7thNational Congress on Medicinal Plants
12-14th May 2018
Shiraz, Iran

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Investigation and Comparison of Saponin Contents in Different Populations of *Achillea wilhelmsii* C.Koch.

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Achillea L. is belonging to Asteraceae family which has a global distribution and includes 18 species in Iran [1]. A wide range of secondary metabolites including saponins have been reported in this genus. Saponins or saponosides are amphiphilic glycosides, which are composed of hydrophobic sapogenin and hydrophilic sugar moieties. They are used for industrial and pharmacological purposes. Aim of this study was investigation and comparison of saponin contents in different populations of *Achillea wilhelmsii* C.Koch which grown in Iran. Based on geographical location, samples were collected from 12 different locations in Isfahan, Qazvin and Kohgiluyeh and Boyer-Ahmad Provinces. The collected plants (leaves and flowers) were dried at room temperature and shading. At first, dry materials were extracted by ethanol 70% using a combination of three methods including maceration, ultra sound and microwave techniques. Then, crude extract were fractioned by three solvent systems. Saponin content of each fraction was assayed according to Wu et al. (2013) method at 560 nm. Our results showed that leaf and flower tissues of the *A. wilhelmsii* populations had a considerable amount of saponin. In all studied populations, total saponin of the leaves was higher than the flowers. Comparison of the total saponin means among different populations showed that three populations which collected from Kashan had generally the highest total sponin. In the leaf tissues, highest total saponin contents were estimated in Qazvin, Kashan-2 and Vadeghan populations (209.5 to 231.4 mg/g DW); and the lowest total saponin contents were assayed in the samples which collected from Farsian village and Qazvin suburb (respectively 101.6 and 126.2 mg/g DW). As well as in the flowers tissues, the samples which collected from Kashan-2 and Qazvin suburb had the highest and lowest amounts of saponin content, respectively (197,9 and 76 mg/g DW). It seems that different environmental factors such as temperature, altitude, humidity and biotic stress in growth media of the plants affected saponin content in *A. wilhelmsii*. Same as our results Szakiel et al. (2010) showed that amount and type of synthesized saponins can be verified by environmental factors including light, temperature, humidity, soil fertility, carbon dioxide levels, and climate and geographical conditions.

Keywords: *Achillea wilhelmsii* C.Koch, Populations, Saponin

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