Study on Antioxidative Properties of Extracts from Pine Leaves

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ABSTRACT

Recent research interest of functional and healthy foods has been focused on antioxidation and anticarcinogen. Pine bark extract (PBE) has been found to contain high concentration of polyphenols and exhibited antioxidative and anticarcinogenic effects. Pinus taiwanensis and pinus morrisonicola used in this study were freeze-dried and hot air-dried. The antioxidative components in these two samples were extracted with methanol. The antioxidative properties, including reducing power, ferrous ion chelating power, α, α-diphenyl - β-picrylhydrazyl (DPPH) free radical scavenging activity, were measured and compared with those of alpha-tocopherol and butylated hydroxyanisole (BHA) .The results showed that methanol extracts from these Pinus taiwanensis and pinus morrisonicola sample after freeze-drying and hot-drying all had high reducing power. The highest reducing power was from pinus morrisonicola sample after freeze-drying. Data showed that which was 1.04 times as high as those of BHA and 3.2 times of alpha-tocopherol when the ratio of sample weight/solvent volume was at 20 mg/mL. In the results of DPPH free radical scavenging activity, the methanolic extracts from pinus leaves after different drying treatments had an equivalent scavenging activity. The highest DPPH free radical scavenging was from Pinus taiwanensis sample after hot air-dried which 93.4 % when ratio of samole weight/solvent volume was 2 mg/mL. The scavenging activity of the methanolic extracts was in the order of hot air-dried pinus morrisonicola > freeze-drying pinus morrisonicola > hot air-dried Pinus taiwanensis > freeze-drying Pinus taiwanensis > BHA > alpha-tocopherol. In the result of ferrous ion chelating power, The extracts from Pinus taiwanensis sample after freeze-drying had the highest ferrous ion chelating power, a value of 26.0 % when the ratio of sample weight/solvent volume was at 2 mg/mL. BHA and alpha-tocopherol showed no ferrous ion chelating power. In the analysis of components of the methanolic extracts from pinus leaves after different drying treatments, the results showed the polyphenols content of the extract from freeze-dried pinus morrisonicola and freeze-dried Pinus taiwanensis were 52.77 mg/g, and 73.05 mg/g respectively. Which were 2.5?2.8 times as high as those of hot air-dried pinus morrisonicola and Pinus taiwanensis. The flavonoids content of the extract from hot air-dried pinus morrisonicola , hot air-dried Pinus taiwanensis , freeze-dried Pinus taiwanensis , freeze-dried pinus morrisonicola were 21.26 mg/g , 20.37mg/g , 16.10 mg/g and 15.16 mg/g respectively. The ascorbic acid content was the highest in the extract from pinus morrisonicola .The result of this research will help the developing of functional healthy food and help further investigation of the functional properties of pinus leaves.

Keywords : Pinus leaves ; Antioxidative properties ; Reducing power ; Ferrous ion chelating power ; DPPH radical scavenging activity

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