

"A Review of Hydroponic Systems for Medicinal Herb Cultivation: Practices and Prospects"

Abstract:

This literature review extensively explores the promising application of hydroponics in cultivating endangered medicinal plants, with a particular emphasis on the renowned *Rhodiola rosea*. The aim of this study is to evaluate the feasibility and potential advantages of integrating hydroponic systems into the cultivation of endangered plant species, addressing the pressing need for sustainable approaches in herbal medicine production. By systematically examining the impact of hydroponic systems on plant growth and the production of bioactive compounds, this review provides valuable insights into the optimization of hydroponic methods for the sustainable cultivation of medicinal herbs.

The scope of this review encompasses a comprehensive analysis of the existing literature related to the use of hydroponics in cultivating endangered medicinal plants, with a specific focus on *Rhodiola rosea*. It seeks to synthesize and critically evaluate research findings, methodologies, and outcomes in the field. Moreover, this review extends its scope to explore the broader significance of integrating hydroponics into the cultivation of endangered medicinal plant species. It emphasizes the crucial roles hydroponics can play in ecological conservation, promoting sustainable agriculture practices, and its implications for the pharmaceutical industry.

This comprehensive review not only contributes to the body of knowledge on sustainable medicinal herb production but also underscores the significance of hydroponic cultivation in the preservation of genetic diversity within endangered plant species.

Keywords: Hydroponics; Endangered Medicinal Plants; *Rhodiola rosea*; Sustainable Agriculture; Bioactive Compounds; Ecological Conservation