



## ***Marrubium parviflorum* Fisch. & C.A.Mey.; phytochemical constituents and antioxidant activity**

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**Background and objectives:** *Marrubium parviflorum* Fisch. & C.A.Mey. (Lamiaceae) is a medicinal plant with documented antioxidant and analgesic effects distributed in Iran and Turkey. In the present study, the aerial parts of this species were subjected to phytochemical analysis, as well as antioxidant activity assays. **Methods:** Antioxidant activity of the petroleum ether, chloroform, ethyl acetate and *n*-butanol fractions of *M. parviflorum* aerial parts were evaluated using DPPH free radical-scavenging assay. Phytochemical constituents of the fractions having the most antioxidant activity were investigated on silica gel (normal and reversed phases) and sephadex LH-20 columns. Structures of the isolated compounds were elucidated using <sup>1</sup>H-NMR, <sup>13</sup>C-NMR and UV spectral analyses. **Result:** In DPPH free radical-scavenging assay, the ethyl acetate and *n*-butanol fractions demonstrated considerable antioxidant activity with IC<sub>50</sub> values of 84.1 ± 5.1 and 85.6 ± 3.4 µg/mL, respectively. Phytochemical investigation of the mentioned fractions resulted in the isolation of eleven compounds including forsythoside B (**1**), verbascoside (**2**), quercetin-3-O-rutinoside (**3**), chlorogenic acid (**4**), quercetin-3-O-β-D-glucopyranoside (**5**), 1,5-dicaffeoylquinic acid (cynarin) (**6**), 4,5-dicaffeoylquinic acid (**7**), caffeic acid glucoside (**8**), chrysoeriol 7-O-(3"-O-E-*p*-coumaroyl)-β-D-glucopyranoside (**9**), chrysoeriol 7-O-(3",6"-di-O-E-*p*-coumaroyl)-β-D-glucopyranoside (**10**) and apigenin 7-O-(6"-O-E-*p*-coumaroyl)-β-D-glucopyranoside (**11**). **Conclusion:** The results of this study introduced *M. parviflorum* as a plant rich in flavonoids, phenylethanoid glycosides and caffeoylquinic acid derivatives. A review on biological activity of the isolated compounds suggested the possible involvement of these compounds in previously reported antioxidant and analgesic activity of *M. parviflorum*. These findings were also indicated more medicinal potential of *M. parviflorum* and highlighted the species for further biological studies.

**Keywords:** antioxidant, *Marrubium parviflorum* Fisch. & C.A.Mey., phenolic compounds