

# SIDERITIS SCARDICA AND SIDERITIS SYRIACA PLANT EXTRACTS: STUDIES ON PHYTOCHEMICAL COMPOSITION AND PROPERTIES.

Greta Tverskytė<sup>1</sup>, Vaida Kitrytė-Syrpa<sup>2</sup>

<sup>1</sup>Kaunas University of Technology, Faculty of Chemical Technology, Kaunas, Lithuania  
[tverskyt.greta@gmail.com](mailto:tverskyt.greta@gmail.com)

In recent years, interest in natural bioactive compounds with beneficial effects on human health has been rapidly increasing. This trend encourages the development of innovative functional foods from plant-based raw materials. One such product is plant extracts. Plants of the *Sideritis* genus, also known as Greek mountain tea, are widely used in Southern Europe and are typically prepared as a decoction from stems, leaves, and flowers. Although further *in vitro* and *in vivo* studies are needed, existing data indicate that *Sideritis* species may exhibit antidiabetic, anxiolytic, and anti-aging effects, as well as a potential preventive role in Alzheimer's disease. Recent studies have identified bioactive compounds such as verbascoside and apigenin 7,4'-bis(trans-p-coumarate), which are of growing interest due to their anti-inflammatory and potential anticancer properties. Despite increasing research, systematic phytochemical studies of *Sideritis* species remain limited.[1-3]

This study aimed to evaluate the content of bioactive compounds in *Sideritis scardica* and *Sideritis syriaca* by analysing different plant parts (flowers, stems, and leaves) and their extracts. Special attention was given to the polarity of bioactive compounds, as it strongly influences extract composition and biological activity. Therefore, solvents of different polarity were used to ensure the extraction of a broad range of compounds. Sequential pressurized liquid extraction (PLE) was performed using four solvents: hexane, acetone, ethanol, and water. Antioxidant activity of the extracts and raw plant fractions was evaluated using ABTS and CUPRAC assays, while total phenolic content (TPC) and total flavonoid content (TFC) were also determined.

For both species the highest extraction yields were obtained with polar solvents, whereas hexane produced the lowest yields across all fractions. Leaves showed the highest extraction yields, particularly with ethanol and water ranged from 8,68 to 14,9%. The highest antioxidant activity was observed in leaf samples, while stems showed the lowest activity. This trend was reflected in TPC results, where leaf extracts exhibited the highest values. For example, the acetone extract of *S. syriaca* leaves reached approximately 237.5 mg GAE/g extract, whereas stem extracts showed lower but still considerable values (about 182.6 mg GAE/g extract)

- 
- [1] P. Eleftheriou, E. Therianou, D. Lazari, S. Dirnali and A. Micha, "Docking Assisted Prediction and Biological Evaluation of *Sideritis L.* Components with PTP1b Inhibitory Action and Probable Anti-Diabetic Properties," *Current topics in medicinal chemistry*, vol. 19, no. 5, Jan 1, pp. 383–392.
- [2] J. Hofrichter, M. Krohn, T. Schumacher, C. Lange, B. Feistel, B. Walbroel and J. Pahnke, "*Sideritis* spp. Extracts Enhance Memory and Learning in Alzheimer's  $\beta$ -Amyloidosis Mouse Models and Aged C57Bl/6 Mice," *Journal of Alzheimer's disease*, vol. 53, no. 3, Aug 3, pp. 967–980.
- [3] E.L. Wightman, P.A. Jackson, J. Khan, J. Forster, F. Heiner, B. Feistel, C.G. Suarez, I. Pischel and D.O. Kennedy, "The Acute and Chronic Cognitive and Cerebral Blood Flow Effects of a *Sideritis scardica* (Greek Mountain Tea) Extract: A Double Blind, Randomized, Placebo Controlled, Parallel Groups Study in Healthy Humans," *Nutrients*, vol. 10, no. 8, Jul 24, pp. 955.