

Treatment against the forid fly *Pseudohypocera kerteszi* in *Melipona quadrifasciata* Lep

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ABSTRACT. The forid fly *P. kerteszi* is a pest that mainly attacks the brood of social bees. The consequences of this attack range from weakening to total extermination of bee colonies. The objective of the present study was to develop a methodology that would eradicate this pest when *P. kerteszi* is parasitizing colonies of *Melipona* bees. Three *M. quadrifasciata* colonies parasitized with the forid fly were treated with a solution of meliponid honey or vinegar in combination with the oktrine fly poison. A flask containing this solution was placed between the nest and a garbage tray separated by a mesh net that would permit the passage of forid flies but not of bees. Dead forid flies inside or close to the solution were found daily for a period of three to seven days.

Key words: *Pseudohypocera kerteszi*, *Melipona quadrifasciata*, forid fly, treatment.

RESUMO. Tratamento para o combate do forídeo *Pseudohypocera kerteszi* em *Melipona quadrifasciata* Lep. O forídeo *P. kerteszi* é uma praga que ataca principalmente as crias de abelhas sociais. As consequências do ataque vão desde o enfraquecimento até o extermínio total da colônia de abelhas. O objetivo deste trabalho foi a criação de uma metodologia que permita a erradicação deste parasita quando estiver atacando colônias de abelhas melipona. Três colônias de *M. quadrifasciata* parasitadas com o forídeo foram tratadas com solução de mel de meliponídeos ou vinagre associada ao veneno de mosca oktrine. Um frasco contendo essa solução foi colocado entre o ninho e a lixeira em colmeias do modelo Uberlândia. Uma tela de malha que não permitisse a passagem das abelhas foi colocada entre o ninho e a lixeira. Por um período de três a sete dias foram encontrados forídeos mortos dentro ou próximo à solução.

Palavras-chave: *Pseudohypocera kerteszi*, *Melipona quadrifasciata*, forídeo, tratamento.

Activities related to meliponiculture (stingless native bees rearing) are frequently impaired by some type of attack against the bee colony. Diseases, predators and pests have provoked countless problems especially related to production activity.

Inadequate beekeeping often causes several problems that impair development. Thus, colony attack by enemies may be avoided as long as adequate management techniques are used.

Among pests that greatly affect bee colonies, is the forid fly *Pseudohypocera kerteszi*, usually found in colonies of meliponinae bees, where it causes serious problems. Forids are small dark flies that enter the hives, where they lay eggs in pollen pots or in brood cells containing pollen (Nogueira-Neto *et al.*, 1986; Kerr *et al.*, 1996).

The presence of this fly in bee colonies usually occurs after inadequate hive management or after

the transfer of bee colonies from one hive to another (Aidar, 1996). Adult forids cause little damage to meliponines, whereas their larvae, if present in large numbers, cause the death of the bee colony (Nogueira-Neto, 1997).

Little is known today about the control of this pests. Only preventive measures are available, consisting of traps placed in order to attract and capture the flies before they enter the beehives (Aidar, 1996).

The objective of the present study was to develop a methodology for eliminating the forid fly *P. kerteszi* from colonies of some meliponine species.

Material and methods

The study was conducted on three *Melipona quadrifasciata* Lep. ("mandacaiá") colonies in the

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Forids were eliminated by poisoning. A solution of vinegar (pure) or meliponid honey containing oktrine (fly poison), at 30:1 proportion, was placed in the bee colonies contaminated with the fly. The solution was placed in a small flask on the bottom of a hive (garbage tray) of the Uberlândia model. A number-eight copper net (3 x 3 mm) was placed between the bottom and the nest to prevent contact of the bees with the solution containing poison.

After applying of the treatment, the hives were examined at 24-hour intervals and the number of dead forids found immersed in the solution or fallen on the garbage tray was counted. The process was interrupted after the third consecutive day of no detection of dead forids.

The forid fly population of a colony could not be determined before starting treatment and therefore the total number of dead forids from the beginning to the end of treatment was considered to be the total population of this insect. After the number of dead forids was counted, a survival curve was constructed for the period during which each bee colony was submitted to treatment.

Results and discussion

Excellent results in terms of pest extermination were obtained for the three *Melipona quadrifasciata* beehives where the solution against *P. kerteszi* was tested. Several dead forids inside the solution or on the bottom of the hive were observed at each 24-hour interval. During the first 24 hours after application of the solution to the beehive, a mean rate of 43% of dead forids was observed.

Dead forids have been found in both solutions (oktrine + vinegar and oktrine + meliponid honey). No individual register about forid mortality was made so it was impossible to decide which solution is more efficient to kill the forid.

The period needed for complete elimination of adult forids varied according to the degree of infestation of the bee colony. Thus, more affected beehives require a longer period of time for elimination of the forid fly. In the present study, the total time needed to eliminate adult forids ranged from three to seven days (Figure 1). Hive number one, for example, appeared to be highly infested at the beginning of the experiment compared to the other colonies used in the experiment, with 75 dead flies being counted over a period of one week. In contrast, hive number three, the least infested (only nine forids) required only three days for the elimination of adult flies.

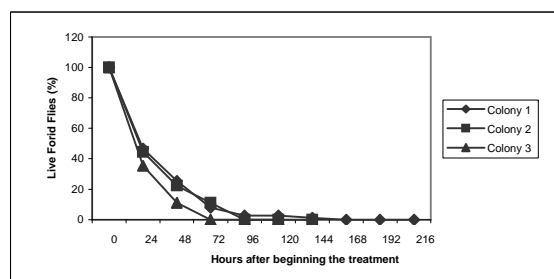


Figure 1. Survival of the forid fly *Pseudohypocera kerteszi* in *Melipona quadrifasciata* colonies treated with the oktrine poison

A period of approximately one week was sufficient to eliminate adult forids existing in the hive at the beginning of treatment. However, we observed that, after a few days of elimination of the initial population, new flies arise in the hive. This means that during the treatment, eggs and larvae phage are developing in the pots and cells containing pollen and reach the adult phase after the initial forid population has been eliminated. Thus, for an effective extermination of the pest, the treatment must be applied every three days for a period of approximately three weeks.

The present method for the extermination of forids in meliponine hives has proved to be efficient for *Melipona quadrifasciata* colonies. So this technique may be efficient for all bee colonies having workers and queens whose body is larger than the mesh of the net used to prevent the contact of bees with the solution used against the forid fly. For bee species whose body size is equal to or smaller than that of the forid fly, as it is the case for *Tetragonisca angustula* (jataí), *Plebeia spp* (mirim) and other trigonini, the technique cannot be used because the bees could also pass through the net which the forids pass to reach the solution.

Another aspect to be considered for the use of this solution against the plague is the hive model. Models that permit application of the solution in the garbage tray are indicated because they permit the placement of the net between the garbage tray and the nest to prevent bee contact with the solution used against the fly.

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