

international conference

ABSTRACT BOOK



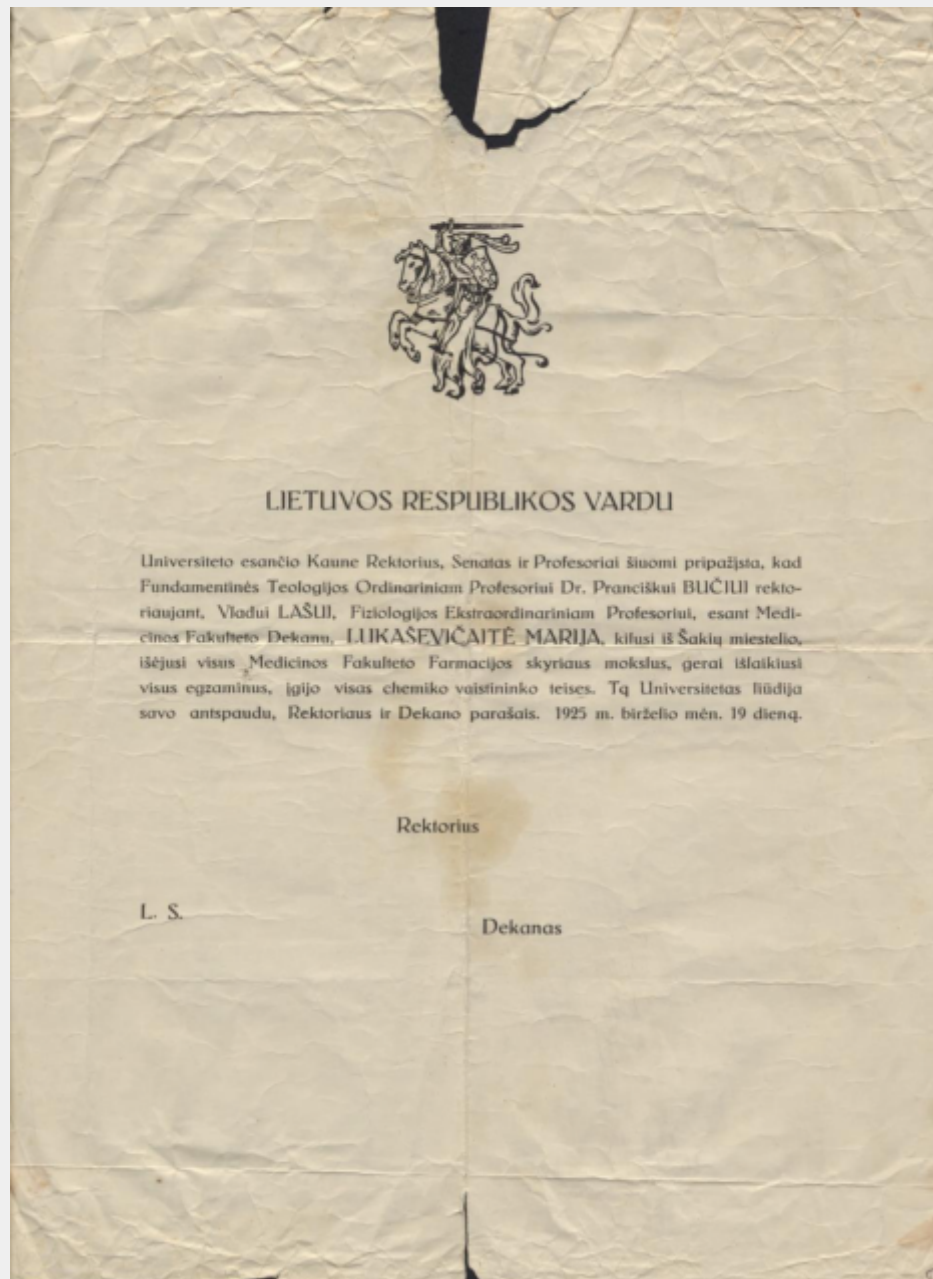
CONTEMPORARY PHARMACY: ISSUES, CHALLENGES AND EXPECTATIONS 2025

April 10
Lithuania, Kaunas

Conference dedicated to the Centennial of the First Lithuanian Pharmacy Diploma.

One hundred years ago, the first nine graduates of the University of Lithuania completed their higher pharmacy studies and were awarded the diploma of Chemist-Pharmacist. Over the past 100 years, approximately 5,600 individuals have completed higher pharmacy studies in Kaunas. These graduates are not only the creators of Lithuanian pharmacy history but also contributors to the broader history of our country.

As we mark this centennial milestone, it is a fitting moment to look back and reflect on the remarkable journey we have taken...



Modern Approaches for Assessing the Antioxidant Activity of Lipophilic Compounds

Tetiana Matus^{*1}, Kateryna Khokhlova², Olha Mykhailenko^{1,3,4}, Liudas Ivanauskas⁵, Victoriya Georgiyants¹

¹ Department of Pharmaceutical Chemistry, National University of Pharmacy, Kharkiv, Ukraine; ² HPTLC Association, Ukrainian Chapter, Switzerland; ³ Pharmacognosy and Phytotherapy Group, UCL School of Pharmacy, London, United Kingdom; ⁴ Department of Pharmaceutical Biology, Kiel University, Kiel, Germany; ⁵ Department of Analytical and Toxicological Chemistry, Lithuanian University of Health Sciences, Kaunas, Lithuania

* Corresponding author's e-mail: vgeor@nuph.edu.ua

Background: The assessment of antioxidant properties is very important for predicting the possible vector of pharmacological activity of bioactive compounds (1). For plant extracts, it is important to evaluate not only the total effect but also the activity of individual compounds. Such studies for phenolic compounds are widely conducted by LSMU scientists using the HPLC method with post-column derivatisation by appropriate chemical agents (2). Lipophilic antioxidants protect biological systems from oxidative stress by neutralising lipid peroxidation and scavenging lipid-soluble free radicals (3). The identification of the most active compounds in plant essential oils or lipophilic extracts is highly promising for optimising their research and further application. However, the use of the HPLC method for such purposes is not always feasible due to the nature of compounds and the limited use of reagents that may negatively affect the equipment.

Aim: This study assesses the feasibility of selecting methods for evaluating the antioxidant activity of individual lipophilic substances in plant objects.

Methods: A literature review was conducted to evaluate antioxidant assays used for lipophilic antioxidants.

Results: Few studies have focused on determining the antioxidant activity of individual lipophilic compounds, particularly in essential oils (4). Various methods, including GC and HPTLC, and assays such as ORAC, HORAC, TEAC, CUPRAC, and β -carotene linoleic acid have been applied. Among these, CUPRAC is particularly for assessing reducing capacity in lipid environments. Among *in vitro* methods, DPPH is the most commonly used due to its simplicity and cost-effectiveness, followed by hydroxyl radical scavenging, SOD, and β -carotene linoleic acid assays. The challenge of evaluating the antioxidant activity of individual lipophilic compounds can be effectively addressed using HPTLC, which offers extensive possibilities for the use of both mobile phases and derivatisation reagents.

Conclusion: HPTLC enables rapid, cost-effective detection of antioxidant activity, especially for lipophilic compounds in complex plant mixtures.

References:

1. Tao Y, Zhang H, Wang Y. Revealing and predicting the relationship between the molecular structure and antioxidant activity of flavonoids. *LWT*. 2023;174:114433.
2. Marksa M, Radušienė J, Jakštas V, Ivanauskas L, Marksienė R. Development of an HPLC post-column antioxidant assay for *Solidago canadensis* radical scavengers. *Nat Prod Res*. 2016;30(5):536-43.
3. Chaudhary P, Janmeda P, Docea AO, Yeskaliyeva B, Abdull Razis AF, Modu B, et al. Oxidative stress, free radicals and antioxidants: potential crosstalk in the pathophysiology of human diseases. *Front Chem*. 2023;11:1158198.
4. Dawidowicz AL, Olszowy M. Does antioxidant properties of the main component of essential oil reflect its antioxidant properties? The comparison of antioxidant properties of essential oils and their main components. *Nat Prod Res*. 2014;28(22):1952-63.