Lengguru 2014 scientific expedition returns – an initial overview

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Credit: IRD/Jean-Marc Porte/Lengguru 2014 : Amphibian specimens registered and filed by researchers

Having left on 17th October to produce a biodiversity inventory of the Lengguru karsts in West Papua, the scientists are back after more than a month of exploration both on land and at sea. Conducted by the French Institut de recherche pour le développement (IRD), the Indonesian Institute of Sciences (LIPI), and the Sorong Fisheries Academy

(APSOR), this expedition involved more than 70 European and Indonesian researchers. Lengguru 2014, the largest scientific expedition ever undertaken in Indonesia, enabled the study of several original karst environments and the collection of hundreds of animal and plant species, testifying to a clear indication of the area's rich biodiversity.

The aim of the Lengguru 2014 expedition, a tremendous scientific and human venture, was to produce a biodiversity inventory of the Papuan karsts, so as to better understand the genealogy of local species. For six weeks, researchers explored three regions in the Lengguru mountains – Lobo (Triton Bay), Urisa (Sewiki Lake area) and Nusa Ulan (Kumawa mountains) – and inventoried three types of environment – marine, land and underground. Being cross-disciplinary, the expedition included ichthyologists, botanists, ornithologists, herpetologists, entomologists, marine biologists, hydrologists, and so on. Hundreds of specimens were collected, from 100 metres below sea level to a height of 1,400 metres. They reveal the outstanding biodiversity of the local ecosystems.

An extremely rich fauna and flora

The scientists explored some very different terrains and underground environments: fragmented rivers, flooded sinkholes, isolated lakes, mountain forests (at altitudes above 1,000 metres), caves, etc. Hundreds of species were collected, including many bird species (over 50), insects (between 100 and 150 species of cricket), reptiles (47), amphibians (35), bats (20), rodents, palm trees and orchids (some 300 species).

The scientists also studied various key groups in the marine environment: hard corals, gorgonians, echinoderms (sea cucumbers, sea urchins, star fish, etc.), molluscs, phanerogams (flowering plants), sea slugs, fish (seahorses, pipefish, etc.), selachians (sharks, etc.), cetaceans (dolphins, etc.).

Credit: IRD / Régis Hocdé; Lengguru, Nusa Ulan

Used for the first time during a French scientific expedition, closed-circuit rebreather diving equipment made it possible for researchers to explore environments at great depths (up to 100 metres below sea level).

All these preliminary observations confirm that the karsts of the Lengguru mountains are a hotspot for world biodiversity, made up of unique ecosystems. Genetic analyses (molecular barcoding) and conventional taxonomy, to be carried out in Indonesia from January 2015, will make it possible to confirm the discovery of at least 50 new animal and plant species. Biologists will also compare the Lengguru species with those identified in surrounding areas (on the island of New

Guinea) to understand the processes by which they evolve and adapt to their environments.

This expedition is part of a long-term research programme begun in 2010. Teams of scientists are planning to continue to explore the Lengguru mountains, through in-depth special purpose expeditions (ornithology, archaeology, oceanology, etc.) in 2016.

A balanced and sustainable partnership with Papua

Examination and taking of samples of mites on the feathers of bird, near the Sewiki lake. Credit: IRD/Jean-Marc Porte/Lengguru 2014

Lengguru 2014 is based on a sustainable partnership with Indonesia, set within the framework of the Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS)

protocol, as agreed at the 2010 Nagoya Conference on Biological Diversity. Mixed European and Indonesian teams were consequently involved in the fieldwork. In addition, the teams will test the majority of biological samples at the Cibinong LIPI zoological and botanical laboratories near Jakarta, Indonesia. The only genetic material that will be required to leave the country will be for analyses that cannot be carried out locally, in the form of extracted DNA or specimens, which will subsequently be returned. Lastly, the expedition has strengthened relationships with Indonesian and Papuan researchers and students, boding well for future joint ventures with European teams.

An educational and development support tool

This expedition was an opportunity to raise public awareness, with a focus on the younger generation, as to the role of research in understanding and preserving biodiversity. Various educational events have been held in France (in the Montpellier region), Indonesia and Papua over the last year. In September, primary and secondary school pupils and students met researchers before their departure, talked with them during the expedition via a satellite connection, and followed the expedition's progress on its dedicated website.

Finally, the expedition, in conjunction with the Indonesian Air Kita Foundation, produced a feasibility study on the main water extraction spots and possible water supply options for the village of Urisa.

Provided by Institut de Recherche pour le Développement