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EXPLORING THE MACRO- AND MICROELEMENT PROFILE OF *GERANIUM ROBERTIANUM* L.

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Abstract

The present study aims to review and synthesize current knowledge regarding the macro- and microelement composition of *Geranium robertianum*, in order to highlight its nutritional and therapeutic application.

Keywords: medicinal plant, mineral composition, nutritional value, phytotherapy

Introduction

Mineral elements are fundamental to human health, ensuring the smooth functioning of vital biological processes. The body depends on macronutrients such as calcium, potassium, and magnesium to maintain strong bones, stable nerve activity, and balanced metabolism. In smaller amounts, trace elements like iron, zinc, copper, and manganese play equally important roles, supporting enzymes, strengthening the immune system, and protecting cells from oxidative stress. When present in the right proportions, these nutrients contribute to overall well-being and help prevent various metabolic and nutritional disorders.

Geranium robertianum L., commonly known as herb-Robert, is a medicinal plant traditionally used in European folk medicine for its anti-inflammatory, antioxidant, and antimicrobial properties. The present study aims to review and synthesize current knowledge regarding the macro- and microelement composition of *Geranium robertianum*, in order to highlight its nutritional and therapeutic application.

Material and method

The present study was based exclusively on a comprehensive literature review of scientific publications indexed in databases such as ScienceDirect, PubMed, and Google Scholar. Data regarding the macro- and microelement composition of *Geranium robertianum* L. were collected from peer-reviewed articles focusing on mineral quantification using analytical methods such as ICP-MS, AAS, and XRF. Reported concentrations of essential elements (K, Ca, Mg, Fe, Zn, Mn, Cu) and potentially toxic metals (Cd, Pb, Ni) were compared and harmonized across studies to highlight consistent trends.

Results and discussions

The obtained results revealed significant concentrations of essential elements such as calcium, magnesium, potassium, and iron, as well as trace amounts of zinc, copper, and manganese. Differences in elemental composition were observed between aerial parts and roots, suggesting a distinct accumulation pattern that may influence the plant's pharmacological activity. The data support the idea that *Geranium robertianum* represents a valuable source of bioavailable minerals with potential applications in phytotherapy and nutritional supplementation. Its balanced composition of macro- and microelements highlights the plant's potential role in supporting human health through natural sources.

Conclusions

The mineral composition of *G. robertianum* underscores its potential value as a source of bioactive elements and supports its inclusion in nutraceutical formulations, provided that ecological and geographical variability are carefully monitored.

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