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The Role of Medicinal Plants in Alleviating Malaria-Related Fever

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ABSTRACT

Malaria remains one of the most persistent global health challenges, with over 200 million cases annually and significant mortality, particularly in sub-Saharan Africa. Fever, a primary symptom of malaria, often compels individuals to seek medical care. Conventional antimalarial drugs face increasing resistance and can present severe side effects, making searching for alternative treatments both urgent and necessary. Medicinal plants have long been used in traditional medicine to treat malaria-related fever and offer an accessible, affordable, and culturally accepted solution, especially in developing nations. This paper explores the role of key medicinal plants such as *Azadirachta indica* (Neem), *Ajuga remota*, and *Aloe macrocarpa* in managing malaria fever. It reviews their phytochemical composition, pharmacological efficacy, safety concerns, and the outcomes of related clinical studies. Furthermore, it considers the cultural dimensions that shape the use of traditional medicine in malaria-endemic areas. While promising, the widespread adoption of plant-based antimalarial therapies requires rigorous scientific validation to ensure their safety, efficacy, and integration into modern healthcare systems.

Keywords: Malaria-related fever, Medicinal plants, Antiplasmodial activity, Traditional medicine, Phytochemicals, Drug resistance, *Azadirachta indica*, Malaria treatment.

INTRODUCTION

Medicinal plants are important for therapeutic use, both historically and in modern medicine, having a key role in drug development and treating diseases like COVID-19. Fever is one of the main reasons for patient consultations, with malaria, dengue, viral infections, and other tropical diseases being significant causes, particularly in developing nations. These plants offer accessible and affordable healthcare solutions where infections are prevalent. Malaria is a mosquito-borne disease caused by Plasmodium protozoans, leading to symptoms such as fever, fatigue, and vomiting. Female Anopheles mosquitoes transmit the infections, with six Plasmodium species that affect humans; P. falciparum and P. vivax are the most dangerous. Malaria remains widespread, especially in tropical and subtropical regions, with 1.7 to 2.7 million deaths annually. The severity of the disease varies based on the species, transmission rates, the infected person's health, and treatment access, with P. falciparum often requiring urgent care. Although diseases like dengue and SARS can also lead to high fevers, their patterns differ; malaria's distinct fever patterns are crucial for clinical diagnoses in endemic regions [1, 2].

UNDERSTANDING MALARIA

Malaria is a protozoan disease spread by infected female Anopheles mosquitoes, affecting over 200 million people globally, mostly in sub-Saharan Africa. In Kenya, over a million cases of Plasmodium falciparum were reported in 2017, contributing to more than 35,000 deaths annually. Initial symptoms include fever with chills, headaches, and vomiting. The disease is caused by four main species: Plasmodium falciparum, P. vivax, P. malariae, and P. ovale, with P. falciparum being the deadliest. Malaria presents in three forms:

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tertiana, quartana, and the serious tropica. Conventional antimalarials are becoming less effective due to resistance, and synthetic drugs can be toxic with side effects. This situation necessitates seeking alternative treatments from medicinal plants, which have been used extensively in healthcare throughout history. Many regions, especially in Africa, Asia, and South America, still rely on herbal remedies. Medicinal plants offer potential for new phytomedicines, with estimates suggesting over 80% of medical products derive from them. While some drugs are already sourced from plants, scientific validation of their antiplasmodial activities and safety remains limited [3, 4].

FEVER AS A SYMPTOM

1. Introduction 2. Malaria 4. Materials and Methods 5. Results 6. Discussion 7. Conclusion 8. Acknowledgments 9. References: Fever is an abnormally high body temperature, a common symptom in a number of tropical and other infectious diseases. While fever is generally regarded as an excellent host defence mechanism, it also acts as the primary cause of discomfort in affected individuals and, in the absence of any other symptoms, often stimulates patients to seek medical intervention. The febrile response, which depends on increased levels of circulating cytokines, generally has the capacity to control even severe parasitemia. It has been reported that delayed fever and a low early fever response are independent predictors of severe malaria and death. However, whether this is the case under all circumstances is not fully resolved, and, in practice, the degree of pyrexia is usually taken simply as an indicator of the level of parasitemia [5, 6].

MEDICINAL PLANTS: AN OVERVIEW

Plants have been essential in treating ailments since prehistoric times, with traditional knowledge highlighting their role in drug discovery. Research into plant-based drugs reveals significant therapeutic benefits, particularly where conventional medicine is lacking. Many plants show strong effects against various diseases, often more so than isolated compounds, due to the synergistic interaction of multiple bioactive compounds. This means separation can reduce efficacy and increase toxicity risks. Consequently, medicinal plants are widely used for treating numerous ailments, offering alternatives to single-target therapies and minimizing side effects. In Ethiopia, indigenous populations have relied on medicinal plants for healthcare since ancient times, especially where modern facilities are scarce or synthetic drugs are too costly. Malaria's spread across Ethiopia has led to a preference for these plants when modern treatments are unavailable. Ethnobotanical studies have identified various plants for malaria treatment, with leaves being the most common part used. Species such as Ajuga remota and Aloe macrocarpa have shown significant effects against parasitaemia in studies, with Aloinoside from Aloe macrocarpa achieving 100% suppression in infected mice at 400 mg/kg, suggesting its potential as a safe antimalarial. Given the high malaria prevalence, Ethiopia is expanding control efforts, aiming to discover new, effective, affordable drugs from medicinal plants. However, further research is essential to confirm the efficacy of these plants and support the development of new treatments for malaria eradication [7, 8].

KEY MEDICINAL PLANTS FOR MALARIA-RELATED FEVER

Anti-malarial plants are frequently used in the treatment of malaria-related fever. Azadirachta indica A. Juss. (Neem) (Meliaceae) is very popular and well-known for a wide variety of uses. Its aqueous leaf extracts show promising in vitro activity against Plasmodium falciparum, and the decoction of A. indica, often combined with other species, is a preferred dosage form for malaria treatments. Scientific evidence of antimalarial activity is available for many of the other frequently reported species in the traditional anti-malarial plant survey. Azadirachta indica A. Juss. (Meliaceae) It is widely used across Asia, Africa, and America in the treatment of malaria and several other diseases. In India, fresh A. Indica leaves are cooked as part of the diet for improved immunity. In Ghana, steam inhalation of A. indica leaves is believed to relieve malaria symptoms. Orally administered A. indica extracts are generally nontoxic. The Leguminosae includes many antimalarial species throughout the tropics. Some of the genera most frequently collected by traditional healers are Pilostigma (P. thonningi), Cassia (C. siamea and C. alata), Tetrapleura (T. tetraptera), and Albizia (A. ferruginea). The Meliaceae is also well known for the abundance of bioactive secondary metabolites it produces, especially triterpenoids, limonoids, and non-isoprenoid-based C-seco triterpenes; Carapa (C. procera), Khaya (K. senegalensis and K. ivorensis), and Azadirachta (A. indica) are particularly intriguing on account of their frequent collection and well-documented biological activities. Several of the frequently reported Asteraceae species collected for malaria treatments are not discussed, as the genus Hippocratea (lianas) is more commonly associated with Tetrapleura-like zygomorphic flowers, indicating a possible identification error for members of the Celastraceae [9, 10].

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PHYTOCHEMICAL PROPERTIES

The phytochemical composition of plants strongly influences their pharmacological properties and is therefore an important consideration when investigating traditional medicines. Many herbal medicines are liquid concoctions prepared by boiling or infusion of whole plant material, and as a result, the polarity of the chemical composition is important. The use of methanol/dichloromethane mixtures to extract plant material can improve the recovery of secondary metabolites suitable for chemotaxonomic and pharmacological studies; however, a single solvent may be preferred for higher sample throughput. Many medicinal plants have been screened to identify extracts containing pharmacologically active compounds. Plant-derived alkaloids have been widely investigated for the treatment of malaria. Other groups of compounds, including terpenoids, polyphenols, and flavonoids also have potential anti-malarial properties [11, 12].

CLINICAL STUDIES AND EFFICACY

The ongoing search for improved and alternative anti-malarial therapies has received substantial attention, particularly due to the persistent and alarming spread of resistance against existing treatments. Over the last two decades, the proportions of anti-malarial drugs that are derived from natural products have significantly increased, highlighting their potential value. These natural products have garnered considerable interest as a promising source for new anti-malarial drugs. A vast number of plant species continue to be utilized worldwide for the treatment of malaria and fevers, and these plants represent an important reservoir of potentially new and effective treatments. Furthermore, a wide array of compounds possessing novel structures and exhibiting activity against malaria parasites have already been identified from various medicinal plants, which are traditionally used as remedies for malaria and other infectious diseases. This botanical approach offers a rich landscape for the discovery of innovative therapeutic agents aimed at combating malaria infection effectively [13, 14].

SAFETY AND SIDE EFFECTS

The safety and side effects of medicinal plants used to alleviate malaria-related fever constitute crucial considerations that remain underexplored. While numerous plants demonstrate antiplasmodial activity, scientific data validating their therapeutic efficacy and safety are limited. Extracts of Brownii and S. africana have been identified as potent antiplasmodial agents; however, research is needed to isolate active constituents and evaluate in vivo toxicities to establish safety profiles. Malaria afflicts over 219 million individuals annually, predominantly in sub-Saharan Africa, with pregnant women and children representing vulnerable groups. Conventional antimalarials encounter growing parasite resistance and adverse effects, underscoring the demand for alternative treatments. Herbal medicine offers advantages of affordability, accessibility, and cultural acceptance, with supporting bioactive compounds. In Ghana, Mist Amen Fevermix, a bi-herbal formulation employed for uncomplicated malaria, displays clinical effectiveness and safety when used as directed. Yet the persistent challenge of drug resistance, partly attributed to counterfeit medicines, accentuates the necessity for new antimalarial agents from medicinal plants. Confirmation of therapeutic potential will remain contingent upon rigorous elucidation of safety and possible side effects [15, 16].

CULTURAL PERSPECTIVES ON MEDICINAL PLANTS

In indigenous communities, traditional medicine frequently represents the exclusive form of treatment for many diseases, which is unsurprising considering populations often consist of low-income groups residing in remote, tropical areas where medicinal plants are abundant and accessible. Such accessibility frequently elicits preference for herbal remedies over costly treatment options available in health facilities. Medicinal plants generally constitute the foundation of primary health care for approximately 80 % of the global population due to their local availability, cultural acceptability, and trial-based efficacy. Practically, herbal medicines remain the primary health care resource employed by local inhabitants for the prevention and treatment of various illnesses including malaria. Conversely, campaigns promoting modern medicine in tropical regions commonly attempt to extirpate indigenous beliefs and practices from underdeveloped countries. The principal reasons sustaining mistrust towards traditional medicine in contemporary society encompass insufficient mutual understanding between biomedical practitioners and indigenous healers, ambiguity concerning the active substances and their mechanism of action, as well as reports of severe adverse effects. Regardless of these factors, plant medications constitute the main source of therapy for many individuals, forming a solid basis for primary health care globally. In fact, approximately 70 %–80 % of the world's population in developing countries presently depend on medicinal plant-based

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medicines. Figure 2.2 lists some commonly utilized traditional medicinal plants for malaria treatment [17, 18].

REGULATORY CONSIDERATIONS

Medicinal plants' widespread use in malaria treatment and symptomatic relief underscores the need for quality and safety assurance before clinical application. Proposals for standardization encompass monographs detailing pharmacognostic specifications, physicochemical characteristics, active compounds, clinical investigations, and potential drug interactions; the development of quality assurance protocols; and factory licensing to ensure Good Manufacturing Practices. Given the reliance of millions on herbal remedies, a collaborative program involving relevant government agencies is vital to uphold standards. High-quality, evidence-based research that reflects traditional practices is essential for successful policy translation of herbal medicine. Trial designs should incorporate randomization, blinding, appropriate comparison groups, transparent reporting, and dosage justification to clarify efficacy. Concerted efforts among scientists, ethnobotanists, healers, medical professionals, herbalists, and policymakers will foster acceptance, attract funding, ensure availability and sustainability, and empower communities in malaria-heavy countries [19, 20].

FUTURE DIRECTIONS IN RESEARCH

Medicinal plants have been used extensively throughout history to alleviate symptoms of malaria, with febrifuge properties being the most prominent bioactivity underpinning their therapeutic effects. Many traditional antimalarials reportedly exert fever-relieving actions, indicating an empirical linkage between these effects in malaria interventions. Eight pantropical plant species with known ethnomedical and pharmacological febrifuge properties were identified, representing ten diverse genera and four families. The limited overlap between the geographic ranges of these pantropical febrifuges and the distribution of fever-inducing protozoa suggests that the febrifuge properties emerged independently of malaria in these species. Given the widespread use of fever-relieving remedies, it is plausible that antimalarial uses and other tropical applications arise secondarily from broad-spectrum febrifuge phytochemistry. Five of the eight pantropical febrifuge species were well characterized—Jatropha curcas L., Aleurites moluccana (L.) Willd., Citrus aurantiifolia (Christm.) Swingle, Morinda lucida Benth., and Nauclea latifolia Sm.—whose extensive phytochemical profiles reflect fatty acids (including uncommon derivatives), diverse essential oils and terpenoids, and various alkaloids. Four temperate taxa classed as probable febrifuges—Achillea millefolium L., Hamamelis virginiana L., Larix decidua Mill., and Rosmarinus officinalis L.—exhibit a similar spectrum of bioactive constituents including flavonoids, diterpenes, and tannins. This conservation of phytochemical space across pantropical and temperate febrifuge exemplars highlights the pharmacological avenues from which effective herbal fever remedies arise and provides specific leads for therapeutically important malaria-related fever species in Madagascar and elsewhere [21, 22].

CONCLUSION

Medicinal plants hold great potential in the alleviation of malaria-related fever, especially in regions where healthcare access is limited and drug resistance is a growing threat. Species such as *Azadirachta indica*, *Aloe macrocarpa*, and *Ajuga remota* have demonstrated significant antiplasmodial properties, offering a viable alternative or complement to synthetic antimalarials. Their use is deeply rooted in cultural practices, emphasizing the importance of preserving traditional knowledge while promoting scientific validation. However, widespread clinical use demands standardized extraction methods, comprehensive safety evaluations, and clear pharmacological profiling. Integrating traditional medicine with modern healthcare can improve treatment outcomes and provide cost-effective, locally accepted solutions to the malaria crisis. Continued research, policy support, and cross-cultural collaboration will be essential to fully realize the therapeutic promise of these natural resources.

REFERENCES

1. Chandra G, Bhattacharjee I. Mosquito-Borne Human Diseases. In Mosquitoes: Biology, Pathogenicity and Management 2024 Sep 12 (pp. 257-286). Singapore: Springer Nature Singapore. [HTML]
2. Alshamrni MM, Alqarni MR, Al Hamamah MM, Alsubaie MD, Alhusayni YM, Alhejaili AS, Almutairi FO, Alateeq OS. Comprehensive Analysis of Malaria: Causes, Incubation Period, Transmission Methods, Prevention, Control, and Treatment. Journal of International Crisis and Risk Communication Research. 2024;7(S10):608. [HTML]

OPEN ACCESS
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PRINT ISSN: 2992-605X

3. GHIAEE A, NAGHIBI F, ESMAEILI S, MOSADDEGH M. Herbal Remedies Connected to Malaria-like Fever in Iranian Ancient Medicinal Books- Brief Review Article. 2014. ncbi.nlm.nih.gov
4. Waiganjo B, Moriasi G, Onyancha J, Elias N et al. Antiplasmodial and Cytotoxic Activities of Extracts of Selected Medicinal Plants Used to Treat Malaria in Embu County, Kenya. 2020. ncbi.nlm.nih.gov
5. Jumba BN, Webale M, Makwali J, Shaviya N. Predictors of complicated pediatric malaria among children under five in the Vihiga Highlands, Western Kenya. African Journal of Empirical Research. 2025 Mar 31;6(1):895-905. ajol.info
6. Duvignaud A, Jaspard M, Etafo IC, Gabillard D, Serra B, Abejegah C, Le Gal C, Abidoye AT, Doutchi M, Owhin S, Séri B. Lassa fever outcomes and prognostic factors in Nigeria (LASCOPE): a prospective cohort study. The Lancet Global Health. 2021 Apr 1;9(4):e469-78. thelancet.com
7. Aracil A, Green J, Aracil A, Green J. Plants with antimalarial properties: A systematic review of the current clinical evidence. 2019. [PDF]
8. Nigussie G, Wale M. Medicinal plants used in traditional treatment of malaria in Ethiopia: a review of ethnomedicine, anti-malarial and toxicity studies. 2022. ncbi.nlm.nih.gov
9. Gokri V, Puri R, Dokuparthi SK. Ethnopharmacological Profiling and Flavonoid-Enriched Extract Characterization of Himalayan Krambe Kotschayana: Integrative Preclinical Assessment of …. papers.ssrn.com. . ssrn.com
10. Whittaker CF. Quantifying the Impacts of Variation in Entomological and Epidemiological Determinants of Malaria Transmission. 2022. core.ac.uk
11. Ogbuagu OO, Mbata AO, Balogun… OD. Novel phytochemicals in traditional medicine: Isolation and pharmacological profiling of bioactive compounds. … Journal of Medical …. 2022. allmedicaljournal.com
12. Heinrich M, Jalil B, Abdel-Tawab M, Echeverria J, Kulić Ž, McGaw LJ, Pezzuto JM, Potterat O, Wang JB. Best practice in the chemical characterisation of extracts used in pharmacological and toxicological research—the ConPhyMP—guidelines. Frontiers in Pharmacology. 2022 Sep 13;13:953205. frontiersin.org
13. Ain QT, Saleem N, Munawar N, Nawaz R, Naseer F, Ahmed S. Quest for malaria management using natural remedies. Frontiers in Pharmacology. 2024 Jun 26;15:1359890. frontiersin.org
14. Adetunji CO, Michael OS, Nwankwo W, Anani OA, Adetunji JB, Olayinka AS, Akram M. Biogenic nanoparticles based drugs derived from medicinal plants: A sustainable panacea for the treatment of malaria. InGreen Synthesis in Nanomedicine and Human Health 2021 Mar 9 (pp. 103-122). CRC Press. [HTML]
15. David BG. Maternal-Infant Transmission of Malaria. 2024. kiu.ac.ug
16. de Oliveira GG, da Silva SM, de Souza AP, da Silva LV, Silva AL, de Melo AC, Roque RA, de Oliveira AC, de Melo Filho AA, Soares AM. Larvicidal Potential of Trattinnickia Burserifolia Mart. Essential Oil in Controlling the Malaria Vector in the Amazon. Pharmaceuticals. 2025 Apr 22;18(5):604. mdpi.com
17. Balkrishna A, Sharma N, Srivastava D, Kukreti A, Srivastava S, Arya V. Exploring the safety, efficacy, and bioactivity of herbal medicines: bridging traditional wisdom and modern science in healthcare. Future Integrative Medicine. 2024 Mar 28;3(1):35-49. xiahepublishing.com
18. Ralte L, Sailo H, Singh YT. Ethnobotanical study of medicinal plants used by the indigenous community of the western region of Mizoram, India. Journal of Ethnobiology and Ethnomedicine. 2024. springer.com
19. Nigussie G, Wale M. Medicinal plants used in traditional treatment of malaria in Ethiopia: a review of ethnomedicine, anti-malarial and toxicity studies. Malaria journal. 2022. springer.com
20. Million E, Mulugeta T, Umeta B. Traditional medicine practice and its role in the management of malaria in Jimma Town, Oromia, Ethiopia. Infection and Drug Resistance. 2022. tandfonline.com
21. Evbuomwan IO, Stephen Adeyemi O, Oluba OM. Indigenous medicinal plants used in folk medicine for malaria treatment in Kwara State, Nigeria: an ethnobotanical study. BMC Complementary Medicine and Therapies. 2023 Sep 16;23(1):324. springer.com

OPEN ACCESS
ONLINE ISSN: 2992-5479
PRINT ISSN: 2992-605X

22. Ceravolo IP, Aguiar AC, Adebayo JO, Krettli AU. Studies on activities and chemical characterization of medicinal plants in search for new Antimalarials: a ten year review on Ethnopharmacology. Frontiers in Pharmacology. 2021 Sep 22;12:734263. frontiersin.org

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