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UPLC analysis of phenolic compounds in *Matricaria chamomilla*

G. Haghi[1,2*], A. Hatami[1,2], M. Mehran[2]

[1]*Phytochemistry Group, Jundi Shapour Medicinal Plants Research Center, Kashan, Iran*
[2]*Barij Essence Pharmaceutical Company Research Center, Kashann, Iran*

Background and Aims: Chamomile (*Matricaria chamomilla* L.) has been used for centuries as a medicinal plant mostly for its anti-inflammatory, analgesic, antimicrobial, antispasmodic and sedative properties. The biological activity of chamomile is mainly due to the flavonoids apigenin, luteolin, quercetin, patuletin and essential oil constituents such as α-bisabolol and its oxides and azulenes. The purpose of this study was to develop a method based on Ultra Performance Liquid Chromatography (UPLC) coupled with photodiode array (PDA) detector for the analysis of phenolic compounds in the extracts of *M. chamomilla* aerial parts.
Methods: Extraction was performed with different solvents including methanol, 70% aqueous ethanol and water. The extracts obtained were analysed on a C_{18} column under gradient elution using acetonitrile and acetic acid in water as mobile phase at ambient temperature. The wavelength used for analytes detection was 340 nm. The method proposed was validated for determination of free and total apigenin and apigenin 7-glucoside contents as bioactive compounds in the extracts by testing sensitivity, linearity, precision and recovery. In general, UPLC produced significant improvements in method sensitivity, speed and resolution. The total phenolic and total flavonoid contents of the extracts were measured by colorimetry using the Folin-Ciocalteu and aluminum chloride reagents.
Results: The results revealed a considerable difference in total phenolic and total flavonoid contents in three kinds of dry extract. Methanol and aqueous extracts had the highest and lowest of total phenolic and total flavonoid contents, respectively.
Conclusions: An UPLC method with PDA detector has been developed to separate the phenolic compounds in chamomile. Analysis time was short and fast in comparison with conventional method of HPLC. This method reduced the mobile phase consumption and run time.

Keywords: *Matricaria chamomilla*; Flavonoids; UPLC