Mystery of high diversity of ants in tropical forest canopies revealed: Migrant workers are more common than the locals.

Ants are one of the most ecologically important organisms in the world and they are especially diverse and abundant in tropical forests. Researchers from the Czech Republic (Biology Centre CAS and University of South Bohemia) and Papua New Guinea (NGBRC) published unique research on ants living in tropical rainforest canopies in February in PloS One[1]. The study represents the first complete census of these insects from whole patches of rainforest. To succeed in this demanding task, the authors worked in close collaboration with the local villagers of Wanang, who are the owners of the forests[2]. As part of their traditional shifting agriculture, villagers felled trees to create small food gardens, and researchers used the opportunity to intensively search the trees from top to bottom for insects, without contributing to further deforestation[3].

Within an area the size of a soccer pitch (0.6 ha), 126 kinds of ant were discovered in trees alone[1], which is more ant species than are found in the whole of the Czech Republic or the UK. More than 1300 ant nests were found and over 22,000 individual ants, but most of the ants collected were foragers visiting from neighbouring trees[1]. Surprisingly, the ants actually nesting in a tree made up a smaller part of the fauna than migrant workers. These findings explain why biologists often observe a few super-abundant species but a lot of rare species in a tropical tree. The diversity of ants in trees is not random, but depends on who is nesting nearby and how far they travel to find food. The study also stresses the significant role of primary forests for conserving biodiversity. While primary forest communities of ants were diverse and almost completely free of invasive ant species, the disturbed forest hosted half the number of species and over 50% of foragers were invasive ant pests. Primary forest seems to be thus more resistant against these non-native species.

The native Carpenter ants (*Camponotus* spp.), who build nests inside wood, where they block the entrances with their plug-shaped heads, were the most diverse group in the study. From the 19 species of Carpenter ants, 13 have never been seen before in New Guinea and 4 are new to science[4]. One of them, *Camponotus wanangus* was named in dedication to the villagers, who chose to protect their forest rather than selling it to loggers. The activities of researchers in the area helped them to successfully establish Wanang Conservation Area, 10,770 ha of rainforest home to many species of ants, beetles, butterflies, and other insects, as well as many mammals and birds, which are now protected from logging and hunting[2,5]. The area also has attracted the research on global changes of forests as the first plot of the Center for Tropical Forest Science in the Pacific and Australia region was built there[5]. Discovering so much in such a small area demonstrates how little we know about canopy insects in tropical forests, and the continued monitoring and protection of those forests will reveal and safeguard much of this hidden diversity.

Sources:

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2. **Novotny, V. (2010)** Rainforest conservation in a tribal world: why forest dwellers prefer loggers to conservationists. ***Biotropica*** 42(5): 546–549. Pdf at: https://www.entu.cas.cz/png/NovotnyBIOTROPICA2010.pdf
3. **New Guinea Binatang Research Center (2015a)**: Plant-herbivore food webs in primary and secondary rainforests https://www.entu.cas.cz/png/food-web-studies_1.php
4. **Klimes P, McArthur A (2014)** Diversity and ecology of arboricolous ant communities of *Camponotus* (Hymenoptera: Formicidae) in a New Guinea rainforest with descriptions of four new species. ***Myrmecological News*** 20: 141-158. Pdf available at: https://antscience.files.wordpress.com/2014/11/klimes-mcarthur-2014-myrm-news.pdf
5. **New Guinea Binatang Research Center (2015b)**: Wanang Conservation Area. http://www.entu.cas.cz/png/wanang/conservation-management

Camponotus wanangus, a new ant species found in the tops of New Guinean trees and dedicated to Wanang Conservation Area and Wanang people (**Klimes and McArthur 2014, Myrm. News 20: 141-158).**

Does money grow on trees? Conservation royalty payment of 10,000 Kina (U.S.$3680), in 10 Kina (U.S.$3.80) bills displayed in traditional fashion on bamboo stalks. The payment was made to ten clans from Wanang village (Papua New Guinea) for conserving over 10,000 ha of primary forest, while their neighbors opted for logging **(Novotny V. 2010, Biotropica 42(5): 546–549).**