



The Cultural Significance of Medicinal Plants in HIV and Diabetes Management

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ABSTRACT

The growing global burden of HIV and type 2 diabetes mellitus (T2DM) has intensified the need for culturally sensitive, integrative health approaches, particularly in low- and middle-income countries. This paper explores the dual role of medicinal plants not only as therapeutic agents but also as culturally embedded tools in the management of HIV and diabetes. Drawing on ethnographic case studies from Belize, sub-Saharan Africa, and Ethiopia, the study highlights how traditional knowledge systems shape health-seeking behaviors and perceptions of efficacy. While the pharmacological potentials of plant-based treatments are increasingly validated through scientific research, their cultural significance rooted in ancestral knowledge, spiritual beliefs, and communal practices remains critical in patient adherence and health outcomes. The paper also examines tensions between biomedicine and ethnomedicine, noting the influence of sociopolitical factors, trust, and access. By integrating ethnopharmacological evidence with anthropological insights, the paper advocates for interdisciplinary strategies that preserve Indigenous knowledge while enhancing evidence-based healthcare delivery. These findings provide a framework for developing culturally informed interventions, fostering dialogue between traditional and modern practitioners, and encouraging further research into sustainable, community-based health solutions.

Keywords: Medicinal plants, HIV/AIDS management, Type 2 Diabetes Mellitus (T2DM), Ethnomedicine, Cultural beliefs, Traditional healing, Belize, Ethnopharmacology.

INTRODUCTION

The World Health Organization (WHO) acknowledges traditional medicine's importance in health care systems throughout the Americas, especially in the Greater Caribbean and Mesoamerica. Belize, located in Central America, showcases a blend of conventional and non-conventional health systems among its diverse ethnic groups. In managing diabetes mellitus, various plants, known as "medicinal plants," play a crucial role in controlling the condition, alleviating symptoms, and preventing complications. Beyond their pharmacological effects, these plants carry significant cultural meanings, emphasizing the need for understanding culturally-relevant terms to develop effective research methodologies and interventions. Anthropology and ethnopharmacology can assess the effectiveness and cultural significance of these plant medicines [1-3]. Despite extensive documentation of plants used for similar diseases globally, limited information exists on Belizean plants effective for those with type 2 diabetes. Belizeans are investigating traditional plants for their potential health benefits through scientific approaches. However, cultural barriers often hinder progress. For instance, a case study on youths with HIV/AIDS highlighted that distrust in western medicine could lead to the avoidance of biomedical treatments. Therefore, enhancing communication and understanding at both interpersonal and institutional levels is essential. Facilitating group dialogues can enable patients facing similar health issues to share experiences with various practitioners, including biomedical professionals and traditional Mayan healers. This collaborative effort among diabetes educators, healers, and herbalists aims to enhance dialogue, understanding, and support for Belizeans managing diabetes [4-8].

Overview of HIV and Diabetes

Acquired immunodeficiency syndrome (AIDS) results from HIV infection, which destroys CD-positive T cells, impairing the immune system and leading to opportunistic infections. There are two main types of This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

HIV: HIV-1, which is more prevalent globally, and HIV-2, which is less common. By 2021, approximately 36.1 million people were living with HIV, with sub-Saharan Africa recording the highest prevalence. Antiretroviral therapy (ART) can effectively suppress the virus and improve health outcomes, but it has led to drug-resistant HIV variants. Despite ongoing research, no cure for HIV has been found, though natural products from traditional medicine, especially in Africa, are being explored for their potential against HIV. Various southern African plants have shown activity against viral infections. Diabetes mellitus is characterized by high blood glucose due to inadequate insulin production or action. Insulin helps move glucose into cells for energy [9-12]. Diabetes can emerge at any age, particularly type 2 diabetes, which can lead to serious complications if untreated. As of 2017, around 451 million adults had diabetes, projected to increase to 693 million by 2045, primarily affecting those in low- and middle-income countries. Managing diabetes is challenging in these regions due to socio-economic constraints. Many patients use medicinal plants for treatment, either alone or alongside prescribed medications, relying on traditional remedies that are often more accessible and affordable. However, knowledge gaps regarding effective usage and extraction methods persist, leaving patients concerned about potential side effects, dependence on herbal medicines, and treatment efficacy [13-17].

Traditional Medicine Practices

Traditional medicine has been used for centuries by various societies and cultures throughout the world, although it is more common in developing countries. Traditional treatment is defined in broad terms as any treatment that does not come from a pharmaceutical company and has been used for a long time, especially for chronic diseases. On the mainland, it is believed to be antiquated, unregistered, unregulated, unguaranteed, and malicious [18-23]. Medicinal plants play a major role in the Ethiopian people's health care system. Using different plants as traditional medicine to treat various human ailments has been applied for generations in Ethiopia, particularly in Silte Zone. Despite the widespread local application of traditional medicine, little information is available on its use by the local community. This study, therefore, aims to investigate the traditional Medicinal Plants used by the local people to treat various human ailments in the Halabu valley, Southern Ethiopia. Ethiopia is an African country that has long been recognized for its rich and diverse flora. Ethiopia has 6300 species of flowering plants, which can be divided into 2868 endemics, 205 one-plant endemics, and 726 Afroalpine and 300 Afromontane. In Ethiopia, medicinal plants have been used to treat many ailments. In many villages around Ethiopia, traditional medicine is still in widespread use to treat several human ailments despite the introduction of modern health care services as early as 1920. Plant remedies have been generally preferred to synthetics by the community [24-29].

Historical Context

Humanity's understanding of HIV and diabetes dates back to historical records. Early examinations focused on symptoms. Texts on diabetes date to around 500 BCE, where Egyptians noted excessive urination and body wasting. About 1500 years later, Greek physician Aretaeus of Cappadocia described body lesions and compared them to moths eating away at the body. The term diabetes first appeared during this period to describe the excessive urination in patients. Hippocrates identified two types of diabetes, labeling the first as ainsulinous diabetes. The modern understanding of diabetes did not develop for another 1500 years [30-34]. The 1400-1600s saw significant scientific advancements regarding bodily functions, leading to models for urine production and pancreatic physiology, although these were not acted upon immediately. The 1800s marked a turning point, as scientific community advancements led to the discovery of aldose sugars in urine. Researchers investigated diabetic chemicals, believing they influenced the disease's progression or might counteract its effects. From the 1860s until Fisher isolated and purified insulin nearly 60 years later, various attempts were made to identify the sugar linked to diabetes [35-39].

Cultural Beliefs and Practices

Beginning in the 1990s, an HIV/AIDS epidemic emerged in Belize, increasing infection rates and highlighting the need for preventative healthcare and alternative treatments. Indigenous healthcare providers began to play a significant role, using ethnomedicine particularly in rural areas. Plant medicine remains widespread, gaining cultural significance in treating HIV/AIDS and diabetes mellitus. Modernity is shifting perspectives among Indigenous healers and patients regarding HIV/AIDS treatment [30-34]. Social interactions shape the cultural meaning of medicinal plants. As the ethnomedicine paradigm evolves under Western scientific influence, rural populations trust Indigenous healers due to skepticism towards biomedicine, social pressures, and cultural changes. Patients also begin to incorporate biomedicine alongside Indigenous treatments, reflecting a reciprocal relationship in treatment approaches. The growing capacity of Indigenous providers affects the perception of medicinal

plants, symbolizing knowledge and social integrity. Patients often expect biomedicine to be effective, while those in prolonged treatment may view medicinal plants as ineffective in addressing HIV/AIDS [35-39].

Medicinal Plants in HIV Management

HIV attacks the immune system, leading to AIDS, which can cause cancer and opportunistic infections. It was the leading cause of death in developing countries until 2009. In 2018, about 7.7 million people were HIV-positive, primarily in low- to middle-income countries in sub-Saharan Africa, with South Africa alone having 7.2 million cases. Only 47% of those in care programs received treatment by the end of 2018, following 1 million new infections globally in 2016, resulting in approximately 920,000 deaths. Sub-Saharan Africa accounted for about 70% of new infections and 71% of all HIV cases. Living with HIV involves discrimination, isolation, and societal challenges [20-24]. Many patients are skeptical of health facilities and prefer traditional remedies over modern treatments, which they view as politically influenced. This perspective contrasts with antiretroviral therapy (ART), which aims to suppress HIV replication. While ART reduces viral load, it does not eliminate the virus or prevent new infections, and issues like viral resistance highlight the need for improved treatment options. There is a growing interest in natural products with anti-HIV properties, similar to their use in cancer and infectious disease treatments. Secondary metabolites from medicinal plants show anti-retroviral activity against HIV-1. Many patients, about 70%, seek traditional healers for symptom relief instead of Western medicine, especially in rural areas with limited access to healthcare. Various Southern African plants are also used by different ethnic groups to treat conditions related to HIV, AIDS, and ART therapy [25-30].

Medicinal Plants in Diabetes Management

The study conducted in Mopani District, Limpopo Province, South Africa has revealed that people residing in poverty-stricken areas still use medicinal plants as first-line health care despite having access to primary health care facilities where conventional medicines are available. The results displayed that nationally and locally, the majority of villagers use medicinal plants to treat and manage the severity of a wide range of ailments. It was also found that herbalists often during the consultation identify the disease name, which they also translate into English. It was also noted that villager's intake of medicinal plants is often based on fashion or some prior experience. The study also makes recommendations for the conservation of the important plant resource, increased research efforts, and post-graduate studies of student researchers. It was found that some plant species unique to the area offer numerous opportunities for phytochemical bioassays leading to the discovery of novel compounds with potential health benefits for humans. Eighty-three plant species belonging to 69 different families were documented as being used in the treatment of over twenty ailments. Such ailments included sexually transmitted diseases, infertility and erectile dysfunction, diabetes mellitus, headaches, hypertension, stomach-ache, hepatitis B, as well as miscellaneous ailments such as malnutrition and cardiac health [31-34].

Case Studies

The potential of medicinal plants in enhancing health care access for HIV management in Zambia is well recognized. This study focuses on plants used for chronic HIV management in Livingstone, where residents often consult health practitioners. Health is seen as contingent upon ancestral approval, achieved through good behavior and rituals, including chicken sacrifices. Two food plants, *Solanum aethiopicum* and *Amaranthus spinosus*, were associated with the initiation of HIV/AIDS, along with preservatives from *Lonchocarpus* spp. Over half of participants lacked information on the plants' actions, either due to unavailability or discouragement from practitioners. In Lesotho, a study highlighted the role of goats and cattle in diabetes management, serving as sources of milk, meat, and fertilizer, treating ailments like sore throat and tuberculosis. Goats, in particular, were believed to alleviate headaches and foster strong emotional bonds with herders. Surprisingly, factors like age and sex did not affect knowledge in this context. In Namibia's Omusati Region, another study explored plants used for medicine and diet by locals, documenting various species. In Limpopo Province, medicinal plant usage for diabetes was assessed, primarily featuring *Aloe* species, alongside *Cassia abbreviata*, *Opuntia ficus-indica*, *Tinospora fragosa*, and *Grewia villosa*. For HIV/AIDS-related ailments, *Aloe* species, *Tetraclinis articulata*, *Siphonochilus aethiopicus*, and *Kalanchoe thyrsiflora* were noted, with *Siphonochilus aethiopicus* being the most commonly used. Modern lifestyles, while beneficial, can detrimentally impact well-being. It is crucial to preserve the utilization of medicinal plants globally for health and longevity [15, 16].

Ethnobotanical Research

This paper examined the ethno-botanical knowledge of plant medicine for managing T2DM culturally in Belize. It highlighted the cultural significance of plant medicines in enhancing glycemic control, reducing

diabetes complications, and improving overall well-being. The findings aim to inform future research on folk medical practices for diabetes and serve as a model for studying medicinal plants and well-being in various cultures. The study engaged T2DM patients from folk schools through multi-tiered recruitment methods, including semi-structured interviews and snowball sampling to gather knowledge at family and community levels. Participants included 23 individuals from diverse socio-demographic backgrounds. Ethno-botanical techniques such as context-setter interviews, free-listing, pile-sorting, and cognitive testing were utilized. Results indicated that plant medicines play a vital role culturally, categorized as glycemic regulators, diabetes mitigators, and well-being enhancers. The study contextualized the importance of these plant remedies through historical, social, and medical lenses within an ethnographic case study framework, emphasizing the cultural dynamics of living with and treating T2DM as a chronic condition [17, 18].

Challenges in Integrating Traditional and Modern Medicine

Aspects of culture have influenced how learning and belief systems unrelated to western and/or scientific influence relate to HIV/AIDS and diabetes mellitus management in Botswana and South Africa, respectively. Traditional communities have been illuminated in the role cultural practices, food beliefs and eating habits, and the use of traditional healing practices to manage diabetes and HIV in Botswana and South Africa, respectively. Recommendations towards improving communication; educating cultural groups about medications and treatment; empowering people to manage their health; aligning dietary guidelines with cultural norms; including traditional foods in health programs; and utilizing popular figures to disseminate health information have been offered. Medicinal plants, over the years, have gained credence in HIV/AIDS and diabetes mellitus management across different communities in Botswana and South Africa. Ethnobotanical surveys have revealed the extensive use of medicinal plants in managing HIV/AIDS in and around Gaborone in Botswana. Many plant species reported for use have; however, a wider clinical appeal, having also been reported for HIV/AIDS management in other countries in Africa and beyond. Nevertheless, testing of safety, efficacy and identification of bioactive(s) for leads optimization remains a task of high priority. Amongst other plants belonging to the Acanthaceae family and with wide pre-clinical antiretroviral character, further work on *Agapanthus praecox* with potential for enteric bioavailability has been suggested. Additionally, there is a growing call for research(s) on medicinal plants used in and around the Free State province for the management of diabetes mellitus. To provide a basis for the international comparative and evaluation of such practices realizing more internationally and culturally appropriate treatments, standardization of products is of high priority. Though limited knowledge of the expected physiological effects of traditional medicines in general, on HIV/AIDS and diabetes mellitus in particular, the affordability, accessibility and cultural relevance of traditional medicines to the high disease burden of the respective conditions in South Africa have been identified [19, 20].

Future Directions

Medicinal plants are widely utilized for health care worldwide, particularly in treating HIV/AIDS and diabetes in several African nations like Nigeria, where faith-based approaches are crucial. The integration of herbal medicine with clinical options in managing chronic diseases has been emphasized. Healing plants are increasingly used in developing countries, yet research on those effective for non-communicable diseases (NCDs) like HIV and type 2 diabetes (T2DM) is limited. The cultural importance of these plants, alongside the growing impact of NCDs on traditional societies, is underexplored. Ethical concerns surrounding ethnopharmacological research into T2DM and the HIV crisis have emerged, especially regarding the potential misuse of traditional knowledge through patenting without consent. Such practices could exacerbate inequalities between marginalized communities and the global economy and raise biosecurity issues. The lack of legal protection for traditional knowledge and genetic resources means nations risk losing invaluable information as global sharing practices remain inequitable. The bioethics concerning biopiracy and the WHO's Traditional Medicine Strategy from 2021-2023 aimed to regulate traditional knowledge use. It's essential to examine the cultural relevance of traditional healing for HIV and T2DM amid rising NCDs. Identifying commonly used plants and researching their medicinal interactions will provide insights for future studies. This investigation will help preserve crucial plant knowledge that globalization threatens, particularly in rural regions where reliance on these plants is highest [21, 22].

CONCLUSION

Medicinal plants represent more than therapeutic agents; they are cultural artifacts embedded in social, historical, and spiritual frameworks of health. In managing chronic diseases such as HIV and T2DM, especially in regions like Belize, sub-Saharan Africa, and Ethiopia, the use of traditional remedies is both a

necessity and a reflection of deeply rooted cultural identities. These plants serve as glycemic regulators, immune boosters, and symbols of ancestral wisdom, offering accessible alternatives where biomedical infrastructure may be limited. However, barriers such as mistrust in biomedicine, lack of standardization, and limited ethnobotanical documentation persist. To optimize health outcomes, it is imperative to foster respectful collaboration between biomedical professionals and traditional healers, promoting mutual understanding and evidence-based validation of plant medicines. Ethnobotanical and anthropological research must continue to preserve this knowledge, while health systems should adapt to incorporate culturally grounded practices. In doing so, we move closer to a truly integrative and inclusive model of global health care—one that honors both science and tradition.

REFERENCES

1. Allen LP, Ellis L, Engleton C, Valerio VL, Hatala AR. Plant medicine usage of people living with type 2 diabetes mellitus in Belize: A qualitative exploratory study. *PloS one*. 2023 Aug 3;18(8):e0289212.
2. Chauke MA, Shai LJ, Mogale MA, Tshisikhawe MP, Mokgotho MP. Medicinal plant use of villagers in the Mopani district, Limpopo province, South Africa. *African Journal of Traditional, Complementary and Alternative Medicines*. 2015;12(3):9-26.
3. Prinsloo G, Marokane CK, Street RA. Anti-HIV activity of southern African plants: Current developments, phytochemistry and future research. *Journal of ethnopharmacology*. 2018 Jan 10;210:133-55.
4. Kasole R, Martin HD, Kimiywe J. Traditional medicine and its role in the management of diabetes mellitus: "patients' and herbalists' perspectives". *Evidence-Based Complementary and Alternative Medicine*. 2019;2019(1):2835691.
5. Eshete MA, Molla EL. Cultural significance of medicinal plants in healing human ailments among Guji semi-pastoralist people, Suro Barguda District, Ethiopia. *Journal of ethnobiology and ethnomedicine*. 2021 Oct 18;17(1):61.
6. Alemu M, Asfaw Z, Lulekal E, Warkineh B, Debella A, Sisay B, Debebe E. Ethnobotanical study of traditional medicinal plants used by the local people in Habru District, North Wollo Zone, Ethiopia. *Journal of Ethnobiology and Ethnomedicine*. 2024 Jan 4;20(1):4. [springer.com](https://www.springer.com)
7. David R, Forshaw R. Medicine and Healing Practices. *Ancient Egypt*. 2023 Jan 1;23(2):36-41.
8. Angulo JC, Virseda-Chamoro M. The evaluation of urinary signs and symptoms in medieval medicine. *Continence Reports*. 2024 Sep 1;11:100057.
9. Attah AF, Fagbemi AA, Olubiyi O, Dada-Adegbola H, Oluwadotun A, Elujoba A, Babalola CP. Therapeutic potentials of antiviral plants used in traditional African medicine with COVID-19 in focus: A Nigerian perspective. *Frontiers in pharmacology*. 2021 Apr 26;12:596855. [frontiersin.org](https://www.frontiersin.org)
10. Olwenyi OA, Asingura B, Naluyima P, Anywar GU, Nalunga J, Nakabuye M, Semwogerere M, Bagaya B, Cham F, Tindikahwa A, Kiweewa F. In-vitro Immunomodulatory activity of *Azadirachta indica* A. Juss. Ethanol: water mixture against HIV associated chronic CD4+ T-cell activation/exhaustion. *BMC Complementary Medicine and Therapies*. 2021 Apr 9;21(1):114.
11. Assefa MT, Frounfelker RL, Tahir SA, Berent JM, Abdi A, Betancourt TS. Traditional medicine and help-seeking behaviors for health problems among somali bantu refugees resettled in the United States. *Qualitative Health Research*. 2021 Feb;31(3):484-97. [academia.edu](https://www.academia.edu)
12. Cruz ML, Christie S, Allen E, Meza E, Nápoles AM, Mehta KM. Traditional healers as health care providers for the Latine community in the United States, a systematic review. *Health equity*. 2022 Jun 1;6(1):412-26. [liebertpub.com](https://www.liebertpub.com)
13. Asiimwe S, Kamatenesi-Mugisha M, Namutebi A, Borg-Karlsson AK, Musiimenta P. Ethnobotanical study of nutri-medicinal plants used for the management of HIV/AIDS opportunistic ailments among the local communities of western Uganda. *Journal of ethnopharmacology*. 2013 Nov 25;150(2):639-48.
14. Ogbuji NG, Ataga EA. Comparative Bacterial Metagenomics of *Cnidioscolus aconitifolius* (Mill.) IM Johnston and Other Leafy Vegetables. *Microbiology Research Journal International*. 2021 Nov 6;31(7):34-49. [send2pub.com](https://www.send2pub.com)
15. Anywar G, Kakudidi E, Byamukama R, Mukonzo J, Schubert A, Oryem-Origa H, Jassoy C. A review of the toxicity and phytochemistry of medicinal plant species used by herbalists in

- treating people living with HIV/AIDS in Uganda. *Frontiers in pharmacology*. 2021 Apr 15;12:615147. [frontiersin.org](https://www.frontiersin.org)
16. Mutola S, Pemunta NV, Ngo NV. Utilization of traditional medicine and its integration into the healthcare system in Qokolweni, South Africa; prospects for enhanced universal health coverage. *Complementary Therapies in Clinical Practice*. 2021 May 1;43:101386. [sciencedirect.com](https://www.sciencedirect.com)
 17. Johnson R, Fiddler T, Pirozek J, Gordon J, Sodhi S, Poirier J, Kattini R, Kelly L. Traditional medicine and type 2 diabetes in first nations patients. *Canadian Journal of Diabetes*. 2022 Feb 1;46(1):53-9. [chwconnect.ca](https://www.chwconnect.ca)
 18. Omodara DA, Gibson L, Bowpitt G. ... impact of cultural beliefs in the self-management of type 2 diabetes among Black sub-Saharan Africans in the UK—a qualitative study informed by the PEN-3 cultural *Ethnicity & health*. 2022. [tandfonline.com](https://www.tandfonline.com)
 19. Okubena O, Adebesein A, Omogbiya A, Oluwole O, Asomadu R, Afolabi M, Makanjuola S, Ajonuma L, Dosunmu A, Otitolaju O, Umukoro S. Polyphenol Rich Nutritional Supplement Derived from the West African Sorghum Bicolor Leaf Sheaths Has Evidence-Based Efficacy and Health Promoting Effects. [preprints.org](https://www.preprints.org)
 20. Şahin T, Acar AG, Kılıç Ö, Taşkın T. Traditional and Modern Health Uses of Cannabis sativa L. In *Plants as Medicine and Aromatics* 2024 Jan 1 (pp. 108-117). CRC Press. [HTML]
 21. Richard K, Andrae-Marobela K, Tietjen I. An ethnopharmacological survey of medicinal plants traditionally used by the BaKalanga people of the Tutume subdistrict in Central Botswana to manage HIV/AIDS, HIV-associated conditions, and other health conditions. *Journal of Ethnopharmacology*. 2023 Nov 15;316:116759.
 22. Nakibuuka MM, Mugabi R. Ethnobotanical study of indigenous nutri-medicinal plants used for the management of HIV/AIDS opportunistic ailments among the local communities of central Uganda. *Scientific African*. 2022 Jul 1;16:e01245.
 23. Orji OU, Ibiam UA, Aja PM, Ugwu P, Uraku AJ, Aloke C, Obasi OD, Nwali BU. Evaluation of the phytochemical and nutritional profiles of *Cnidioscolus aconitifolius* leaf collected in Abakaliki South East Nigeria. *World J Med Sci*. 2016;13(3):213-217.
 24. Enechi OC, Okpe CC, Ibe GN, Omeje KO, Ugwu Okechukwu PC. Effect of *Buchholzia coriacea* methanol extract on haematological indices and liver function parameters in *Plasmodium berghei*-infected mice. *Glob Veterinaria*. 2016;16(1):57-66.
 25. Alum EU, Uti DE, Ugwu Okechukwu PC, Alum BN. Toward a cure—Advancing HIV/AIDS treatment modalities beyond antiretroviral therapy: A review. *Med*. 2024;103(27):e38768.
 26. Obeagu EI, Bot YS, Obeagu GU, Alum EU, Ugwu Okechukwu PC. Anaemia and risk factors in lactating mothers: A concern in Africa. *Int J Innov Appl Res*. 2024;11(2):15-17.
 27. Alum EU, Ibiam UA, Ugwuja EI, Aja PM, Igwenyi IO, Offor CE, Orji UO, Ezeani NN, Ugwu OP, Aloke C, Egwu CO. Antioxidant effect of *Buchholzia coriacea* ethanol leaf extract and fractions on Freund's adjuvant-induced arthritis in albino rats: A comparative study. 2022;59(1):31-45.
 28. Offor CE, Ugwu Okechukwu PC, Alum EU. Determination of ascorbic acid contents of fruits and vegetables. *Int J Pharm Med Sci*. 2015;5:1-3..
 29. Amusa MO, Adepoju AO, Ugwu Okechukwu PC, Alum EU, Obeagu EI, Okon MB, Aja PM, Samson AOS. Effect of ethanol leaf extract of *Chromolaena odorata* on lipid profile of streptozotocin-induced diabetic Wistar albino rats. *IAA J Biol Sci*. 2024;10(1):109-117.
 30. Enechi YS, Ugwu OC, Ugwu Okechukwu PC, Omeh K. Evaluation of the antinutrient levels of *Ceiba pentandra* leaves. *IJRRPAS*. 2013;3(3):394-400.
 31. Ugwu Okechukwu PC, Nwodo OFC, Joshua EP, Odo CE, Ossai EC. Effect of ethanol leaf extract of *Moringa oleifera* on lipid profile of malaria-infected mice. *Res J Pharm Biol Chem Sci*. 2014;4(1):1324-1332.
 32. Ugwu OPC, Alum EU, Uhama KC. Dual burden of diabetes mellitus and malaria: Exploring the role of phytochemicals and vitamins in disease management. *Res Inven J Res Med Sci*. 2024;3(2):38-49.
 33. Alum EU, Ugwu Okechukwu PC, Aja PM, Obeagu EI, Inya JE, Onyeije AP, Agu E, Awuchi CG. Restorative effects of ethanolic leaf extract of *Datura stramonium* against methotrexate-induced hematological impairments. *Cogent Food Agric*. 2013;9(1):2258774.
 34. Offor CE, Nwankwegu FC, Joshua EP, Ugwu Okechukwu PC. Acute toxicity investigation and anti-diarrhoeal effect of the chloroform-methanol extract of the leaves of *Persea americana*. *Iran J Pharm Res*. 2014;13(2):651-658. PMID: 25237361; PMCID: PMC4157041.

35. Afiukwa CA, Oko AO, Afiukwa JN, Ugwu Okechukwu PC, Ali FU, Ossai EC. Proximate and mineral element compositions of five edible wild grown mushroom species in Abakaliki, southeast Nigeria. *Res J Pharm Biol Chem Sci.* 2013;4:1056-1064.
36. Ugwu OP, Alum EU, Ugwu JN, Eze VH, Ugwu CN, Ogenyi FC, Okon MB. Harnessing technology for infectious disease response in conflict zones: Challenges, innovations, and policy implications. *Med.* 2024;103(28):e38834.
37. Obeagu EI, Ugwu OPC, Alum EU. Poor glycaemic control among diabetic patients; A review on associated factors. *Newport Int J Res Med Sci (NIJRMS).* 2023;3(1):30-33.
38. Nwaka AC, Ikechi-Agba MC, Okechukwu PU, Igwenyi IO, Agbafor KN, Orji OU, Ezugwu AL. The effects of ethanol extracts of *Jatropha curcas* on some hematological parameters of chloroform intoxicated rats. *Am-Eur J Sci Res.* 2015;10(1):45-49.
39. Ezeani NN, Ibiam UA, Orji OU, Igwenyi IO, Aloke C, Alum E, Aja PM, Ugwu OP. Effects of aqueous and ethanol root extracts of *Ola x subscopioidea* on inflammatory parameters in complete Freund's adjuvant-collagen type II induced arthritic albino rats. *Pharmacogn J.* 2019;11(1)

CITE AS: Maina Mwaura F. (2025). The Cultural Significance of Medicinal Plants in HIV and Diabetes Management. Research Output Journal of Biological and Applied Science 5(3):105-111. <https://doi.org/10.59298/ROJBAS/2025/53105111>