The nature of the site and the addition of flora by humans is also reflected in the high abundance of species like *Terminalia mantaly* (Umbrella tree), *Mangifera indica* (Mango), and *Anacardium occidentale* (Cashew). This dual distribution is in line with the findings of [21], which suggested that tertiary institutions in Nigeria are important conservation hotspots because of their diverse topography and the fact that they are relatively safe from industrial encroachments. In addition, the predominance of the tree species in IBBUL is consistent with recent work done by [3] in Ede, Osun State, where some of the tree taxa were found to be dual in nature (medicinal and ecological). This implies a uniformity in all ecosystems in Nigeria where the woody perennials constitute the structural and functional fabric of the local ethnobotanical resources [3].

The dominance of trees (followed by herbs and shrubs) in the taxonomic representation at IBBUL, is typical of the savanna ecological zone. This structural composition is beneficial to the woody species, such as Khaya senegalensis and Parkia biglobosa, which are very valuable because of their therapeutic properties [19]. The families that occur in abundance, such as Anacardiaceae, Fabaceae, and Meliaceae, also suggest a high potential for medicinal uses, since they are families well known for their secondary metabolites that have medicinal value worldwide. The same taxonomic patterns have been documented in other regional surveys, such as the ones conducted in East Africa [16], and show that these families represent a basic component of the medicinal flora of Africa. The use of various parts of plants like leaves, bark, roots and fruits illustrates the versatile nature of traditional remedies in the region, similar to

that mentioned in other Nigerian campus surveys [3,22], which explained that the region is well-endowed with herbs. From an ecological perspective, there is a difference between forested areas and cultivated gardens: species richness is higher in the forested area, indicating that the natural regeneration of medicinal flora is favored by the different microclimates present in these areas of the university. There is, however, a measure of synanthropization in the presence of medicinal species in footpaths and habitats modified by humans. Such adaptation of habitat has also been observed in northern Nigeria, from natural forest to anthropogenic landscape, in the case of medicinal flora [24].

In the socio-cultural context, the results indicate that the IBBUL community has a high level of basic plant recognition (78-86%), indicating that traditional botanical knowledge is still a very important cultural asset. The use of family and community sources (60%) of this information, however, confirms the results of [25], who reported that the indigenous knowledge base in Nigeria is largely passed on through oral means and not formal education. However, the relatively low level of deep ethnobotanical awareness amongst students and staff (22%) indicates a fairly large "knowledge gap". As pointed out by [25], the lack of incorporation of ethnobotanical research into academic curricula could lead to the loss of this valuable indigenous knowledge system from being connected to scientific progress.

Lastly, the unclear nature of conservation threat for a third of the respondents (36%) indicates a key conservation education need. However, as noted by [26], lack of awareness about sustainable harvesting often leads to depletion of the local species. This is a worldwide issue, and both [15] and [27] have emphasized that sustainability frameworks based on evidence are needed for the future of traditional medicine. A university botanical garden and awareness programs could be a proactive measure to protect IBBUL's biological resources for sustainable pharmaceutical innovations at the crossroads of traditional knowledge and modern science.

CONCLUSION

To sum up, the study has confirmed that university campuses like Ibrahim Badamasi Babangida University, Lapai (IBBUL) are important biodiversity reserves in fast urbanizing environments. These academic environments are semi-protected ecological sanctuaries that help maintain a high level of medicinal flora diversity, which may otherwise be eliminated by unsustainable land management practices. The documentation of 30 varieties of medicinal plants at IBBUL is not merely a botanical record, but also a rich source of knowledge about the indigenous ethnobotanical practices that can serve as a guide for future developments in drug discovery and related pharmacological research. These systematic surveys can help identify bioactive compounds that hold promise for solving global health problems while bringing together the traditional and scientific worlds. In addition, the results indicated that there were definite policy implications for the university administration and regional conservationists. The need to shift from passive preservation to active stewardship is voiced: formal campus botanical gardens are established, and ethnobotanical studies are added to the course in Biological Sciences. By encouraging sustainable exploitation and formalizing the conservation of these "living laboratories", IBBUL can remain a sustainable provider of biological resources and cultural heritage. In conclusion, the synergy emanating from the conservation of this flora with their systematic scientific documentation is key to ensuring the future of traditional medicine and sustainable utilization of the country's rich floral resources.

CONFLICT OF INTEREST

The authors do not identify any conflict of interest in regard to this article.

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AUTHORS' CONTRIBUTIONS

A.M.T. conceived and designed the study, supervised the research, and drafted and critically revised the manuscript. Y.A. carried out the field survey, collected the ethnobotanical data, and contributed to drafting the manuscript. A.D.A. participated in data collection, administered the questionnaires, and performed the preliminary data analysis. A.M. contributed to validating the plant identification and biochemical relevance of the findings and reviewed the manuscript for scientific content. All authors read and approved the final manuscript.

DECLARATION OF AI

The authors hereby declare that no generative Artificial Intelligence (AI) technologies have been used during writing or editing of this manuscript.

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