Study on Antioxidative Properties of Extracts from Day Lily in Taiwan after Different Drying Treatments

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ABSTRACT

Day Lily (Hemerocallis fulva L.) used in this study was sampled as freeze-dried, hot air-dried, and commercialized Day Lily. The antioxidative components in these three samples were extracted using methanol. The antioxidative properties, including reducing power, ferrous ion chelating power, α , α -diphenyl- β -picrylhydrazyl (DPPH) radical scavenging activity and inhibitory effect on lipid peroxidation, were measured and compared with those of alpha-tocopherol and butylated hydroxyanisole (BHA). Data showed that the methanolic extract from freeze-dried Day Lily had the highest reducing power in these three samples, and the methanolic extract from hot air-dried Day Lily had the lowest value. The methanolic extract from freeze-dried Day Lily had the highest reducing power, which was 1.6 times as high as those of alpha-tocopherol and BHA when the ratio of sample weight/solvent volume was at 20 mg/mL. In the results of ferrous ion chelating power, the methanolic extracts from Day Lily after different drying treatments had a limited ferrous ion chelating power in all three samples, however, the methanolic extracts from freeze-dried Day Lily had the highest chelating power among the extracts from these three samples. The methanolic extracts from Day Lily after different drying treatments had an increasing followed by decreasing chelating power as the ratio of sample weight/solvent volume increased. alpha-Tocopherol and BHA showed no ferrous ion chelating power. In the results of DPPH radical scavenging activity, the methanolic extracts from Day Lily after different drying treatments had an equivalent scavenging activity to those of BHA, and alpha-Tocopherol, which were 92.6, 91.9 and 92.1%, respectively for freeze-dried, hot air-dried, and commercialized Day Lily when the ratio of sample weight/solvent volume was 20 mg/mL. In the results of inhibitory effect on lipid peroxidation, the methanolic extract from freeze-dried Day Lily had the highest inhibitory effect, however, which was only 0.6 times as high as those of alpha-tocopherol and BHA. The methanolic extracts from Day Lily after hot air-drying treatments showed low inhibitory effect, which was 0.4 times as high as those of alpha-tocopherol and BHA. The results of heat and pH stability for antioxidative properties of the methanolic extracts from these three samples showed that the extract from freeze-dried Day Lily had a higher stability than hot air-dried and commercialized Day Lily. The extract from freeze-dried and hot air-dried Day Lily after heating at 100±5℃for 2 hour still showed a high antioxidative activity in linoleic acid emulsion system. In the analysis of components of the methanolic extracts from Day Lily after different drying treatments, the results showed the polyphenols content of the extract from freeze-dried Day Lily was 17.34 mg/g, which was 1.2~1.4 times as high as those of hot air-dried and commercialized Day Lily. The flavonoids content of the extract from freeze-dried Day Lily was 7.69 mg/g, which was 1.36 times as high as that of hot air-dried Day Lily, and was 3.2 times as high as that of commercialized Day Lily. The carotenoids content of the extract from freeze dried Day Lily was 0.38 mg/g, which was 1.6 times as high as that of hot air-dried Day Lily, and was 2.4 times as high as that of commercialized Day Lily. The ascorbic acid content was the highest in the extract from hot air-dried Day Lily. From above results, it revealed that the extract from freeze-dried Day Lily had high contents of polyphenols, flavonoids and carotenoids, and so that had high values of reducing power, ferrous ion chelating power, DPPH radical scavenging activity, and inhibitory activity on lipid peroxidation. These results could be given as references for the application in Day Lily drying processing and food supply.

Keywords : Day Lily ; Antioxidative properties ; Reducing power ; Ferrous ion chelating power ; DPPH radical scavenging activity

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