

# Antioxidative activity and cell assay of coleus blumei extracts

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## ABSTRACT

Fresh leaves of *Coleus blumei* were first dried under various temperatures (40, 60, 80 and 100 °C) and then were extracted using a hot water reflux. Also some fresh leaves of *Coleus blumei* were first sun-dried and then extracted by using a hot reflux with one solvent (water, methanol, ethanol, ethyl acetate or n-hexane). The purpose of this study is to examine the effect of extraction method on antioxidative activities of extracts. The assays of antioxidative activities included DPPH (1,1-diphenyl-2-picrylhydrazyl) radical scavenging ability, Fe<sup>2+</sup> chelating ability, relative reducing power, superoxide anion scavenging ability, the inhibition of Fe/ascorbate-induced lipid peroxidation, and ABTS cation scavenging ability. These antioxidative activities of *Coleus blumei* extracts were measured and compared with those of butylated hydroxyanisole (BHA), ethylene diamine tetracetic acid (EDTA) or gallic acid. The component analysis and cell assay were also carried out for *Coleus blumei* extracts with the highest antioxidative activities. The results have showed that both of the extraction yield and the content of total phenols reached the highest when fresh leaves of *Coleus blumei* were extracted by hot water. The fresh leaves of *Coleus blumei* extracted by ethyl acetate had the highest content of total flavonoids, and however, most of total phenols and total flavonoids lost during drying. For the antioxidative activities, the extracts obtained by water and ethyl acetate had a higher DPPH radical scavenging ability (IC<sub>50</sub> < 0.01 mg/mL); the aqueous extract had the highest relative reducing power (IC<sub>50</sub> = 0.7 ± 0.00 mg/mL), the highest Fe<sup>2+</sup> chelating ability (IC<sub>50</sub> = 0.13 ± 0.02 mg/mL), and the highest superoxide anion scavenging ability (IC<sub>50</sub> = 0.35 ± 0.00 mg/mL); the extract by ethyl acetate had the highest ABTS cation scavenging ability (IC<sub>50</sub> < 0.01 mg/mL); the extract by n-hexane had the highest inhibition ability of lipid peroxidation (IC<sub>50</sub> = 3.89 ± 0.14 mg/mL). In addition, the components of the extracts by water and ethyl acetate were analyzed by using an HPLC. The result showed that rosmarinic acid was the major component, and its content in the aqueous extract (232.09 mg/g) is higher than that in the ethyl acetate extract. In cell assays, the results show that the aqueous extract affected the HepG2 cell viability but didn't affect the PC-12 cell viability. The aqueous extract showed the ability to protect PC-12 cells against hypoxia and H<sub>2</sub>O<sub>2</sub>-induced oxidative stress. In summary, the contents of total phenols and total flavonoids, and the antioxidant activities were highest for the extract from fresh leaves of *Coleus blumei* obtained by a hot water reflux. The extract could inhibit the growth of HepG2 cells and protect nerve cells against oxidative stress. The results obtained in this study are useful for future research and development of functional foods.

Keywords : *Coleus blumei*、antioxidative、rosmarinic acid、HepG2 cell、PC-12 cell、cell viability

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