

Phytochemical Screening and Pharmacological Activities of Various Fractions Derived from Ephedra Foeminea Aerial Parts

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Abstract

Background: Obesity is a major risk of chronic diseases such as metabolic syndrome, cardiovascular diseases, type-2 diabetes mellitus, and some cancers. These diseases are the leading causes of death worldwide. Therefore, it is necessary to search for antiobesity therapeutics. Traditional folk remedies from plants are a potential source of natural alternatives of anti-obesity and consequently anti-diabetes medications. Antiobesity effect of Ephedra foeminea has never been investigated and consequently, we aim to investigate this.

Methods: Qualitative Phytochemical analysis of acetone, hexane, methanol and aqueous fractions derived from ephedra foeminea aerial parts. Antioxidant activity of these fractions was assessed using DPPH (free radical) assay with Trolox as a positive control. Furthermore, anti-lipase, anti-amylase, anti glucosidase, and cytotoxic activities were evaluated employing colorimetric methods.

Results: IC₅₀ of antioxidant activity of acetone, hexane, aqueous and methanol fractions and Trolox reference was 154.88±0.39, 21.87±0.45, 41.68±0.46, 14.45±0.24 and 2.22±1.57 µg/ml respectively. IC₅₀ of α-amylase inhibitory activities of acetone, hexane, aqueous and methanol fractions and acarbose reference was 13.8±0.67, 15.13±1.73, 14.79±1.31, 12.88±0.4 and 28.18±1.22 µg/ml respectively. IC₅₀ of α-glucosidase inhibitory activity of acetone, hexane, aqueous and methanol fractions and acarbose reference was 251.18±0.44, 194.98±0.21, 416.86±0.78, 117.48±0.35 and 41.68±0.34 µg/ml respectively. IC₅₀ of lipase inhibitory activity of acetone, hexane, aqueous and methanol fractions and orlistat reference was 177.83±1.49, 104.7±1.74, 165.95±1.28 24.54±0.49 and 12.3±0.35 µg/ml respectively. The minimal quantity of acetone, hexane, aqueous and methanol fractions that induced cytotoxicity was 312, 312, 5000 and 20000 µg/ml.

Conclusion: our data suggests that methanol fraction of Ephedra foeminea has the most potent antioxidant, anti-α-amylase, and anti-lipase activities and has no cytotoxic effect. This suggests that methanol fraction is a potential and safe source of therapeutically active compounds with anti-obesity and anti-diabetic potency.

Keywords: Ephedra foeminea; α -amylase; α -glucosidase; anti-lipase; obesity; diabetes.