Hepatoprotective effects of *Astragalus kahiricus* root extract against ethanol-induced liver apoptosis in rats

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Abstract

The hepatoprotective activity of the ethanol extract of *Astragalus kahiricus* (Fabaceae) roots against ethanol-induced liver apoptosis was evaluated and it showed very promising hepatoprotective actions through different mechanisms. The extract counteracted the ethanol-induced liver enzymes leakage and glutathione depletion. In addition, it demonstrated anti-apoptotic effects against caspase-3 activation and DNA fragmentation that were confirmed by liver histopathological examination. Moreover, the phytochemical study of this extract led to the isolation of four cycloartane-type triterpenes identified as astrasieversianin II (1), astramembrannin II (2), astrasieversianin XIV (3), and cycloastragenol (4). The structures of these isolates were established by HRESI-MS and 1D and 2D NMR experiments. The antimicrobial, antimalarial, and cytotoxic activities of the isolates were further evaluated, but none of them showed any activity.