

## HABILITATION THESIS REVIEWER'S REPORT

### Masaryk University

#### Applicant

Mgr. Danuše Tarkowská, Ph.D.

#### Habilitation thesis

Trace and ultra-trace analysis of natural substances of terpenoid character

#### Reviewer

Prof. Ing. Ivan Mikšík, DrSc.

#### Reviewer's home unit, institution

University of Chemistry and Technology Prague,  
Department of Analytical Chemistry, Prague  
University of Pardubice, Department of Analytical  
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The habilitation thesis of Mgr. Danuše Tarkowská, Ph.D. deals with using modern separation and detection methods for quantitatively analysing biologically important substances in tissues of plant origin. The whole thesis consists of 50 pages of text, 181 references and 16 attached papers of the author.

The main goals of the presented work are to develop methods suitable for trace and ultra-trace analysis of natural substances of terpenoid character, mainly plant hormones. For these purposes, the author (and her laboratory) developed not only the separation method (involved mainly UHPLC-MS instrumentation) but also the sample preparation step. Frankly, the most important step in ultra-trace analysis is just the sample preparation step(s). Of course, the author also contends with matrix effects. All these aspects of work on plant analysis were successfully resolved as demonstrated in the attached 16 papers. Of course, work on these subjects is continuing and still, it is supposed new results. All these papers were published in reputable scientific journals with a fundamental contribution of the presented author. Her importance in scientific work in a given field of research can be demonstrated on scientometric data, where according to the Web of Science (at the date of the review) she published 106 publications with great response (over 4000 citations and H-index=33).

From my point of view, the presented work is well done and demonstrates the high scientific level of Mgr. Danuše Tarkowska, Ph.D. and I have no significant objections to it.

### Reviewer's questions for the habilitation thesis defence

- 1) The author stated that during the last two decades, four new classes of substances exhibited growth and developed activity. Of course, it can be assumed that this progress is connected to newly developed (and used) not only analytical methods. What is the opinion of

the author – can we expect the finding of other such substances, especially due to the increasing sensitivity of analytical methods?

2) And secondly, I have a similar question regarding instrumentation – the author declared an increased sensitivity of the newly installed MS instrument (see Table 1, p. 22; by the way is the name the same for both instruments?). Does she suppose a great increase of sensitivity at other newly developed mass spectrometers? It could be really important for ultra-trace analysis (or super-ultra?).

## **Conclusion**

The habilitation thesis entitled “Trace and ultra-trace analysis of natural substances of terpenoid character” by Danuše Tarkowská **fulfils** requirements expected of a habilitation thesis in the field of Analytical Biochemistry.

Date: 30<sup>th</sup> December 2023

Signature: