Method for Analysis of Terpenes in *C. Sativa* Using Headspace GC-FID and GC-QQQ

M. Stefanovska[*] and A. Kjulumoska-Gjorgjievska[*]

Farmahem, Skopje, Republic of North Macedonia

* *marijas@farmahem.com.mk, angja@farmahem.com.mk*

Terpenes are cannabis secondary metabolites that provide not only beneficial biological properties for the plant, but also are found to have synergic and/or enhancing effects of the cannabinoids[1]. Therefore, they are extremely important in the production of pharmaceuticals significant for the improvement of human health[1]. To emphasize, terpenes are volatile compounds that produce the plant its aroma and flavor, characterize the specific cannabis strains, and are primary constituents of the essential oils[1,2]. Hence, the analysis of terpene profile, that includes the terpene composition, chemistry, diversity, quantity, and biosynthesis, in the various products obtained from cannabis, is of primary importance[2].

We present method for identification and quantification of terpenes in *C. Sativa* using Agilent 7967A headspace sampler for sample introduction, Agilent 8890 gas chromatograph for terpene separation and Agilent Flame Ionization Detector accompanied with Agilent Triple Quadrupole 7000D for their detection and quantification. Namely, the headspace technique is perfect for analysis of the volatile terpenes, and it can provide better separation, faster analysis, and reduced matrix effect, compared to the traditional automatic liquid sampler[3]. Moreover, we present a comparison of the separation capabilities of two different GC columns, Agilent DB-Select 624 UI and Agilent HP-5. Finally, we optimized the process of sample preparation, without any significant losses because of the terpene volatility.

Keywords: terpene, cannabis, headspace, gas chromatography

References

1. Isidore, E; Karim, H; Ioannou, I. Extraction of Phenolic Compounds and Terpenes from Cannabis sativa L. By-Products: From Conventional to Intensified Processes, *Antioxidants* **2021**, 10, 942. DOI: org/10.3390/antiox10060942

2. Sommano, S. R; Chittasupho, C; Ruksiriwanich, W; Jantrawut, P. The Cannabis Terpenes, *Molecules* **2020**, 25, 5792. DOI: 10.3390/molecules25245792

3. Law, R. An introduction to Headspace sampling in gas chromatography: Fundamentals and theory, *PerkinElmer, Inc* **2014**, 3; Retrieved from https://resources.perkinelmer.com/corporate/pdfs/downloads/gde_intro_to_headspace.pdf