

Investigation of antioxidant, cytotoxic and acetyl cholinesterase inhibitory effects of *Swertia longifolia* roots

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Background and Aims: *Swertia* species are widespread in south and east Asia and are used in traditional medicine as liver and stomach tonic. Among different species of *Swertia*, only *Swertia longifolia* grows in Iran. This plant is rich of xanthenes which have interesting biological effects. In the present investigation, some biological activity of *S. longifolia* roots including antioxidant, cytotoxic and acetyl cholinesterase inhibitory (AChEI) effects have been determined.

Methods: Total extract of the plant roots was obtained by using methanol 80%. Moreover, the roots were fractionated using hexane, chloroform, ethyl acetate, methanol and methanol 50%, respectively. Antioxidant activity of the extracts was measured by inhibition of DPPH free radicals. Cytotoxic properties of the extracts against MDBK, HepG2 and MCF7 cell lines was determined by MTT method and AChEI effect was tested based on Ellman's method in 96-well micro-plates.

Results: The results demonstrated that the plant root had no cytotoxic activity but showed reasonable radical scavenging properties (IC₅₀ 44.7-249.5 ppm). Among the different extracts, ethyl acetate and methanol fractions showed better results. AChEI tests exhibited that the extracts inhibited the enzyme in the range of 16.6-38.8% in 300 ppm and the total extract had the highest effect.

Conclusions: It is concluded that *Swertia longifolia* root is powerful antioxidant agent and this property may be one of the mechanisms for its AChEI activity. Furthermore, regarding to the non-cytotoxicity results, it can be a safe plant in Alzheimer disease but more studies are necessary.

Keywords: *Swertia longifolia*; Cytotoxic; Antioxidant; DPPH; AChEI; Alzheimer