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ESTUDOS BIOLÓGICOS E COMPORTAMENTAIS DE *MIGDOLUS FRYANUS* (WESTWOOD, 1863) (COLEOPTERA: VESPERIDAE) E SUA INTERAÇÃO COM NEMATÓIDES ENTOMOPATOGÊNICOS E OUTROS AGENTES DE MORTALIDADE

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During de present study biological and morphological data of *Migdolus fryanus* (Westwood, 1863) (Coleoptera: Vesperidae) were obtained. Males and females after mating were collected in sugar cane field and brought to the laboratory for morphological and biological investigations. Females were individualized in plastic containers (20 L). The dimensions were calculated utilizing an ocular micrometer of 0,05 mm precision. Males were maintained in glass cylinders (12 cm height X 12 cm Ø), covered with Petri dishes (15 cm Ø) the longevity data for obtained. An artificial and modified diet was studied adding 50 g of triturated fresh sugar cane. For the morphological observations the insects were collected in sugar cane fields, pastures and abandoned coffee crops, and the material was examined by means of an optical microscope. The measurements were taken with a 1 mm precision paquimeter. The females deposited from 19 to 38 eggs, with an average of 29.4 ± 5.5. The egg viability ranged from 65 and 98% with an average of 84.9 ± 11.6 and the egg period from 17 to 25 days, with an average of 20.6 ± 0.9 Egg length varied from 3 to 5 mm. The female longevity lasted from 28 to 38 days, with an average of 32.5 ± 3.5 and the male from 3 to 9 days, with an average of 5.8 ± 1.9. The hatching larvae measured from 4 to 5 mm. The larvae were maintained for 2 years, undergoing 6 or 7 moults without reaching the pupal stage. The adults showed significant variation in color and dimensions, but only the species *M. fryanus* was detected. *M. fryanus* normally causes high damages in sugar cane fields. The reproductive behavior should be considered important as a strategic point to reach control methods. The flight behavior during mating was studied in 4 municipalities of São Paulo state, in sugar cane fields, (Olímpia, Catanduva, Promissão and Teodoro Sampaio), from October 2001 to March 2003. The fluctuation of larvae populations was studied in Catanduva/SP between March 2002 and February 2004. On September 2003, the larval infection among sugar cane roots was compared in the municipalities of Olimpia, Catanduva and Teodoro Sampaio. The reproductive flight involves a high adult male density and occurred after raining, between October and March. Such flights lasted up to seven days. The female comes out from soil in the morning from 8:00 to 10:00 am, for mating. Normally and influenced by the female sex feromone, the male could be seen in the spots before the female emergence. The mating lasted from 5 to 30 seconds. Immediately after mating, the female returned to the soil to start oviposition. Larvae were more frequent between June and September (dry season). The highest larval infestation was observed in Teodoro Sampaio; while the lowest one occurred in Catanduva. Native entomopathogenic nematodes, *Steinernema glaseri* (Steiner, 1929) (Rhabditida: Steinernematidae) e *Heterorhabditis indica* Poinar, Karunakai & David, 1992 (Rhabditida: Heterorhabtidae) (IBCB-n5) were evaluated against eggs and larvae of *M. fryanus* under laboratory conditions. In a first experiment, eggs of the insect were exposed to suspensions of Infective Juveniles (IJs) of *H. indica* in 2 concentrations, 60 and 600 IJs/egg. Three treatments, each one with 3 replications containing 5 eggs, were used. The nematode did not differed significatively from the control, but it penetrated the eggs and reduced the viability. In the

second experiment, *S. glaseri* and *H. indica* (600 IJs/larva) were evaluated against the newly hatching larvae of *M. fryanus*. Four replications per treatment, each one with 5 larvae were used. Both nematodes caused significantly higher mortality. *S. glaseri* caused 100 % of mortality and *H. indica* 80 %. There was no significative difference between the nematodes. In the last experiment, were evaluated *S. glaseri* and *H. indica* in 2 concentrations (400 and 800 IJs/larva) against the last larval stage of *M. fryanus*. Seven replications, each one with 3 larvae per treatment were used. There was no significative difference between the concentrations for both nematodes. However, *H. indica* showed more efficiency for it caused significative difference in larvae mortality in two concentrations (76.43 and 71.57 % respectively). *H. indica*. and *S. glaseri* were pathogenic to egg and larvae of *M. fryanus*. These nematodes seem to have high potential for the control of *M. fryanus* in sugar cane crop, in Sao Paulo State of Brazil. In the field studies the efficiency of three control agents (two biological and one chemical) was investigated in two different situations, against some sugar cane soil insects. While the first situation involves a planted sugar cane field, less than a year old, the second one was set in a 4 years old sugar cane. The entomopathogenic fungus *Metarhizium anisopliae* (Metsch) Sorok (Deuteromycotina, Hyphomycetes, Moniliaceae) (IBCB-348) and the nematode *H. indica* were the biological agents; while fipronil (Regent 800 WG) was the chemical insecticide. Two concentration of *H. indica* were utilized: 5×10^8 and 5×10^9 IJs/ha. The chemical product was applied in a concentration of 300 g/ha, while *M. anisopliae* in a concentration of 30 kg/ha. For the first situation, each treatment was divided in 5 replications with 7 rows each. Each line was 5 m in length and the spacing between rows was 1.4 m. The products were applied by using a costal spraying machine, and the treatments were evaluated 40 and 360 days after application. Two square spots per replication were examined and the insects were counted. The dimensions for each spot were 50 cm x 50 cm x 40 cm depth. The productivity for each treatment was calculated through data obtained during August 2004 and September 2005. For the second situation, the applications were done by using a tractor system, with the same dosages mentioned above, diluted in 1.200 liters per ha. In the case of *H. indica*, only the concentration of 5×10^8 JIs/ha was utilized. Each replication was composed of 6 rows, 10 meter long. Spacing between rows was the same mentioned above. The control agents were applied in the soil at a depth which varied from 10 to 15 cm, on both sides of the same row. The efficiency of each treatment was evaluated 20 days after application. As to the young culture (the 1st situation), *M. anisopliae*, as well as the higher concentration of nematode treatment, resulted in 14.25 % of more productivity. The lower nematode concentration increased the productivity in 17.6 %. While chemical insecticide increased only 5.9% of it. For the older field (the 2nd situation), the nematode as well as chemical insecticide suppressed the soil fauna more successfully than the control.