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Ethnomedicinal survey of plants used in management of common diseases in Delta State, Nigeria

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This study conducted an ethnomedicinal survey of medicinal plants used for the management of common diseases in Umunede, Ika North-East Local Government Area, Delta State, Nigeria. The study investigated common diseases in the community, medicinal plants used in their management. Purposive sampling was used to select fifty (50) respondents from the community. A structured questionnaire and oral interview were used to obtain data for the study. Twenty-nine (29) medicinal plant species were identified and documented in the study area. The results of the study show that diseases such as malaria, cough, diarrhea, dysentery, respiratory infections and joint pains are common in the community. The study also reveals that Umunede residents still depend on traditional medicine in the management of common diseases in the community despite the availability of modern medical facilities in the community. Quantitative values were calculated in the study, which include use value, fidelity level, and informant consensus factor. The study also highlights the need for taxonomic description of medicinal plant resources to avoid the loss of indigenous knowledge of medicinal plants in the community. The results of this study provide baseline data for future ethnomedicinal and pharmacological studies in Delta State and Nigeria at large.

Keywords: Ethnomedicine, medicinal plants, indigenous knowledge, traditional medicine, Umunede, Nigeria

INTRODUCTION

Ethnomedicine is concerned with the ways in which different cultures perceive, manage, and mitigate illness, with medicinal plants at the heart of these approaches to health management. Traditional medicine in many developing countries is at the heart of primary healthcare delivery and, in some cases, is used as the preferred option for treating common ailments in these countries (Evbuomwan, Adeyemi, and Oluba, 2023). Ethnobotanical studies in Nigeria have confirmed that medicinal plants are commonly used for health management and maintenance since they are easily accessible, cost-effective, culturally acceptable and deeply ingrained in local cultures and knowledge systems, reflecting their use in different plant species in different ecological zones in the country (Ojo and Sulaimon, 2020). For example, in Kwara State, Nigeria, a recent ethnobotanical survey identified 62 local plant species used in treating malaria in the region, with leaves and stem bark being the most commonly used plant parts in malaria treatment and

decoctions taken internally as the most common method of treatment in local cultures (Evbuomwan et al., 2023). Similar studies in Lagos State identified 183 medicinal plants used for treating different ailments, including malaria/fevers, stomach problems, and respiratory problems, with high agreement among local populations on using plants such as Mangifera indica, Zingiber officinale, and Waltheria indica for local health problems in rural areas of the state (Ademiluyi, 2023).

One of the keys to the effective utilization of medicinal plants in the management of disease lies in the accurate identification and classification of the species used. This is the domain of plant taxonomy. Accurate plant taxonomy allows for the correct species to be identified and documented, minimizing the risk of misidentification, misapplication or adulteration with less effective or potentially toxic plant species (Odebunmi and Afolayan, 2021). Intertwined with the domain of ethnobotanical studies is the documentation of ethnobotanical features. This is the detailed documentation of physical plant characteristics—leaf arrangement, stem structure, bark texture, flower arrangement, type of fruit, root structure, etc. These physical characteristics are the means by which most herbal practitioners or traditional healers identify the medicinal plant species they utilize. In the rural environment, in the absence of laboratory facilities, the documentation of ethnobotanical features is critical to the reliability of plant species identification and allows for meaningful comparisons to be made across studies.

Aside from the afore mentioned diseases like malaria and fever, ethnobotany studies in Nigeria indicate that medicinal plants are used for a variety of diseases. A study in the north-central region identified a number of plants used in dealing with hypertension, which indicates that traditional medicine is used in dealing with both acute and chronic diseases (Idu MacDonald et al., 2025). In Kafin Hausa, a region in North-West Nigeria, a study identified 15 different plant species used in dealing with malaria (Zakariya et al., 2021). In Oyo State in Nigeria, a study identified a wide variety of plants used in enhancing immune systems in dealing with respiratory and body infections (Oluyemi and Akindele, 2023). In spite of the importance of medicinal plants in addressing health conditions in rural communities in Nigeria, a clear disconnect in taxonomic studies and ethnobotanic studies exists, particularly at the local community level in Nigeria. Without taxonomic studies on medicinal plants, their identifications can be inconsistent, while indigenous knowledge can be lost over time, a situation which can lead to the loss of valuable resources through uncontrolled harvesting practices (Odebunmi and Afolayan, 2021; Ukwubile and Ezike, 2022). Therefore, a taxonomic study on medicinal plants used in dealing with common diseases in Umunede is critical in addressing a number of issues in ethnobotany studies in Delta State and in Nigeria at large.

This study therefore aims to document and analyze traditional ethnobotanical knowledge related to the use of medicinal plants for treating common diseases in Umunede, Delta State, and to classify these plants taxonomically for scientific and conservation purposes. Specifically, it objective is to: identify and document medicinal plants used by traditional healers and residents of Umunede, Delta State, determine common diseases treated with herbal remedies in the community, classify identified medicinal plants by their botanical names, families, and local names, examine the socio-demographic characteristics of respondents involved in the use and knowledge of medicinal plants in Umunede, Delta State and promote awareness of the need for conservation and sustainable utilization of medicinal plants.

MATERIALS AND METHODS

Description of the study area

This study was conducted in Umunede, a historically significant and agriculturally active town located in Ika North-East Local Government Area (LGA) of Delta State, Nigeria. The town lies within the humid tropical rainforest belt of southern Nigeria and is characterized by fertile soils, abundant vegetation, and a climate suitable for the growth of a wide variety of food crops and

medicinal plants. Umunede is strategically located along the Benin/Asaba expressway. This is a prime location that enhances easy movement and increases the importance of the town as a local center of trade, farming, and social life in general (Manpower Nigeria, 2025). The origin of the name “Umunede” is derived from “Umu-Ede,” which means “children of Ede.” According to the oral tradition of the people of Umunede, Ede was a prince from the royal family of the kingdom of Benin. He was banished from the palace because he never obeyed the orders of the king. He later found a home in the present-day Umunede. Ede’s children later developed into the people of the present-day Umunede town. Therefore, the people of Umunede have a unique cultural identity that is different from the Igbo people but has some cultural similarities as a result of intermarriage and trade exchange (Rapidospace, 2024). Climatically, the town of Umunede has two main seasons: the rainy season from April to October and the dry season from November to March. The rainfall is about 2,000 to 2,400 mm annually. In addition, the temperatures in the area vary from 26 to 32 degrees Celsius. This is a favorable environment for the growth of different plant species. Therefore, the area is appropriate for the study of ethnobotany on the medicinal value of plants used in the cure of different ailments (Manpower Nigeria, 2025). The town is divided into four quarters: Idumu Ile, Idumu Ileje, Idumu Oba, and Idumu Obi. These four quarters play different roles in the social life of the people of Umunede. Therefore, they can be used as a sample in the study of ethnobotany because they have different leaders and roles in the town.

Population of the study area

The study participants were recruited from a population consisting of individuals who reside in Umunede and work within the community, focusing on individuals associated with traditional medicine practices, including traditional medicine practitioners, herb vendors, elderly members of the community and others who through their experiences in life possess practical knowledge about medicinal plants used in the region. Such individuals are viewed as having a critical role in recognizing, harvesting and utilizing medicinal plants for addressing common human diseases. Umunede has a population of about 50,000 residents, a number of whom are engaged in farming and trade activities (Manpower Nigeria, 2025). In a bid to ensure a comprehensive representation of ethnobotanical practices in Umunede, the study participants were recruited from all four quarters of Umunede town. By focusing on traditional medicine practitioners, herb vendors and elderly members of the community, the study managed to obtain qualitative information on ethnobotanical practices in Umunede town since these participants possess critical knowledge on how medicinal plants can be identified, harvested, used and socially embedded in a community or culture. By doing so, the study managed to ensure a true representation of ethnobotanical practices in Umunede town.

Sample size and sampling techniques

The study recruited a total of 50 participants for the study. The number was considered adequate in creating a true representation with minimal sampling errors. In this study, traditional medicine practitioners and herb vendors were recruited through a purposive sampling approach in recognition of their expertise in ethnobotany, while others in Umunede town were recruited through a simple random sampling approach. This combination ensured the inclusion of both professional and non-professional users of medicinal plants.

Data collection

Data were collected by means of oral interview and through the use of a structured questionnaire. The questionnaire was divided into five sections:

- Section A: Socio-demographic data of respondents (age, sex, education, occupation).

- Section B: Identification and use of medicinal plants within the community.

• Section C: Common diseases treated with plant-based remedies.

• Section D: Preparation, dosage, and administration methods of herbal remedies.

• Section E: Attitudes toward conservation and sustainability of medicinal plants.

Statistical analysis (Quantitative)

The data collected were analyzed to Provide quantitative measure of cultural significance and informant agreement by calculating use value (UV) number of different use mentioned by informant divided by total informant calculated using the following formular; UV = ΣU/n Where UV is the use value of a species, U is the number of use reports cited by each informant for a given plant species and n is the total number of informants interviewed for a given plant, informant consensus factor (ICF); total use report in category used to analyze the agreement degree of the informants' knowledge about each category of ailments calculated using the following formula: ICF= (Nur – Nt)/(Nur – 1) where Nur stands for the number of use reports of informants for a particular illness category, and Nt is the number of species used by all informants for a particular illness, Fidelity level (FL%); informant citing the species for a particular ailment over informant citing the specie for any ailment. The FL was employed in this study to determine the most important plant species used for treating certain diseases by the local herbal practitioners and elderly people living in the study area. The FL was calculated using the following formula: FL (%) =Np/N×100 where Np is the number of informants that mentioned the specific plant, species used to treat certain ailments, and N is the total number of the informants who utilized the plants as medicine for treating any given ailment (Friedman et al, 1986; Trotter and Logan, 1986).

RESULTS

A total of fifty (50) respondents from Umunede community participated in this ethnomedicinal survey. The respondents comprised traditional healers, herb sellers, farmers, traders, and other knowledgeable elderly individuals who possessed practical knowledge of medicinal plants used in the community. From this age distribution in Table 1, it is clear that those in the 50-59 age bracket were the majority (34%), followed by those in the 40-49 age bracket (28%). Those in the 60-69 age bracket and those 70 years and above were 24% and 14% respectively. This implies that ethnomedicinal knowledge in this community is mostly held by middle-aged and elderly persons.

With regards to gender distribution (Table 2), it is clear that 31 (62%) of the respondents were male, while 19 (38%) were female. This implies that although ethnomedicinal knowledge is held by both genders in this community, men were predominant in this current study and regard to educational background, it's clear that 36% of the respondents had no formal education, 30% had primary education, 22% had secondary education and 12% had tertiary education (Table 5). This also implies that indigenous knowledge of medicinal plants in Umunede is mostly held by persons with little or no formal education.

Occupationally (Table 3) shows that farmers constituted the largest group of respondents (36%), this was followed by herbal practitioners (28%), traders (20%), civil servants (8%), and other occupations (8%).

Table 4 shows that respondents were distributed across all quarters in Umunede as follows Idumu Oba had the most respondents (28%), followed by Idumu Ile (26%), Idumu Ileje (24%), and Idumu Obi (22%) ensuring that ethnobotanical information was obtained from all parts of the community.

The educational status of the respondents is shown in Table 5, shows that most respondents had either primary education or no formal education, while only a small proportion had secondary or tertiary education.

Diversity of medicinal plants used in the study area

The ethnomedicinal survey documented twenty-nine (29) medicinal plant species belonging to diverse botanical families used by residents of Umunede for the treatment of various diseases (Table 6). These plants included commonly known species such as Azadirachta indica, Ocimum gratissimum, Mangifera indica, Carica papaya, Vernonia amygdalina, Zingiber officinale, and Citrus sinensis. The plants were obtained mainly from farmlands, forests, and home gardens within the community.

The study revealed that leaves were the most frequently utilized plant part, followed by roots, seeds, stems, and fruits. Preparation methods were diverse and mostly decoction and boiling. Other methods include pounding, powdering, extraction of plant sap and chewing of plant parts. Oral administration was most common route of application although topical administration in treating wounds and skin infection is also common.

Prevalence of Common Diseases

From this survey, fifty (50) distinct diseases and health conditions that are treated using plant preparations in Umunede were clearly identified (Table 7). Malaria is common in this area (reported by 90% of respondents). Other common conditions include cough (84%), fever (80%), fatigue (80%), diarrhea (76%), cold and flu (76%), catarrh (74%), sore throat (74%), and wound infection (70%), dysentery (66%), skin infection (64%), loss of appetite (64%), and hypertension (60%) respectively.

Quantitative Ethnobotanical Analysis

Use Value (UV)

Use Value (UV) was used to determine the relative importance of the medicinal plant species used by the community (Table 8). Medicinal plant species with high UV values were those most frequently cited by the respondents and commonly used for medicinal purposes. In the current study, Vernonia amygdalina had the highest use value (0.96), followed by Moringa oleifera (0.94), Mangifera indica (0.90), Psidium guajava (0.88), Citrus sinensis (0.86) and Azadirachta indica (0.84). These plant species are therefore the most significant medicinal plant species used by the community.

Informant Consensus Factor (FIC)

Informant Consensus Factor (FIC) was used to determine the level of agreement among the informants regarding the use of particular plant species for the treatment of specific disease categories. FIC values for the different disease categories are presented in Table 9. High FIC values were observed for certain disease categories such as asthma/cough (1.00), gonorrhea (1.00), urinary tract infection (1.00), anemia (1.00), constipation (0.98), pneumonia (0.97), stomachache (0.97) and respiratory problems (0.97). These high FIC values therefore confirm that there is a high level of agreement among the informants regarding the effectiveness of specific plant species for the treatment of these disease categories.

Fidelity Level (FL)

In Fidelity Level (FL) analysis presented in Table 10, it was used to determine plant species that are most commonly associated with the treatment of particular disease categories. The highest Fidelity Level was observed for Vernonia amygdalina used for stomachache (96%), Moringa oleifera for tuberculosis (94%), Mangifera indica for malaria (90%), and Azadirachta indica for cough and catarrh (88%). These high fidelity values therefore confirm that these plant species are commonly used for the treatment of specific disease categories and therefore possess high medicinal

potential.

DISCUSSION

This study presents an account of the ethnomedicinal information on medicinal plants used by the inhabitants of the Umunede community in the management of prevalent diseases. The results of the ethnobotanical survey affirm the continued use of traditional medicine the rural healthcare system. This finding is in conformity with the results of ethnobotanical surveys in diverse parts of Nigeria and Africa, which affirm the continued use of medicinal plants in traditional medicine because of their availability, affordability and acceptability (Ojo and Sulaimon, 2020; Enebeli-Ekwutoziam et al., 2021; Ademiluyi, 2023; Adeniran and Akindele, 2024). The socio-demographic information on the participants indicates that the majority of the participants were middle-aged and older adults. This finding affirms the ethnobotanical knowledge of medicinal plants mostly among the older age group. This has been the case in diverse ethnobotanical studies, which affirm the older age group as the primary custodians of indigenous knowledge (Chijindu and Atubi, 2020; Tukur et al., 2024).

The declining use of traditional medicine among the younger age group raises concern over the potential loss of indigenous knowledge systems if not addressed with deliberate documentation and transmission strategies. The research established that there are twenty-nine medicinal plant species that are utilized in treating various ailments in the community. Such diversity is a characteristic of the tropical rainforest ecosystem of southern Nigeria. Similar ethnobotanical research conducted in various communities of Nigeria revealed a large number of plant species utilized in preparing medicinal plants (Treasure, 2020). For instance, an ethnobotanical survey of plant species in Kwara State revealed that over sixty medicinal plant species are utilized in treating malaria and various ailments (Evbuomwan et al., 2023). Similarly, another research conducted in Osun and Zamfara States of Nigeria revealed that many plant species are utilized in treating various ailments such as malaria, fever, and various gastrointestinal and respiratory problems (Ajao et al., 2023; Tukur et al., 2024).

The predominance of leaves as the most frequently utilized plant part in this research is consistent with various ethnobotanical research conducted in various communities of Africa (Ukwubile and Ezike, 2022; Adeniran and Akindele, 2024). Leaves are preferred plant parts due to their abundance and ready availability in most plant species and their high content of bioactive ingredients that are involved in therapeutic activities. In addition, the use of leaf harvesting is viewed as a sustainable practice compared to other methods such as the use of roots or bark which may lead to the destruction of the plant. Decoction was identified as the most common method of preparing herbal remedies in the study area. This has been extensively documented in previous ethnobotanical literature, owing to the fact that decoction can enhance the effectiveness of herbal remedies for treating diseases by promoting the use of phytochemicals (Evbuomwan et al., 2023; Odebunmi et al., 2022). Other methods of preparing herbal remedies, such as crushing, infusion and chewing, were also identified by the respondents, indicating the rich pool of traditional knowledge regarding herbal remedies. Malaria, cough, fever, diarrhea, respiratory infections and fatigue were identified as the most common diseases within the study area. These aforementioned diseases are some of the leading diseases within many rural communities in Nigeria and other parts of sub-Saharan Africa. Other diseases such as respiratory infections and gastrointestinal diseases have been identified in previous ethnobotanical literature as some of the most common diseases within many rural communities in Nigeria and other developing countries in the world (Mahmoud et al., 2020; Oluyemi and Akindele, 2023). The presence of both communicable diseases such as malaria, cough, fever, diarrhea, respiratory infections, and fatigue and non-communicable diseases such as hypertension and arthritis within the study area further indicates the presence of the dual burden of disease which is common in many developing countries in the world (Idu et al., 2025). Additional information regarding the cultural significance of medicinal plants within the study area was obtained using quantitative ethnobotanical analysis. The high Use Value (UV) of species such as Vernonia amygdalina, Moringa oleifera, Mangifera indica and Azadirachta indica indicates their

cultural significance within the study area, as they are commonly used by the people. Similar findings have been obtained in other ethnobotanical literature regarding the use of these plant species within Nigeria, where these species were identified as some of the most important medicinal plants within Nigeria, owing to their use in the treatment of many diseases (Odebunmi and Afolayan, 2021; Ajao et al., 2023). The high values of Informant Consensus Factor (FIC) in all categories of diseases point to a high level of agreement among informants concerning the use of specific medicinal plants to treat specific diseases. High values of consensus are generally taken to point to effective traditional remedies that have been validated over time (Heinrich et al., 1998; Evbuomwan et al., 2023). Similarly, the high values of Fidelity Level (FL) in all categories of diseases point to specific plant species being associated with specific diseases. For instance, Vernonia amygdalina showed high fidelity level in gastrointestinal upsets, while Mangifera indica and Azadirachta indica were associated with malaria and respiratory diseases respectively. This supports the proposition that traditional healers possess a high level of knowledge concerning the use of medicinal plants for specific diseases. The study therefore highlights the continued relevance of ethno-medicinal knowledge in rural health practices. However, environmental concerns such as deforestation, farming and urbanization could pose a threat to medicinal plant resources. Similar concerns have been raised in previous studies which point to the need to adopt measures to protect medicinal plants (Ukwubile and Ezike, 2022; Enyiukwu et al., 2024). The study therefore supports the need to document medicinal plants to protect ethno-medicinal knowledge for future pharmacological studies.

CONCLUSION

This study outlined the ethno-medicinal practices concerning plant use in addressing common diseases in the Umunede community. The study reveals that medicinal plants are of critical importance in addressing health concerns in rural community areas. A number of plant species belonging to different botanical families that are used to treat a number of diseases, such as malaria, coughs, fevers, diarrhea, respiratory tract infections, stomach upsets, and hypertension were recorded and documented. The high level of dependence on plant-based medicine among the respondents reveals traditional medicine as a critical primary health resource in rural communities. The socio-demographic data revealed that ethno-medicinal practices are mostly found among middle- and old-age groups, which reveals that ethno-medicinal practices are mostly transferred from one generation to another orally. This reveals a high possibility of ethno-medicinal practices disappearing in the future unless documentation and effective knowledge transfer strategies are employed. This is in line with ethnobotanical studies that reveal that traditional knowledge is mostly retained by older persons in rural communities. The study also reveals that leaves are mostly used in herbal medicine, and decoction is the main method of preparing herbal medicine which is in line with ethnobotanical studies that praise leaves for their abundance, ease of collection and high concentration of bioactive compounds. The quantitative analysis of the data also revealed that some of the plants are of critical importance in traditional medicine. The high Use Value (UV) of some of the plants reveals that they are widely known and used by almost all persons in the community. Similarly, high Informant Consensus Factor (ICF) values in all categories of diseases reveal a high level of agreement among all persons in the community concerning plant use in addressing diseases. Similarly, high values of Fidelity Level (FL) in some plants reveal a high level of use of some plants in addressing specific diseases, which could be a reflection of their potential therapeutic value. While medicinal plants are important resources to the community, the study also reveals that there are significant threats facing these resources. Deforestation, agriculture, over-exploitation and environmental degradation are significant threats facing medicinal plant biodiversity. Similar studies on medicinal plant biodiversity revealed that habitat destruction and over-exploitation are significant factors that greatly contribute to the endangering of medicinal plant resources in rural areas. In all, the study findings is a significance of this evident and they are valuable for future scientific studies and the formulation of medicinal plant products.

RECOMMENDATION

Based on the findings from this study, it is therefore recommended that there is a need for continuous documentation of ethno-medicinal knowledge to prevent its loss due to modernization and the decline in traditional knowledge transmission. Indigenous knowledge should be recorded systematically and preserved for future generations and scientific research to cub this, Government agencies, conservation organizations and local communities should collaborate to develop conservation strategies for medicinal plants through community-based conservation programs, establishment of medicinal plant gardens and sustainable harvesting practices should be encouraged to protect plant biodiversity, local communities should be educated on sustainable harvesting techniques to prevent the over-exploitation of medicinal plants. Practices such as selective harvesting, rotational harvesting and cultivation of medicinal plants in home gardens should be promoted to ensure long-term availability, further phytochemical, pharmacological, and toxicological studies should be conducted on the documented medicinal plants to validate their therapeutic properties and determine their safety and efficacy as such studies could lead to the discovery of new plant-based drugs, Appropriate policies should be developed to support the integration of validated traditional medicine into the formal healthcare system, this could enhance healthcare accessibility, particularly in rural communities where modern medical facilities are limited, Educational programs should be organized to raise awareness among younger generations about the importance of medicinal plants and traditional knowledge systems and encouraging youth participation in ethnobotanical research and conservation initiatives will help sustain these practices and finally, additional ethnobotanical studies should be conducted in neighboring communities to expand the database of medicinal plants used in traditional medicine. Comparative studies may reveal new medicinal plant species and broaden the understanding of indigenous healthcare practices.

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