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University of Kaposvár, Faculty of Animal Science, Kaposvár

Influence of the beehive types on the development of some diseases at apiaries

Z. Tucak, M. [1]Periškić, M. [1]Krznarić, V. [2]Feher-Belaj, S. [3]Ozimec, I. [4]Tucak

University of J.J. Strossmayer in Osijek, Faculty of Agriculture, Osijek, HR-31000 Trg Sv. Trojstva 3.,Croatia
[1]Croatian Veterinary Institute Zagreb, Veterinary Department in Vinkovci, Vinkovci, HR-32000 J. Kozarca 24., Croatia
[2]Medical School, Osijek, HR-31000 Vukovarska 209., Croatia
[3]University of J.J. Strossmayer in Osijek, Faculty of Education, Department of Biology, Osijek, HR-31000 L. Jaegera 25., Croatia
[4]University of Josip Juraj Strossmayer in Osijek, Faculty of Low, Osijek, HR-31000 Radićeva 13., Croatia

ABSTRACT

Recently we become aware of the increased presence of disease at various members of honeybee brood (queen, workers, drones), settled in the beehive. It is already known that various factors, specifically environmental factors, determines development of disease. The aim of study was to find which diseases at apiaries corresponds with similar ecological conditions at different types of beehives. The results showed a connection of some disease presence with type of beehive.
(Keywords: beehive type, disease, ecological conditions)

INTRODUCTION

According to Decree regulating the animal protection from the infectious and parasitic diseases, all apiarists, holders of the beehives have an obligation of delivering samples for the analyses to the Veterinary Institute. From the samples brought by various types of beehives the connection of some honey-bee disease with beehive type, under similar ecological conditions, has been established.

MATERIALS AND METHODS

The material for analyses was sampled at following beehive types: Alberti-Žniderščič (AŽ), Langstroth-Root (LR) and Dadant-Blatt (DB). The honeybee brood obtained food and nutrients by visiting various species of the honey vegetables: Oil-seed Rape (*Brassica oleracea* subsp. *Oleifera*), False-acacia (*Robinia pseudacacia*), Lime tree (*Tilia* spp.), Horse-chestnut (*Aesculus hippocastanum*), Sunflower (*Helianthus annuus*), Goldenrod (*Solidago* spp.), Mint (Mentha spp.), False indigo (Amorpha fruticosa), Meadow Sage (Salvia pratensis) and other meadow plants.

For the Nosema disease detection, sampled material (30 dead honeybees from the beehive's floor – winter mortality), was crushed in the mortar, adding 1 ml of water. A drop of the suspension was transferred by the pipette on a microscopic slide, covered by a cover glass and analysed under microscope magnification. The spores of *Nosema apis* have elongate and oval shape with thick mantle disrupting the light intensity.

Fort the confirmation of *Varroa mite* honeybee parasite, samples consisting the waste from the beehive's floor were dried overnight in the thermostat. After that, the

material was sieved - first with a sieve which holes are 2 mm^2 in diameter, then with a sieve with 1 mm^2 diameter holes.

A small portion of the material remained after the second sieving was put on the microscopic slide and analysed under the microscope searching for the presence of parasite. All analyses were carried out by the kindness of the Veterinary Department in Vinkovci.

RESULTS AND DISCUSSION

Long-term investigations indicated the presence of various diseases at different types of beehives. The results of the analyses are shown in *Table 1* and seasonal dynamics of average temperatures and quantity of rainfall in *Vukovar-Srijem county* is shown in *Figure 1*.

The microscopic *Nosema apis* is the causative agent of the European *honeybee* nosema disease. Epozootiological situations in the surveyed area of Vukovar-Srijem County, in the 10-15 km surround from the apiaries that have been examined, is characterised by the diminutive presence of other apiary disease. Registrated abundance of the American Foulbrood disease is 0.001% while for the Chalkbrood disease is 0.01%. Sporadically incidents of the honeybee broods intoxication during the incautiously treatment of weeds with herbicides have been noticed.

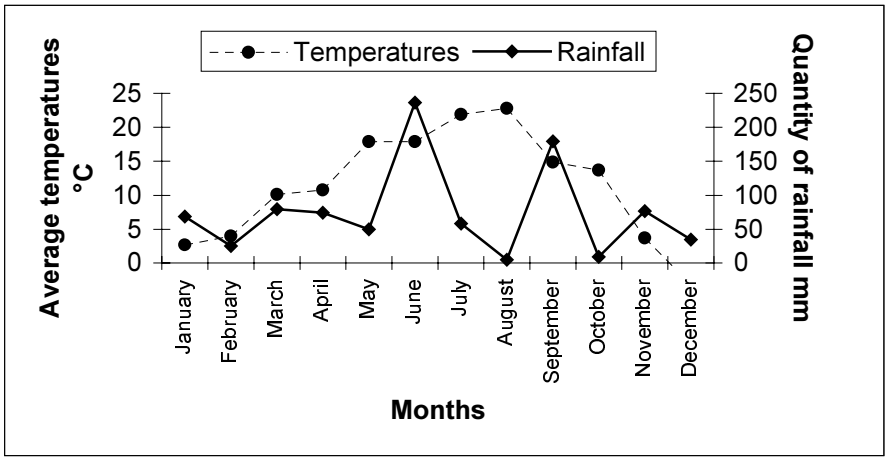
Table 1

The honeybee illness detected at different types of beehive

Beehive type	Number of examined samples	Honeybee illness			
		Nosema disease		Varroa disease	
		Number	%	Number	%
AŽ	567	219	38.62	67	11.02
LR	137	10	7.29	37	27.01
DB	20	10	50.0	8	40.0

Figure 1

Seasonal dynamics of average temperatures and precipitacion



The apiarists strongly habituates with specified type of beehive, excluding the possibilities of composing different types in their apiaries. One of the reason is a great experience in manual operating with the same beehive, and foreseeable behaviour of the honeybees.

CONCLUSIONS

Statistical data analyses by testing the warrantableness of differences between two samples clearly confirms the following:

- Significant differences ($P<0.01$) have been established between AŽ and DB beehives in connection to the presence of nosemosis
- Significant differences ($P<0.01$) have been established between AŽ and DB, and AŽ and LR beehives in the connection to the presence of varosis.

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Corresponding author:

Zvonimir Tucak
University of Josip Juraj Strossmayer in Osijek, Faculty of Agriculture
HR-31000 Osijek, Trg Svetog Trojstva 3., Croatia
T.: 385 31 224 200, Fax: 385 31 207 017