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Biodiversity within the species *(Mentha piperita L. and Mentha spicata var. crispa [Schrod.] Briq.)* at NARDI Fundulea

Niculina Ionescu

National Agricultural Research and Development Institute Fundulea, Romania

Corresponding author: E-mail: nica@ricic.ro

INTRODUCTION

Peppermint occupies an important place among medicinal and aromatic plants due toits aerial organs, which contain volatile oil rich in menthol (E. Paun et. al 1988). Menthol provides peppermint tea with a specific aroma and a pleasant (Ghe. Bîlteanu 2001), refreshing taste, giving it and the volatile oil valuable therapeutic properties (M. Peyman et al 2013)

Peppermint tea, used as a food and medicinal product, has a calming, stomachic, anticolic, antiasthmatic, antiseptic, cholagogue, choleretic and antidiarrheal action (McKay, and Blumberg 2006. S. Henrique 2020; Saqib, Saddam et al.2022).

The volatile oil, namely menthol, is used in the food industry to flavor liqueurs, candies, chewing gum and in the chemical-pharmaceutical industry, to prepare some medicines (M. Abbas 2014).

Crisp mint (*Mentha spicata* var. *crispa*), a species with volatile oil rich in carvone, is cultivated for the aerial organs of the plant, used in the form of tea or for the extraction of the volatile oil(E.Paun et al 1988).

Tea, used for food or medicinal purposes, has a carminative, intestinal spasmolytic, cholagogue, choleretic, stomachic and antiparasitic effect.

METHODOLOGY

In this study peppermint and crispmint varieties were analyzed, from the species Mentha piperita, the following varieties were tested: Columna (1972), Cordial (1989), Cristal (2000) and Coral (2009). Within the species Mentha spicata var: crispa, two varieties were studied: Mencris (1975) and Record (1992).

The experimental plots, including three repetitions/genotype, each with a harvestable area of 5 m^2, were located in the field intended for the maintenance and renewal of the collection of medicinal and aromatic plants. The behavior of the biological material included in the test was analyzed in terms of the production of green grass/ha, volatile oil and menthol content expressed in q/ha. The study was carried out as part of the activities of evaluation and periodic renewal of the germplasm collection of medicinal and aromatic plants existing in the patrimony and responsibility of NARDI Fundulea.

RESULTS AND DISCUSSION

The Columna variety was approved in 1972, it produces 90-130 q/ha of fresh grass. The production of leaves and dried inflorescences is 11-13 q/ha, the volatile oil content is 2.7-3.2 ml%, and the total menthol content is 46%.

The Cordial variety, approved in 1989, with a smaller size, achieves a production of 98-150 q/ha of fresh grass and 13-15 q/ha of dried leaves and inflorescences. The volatile oil content varies between 3.56 and 4.31 ml% and the total menthol content is, on average, 49%. It is resistant to rust.

In 2000, the Cristal variety was approved, characterized by high production potential (95-170 q/ha of fresh grass), high volatile oil content (4.46-4.86 ml%) and menthol (49.6%), resistance to rust and powdery mildew, fast growth rate and high regeneration power.

The last homologated variety (2009) Coral can achieve a production of 126q/ha fresh grass or 32 q/ha dry grass, a volatile oil production of over 10.9 l/ha, with a menthol content of 66.6%.

Mencris is an early variety with a vegetation period of 102 days and which achieves 65-95 q/ha fresh grass or 8-14 q/ha dry inflorescences. The volatile oil content varies between 2.6 and 3.0 ml%. It is very sensitive to rust.

Record is a later variety, with a vegetation period of 112 days. It is characterized by high production capacity, producing 99-190 q/ha of fresh grass and 14-27 q/ha of dried leaves and inflorescences. It is a variety very rich in volatile oil (3.80-5.0 ml%), with very high resistance to falling, but average to rust.

The carvone content varies within both varieties between 55 and 64%.

Average production obtained from pippermint varieties during the analyzed period at NARDI Fundulea

variety	Green herb	dried leaves and inflorescences	volatile oil content	menthol/carvone content
	q/ha	q/ha	ml%	%
M.Piperita				
Columna	90-130	11-13	2,7-3,2	46
Cordial	98-150	13-15	3,56-4,31	49
Cristal	95-170	19-22	4,46-4,86	49,6
Coral	126-197	32	10,9	66,6
M. crispa				
Mencris	65-95	8-14	2,6-3,0	50,4
Record	99-190	14-27	3,8-5,0	55,6

Production obtained fresh shoot in the first and second year of vegetation at NARDI Fundulea

Soiul cultivat	Productia medie coasa I			
	Nr.of fresh shoots/m^2		quantity obtained (g/ $m^{2)}$	
	Anul I 2024	Anul II 2025	AnuI I 2024	Anul II 2025
M.Piperita				
Columna	213	235	680	896
Cordial	295	316	1350	1456
Cristal	278	314	1290	1520
Coral	327	393	1470	1670
M.E.	278	314	1197	1385
M.crispa				
Mencris	467	625	1750	2130
Record	620	846	1835	2561
M.E.	543	735	1792	2345

CONCLUSIONS

By creating peppermint and crisp mint varieties, significant genetic progress was made both in terms of green herb production, ranging from 65 q/ha in older varieties to 190 q/ha in current varieties, and in terms of its quality due to the volatile oil content ranging from 2.7 to 10.9%.

The average production of dried leaves and inflorescences is between 8q/ha in older varieties and 32q/ha in more current varieties.

The menthol content of peppermint varieties was improved from 46% to 66.6% , while the carvone content was adjusted from 50.4% to 55.6%.

Harvests made in the warm months have a much higher volatile oil content than those obtained in the cool months, compared to the same vegetation period.

The alternation of high and low temperatures, accompanied by high atmospheric humidity, favors the development of the attack of some pathogens, especially the one that produces rust.

A decisive factor for achieving a good quality production is light. Sun-grown mint produces volatile oil much richer in menthol and lower in menthone, which gives the volatile oil a superior quality.