

Phenolic compounds from *Foeniculum vulgare* (Subsp. *Piperitum*) (Apiaceae) herb and evaluation of hepatoprotective antioxidant activity

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ABSTRACT

Objective The study was designed to evaluate the antioxidant and hepatoprotective activities of the 80% methanolic extract as well as the ethyl acetate (EtOAc) and butanol (BuOH) fractions of the wild fennel (*Foeniculum vulgare* (Subsp; *Piperitum*)) and cultivated fennel (*F. vulgare* var. *azoricum*). In addition, quantification of the total phenolic content in the 80% methanol extract of fennel wild and cultivated herbs is measured. **Materials and Methods** An amount of 400 g of air dried powdered herb of wild and cultivated fennel were sonicated with aqueous methanol (80%), successively extracted with Hexane, EtOAc, and n-BuOH. The EtOAc and n-BuOH were subjected to repeated column chromatography on silica gel and Sephadex LH-20. The antioxidant effect was determined in vitro using 1,1-diphenyl-2-picrylhydrazyl (DPPH-). Hepatoprotective activity was carried out using a Wistar male rat (250-300 g). Total phenolic and flavonoid contents were determined as chlorogenic acid and rutin equivalents, respectively. **Results** Two phenolic compounds, i.e.,

3,4-dihydroxy-phenethylalcohol-6-O-caffeoyl-b-d-glucopyranoside and 3,8-binaringenin were isolated from the fennel wild herb, their structures were elucidated by spectral methods including 1D NMR, 2D NMR, and UV. The EtOAc and BuOH fractions of wild fennel were found to exhibit a radical scavenging activity higher than those of cultivated fennel. An in vitro method of rat hepatocytes monolayer culture was used for the investigation of hepatotoxic effects of the 80% methanol extract on the wild and cultivated fennel, which were >1000 and 1000 g/mL, respectively. As well as, their hepatoprotective effect against the toxic effect of paracetamol (25 mM) was exerted at 12.5 g/mL concentration. **Conclusions** Fennel (*F. Vulgare*) is a widespread plant species commonly used as a spice and flavoring. The results obtained in this study indicated that the fennel (*F. vulgare*) herb is a potential source of natural antioxidant. Two phenolic compounds, i.e.,

3,4-dihydroxy-phenethylalcohol-6-O-caffeoyl-b-d-glucopyranoside (A) and 3,8-binaringenin (B) were isolated from the fennel wild herb for the first time.

KEYWORDS

Antioxidant (Apiaceae) . *azoricum* . binaringenin . *Foeniculum vulgare* . hepatoprotection . phenolic compounds . *piperitum*

REFERENCES

