Chapter 5

Dung beetles of the Upper Palumeu River Watershed (Grensgebergte and Kasikasima) of Southeastern Suriname (Coleoptera: Scarabaeidae: Scarabaeinae)

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SUMMARY

Dung beetles are among the most cost-effective of all animal taxa for assessing biodiversity patterns, yet RAP's recent surveys are among the few that are expanding our knowledge of Suriname's little known dung beetle fauna. In addition to cost-effective sampling using standardized pitfall traps, dung beetles depend upon large mammals for food and consequently can be used to rapidly assess the health of the overall mammal community and hunting impacts in a fraction of the time it would take to survey the mammals themselves. I sampled dung beetles using baited pitfall traps and flight intercept traps in the Grensgebergte and Kasikasima regions of Southeastern Suriname. I collected 4,483 individuals represented by 107 species. This ranks among the most diverse places on the planet for dung beetles, and exceeds the extraordinarily high species richness observed in nearby southwestern Suriname (94 species, Larsen 2011). Ten species are most likely new to science, while an additional 10-20 species may be undescribed pending further taxonomic revisions.

Dung beetle species richness, abundance and biomass were higher around Upper Palumeu than at Kasikasima, probably due to the extensive intact forest and lack of hunting pressure in this remote headwater region where no one currently lives. Dung beetle diversity and abundance at Kasikasima were still relatively high, indicating only mild to moderate hunting of large mammals and birds in the region. All sites, including the Grensgebergte Mountains, supported high endemism, including several rare species, demonstrating the exceptional biodiversity value of the region. Surprisingly, dung beetle species composition varied strongly among sites within this survey, as well as among sites sampled on previous surveys, including nearby southwestern Suriname. This high Beta diversity shows that the forests of Suriname and the Guiana Shield are not nearly as homogenous as is often assumed, and consequently protecting this varied biodiversity requires conserving many different forest areas.

The high abundance of several large-bodied dung beetle species in the region is indicative of the intact wilderness that remains. These species support healthy ecosystems through seed dispersal, parasite regulation and other processes. Maintaining continuous primary forest and regulating hunting (such as through hunting-restricted reserves) in the region will be essential for conserving dung beetle communities and the ecological processes they sustain. These results indicate that the intact headwater region of the Upper Palumeu watershed merits the highest conservation priority.

INTRODUCTION

Dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) are an ecologically important group of insects. By burying dung as a food and nesting resource, dung beetles contribute to several ecological processes and ecosystem services that include: reduction of parasite infections of mammals, including people; secondary dispersal of seeds and increased plant recruitment; recycling of nutrients into the soil; and decomposition of dung as well as carrion, fruit and fungus (Nichols et al. 2008). Dung beetles are among the most cost-effective of all animal taxa for assessing and monitoring biodiversity (Gardner et al. 2008a), and consequently are frequently used as a model group for understanding general biodiversity trends (Spector 2006). Dung beetles show high habitat specificity and respond rapidly to environmental change. Since dung beetles primarily depend on dung from large mammals, they are excellent indicators of mammal biomass and hunting intensity. Dung beetle community structure and abundance can be rapidly measured using standardized transects of baited traps, facilitating quantitative comparisons among sites and studies (Larsen and Forsyth 2005).

METHODS

I sampled dung beetles at both primary camp sites (Upper Palumeu (Juuru camp) and Kasikasima), as well as on top of the Grensgebergte mountains, using standardized pitfall trap transects (see Executive Summary for site details). Ten traps baited with human dung were placed 150 m apart along a linear transect at each site (see Larsen and Forsyth 2005 for