

## ESTABLISHING THE CONNECTION BETWEEN THE MAIN COMPONENTS OF LAVENDER ESSENTIAL OIL AND PRODUCTION

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### Abstract

Lavender essential oil has been used by our ancestors as an alternative medicine for a long time ago. The lavender essential oil compounds, are mainly influenced by the variety which is chosen to be cultivated and the environmental factors, the quality of these oils is influenced by the quantity of linalool, linalyl acetate and camphor. The volatile oil of this genus has been confirmed to have therapeutic, medicinal properties and it is declared one of the most known essential oils in aromatherapy. The essential oil of the lavender is starting to also have uses in the food industry, in the ecological protection of plants, against pest and diseases.

The aim of the study was to compare the essential oil of two lavender cultivars, in two years of experience (2015 and 2016), the dry matter of essential oil varied from 4.03% to 5.96% at Common lavender and from 4.69% to 5.64% at Blue scent hybrid. Regarding cultural interaction between year and cultivar, 2015 registered the highest values regardless of cultivar, being a favorable year. More accurate reporting and data analysis are needed, therefore, the evolution of the correlation line that indicates the link between the two parameters was followed in this paper.

Keywords: camphor, cultivars, quality, oil content.

### 1. INTRODUCTION

The success of the re-launch in Romania of the eteroleague branch in general, and of the lavender in particular, does not depend only on the quality of the planting material, which will later make the difference between a superior culture/production and the lower the extent of the lavender plantations, but also the flowers quantity and obtained volatile oil.

Due to the fact that the exploitation of a lavender culture lasts (15-25 years), it is necessary to use planting material of first quality, obtained vegetatively, from mature, certified plants (Krausz, 2014).

The production of essential oil in larger quantities began in 1923. In 1953 up to 90% of essential oil was produced from lavender industrial plantations (Butnaraș, 2013). Major production areas of lavender oil are in France, England. Recently, the most important lavender oil producers are France, Bulgaria, Ukraine, Australia, Spain (Woronuk et al., 2011). Since 2010, the demand for essential oil of lavender has increased.

Recently it has also been used in food industry, the lavender essential oil is added in flavouring beverages, ice cream, candy, baked goods and chewing gum. Oil quality is evaluate by the essential oil chemical composition and by the organoleptic opinion of the flavourists (Chemat et al., 2006).

Harvesting each variety at optimal ends, when the concentration of active principles is higher, guarantees the exclusion of raw material and essential oil losses. All these tasks can be accomplished if an appropriate starting material is created and used in the breeding of the species (Cantor, 2015).

## 2. MATERIALS AND METHODS

Experiences were carried out in 2015 and 2016, respectively, on private land in Cluj County. Two cultivars of lavender have been used in the study, namely Blue scent and Common lavender.

The biological material obtained from the crops for the years 2015 and 2016, collected in the morning, between 06-11 hours, was subjected to the steam distillation process. The installation is made of food inox to prevent the transfer of foreign substances to oil, as is the case with copper-based installations. The observations were made using the current technique of making them based on specific descriptors and bonuses. The experimental data on the soluble dry substance, linalyl acetate and the amount of linalool content of the studied cultivars, the calculation of the regression line, was made using the data processing program "Statistica 10".

## 3. RESULTS AND DISCUSSIONS

Since the quality of the essential oil is given especially by the quantity of linalool, linalyl acetate and camphor (the higher the percentage of the premiums, the lower the percentage of camphor, the better the oil is considered). In the correlation between the soluble dry substance and these three essential components it is desired to highlight the quality of the oil obtained.

Following the correlation coefficient between the amount of soluble dry substance and the lavender oil content in linalyl acetate we obtained  $r = 0.921$  (Figure 1).

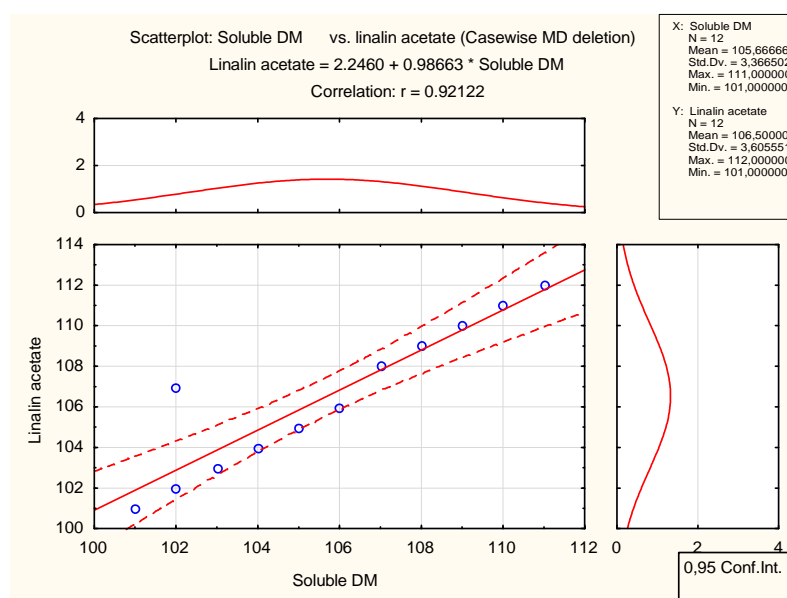
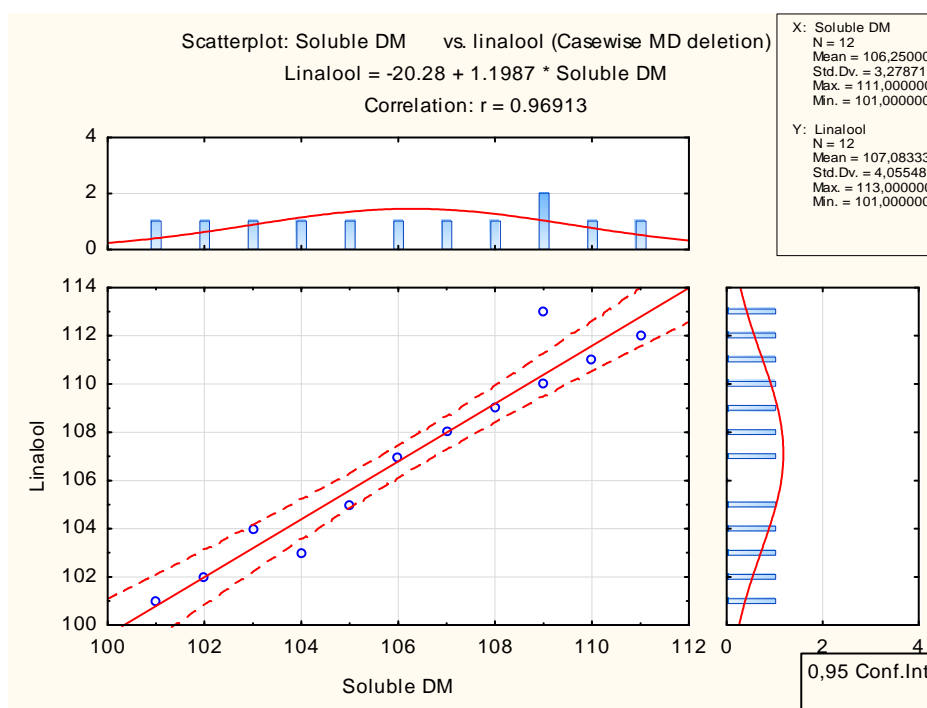


Figure. 1. The correlation between the amount of soluble dry substance and the content lavender oil in linalyl acetate

Comparing this value with the correlation coefficient with the probability of 5% and 1%, respectively.  $r = 0.95 > 0.67$  and  $0.80$  on the basis of these comparisons it can be stated that between the amount of soluble dry substance and the content of lavender oil in linalyl acetate the correlation coefficient is distinctly significantly positive, indicates the close dependence of amounts of dry matter and lavender oil content in linalyl acetate. The higher amount of dry substance in the extracted oil, and the linalyl acetate yield will record higher values (Figure 1).

The amount of dry substance also influences the amount of linalool, determined from lavender oil, with the increase in the quantity of dry matter being increased and the content (Figure 2). It is noticed that the results are real, experimental and faithfully follow the right regression.

The relation between the two characters estimated by simple linear regression is illustrated by the following equation of degree I:  $y = 20.28 + 1.987 * \text{s.d.m}$  and the value of the coefficient of determination  $R^2 = 0.921$ . On the basis of these comparisons it can be stated that between the quantity of dry matter and the content of lavender oil in linalool the correlation coefficient is very significant.



*Figure. 2. The correlation between the amount of soluble dry substance and the content lavender oil in linalool*

The correlation between the amount of dry substance and the amount of linalool depleted from lavender oil shows that there is a close connection between the two characters, the correlation coefficient finds of ( $r = 0.850$ ).

This means that with the decrease in the amount of dry matter, the amount of camphor increases (Figure 3).

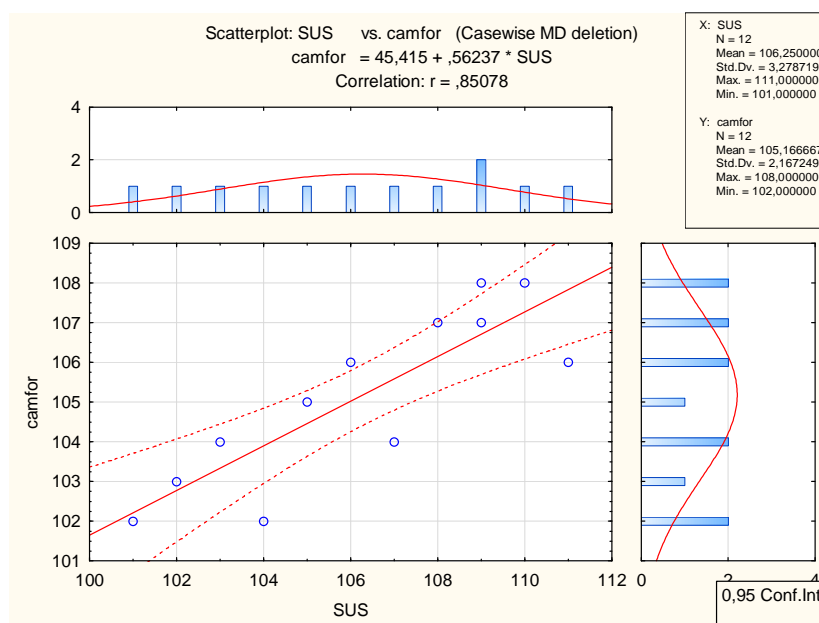


Figure. 3. The correlation between the amount of soluble dry substance and the content of lavender oil in camphor

#### 4. CONCLUSIONS

In order for the *Lavandula* genus to be properly exploited on the market, so that its introduction into crops becomes profitable, it is necessary for the cultivator to know the different species of this genre, each with its particularities, so that it can choose for cultivation exactly those species that are suitable for the forms of exploitation pursued. From these correlations we can see that there is a close link between the soluble dry substance content and the main chemical component.

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