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Content of chlorophyll and carotenoids in dry Dill (*Anethum graveolens* L.) depending on drying method

INTRODUCTION

Dill (*Anethum graveolens* L.) is an annual plant with spicy odor, originally native to Mediteannean area. Dill has been used in traditional medicine for much kind of stomach aches, dyspepsia and liver diseases and even insomnia. Fresh and dry dill is used in salads, sauces and in pickles. Drying is one of the most know method of preservation, preventing herb from unwanted biochemical changes. Drying also enable to protect properties and quality of the product. Attractiveness and high quality of dill depends not only on odor but also on on the content of such compounds as chlorophyll pigments and carotenoids. Chlorophyll is a main pigment of seasonal vegetables. Carotenoids like vitamin C and polyphenols have got strong antioxidative effect. In leafy vegetable losses of these compounds are noticeable during storage and processing, especially in high temperature.

MATERIAL AND METHODS

The experiment was carried out in 2011, on the Experimental Field and the Basic Chemical Analysis Laboratory of the Department of Vegetable and Medicinal Plants SGGW. The effect of preservation method on chlophyll and carotenoids content in dried Dill ('Lukullus, 'Moravan', 'Super Dukat', 'Szmaragd' and 'Turkus' varieties) was investigated. The experiment was set in 3 replications in split-split plot design. Harvest of herb was carried out on June 30th, August 17th and October 3rd. After harvest, raw material was divided into three parts and was dried in 35 °C and 50 °C in convective dryer or freeze-dried in -50 °C, immediately. Total carotenoids and chlorophylls were determined by spectrophotometric method. The objective of this study was to determine the effect of Content of chlorophyll and carotenoids in dry Dill (*Anethum graveolens* L.) depending on drying method.

Statistical analysis was done with the ANOVA using the multiple Tukey's test at the significance level α = 0.05.

Photo 1. Fresh Dill 'Szmaragd' variety

Photo 2. Convective drying

Photo 3. Freeze-drying

RESULTS

Freeze drying appears to be the most effective method of conservation among tested cultivars. The cultivar of herb 'Moravan' and 'Super Dukat'teated by fd characterized with highest amount of chlorofile a. In case of another cultivar 'Turkus' convective method was most effective. The highest concentration of total carotenoids was determined in cultivars 'Szmaragd' and 'Lukullus'. Freeze drying was significantly influented in case of chlorofile b. This method of conservation allows to keep the highest quality of dill.

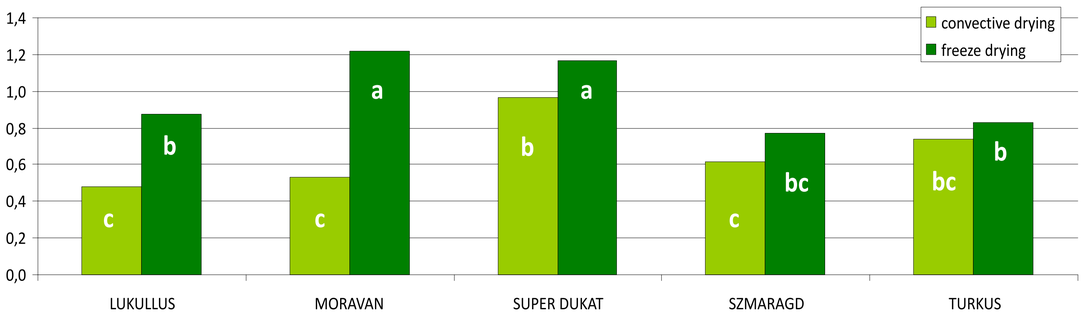

Figure 1. Effect of drying method on the content of chlorophyll a in the herb of dill [g 100 g^{-1}]

Note: Means marked with different letters differ significantly at α = 0.05

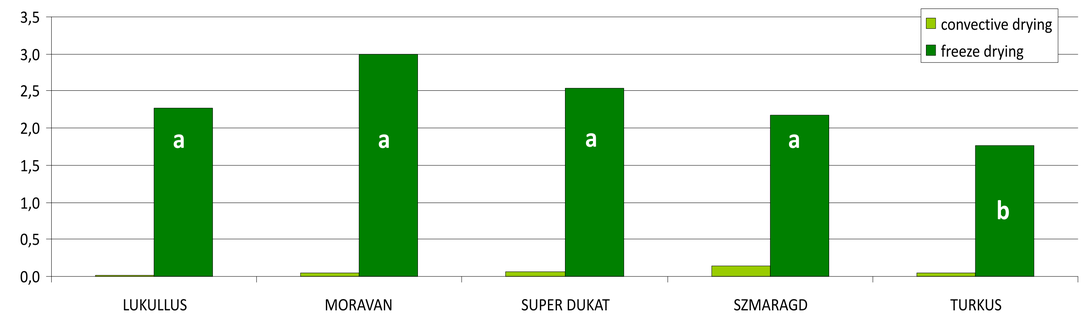

Figure 2. Effect of drying method on the content of chlorophyll b in the herb of dill [g 100 g^{-1}]

Note: Means marked with different letters differ significantly at α = 0.05

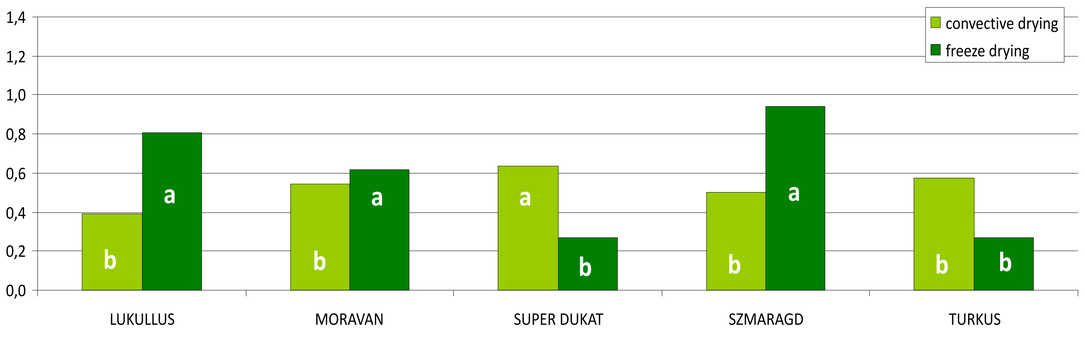

Figure 3. Effect of drying method on the content of total carotenoids in the herb of dill [g 100 g^{-1}]

Note: Means marked with different letters differ significantly at α = 0.05

Acknowledgment

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CONCLUSIONS

1. **Both method of conservation lead to comparable amount of total carotenoids.**
2. **Freeze drying is the most effective in case of chlorofile b concentration.**
3. **Method of freeze drying enable to keep unchange chemical composition according to fresh material.**
4. **The highest concentration of tested compounds was observed in freeze-dried material.**

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