Inhibitory effects of *Lavandula angustifolia* Essential Oil on Selected Metalloproteinases

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The essential oil of lavender (*Lavandula angustifolia* Mill.) has been used in a wide range of products due to its unique phytochemical composition, which confers both aromatic and biological properties. Lavender has also been promoted as a topically applied essential oil that can help to relieve the symptoms of psoriasis, dermatitis and eczema. Moreover, lavender essential oil possesses anti-inflammatory, wound healing properties also some studies have shown that several constituents have antimutagenic and anticancer properties (1-3). Matrix metalloproteinases (MMPs) form a group of more than 20 zinc-dependent enzymes, which are involved in the remodeling of several components of the extracellular matrix (ECM). They play a role in many physiological processes such as embryo implantation, bone remodeling and organogenesis, and have additional roles in the reorganization of tissues during pathological conditions such as inflammation, wound healing and invasion of cancer cells (4). Therefore, MMPs are selected as attractive cancer targets. In general, synthetic MMP inhibitors exhibit relatively high toxicity, therefore the results of such inhibitors in human clinical trials suggest the need for compounds such as more effective natural compounds (5). In this perspective, the aim of the present study was to evaluate the inhibitory effect of commercial *L. angustifolia* essential oil on gelatinases (MMP-2 and -9), and collagenases (MMP-1, -8 and -13), respectively. The *in vitro* evaluation of cytotoxic properties of the essential oil using the MTT assay was performed for the determination of the selectivity and safety of the test materials. The analyses of the essential oil by both GC and GC-MS showed that the major components of essential oil were linalool 35.8% and linalyl acetate 36 %. The essential oil was relatively non-toxic on *3T3* cell lines with the IC_{50}> *500 µg/mL level.* When compared with the standard compound NNGH the inhibition percentage (%) values were; 100% for MMP-2, and 85.4± 4.2% for MMP-9, (at 0.4 mg/mL concentration), where the essential oil showed a strong inhibition (66.3 ± 5.3%) on MMP-9 and a rather weak inhibition (13.21±2.7%) on MMP-2 at the same concentration, respectively. It may be concluded that the lavender essential oil can be further evaluated for its MMP inhibitory activities. The inhibition of MMPs plays a role at amelioration of the corrupt pathophysiology of the disease, where gelatinase inhibition might be the underlying mechanism for therapeutic efficacy.

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