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Stelica CRISTEA, Georgia BOROS-IACOB*

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Culture of Lavender: Investment for Health, Beauty and Food

Stelica CRISTEA¹, Georgia BOROS-IACOB^{2*}

Abstract

Initially, the lavender cultures were found in the Mediterranean basin, in the limestone and rocky areas (Europe and North Africa), as well as in Western India (Essential oil crops. Production guidelines for lavender, Department of Agriculture, Forestry and Fisheries, 2009). Nowadays, with an increasing spread along Europe, lavender is cultivated on almost every continent and can be found also in North America, South America, South Africa, Asia or Australia. According to INTELLAGRO (Grebenicharski Stilyan, Lavender Production in Bulgaria, 2016), Europe remains a main market, with Bulgaria and France holding 2/3 of the EU's lavender exports. The EU member countries, such as France and Germany, are also among the main importers of lavender, as well as the US and Swiss markets.

Keywords: *lavender culture, investment, health products, food, cosmetics.*

1. Introduction

For most of us, lavender is closely related to grandmother's closet, where it was put to keep the insects away and perfume the interior. Unfortunately, there are still so many who find it surprising that this is not the only use of this aromatic plant. Since ancient times, lavender has been appreciated for its therapeutical and cosmetic properties, and has lately been included on the list of special ingredients that give flavor to various dishes.

¹ University of Agronomic Sciences and Veterinary Medicine Bucharest. 59 Marasti Boulevard. District 1. 011464. Bucharest. Romania.

² University of Agronomic Sciences and Veterinary Medicine Bucharest. 59 Marasti Boulevard. District 1. 011464. Bucharest. Romania, georgibor@yahoo.fr

* Corresponding author.

Having the scientific name "*lavandula angustifolia*" or "*lavandula officinalis*", the etymology of the name being based on the Latin verb "lavare" (to wash), lavender was used by Romans both for internal use (for treatment of various diseases), as well as for external one (in the bathing water or for washing the laundry, as a disinfectant or odorant for the rooms). Its therapeutic and aromatic properties were also recognized by the Greeks, Egyptians and Arabs from Antiquity.

2. Theoretical Background

The unprecedented development of the lavender market is due to the growing interest in this plant, the benefits of which are diversified and surprising. If there is no wonder that lavender is used in the pharmaceutical and therapeutic industry, cosmetics (perfume, hygiene and beauty products), odorants, cleaning agents, insect repellents and pests, or even in the interior or exterior design, it may surprise you when you feel its taste and aroma in a purple ice cream, in cakes, chocolate, honey or tea.

Classification of lavender and main conditions to grow it.

The number of species included in the *lavandula* genus – part of Lamiaceae family - is variable over the years, the corresponding monographies being continuously reviewed, such as:

A taxonomic study of the genus *Lavandula* by D. A. Chaytor, stipulated, in 1937, 28 species [1]

In the book *Lavender: the genus Lavandula*, edited by Maria Lis-Balchin (2002), there is a sectional classification – 6 sections comprising 29 taxa, 3 unclassified taxa and 3 intersectional hybrids [3]

Nowadays, according to The Plant List, there are 132 scientific plant names of species rank for the genus *Lavandula*, but only 47 of these are accepted as species names [4].

The main species of *lavandula* are: *lavandula angustifolia*, also called English lavender or true (common) lavender, which is the most cultivated type; *lavandula dentata* or French lavender; *lavandula latifolia* - Portuguese lavender or spike lavender; *lavandula stoechas* or Spanish lavender. Also, the hybrid between *lavandula angustifolia* and *lavandula latifolia* is widespread, being known as *lavandin*.

Even if between these species there are differences of color shades, shapes of flowers and leaves, sturdiness, intensity and variations of scent, generally, the lavender is a sun addicted plant, with no need of high water consumption, that prefers well drained territories, doesn't need fertilizers and that is able to protect itself against diseases and pest.

The lavender lives along the year; it is a perennial plant, reaching maturity between 2 – 5 years and being harnessed efficiently for 15 – 20 years. Also, in terms of efficiency, it is preferable to grow lavender from cuttings, being a faster manner, instead of seeds, even if this is a cheaper option, because the germination process is a long one (it can take up to six months until a usable plant could be obtained). Besides, the use of cuttings provides reliability in obtaining consistency of lavender features and quality.

It should not be neglected, the possible diseases that lavender can have. So we can talk about main diseases that can affect lavender crops (or the most common and dangerous parasites of lavender):

The drying of plants produced by the *Phoma lavandulae* fungus, which occurs in May – June period and causes yellowing and drying of the sprouts; the more developed strains become brown-gray and the epidermis disintegrates in the form of silver flakes; on the surface of the strains small dots appear, which represent the fruiting of the fungus. The fungus hibernates in the rhizomes and it spreads in the vegetation through the mushroom picnospores. The disease develops well under dryness and low temperature conditions. In order to fight against, it is advisable to remove the affected sprouts and strains, to use healthy cutting and to combat the weeds.

Leaf spotting caused by *Septoria lavandulae* fungus. On the top of leaves, different shapes of spots appear, initially reddish-brown, then they become gray in the central part and surrounded by a purple ring. In the center of the spots, the picnids of the fungus develop, resembling to small black points. The attacked leaves are getting dry and they fall.

Lavender is also affected by the *Cuscuta* parasite (*Cuscuta* spp). On strong attacks of these parasitic agents, the crop is compromised [2].

The blooming period of lavender is a wide one, a process lasting from late spring to autumn, based on the duration of the hot season and conditioned by the cutting of flowers after each bloom. It is possible for the lavender to flower up to three times per season.

3. Argument of the paper

The various use of lavender and its added value - both for producers and consumers.

The main purpose for cultivating the lavender is to obtain essential oil, after the distillation process, in which, in various cases, not only the flowers are used. If leaves or stalks are also exploited and mixed with the flowers, they will diminish the quality of the oil obtained.

The quantity of flowers necessary to obtain one liter of essential lavender oil depends on the species used and on the state of the plant: fresh

or dried. This quantity may vary between 30 to 200 kg. of lavender flowers necessary to produce 1 liter of essential oil.

But what makes this essential oil so appreciated? This answer rests in his chemical composition. According to <http://sallysorganics.com>³, “lavender essential oil is a combination of over fifty individual components that work together to give lavender oil its healing abilities. Alone, these components will not have the same effect as when they are combined in the oil. Lavender oils can vary slightly as there are different types of plants. Climate, environment, the altitude at which the crop is grown and the country of origin can all have an effect on the oil. However, they all contain similar properties.” [5]

The studies regarding chemical composition of lavender volatile oil (reveal that the proportion of the main compounds in the lavender oil is: linalool (20.60%-35.99%), linalyl acetate (12.58%-19.65%), lavandulyl acetate (3.74%-10.48%), α -terpineol (3.67%-6.73%), nerol (0.81%-3.32%), neryl acetate (0.95%-3.64%) and beta-caryophyllene (0.93%-2.43%) [4].

4. Arguments to support the thesis

Considering these elements, it is a fact that significant components of lavender essential oil are terpenes, those compounds that are defining for its characteristics, fragrance, flavor and pigment.

The multiple use of lavender oil is the reason for the appreciation granted to it since the earliest times:

An impressive share of perfumes (80%) contains this essential oil.

The cosmetics (creams, lotions, massage oil), the cleaning products like soaps, shampoos and detergents, pest repellent and odorants that integrate this oil are considered very efficient and preferred for their scent.

Also, lavender oil is widely used for medical and pharmaceutical purposes, as it has various benefits: it is a natural sedative, with calming effects for the nervous system, as well as for the skin problems (irritation, cuts, burns, bites), due to its antiseptic and antibiotic features. The headaches and abdominal problems can be cured with the help of lavender. It is also used for aromatherapy, due to its relaxing effect.

During the distillation process, following the extraction of the essential oil, the lavender water is also obtained. Even if the concentration is significantly lower than the oil, the lavender water has similar characteristics.

³ <http://sallysorganics.com/lavender/lavender-defining-components>

It is also beneficial for the skin, hair, reduces stress, stomach problems, headaches or bed breath.

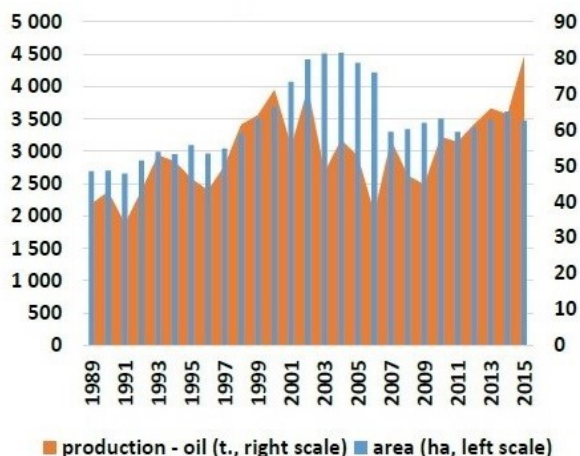
For a scented atmosphere of the room and also for interior decoration, the lavender is used in different arrangements: potpourri, aromatic candles, incense sticks, dried flower bags, dried flowers bunches.

In various forms, such as essential oil, water or dried flowers, the lavender is a special ingredient in different culinary recipes that enriches with its aroma: biscuits, syrups, honey, jelly, cookies, ice cream, tea, aromatic herb blends or salt.

As well, the lavender contributes to the increase of revenues in tourism industry, as people are interested to travel to see the purple fields and enjoy the benefits of related products.

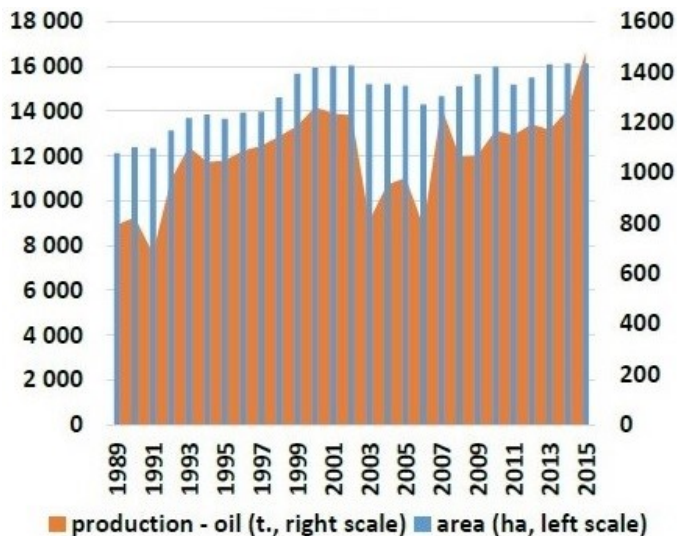
5. Arguments to argue the thesis

The growing interest for lavender due to its benefits influences the uninterrupted extension of surfaces where it is cultivated. In Europe, where continues to be the pole of lavender production, in the last few years, Bulgaria took from France the first place. According to INTELIAGRO (Greibenicharski Stiliyan, Lavender Production in Bulgaria, 2016), “the planted areas in the country have increased more than three times since 2008, reaching nearly 7,000 ha.”[2] The graphs below [2] are showing the evolution of the surfaces allocated to lavender and lavandin culture in France, in parallel with the oil production, and Bulgarian development, in terms of cultivated areas and the lavender flower mass.



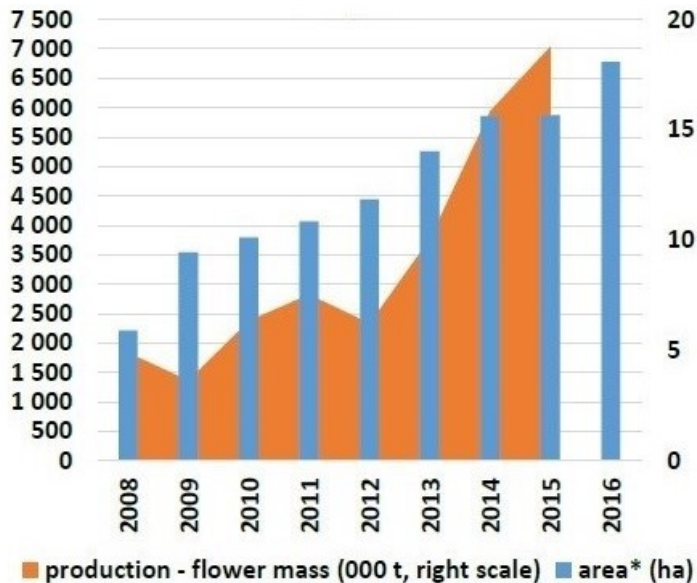
Source: Agreste, Ministry of Agriculture, Agrifood and Forestry, France

Fig.1 Lavender in France – areas and production



Source: Agreste, Ministry of Agriculture, Agrifood and Forestry, France

Fig.2 Lavandin in France – areas and production



Source: „Agrostatistics” Department, MAF; State Fund Agriculture* Declared for direct payments

Fig. 3 Areas and production of Lavander in Bulgaria

The following charts [2] present the situation of the exports and imports of terpeneless lavender and lavandin oil at the EU level, mentioning the impossibility of having the data related to the entire trade with these types of oils, since after 2007, the lavender and lavandin terpenic oils were combined in "a common group with essential oils of other origin". [2]

Table 1. Export of terpeneless lavender and lavandin oil

	2015		2012-2015		12-15/08-11	
	mln. €	MT	mln. €	MT	mln. €	MT
Bulgaria	10,4	125	28,8	397	122%	117%
France	10,3	378	35,0	1273	53%	33%
Spain	3,6	107	11,5	490	273%	245%
Germany	1,5	26	5,2	94	49%	32%
Great Britain	1,3	88	5,1	246	451%	406%
Belgium	1,1	9	4,6	33	109%	-57%
others	1,0	22	3,4	131	8%	-5%
EU-28	29,2	754	93,6	2664	92%	65%

Source: Eurostat

These data indicate that the 2012 – 2015 period encountered an unprecedented expansion, compared to the 2008 -2011 years.

Also, as shown in the following chart [2], the main markets for these EU exports are Union members as well, as matter of pricing and development of oil utilization means.

Table 2. Markets for terpeneless lavender and lavandin oil

Trade partner	2015		2012-2015		12-15/08-11	
	mln. €	MT	mln. €	MT	mln. €	MT
EU-28	16,1	343	50,5	1 193	141%	126%
USA	5,0	120	13,8	320	71%	47%
Switzerland	2,9	109	11,8	461	62%	47%
Mexico	1,0	41	2,1	86	30%	-6%
Australia	0,8	16	2,2	49	198%	186%
Brazil	0,7	24	2,0	73	-22%	-52%
Japan	0,4	18	1,8	91	70%	257%
Canada	0,3	5	1,2	23	70%	75%
India	0,3	12	1,2	45	23%	36%
Singapore	0,3	12	1,1	42	120%	64%
China	0,3	9	1,3	39	86%	63%
Columbia	0,1	6	0,3	15	658%	485%
Argentina	0,1	7	0,4	26	-35%	-35%
South Africa	0,1	1	0,2	2	160%	29%
South Korea	0,1	2	0,2	5	-8%	-53%
Hong Kong	0,1	6	1,1	45	-11%	-25%
other	0,5	24	2,3	149	164%	73%
total	29,2	754	93,6	2 664	92%	65%

Source: Eurostat

Table 3. Import of terpenless lavender and lavandin oil into the UE

country	2015		2012-2015		12-15/08-11	
	mln. €	MT	mln. €	MT	mln. €	MT
France	3,6	51	9,6	163	134%	13%
Germany	2,7	58	7,4	165	44%	-22%
Spain	0,8	115	1,8	170	133%	387%
Belgium	0,8	10	2,7	41	117%	83%
Italy	0,6	20	2,3	80	60%	62%
Netherlands	0,5	11	1,9	110	26%	23%
Austria	0,3	10	2,5	116	-32%	-15%
Bulgaria	0,2	4	0,6	12	-21%	-29%
Great Britain	0,2	4	1,6	59	-30%	-60%
other	0,5	11	1,8	43	14%	4%
total	10,2	296	32,1	958	43%	7%

Source: Eurostat

Even if Romania is not yet considered as a lavender producer country, an increasing number of growers who own small to medium plots of land are granting higher attention from year to year to this not so pretentious plant in terms of farming, but whose benefits are indisputable.

In this context, we can say that the lavender culture presents "economic advantages and one of the most important aspect is that there is a good market for it (...). At first, the costs are quite raised, but considering that it is a perennial plant, with a high interest on the market, the costs are recovered shortly." [7]

Therefore, "the interest in cultivating lavender has increased greatly, since it has been noticed that the profit that can be obtained from cultivating a hectare amounts to 8,000 euros. Those who start a business with the "purple gold" of farming are generally Romanians with smaller pieces of agricultural land, only a few hectares, and have a certain amount available to invest." [8].

6. Conclusions

Currently, lavender production has a significant development, especially in Bulgaria, for both cosmetic and pharmaceutical & therapeutic products;

The special benefits of lavender determine the development of its market, which is constantly rising;

The special flavor and its curative characteristics make lavender to be used even in food sector as an ingredient in various recipes of cookies, syrups, honey etc.;

Lavender cultivation is an activity that has begun to gain more and more interest in Romania, given the relatively small investment, in relation to the profit that can be obtained from the purple flowers..

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