A new species of predatory bagworm from Panama's tropical forest

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University of Panama and Smithsonian researchers report the discovery of a new Bagworm Moth species, in the *Annals of the Entomology Society of America*. Unlike nearly all other Bagworms, *Perisceptis carnivora* have predatory larvae. Strangest of all, according to Annette Aiello, staff scientist at the Smithsonian Tropical Research Institute, the adult moths wrap their eggs individually in beautiful cases fashioned from golden abdominal hairs called setae, a behavior unique among insects.

"We were mystified when we found a bizarre bag-like structure, about 12 mm long, studded with fragments of other insects, and containing a live insect larva," said Diomedes Quintero, professor of biology at the University of Panama. During 8 years of field work he and Roberto Cambra, also of the University of Panama, found several larvae from which to rear adult moths for identification.

Aiello, an expert in Lepidopteran behavior, realized that the small golden objects produced by the adult female moths were not eggs per se, but tiny cases only 1 mm long, made from setae, and each containing a single egg about 0.5 mm long. The collaborators suspect that the setal egg cases may help protect carnivorous siblings from one another and may keep other predators away during development. That some of the cases are empty would make it less worth while for a predator to break into them.

It was Donald Davis, curator of Lepidoptera of the Department of

Entomology at the Smithsonian's National Museum of Natural History, who determined that the moths belonged to the family Psychidae and represented an undescribed species of *Perisceptis*, a genus including only one other species. The larvae of the roughly 1000 species of the Family *Psychidae* construct portable structures, "bags," within which all larval functions, and pupation, take place.

The authors describe the eggs, egg cases, larvae, larval "bags", male and female pupae, and male and female adult stages of *Perisceptis* carnivora. Both male and female adults of this species are fully winged, whereas in many other bagworm species, the female has reduced wings, or no wings at all.

At first Quintero and Cambra were puzzled to find *Perisceptis* carnivora on plants belonging to ten different families, but once they realized that the larvae were predators, not herbivores, it became clear that plant species was irrelevant. Unlike other bag worms which move about freely as they eat leaves, this species attaches one end to a surface and reaches out of the free end to capture prey.

Bits of spiders, grasshoppers and katydids, flies, beetles, wasps and especially ants are attached to the silk matrix of field-collected larval bag. The authors posit that attaching the bag at one end and reaching out of the free end makes it possible for the larva to attack its prey without falling, bag and all, from its support. After eating the prey, the larva affixes the remains of the carcass to its bag.

The researchers plan to investigate the possibility that the larvae produce chemicals to lure their victims close enough to grab them.

These predatory bagworm larvae have shiny black heads and apparently harder thoracic plates than most Bagworms, but otherwise appear to be very similar to their herbivorous relatives. This is the first report of a

lepidopteran larva feeding on such a wide range of other arthropods.

The researchers find it ironic that one prey item was a lacewing larva—order Neuroptera, which itself is a predator that camouflages itself with pieces of its prey. During a laboratory observation of predation on an ant, the victim's legs were seen to twitch, which suggests that *P. carnivora* devours its prey alive. In spite of the ferocity of these small creatures, *P. carnivora* larvae do have at least one enemy; parasitoid wasps were reared from several pupae.

Reference:
Donald Ray Davis, Diomedes Quintero A., Roberto A. Cambra T., and Annette Aiello. 2008. Biology of a new Panamanian Bagworm Moth (*Lepidoptera:Psychidae*) with predatory larvae, and eggs individually wrapped in setal cases. *Annals of the Entomological Society of America*, 101(4):689-702.

Source: Smithsonian Tropical Research Institute