

Abstract

Methods of Obtaining Extracts from *Hedera helix* L. Leaves and Evaluation of the Total Saponins Content [†]

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- [†] Presented at the 17th International Symposium “Priorities of Chemistry for a Sustainable Development” PRIOCHEM, Bucharest, Romania, 27–29 October 2021.

Abstract: *Hedera helix* L. is known for its therapeutic properties, such as analgesic, anti-inflammatory, expectorant activity. It is currently known that the characteristic therapeutic effects of ivy extracts are induced by phytochemicals, such as: saponins (hederagenin, α and β -hederin, hederacoside B and C), phytosterols (sitosterol, stigmasterol, campesterol), flavonoids, falcarinol, falcarinone, scopolin, chlorogenic acid, caffeic acid, phytoestrogens [1]. The purpose of our study was to evaluate the total saponin content of *Hedera helix* L. leaves extracts obtained by both conventional, and unconventional methods. The commercial fresh leaves of *Hedera helix* L. were purchased from Hofigal SA, Romania. The following reagents used for testing were α -hederin, hederagenin, and hederacoside C at purity $\geq 98\%$ (HPLC), DMSO were purchased from Sigma Aldrich. The chemical composition of the obtained extracts was analyzed by HPLC-MS/MS, and the total saponin content was evaluated [2,3]. Our study indicated an optimal method for obtaining *Hedera helix* L. leaves extract with an enriched saponin content.

Keywords: *Hedera helix* L. leaves extract; HPLC-MS/MS; total saponin content



Citation: Tatia, R.; Moldovan, L.; Tarcomnicu, I.; Raiciu, A.D.; Gavrilă, A.; Calinescu, I.; Zalaru, C. Methods of Obtaining Extracts from *Hedera helix* L. Leaves and Evaluation of the Total Saponins Content. *Chem. Proc.* **2022**, *7*, 56. <https://doi.org/10.3390/chemproc2022007056>

Academic Editors: Mihaela Doni, Florin Oancea, Zina Vuluga and Radu Claudiu Fierăscu

Published: 24 March 2022

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Author Contributions: Conceptualization, C.Z. and I.C.; methodology, C.Z. and R.T.; validation, L.M., I.C. and C.Z.; resources, A.D.R. provided the plant material and made the qualitative phytochemical screening of the leaves; C.Z. obtained the extract by conventional methods; A.G. and I.C. obtained the extract by unconventional methods; R.T. determined the total saponin content; I.T. analyzed the samples tested by HPLC-MS/MS targeting quantification and interpreted the data; writing—original draft preparation, C.Z. and R.T.; writing supervision, L.M. and I.C.; funding acquisition, C.Z., R.T. and L.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was financed by the Project 381PED/2020.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not public available, because these will be published in an article.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Lutsenko, Y.; Bylka, W.; Matławska, I.; Darmohray, R. *Hedera helix* as a medicinal plant. *Herba Pol.* **2010**, *56*, 83–95.
2. Hiai, S.; Oura, H.; Hakajima, T. Color reaction of some sapogenins and saponins with vanillin and sulfuric acid. *Planta Med.* **1976**, *29*, 116–122. [[CrossRef](#)] [[PubMed](#)]
3. Wang, Y.; Yang, L.; Zhihui, L.; Jun, Y. The quality control of the effective fraction from *Dioscoreaspongiosa*. *Asian J. Trad. Med.* **2007**, *2*, 12–18.