Evaluation of the Biological Activities of Various Extracts from the Endemic Sideritis Trojana Bornm

T. Dikpınar*
Marmara University, Faculty of Pharmacy, Department of Pharmacognosy, Istanbul, Türkiye

M. Yücetürk
Marmara University, Faculty of Pharmacy, Department of Pharmacognosy, Istanbul, Türkiye

M. Hacıoğlu
Istanbul University, Faculty of Pharmacy, Department of Microbiology, Istanbul, Türkiye

N. Özsoy
Istanbul University, Faculty of Pharmacy, Department of Biochemistry, Istanbul, Türkiye

L. Bitiş
Marmara University, Faculty of Pharmacy, Department of Pharmacognosy, Istanbul, Türkiye

Abstract:

The genus Sideritis, belonging to the Lamiaceae family, is represented in Türkiye by 46 species, 36 of which are endemic. The endemic Sideritis trojana Bornm., commonly known as "Kazdağı tea," was collected from Çanakkale. The aerial parts of S. trojana were extracted using n-hexane (STH), chloroform (STK), methanol fractionally (STM1), direct methanol (STM2), and distilled water (STW) through the percolation method. These five extracts were evaluated for their anticholinergic, antimicrobial, and antioxidant activities. Additionally, the total phenolic and flavonoid contents of the extracts were quantified. The results indicated that the total phenolic content of the extracts ranged from 15.63 to 33.93 mg GAE/g extract, while the flavonoid content ranged from 23.04 to 32.60 mg CE/g extract. The IC50 values (mg/mL) of the extracts were determined through various antioxidant assays (DPPH, ABTS, FRAP, and superoxide) and compared to rutin. The most effective extracts in all antioxidant assays were STM1 and STM2. Moreover, STM1 and STM2 extracts inhibited AChE and BuChE enzymes in a dose-dependent manner. At 1.25 mg/mL, the AChE and BuChE inhibition activities of STM1 (IC50: 80.55 ± 0.880 mg/mL, 74.29 ± 1.930 mg/mL) and STM2 (IC50: 80.04 ± 1.670 mg/mL, 79.02 ± 0.430 mg/mL) were found to be comparable to those of galantamine (IC50: 97.62 ± 0.480 mg/mL, 94.25 ± 0.150 mg/mL) at 0.1 mg/mL. None of the extracts exhibited antimicrobial activity (MIC) against the Gram-positive and Gram-negative bacterial strains tested. However, the STH extract showed activity against Candida albicans, with a MIC value of 325 mg/mL.

Keywords:

S. trojana, antioxidant, anticholinergic, antimicrobial.