ABSTRACT

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Title of diploma thesis: **Influence of selected sesquiterpenes on the activity of hepatic cytochromes P450**

Sesquiterpenes are 15-carbon compounds that consist of 3 isoprenoid units in their molecule. Sesquiterpenes together with monoterpenes are the main components of plain essential oils and they play an important role in the plant development, physiology and ecological interactions. They are widely used in folk medicine and as a part of food supplements because of their biological effects - especially anti-inflammatory, anti-parasitic and anti-cancer. Moreover, essential oils represent a rich reservoir of candidate compounds, which could be potentially used as a drugs in future.

The aim of the present study was to test and compare the influence of seven selected sesquiterpenes (*β*-caryophyllene, caryophyllene oxide, α-humulene, farnesole, valencene, *trans*-nerolidole and *cis*-nerolidole) on the activities of the main hepatic enzymes involved in phase I biotransformation of xenobiotics, cytochromes P450 (CYPs) 1A and 3A, in rat and human in *in vitro* model systems.

In the present study, the activities of the CYP1A were assayed using ethoxyresorufin as a specific substrate. Benzyloxyresorufin and midazolam were used as specific substrates for the measurement of CYP3A activity. The results have showed that all tested sesquiterpenes significantly inhibit the activity of 1A and 3A subfamily of cytochrome P450 in rat as well as in human liver microsomal fractions. Thus, sesquiterpenes might affect the CYP1A and CYP3A mediated metabolism of concomitantly administrated drugs and other xenobiotics. Possible drug-sesquiterpene interactions as well as potential chemoprotective activity mediated via inhibition of CYP1A should be further evaluated in *in vivo* experiments.