Holy Pleistocene Batman, the answer's in the cave

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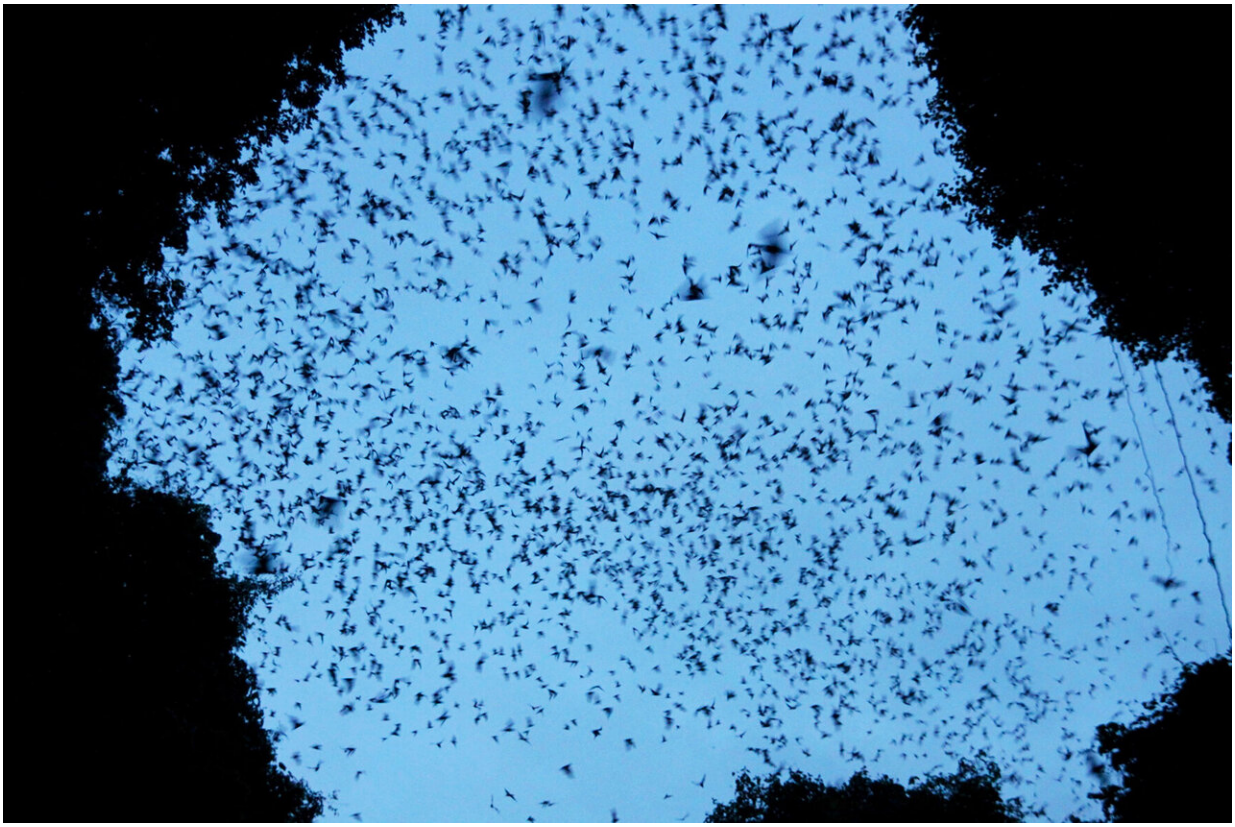

Bats flying out of an Indonesian cave for their nightly meal. Credit: Chris Wurster

Let's say you wanted to solve a 20,000-year-old mystery, where would you start? Perhaps archaeology and geology come to mind. Or, you could

sift through a 3-metre pile of bat faeces.

Researchers from James Cook University in Cairns, Australia, chose the bat poo in their quest to answer to a long-standing question: why is there some much biodiversity on the islands of Sumatra, Borneo and Java, when not so long ago (geologically speaking) they were all part of one vast continent?

One theory has been that the former continent (Sundaland) was dissected by a savanna corridor. "That might explain why Sumatra and Borneo each have their own species of orang-utan, even though they were linked by land for millions of years," Dr. Chris Wurster said. "The corridor would have divided the two separate rainforest refuges, as the sea does now."

The corridor theory has been boosted by millions of insect-eating bats, which have gathered evidence about the landscape over millennia and deposited it in layers in their caves.

"Bat poo is highly informative, and especially so in the tropics, where the climate can make some of the more traditional modes of investigation less available," Dr. Wurster said.

A three-metre pile of bat faeces at Salah Cave in Borneo gave the researchers a 40,000-year-old record composed of insect skeletons.

"We can't tell what insects the bats were eating throughout that time, because they're in tiny fragments, but we can read the chemistry," Dr. Wurster said.

Bats clustering together on the wall of an Indonesian cave. Credit: Chris Wurster

"Eating insects that have been feeding on tropical grasses results in faeces with a characteristic chemical imprint. It's quite different from the result you'd get from eating insects that fed on tropical trees."

According to the bat record the landscape around Saleh Cave (now featuring lush rainforest) was once dominated by tropical grasses.

"Combined with other cave studies in the region, this leads us to support the corridor theory, and also gives us some confidence as to the extent of the corridor," Dr. Wurster said.

The corridor could also shed light on human pre-history.

"A savanna corridor, which would be much more easily traversed than rainforest, might help to explain how people moved relatively quickly through this region and on to Australia and New Guinea."

'Savanna in equatorial Borneo during the late Pleistocene' is published in the latest edition of *Scientific Reports*.

Dr. Chris Wurster is a Senior Research Associate at James Cook University, specialising in stable isotope geochemistry.

Provided by James Cook University