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Review of doctoral thesis

The doctoral thesis of Ing. Katerina Vihanova titled "Chemical composition and antimicrobial activity of essential oils and supercritical carbon dioxide extracts of Asian spices against food pathogens in liquid and vapour phase" describes the effect of plant extracts obtained from 17 plant species against 4 bacterial strains that can cause diarrheal disease. The activity of essential oils and CO₂ extract was compared and tested in liquid and vapor phase. Chemical profile of the extract was also determined.

All chapters of the thesis are well structured, most of the comments from the prereview were addressed. The experimental part is comprehensive. Unfortunately, due to the lack of the plant material antimicrobial activity of only 10 of the selected plant species was finally tested.

The results are present clearly. Just in some tables that present chemical composition of plant extracts, information about standard deviation is missing. The work also brings completely new information about the chemical composition of EO and CO₂ extract from *Piper nigrum* 'Kampot' fruits, and CO₂ extract from the peel of *Citrus hystrix*. Discussion and conclusion are clear, all the research questions were answered. The results are of good quality and were also published in two scientific journals.

To conclude, the submitted thesis in general fulfils all requirements of doctoral thesis. Therefore, I recommend it for final defence.

Questions:

- 1) The influence of the environment, maturity and plant variety on the chemical composition of extracts is mentioned in your work quite often. Did you any have chance to collect this information for tested plants?
- 2) Antimicrobial activity of several plants was not tested due to the low extract yield. Why did not you buy or collected higher amount of the plants?
- 3) The antimicrobial activity of EO was usually slightly better compared to CO₂ extracts, probably due to the higher content of the main antimicrobial agent (e.g. cinnamaldehyde). Did you consider measuring absolute concentration of the main antimicrobial compounds in CO₂ and EO extracts? This could help to elucidate, whether the other compounds in extract significantly influence the antimicrobial activity.
- 4) The antimicrobial activity of plant EOs against pathogenic bacteria is widely researched. Are there also data how the EOs you tested can influence the human microbiome?
- 5) According to your findings and gained knowledge, can you recommend the best application of the CO₂ extracts and EOs in food industry as antimicrobial agents?

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