# Research on the Influence of Apiary Biostimulators on Bee Families Development in Spring

**Silvia Pătruică, Ionuţ Bănăţean- Dunea, Alin Jivan, Antonina Jivan, Alin Stroe**

*Banat's University of Agricultural Sciences and Veterinary Medicine, 300645 Timisoara, Calea Aradului 119, Romania*

**Abstract**
In this paper is prezented a study on the influence of apiary biostimulators on the development the bee families in spring. The research was made at beeyards from Armenis, Caras-Severin county from 20 March to 10 April 2010. The biological material being represented by 20 bee families of Apis mellifica carpatica, Banat ecotype, splited in 2 experimental grups of 10 families each with equal strength. The bee families were fed sugar syrup where introduced savory and underbrush extracts. During the research period was analized the number of brood cells at 7, 14, 21 days. The experimental group that was fed bee biostimulator recorded statistical differences in terms of the number of brood cells at 14 and 21 days compared with control grup.

**Keywords**: apiary biostimulators, bee families, spring

## 1. Introduction

The application of stimulating feeding in the spring should be performed to supply the lack of gathering and to stimulate the queen to start laying eggs as early as possible, so that the bee families should develop in order to capitalize the gatherings from entomophil plants best [ 1,2] .
After the cleaning flight, we may incorporate, in the sugar syrup, some apicultural stimulators that influence positively the development of bee families and exert a positive effect on bee health condition as well [ 3, 4, 5] .

## 2. Materials and methods

The biological material was represented by families of *Apis mellifica carpatica* bees, the Banat ecotype, distributed in two experimental variants, each one consisted of 10 families with approximately similar power. The bee families were maintained in horizontal beehives and the queens were the same age.
The experiments were carried out in Armeniş, Caraş-Severin County, between 20 March - 10 April 2010.
Table 1 presents the experimental organization scheme and the percentage of the preparations offered.
The preparation of the underbrush and savory extract relies on the extraction of active principles from underbrush and savory with the help of alcohol, through maceration for 24 hours.
The statistical interpretation of the results obtained successive to apicultural stimulator administration was carried out with the help of the software MINITAB.

## 3. Results and discussion

To determine the effect exerted by underbrush and savory extracts on queen prolificity and implicitly on the development of bee families during the spring season, we measured, with the help of the frame Netz, the number of cells with brood bees in

* Corresponding author: Silvia Pătruică, patruica_silvia@yahoo.com

**Table 1.** The experimental organization scheme and the percentage of the preparations offered

| No. | Specification | Experimental variants | |
|---|---|---|---|
| | | Control group | Experimental group |
| 1. | Underbrush extract (%) | - | 2 |
| 2. | Savory extract (%) | - | 2 |
| 3. | Sugar syrup (%) | 100 | 96 |

7, 14 and 21 days after the administration of these extracts..

The number of cells with brood bees, in the case of the bee families studied, 7 days after the administration of sugar syrup with underbrush and savory extract, is presented in table 2.

Analyzing this table, we may observe that the number of cells with brood bees, measured 7 days after the administration of underbrush and savory extracts, is similar for both bee groups studied. There were not any statistical differences between the two groups as regards the number of cells with brood bees (table 3).

**Table 2**. The number of cells with brood bees at 7 days after the administration of the savory and underbrush extracts

| No. | Statistical indicators | Control group | Experimental group |
|---|---|---|---|
| 1 | n | 10 | 10 |
| 2 | $\bar{x}$ | 6600 | 6790 |
| 3 | $S_{\bar{x}}$ | ±280 | ±227 |
| 4 | S | 884 | 719 |
| 5 | CV | 13.4 | 10.58 |

**Table 3**. The statistical significance between the number of cells with brood bees studied at 7 days after the administration of the savory and underbrush extracts

| Specification | Control group (n=10) $\bar{x}$ =6600 | Experimental group (n=10) $\bar{x}$ =6790 |
|---|---|---|
| Experimental group (n=10) $\bar{x}$ =6790 | NS | - |
| Control group (n=10) $\bar{x}$ =6600 | - | NS |

14 days after the administration of underbrush and savory extracts, the number of cells with brood bees in the experimental group was bigger with 4194 cells compared with the control group, recording a 34.26%-increase compared with this one (table 4). From a statistical viewpoint, we recorded significant differences ($p<0.01$) between the experimental variants studied (table 5).

This increase of the number of cells with brood bees may be explained by the positive effect exerted by the underbrush and savory extracts on queen's prolificity, who laid more eggs.

**Table 4.** The number of cells with brood bees at 14 days after the administration of the savory and underbrush extracts

| No. | Statistical indicators | Control group | Experimental group |
|---|---|---|---|
| 1 | n | 10 | 10 |
| 2 | $\bar{x}$ | 12240 | 16434 |
| 3 | $S_{\bar{x}}$ | ±758 | ±599 |
| 4 | S | 2396 | 1895 |
| 5 | CV | 17.62 | 10.38 |

**Table 5**. The statistical significance between the number of cells with brood bees studied at 14 days after the administration of the savory and underbrush extracts

| Specification | Control group (n=10) $\bar{x}$ =12.240 | Experimental group (n=10) $\bar{x}$ =16.434 |
|---|---|---|
| Experimental group (n=10) $\bar{x}$ =16.434 | ** | - |
| Control group (n=10) $\bar{x}$ =12.240 | - | ** |

**p<0.01

21 days after the administration of underbrush and savory extracts, the number of cells with brood bees was bigger with 3942 cells in the experimental group than in the control group, recording an increase of 19.58% (table 6).

The statistical significance between the number of cells with brood bees studied 21 days after the administration of the underbrush and savory extracts (end of the experiment) is presented in table 7.

**Table 6**. The number of cells with brood bees at 21 days after the administration of the savory and underbrush extracts

| No. | Statistical indicators | Control group | Experimental group |
|---|---|---|---|
| 1 | n | 10 | 10 |
| 2 | $\bar{x}$ | 20124 | 24066 |
| 3 | S $\bar{x}$ | ±886 | ±942 |
| 4 | S | 2801 | 2980 |
| 5 | CV | 12.53 | 11.14 |

**Table 7**. The statistical significance between the number of cells with brood bees studied at 21 days after the administration of the savory and underbrush extracts

| Specification | Control group (n=10) $\bar{x}$ =20.124 | Experimental group (n=10) $\bar{x}$ =24.066 |
|---|---|---|
| Experimental group (n=10) $\bar{x}$ =24.066 | ** | - |
| Control group (n=10) $\bar{x}$ =20.124 | - | ** |

**p<0.01

At 21 days of administration of sugar syrup with addition of underbrush and savory extracts, the experimental group recorded significant differences (p<0.01) as regards the number of cells with brood bees, compared with the control group, which was fed only sugar syrup.

This numeric increase of the cells with brood bees leads to the increase of bee family power, superior capitalization of gatherings and also to the increased production of honey and other bee-based products.

The graphic representation of the number of cells with brood bees, during the administration of the apiary biostimulators represented by underbrush and savory extracts, is presented in figure 1.

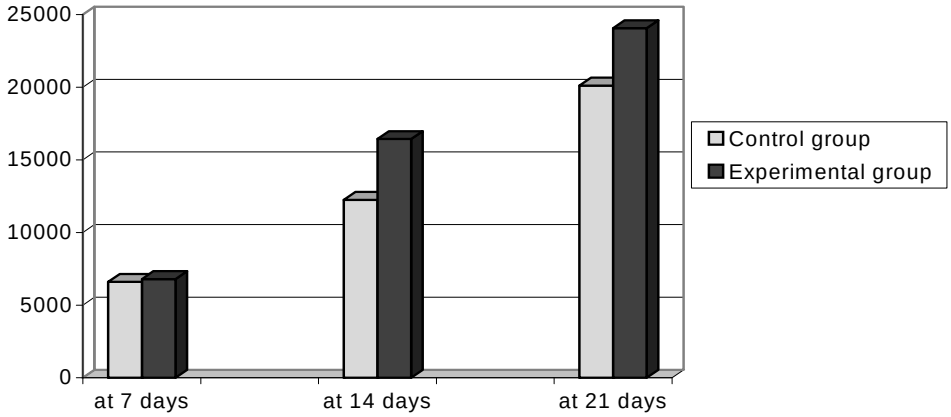


**Figure 1**. The number of cells with brood bees, during the administration of the apiary biostimulators represented by underbrush and savory extracts

## 4. Conclusions

1. The number of cells with brood bees, measured 7 days after the administration of underbrush and savory extracts incorporated in sugar syrup, is similar for both bee groups studied. There were not any statistical differences between the two groups as regards the number of cells with brood bees.
2. 14 days after the administration of sugar syrup with addition of underbrush and savory extracts, the experimental group recorded significant differences ($p<0.01$) as regards the number of cells with brood bees compared with the control group, which was fed only sugar syrup.
3. 21 days after the administration of sugar syrup with incorporation of underbrush and savory extracts, the experimental group recorded significant differences ($p<0.01$) as regards the number of cells with brood bees in comparison with the control group, which was fed only sugar syrup. This increase of the number of cells with brood bees leads to the increase of bee family power, superior capitalization of gatherings and also to the increased production of honey and other bee-based products.
4. The utilization of underbrush extract, together with the savory extract, has generated the maintenance of the health condition in bee families, beside the increase of bee livestock.
5. We recommend that the incorporation of the natural apicultural biostimulators (underbrush extract + savory extract) within the sugar syrup and the administration of this in bee alimentation should be began in the spring, after the cleaning flight, and be repeated in the autumn, in order to prevent the apparition of diseases during winter and to stimulate the queen to start laying eggs as early as possible.

## References

1. Bura, M., Pătruică, S., Nutriţia şi alimentaţia albinelor, Ed. Agroprint, Timişoara, 2003
2. Pătruică, S., Tehnologia creşterii albinelor, Editura Eurobit, Timişoara, 2005
3. Patruica, S., Bura M., Banatean Dunea, I., Popescu, I., Simiz, E., Schiopescu, P., Research on the influence of some apiary biostimulators on the development of bee families salping in the autumn season, Lucrari stiintifice Zootehnie si Biotehnologii, Timisoara, 2006
4. Popovici, D., Influenta unor aditivi furajeri în hrănirea suplimentară a familiilor de albine, Teză de doctorat, USAMVB Timisoara, 2011
5. Tofalvi, M., Efectul biostimulator al unor extracte vegetale asupra dezvoltării familiilor de albine, Teză de doctorat, USAMV Cluj-Napoca, 2009