Chapter 4

Medicinal uses of *Hygrophila auriculata*

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ABSTRACT

Hygrophila auriculata, a plant species widely used in traditional medicine, has been found to possess a broad range of medicinal properties. The plant's root, seed, and whole plant have been used to treat various health conditions, including oxidative stress, liver damage, microbial infections, cancer, diabetes, and male infertility. The plant's medicinal properties are attributed to its rich content of bioactive compounds, including alkaloids, glycosides, and phenolic acids. This study provides a comprehensive overview of the medicinal uses of *H. auriculata*, highlighting its potential as a valuable resource for developing new medicines and treatments. The study's findings suggest that *H. auriculata* is a promising candidate for further research into its medicinal properties and applications. The study's results are expected to contribute to the development of new treatments and medicines based on the plant's bioactive compounds, and to provide a valuable resource for researchers, healthcare professionals, and the public.

Keywords: Wetland plants, bioactive compounds, pharmacology

INTRODUCTION

Traditional medicine has used *Hygrophila auriculata* (Figure 1), a plant species from the Acanthaceae family, for centuries to treat various health conditions (Shanmugasundaram and Venkataraman 2006). Traditional medicine uses different parts of this plant, including the root, seed, and whole plant, to treat conditions such as bronchitis, asthma, fever, and rheumatism (Sethiya et al. 2018). Scientists have not extensively studied the medicinal properties of *H. auriculata*, despite its long history of use in traditional medicine. Recent studies have shown that the plant contains a range of bioactive compounds, including alkaloids, glycosides, and phenolic acids, which may contribute to its medicinal properties (Alghamdi et al. 2024). However, to fully understand the medicinal properties of *H. auriculata* and identify its potential as a source of new medicines, further research is necessary. The need for such a study is evident given the growing interest in natural products as a source of new medicines. Natural products have led to the development of many conventional medicines, with a growing recognition of the importance of preserving traditional knowledge and promoting the sustainable use of medicinal plants (Gupta et al. 2005). Furthermore, the increasing prevalence of chronic diseases, such as cancer, diabetes, and cardiovascular disease, has highlighted the need for new and effective treatments. The present study aims to provide a comprehensive overview of the medicinal properties of *H. auriculata*, including its phytochemistry, pharmacology, and traditional uses. The study will review existing literature on the plant's medicinal properties and identify areas for further research. The results of this study will help make new medicines and treatments using the bioactive compounds found in *H. auriculata*. They will also help protect and use this valuable medicinal plant in the future.

DESCRIPTION

H. auriculata is a rubust herb species about 0.4 to 1.1 m with hairy stems and whorled spines at the nodes. The leaves are sessile, pseudo-whorled from the

shortened axillary branchlets. Flowers are purple in colour, 3-3.6 cm long, in axillary whorls. Ovules 4 per cell, style pubescent. Capsule linear-oblong, 7.4-7.6 mm long. Seeds 4-8 on hard retinacula, flat and white hairy when wet (Saxena and Brahmam 1995).

METHODOLOGY

This review was conducted through a comprehensive search of existing literature on the medicinal values of *H. auriculata* during 2023-2024, focusing on their medicinal, pharmacological, and traditional uses along with reported bioactive compounds. A range of databases, including PubMed, Scopus, and Web of Science, were searched using keywords such as " *Hygrophila auriculata*, "medicinal properties," "traditional medicine," and "pharmacology." Relevant articles and books published were selected and reviewed (Saxena and Brahmam 1995; Sethiya et al. 2018; Dev et al. 2019; Dhanalakshmi et al. 2020; Alghamdi et al. 2024)

RESULTS AND DISCUSSION

The Table 1 presents a comprehensive overview of the medicinal uses of *Hygrophila auriculata*, a plant species widely used in traditional medicine. The table categorizes the medicinal uses based on the parts of the plant used, including the root, seed, and whole plant. The medicinal uses range from antioxidant, hepatoprotective, and antimicrobial to antitumor, antidiabetic, and anticancer properties. The table highlights the versatility of *H. auriculata* in treating various health conditions. For instance, the root is used for its antioxidant and hepatoprotective properties, while the seed is used to treat male infertility. The whole plant is used for its antimicrobial, antitumor, and antidiabetic properties, among others. This suggests that *H. auriculata* is a valuable resource for developing new medicines and treatments. The table also underscores the importance of continued research into the medicinal properties of *H. auriculata*. The references cited in the table span several years, indicating ongoing research into the plant's medicinal uses. Further studies are needed to fully explore the

potential of *H. auriculata* and to develop new treatments based on its medicinal properties. Overall, the table provides a valuable summary of the medicinal uses of *H. auriculata* and highlights its potential as a source of new medicines.

Figure 1: *H. auriculata* in wild

Table 1: Medicinal uses of *H. auriculata*

Parts used	Medicinal uses	Source
Root	Antioxidant	Shanmugasundaram and Venkataraman (2006)
Root	Hepatoprotective	Shanmugasundaram and Venkataraman (2006)
Whole plant	Antimicrobial	Sethiya et al. (2018)
Whole plant	Antitumor	Sethiya et al. (2018)
Whole plant	Antidiabetic	Sethiya et al. (2018)
Whole plant	Antioxidant	Vijayakumar et al. (2006)
Seed	Male infertility	Ghosh and Mallick (2020)
Whole plant	Neuroprotective	Kanhere et al. (2013)
Whole plant	Renal tonic	Dhanalakshmi et al. (2020)
Whole plant	Antiplasmodial	Mboni et al. (2023)
Whole plant	Antirheumatic	Alghamdi et al. (2024)
Whole plant	Anti-inflammatory	Alghamdi et al. (2024)
Whole plant	Anticancer	Uddin et al. (2011)
Root	Wound healing	Dev and Roy (2019)
Whole plant	Anti-viral	Nallusamy et al. (2021)

CONCLUSION

Hygrophila auriculata is a valuable medicinal plant with a rich history of traditional use, and its bioactive compounds have shown promising medicinal properties. This study has highlighted the plant's potential as a source of new medicines and treatments for various health conditions. Future aspects of this research include further phytochemical and pharmacological investigations to

isolate and characterize the bioactive compounds responsible for the plant's medicinal properties, as well as clinical trials to evaluate the safety and efficacy of *H. auriculata* based treatments. Additionally, conservation efforts are needed to ensure the sustainable use and preservation of this valuable medicinal plant, and to promote its cultivation and use in traditional medicine practices.

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