

ABSTRACT

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Title of diploma thesis: Effect of sesquiterpenes on detoxifying enzymes in liver slices

Sesquiterpenes are secondary metabolites produced by higher plants, bacteria and fungi. They ensure the survival and competitiveness of plants. Sesquiterpenes are composed of three isoprene units. They possess anti-inflammatory, antimalarial, antibacterial, antiviral, antioxidant, analgesic, antifungal and anticancer activity. Sesquiterpenes, the main components of plant essential oils, have been used in folk medicine and as spices for years. The aim of this diploma thesis was to find out the effect of three structurally related sesquiterpenes α -humulene (HUM), β -caryophyllene (CAR), and β -caryophyllene oxide (CAO) on the activities of the main drug-metabolizing enzymes. Precision-cut tissue slices from the rat liver (*Rattus norvegicus*) were chosen as model system. Thickness of the slices was 200-250 μm and diameter 8 mm. Liver slices were pre-incubated for 30 minutes and then incubated for 8 and 24 hours. Samples of liver slices and incubation medium were taken upon replacing the medium after pre-incubation (time 0 hours) and then after 8 and 24 hours. Concentration of sesquiterpenes was 10 μM . It was found out that activity of aldo-keto reductase AKR1A1, cytochrome P450 (CYP2B/3A) and NADPH-quinone oxidoreductase 1 (NQO1) was influenced in comparison to control. Activity of AKR1A1 and CYP2B/3A affected by CAR and HUM showed decrease after 8 hours of incubation. Activity of CYP2B/3A affected by CAO showed decrease after 24 hours incubation. Activity of NQO1 affected by HUM showed decrease after 24 hours of incubation.