

the primary forest. Exclusion experiments were carried to investigate the effects of different dung beetle functional groups on ecosystem functioning. These experiments suggest that the most important group in maintaining the ecosystem function of dung removal in these forests is the large tunnellers. The implication of these results for the management of Sabah's protected and production forests will be further explored.

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## ATTRACTIVITY OF DIFFERENT DUNG PAD SOURCES TO DUNG BEETLES (COLEOPTERA, SCARABAEIDAE)

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Large extensions of cerrado biome are used as pastures to raise cattle, and on their droppings several insects develop, including the horn fly, *Haematobia irritans*, a cattle parasite. coprophagous Scarabaeidae are important agents on the removal of dung pads, and by doing so and burying them, they enhance the physical and chemical properties of the soil, as well as they act as biological control agents of cattle parasitic flies. Dung beetles are divided into three types, according to their nesting behavior: telecoprid beetles, which form a ball of dung and roll it away from the dung pad and bury it, paracoprid beetles, which construct their nest and bury dung under the dung pad, and endocoprid beetles, which nest directly in the dung pad. The objective of this research was to compare the attractiveness of fresh dung pads of horse (*Equus caballus*), pig (*Sus scrofa*), cattle (*Bos indicus*) and collared peccary (*Tayassu tajacu*) to dung beetles, in both a pasture area and a fragment of Atlantic forest, in UNESP Farm, located in Selvíria, state of Mato Grosso do Sul, Brazil. Pitfall traps baited with the different dung pads were used in weekly trappings from April 2003 until May 2004. A total of nearly 90.000 specimens were trapped, in 87 dung beetle species. Abundance was highest during the rainy season for the majority of the species, except for *Onthophagus* near *hirculus* and *Eurysternus* near *hirtellus*, more abundant in the dry season. The most attractive source was pig dung, for both sites, the exceptions being *Ataenius crenulatus* and *A. aequalis*, more trapped in dung of cattle-baited traps, and *Aphodius lividus*, more abundant in dung of horse-baited traps in the pasture. The majority of the telecoprid species included in the analyses (*Canthon* sp. 1, *C. septemmaculatus histrio*, *Eurysternus* near *hirtellus* and *Deltochilum* sp.) were more abundant in the woods, while endocoprid (*Pedariidum bidens*, *Trichillum externepunctatum*, *Ataenius crenulatus* and *Aphodius lividus*) and paracoprid species (*Ontherus appendiculatus*, *Digitonthophagus gazella*, *Dichotomus nesus* and *Onthophagus* near *hirculus*) were so in the pasture. During the rainy season, diversity was highest in the woods, while during dry season this was in the pasture. Despite traps baited with pig dung caught the largest amount of dung beetles, diversity was highest in traps baited with cattle dung, in both areas. Results clearly indicate the composition and abundance of dung beetles in pasture was different than in the woods, and there is a seasonal effect on it. The dung of cattle appears to be the most indicated in faunistic surveys of dung beetles.

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## ESSENCE OF ECUADOR – A SEARCH FOR AN ANSWER TO THE *Macroductylus* PROBLEM

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A 20- to 25-minute DVD presentation. This film shows the ravages of these scarab beetles to corn, beans, blackberries, fava and many other crops in Ecuador. The film focuses on various facets of the beetle's biology, including rearing procedures, survey methods use of feeding attractants to catch large numbers of adults, and the use of fungi to control *Macroductylus*. In these studies we used attractants developed at Ohio State University for the trapping of *Macroductylus subspinosus* in Ohio and other midwestern and northeastern states in the USA and in Canada. The studies were conducted by students at Central University and Catholic University of Quito, Ecuador.