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## Review of the doctoral thesis

Author: **Julien Antih, PharmD.**

Title: **Chemical composition and in vitro antibacterial effects of vapours of essential oils from plants recommended by the European Medicines Agency against respiratory infections**

Lower respiratory tract infections are a global health problem, especially in children. Using essential oils vapours is a promising alternative to current antibiotic treatment against respiratory bacterial pathogens.

The dissertation thesis deals with the in vitro antibacterial effects of essential oil vapours against respiratory infections. Chemical composition in headspace above the *Thymus vulgaris* essential oil have been analyzed. In the first part, the set of five EOs have been tested for antimicrobial activity against pathogens causing pneumonia. The chemical profile of *Thymus vulgaris* EO has been characterized, with the special emphasis for the vapour phase composition. Two headspace techniques for sampling of essential oils have been utilized and compared, together with two different matrices in which the essential oil had been formulated.

Literature review summarizes respiratory infections in pediatric patients as well as botany, chemistry, and antimicrobial activity of essential oils. Three research questions have been clearly formulated. Both experimental methods and obtained results have been described in detail.

Questions:

1. Thymol is known to possess strong antiseptic and antibacterial properties. What are other active ingredients of the *Thymus vulgaris* EO?
2. What is the biosynthetic precursor of thymol?
3. Using GTS for headspace sampling might require some optimization such as adjusting volume withdrawn from the headspace and preheating of syringe to the same temperature as the samples. Withdrawing the similar volume as the headspace volume over the sample may disrupt the equilibrium in the vial. Have you optimized those parameters?
4. Can you name other techniques to sample headspace, that can be used with the GC analysis?

Comments:

In the list of publications (page 115), P1, year of publication is missing.

The dissertation thesis of PharmD. Julien Antih meets the requirements of CULS in Prague. The literature review is written comprehensively, experimental part and results described in detail and the discussion is of high quality. The aims of the thesis have been accomplished. I evaluate the work as of good quality.

**I am recommending the thesis for defence.**

In Prague, 6.1.2024

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