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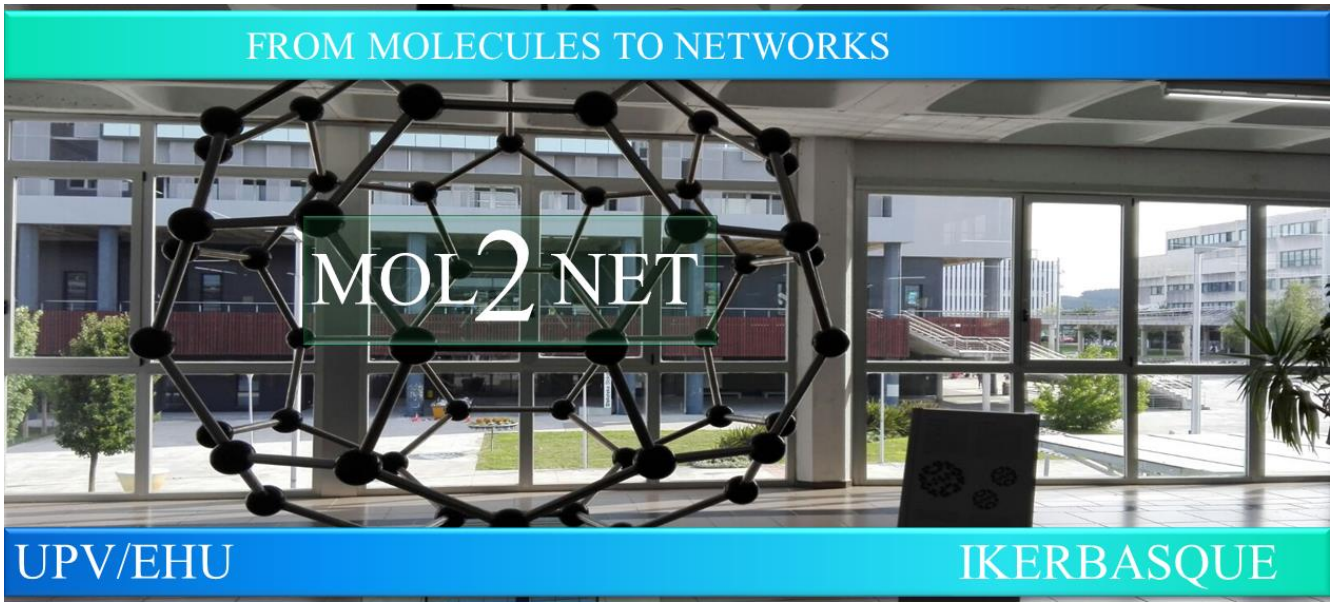

Quality control of lavender essential oil from Vinnytsia region

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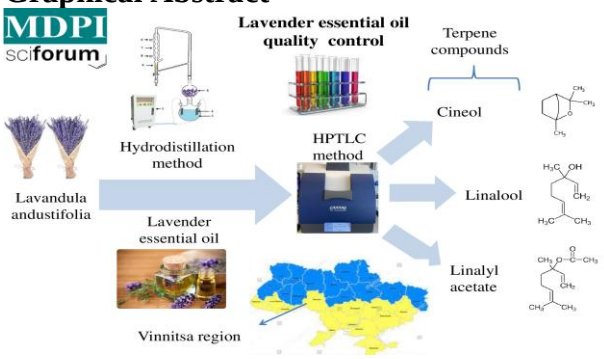
Graphical Abstract



Abstract.

One of the largest lavender fields in Ukraine is located in the Vinnytsia region. The introduction of essential oil (EO) into the pharmaceutical industry must be subject to product quality control. Terpenes, such as linalool and linalyl acetate are markers of lavender EO quality. According to HPTLC analysis of EO sample revealed of 6 zones of varying intensity, with the zone of linalool and linalyl acetate being the most saturated have been established. Thus, the presence of marker compounds in EO can be used in further quantitative assessment of compounds and substantiation of the prospects of Ukrainian lavender raw materials for the pharmaceutical industry.

Introduction

Essential oil is the most valuable product obtained from lavender and it's has a fairly broad chemical composition, among which the terpene compounds linalool and linalyl acetate as markers of the essential oil quality, and polyphenolics with antioxidant properties [1,3,4]. Previously, the quality assessment of lavender oil from Kherson region has already been carried out [2]. However, the profile and content of components in the oil depends on the region of cultivation, so the objectives of the current study included quality control of lavender essential oil from Vinnitsa region.

Materials and Methods

The object was *Lavandula angustifolia* "Hidcote" herb harvested in Ksaverivka village, Vinnitsia region, Ukraine, 2022. The essential oil obtained by hydrodistillation method. Chromatographic compound identification was performed using the High-Performance Thin-Layer Chromatography (HPTLC) on Camag Visualizer Linomat system S with WinCats according to the modified method from Ph. Eur. (11^{th} edition) monograph "Lavander oil"[5]. Analysis was on the HPTLC plates Si 60 F_{254} (Merck) in mobile phase: toluene: ethylacetate (95:5). As reference standards were used cineol, linalool and linalyl acetate. The silica gel plate was examined in UV light at 366 nm after derivatization with anisaldehyde solution and heating the plate up to 100°C for 5 min.

Results and Discussion

The chromatogram had 5 purple zones with an R_f from 0.55 to 0.28 and one reddish-violet zone with an R_f ~0.38 between the linalyl acetate and linalool zones. The zones were at the level of the standard zones and had the same coloring and R_f. The EO sample tested had the most intense linalool zone. However, the linalyl acetate and cineole zones were also well visualized, despite the weaker intensity. The advantages of the HPTLC method are its ability to effectively separate the components of a mixture and thus identify the presence of each compound. Identified marker compounds confirm the quality of essential oil obtained from lavender collected in the Vinnytsia region, Ukraine.

Conclusions

Essential oil is one the most valuable medical product, obtained by lavender, due to its rich chemical composition and, respectively, a wide range of pharmacological effects, among which antibacterial, antifungal, spasmolytic and sedative effects. Considering the above listed facts, lavender essential oil has lots of prospects in pharmaceutical industry uses. Thus, according to the obtained results, different regions of Ukraine and, especially, Vinnitsa region are suitable for *Lavandula angustifolia* cultivation in order to obtain essential oil, which is confirmed by the results of the HPTLC analysis.

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