Journal of Metabolic Syndrome
ISSN: 2167-0943
Buitrago I, et al., J Metabolic Synd 2021, 10:3
Short Article
Open Access

Metabolic profiling of hydroponics-growing mint (mentha x pepermint var. Piperita) leaves under supercritical fluid extraction

Ivonne Buitrago, Juan David Galvis, Laura Ceron-Rincon

Bioorganic Chemistry Laboratory, Universidad Militar Nueva Granada (UMNG), Cajica, Colombia

*__Corresponding author:__ Ivonne Buitrago, Bioorganic Chemistry Laboratory, Universidad Militar Nueva Granada (UMNG), Cajica, Colombia

Received date: November 05, 2021**; Accepted date:** November 12, 2021; **Published date:** November 25, 2021

Abstract

Hydroponics consists of production of plants through the supply of required nutrients for their growth and development in the appropriate proportions and under controlled conditions, allowing the nutrients variation directly related to the production and metabolic composition. Recently metabolomics is used for the analysis of quality and searching of useful compounds in food and pharmaceutical industry. Metabolic profiling (metabolomics/metabonomics) is the measurement in biological systems of the complement of low-molecular-weight metabolites and their intermediates that reflects the dynamic response to genetic modification and physiological, pathophysiological, and/or developmental stimuli. Medicinal Plant are also known as functional foods due to its high content in secondary metabolites with important medicinal properties can be considered in the treatment of diseases. These compounds include the flavonoids and the isotiocyanates, the latter are synthesized as product of glucosinolates hydrolysis. Peppermint is an aromatic plant with high benefit due to its phytochemical content, so studying its metabolic production in hydroponic systems comprises great interest and applicability. The main objective was therefore to analyze the variation of volatile compound profiles (obtained from supercritical fluid extraction) for mint leaves in hydroponics growing. This research was conducted to design and construct six hydroponic system, they were divided into three systems with standard nutrient solution and other three with nutrient solution + foliar salicylic acid (2 mM). As results, particular changes were found in the profiles of mint-derived volatile metabolites. These changes were mediated by the selective occurrence and/or content of some monoterpenes such as L-menthone, pulegone, and terpenes such as menthol. The profiling of volatile metabolites could be an excellent tool to evaluate the mint quality in hydroponics growing. This work was supported by Vicerrectoría de Investigaciones at UMNG Project INV-CIAS-2542.

References

1. Kumar P., Mishra S., Malik A., Satya S. Insecticidal properties of Mentha species: A review. Ind. Crop. Prod. 2011;34:802–817. doi: 10.1016/j.indcrop.2011.02.019.
2. 2. Ali M.S., Saleem M., Ahmad W., Parvez M., Yamdagni R. A chlorinated monoterpene ketone, acylated β-sitosterol glycosides and a flavanone glycoside from Mentha longifolia (Lamiaceae) Phytochemistry. 2002;59:889–895.
3. 3. Dorman H.D., Kosar M., Kahlos K., Holm Y., Hiltunen R. Antioxidant properties and composition of aqueous extracts from Mentha species, hybrids, varieties, and cultivars. J. Agric. Food Chem. 2003;51:4563–4569. doi: 10.1021/jf034108k.
4. 4. Shaikh S., Yaacob H.B., Rahim Z.H.A. Prospective role in treatment of major illnesses and potential benefits as a safe insecticide and natural food preservative of mint (Mentha spp.): A review. Asian. J. Biomed. Pharm. Sci. 2014;4:1–12. doi: 10.15272/ajbps.v4i35.559.
5. 5. Pourmorad F., Hosseinimehr S., Shahabimajd N. Antioxidant activity, phenol and flavonoid contents of some selected Iranian medicinal plants. Afr. J. Biotechnol. 2006;5:1142–1145.