



BIO-SUSTENTABILIDADE E BIO-SEGURANÇA ALIMENTAR, INOVAÇÃO E QUALIDADE ALIMENTAR

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Advantages and disadvantages of flavouring olive oils

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Flavoured and fortified olive oils have been a growing trend, meeting consumer preferences and offering differentiated and innovative products. However, these preparations can positively or negatively affect the physicochemical and sensory characteristics. The most noticeable changes occur in sensory terms, which can lead to the appearance of desired sensations, depending on the flavouring agent used. On the other hand, it can mask the presence of any sensory defect present in the olive oil. For the physicochemical characteristics and stability, flavouring can influence the levels of antioxidants and increase the olive oils' shelf-life, increasing the incorporation of antioxidant compounds, promoting oxidative stability and reducing oxidation. However, some studies report that incorporating flavouring agents has pro-oxidant effects.

Generally, three techniques are used for flavouring olive oils: i) through permanent or temporary contact with the flavouring agent, ii) by co-extraction, and iii) the addition of essential oils¹. From them, direct contact between the olive oil and the flavouring agent is the most usual and traditional technique. Currently, natural extracts rich in a certain compound, such as lycopene or lutein, in the olive oils are used to fortify olive oils². These extracts are incorporated to enrich it in a certain compound or set of compounds, with nutritional and healthy properties but without sensory objectives. Nevertheless, fortification can cause turbidity in the olive oil and/or can promote the appearance of unpleasant sensory sensations. For the present work, a vast bibliographic review³ was done devoted to the flavouring of olive oils, pointing out the interest in this ancient Mediterranean practice, as well as the diversity of techniques, agents and effects of the flavouring process. Based on the available data, it can be stated that the use of flavouring by direct contact is the most studied technique, which could be attributed to the easy implementation of this technique, not requiring any change in the usual oil extraction process. Furthermore, considering that flavouring is performed directly on the extracted oils, the desirable sensory properties of the flavouring agent can migrate to the olive oil. Even so, a considerable number of studies still report the production of flavoured olive oils by co-extraction or by adding essential oils. However, a lower but significant number of studies have focused on the enrichment of olive oil with specific bioactive compounds, mainly antioxidants, to enhance the nutritional and healthy properties of olive oils.

Regarding the used flavouring agents and based on the compiled literature (**Figure 1**), different classes can be grouped, namely aromatic plants, which represent more than 42% of the references compiled in this work, followed by spices, with around 24% of the references, fruits, with 14%, and the other agents representing around 19%. Within the aromatic plants, oregano and rosemary were the most common agents (14 references), followed by thyme (12 references) and basil (9 references). The lemon dominates with eight references in fruit, followed by tomato (with 7) and orange (3 references). Regarding spices, three flavouring agents should be highlighted, namely garlic (11 references), pepper (7 references) and chilli (4 references). In the other flavouring agents, the olive leaves had been frequently used (11 references), which is justified as a by-product of olive growing. The huge use of aromatic plants could be related to different factors, such as the wide range of flavours and aromas, the great availability, low price and easiness of use.

It is also possible to infer that different, sometimes contradictory, effects were obtained by different studies when using the same flavouring agent or the same flavouring technique. These differences may be due to or attributed to different factors, which must be considered when comparing similar studies, such as the conditions under which the flavouring is carried out (time, temperature), the amount of flavouring agent used and its state (dry, fresh, powdered), the chemical composition of the flavouring and its storage conditions before use.

Hence, the world of flavoured olive oils still needs to be further studied, being clear the need to go through a path that would allow the standardization of this Mediterranean tradition, aiming to limit and/or overcome the intrinsic variabilities of the flavouring/fortification commercial strategies.

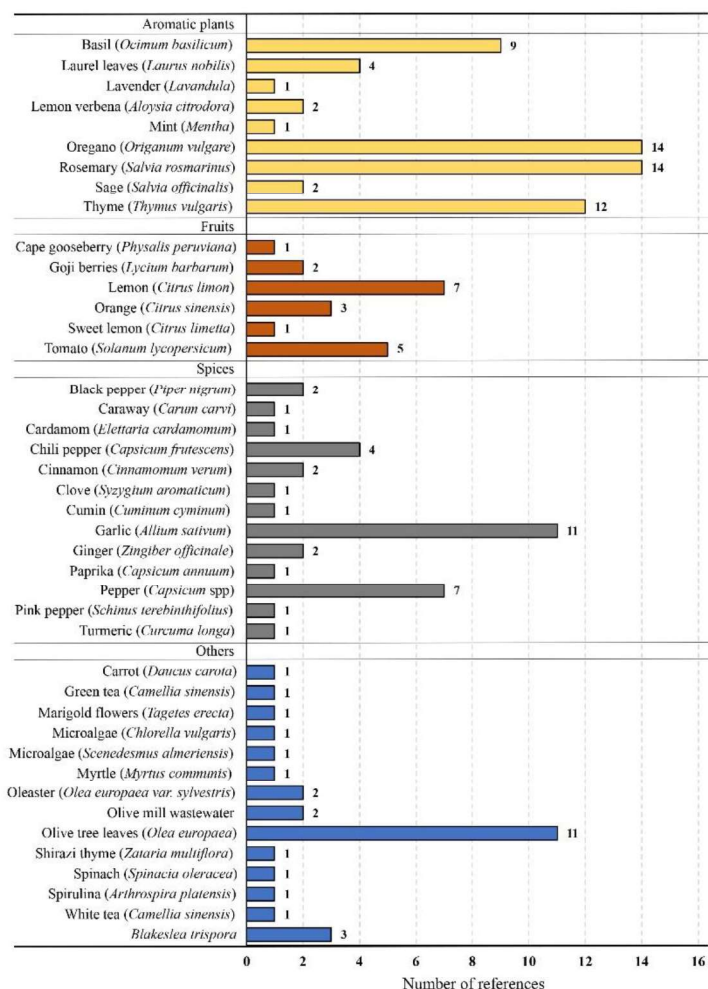


Figure 1: Number of references, compiled from the literature (1996–2022), of each flavouring and fortification agent used for obtaining flavoured olive oils³.

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