
CHEMICAL COMPOSITION OF BASIL ESSENTIAL OIL

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ABSTRACT

The essential oils content and the chemical compositions of green and dry drogue, of two basil varieties, *Ocimum basilicum*, var. *genovese* (broad leaf basil) and *O. basilicum* var. *apalla* (narrow leaf basil) were assessed in this study. The essential oil was obtained via hydrodistillation and analyzed using Gas Chromatography. The essential oils yield was found to be higher in broad leaf basil variety compared to narrow leaf variety. Regarding the active substances, Linalool exhibits the highest concentration followed by Estragol and Eugenol for both basil varieties. Broad leaf basil variety showed slightly higher concentration in Eugenol compared with narrow leaf basil variety.

INTRODUCTION

Basil (*Ocimum basilicum* L.) is member of the Lamiaceae family, which has about 3500 species, distributed among 210 genera. The genus *Ocimum*, includes around 30 plant species from tropical and subtropical areas. *Ocimum* is widely cultivated and extensively used for food, perfumery, cosmetics, pesticides, medicine and traditional rituals because of their natural aroma and flavor and other properties (Albuquerque, 1996; Darrah, 1974).

The chemical composition of *O. basilicum* essential oils has been intensively investigated throughout the world indicating the presence of tanines, flavonoids, saponins and volatile terpenes like camphor, tymol, methylchavicol, linelool, eugenol, 1-8-cineol and pinenes. The aim of this work was to study the essential oils content and chemical composition of two species of basil.

MATERIAL AND METHOD

The experiment took place at the laboratory of aromatic and medical plants at the Technological Education Institute of Larissa. Two basil varieties *Ocimum basilicum*, var. *genovese* (broad leaf basil) and *O. basilicum* var. *apalla* (narrow leaf basil) were used for volatile oil isolation. A sample (10 g) of dried drogue was extracted by the hydrodistillation technique during 2 hours with essential oil determination apparatus. The oils obtained were then immediately analyzed using Hewlett-Packard 5890 type gas chromatograph (GC) equipped with Flame Ionization Detector (FID).

The components of oil samples were identified with the use of commercial standard Eugenol, Estragol and Linalool (99% pure).

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The experiment had two varieties, two treatments (green and dry drogue) and forty replications. Data were analyzed using the SPSS statistical package. Analysis of variance was used to assess treatments effect.

RESULTS AND DISCUSSION

There were not significant differences on the green and dry drogue between the two basil varieties. The average fresh and dry weight of broad leaf basil was 887.5 g/m² and 126.5 g/m² respectively, while the narrow leaf basil had dry weight 689.6 g/m² and fresh weight 97.8 g/m².

In this experiment, the essential oils yield differed between varieties ($P < 0.001$). The narrow leaf basil variety had significantly lower content in oil (0.154 ml/10g dry weight) than broad leaf basil variety (0.225 ml/10g dry weight).

According to Hanus et al. (2006), the basil oil extraction yields were in the rage of 0.04 to 0.7%, while Dachler and Pelzman (1999) reported changes from 0.5-1.5%. The concentration of basil essential oil is depending from plant genotype and variety, year of culture, date of sowing and harvest time (Hanus et al. 2006; Dachler and Pelzman1999; Marquard and Kroth, 2002).

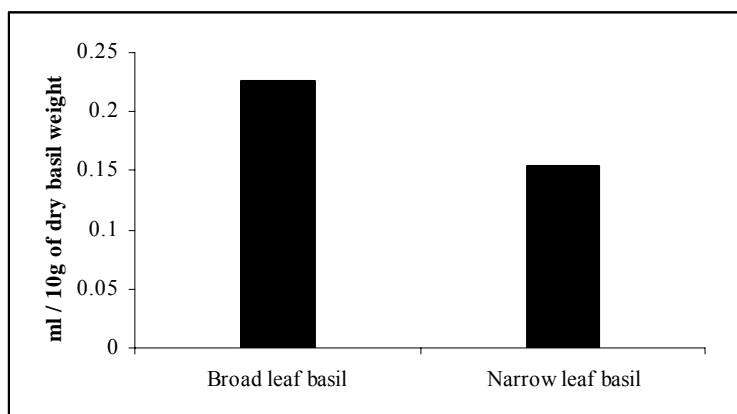


Figure 1. Essential oil yield in two basil varieties.

In addition, the main active substances show remarkable differences which depend from variety. According to Hanus et al. (2006), there are basil varieties with high concentration in Linalool (more that 75% of oil) and others with increased concentration in Eugenol.

In this study, the chemical composition of basil oil differed in both varieties ($P < 0.001$). The Linalool was in greater content than Estragol and Eugenol. Moreover, the Eugenol concentration differed between varieties. Narrow leaf basil variety had lower content in this chemical substance that broad leaf basil variety.

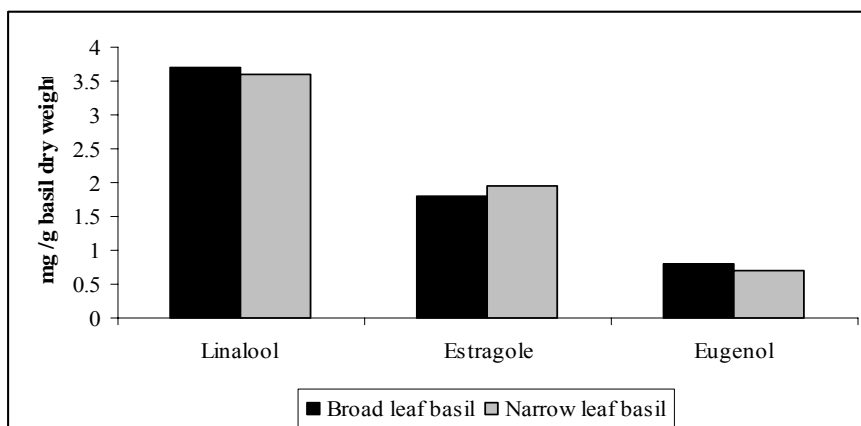


Figure 2. Concentration of main chemical substances in two basil varieties.

CONCLUSION

The production of basil essential oil depends on the variety. Broad leaf basil variety was more productive than narrow leaf variety. However, the content of the main active substances Linalool and Estragole were formed independently of the variety in contrast with Eugenol. Linalool exhibits the highest concentration followed by Estragole and Eugenol in both basil varieties.

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