

## Phytochemical analysis and antioxidant activity of *Fumaria parviflora*

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**Background and Aims:** *Fumaria parviflora* one of the endemic Iranian perennial herb with a long history of medicinal use, was studied to detect some biologically active chemical constituents of the aerial parts of plant.

**Methods:** The air dried powder (150g) of the plant was Soxhlet-extracted successfully with solvents of increasing polarity; n-hexane, dichloromethane and methanol. The resultant methanol extract was subjected to Sep-Pack fractionation (using a step gradient of methanol–water mixture). The preparative reversed phase high-performance liquid chromatography analysis of the 40% and 60% methanolic Sep-Pak fraction afforded two purified compounds. Next, the structures of the isolated compounds were elucidated on the basis of UV and NMR spectroscopic techniques. Besides, the alkaloid content of the methanol extract were taken up in hydrochloric acid that were filtered and the aqueous acid solution brought to pH 8 with concentrated ammonium hydroxide and extracted with dichloromethane. Subsequently, a gas chromatography–mass spectrometry technique was applied for determination and identification of tertiary bases in alkaloid extracts of *F. parviflora*. Furthermore, the in vitro antioxidant activity of the extracts were assessed by free radical scavenging capacity of the stable 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radicals.

**Results:** According to the patterns of <sup>1</sup>H NMR and UV spectrums for the compounds isolated from HPLC their structures were suggested as 1) 7-O-Glucosyl coumarin, 2) 4-Methoxy-3-rutinosyl-kampferol. GC-MS analysis of the prepared extract determined four known alkaloids 3) Fumariline 4) Dihydro fumariline 5) Fumaritine 6) Oxyberberine within *F. parviflora*. Moreover, the antioxidant activity for different solvent extracts varied according to the presence of compounds in each of them, where the methanol extract with RC<sub>50</sub> of 72×10<sup>-3</sup> mg/ml exhibited the potent activity.

**Conclusions:** *F. parviflora* with assorted valuable compounds possessed favorable antioxidant properties that could be assigned to the variety of its medicinal usages.

**Keywords:** *Fumariaceae*; *Fumaria parviflora*; Alkaloids; gas chromatography–mass spectrometry; DPPH