

EFFECT OF DIFFERENT MENTHA PIPERITA VARIETIES ON PROLIFERATION AND CYTOKINE PRODUCTION IN HUMAN PERIPHERAL BLOOD MONONUCLEAR CELLS

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Mentha plants have been used as aromatic herbs for thousands of years. *Mentha* preparations and extracts have a well-established role in folk medicine in the treatment of several disturbances, such as loss of appetite, common cold, bronchitis, and vomiting, however up to now only a few of their pharmacological properties have been investigated in depth. The role of some components of *Mentha* in alleviating inflammatory diseases including arthritis and rheumatism is also well documented at least in experimental models. Essential oils of *Mentha* are used as anti-inflammatory remedies in aromatherapy, as well, although in this case their possible mechanism(s) of action is still matter of speculation. The present study was undertaken to investigate the effects of some *Mentha* varieties on the proliferation and the production of T_h1 (interferon [IFN]- γ) and T_h2 (interleukin [IL]-4) cytokines in human peripheral blood mononuclear cells (PBMCs). In particular, we studied the essential oils of two varieties of peppermint, *Mentha piperita* var. 541 (*Mentha* 541) and var. Laimbourg (*Mentha* Laimbourg), harvested in two different fields (located respectively in Valtellina and Val Formazza, Italy) and at two different harvest times (june and september). PBMCs were isolated from venous blood of healthy donors, stimulated with anti-CD3 (10 μ g/ml) and anti-CD28 (10 μ g/ml) moAbs and cultured *in vitro* under standard conditions for 48 h. The essential oils were diluted 1:1 with dimethylsulfoxid and used in non-cytotoxic dilutions (1:100000-1:500). Cell proliferation and production of cytokines were assayed by standard ELISA kits. Essential oils of *Mentha* Laimbourg harvested either in september or in june (1:1000-1:500) significantly reduced cell proliferation down to 50-60% of control (P<0.01). A similar inhibitory effect was exerted by both *Mentha* 541 harvested in Valtellina in september (1:1000-1:500) and *Mentha* 541 harvested in Val Formazza in june (1:10000-1:500). On the contrary, *Mentha* 541 harvested in Valtellina in june had no effect at all on this parameter. No effect was observed on the production of cytokines in the presence of any of the essential oils tested, however *Mentha* 541 harvested in both Valtellina and Val Formazza in june (1:10000-1:1000) significantly increased the ratio IFN- γ /IL-4 up to 70-80% of control (P<0.01). In human PBMCs essential oils from different *Mentha* varieties inhibit proliferation and seem to affect T_h1/T_h2 balance, assessed by IFN- γ /IL-4 ratio. The differences observed between *Mentha* varieties harvested in various fields and at different harvest times may be accounted for by differences in the composition and quality of essential oils.