

New 'ghost' scorpion among several species recorded for the first time in Malaysian rainforest

by Shreya Dasgupta on 4 January 2018



- *For the first time ever, scientists have surveyed the rainforest of Penang Hill comprehensively. The 130-million-year old forest is believed to have never been cut before and has remained largely unexplored.*
- *Among the exciting discoveries is a potentially new species of "ghost" scorpion, and numerous first records for Penang Hill.*
- *With a more complete understanding of the forests of Penang Hill, the scientists hope to nominate Penang's forest as a UNESCO biosphere reserve.*

In a first-of-its-kind expedition, a team of more than 100 scientists and students have surveyed the largely unexplored Penang Hill in the Malaysian state of Penang. The landscape of rolling hills is covered by a

large expanse of old-growth tropical hardwood trees and lies just 6 kilometers (3.7 miles) from George Town, the state capital. Yet remarkably the 130-million-year-old rainforest is believed to have never been cut before.

Over a span of two weeks last October, a 117-member team climbed tall trees, searched the forest floor and scoured the dark, mysterious depths of caves to discover a treasure trove of animals and plants. They recorded more than 1,400 species, including four likely new to science — a scorpion, a fly, a bacterium and a water bear — and at least 25 species of plants and animals that were recorded in Penang Hill for the very first time. For the expedition, researchers from the California Academy of Sciences (CAS) partnered with The Habitat, an ecotourism facility on Penang, as well as scientists from the University of Science Malaysia (Universiti Sains Malaysia or USM) and local students.

The expedition produced an "extraordinary number of firsts," Margaret D. Lowman, CAS's Lindsay Chair of Botany and expedition leader, told Mongabay in an email. "This was an unprecedented whole-forest, and all-taxa BioBlitz by scientists, the majority of which were female."

What was also surprising, Lowman added, was that "a rainforest so close to 1.5 million people was so pristine!"

Biologist Siti Azizah Mohd Nor of USM agreed. "It was certainly gratifying to obtain such good biodiversity records from an area of forest which is very close to human settlement and activity areas."



Researcher Wendy Baxter surveying the treetops in Penang Hill. Photo copyright 2017 Anthony Ambrose.

Among the exciting discoveries is a potentially new species of "ghost" scorpion that arachnologists Lauren Esposito and Stephanie Loria of CAS chanced upon during the very first collecting day of the trip.

"We had spent the morning out on a short trail near the base camp, and had just made it out to one of the longer trails leading into the primary rainforest," Esposito told Mongabay. "It was about 3 p.m., and we had just found each other again after meandering off on our own. About 100 yards down the trail, Stephanie paused to break apart a log dangling across the steep, muddy path. We were just casually standing around talking when Stephanie yelled out, 'A chaerilid [scorpion]!'"

The scorpion belongs to one of the oldest lineages on Earth, known as the ghost scorpions, a group that is native to Southeast Asia. Most scorpions glow a bright cyan-green under ultraviolet light, but the ghost scorpions' glow is very faint. "It's almost eerie," Esposito explained, "resembling the ghost of the scorpion."

The local partners had seen the scorpion before, but they did not know that it was something new, she added. "We had a hunch this new species was out there, but it was really a matter of odds. For every hundred logs or so we turn over, we find a scorpion. We got lucky."



A new-to-science scorpion discovered on Penang Hill. Photo copyright 2017 Phil Torres/bioGraphic. This photo originally appeared in bioGraphic, an online magazine about nature and sustainability powered by the California Academy of Sciences.

The researchers identified numerous species that had never been recorded on Penang Hill before. These include the red-rumped swallow, the stripe-throated bulbul, the spotted-wing fruit bat, a species of orchid, eight species of mammals (including the peculiar lesser mouse deer), two species of frogs, and several species of flies, ants and spiders. The team also managed to record the cryptic Sunda colugo (*Galeopterus variegatus*), also called the Sunda or Malayan flying lemur.

"The most interesting finding from this expedition involves insights into the biology and behavior of the elusive Sunda colugo," primatologist Nadine Ruppert of USM told Mongabay. "We will reveal details of this in a forthcoming scientific publication soon. So please stay tuned."



A Sunda colugo, or flying lemur, was recorded for the first time on Penang Hill. Photo copyright 2017 Phil Torres/bioGraphic. This photo originally appeared in bioGraphic, an online magazine about nature and sustainability powered by the California Academy of Sciences.

The surveys involved not just scientists but also students from local schools, giving them the opportunity to become citizen scientists.

"Many of the students that were involved ... hail from schools in the immediate vicinity of the lower station at the foothills of Penang Hill," Justine Vaz, the general manager of the Habitat Foundation, told Mongabay. "We expect to continue to engage actively with these students so that they will become good stewards and ambassadors for the Penang forest within their communities."

The survey teams are currently analyzing their collections from the expedition. "We are confident of a few more discoveries in the coming weeks," Siti Azizah said.

With a more complete understanding of the biodiversity within Penang Hill, the scientists hope to nominate the area as a UNESCO biosphere reserve. The size of the proposed Penang Hill Biosphere Reserve is currently in the final stages of being finalized by the state government. "Penang is fortunate to have almost one quarter of the island still relatively pristine," Lowman said. "So this UNESCO site would ensure long-term forest conservation."



Nur Faeza Abu Kassim of USM and her student Nur Zulaikha Zainal Abidin investigate a mosquito trap. Photo by Wendy Baxter/2017.

