

CHARACTERIZATION OF FLAVOURED VEGETABLE OILS ENRICHED WITH AN ESSENTIAL OIL OBTAINED FROM HEMP INFLORESCENCES

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Hemp has been used by humankind for millennia. *Cannabis sativa* L. has been an important crop for a variety of uses, including the production of textiles, medicines, and food, particularly hemp seeds, which are consumed as food, mainly as they are or processed into hemp seed oil. Moreover, in recent years, essential oil extracted from hemp inflorescences has gained attention in the agri-food sector. Essential oils are concentrated volatile aromatic liquids obtained from plants and can be extracted from different parts, including inflorescences (Pezantes-Orellana et al., 2024). They are synthesised and stored in plant specialised structures, as secretory ducts or cavities, oil cells, and glandular trichomes. The main components of essential oils are terpenes, which are responsible for the characteristic flavour (de Sousa et al., 2023). Essential oils have a wide range of properties (aromatic, antioxidant, anti-inflammatory, among others), thus being interesting for numerous applications in the agri-food sector, where they are also used as food preservatives or flavouring agents.

Essential oil was extracted from dry hemp inflorescences of *C. sativa* L. (Enectaliana variety), using a steam distillation apparatus. The sample of essential oil was added to a virgin olive oil (i.e., with a fusty/muddy sediment sensory defect) and to a cold-pressed hemp seed oil for the formulation of related flavoured oils. Different oils were produced at various dilutions. The aromatic profiles of the essential oil and the flavored oils were studied using gas chromatography coupled with mass spectrometry, with and without the use of an olfactory detection port (HS-SPME-GC-MS-O and HS-SPME-GC-MS). The oxidative stability of these oils was then assessed by Rancimat and an HPLC-UV method was used to determine the main cannabinoids in the essential oil, in the oils enriched with it, and in the hemp inflorescences after distillation. The oils were also evaluated by sensory analysis.

The essential oil exhibited a peculiar aromatic profile. Its addition to olive oil and hemp seed oil resulted in products that were noticeably different from the originals in terms of aromatic profile and sensory characteristics. The essential oil could partially mask the perception of undesirable sensory attributes (in the virgin olive oil) and add hemp-related olfactory notes to hemp seed oils, which lack the terpenic note that consumers would expect. The analysis of cannabinoids suggests an innovative use of hemp inflorescences, alongside cannabidiol (CBD) extraction.

The hemp inflorescences appear to be a promising product to obtain essential oil, which can be used to flavor edible oils and many other products, as a component in fragrances, and can be tested for multiple applications, for example, as a repellent or an antibacterial, thus demonstrating an interesting market potential across different sectors.

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