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PhD project: Biomechanics of wear in insect mouthparts

The Evolutionary Biomechanics Laboratory invites applications for a funded research studentship leading to the award of a PhD degree. We are seeking an enthusiastic, kind, open, and curious candidate with a degree in materials or natural sciences, biomechanics, mechanical engineering, physics or related fields.

London, November
2020

The aim of the project is to study the mechanisms and consequences of wear in insect mouthparts specialised for feeding. Pest species such as coffee wood stem borers, mosquitoes or leaf-cutter ants use their mouthparts repeatedly to scrape, pierce or cut material. Minimising the associated forces requires mouthparts to be sharp, which in return renders them prone to wear. How do insects minimise wear of their cutting tools, what are the consequences of wear on the feeding performance and behaviour of pest species, and how can plants maximise wear to potentially deter herbivores? We will address these questions with a multi-scale approach, ranging from nanoscale mechanical and structural characterisation of the cutting tools, to biomechanical and physiological experiments with live animals. The project hence crosses both disciplines and scales, and will involve experimental as well as theoretical approaches. All work will be conducted in our collaborative multi-disciplinary group at Imperial, and is embedded in a larger project – involving 4 PhD students and 2 PostDocs – on the biomechanics of plant eating in insects. More information about who we are and the work that we do can be found on the group's website; for further details on the project, contact David via email.

Interested applicants should send an up-to-date CV to David via email. Applications are invited until the position is filled, and successful applicants can start as of now!