Antioxidative activity and cell protective effect of gastrodia elata blume

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ABSTRACT

Gastrodin and p-hydroxybenzyl alcohol (4-HBA) are the main active constituents of Gastrodia elata of which has numerous physiological functons, and has been used as an anti- convulsant, analgesic and sedative agent for the therapeutics of epilepsy, paralysis, inflammation, aging, and ameliorated memory impairment. The oxidative stress is caused by free radicals that increase the chain reactions of proteins, polysaccharides and lipids. The results are altered cellular oxidation and impaired cellular function in many neurodegenerative diseases including aging, cancer, atherosclerosis, inflammation and immune problems. In ths study, extracts of Tianma (G. elata), extracted with a variey of solvents via diferrent extraction, were applied to the cell viability and the measurement of the yield, total phenol content and the in vitro antioxidant activity, including the free radical scavenging activity of 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ABTS cation, reducing power assay, superoxide dismutase activity and the inhibition activity of thiobarbituric reactive substances (TBARS); the PC-12 cell line was established to evaluate the protective function of G. elata extracts. As a result, the water extract obtained via hot reflux has the highest yield of 40.9%. For the antioxidant activity evaluation, the methanolic extract of G. elata has the highest DPPH scavenging activity (97.3%) at a concentrationf 0.4 mg/mL and the ethanolic extract of G. elata has the highest inhibition capacity of TBARS (93.4%) at a concentration of 1.0 mg/mL. The result of PC-12 cell viability in hypoxia-reoxygenation model suggested that the ethanolic extract of G. elata has the highest protective effect (about 81.3%) at a concentra-tion of 100 μg/mL. In the protective activity result of H2O2-induced cell death model, the highest protective activity (about 97.1%) standard 4-HBA had and followed the 70% ethanolic extract of G. elata (about 94.3%) at a concentration of 50 μg/mL.

Keywords : Gastrodia elata、gastrodin、free radical scavenging capacity、TBARS

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