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CONTROL OF *DERMANYSSUS GALLINAE* (ACARI: *DERMANYSSIDAE*): EXPERIMENTAL TRIALS WITH INERT POWDERS

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Introduction *Dermanyssus gallinae* is the most common and feared pest in poultry. At the present, the main method of control of the infestation is the use of chemical acaricides [1]. The onset of resistance phenomena and their toxicity have required further studies to find alternative methods for *D. gallinae* control; encouraging results were obtained through the use of essential oils [2], biological control [3] or physical treatments [4].

The aim of this study was to investigate the effectiveness and persistence against *D. gallinae* of two products, based on inert powders, already marketed and used in poultry farms as sanitizers: Bi-Protec[®] (15% silicon-based and 85% sodium bicarbonate) and Diatom[®] (based on diatomaceous fossil powder). Additional objective was to test the association of their active ingredients to verify the possibility of obtaining a better, faster and more effective acaricide.

Field trial: it was conducted in a layer hen breeding in Forlì (Italy) infested with *D. gallinae*, in May-October 2013. Bi-Protec[®] (shed A) and Diatom[®] (shed B) were applied as a single dose, according to the manufacturer instructions, by a high pressure automatic pump. The monitoring was carried out every 15 days for 4 months, removing 10 samples of substrate (4 grams) for each shed. At the Istituto Zooprofilattico della Lombardia e dell'Emilia Romagna the samples were kept in an incubator (T: 30°C, RH: 70%) for 3 days to allow the hatching of eggs, and then observed by stereomicroscope to count the mites.

The first test was carried out at the Urania Centre of Research (Perugia, Italy) using Petri dishes containing 20 adults of *D. gallinae*; for each test (Bi-Protec[®] diluted and in powder, Diatom[®] diluted and in powder, test control) three replications were set up. Plates were observed daily by stereomicroscope until the death of all individuals, counting alive mites. In December 2013 a second test was carried out at the Lab. of Entomology Dept. of Veterinary Medicine (Perugia, Italy); the active ingredients in powder form, amorphous precipitated silica and Diatom powder, were tested together in proportions 3:7.

In the field trial, a considerable reduction of the infestation occurred with both products, even if the treatment with Bi-Protec[®] was more lasting (> 4 months) compared to treatment with Diatom[®] (3 months). In addition, farmers reported a reduction in visual mites, the absence of blood stains on the eggs and a reduction of itching in the staff. In the first laboratory test Bi-Protec[®] showed a better result. Both products diluted showed less effective, probably because the powder diluted in water is compacted when it dries and mites easily walk over it without getting dirty; in the field trial this does not happen, because the movement of the birds disrupts the compacted powder. The last test, with both the active ingredients of the two products, gave good result, because in 6 hours' time there was 100% mortality of mites.

The data emerging from our tests are very significant, as it give us hope in the possibility of formulating new effective antiparasitic products with less environmental impact and less toxic to animals and operators.