

ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Biochemical Sciences

Candidate: Marie Elstnerová

Supervisor: prof. Ing. Barbora Szotáková, Ph.D.

Title of diploma thesis: *Pistacia lentiscus* essential oil: in vitro testing of cytotoxicity and anti-inflammatory activity

This project, which has been initiated in cooperation with University of Sassari (Italy), is aimed to find out more details about biological activity of essential oil from *Pistacia lentiscus*. We want to contribute to the decision, if this essential oil can be used as a part of oral health products. The essential oil was prepared from leaves of wild occurring plants growing in North Sardinia. The cytotoxicity and anti-inflammatory activity of not only the pure essential oil but also of the lecithin nanoemulsion with *P. lentiscus* oil and Tween 80 nanoemulsion with *P. lentiscus* oil and moreover, the two most abundant terpenes in the essential oil, (-)- α -pinene and (-)-terpinen-4-ol, were tested. The cytotoxicity was measured by the colorimetric assay using tetrazolium salt WST-1 on four oral cell lines (gingival fibroblasts, periodontal ligament fibroblasts, dysplastic oral keratinocytes and primary gingival keratinocytes). The viability of human oral cells was the most diminished by lecithin nanoemulsion, pure essential oil had the lowest influence on the viability. The anti-inflammatory activity was measured in a cell-free enzymatic *in vitro* assays using recombinant cyclooxygenase 1 and 2 (COX-1, COX-2) and soybean lipoxygenase (LOX). The activity of COX-1 and COX-2 was determined by the colorimetric assay using ELISA kit, the activity of LOX was measured spectrophotometrically. *P. lentiscus* essential oil showed the capacity to inhibit all enzymes, but more COX-1 and COX-2 than LOX. Based on our results, the essential oil can be a safety and beneficial part of oral health product – it is not cytotoxic for oral cells and show an anti-inflammatory activity.