PROJECT TITLE: Seeing the forests from the top: the role of canopy for sustaining tropical forest biodiversity

Project Science Theme: Evolution and Biodiversity
Project keywords: Tropical forests, Canopy, Insects, Microclimate

Lead Institution: University Bristol
Lead Supervisor: Dr Filipe Machado França, Bristol, School of Biological Sciences
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Co-Supervisor: Dr Fernanda de Vasconcellos Barros, University of Exeter, Geography
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Project description:

Tropical forests hold 50% of Earth's species and half of them are expected to live in the canopy of those forests. Tropical forest canopies are the new ecological frontier, with very little known about their microclimate, insect biodiversity patterns, and contribution to microhabitat formation. These knowledge gaps limit our understanding of microclimate-biodiversity relationships, as well as of the consequences from anthropogenic activities in tropical forests, and have key consequences for conservation decision-making and policy. This project asks: who is in the canopy, what drives canopy insect communities, and how resilient is forest canopy biodiversity to disturbance in tropical forests? To advance our knowledge of the unknown biodiversity and microclimate-biodiversity relationships of tropical forest canopies, the doctoral researcher (DR) will combine forest inventory data, microclimate-monitoring sensors, 3D forest models, insect surveys, and remote sensing to quantify vertical and spatial changes in biodiversity and microclimate in undisturbed and human-modified Amazonian forests with large canopy ('giant') trees. The DR will co-develop the project with the supervisory team, having the opportunity to define specific research questions, the amount of fieldwork they may carry out, and the balance of fieldwork and remote-sensing/desk-based analysis, giving real ownership over research direction and accommodating different capacities. Training is embedded in the supervisory team's complementary expertise: tropical forest biodiversity and conservation (Bristol), plant hydraulics, environmental sensors and ecophysiology (Cardiff/Exeter), global change ecology (Cambridge), alongside remote-sensing, sensor-network, statistics, and scientific-writing skills mentored throughout. The DR will join a pan-tropical network researching tropical forest biodiversity in the Amazon, Ghana and Borneo, opening further opportunities for collaboration and training in tree climbing, insect and tree survey and monitoring in tropical forests.

Useful recruitment links:

For information relating to the research project please contact the lead Supervisor via: filipe.machadofranca@bristol.ac.uk

Bristol NERC GW4+ DTP Prospectus:
https://www.bristol.ac.uk/study/postgraduate/research/great-western-four-doctoral-training-partnership-nerc/

How to apply to the University of Bristol:
http://www.bristol.ac.uk/study/postgraduate/apply/

The application deadline is Thursday 7 January 2027 at 2359 GMT