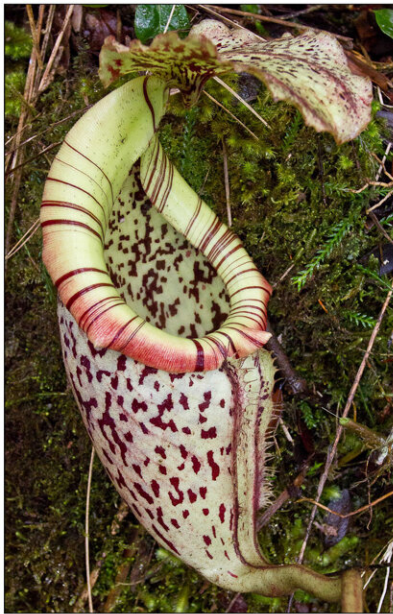


Carnivorous plants have turned to capturing mammal droppings

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Some of the *Nepenthes* species sampled in Malaysian Borneo as part of this study. Note the presence of scats in the first two pitchers on the bottom row. Credit: A. van der Ent (1), A. Robinson (2–6)

In a paper published today in the *Annals of Botany*, botanist Dr. Alastair Robinson, Manager Biodiversity Services at Royal Botanic Gardens Victoria, and colleagues in Western Australia, Queensland, Malaysia, and Germany have shown that some *Nepenthes* (tropical pitcher plants) are capturing more nitrogen, and therefore nutrients, from mammal droppings as compared to those that capture insects.

"A handful of *Nepenthes* [species](#) have evolved away from carnivory towards a diet of animal scats," says Dr. Robinson.

"We found that [nitrogen](#) capture is more than two times greater in species that capture mammal droppings than in other *Nepenthes*. Insect prey is scarce on tropical peaks above 2200 m, so these plants maximize nutritional returns by collecting and retaining fewer, higher-value nitrogen sources like tree-shrew droppings," he said.

Nepenthes are some of the most recognizable carnivorous plants on the planet, capturing and digesting [organic material](#) in their modified leaves to acquire nitrogen and valuable nutrients that are naturally scarce in their habitats. There are around 160 named *Nepenthes* species, and these results may explain why some of the most spectacular species occur at [high elevations](#), where investment in food capture mechanisms is greater and more critical to survival.

To reach their conclusions, the team studied isotope enrichment in *Nepenthes* tissue samples to compare the levels of externally acquired

nitrogen and carbon present; they compared the species that capture invertebrates with those that are specialized for the collection of mammal scats, also testing co-occurring non-carnivorous plants as reference controls.

They found that the heavier ^{15}N isotope of nitrogen was significantly enriched in all *Nepenthes* tested as compared to non-carnivorous plants nearby, but that ^{15}N levels were even greater in those *Nepenthes* specialized to capture mammal droppings.

Their mutualistic relationship with mountain tree shrews was first published in 2009, but the effectiveness of this strategy for obtaining supplementary nutrition was unknown.

More information: Adam T Cross et al, Capture of mammal excreta by *Nepenthes* is an effective heterotrophic nutrition strategy, *Annals of Botany* (2022). [DOI: 10.1093/aob/mcac134](https://doi.org/10.1093/aob/mcac134)

Provided by Royal Botanic Gardens Victoria

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