Selective antibacterial and apoptosis-modulating activities of mastic


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Abstract
Mastic is a resinous exudate obtained from the stem and the main leaves of Pistacia lentiscus. We have reported the antiplaque effect of mastic-containing chewing gum on the oral cavity. We hypothesize that mastic may be a multifunctional food which has some beneficial pharmaceutical properties. The aim of this study was to assess the biological activity of solid and liquid types of mastic by cytotoxicity against fibroblasts, radical-scavenging activities and inhibitory effect on cell death of oral polymorphonuclear leukocytes (OPMNs). Mastic showed selective antibacterial action against Porphyromonas gingivalis and Prevotella melaninogenica, but no anti-HIV activity. Among a
total of thirteen human cell types, promyelocytic leukemia HL-60 was the most sensitive to the
cytotoxicity of mastic, followed by myeloblastic leukemia (ML-1, KG-1), erythroleukemia (K-562), oral
squamous cell carcinoma (HSC-2, HSC-3, HSC-4), hepatocellular carcinoma (HepG2), glioblastoma
(T98G, U87MG) and normal oral cells (gingival fibroblast, pulp cell, periodontal ligament fibroblast,
most resistant). Mastic did not induce the differentiation of myelogenous leukemic cells into maturing
cells with higher nitroblue tetrazolium-reducing activity, but induced apoptotic cell death,
characterized by internucleosomal DNA fragmentation, caspase-3 activation and a decline in the
intracellular concentration of putrescine. The cytotoxicity of mastic against leukemic cells did not
diminish during its storage. On the other hand, mastic inhibited the spontaneous apoptosis of
OPMNs. Mastic showed hydroxyl radical-scavenging activity. The selective antibacterial and
apoptosis-modulating activity of mastic suggests its possible beneficial effects on oral health.