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INTRODUCTION

Dill (*Anethum graveolens* L.) is an annual plant originally native from mediterranean area. Dill has been used in traditional medicine for many kind of stomach aches. Storage in a control condition atmosphere in which gases concentrations as well as temperature and humidity are regulated is one of the best method of preventing plants from unwanted biochemical changes during after harvest.

Attractiveness and high quality of product depends also on chemical compositions such as chlorophylls and essential oil. During traditional storage in regular air they are oxidized. In leafy vegetable this loses are high noticeable. The aim of the experiment was to evaluate the influence of storage conditions on the content of chlorophylls and essential oil of fresh dill.

MATERIAL AND METHODS

The experiment was carried out in years 2010-2012, on the Experimental Field and at the Vegetable Storage Laboratory of the Department of Vegetable and Medicinal Plants SGGW in Warsaw. The study included three cultivars of dill. i.e. 'Moravan', 'Szmaragd' and 'Turkus'. The plants were harvested after two month. The plants were stored i plastic sterile boxes for two weeks in various combination in 1°C, 98% humidity under the following conditions: RA (Regular Air) 21.0 % O₂, 0.3 % CO₂, ULO (Ultra Low Oxygen) 1.5 % O₂, 1.5 %, CO₂, CA (Controlled Atmosphere) 3% O₂, 1.5% CO₂, respectively. The experiment was set on three replications for each cutlivar. Essential oil content was determined by the steam distillation in Deryng apparatus, its quality and quantity was evaluated by gas chropatography (gas chromatograph Hewlett-Packard 6890 GC with FID detector. Total amount of chlorophylls were obtained by spectrophotometric method on 441 nm, 646 nm, 663 nm.



Cultivar 'Szmaragd'



CA storage chambers

CONCLUSIONS

1. CA maintains a high level of monoterpenes content in essential oil.
2. The ULO storage and CA storage restrict losses of plants pigments such as chlorophylls.
3. Regular air positively affect the amount o essential oil.

Influence of controlled storage method on the content of chlorophylls and essential oil in dill

RESULTS

Concentration of chlorophyll a was higher than chlorophyll b in all way of storage. The highest amount of chlorophyll a was observed in RA and ULO.

Content of essential oil was maintain on high level at RA in all used cultivars. Cultivar Szmaragd in each combination kept the high level of essential oil. The main composition of essential oil was alfa felandren (43.23%) and p-cymene (24.05%) CA maintain the high level of monoterpen content in essentail oil.

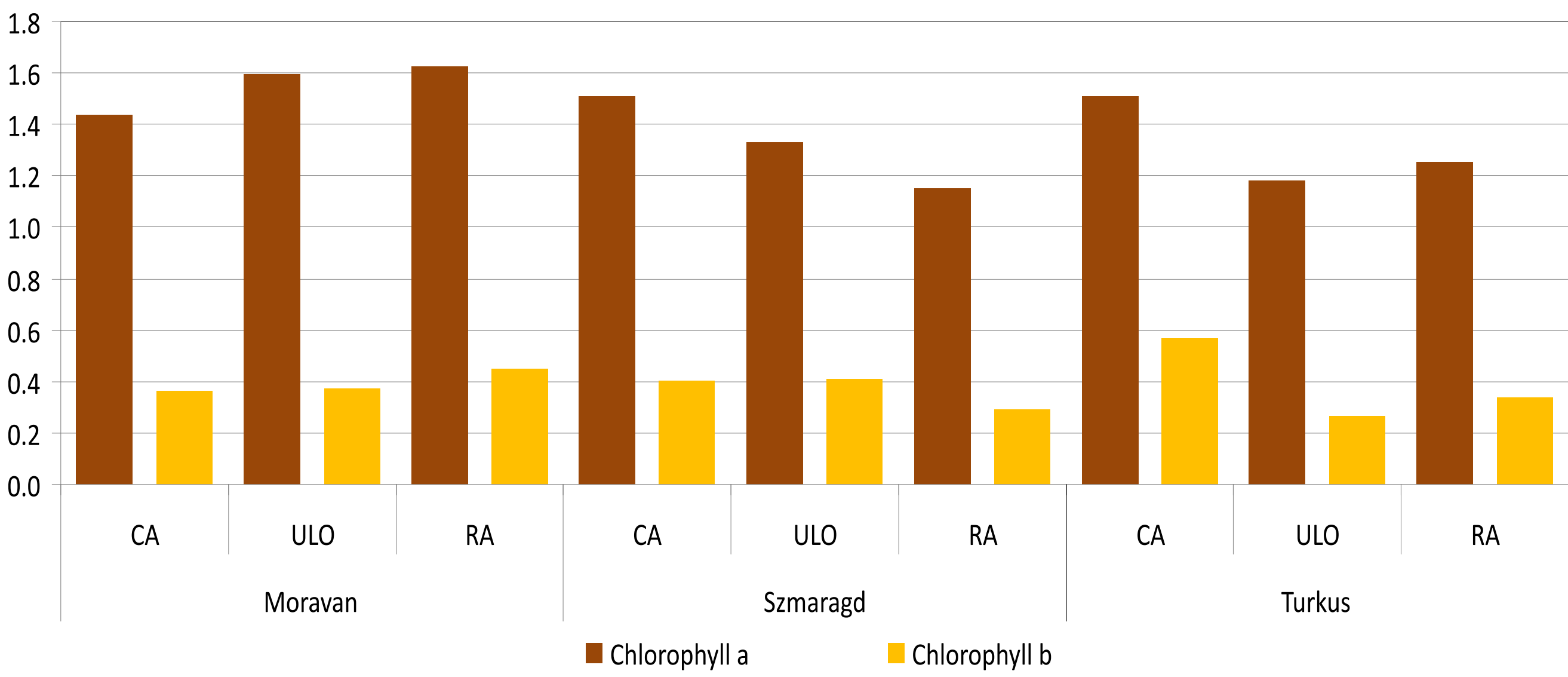


Figure 1. Influence of storage conditions on the content of chlorophyll a and chlorophyll b in Dill (µg g⁻¹)

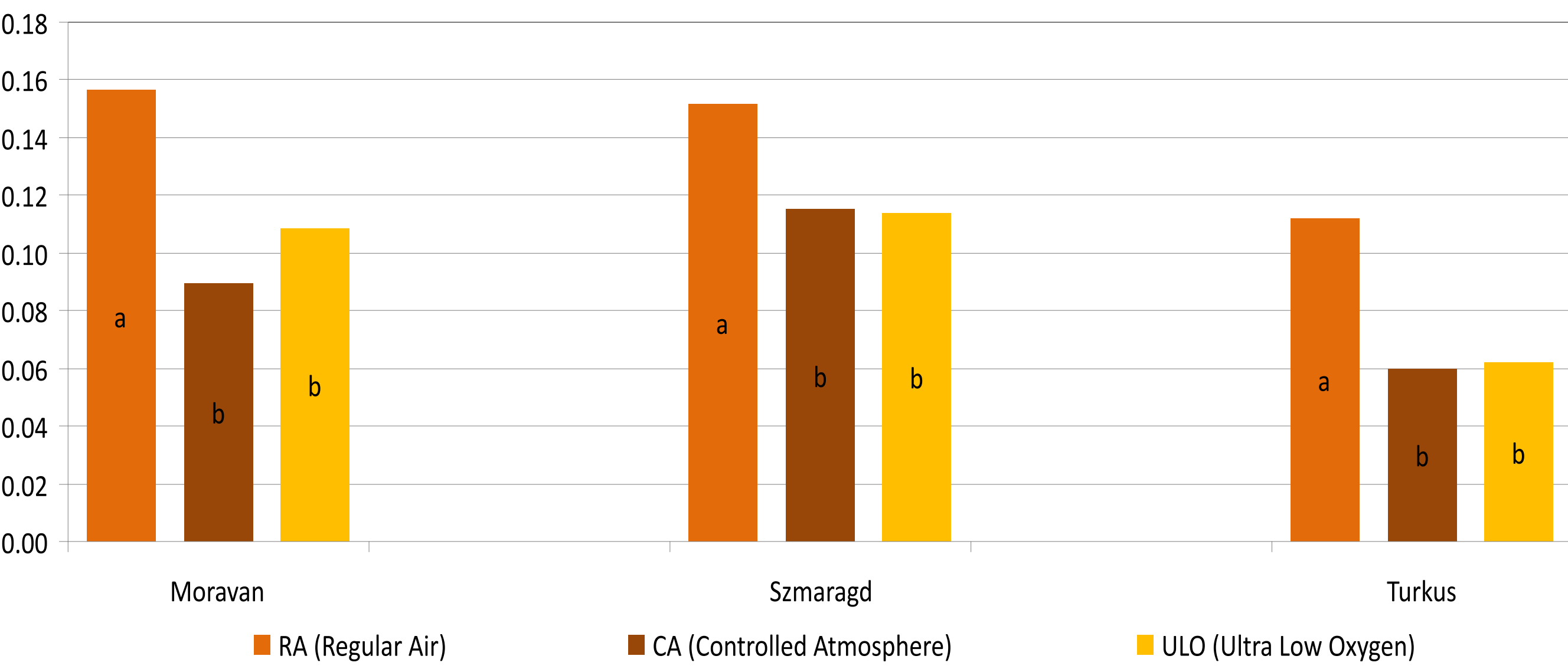


Figure 2. Influence of storage conditions on the content of essential oil in Dill [%]

Figure 3. Influence of storage conditions on the content of chemical compound in essential oil of Dill [%]

		Cultivar									
		Moravan			Szmaragd			Turkus			
		RA	CA	ULO	RA	CA	ULO	RA	CA	ULO	mean
Chemical compound	α-Pinene	0,77	1,25	0,90	1,22	1,56	0,64	0,87	1,48	0,71	1.04
	α-Phellandrene	30,08	49,23	32,32	3,62	8,55	42,65	6,36	26,75	21,38	24.55
	1,8-Cineole	3,03	2,99	2,99	2,55	2,83	2,27	2,68	2,66	2,77	2.75
	Limonene	6,69	7,80	6,76	6,12	7,04	7,34	6,22	7,42	6,70	6.90
	p-Cymene	9,53	6,10	9,48	24,05	23,88	8,25	21,71	16,11	15,34	14.94
	Decanal	6,66	7,11	8,86	17,76	14,98	16,93	17,83	13,75	15,38	13.25
	Nerol	0,89	0,52	0,80	10,71	1,30	0,51	1,60	1,04	1,05	2.05
	Anethole	4,65	2,50	4,56	2,56	8,86	1,32	9,92	7,05	6,96	5.38
	Thymole	2,03	0,71	1,66	2,52	4,17	0,71	2,51	2,31	0,97	1.95
	Myristicin	15,59	10,06	14,95	2,52	1,96	2,22	3,40	1,17	7,16	6.56

RA (Regular Air), CA (Controlled Atmosphere), ULO (Ultra Low Oxygen)

