

Vitaeapis®—information on the effects of the preparation on the bee family

In modern agriculture and fruit farming, the use of plant protection agents is very often a *sine qua non* condition of the expected crop size. However, insects pollinating plants, in particular honeybees, are particularly exposed to the negative aspect of pesticides.



A phenomenally bilaterally reddened Dadant frame, the family after using Vitaeapis twice. Opinion: Tomasz Wudarczyk, a beekeeper from the area of Włocławek (Polankowicz). photograph by Tomasz Wudarczyk

The death of families due to neonicotinoid poisoning is not only a waste for beekeepers. Insufficient pollinators on crops of entomophilous plants means crop failure. In the absence of insects, even intensive plant protection treatments will not bring tangible results.

The pollination of plants is a necessary condition for good yields, together with appropriate agrotechnical measures and combating diseases and pests.

The analysis of the effects of neonicotinoids on the nicotinic receptors of insects has been the subject of many scientific papers published in renowned journals from the so-called Philadelphia list. The use of neonicotinoid pesticides results in the death not only of the crop pest, but also of the beneficial insect—the honey bee.

Prenyl derivatives of hop chalcones present in the preparation Vitaeapis® created and patented by BioActive-Tech Sp. z o. o. from Lublin, by affecting the nervous system of bees, protect them against the effects of plant protection agents, especially those from neonicotinoid group.

Bees protected with the preparation show resistance to insecticides — after the application of the Vitaeapis® preparation, bees remain alive even after direct contact with pesticides in toxic doses (details can be found in the monthly journal "Pszczelarstwo" ("Beekeeping") 2014, No. 3).

Neonicotinoids are structurally and functionally nicotine-like compounds, and due to their chemical structure they are also called chloronicotinyls. The main target of the neonicotinoid action is the nervous system of insects. Their use in agriculture is necessary.

Nevertheless, numerous laboratory and field tests describe the lethal or near-lethal effects of neonicotinoids on the loss of memory and behaviour of bees and other pollinators. Sub-lethal doses of imidacloprid given to bees with pollen in their diet had a negative effect on the level of proteolytic activity in honeybees.

Not always does the survival of insects after exposure to the permissible doses of neonicotinoids indicate their good condition, as noted in studies on bumblebees.

Neonicotinoids effectively imitate the effects of nicotine in the central nervous system. In small concentrations, they activate nicotinic type cholinergic receptors and depolarize neuronal membranes —i.e. the state of arousal—while they block synaptic conduction in higher concentrations.

This condition persists because there are no esterases that break down the nicotine analogs in the synaptic space. This leads to impaired transmission of nerve impulses, causing the hyperactivity of postsynaptic neurons. The excitotoxicity of nicotine and its analogues leads to neuronal damage and consequently to the death of insects.

In addition to neurological symptoms, neonicotinoids also reduce the resistance of bees to diseases. Imidacloprid is an agonist of nicotinic acetylcholine receptors (nAChRs) and shows selective toxicity to insects.

Recent studies using binding assays, methods of molecular biology and electrophysiology suggest that some of the nAChRs nicotinic receptor sub-units interact electrostatically with imidacloprid.

As mentioned above, even low exposure to neonicotinoids can cause serious sub-lethal effects on bees. Greenpeace published a "Review of Factors Threatening Pollinators and Agriculture in Europe", which found that the sub-lethal effects include a wide range of behavioural disorders in honeybees— e.g. thiamethoxam "in sub-lethal concentrations:

- aggravation of mid-term memory and brain metabolism of honey bees,
- disturbance in the behaviour of honeybees gathering food,
- even at very low doses it has a detrimental effect on the development of bumblebee colonies; particularly a negative impact on mothers,
- a negative impact on the development of the nervous system and the ability to move in the newly erased worker bees of wild bee species,
- at low doses comparable to concentrations found in field conditions and in combination with pyrethroid (lambda-cyhalothrin), it increases the mortality of worker bees and reduces the ability to collect food among bumblebees, damaging the health of the entire colony.

In response to the above-mentioned problems outlined by Greenpeace, it should be stated that Vitaeapis® fulfils the expectations of modern beekeeping as well as agriculture and fruit farming, basically by tackling the challenges of modern times.

The conducted studies indicate the supreme effectiveness of Vitaeapis® in the protection of bee colonies against the effects of neonicotinoids. Even poisoned bees quickly recover after the use of Vitaeapis®.

According to current knowledge, neonicotinoid molecules probably do not reach the nicotine receptor and do not block its function. It can be assumed that active molecules of the preparation may interact with the receptor, creating a kind of barrier blocking the propagation of neonicotinoids in the body of a bee.

Vitaeapis® meets the need for selective protection of bees from the negative effects of neonicotinoids on bee families.

Studies conducted by BioActive-Tech Sp. z o.o. and published in 2014 in the monthly journal "Pszczelarstwo" ("Beekeeping") No. 10 indicate that Vitaeapis® is also attractive for bees in terms of smell and taste. In terms of taste, the bees quickly and eagerly consume it in the form of a sugar syrup and. In terms of smell, an attempt to rob the family where the preparation had been given in syrup form turned out to be successful, despite protection in the vicinity.

After the application of Vitaeapis® to the bee family, there is an increased movement of bees at the outlet and the beehive is protected. In addition, bees were noted to manifest increased activity and vigour. In the first half of August in the beehives protected with Vitaeapis®, a significant increase of bee mothers' red was observed compared to the control group.

This means increasing the strength of the bee colony before winter, which significantly contributes to its survival.

Vitaeapis® stimulates the hygiene instinct and self-cleaning of bees

The hygienic behaviour of bees is a feature that correlates with resistance to fungal infections, American rot, *Varroa destructor* and other diseases jeopardise the hive. As a result of the hygienic behaviour, bees are able to detect, open and remove infected members of the brood before it becomes contagious and thus slow down the spread of the disease and even eliminate it.

Many scientific papers can be mentioned, in which the authors clearly emphasize that an increase in the instinct of a hygienic bee family is at the heart of its health. One of the methods of boosting the hygienic instinct of bees is to choose the right genetic material for the insemination of the queen.

In addition, the way of nutrition, the presence of nectar and the season all affect the proper level of natural hygiene behaviour among the bee colony.

Specialist research was carried out on the hygienic instinct of bees, consisting in freezing the sealed brood or puncturing it with a needle. The aim was to assess the response time needed by the bees to locate the dead larvae and then remove them from the hive.

Based on the preliminary tests carried out by a beekeeper—a well-known bee colony grower—it can be stated that the response time of bees protected with Vitaeapis® is shortened two or even three-fold, depending on the control group.

In a short time the bees discarded dead brood from the hive, thus eliminating the development of infections. This means that Vitaeapis® supports and even restores the natural hygienic instinct of bees.

In addition, it was found that a similar mechanism occurs among bee families affected by mycosis. After the application of Vitaeapis®, the bees were more efficient in cleaning of the nest of limestone mummy (overgrown with mycorrhiza mycelium), while at the same time inhibiting the further development of the disease (wolnepszczoly.org/wywiad-z-pania-elzbieta-kowalczyk).

After the use of Vitaeapis® in the families of patients with mycosis, there was a silent exchange of the mother. Thus, Vitaeapis® can trigger mechanisms leading to the diagnosis of the mother as a reservoir of disease (transfer vector) with a simultaneous signal for its silent exchange.

Similar observations have been made in the case of invasion of *Varroa destructor*. Significant free fallout was observed after the use of Vitaeapis® *V. destructor* on the bottom. A careful observation

showed that the *Varroa* were alive but dropped from the bees as a result of so-called jumping, occurring in, for example, a Caucasian bee.

This means that the preparation does not kill *V. destructor* but the bees, as a result of increased hygienic instincts, drop it themselves as a result of self-cleaning.

Summary

The product protects bees from the negative effects of the use of plant protection products. As a consequence of Vitaeapis®, the hygiene instinct is activated in families with prolonged delivery time of sick or dead brood.

The activation of the hygienic instinct causes the mites to shed *Varroa*, discarding mycosis, including *Nosema*. A clean beehive means increasing the mother's redness and, consequently, a strong family. Beekeepers who used Vitaeapis® for bee families noticed the lack of moodiness after administration of the preparation.

On the other hand, in some families there was a silent exchange of the mother.

According to the research, as a result of the use of Vitaeapis®, the beekeeper obtains up to 30 kg more honey from the hive (study by Grzegorz Jasina—Lublin). Dump on the bottom after winter is scarce. The bees live longer (studies by Mr. Wojciech Pelczar, Krosno).

More information at <https://vitaeapis-new.com>