NATURAL BIOLOGICALLY ACTIVE COMPONENTS OBTAINED FROM PEPPERMINT, METHODS OF PRODUCTION AND USE

Hol I., Vasylenko V., Sidorenko M., Mickevičius S.
Vytautas Magnus university, Kaunas, Republic of Lithuania
illia.hol@vdu.lt

Peppermint (*Mentha piperita*), well-known and widely used aromatic plant, has a complex chemical composition that imparts its distinctive taste, aroma, and diverse biological activity. This botanical species, belonging to the Lamiaceae family, is renowned for its exceptional culinary, therapeutic, and aromatic qualities, specifically its sharp fragrance and cool, intense menthol flavor. All these properties are attributed to the essential oils of peppermint, which constitute a complex mixture of volatile and non-volatile chemical compounds, including terpenoids, phenolic compounds, and flavonoids. Peppermint comprises various components, such as menthol, mentone, isomenthone, and others. All these components make peppermint a unique plant for combating various diseases such as arthritis, asthma, influencing joint health, and preventing cardiovascular diseases.

The purpose of study is to evaluate and determine the chemical composition of peppermint in both fresh and dried forms. Also, compare our data with information from other sources. To assess and determine the chemical composition of peppermint, both in its fresh and dried forms, chromatography was used. This method effectively separates components, simplifying identification and quantitative analysis. In this study, we utilised GC-MS using the Shimadzu GCMS-QP2020NX system with the SH-Rxi-5ms column (30 m × 0.25 mm × 0.25 μm). Mass spectra were compared with reference libraries containing standards, notably NIST 2005 v.2.0 and Wiley Access Pak v.7.

In fresh mint (were purchased from the ©Maxima, manufactured by Well Done) we see components such as menthol, menthone, limonene. These findings are consistent with data from other articles. Differences were found in some chemical components such as pinocarveol, isopulegol, estragole, eudesmol and eudesmol, which were reported in some studies. This indicates the instability of the chemical composition of peppermint elements. This fact should not be considered negative, as many researchers note that the chemical profile of peppermint can vary depending on when the plant was collected and where it was grown.

The results significantly differ when examining a sample of peppermint extract from dried leaves (were purchased from the pharmacy ©Gintarinė Vaistinė, manufactured by Herba Humana). Chromatographic analysis indicates a noticeable lack of various substances, with the presence limited to menthol and tannins. It can be assumed that dried mint leaves do not contain enough biologically active substances that could influence the pharmacological application of preparations.

The findings from this study highlight the chemical complexity and variability of peppermint, influenced by its form (fresh vs. dried) and possibly by the processing methods applied. The diminished chemical diversity in dried peppermint suggests a reduction in its therapeutic potential, emphasizing the need for careful consideration in its medicinal use. These results contribute to the broader understanding of how post-harvest processing and storage conditions can affect the chemical profile of medicinal plants, thereby influencing their efficacy.

The study highlights the considerable chemical variability between fresh and dried peppermint, pointing to a potential decrease in medicinal properties post-drying. These findings underscore the importance of considering the form of peppermint used in pharmacological preparations and advocate for further research into how processing affects its bioactive compound profile.