Osińska Ewa*, Rosłon Wiesława, Kowalska Nina

Warsaw University of Life Sciences – SGGW
Faculty of Horticulture and Landscape Architecture
Department of Vegetable and Medicinal Plants

Nowoursynowska 159, Warsaw
http://krwil.sggw.pl
* ✉ ewa_osinska@sggw.pl

Influence of the Method of Stabilization on the Quality of Herb of *Satureja* ssp.

INTRODUCTION

The genus *Satureja* L. (*Lamiaceae*) includes about 200 species of herbs and shrubs, often aromatic, widely distributed in the Mediterranean area, Asia and boreal America. *Satureja* species are native to warm temperate regions and may be annual or perennial. *Satureja* species have economic and medicinal importance because of their high essential oil content. Apart from essential oil, the herb contains tannin, mucus, flavonoids, and minerals like calcium, potassium, magnesium, iron and zinc. Different Satureja species have been used in traditional medicine as antimicrobial, spasmolytic, analgesic, cicatrising and diuretic agents. The antibacterial properties of several essential oils of *Satureja* have been evaluated as spasmolytic agents. The green leaves and herbaceous part of stems are used fresh and dried as flavouring agents in seasoning stews, meat dishes, poultry, sausages and vegetables.

The aim of this study was an evaluation of quality of fresh herb of 5 populations representing three species of *Satureja* genus: *Satureja montana*, *Satureja parnassica* and *Satureja amoena*. The influence of different stabilization methods of herb, gained from these populations (drying and lyophilization) on content chosen groups of active compounds, was also determined. The sensory quality of the herb obtained from different stabilization methods was determined, too.

MATERIAL AND METHODS

The study was carried out in the years 2008 – 2009. The object of investigation were plants of 5 populations representing three species of *Satureja* genus: *Satureja montana* (No 176,25 and 9), *Satureja parnassica* (No 176) and *Satureja amoena* (No 177), which were collected on the experimental field at Department of Vegetables and Medicinal Plants in Wilanów. The raw material (herb) was collected twice at the vegetative stage of plant development (June) and at the generative stage (August), from 10 randomly selected plants. After harvesting the raw material, it was divided in three parts: chemical analysis were carried out in the first part of the fresh raw material; the second part of raw material was dried in dryer chamber at temperature of 35°C; the third part of the herb was lyophilized. The content of essential oil, flavonoids and polyphenolic acids was determined according to the method described in Pharmacopoea VI (2002). The identification of essential oil constituents was performed by gas chromatography. Sensory analysis was performed on basis of the profile method. Quantitative descriptive analysis (QDA) method was used for odour and taste of fresh, lyophilized, and dry savory herb. The present results are the means of two years of investigation.

RESULTS

Mean scores for sensory taste descriptors of savoy's herb

ATTRIBUTES OF TASTE (UC#)	TERM OF HARVEST			METHOD OF STABILIZATIO N			
	First	Second	*Significance*	Fresh	Dry	Lyophilised	*Significance*
sharp, baking taste	3.6	2.4	**	4.1	3.1	3.7	a
bitter taste	1.9	2.5	**	2.5	2.7	1.4	a
tart taste	2.2	2.2	ns	2.3	2.3	2.3	ns
mushroom taste	1.2	0.6	***	0.8	0.8	0.8	ns
sour taste	0.8	0.9	*	1.2	0.6	0.9	**
sour taste	2.1	3.7	a	2.6	1.3	2.9	***
other taste	1.1	0.3	***	0.5	1.0	0	***

*** – the least significant difference at $p \leq 0.001$; ** – the least significant difference at $p \leq 0.01$; * – the least significant difference at $p \leq 0.05$; a – the least significant difference at p. ≤ 0.10; ns – non significant

Content of essential oil (%)

POPULATION	FIRST TERM OF HARVEST			SECOND TERM OF HARVEST			MEAN
	FRESH	LYOPHILISED	DRY	FRESH	LYOPHILISED	DRY	
S.montana No 176	0.20	1.00	1.00	0.70	2.00	2.60	1.25b
S.montana No 25	0.35	1.45	1.60	0.45	1.50	2.50	2.71a
S.montana No 9	0.35	0.80	1.40	0.35	1.40	1.45	0.96c
S.parnassica No 176	0.25	0.90	0.90	0.15	0.60	1.00	0.63cd
S.amoena No 177	0.30	1.50	1.60	0.55	1.70	1.70	1.23b
Mean	0.29d	1.13c	1.30b	0.44d	1.44b	1,85a	

Participation of main identified compounds of essential oils obtained from the fresh herb (%)

COMPOUND	*S. parnassica* 176		*S. amoena* 177		*S. montana* 25		*S. montana* 9		*S. montana* 176	
	F	S	F	S	F	S	F	S	F	S
α - pinene	0.18	1.30	1.20	1.35	0.27	1.25	1.50	1.49	1.10	1.33
α – felandren	2.20	1.80	1.68	1.35	1.11	1.48	1.70	1.82	1.66	1.58
α - terpinen	1.85	1.70	1.80	1.95	1.54	1.55	2.64	2.83	1.61	1.89
γ – terpinen	10.35	13.80	12.88	10.83	10.66	1.15	-	-	8.40	4.06
o - cymen	3.49	-	-	-	-	-	50.23	59.20	-	-
p - cymen	-	-	-	-	-	-	19.00	15.00	-	-
p – cymol	3.14	8.88	6.13	9.18	5.10	6.56	-	-	3.96	8.02
β – kariofilen	3.05	2.69	0.95	0.93	2.00	2.32	1.99	2.04	2.74	2.43
karwakrol	59.75	51.22	59.70	53.44	51.30	62.26	11.18	11.53	76.18	60.48

F - First term of harvest
S - Second term of harvest

Content of polyphenolic acids (%)

POPULATION	FIRST TERM OF HARVEST			SECOND TERM OF HARVEST			MEAN
	FRESH	LYOPHILISED	DRY	FRESH	LYOPHILISED	DRY	
S.montana No 176	0.10	0.51	0.33	0.15	0.61	0.24	0.32a
S.montana No 25	0.15	0.27	0.30	0.12	0.48	0.25	0.26b
S.montana No 9	0.15	0.29	0.32	0.09	0.20	0.29	0.22c
S.parnassica No 176	0.17	0.32	0.35	0.18	0.68	0.32	0.33a
S.amoena No 177	0.09	0.18	0.21	0.17	0.60	0.32	0.26b
Mean	0.13c	0.31b	0.30b	0.14c	0.51a	0.28b	

CONCLUSIONS

1. The term of harvest and method of stabilization had an influence on content of essential oil, polyphenolic acids and flavonoids. Raw material harvested in August contains considerably more biologically active compounds.
2. Investigated populations of savoury differ in content of all tasted compounds. Raw material from *S. montana* No 25 was characterized the higher content of essential oil.
3. The highest percentage of content in essential oil for all investigated savory populations has carvacrol.
4. The way of its stabilization has significantly influenced on the quality of savory herb. The highest intensity of the taste and the smell characterized a fresh raw material.