Studies on Antioxidative, Antibacterial, and Antihyperlipoidemia Effects of the Peel Oil of Taiwan Citrus grandis（L....

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ABSTRACT

In this study, peel essential oils were obtained from different Citrus grandis (L.) Osbeck varieties by steam distillation and dichloromethane extraction. The compositions of the volatile components in the essential oil were analyzed by Gas chromatograph-Mass spectrometer (GC-MS). The antioxidation, antibacterial, and serum lipid lowering ability of these essential oils were also studied. The yields of the essential oils of Taitung Wentan, Madou Wentan, Douliou Wentan, Yilan Wentan, Hsishihyu, Grapefruit, Redyu, and Pejyu obtained by steam distillation were 5.70, 9.13, 7.54, 10.61, 6.67, 6.94, 5.12, and 3.80 %, respectively. After silica gel fractionation, the yields of the distilled essential oils of Taitung Wentan, Madou Wentan, Douliou Wentan, Yilan Wentan, Hsishihyu, Grapefruit, Redyu, and Pejyu oil in pentane fraction were 4.18, 6.12, 5.40, 7.49, 3.05, 4.15, 2.65, and 2.29%, respectively. After silica gel fractionation, the yields of the distilled essential oils of Taitung Wentan, Madou Wentan, Douliou Wentan, Yilan Wentan, Hsishihyu, Grapefruit, Redyu, and Pejyu oil in ether fraction were 0.63 1.02, 0.66 1.22, 1.33, 1.74, 1.07, and 0.69%, respectively. The yields of the essential oils of Taitung Wentan, Madou Wentan, Douliou Wentan, Yilan Wentan, Hsishihyu, Grapefruit, Redyu, and Pejyu obtained by dichloromethane extraction were 6.14, 7.77, 12.25, 10.12, 5.05, 4.13, 4.37, and 4.09%, respectively. After silica gel fractionation, the yields of the solvent extracted essential oils of Taitung Wentan, Madou Wentan, Douliou Wentan, Yilan Wentan, Hsishihyu, Grapefruit, Redyu, and Pejyu oil in pentane fraction were 2.55, 3.71, 6.02, 5.52, 2.29, 2.16, 2.06, and 2.13%, respectively. After silica gel fractionation, the yields of the solvent extracted essential oils of Taitung Wentan, Madou Wentan, Douliou Wentan, Yilan Wentan, Hsishihyu, Grapefruit, Redyu, and Pejyu oil in ether fraction were 2.15, 2.15, 4.46, 4.09, 2.06, 1.69, 1.61, and 1.63%, respectively. The major volatile components in peel oils of different varieties Citrus grandis (L.) Osbeck were found to be terpenes, especially the limonene. When 10mg/ml dosage was used, solvent extracted oil of different varieties Citrus grandis (L.) Osbeck was found to have higher DPPH free radical scavenging effect (30~40%) than those of distilled oil (20~30%). When 10mg/ml dosage was used, dichloromethane extracted oil of different varieties Citrus grandis (L.) Osbeck was found to have higher ferrous ion chelating effect (20~30%) than those of distilled oil (10~20%). Broth dilution method was used for the study of antibacterial activities the different varieties Citrus grandis (L.) Osbeck distilled essential oil. Distilled Citrus grandis (L.) Osbeck essential oil showed stronger antibacterial activity in G(+) bacterial (60~70 % inhibition) than in G(-) bacterial (40~50 % inhibition). In the essential oil feeding study of the male hamsters, it was found that the male hamsters fed with the controlled feed and with 0.01% and 0.1% distilled Taitung Wentan Citrus grandis (L.) Osbeck essential oil had lower triglyceride, total cholesterol, low-density cholesterol on blood and liver than those without distilled Wentan Citrus grandis (L.) Osbeck essential oil addition（$p < 0.05$）.

Keywords : Citrus grandis (L.) Osbeck ; essential oil ; terpene compounds ; hamster ; antioxdation ; antibacterial ; serum lipid lowering effect

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