

Antimalarial and Cytotoxic Effects of Indigenous Plants Utilized in Traditional Medicine Practices in Cabo Verde

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Abstract

Mosquito-borne diseases represent a considerable public health burden worldwide, impacting millions of individuals annually. While traditional methods like insecticides and physical barriers have shown efficacy in controlling mosquito populations, they often come with environmental and health drawbacks. In recent times, there has been a surge in interest regarding biotechnological solutions, particularly harnessing the capabilities of microorganisms, to tackle this challenge. This article delves into the biotechnological potential of microorganisms in controlling mosquito populations and diminishing vector competence, thus playing a pivotal role in the prevention and management of mosquito-borne diseases.

Keywords: Indigenous plants • Traditional medicine • Cabo verde

Introduction

Traditional medicine has long been a significant aspect of healthcare practices in Cabo Verde, with indigenous plants playing a central role in treating various ailments, including malaria. As malaria remains a prevalent health concern in the region, exploring the antimalarial properties of these indigenous plants holds considerable promise. Moreover, assessing their cytotoxic effects is crucial for understanding their safety profile and potential therapeutic applications. This article provides an overview of the antimalarial and cytotoxic effects of indigenous plants utilized in traditional medicine practices in Cabo Verde [1].

Literature Review

Cabo Verde, an archipelago off the coast of West Africa, boasts a rich biodiversity of flora, many of which have been traditionally used for medicinal purposes by local communities. Plants such as *Artemisia annua*, *Cissus quadrangularis*, and *Azadirachta indica* are among the numerous species revered for their therapeutic properties, including their purported efficacy against malaria. Studies have increasingly focused on evaluating the antimalarial activity of indigenous plants in Cabo Verde. Extracts derived from these plants have demonstrated promising results in inhibiting the growth and proliferation of *Plasmodium* parasites, the causative agents of malaria. Bioactive compounds such as artemisinin, quinine, and neem leaf extracts have been identified as key contributors to the antimalarial properties of these plants. Their mechanisms of action include disrupting parasite metabolism, inhibiting parasite growth, and enhancing host immune responses [2].

Discussion

Assessing the cytotoxic effects of traditional medicinal plants is essential for ensuring their safety and efficacy. While these plants exhibit promising antimalarial activity, their cytotoxicity profiles must be thoroughly evaluated

to mitigate potential adverse effects on human cells. Various cytotoxicity assays, including cell viability assays and apoptosis assays, are employed to assess the impact of plant extracts on different cell lines. Preliminary studies have suggested that while some indigenous plants possess potent antimalarial activity, they may also exhibit cytotoxic effects at higher concentrations, underscoring the importance of dose optimization and safety considerations. Despite the growing interest in traditional medicinal plants for malaria treatment, several challenges persist. Standardization of extraction methods, dosage formulations, and quality control measures are essential for ensuring reproducibility and efficacy of plant-based remedies. Additionally, further research is needed to elucidate the mechanisms of action of bioactive compounds derived from indigenous plants and their potential interactions with conventional antimalarial drugs [3,4].

Moreover, community engagement and collaboration with local healers are crucial for preserving traditional knowledge and integrating indigenous medicine into modern healthcare systems. Indigenous plants offer a diverse array of bioactive compounds that have demonstrated efficacy against *Plasmodium* parasites, the causative agents of malaria. These compounds often exhibit multifaceted mechanisms of action, including inhibition of parasite growth, disruption of parasite metabolism, and modulation of host immune responses. Examples of bioactive compounds found in indigenous plants with antimalarial properties include artemisinin, quinine, and various alkaloids, flavonoids, and terpenoids. Research into the antimalarial potential of indigenous plants typically involves screening plant extracts or isolated compounds for their ability to inhibit parasite growth in vitro and in vivo. Extracts derived from indigenous plants are subjected to various bioassays, such as the schizont maturation inhibition assay and the lactate dehydrogenase assay, to assess their antimalarial activity. Compounds showing promising activity are further evaluated for their safety, pharmacokinetics, and mechanism of action [5].

Several indigenous plants have emerged as promising sources of antimalarial agents. For example, *Artemisia annua*, commonly known as sweet wormwood, is revered for its high artemisinin content, which forms the basis of artemisinin-based combination therapies the frontline treatment for malaria. Other indigenous plants with documented antimalarial activity include *Cinchona officinalis* (the source of quinine), *Azadirachta indica* (neem) and *Cryptolepis sanguinolenta* (African chewing stick), among others. The exploration of indigenous plants for their antimalarial potential offers several advantages. These plants are often readily available and culturally accepted, making them accessible and affordable options for malaria treatment, particularly in resource-limited settings. Furthermore, their use aligns with the principles of sustainable and traditional medicine, preserving local biodiversity and traditional knowledge. The antimalarial potential of indigenous plants represents a promising avenue in the search for effective treatments against malaria, particularly in regions where the disease is endemic. Indigenous

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plants, deeply rooted in traditional medicinal practices, have long been recognized for their therapeutic properties. In recent years, scientific studies have increasingly focused on exploring the antimalarial properties of these plants, aiming to identify novel compounds and develop alternative treatments for malaria [6].

Conclusion

Indigenous plants used in traditional medicine practices in Cabo Verde hold significant potential as sources of antimalarial agents. Their rich pharmacological diversity, coupled with centuries-old traditional knowledge, presents a valuable resource for combating malaria and other infectious diseases. However, rigorous scientific validation, including evaluation of antimalarial efficacy and cytotoxicity, is essential to harnessing their therapeutic benefits safely and effectively. By combining traditional wisdom with modern scientific approaches, Cabo Verde can leverage its rich botanical heritage to address contemporary healthcare challenges and promote holistic well-being in its population.

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Conflict of Interest

There are no conflicts of interest by author.

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