The contamination of winter stores and early spring honey with spores of *Paenibacillus larvae larvae* in Polish apiaries of the Małopolska province

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Abstract

We analysed 251 early spring and winter storage honey samples, individually collected from the apiaries of 9 districts of Malopolska province in South Poland and revealed that 51 of these specimens were contaminated with different levels of *P. larvae larvae* spores. Among these samples 8.8% were classified as a category I contamination and 11.5% as a category II – representing 22 (43.1%) and 29 (56.9%) of the total positives, respectively.

We conclude from these analyses that: (1) – the total number of new outbreaks of AFB in Poland are most likely to be higher than previously reported, (2) – the quantitative examination of samples of winter stored or early spring honeys for the presence of *P. larvae larvae* spores can improve the detection rate of AFB outbreaks, (3) – the high percentage of apiaries that were found to be free of *P. larvae larvae* (80%) may facilitate the implementation of an AFB eradication programme on a large scale in Poland.

Key words: American Foulbrood, *Paenibacillus larvae larvae*, honey, winter stores, spore concentration, eradication programme.

Introduction

Honey bees (*Apis mellifera* L.) suffer from a number of diseases caused by pathogens and parasites (Shimanuki 1997). This includes American foulbrood (AFB), a bacterial (*Paenibacillus larvae* subsp. *larvae*) disease of the brood that has spread to all continents where there are honey bees (Matheson 1993). The pathogen produces extremely environmentally stable spores (White 1920), and once clinical symptoms of a diseased capped brood are evident to the bee owner, infected colonies will die, if proper treatment is not implemented (Ratnieks 1992, Hansen and Brodsgaard 2003).

Interestingly, *P. larvae larvae* spores can also be found in healthy larvae, on the body and in the digestive system of adult bees, as well as in their food supply (honey and pollen) (Von Der Ohe 2003).

The outbreak of AFB after the transfer of the pathogen agent depends, apart from the number of pathogen agents, mainly on the power of resistance of the infected bee colony (Ritter 2003). Most decisive in