



<b>WRL reference</b>	M04 D03
<b>Module</b>	M04 Ecosystems – Tropical Rainforests
<b>Data set</b>	D03 The effect of altitude on dung beetle community structure

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## **Background to the research:**

Dung beetles are important to the conservation of tropical rainforests by their provision of 'ecosystem services' and as biological indicators. Dung beetles provide these 'services to the ecosystem' as they relocate dung for feeding and nest building. These 'services' include enhancing forest growth and regeneration through soil fertilisation and aeration, nutrient recycling, seed dispersal, pollination, reduction in seed predation and the biological control of the eggs and larvae of mammalian parasites. The key role dung beetles play in maintaining tropical forest ecosystems is being increasingly recognized as recent studies begin to relate changes in burial rates to the loss of biodiversity in tropical rainforests. As forests degrade they also threaten the survival of dung beetles and the important role they play within rainforest habitats.

Dung beetles can be a good alternative taxon to use as Biological Indicators and the sensitivity of dung beetle communities to habitat structure, vegetation cover and soil type makes them good indicators of disturbance and loss of biodiversity. The usefulness of dung beetles as a biological indicators will depend on a good understanding of the group but it is also important to determine the factors that shape the dung beetle 'community' before attempting to predict how the community will respond to disturbance.

Understanding the responses of organisms to geographical gradients is another important component of conservation planning as it enables scientists to predict how organisms will cope in a changing environment. The effects of global climate change are often first observed by the changes in distribution of organisms related to gradients such as latitude and more often elevation (altitude). Many studies examine the responses of insect communities to altitude and in dung beetles these suggest that high interspecific competition leads to complex patterns of species abundance and range exclusion within communities along elevational transects. Studies also show that altitude affects species richness and diversity although fewer studies have concentrated on variation within species along their elevational range.

Dung beetle research in Cusuco National Park, Honduras, provides us with a rich dataset with which we can use to address some of the research questions discussed in this WRL data set. Community data is provided on dung beetles from 123 sites throughout the park, with further environmental and habitat data collected by satellite or in person for every one of these sites. This has resulted in a large and complex dataset and as is so often the case in real-world ecology, it will require careful and enthusiastic analysis.

