

## Parasitic pathogens occurring in workers in honeybee colonies (*Apis mellifera*)

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**INTRODUCTION.** Honey bee (*Apis mellifera*) is the most effective pollinating insect in the world. Nowadays, a lot of attention is devoted to the aspect of their health. The main threats include the presence of many pathogens in bees including *Varroa destructor* mites, *Nosema apis*, *N. ceranae* fungi and protozoa. The influence of the Trypanosomatidae family is still the least known.

The aim of the research was to detect and identify two species of protozoa (*Lotmaria passim*, *Crithidia mellificae*), *V. destructor*, *N. apis* and *N. ceranae* in workers in bee colonies in central Poland apiaries (Mazovia).

**MATERIAL AND METHODS.** The research was carried out in March 2018 in three (U, K, WKW) randomly selected =apiaries in Mazovia. There were about 70 bee colonies in each apiary. From each apiary 10 bee colonies without any disease symptoms were selected to the study. The samples for research (60 workers from the winter hive debris) were taken at random from each hive. To detect: *L. passim*, *C. mellificae*, *Nosema* spp., samples (60 insects) were tested by PCR using primers specific to the species (Martin-Hernandez *et al.*, 2007, Stevanovic *et al.*, 2016). In the winter hive debris number of *V. destructor* females was evaluated according to OIE (2018).

**RESULTS.** For 30 (100%) samples of worker bees, in 19 of them (63.3%), *Nosema* spp. were identified, including 17 (56.6%) *N. ceranae* and in 2 (6.66%) co-infection *N. apis*/*N. ceranae*. *L. passim* was detected only in 3 (10%) samples, while *C. mellificae* was not detected in any of the samples. In 15 (50%) of the winter hive debris samples, the *V. destructor* females were found (mites count varying from 3 to 35). The results of the research are presented in Table 1.

Table 1. The number of samples of worker bees infected with the pathogens in individual apiaries

Apiary	<i>L. passim</i>	<i>C. mellificae</i>	<i>Nosema</i> spp.			<i>V. destructor</i>
			<i>N. apis</i>	<i>N. ceranae</i>	<i>N. apis</i> / <i>N. ceranae</i>	
U	2	-	-	8	-	4
K	1	-	-	2	2	8
WKW	-	-	-	7	-	3

**CONCLUSION.** It should be emphasized that in infected bee colonies no disease symptoms were observed. Nevertheless, we have shown that there are various pathogens in honeybees (*A. mellifera*) in honeybee colonies. Declared by the beekeepers control methods of *V. destructor* didn't eliminate the presence of the parasite in the half of the samples tested. There is similar situation like the fight against *Nosema* spp., which is additionally limited by European Union directives. Only in 3 samples we confirmed the presence of one species of protozoa – *L. passim*.