



## Influence of cropping systems on epigeal coleopteran predators

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### Introduction

Generalist Coleopteran predators are major regulators of pest populations. Therefore, studies about the influence of cropping systems on the structure of the community of these predators are important to enhance their preservation in a landscape and conserve their local natural biological control service. In this study, we evaluated the effect of different monocultures and an integrated cropping system (with soybean, livestock and eucalyptus) on the community of epigeal coleopteran predators.

### Material and methods

The study was conducted during the 2014/2015 cropping season in an experimental field located in Sinop-MT, Brazil, (11°51'43''S, 55°35'27''W and 384 m altitude). The cropping systems evaluated were: 1) soybean monoculture, 2) integrated crop-forestry system (soybean cultivated between rows of eucalyptus), 3) eucalyptus monoculture, and 4) palisade grass monoculture (pasture). Eucalyptus in the crop-forestry system was planted in three strips, each containing three rows of eucalyptus. Strips were spaced 30 m apart. The experiment was a randomized complete block design with four replications and plot size was 1 ha for the soybean and eucalyptus monocultures and 2 ha for the others. Insects were collected from 5 pitfall traps per plot in a single transect crossing the eucalyptus strips. The traps were 5 m apart in each transect and kept in field for 24 hours. The samples were taken every 30 days in the dry season (September-October) and every 15 days during the rainy season (November-February). We used canonical variables to investigate the differences of the total of coleopteran predators collected between the cropping systems.

### Results and conclusions

A total of 121 coleopteran predators belonging to five families (Carabidae, Elateridae, Coccinellidae, Staphylinidae and Anthicidae) and 27 morphospecies were collected. Activity-density of total coleopteran predators differed among the cropping systems ( $F=2.33$ ,  $p=0.04$  Wilk's Lambda), with the highest activity-density/cropping system in the soybean monoculture (56) and the lowest in the pasture monoculture (8). The Anthicidae family differed among the cropping systems ( $F=8.14$ ,  $p=0.01$ ) with the highest activity-density in soybean monoculture (10). The Carabidae family had the highest activity-density of all of the families (65% of the collected insects) and also had the highest richness (15 morphospecies); however, there were no differences in carabid activity-density among the cropping systems ( $F=2.52$ ,  $p=0.11$ ) as well as no differences among the cropping systems in the activity-density of Coccinellidae, Elateridae or Staphylinidae ( $F=0.57$ ,  $p=0.65$ ;  $F=1.61$ ,  $p=0.24$ ;  $F=1.87$ ,  $p=0.19$ ), respectively. Thus, soybean monoculture provided the best environment to coleopteran predators probably due to the amount of herbivores in this culture. However, soybean integrated with forestry had less number of predators than monoculture probably due to the eucalyptus strips where the traps collected a less number of predators.

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