

Evaluation of the antioxidant and anti-inflammatory capacity of hydroalcoholic and methanolic extracts of *Scrophularia striata*: Inhibition of albumin protein denaturation and stabilization of erythrocyte membrane

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Introduction: Acute and chronic inflammation are the most common causes of hypoalbuminemia. This deficiency is because of increased consumption of cells, decreased synthesis and entering into space. The use of herbal compounds with antioxidant properties can be used as an important strategy to reduce inflammatory diseases by reducing oxidative stress. The aim of this study was to investigate the antioxidant and anti-inflammatory capacity of methanolic and hydroalcoholic extracts of *Scrophularia striata* plant on the inhibiting of albumin denaturation as well as inhibiting of the erythrocyte hemolysis.

Materials & Methods: In this study, methanol and hydroalcoholic extract of *Scrophularia striata* were prepared and total phenol and flavonoids were calculated spectrophotometrically. The antioxidant activities of the plant extracts at different concentrations (25, 50, 100, 200, 400, 600 µg/ml) were investigated by the DPPH method. In protein denaturation inhibition, 1% bovine serum albumin was added to different concentrations of the extract and after heating, the percentage of inhibiting albumin denaturation was calculated. In the RBC membrane immobilization assay, to non-clot RBC, different concentrations of the extract were added and after heating, the percentage of hemolysis inhibition was calculated. The results were expressed as Mean ± SD in Excel software.

Results & discussion: The results showed that the amounts of phenol and flavonoid in each extract were different and the highest amounts were in the methanolic extract of *Scrophularia striata*. The IC₅₀ of methanolic extract of *Scrophularia striata* in the DPPH test equals 312.4 µg/ml, anti-inflammatory protein denaturation inhibition test, 393.2 µg/ml, and anti-inflammatory erythrocyte membrane immobilization test 502.52 µg/ml, which are lower than the IC₅₀ of hydroalcoholic extract. In addition, there is a direct relationship between antioxidant and anti-inflammatory activities and extract doses.

Conclusion: According to the results of this study, the type of solvent used for extraction has an important role in the antioxidant and anti-inflammatory effects of the plant.

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Declaration of conflict of interest:

The authors declare that they have no conflict of interest.