



## Etherio, a new variety of *Lavandula angustifolia* with improved essential oil production and composition from natural selected genotypes growing in Greece

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### ABSTRACT

Lavender oil is a popular essential oil which unfortunately is not produced in any Greek region due to problems reported before from insufficient lavender cultivars or varieties used. The aim of the present study was to create a synthetic *Lavandula angustifolia* variety from native Greek plants which however present very well adaptation in local fields. Thirty native plants of *L. angustifolia* from 10 different habitats were quantified and qualified for essential oil. The best two plants of each population were cross pollinated and the seeds came out from this pollination cultivated until new plants test again for oil quantity and quality. This cycle process was being repeated for 6 years until it resulted in a final plant genotype with high amount of essential oil. The essential oil yield reached under laboratory extraction 2.6% (w/fw) while under field steam distillation was 2.3%. The name of this synthetic variety is *L. angustifolia* var. *etherio* and the major essential oil compounds are linalool 26.9% and linalyl acetate with 22.8%. *L. angustifolia* var. *etherio* was reproduced by tissue culture and 2 ha of this variety are cultivated for 6 years now. The variety showed high transplantation degree, high adaptation, plant viability, rich flower production and high essential oil yield.

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### 1. Introduction

The genus *Lavandula* contains many different species which belong to the 'Labiatae' family that geographically grown in Mediterranean countries (Baytop, 1984). Labiatae are generally known for their multiple pharmacological effects such as anti-convulsant, sedative, antispasmodic, analgesic, antioxidant, local anaesthetic activity and it has been used for medicinal purposes (Lis-Balchin and Hart, 1997; Ghelardini et al., 1999; Hosseinzadeh et al., 2000; Kovatcheva et al., 2001).

Essential oils obtained from aromatic plants, are complex mixtures of several chemical compounds including terpenes, alcohols, aldehydes and phenols. Lavender oil, obtained from the flowers of *Lavandula angustifolia*, is composed mainly of linalyl acetate, linalool, lavandulol, 1,8-cineole, lavandulyl acetate and camphor (Lis-Balchin and Hart, 1999). Because of its delightful odour, lavender is one of the most useful medicinal plants and has found wide application in perfumes and cosmetics, colognes, skin lotions and other cosmetics (Paul et al., 2004). In food manufacturing, lavender essential oil is employed in flavouring beverages, ice-cream, candy, baked goods, and chewing gums (Kim and Lee, 2002). Recently, aro-

matheapy is becoming increasingly popular, and lavender is used in aromatherapy as a relaxant (Valnet, 1986; Hohmann et al., 1999; Lis-Balchin and Hart, 1999). Several therapeutic effects of lavender, such as sedative, relaxant, carminative spasmolytic, antioxidant, antiviral and antibacterial activities as well as several gastrointestinal nervous and rheumatic disorders have been reported (Duke, 1989; Gamez et al., 1990; Leung and Foster, 1996; Cavanagh and Wilkinson, 2002). An *in vitro* cytotoxic activity of lavender oil and its main components linalyl acetate and linalool on human skin cells has been reported by Prashar et al. (2004).

The world demand for lavender essential oil is still increasing. It is estimated that over 200,000 ha are being cultivated in Europe and the quality of produced essential oil is important especially for medicinal, pharmaceutical and aromatherapy uses. Greece is a Mediterranean country with favourable climatic and edaphic conditions for aromatic and medicinal plants. *L. angustifolia* and *Lavandula stoechas* are grown naturally on calcareous substrates, slight well drainage slopes in altitudes ranged from 100 to 800 m. Despite of growing interest and the commercial importance of lavender, farmers are not interested to imply in this production due to problems raised from unsatisfied adaptation and low productivity presented by commercial varieties of *Lavandula*. The aims of the present study were: first to find native populations of *L. angustifolia* in Greek region; second, to evaluate these populations for essential oil quantity and quality; third, to pollinate the most valuable

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