

Project Title

The metabolic costs of insect herbivory

Supervisor

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Themes

Biomechanics and Mechanobiology

Project Description

Leafcutter ants are the principal insect pests in the Neotropics, harvesting up to 4500 m² of plant matter per year. Using their sharp mandibles, they cut a variety of food sources such as leaves, fruit and flower petals. Herbivory at such a large scale requires a large amount of cutting, which in turn uses a lot of energy. The energetic cost of such an endeavour can vary based on both the size of the ant and the toughness of the plant.

Here we will look at how material properties influence the amount of energy needed to cut by ants of one size. Our goal is to gain a deeper understanding of how energetic costs scale with material properties.

In this project, you will investigate this question with a multi-disciplinary experimental approach. An artificial leaf system of repeatable and controllable material properties will be made out of polymers. Using an ultra-sensitive flow-through respirometry system, we will measure both resting metabolic rates, and active metabolic rates during cutting synthetic leaves.

For more information on the group visit: <http://evo-biomech.ic.ac.uk/>