

STUDY OF INFLUENCE OF ALGAL „CHLORELLA VULGARIS” SUSPENSION ON GROWTH AND PRODUCTIVITY OF BEES FAMILIES

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Abstract

Obtaining of the products largely depends on maintenance conditions of the bees' families, honey, local weather conditions and other factors. The goal of the present research is to determine the efficiency of algal suspension "Chlorella Vulgaris" on growth and productivity of bees' families. There was mentioned for growth promoting of bee families during spring time, when there is not collecting, it can be used algal suspension "Chlorella Vulgaris" mixed with sugar in proportion 1:1, one litre per family. Use of algal suspension "Chlorella Vulgaris" helped to better developing of bees families. The highest number of captured brood was found in bees families what had been fed with algal suspension (162 hundred captured brood cells or by 29.67 hundred more than in the control group) - 22.4%. Freight honey production in bees' families from the experimental group increased by 17.0% compared with control, which was fed with sugar water solution. To stimulate growth of bee families during spring time, when there is no harvest, it is reasonable to use algal suspension "Chlorella Vulgaris" with sugar 1:1, one litre every 12 days.

Key words: bees, syrup, algal suspension, food

INTRODUCTION

Beekeeping plays an important role in Moldova's agriculture, the fact that bees provide people with products such as honey, beeswax, pollen, bee bread, propolis, royal jelly etc. However, honey bees are involved in crops' pollination and as a result it significantly increases quantity and quality of seeds and fruit.

Obtaining of the bees production largely depends on maintenance conditions of the bees' families, honey, local weather conditions and other factors.

Character at the growth and morph-productive qualities of bees families are linked to their origin. Bee family has a high ecological plasticity, it is able to exist in a wide range of living conditions.

Adaptive capacity of each family is constant in the growth process and changes regardless of conditions throughout the season.

Under the anthropogenic influence, there have been changed quite suddenly living

conditions of bees - plant species composition and type of collecting, especially in regions with intensive agriculture [1, 2].

Marghitas L.A. [3, 4] communicates that in the same environmental conditions, in the same growing technology, bees' family with equal population achieves quantitatively different production.

One of the methods by which it can ensure profitability of medium and small apiaries, is early stimulating nutrition. Practicing this nutrition can be achieved by the increasing of laying queen, number of bees and honey harvest increasing of white acacia and fruit trees.

For spring feeding can be used stimulants as honey, syrup with honey, pollen and sugar syrup.

Nescubo P.M., Crahotin N.F., Rogov V. A. [6] – fed the bees from the experimental group with Chlorella paste mixed with sugar syrup. Each bee family received 300-350 g of nutrient mixture daily. Analogue amount of sugar syrup, what did not contain ads, there was given to bees families in the experimental group: in proportion one part

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water and one part sugar. Over 12-15 days in experimental bees families, was noted an increase of juveniles compared to control families, which were fed with sugar syrup without biological supplement.

According to the authors, *Chlorella* can be used for family nutrition, at the production of bee venom and royal jelly, at bees work and selection.

Based on the above mentioned the purpose of the research is to determine the efficiency of algal suspension "*Chlorella Vulgaris*" on growth and productivity of bees families. The study of quality production and improving knowledge of the use of feed additives in bees feeding that helps increase the genetic potential of honey production of bees family.

MATERIAL AND METHOD

To fulfill the objectives, the object of investigations has served the bees families of Carpathian breed, from apiary "Albinarie", district Strasenii.

There were studied from the productive characters of bee families: strength, capacity and productivity of brood and quantity of honey.

To study the influence of algal suspension "*Chlorella Vulgaris*" on growth, development and productivity of bees families, at the apiary "Albinarie" there were formed 3 groups of bees' families, by 3 in each group.

The first group (control I) bees' families received one litre of sugar syrup (1:1);

Group II (control II) - were not fed additionally and they worked with their own honey;

Group III - received a litre of algal suspension "*Chlorella Vulgaris*" with sugar 1:1.

Families of group I and III were fed on 22/04/11, 07/05/11, 19/05/11 respectively with one litre of solution.

During the active season, there was made the control of bees' families over every 12 days until the main harvest of white acacia.

Data were processed by statistical variation method, after Mercurieva E. [5],

Plohinschii N. [7] and using computer programs Microsoft Excel.

RESULTS AND DISCUSSIONS

Researches have shown that at the moment of experimental groups setting up (01/04/2011) the power of bees' families averaged 6.0 areas between the honeycombs populated with bees. Coefficient of variation was from 11.78 to 16.67%.

During bees families control held on 22.04.2011, it was found that the strength of families ranged from 6.3 (group I) and 6.67 spaces of honeycomb populated with bees (group II) (Figure 1). There was found in the family nest from 63.33 to 77.33 hundred of capped brood cells in control groups I and II and 76.6 in the experimental group (Figure 2) and food supply varied at average 1.8 kg (group III) and 4.0 kg honey (group I).

At the next control over 12 days on date of 07.05.2011 it was found that better were developed the bees' families that received syrup with algal suspension. Compared with control groups (I and II) bees' families from experimental group III had higher power of 0.33 to 0.67 spaces between honeycombs populated with bees.

The largest number of captured brood detected in bees' families what received algal suspension and had grown - 162 hundred captured brood cells, or by 29.67 hundred cells more than in control group.

At the conducted control on 19/05/2011 there was found that bees families that received algal suspension had virtually the same power as those in control groups of 9.67 to 10.5 spaces between honeycombs populated with bees. Essential difference was not found as well at the number of captured brood.

Queens's prolificacy during this period in group III was 1246 eggs in 24 hours, at those in control groups I and II respectively 1106-1171 eggs.

Honey reserve in the bees' experimental families and control groups was 1.33 kg and 3.33 kg, confirming that during this time around apiary is missing active harvesting and bees consume stored honey from the family.

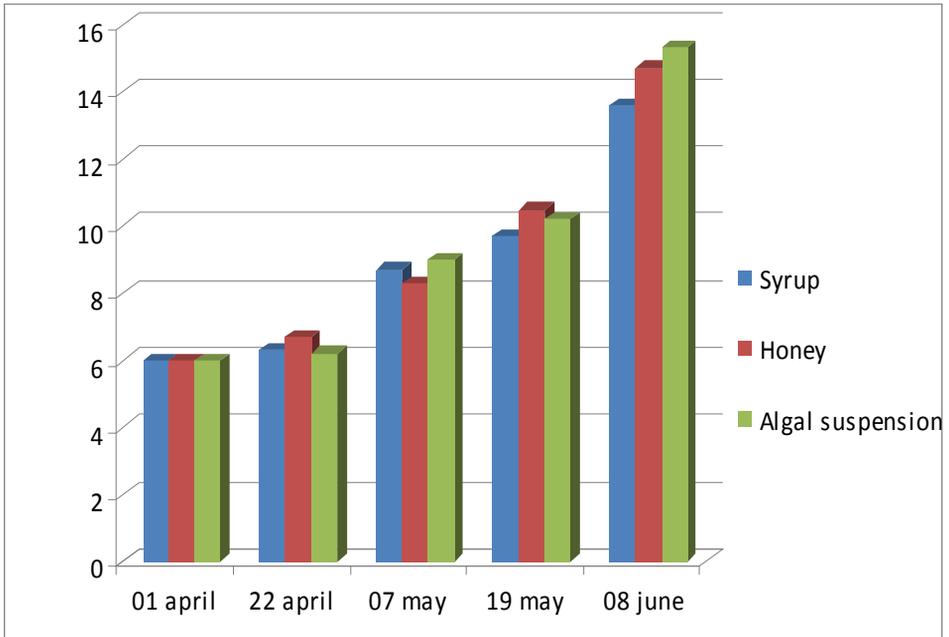


Fig. 1 Dynamic of bees' families' power, spaces between combs populate with bees

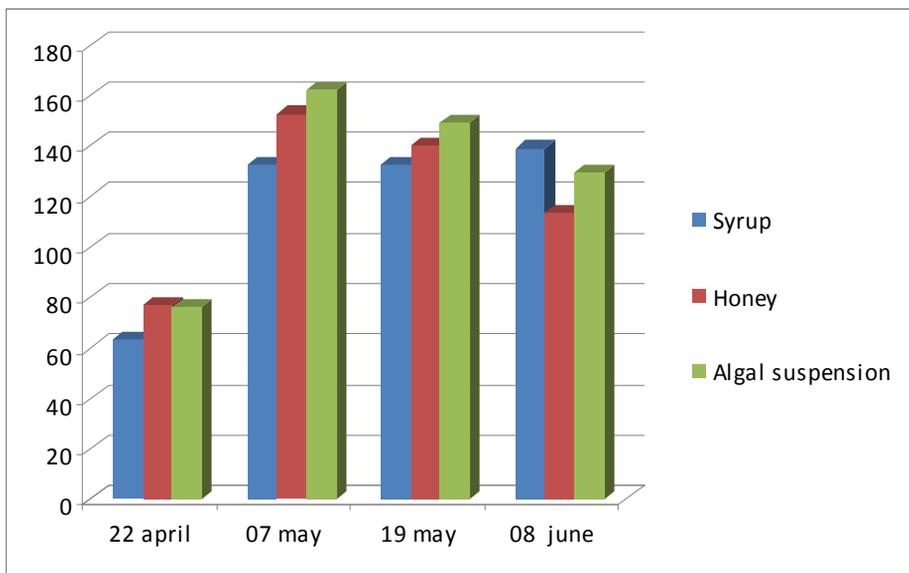


Fig. 2 Dynamic of captured brood, hundred cells

Before flowering of white acacia (8/06/2011) bees families had the power in the control groups of 13.67 to 14.7 areas between populated honeycombs with bees. Best developed had been the bees' families

of group III what received algal suspen-
 averaging 15.3 areas between populated
 combs with bees, or by 0.6 to 1.63 (4.1 to
 11.9%) more than in control groups.

Bees families what had receiving algal suspension had grew in this period - 129.2 cells, or by 9.8 hundred less than cells in group I and 15.9 more than in group II.

From the white acacia bees families from the control groups had stored 24.9 to 25 kg of honey (Figure 3). Maximum amount of honey had stored the bees families in group III what received algal suspension - 26.5 kg, or by 6.0 to 6.4% more than control groups. There was harvested honey by bees' families in the control group 8.7 kg / family and the experimental group III - 10.2 kg / per family.

So the algal suspension contributed to honey cargo by 17.2% more compared to the control group.

During the four controls, on 22/04/2011 up to 08/06/2011 bees' families in the control groups as a whole had grown from 467.33 to 479.8 hundred captured brood cells. The highest number of captured brood cells had grown bees' families of group III - 517.3 hundred cells, or by 10.7% more than in control group I and 7.8% in control group II (Table 1).

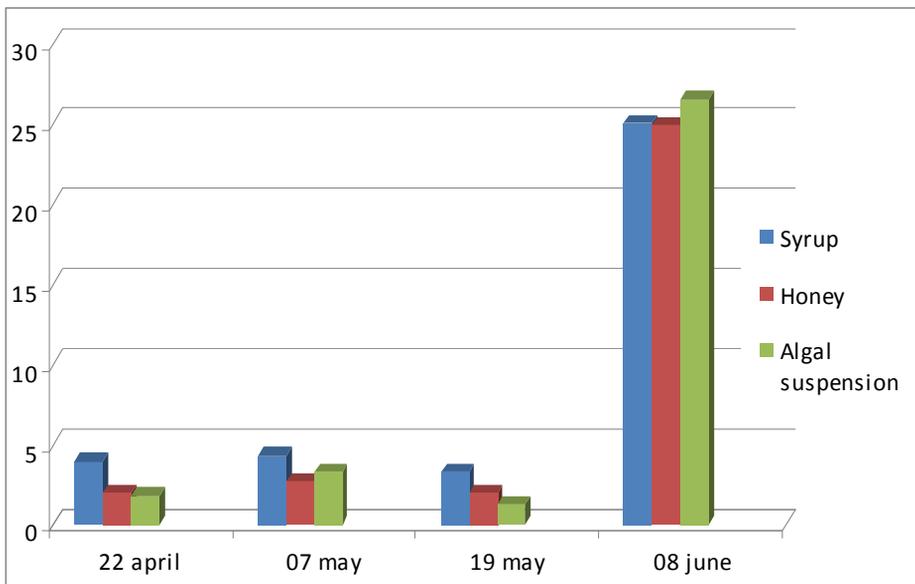


Fig. 3 Dynamic of honey storage, kg

Table 1 Number of captured brood

Date of control	Experimental groups		
	I	II	III
22.04.11	63,33 ± 4,702	73,33 ± 10,651	76,6 ± 9,667
7.05.11	132,33 ± 21,835	152,67 ± 26,235	162,0 ± 14,183
19.05.11	132,67 ± 10,806	140,5 ± 13,59	149,5 ± 12,391
8.06.11	139,0 ± 10,693	113,3 ± 12,72	129,2 ± 8,07
Total	467,33	479,8	517,3
±, %	100	102,7	110,7

So it may be noted that the use of algal suspension "Chlorella Vulgaris" in bees feeding during spring time has positive influence on the development and productivity of families.

CONCLUSIONS

The results give the possibility to conclude the following:

1. Use of algal suspension "Chlorella Vulgaris" helped to better developing of bees families;

2. The highest number of captured brood was found in bees families what had been fed with algal suspension (162 hundred captured brood cells or by 29.67 hundred more than in the control group) - 22.4%.

3. Honey production in bees' families from the experimental group increased by 17.0% compared with controls that were fed with sugar and water solution.

PROPOSALS

To stimulate growth of bees' families during spring time, when there is no harvest, it is reasonable to use algal suspension "Chlorella Vulgaris" with sugar 1:1, one litre every 12 days.

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