Studies on the Antioxidative Activities of Vitex trifolia

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ABSTRACT

In this study, traditional Chinese herb medicine, Vitex trifolia, was extracted by using various solvents (H2O, 50% ethanol, methanol, 95% ethanol, ethyl acetate, and n-hexane) with reflux. The contents of polyphenolics and flavonoids in the extracts were measured, and their antioxidant activities were analyzed. The analyses of antioxidant activities included DPPH scavenging activity, reducing power, superoxide anion and ABTS scavenging activities, and Fe2+ chelating ability, and the above antioxidative activities of the extracts were compared with those of BHA, EDTA, Trolox, Vitamin C and Gallic acid. In comparison of extracts by various solvents, the highest extraction yield (9.49%) was obtained by using 50% ethanol; the extraction by n-hexane has the highest total polyphenolic and total flavonoid compounds, and they were 53.13 ± 0.10 mg/g and 1.12 ± 0.10 mg/g, respectively. In the DPPH free radical scavenging activity experiment, the extract by ethyl acetate reached 100% scavenging activity at an extract concentration of 0.8 mg/mL. The smallest DPPH IC50 is 0.02 ± 0.00 mg/mL of the extract by 50% ethanol. The extract by H2O at a concentration of 0.8 mg/mL has reducing power even better than that of BHA; In the Fe2+ chelating test, the extract by H2O has the greatest reaction activity, up to 98.8%, which is equivalent to that of EDTA (about 99.9%), and the IC50 of the extract was 0.29 ± 0.01 mg/mL. Finally, the extract by H2O had the highest superoxide anion scavenging activity (96.3%) and ABTS scavenging activity (63.2%) and their IC50 ’s were 0.18 ± 0.01 mg/mL and 0.19 ± 0.00 mg/mL, respectively. By using HPLC analysis, quercetin (3,3',4',5'-7-penta-hydroxy flavone) was found in all the extracts, In addition to 50% ethanol extracts.. The extracts contained higher amount of this compounds when non-polar solvents were used during extraction. In an in vitro experiment, results indicated that the extract by water had good protection to PC12 cells when they were damaged by H2O2. Furthermore, higher concentrations of the extract made cell protection in a dose-dependent manner. Based on the findings above, the extracts of Vitex trifolia L. have high antioxidant activities there is showing that the extract (by water) could correct PC12 cell damage induced by H2O2. However, Vitex trifolia L. is still worth for further study and other applications.

Keywords : Vitex trifolia、reflux extraction、polyphenolics、flavonoids、antioxidant activity、HPLC、PC12、MTT

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