

The peculiar life history of Middle American *Stenamma* ants

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This image shows a worker ant of the newly described species *Stenamma callipygium*. Credit: Michael G. Branstetter

Stenamma is a cryptic "leaf-litter" ant genus that occurs in moderately humid to wet forest habitats throughout the Holarctic region, Central America, and part of northwestern South America (Colombia and Ecuador). The genus was thought to be restricted primarily to the temperate zone, but recent collecting efforts have uncovered a large variety of Neotropical forms, which rival the Holarctic species in terms

of morphological and behavioral diversity. The Middle American clade of *Stenamma* is revised in a paper published in the open access journal *ZooKeys* to recognize 40 species, an astonishing 33 of which are described as new.

"The [paper documents](#) a large radiation of previously overlooked Neotropical ants. When I began the study, only six [species](#) were known from the region, now there are 40. The fact that this radiation has been missed for so long is surprising, since ants are an insect group that attracts much interest and study," remarks Dr. Michael G. Branstetter, [National Museum of Natural History](#), Smithsonian Institution. "This revision provides a rare look into the biology and life history of this intriguing genus."



This image shows the male caste of *Stenamma diversum*, a clay bank nesting species. Credit: Michael G. Branstetter

An exceptional characteristic of *Stenamma* is that many species seem to be well adapted to cool, wet environments at mid to high elevations between 800 m. In fact, it has been found that *Stenamma* can be the most common ant genus in [leaf-litter](#) samples collected from very wet and cool [cloud forest](#) localities. These ecological traits are in contrast to the

pattern seen in ants generally, in which diversity and abundance decrease with elevation. Furthermore, it is slowly becoming apparent that the life history strategies of *Stenamma* species are quite diverse, and in some cases unique among ants.

Most collections of the group are made by sifting leaf-litter from the [forest floor](#), which is why *Stenamma* has its stereotype as a "leaf-litter ant [genus](#)." Although nests of many species do occur in the leaf litter, and foragers are common there, recent collecting has revealed that *Stenamma* species nest in a variety of microhabitats, not just leaf litter. Nests have been found in large logs, in small rotting branches, in and under bark, in steep clay or mud banks, in and under epiphytes, under rocks, in the ground, and under leaves in leaf litter. In addition, several species are now known to nest and forage in the forest canopy. The reason these nests are rarely encountered is because most species are cryptic, forming small colonies composed of slow-moving worker ants.



This image shows a clay bank nest of *Stenamma diversum* with a worker going inside Credit: Michael G. Branstetter

One of the most intriguing recent discoveries has been the observation that some *Stenamma* species nest in clay banks and exhibit novel behaviors. In the first documented example of clay bank nesting within *Stenamma*, it was found that the two species involved construct multiple nests per colony, but only occupy one with a queen and brood, and they maintain a small clay "door-pebble," which is used to block the nest entrance upon encounter with aggressive ants, such as army ants.

The work of Branstetter reveals that not only two, but many *Stenamma* species nest in the clay bank environment, suggesting that this habitat may be important in the evolution and ecology of the group. Most intriguingly, one of the newly observed species has been found to have convergently evolved a similar nest architecture to the door-pebble ants. The reason for this convergence is not known and is in need of further investigation. "I hypothesize that like cloud forests, the clay bank habitat is less hospitable to the average ant, and thus provides *Stenamma* species with a more protected and less competitive environment in which to nest and forage." explains Dr. Branstetter.

More information: Branstetter MG (2013) Revision of the Middle American clade of the ant genus *Stenamma* Westwood (Hymenoptera, Formicidae, Myrmicinae). *ZooKeys* 295: 1, [doi: 10.3897/zookeys.295.4905](https://doi.org/10.3897/zookeys.295.4905)

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