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GONDWANA SURVIVORS

SCIENTISTS TRACK EVOLUTION ACROSS SIX CONTINENTS

A group of scientists from Australia and France are undertaking 'extreme science' in the canopies of tropical Australian forests – as part of a mission to map the evolution of insects that were once part of the supercontinent Gondwana.

Scientists tree-climbing in WA - photo by Philippe Psaila

Researchers from the South Australian Museum, France's National Museum of Natural History and collaborators from other institutions are studying several groups of insects following the fragmentation of the immense continent which once consisted of South America, Africa, India, Australia, New Zealand and Antarctica – as part of a project run by Cafotrop.

The study of these insects in relation to geological and paleoenvironmental events (about 140 million years ago), allows us to understand the evolutionary relationships among species. The scientists have already collected insects during other expeditions in South America, South Africa, New Zealand, New Caledonia, and Madagascar.

South Australian Museum entomologist Dr Mark Stevens, who specialises in Collembola and Apoidea, is on the trip collecting insects until 4 December. He says a variety of collection points, from the soil to the canopies, have been marked in a triangle between Perth, Albany, and the extreme southwest of Australia.

A specimen of the Hylaeus native bee - photo by Cyrille D'Haese

"The south west of Australia is considered as one of the few Mediterranean biodiversity hotspots, because of its important endemism, biodiversity and fragile habitats," he says.

"We identified and chose these sites based on their biological wealth. They include relictual forests (parts of old-growth *Eucalyptus* forests) and open bushland areas."

Scientists are collecting in national parks, including

MEDIA RELEASE

Porongurup National Park, Bramley National Park (Margaret River), Shannon National Park, D'Entrecasteaux National Park, and Midgegoroo National Park.

Dr Stevens says the expedition includes extreme tree-climbing – a method developed by previous Cafotrop field trips in conjunction with the National Museum of Natural History in Paris.

"A working platform of about 28m^2 was installed in the D'Entrecasteaux National Park for five days to work in the canopy. The specimens will be studied at the National Museum of Natural History in Paris and the South Australian Museum in Adelaide. The team have already identified one new genus of Empididae along with 10 new species, one new species of Tingidae, and several new Collembola species including a new species in the subfamily Neanurinae. We've got many more samples across all the insect groups yet to sort that will likely reveal many new species, along with key lineages vital for comparisons across the southern continents."

The Cafotrop team has attracted international attention from both scientists and media networks.

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South Australian Museum Entomologist Dr Mark Stevens onsite in WA

Meet the research team
The team consists of eight people (five scientific researchers, a student, two climbers and photographer).

- Christophe Daugeron, entomologist specialist of Diptera Empididae (Origin, Structure and Evolution of Biodiversity, National Museum of Natural History / CNRS)
- Cyrille D'Haese, entomologist, specialist of Collembola (Origin, Structure and Evolution of Biodiversity, National Museum of Natural History / CNRS)
- Eric Guilbert, entomologist, specialist Arthropods (Origin, Structure and Evolution of Biodiversity, National Museum of Natural History / CNRS)
- Olivier Montreuil, entomologist, specialist of Scarabaeidae (Origin, Structure and Evolution of Biodiversity, National Museum of Natural History / CNRS)
- Mark Stevens, entomologist, specialist of Collembola and Apoidea (SA Museum, Adelaide)

MEDIA RELEASE

- Rebeca Dew, PhD student in entomology, specialist of Apoidea (SA Museum, Adelaide)
- Lionel Picart, climber Hevea – tree climber
- Philippe Psaila, photojournalist, videographer

Other scientists involved in the project by studying the collected material:

- Stéphane Boucher, entomologist, specialist of Melolonthidae and Rutelidae (correspondant of the National Museum, Paris)
- Thierry Bourgoin, entomologist, specialist planthoppers (Origin , Structure and Evolution of Biodiversity, National Museum of Natural History / CNRS)
- Adeline Soulier -Perkins, entomologist of Cercopidae (Origin , Structure and Evolution of Biodiversity, National Museum of Natural History / CNRS)
- Melinda L. Moir, entomologist, specialist planthoppers and Tingidae (Univ. Melbourne)
- Michael Schwarz, entomologist, specialist Apoidea (Flinders Univ. Adelaide)

What is **Cafotrop?**
Cafotrop is a non-profit scientific organization. It addresses some of the major challenges of sustainable development such as the loss of biodiversity, climate change, depletion of natural resources, deforestation and forest destruction across the globe, but focuses on tropical rainforests Cafotrop activities are in line with the issues and research strategies defined by the scientific partner institutions (MNHN and CNRS).

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Neanuridae collembolla - Photo by Cyrill Haese