

SUMMARY

Paenibacillus larvae is a serious bee disease that is spread worldwide. Every year, hundreds of thousands of bee colonies die from the consequences of this disease.

This work takes up the topic of substance-related medication of infected colonies.

At first 90 000 Plant compounds were checked for their toxicity towards humans, animals, and environment. After that 10 000 substances remain, which were examined in the laboratory for their effect on P. larvae. To treat diseased colonies in field, a weakly concentrated sugar solution was mixed with the above-mentioned substances and fed to the bees.

Throughout the project, the substance, used at the apiaries, was called SP50.

To determine the success of the treatment and make it measurable, samples were taken from the colonies before and after the treatment. These were microbiologically analysed. All samples were examined according to the standard of the Friedrich-Loefflers-Institute. Since this method can only be applied to the brood samples examined, if colonies are symptomatically diseased, the method was slightly modified to achieve a higher sensitivity of the examination. To be able to use the collected data for an approval, all samples were also tested by AGES (Austrian Agency for Health and Food Safety) for their contamination with P. larvae.

It was researched that P. larvae was no longer detectable in mildly diseased colonies without pronounced symptoms after a single treatment with SP50 (beehives were feed) in the procedure described. To achieve the same result in severely diseased colonies (large-scale death of the brood, scabbing of the brood combs), a second treatment with SP50 after 14 days is recommended, since after a single treatment only small amounts of colony-forming units could be detected. In the current use all bee colonies are treated twice as standard.

During the treatment period with SP50, it was found that the cleaning instinct of the colonies increased significantly and the vitality as well as the brood activity increased strongly. As a result, formerly infected colonies recovered completely within a few weeks.

The results of the work suggest that a breakthrough has been made in the global control of American foulbrood. Until now (13.06.2022), 30 000 bee colonies have been saved through the project.

A patent was filled, and a company was established for commercial use.