

Insect Diversity During Different Stages of Asiatic Elephant Dung Deterioration in Eastern Thailand

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ABSTRACT

A determination was conducted in eastern Thailand of the family composition of dung-utilizing insects in relation to various elephant dung pad stages: A (dung intact with odor and moisture), B (dung intact, no odor, no moisture), C₁ (less than 50% degraded), C₂ (50% or more degraded) and stage D (flat mass). A total of 4,857 individuals representing 30 families of insects utilized the sampled elephant dung; these included beetles from three prominent families: Ptiliidae, Staphylinidae and Scarabaeidae. Scarab beetles could be found throughout all stages of dung disintegration. The Shannon-Wiener index (H') for all insects in all elephant dung piles was considered relatively high. In addition, H' obtained by calculating the pooled data set of this study was 2.09, with high evenness ($E = 0.615$), and dominance by the Simpson index was high for all dung-utilizing insects ($D = 0.723$). Stage B showed the highest family diversity index ($H' = 2.274$), whereas stage C₁ had the lowest levels of diversity ($H' = 1.401$). Significant differences in the family diversity indices of five Asian elephant dung stages were detected ($P < 0.05$) in all comparisons. The results show that such biodiversity parameters as the richness, diversity and composition of these insect communities differ during the various stages of elephant dung decay. The relevance of these findings to the interpretation of what constitutes a dung stage preference is discussed.

Keywords: dung-utilizing insects, insect decomposer, diversity, asian elephant

INTRODUCTION

Insects are the earth's most varied organisms (Daly *et al.*, 1998). Almost three-quarters of all described animal species are insects (Borror *et al.*, 1989; Gullan and Cranstan, 1994; Daly *et al.*, 1998). Their numbers far exceed all other terrestrial animal species, and are found in almost every terrestrial habitat on the Earth's surface, having diversified to fill almost every environmental niche imaginable (Putman, 1983;

Gullan and Cranstan, 1994), which makes them one of the most crucial components of most terrestrial ecosystems. Considered to be the dominant detritivores in terrestrial systems (Matherson, 1960), they play an important role in the recycling of nitrogen and other nutrients, herbivory, pollination and seed dispersal (Triplehorn and Johnson, 2005; Nichols *et al.*, 2008).

Dung provides a temporary, changing habitat which can support a large community of organisms and an arthropod community

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