



RESTRAIN HYPERCHOLESTEROLEMIA WITH ORANGE AND MANDARIN VOLATILE AND FOLDED OILS

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ABSTRACT

The findings of this study proved that orange peels contain more twice oil yield over mandarin peels (0.24% and 0.12%, respectively). Concentrated orange and mandarin peel essential oils were obtained by fractional distillation. The chemical constituents of original orange and mandarin oils (OO and MO) and their fivefold (5FOO and 5FMO) were fractionated and identified by GC/MS and GC. Limonene was the major monoterpene component in orange and mandarin oils, 89.65% and 65.57%, respectively, followed by myrcene (3.95%) and γ -terpinene (23.07%) in orange and mandarin oils, respectively. Octanal (1.47%) and linalool (1.5%) were the abundant oxygenated components in orange and mandarin oils, respectively. The decrement percentages of limonene were 18.58 and 19.25% in five fold orange and mandarin oils, respectively. The major oxygenated component in 5FOO was the alcoholic β -Cis-terpeneol (4.27%). The main esters of mandarin oil, methyl N-methyl anthranilate and geranyl acetate were increased to 0.45% and 1.05%, respectively in 5FMO. In general, total oxygenated compounds percentages increased by 6.9 and 7.3 times after folding of orange and mandarin oils, respectively.

The above mentioned oils, pure limonene and synthetic antioxidant (BHT) were orally administrated for hypercholesterolemic rats for four weeks. No significant differences were recorded among groups of rats administrated with all different tested oils in body weight gain (%) or feed intake (g) ($p \leq 0.05$). In general, all rat groups administrated with orange and mandarin oils and their concentrates, showed improvement in HDL levels nearly to normal level compared to the negative control. Thus, the decrement of serum cholesterol level among cholesterol-fed groups did not correlate with the amount of limonene consumed by rats and may be related to other minor components associated with limonene and shared in the antioxidant effect. The efficiency of folded oils on hypocholesterolemic rats did not affect by decreasing limonene by deterpenation process.