

## ACARICIDE EFFECT OF THE ALKALOID MATRINE AND THE FUNGUS *Metarhizium anisopliae* S.S. AGAINST THE TICK *Rhipicephalus microplus*

**Filgueiras, M. D. G<sup>1</sup>, Moreira, P. F<sup>1</sup>, Rodrigues, J. A. A.<sup>1</sup>, Alves, F. M & Fernandes, E. K. K<sup>1</sup>.**

1. Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás, Goiânia, Goiás, Brasil. E-mail: [mdgfilgueiras@gmail.com](mailto:mdgfilgueiras@gmail.com)

Resistance of ticks to chemical acaricides are often reported; therefore, alternative control methods, such as the use of plant secondary metabolites and entomopathogenic fungi have been investigated to reduce the use of chemical products for tick control. The current study evaluated the acaricide effect of the association of the plant alkaloid matrine and *Metarhizium anisopliae* s.s. IP 146 against engorged females of *Rhipicephalus microplus* (Acari, Ixodidae). Experiments were conducted with eight treatment groups: matrine only (at three different concentrations: 3.25, 6.25 and 12.5 mg mL<sup>-1</sup>); fungus only (at 10<sup>7</sup> conidia mL<sup>-1</sup>); association of fungus (10<sup>7</sup> conidia mL<sup>-1</sup>) and each of the three concentrations of matrine; and a control group, treated with distilled water. Each treatment was composed of 10 engorged females, which weighed from 0,180 g to 0,300 g and were distributed by weight as homogeneous as possible among the groups. Females were immersed in 5 mL of the respective solution/suspension for 3 min. Females from each group were then placed individually in a 10-well cell culture plate and incubated at 27 °C with relative humidity ≥ 90% for 20 days. The following biological parameters were investigated: female initial weight, oviposition weight, female residual weight, larval hatchability, pre-oviposition and oviposition periods. The data were used to calculate the egg production index (EPI), nutrient index (NI), and percent control. Matrine, *M. anisopliae* conidia, or their association were effective against *R. microplus* engorged females. The EPI was reduced in all treatment groups, with exception of females treated with the lowest concentration of matrine (3.25 mg mL<sup>-1</sup>) not associated to *M. anisopliae*. The lowest concentration of matrine tested, associated or not to *M. anisopliae*, did not change the NI of treated engorged females; however, the intermediary and the highest doses of matrine significantly reduced the NI. All concentrations of matrine, associated or not to *M. anisopliae*, caused high percent control of ticks (82.26% to 86.03%), with exception of the lowest concentration of matrine which caused 55.68% control of ticks. In conclusion, the alkaloid matrine (at 6.25 and 12.5 mg mL<sup>-1</sup>), in association to *M. anisopliae* conidia or not, reduced biological parameters of *R. microplus* engorged females; a synergistic effect, however, was not demonstrated. The results indicate the alkaloid matrine and the fungus *M. anisopliae* may be considered for integrated tick management.

Keywords: Biological control; Entomopathogenic fungi; Ticks  
Financial support: CAPES, CNPq.