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Graduate School

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The Thesis Submitted for the Degree of M. Sc

**Phytochemical Investigation and Biological
Activity of *Artemisia amsinthium* L., a
Rangeland- Medicinal Plant from the
Sarbisheh Rangelands in the South
Khorasan Province**

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Abstract

Due to the importance of the rangeland medicinal plants, the present study was carried out to assess the phytochemical compounds and biological activities of the *Artemisia absinthium* L. as a rangeland-medicinal plant at different phenological stages. For this purpose, the aerial parts and root samples were collected at three phenological stages (vegetative, flowering, and seeding). The collected samples were dried and the plant extracts were prepared. Folin-Ciocalteu and aluminium chloride colorimetric methods were used for determination of total phenol and flavonoids contents, respectively. To investigate the biological activity of the extracts, the antioxidant activity was investigated by DPPH free radical scavenging activity method and antibacterial activity was evaluate by disk diffusion, minimum inhibitory concentration (MIC), and minimum bactericidal concentration (MBC) methods. The results of this study showed that the highest amount of total phenol (86.4 ± 2 mg gallic acid equivalents (GAE)/g dry weight) and total flavonoids (36.2 ± 1.3 mg quercetin equivalents (QE)/g dry weight) were recorded for the root extract obtained from flowering stage. Also, the results showed that the root extract obtained from flowering stage had the highest antioxidant activity among the all extracts. According to the results of the antibacterial tests, the largest inhibition zones, minimum inhibitory concentration, and minimum inhibitory concentration were observed for the flowering stage extracts, seeding stage extracts, and vegetative stage extracts, respectively. In general, it can be concluded that the *A. absinthium* and in particular its flowering stage has good antioxidant and antibacterial activity and can be considered as a suitable alternative source for synthetic antioxidants and antibiotics agents.

Keywords: Phytochemical compounds, Antioxidant activity, Antibacterial activity, Phenological stages, *Artemisia absinthium*