Sub-Saharan medicinal plants and their medical use: a semi-systematic review

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Abstract

Medicinal plants have long played a central role in traditional medicine systems worldwide, particularly in Sub-Saharan Africa, where they continue to serve as primary sources of healthcare. This review investigates the current state of scientific research on medicinal plants in Sub-Saharan Africa, based on a bibliographic search conducted on PubMed and Scopus, retrieving 2,770 and 435 records, respectively. A rigorous screening process was applied, beginning with filters to include only peer-reviewed documents such as original research articles, reviews, and clinical trials. This initial filter yielded 388 papers from PubMed and 369 from Scopus. A second filter was then applied to limit the selection to publications from the last two years (2023-2025), resulting in 35 documents from PubMed and 71 from Scopus, for a total of 106 articles, thus allowing the analysis to focus on the most recent scientific contributions in the field. The review aims to explore the evolution of research in terms of biological, chemical, and methodological rigor, with particular emphasis on the validation of traditional uses through experimental studies. Articles were clustered based on plant species, extract type (*e.g.*, ethanolic, methanolic, aqueous), target pathogens (bacterial, fungal, viral), extraction and analytical techniques, and reported pharmacological effects. Our findings highlight a shift toward more standardized methodologies, improved characterization of bioactive compounds, and stronger experimental designs, revealing a growing synergy between ethnobotanical knowledge and modern pharmacology.

Introduction

Medicinal plants have historically served as the foundation of therapeutic practices across all known civilizations. Since antiquity, plant-based remedies have been employed to treat a wide range of ailments and remain widely used today, particularly in regions where access to modern healthcare is limited.[1] However, these practices often lacked scientific rigor, standardized methodologies for harvesting, preserving, or processing plant materials, and systematic identification of active compounds. According to the World Health Organization (WHO), up to 80% of the population in developing regions continues to rely on plant-based remedies for primary healthcare. Recognizing this enduring relevance, the WHO has encouraged African member states to promote and integrate traditional medicine into national healthcare policies and to

strengthen international collaboration aimed at standardizing and scientifically validating plant-based therapies.[2] Despite significant progress in public health initiatives, several infectious diseases, including the neglected tropical diseases (NTDs), persist in sub-Saharan Africa. This persistence is largely due to fragmented healthcare systems, insufficient funding, and weak disease surveillance infrastructures.[3] Among the many challenges currently affecting public health, antimicrobial resistance (AMR) has become a major and growing concern. These microorganisms have become resistant through different mechanisms, which can be native or acquired from other microorganisms. These mechanisms include limiting drug absorption, modifying its target, inactivating a drug, and active efflux.[4] The emergence and spread of the latter are accelerated by human activity, primarily through the excessive and misuse of antimicrobials to treat, prevent, or control infections in humans, animals, and plants. These factors have contributed to the rapid emergence and spread of resistant microbial strains, complicating the treatment of common infectious diseases and threatening the effectiveness of existing antimicrobial therapies.[5] AMR currently constitutes one of the greatest public health threats of the 21st century, ranking antimicrobial-resistant infections as the third leading cause of death after cardiovascular diseases.[6] In the African context, this problem is particularly alarming, as in 2019, sub-Saharan Africa recorded the highest mortality rate, at 23.5 deaths per 100,000 people, attributable to AMR compared to other regions.[7] Some sub-Saharan African countries lack adequate controls to monitor antibiotic distribution.[8] In response to this growing threat, research efforts have increasingly focused on alternative or complementary therapeutic strategies aimed at enhancing the efficacy of conventional treatments. The plant kingdom constitutes an attractive source for new antibacterial agents due to the variety of plant secondary metabolites, in addition to the scarcity of new synthetic antibiotics.[9-11]

One such promising approach is combination therapy, particularly involving the use of natural products in conjunction with standard antimicrobial agents.[12] It has been documented that antimicrobial resistance can be mitigated through the synergistic interactions of natural products with conventional antimicrobials.[13]

Today, natural products and their derivatives account for more than 50% of all the drugs currently in clinical use worldwide.[14,15] In Sub-Saharan Africa, where access to modern medical care remains limited, traditional medicine based on local flora is not only a cultural heritage but also a public health necessity. Continued reliance on traditional medicine can be attributed to two main factors. First, access to allopathic medicines and Western forms of treatment remains limited across Sub-Saharan Africa, primarily due to poverty, geographic inaccessibility, and underdeveloped healthcare infrastructure.[16] A large portion of the population is unable to afford or access modern medical care, especially in rural and underserved areas. Second, while effective treatments exist for many infectious diseases, they are often constrained by high costs, poor availability, or the emergence of drug resistance.[17] NTDs and other conditions disproportionately affecting African populations remain poorly addressed by current medical interventions, highlighting an urgent need for innovative and locally adapted therapeutic strategies.[18]

Plants typically contain a complex array of bioactive metabolites that may act individually, additively, or synergistically.

These compounds can enhance bioavailability, facilitate absorption, improve therapeutic efficacy, and reduce adverse effects. Compared to some conventional therapies, most herbal remedies are based on multi-plant formulations, where the interactions among different constituents can amplify or modulate their therapeutic potential.[19] Ongoing exploration and scientific validation of the medicinal properties of plants hold promise for discovering novel drugs and innovative therapeutic strategies, thereby advancing modern medicine. Beyond their significant role in managing infections and diseases prevalent in rural or remote areas, plant extracts may also offer viable approaches to combat antibiotic resistance or serve as adjuvants to existing pharmaceutical treatments. To reflect the growing international research interest in this emerging field, we conducted a comprehensive review focusing on the use of traditional medicine to address pressing health challenges in African countries.

Our findings underscore the need for continued and innovative research to validate traditional uses, optimize and standardize protocols, and develop sustainable approaches for harnessing these valuable medicinal resources. While current global research trends prioritize the discovery of new bioactive compounds or pharmaceutical candidates, there is a relative neglect of the cultivation and domestication of medicinal plant species with proven therapeutic value. Addressing this gap is crucial not only for ensuring a sustainable supply of effective plant-based medicines but also for safeguarding endemic plant biodiversity.

Objective

This review aimed to map recent scientific contributions on the use of medicinal plants in Sub-Saharan Africa, applying a structured selection and analysis process to identify emerging trends in experimental validation, bioactive compound profiling, and pharmacological efficacy.

In this bibliometric analysis, we examined all indexed publications from 2023 to 2025 across major scientific databases such as Scopus and PubMed. A rigorous, multi-stage screening process was applied to select only peer-reviewed documents, such as research articles, reviews, and clinical trials. To identify patterns in research collaboration and thematic focus, we employed community detection methods to map relationships among authors, countries, and research topics. Additionally, thematic content analysis was conducted to highlight emerging trends and dominant research directions in the field. By integrating thematic synthesis with content-based clustering techniques, this review identifies the most extensively studied medicinal plants, their primary therapeutic applications, the types of extracts commonly investigated, and the experimental methodologies used to assess bioactivity. This systematic review provides a comprehensive overview of the current state of research on medicinal plants in Sub-Saharan Africa, analyzing their ethnobotanical uses, pharmacological properties, and therapeutic potential. Beyond synthesizing the available scientific evidence, it aims to promote greater awareness and the responsible integration of traditional medicine into public health strategies. The findings highlight the value of plant-based therapies as a complementary approach, particularly in resource-limited settings where access to conventional treatments remains constrained.

Materials and Methods

The data analyzed in this study were obtained through a structured search query conducted in the PubMed and Scopus databases, a widely adopted approach in bibliometric and systematic reviews.[20] The search strategy followed the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines to ensure methodological rigor and transparency.[21] In this study, the search string used was "TITLE-ABS KEY" ("med-

icinal plant" AND "Sub-Saharan Africa").

The selection of these databases was based on their complementary strengths. PubMed, considered the gold standard for biomedical literature, provides access to over 30 million citations from MEDLINE, life science journals, and online books. Its focus on peer-reviewed content makes it essential for systematic reviews in medicine and pharmacology.[22] Scopus, on the other hand, offers broader disciplinary coverage, including fields such as ethnobotany, anthropology, and cultural heritage. It also features advanced citation analysis tools and includes non-MEDLINE journals, thereby addressing some of the scope limitations of PubMed.[23] To identify emerging research trends, knowledge gaps, and thematic clusters, we employed VOSviewer for keyword co-occurrence mapping. This tool enables the visual exploration of conceptual linkages within a body of literature; for instance, clustering terms such as "ethnobotany", "drug discovery", and "traditional medicine" can reveal interdisciplinary synergies and evolving research *foci*.[24] An overview of the methodological workflow is illustrated in Figure 1.

To ensure the scientific rigor and relevance of the selected literature, a set of exclusion criteria was applied during the screening process. The primary aim was to retain only documents presenting original or structured scientific content suitable for evaluating the current state of research on medicinal plants in Sub-Saharan Africa. Specifically, documents were excluded if they did not fall into one of the following peer-reviewed categories: original research articles, review articles, book chapters, or clinical trials.

Keyword, author, and country co-occurrence analyses were conducted utilizing VOSviewer (analysis type: co-occurrence; counting method: full counting). Additionally, parts of the linguistic structuring and methodological drafting of this review were assisted by the AI-based language models, specifically ChatGPT (OpenAI, GPT-4, 2025) and QWEN (Tongyi, Lab, 2025). These tools were used to assist in the formulation of PRISMA-compliant sections and summary texts. However, all content was critically reviewed and verified by the authors to ensure accuracy and academic integrity. Data analysis and visualization were performed using RStudio (version 4.x), with packages including tidyverse, ggplot2, and stringr for data manipulation, statistical analysis, and graphical representation.

Results

An initial search conducted across two databases using the keywords "medicinal plants" AND Sub-Saharan Africa" retrieved 2,770 documents from PubMed and 435 from Scopus. After applying filters to include only reviews, original research articles, and clinical trials, the number of records was reduced to 388 from PubMed and 369 from Scopus. A comparison between the two databases revealed approximately 40 duplicate entries, which were removed from the Scopus dataset to ensure consistency in the number of documents across both sources. A total of 757 records were retrieved from the Scopus (n=369) and PubMed (n=388) databases after applying filters for document type (articles, reviews, clinical trials, and book chapters). The most cited studies are summarized in Table 1.

A subsequent date filter (limiting results to the years 2023-2025) further narrowed the selection to 35 articles from PubMed and 71 from Scopus.

As shown in Table 2, a total of 36 records (33.96%) were identified as reviews, indicating a strong emphasis on summarizing and synthesizing existing knowledge on medicinal plants and related topics in Sub-Saharan Africa. These reviews likely reflect ongoing efforts to consolidate traditional and scientific knowledge for broader understanding and application.

Only six studies (5.66%) were classified as systematic

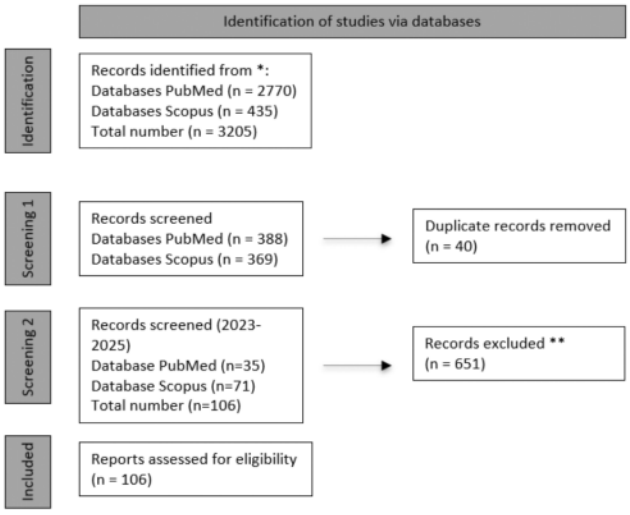

Figure 1. PRISMA 2020 flow diagram. *Number of records identified in each database; **number of records excluded only due to the exclusion criteria: non-review, non-article, non-clinical trials, non-book or chapter.

Table 1. Classification of the 757 records retrieved from Scopus (n=369) and PubMed (n=388) according to study type. The distribution highlights the prevalence of articles over the entire time span (%) out of a total of 757 documents.

Type of document	Total	Percentage (%) based on a total of 757 records
Article	409	54.03%
Book/book chapter	35	4.62%
Clinical study/clinical trial	8	1.06%
Ethnobotanical study	20	2.64%
Experimental study	24	3.17%
Nutritional study	9	1.19%
Pharmacological study	8	1.06%
Review	203	26.82%
Scoping review	4	0.53%
Systematic review	17	2.25%

reviews, highlighting a relative scarcity of rigorously synthesized evidence that follows structured methodologies to evaluate and integrate findings across multiple sources. Similarly, four documents (3.77%) were categorized as scoping reviews, suggesting limited efforts to map the breadth of available evidence and identify gaps in the literature.

In contrast, 50 items (47.17%) were identified as original research articles, showing a considerable level of primary research activity, although these may vary in methodological rigor and depth of analysis. Nine contributions (8.49%) were classified as books or book chapters, pointing to some integration of traditional knowledge within broader thematic or cultural contexts, though often lacking detailed empirical validation. Finally, only one clinical study (0.94%) was identified, further emphasizing the very limited presence of human-based experimental research into the efficacy, safety, or therapeutic applications of traditional remedies. These findings reveal a marked predominance of narrative and descriptive literature, with minimal empirical validation, clinical testing, or systematic synthesis of evidence. This pattern reinforces the relevance and timeliness of conducting a structured and updated systematic review to critically assess and synthesize current knowledge, while identifying key areas for future research and policy development.

These documents were analyzed separately, and keyword maps (Figure 2) were generated based on the research topics addressed. Based on Scopus data (total 71), using a minimum keyword occurrence threshold of five, a total of 62 out of 1,594 keywords met the inclusion criteria. For each of these 62 keywords, the total strength of co-occurrence links with other keywords was calculated. The final number of keywords selected for analysis was then reduced to 55, as closely related terms, such as “human” and “humans”, or “plants, medicinal” and “medicinal plants” were considered duplicates, and only the most representative term was retained (Figure 3). Similarly, based on PubMed data and applying

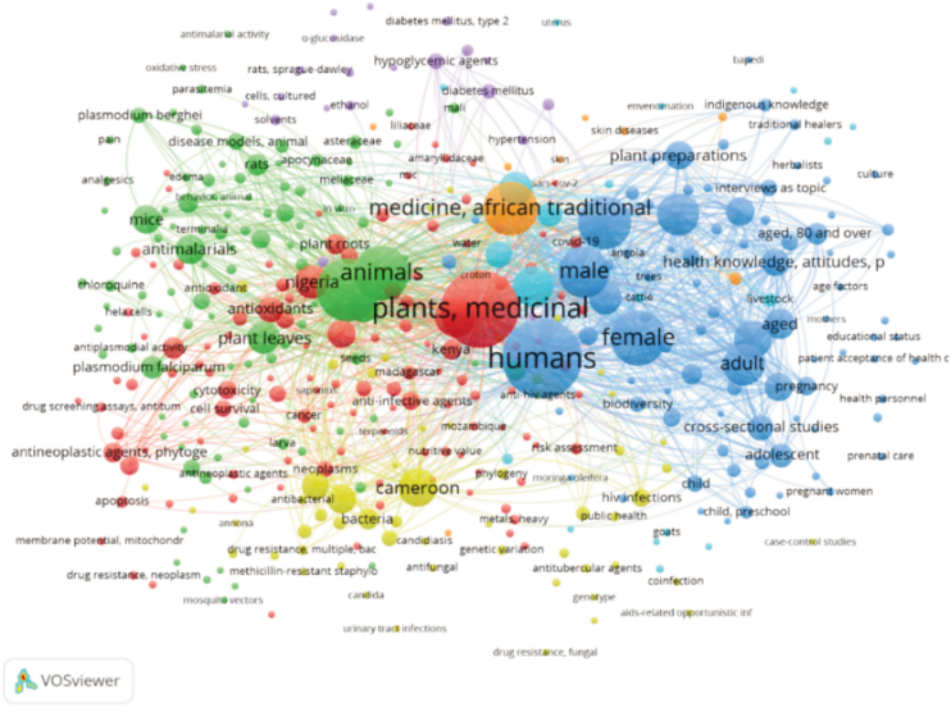

Figure 2. Example of a keyword co-occurrence map from the PubMed database before applying inclusion filters. The map was generated using VOSviewer from all articles retrieved from PubMed before filtering. Nodes represent the most frequent terms in titles and abstracts; circle size indicates term frequency, and distances and connections show the strength of associations.

Table 2. Classification of the 106 records retrieved from the second filtering step from Scopus (n=71) and PubMed (n=35) according to study type. Types of documents published in the last two years (%) out of a total of 106 documents.

Type of document	Counts	Percentage (%) based on a total of 106 records
Article	50	47.17%
Book/book chapter	9	8.49%
Clinical study	1	0.94%
Review	36	33.96%
Scoping review	4	3.77%
Systematic review	6	5.66%

the same occurrence threshold (five), 9 out of 248 keywords met the criteria (Figure 4).

To examine the contributions of individual countries in greater detail, a clustering analysis was conducted based on the first author's country of affiliation. The analysis revealed that, overall, 106 articles included affiliations from institutions spanning multiple countries. This approach aimed to elucidate geographic trends and highlight the regional distribution of scientific output within the field (Table 3 and Figure 5). South Africa (16.98%) and Nigeria (15.09%) are the two most prolific countries in the scientific literature on medicinal plants in Sub-Saharan Africa, together accounting for over 32% of the total 106 publications reviewed. This dominant contribution reflects their established academic and research infrastructures, as well as a strong national interest in tra-

Figure 3. Keywords co-occurrence map generated using VOSviewer based on filtered data published from 2023 to 2025 from Scopus database (71 documents).

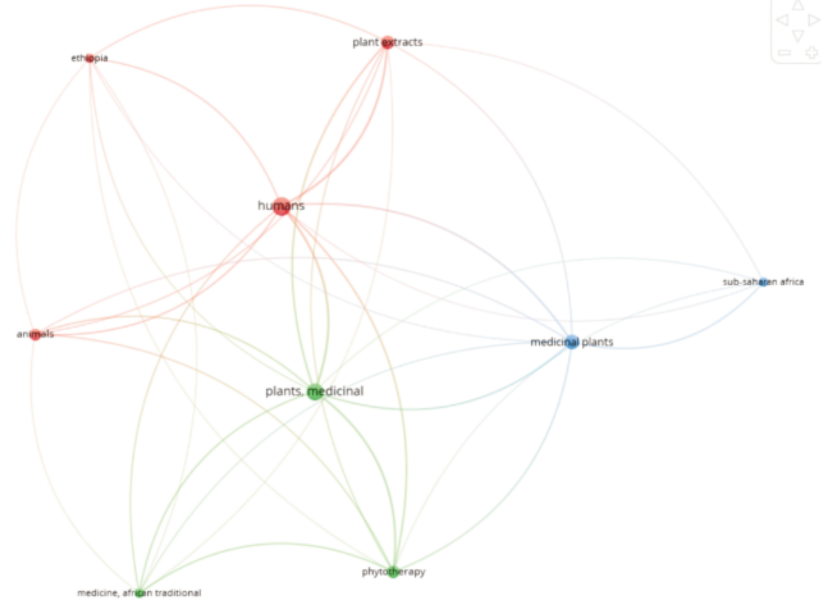

Figure 4. Keywords co-occurrence map generated using VOSviewer based on filtered data published from 2023 to 2025 from PubMed database (35 documents).

ditional medicine and biodiversity. A second tier of contributors includes Cameroon and Ethiopia (both at 7.55%), followed by Benin and Uganda (5.66% each), and Kenya (4.72%). These countries demonstrate a steady, though less dominant, engagement in the field, highlighting growing research capacities across Central and East Africa. Several countries, including India (3.77%), Botswana, Burkina Faso, the Democratic Republic of Congo, and Ghana (each at 2.83%), show emerging interest in the topic. Meanwhile, a broad group of nations, including Algeria, the United Kingdom, the United States, and Zimbabwe (1.89% each), as well as numerous others with only 0.94% representation, have a minimal presence. This suggests not only limited research and a lower interest in Sub-Saharan traditional medicine specifically, but also potentially indicates a gap in global engagement with this field. The leading roles of South Africa and Nigeria position them as central hubs for medicinal plant research in Sub-Saharan Africa, possibly due to better access to funding, higher research capacity, and a strategic focus on traditional medicine as part of national health strategies. While the diversity of countries involved in the literature reflects the rich ethnobotanical heritage of the region, the significant variation in publication output underscores persistent disparities in research infrastructure, funding availability, and academic networks among Sub-Saharan countries. Countries with minimal representation, despite often being rich in plant biodiversity, may benefit from increased investment, regional collaboration, and capacity-building programs. Targeted efforts could help fill current gaps in the literature, promote equitable research development, and encourage sustainable use of local medicinal resources.

Delving deeper into the use of medicinal plants, we identified the most frequently targeted pathogens in the selected studies (Table 4). Most of the research focused on microorganisms of high public health relevance, including *Plasmodium spp.* (malaria), HIV and diarrhea-associated enteric pathogens. These pathogens reflect regional health priorities and indicate a strong alignment between traditional knowledge and contemporary infectious disease burdens in Sub-Saharan Africa.

In particular, *Plasmodium spp.* emerged as the most commonly addressed pathogen group (Table 5), with several studies reporting the use of multiple species (*e.g.*, *Vernonia amygdalina*, *Aloe vera*, *Azadirachta indica*) and preparation methods (mainly decoctions and infusions) for antimalarial purposes. Similarly, medicinal plants were also reported for their efficacy against HIV/AIDS and associated opportunistic infections, with a subset of species being used exclusively for this indication.

Additionally, experimental studies investigating diarrheal disease models revealed significant inhibitory effects of various plant extracts on gastrointestinal motility and fluid accumulation, underscoring their potential role in managing enteric infections. These findings not only validate the empirical use of these plants but also emphasize the need for further bio-guided research to isolate and characterize their active compounds, with the goal of developing accessible and culturally relevant therapies for priority pathogens.

In the 106 data entries reporting pathogen strains studied in relation to medicinal plants, the following observations are highlighted:

- *Plasmodium* species (malaria parasites) are the most frequently studied pathogens, appearing in approximately 25.5% of the entries. This underscores the critical importance of malaria research in the context of traditional medicinal plant use.
- *Staphylococcus aureus* (including MRSA strains) ranks second, cited in about 21.7% of the studies, reflecting significant attention to bacterial infections and antimicrobial resistance challenges.
- HIV appears in roughly 12.3% of the data, indicating a notable focus on antiviral properties of medicinal plants.
- *Escherichia coli* and other sexually transmitted infections (including *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, syphilis, and *Trichomonas vaginalis*) each feature in about 7.5% of the records, demonstrating their relevance in infectious disease research.

Table 3. Countries involved in the 106 documents published from 2023 to 2025.

Country	Percentage (%) based on a total of 106 records
South Africa	16.98%
Nigeria	15.09%
Cameroon	7.55%
Ethiopia	7.55%
Benin	5.66%
Uganda	5.66%
Kenya	4.72%
India	3.77%
Botswana	2.83%
Burkina Faso	2.83%
Democratic Republic of Congo	2.83%
Ghana	2.83%
Algeria	1.89%
United Kingdom	1.89%
USA	1.89%
Zimbabwe	1.89%
Belgium	0.94%
Central African Republic	0.94%
China	0.94%
Chad	0.94%
Indonesia	0.94%
Côte d'Ivoire	0.94%
Madagascar	0.94%
Malawi	0.94%
Mali	0.94%
Netherlands	0.94%
Pakistan	0.94%
Portugal	0.94%
Romania	0.94%
Rwanda	0.94%
Saudi Arabia	0.94%
Tanzania	0.94%

Table 4. List of pathogen types cited across the 106 reviewed documents.

Pathogen	Citation frequency (%)
Bacteria	18.87%
Fungi	2.83%
Virus	25.47%
Protist and parasite	35.85%

- *Schistosoma* species, causative agents of schistosomiasis, appear in 6.6% of the entries, highlighting the attention to parasitic diseases.

Other bacteria, such as *Salmonella spp.*, *Pseudomonas spp.*, *Enterococcus spp.*, and *Mycobacterium tuberculosis,* show moderate representation, ranging from approximately 2.8% to 4.7%.

Pathogens, including *Trypanosoma spp.*, human papillomavirus (HPV), various fungi, filarial worms (*Wuchereria* and *Brugia*), and emerging viruses like SARS-CoV-2, are less frequently studied but still present, each accounting for between 1.9% and 4.7% of the entries.

The studies collectively report the use of over 200 plant species (*Supplementary Table 1*), primarily from families such as Fabaceae, Asteraceae, and Asphodelaceae, traditionally employed across African communities to manage a broad spectrum of health conditions, including HIV/AIDS, malaria, gastrointestinal disorders, and snakebite envenomation. Ethnobotanical data were frequently supported by pharmacological and experimental evidence, including significant antidiarrheal effects (*in vivo*), inhibition of snake venom-secreted phospholipase A_2 (svPLA_2) activity (*in vitro*), and the extraction of bioactive compounds using solvents such as hydro-methanol, ethyl acetate, dichloromethane, and hexane.

Leaves were the most commonly used plant part, and oral administration was the predominant route, although topical application and therapeutic bathing were also reported. Preparation methods typically included decoctions, infusions, and macerations. Several studies additionally investigated cytotoxicity and chemical composition, highlighting the presence of glycosides, flavonoids, tannins, and phenolic compounds to support the efficacy and safety of the remedies.

The widespread occurrence of polyphenols in many of the analyzed species indicates a strong potential for antibacterial activity. Polyphenols are known to interfere with key bacterial mechanisms due to their antimicrobial, antioxidant, and anti-inflammatory properties. These compounds can alter bacterial membrane permeability, inhibit protein synthesis, and disrupt biofilm formation. As such, polyphenol-rich plants, including *Moringa oleifera*, *Allium sativum*, *Artemisia annua*, *Curcuma longa*, and *Eucalyptus globulus*, emerge as promising candidates for the development of natural antibacterial agents.

Overall, these findings underscore the richness and resilience of traditional medicinal knowledge, often transmitted orally across generations and shaped by the local health context. Notably, up to 30% of the plant uses reported in the reviewed studies were previously undocumented in the scientific literature, revealing a high potential for the discovery of novel bioactive compounds. Nonetheless, challenges such as inconsistent posology, lack of dosage standardization, and limited clinical validation remain significant hurdles to be addressed in future research.

We selected 7 studies published in journals with an impact fac-

Table 5. List of specific pathogen strains cited across the 106 reviewed documents.

Pathogen strains	Citation frequency (%)
Plasmodium spp.	25.5%
Staphylococcus aureus (incl. MRSA)	21.7%
HIV/HIV-1	12.3%
Escherichia coli	7.5%
Schistosoma spp.	6.6%
STIs (chlamydia, gonorrhoea, syphilis, trichomonas)	7.5%
Salmonella spp.	4.7%
Mycobacterium tuberculosis	2.8%
Pseudomonas spp.	4.7%
Enterococcus spp.	4.7%
Trypanosoma spp.	4.7%
HPV	2.8%
Fungi (endophytic fungi, Fusarium, etc.)	2.8%
Filarial worms (*Wuchereria, Brugia*)	1.9%
SARS-CoV-2	2.8%
Other bacteria	7.5%
Other parasites	2.8%

MRSA, methicillin-resistant *Staphylococcus aureus*; STIs, sexually transmitted infections; HPV, human papillomavirus.

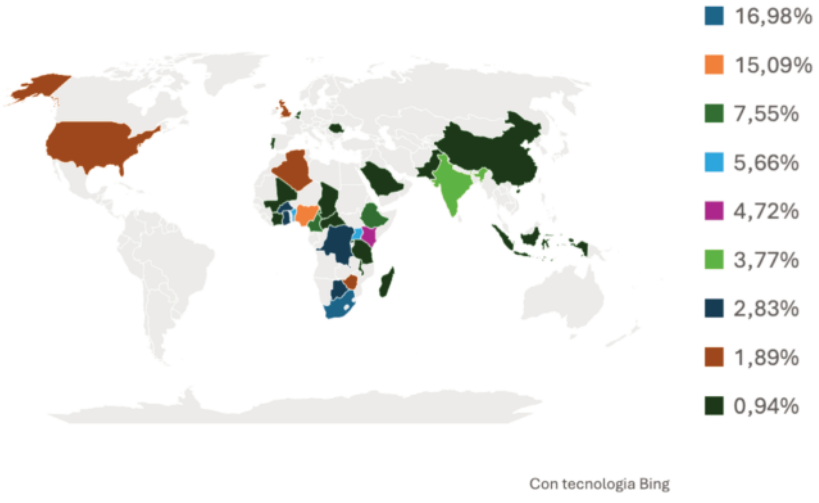

Figure 5. Distribution of countries involved in scientific documents on medicinal plants in Sub-Saharan Africa (n=106).

tor ranging between 4 and 5 (*Supplementary Table 2*), which collectively document between 45 and 108 plant species, predominantly from families such as Fabaceae, Leguminosae, and Asteraceae. Common therapeutic targets include malaria, HIV/AIDS and its related symptoms, diarrhea, and snakebite envenomation. Preparation methods vary but mainly include decoctions, infusions, and macerations, with hydro-methanolic, ethyl acetate, hexane, dichloromethane, and aqueous extractions frequently used. Oral administration is the most common route, and leaves are the most widely used plant part. In pharmacological studies, extracts showed significant antidiarrheal activity (reduction in defecation frequency, enteropooling, and motility; $p<0.05$-0.001) and strong inhibition of $svPLA_2$ activity in venom-neutralization assays (some with >90% inhibition and EC_{50} values as low as 3.51 µg/mL). Ethnobotanical indices like Relative Importance (RI) and Use Value (UV) were employed to quantify traditional relevance, revealing cultural overlaps and highlighting taxa like *V. amygdalina*, *A. vera*, *A. indica*, and *Annona senegalensis*. Up to 30% of the medicinal uses described were not previously reported in the literature, underscoring the potential for discovering new bioactive compounds. Some cytotoxicity assessments confirmed the safety of extracts, especially in *Artemia salina* assays. These findings emphasize the pharmacological relevance of traditional medicinal knowledge and the need for further experimental validation.

Conclusions

Overall, this systematic review demonstrates notable progress in the scientific exploration of medicinal plants in Sub-Saharan Africa. We observed the implementation of improved methodologies, more accurate identification of bioactive compounds, and increasingly rigorous experimental designs, highlighting a promising convergence between traditional knowledge and modern scientific validation.

From an initial pool of 2,770 articles on PubMed and 435 on Scopus, 106 studies published between 2023 and 2025 met our inclusion criteria. These comprised mostly original research articles (47.17%) and reviews (33.96%), with a strikingly low proportion of systematic reviews (5.66%) and clinical trials (0.94%).

Among the pathogens studied, *Plasmodium* species (25.5%) were most frequently addressed, followed by *Staphylococcus aureus* (21.7%) and HIV (12.3%). Other important targets included *Escherichia coli* and sexually transmitted infections such as *Chlamydia*, *Neisseria gonorrhoeae*, *Treponema pallidum*, and *Trichomonas vaginalis*, each appearing in approximately 7.5% of the selected articles.

In the domain of phytochemicals, *Vernonia spp.* (11.32%), *Aloe spp.* (10.38%), and *Moringa oleifera* (10.38%) were identified as the most extensively studied genera. Leaves were the most frequently used plant part, typically administered orally in line with traditional usage. Notably, nearly 30% of plant uses reported in these studies had not been previously documented in the scientific literature, underscoring the immense potential for the discovery of novel bioactive compounds.

Geographically, South Africa (16.98%), Nigeria (15.09%), Cameroon (7.55%), and Ethiopia (7.55%) led scientific output in this field, likely reflecting stronger research infrastructures and a more pronounced institutional interest in traditional medicine. However, numerous other biodiversity-rich countries remain significantly underrepresented.

The need to expand scientific research on medicinal plants in Sub-Saharan Africa is urgent. This effort must go beyond validating ancestral knowledge: it should fill the gap in clinical trials, support bioprospecting, and promote the conservation and scientific valorization of understudied plant species. Innovative therapeutic options are essential to address AMR and reduce the burden of infectious diseases. Bioactive compounds derived from indigenous medicinal plants – whether used alone or synergistically with existing antimicrobials – offer promising avenues to tackle global AMR challenges.

As this review shows, the African continent holds remarkable phytochemical diversity. Future research should focus on the discovery and mechanistic study of novel plant secondary metabolites with antimicrobial properties. Progress has already been made in developing new antimicrobial therapies, aided by the rise of omics-based technologies such as proteomics and metabolomics. However, many African countries still lag behind in the adoption of such approaches, due to socio-economic barriers and limited access to genomic sequencing infrastructure.

To sustainably harness this medicinal heritage and ensure equitable access to innovative health solutions, substantial investments are needed in research, regional scientific collaboration, and capacity building.

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Online Supplementary Material:
Supplementary Table 1. List of the most frequently cited endemic plants with therapeutic potential, the associated chemical compounds, and the methods of administration in the 106 documents.
Supplementary Table 2. Results identified in articles published in peer-reviewed journals with an impact factor> 5.