

Antioxidant Activity and HPLC Analysis of *Chrysanthemum morifolium* Ramat.

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Chrysanthemum morifolium Ramat. (CM) is kind of flower. It is an important oriental herbal drug for eye diseases in China and Japan. In addition, studies demonstrate that dried CM possess antioxidant, cardiovascular protection effects, protection against terminal tumors, and anti-inflammatory activities. Thus, the objectives of this research were to determine the α -glucosidase inhibitory effect, reducing power and scavenging ability on 2,2-diphenyl-2-picrylhydrazyl hydrate (DPPH) radicals were investigated.

Materials and Methods

◦ Materials

The dried chrysanthemum was extracted in different solvents, including methanol (60%, 80%, 100%), ethanol (60%, 80%, 100%), 100% acetone, 100% ethyl acetate and aqueous. The extract was filtered and three replicated were extract for sample under the same conditions with new solvent. The filtered extracts were mixed and concentrated using a rotary evaporator. The extract was then stored under refrigeration for further analysis.

◦ Methods

The total phenolic content, DPPH radical scaring, reducing power and α -glucosidase inhibitors activity of CM were investigated. In addition, the CM extracts were dissolved in methanol and filtered (0.45 μ m) for HPLC analysis. Chromatographic separation was carried out at room temperature using an j'sphere ODS H80 analytical column (250 mm \times 4.6 mm, 5 μ l). The mobile phase consisted of methanol, 0.2% phosphatic acid in water and acetonitrile; flow rate was 0.8 ml/min. The detector wave length was set at 350 nm.

Results

In this study results showed that the maximum solvent extract yield (35.47%) and luteolin concentration (1.34 μ g/ml) were achieved in methanol extract. In addition 60% methanol extracts of CM exhibited good scavenging activites against DPPH radical and significant reducing power among all the extracts. Futhermore, the amount of total phenolics was 0.38 ± 0.02 mg GAE/g. The amount of phenolics in 60% methanol extract may cause its strong antioxidant ability. These results provide scientific support for the food industry could be benefited by the usage of this extract containing this constituent.

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Solvent	Extract yield (%)	Total phenolic ($\mu\text{g/ml}$)	DPPH radical Scavenging activity $\text{IC}_{50}(\mu\text{g/ml})$
W	31.52	0.16 \pm 0.03	28.62 \pm 0.23
E	13.41	0.16 \pm 0.01	30.48 \pm 0.16
A	5.84	0.27 \pm 0.01	28.32 \pm 0.13
60 E	28.40	0.31 \pm 0.01	28.26 \pm 0.11
80 E	28.27	0.31 \pm 0.02	28.21 \pm 0.20
100 E	22.46	0.20 \pm 0.00	29.16 \pm 0.15
60 M	30.08	0.38 \pm 0.01	26.66 \pm 0.12
80 M	35.11	0.31 \pm 0.00	25.88 \pm 0.10
100 M	35.47	0.29 \pm 0.02	28.41 \pm 0.12
BHA			1.13 \pm 0.11
BHT			86.00 \pm 0.11

Table 1. The extract yield, total phenolic content, DPPH free radical scavenging activity from chrysanthemum.

Table 2. Luteolin concentration in chrysanthemum from different solvents.

Extract	Luteolin ($\mu\text{g/ml}$)
W	0.38 \pm 0.00
E	0.91 \pm 0.00
A	0.87 \pm 0.01
60 E	1.12 \pm 0.02
80 E	1.00 \pm 0.02
100 E	0.17 \pm 0.00
60 M	1.19 \pm 0.00
80 M	1.34 \pm 0.02
100 M	1.15 \pm 0.02

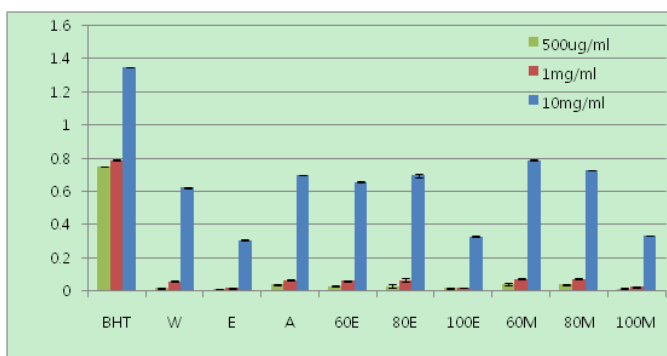


Fig. 1. Reducing power activities of extract from chrysanthemum.

60% methanol (60M), 80% methanol (80M), 100% methanol (100M), 60% ethanol (60E), 80% ethanol (80E), 100% ethanol (100E), 100% acetone (A), aqueous (W) and 100% ethyl acetate (E).