UF IFAS Extension UNIVERSITY of FLORIDA

UF/IFAS PEER REVIEWED EENY-827
https://doi.org/10.32473/edis-IN1474-2026

Southeastern Blueberry Bee *Habropoda laboriosa* (Insecta: Hymenoptera: Apidae)[1]

Andrew J. Ryan, Cody Prouty, and Cameron J. Jack[2]

The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

Habropoda laboriosa Fabricius (1804) is a solitary bee species in the family Apidae, subfamily Apinae, tribe Anthophorini (Figure 1). The bee can be found throughout the southeastern United States. As the common name suggests, it was once thought to be an *oligolectic* pollinator of blueberry flowers in the genus *Vaccinium*, meaning the bee was thought to specialize in blueberry flowers only. However, additional research has discovered a much broader pollen diet including plants such as those in the genus *Gelsemium,* which includes Carolina jessamine (*Gelsemium sempervirens;* Pascarella 2007).

Figure 1. Adult female, top, and male, bottom, southeastern blueberry bee, *Habropoda laboriosa*. Credit: USGS Native Bee Inventory and Monitoring, https://www.flickr.com https://creativecommons.org

Distribution

Despite the common name, *Habropoda laboriosa* is not limited to the southeast (Figure 2). Members of the species have been found ranging from New Jersey south into Florida and west into Illinois and Mississippi (Mitchell 1962; Danforth et al. 2019). The map below (Figure 2) shows reported sightings throughout the Midwest as well as isolated sightings in Utah, California, Canada, and Mexico. However, the map is based on museum collections and may not be completely accurate.

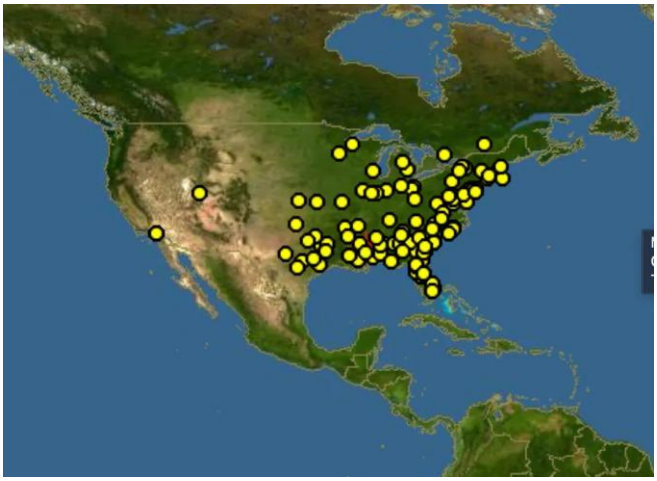

Figure 2. Distribution of *Habropoda laboriosa*. Each yellow dot represents a recorded sighting.
Credit: Map at Discover Life © Designed by The Polistes Corporation; yellow dot credits

Description

Eggs: The eggs of this species are white and cylindrical with a small curve, and the dimensions are approximately 2.6 mm long by 0.7 mm wide (Cane 1994).

Larvae: The larvae of *Habropoda laboriosa*, like most bee species, are white and resemble legless grubs (Michener, 2007).

Adults: *Habropoda laboriosa* length ranges from 13 mm–16 mm. Females (Figure 1, top) are typically longer than males, measuring 15 mm–16 mm while males (Figure 1, bottom) measure 13 mm–14 mm (Mitchell 1962). Both genders have yellow hairs on the thorax, and the head and abdomen are completely black. The males can be differentiated from females by the yellow setae on their clypeus (face) (Figure 1) (Mitchell 1962).

Figure 3. Adult female southeastern blueberry bee, *Habropoda laboriosa*.
Credit: USGS Native Bee Inventory and Monitoring, https://www.flickr.com https:/creativecommons.org

Like other species within the family Apidae, *Habropoda laboriosa* are covered in small hairs, or setae, that aid in pollen collection. These are especially prominent on the legs (Figure 4). Two apical spurs on the hind tibiae help to distinguish *Habropoda laboriosa* and other digger bees from honey bees (Figure 5, Borror and White 1970).

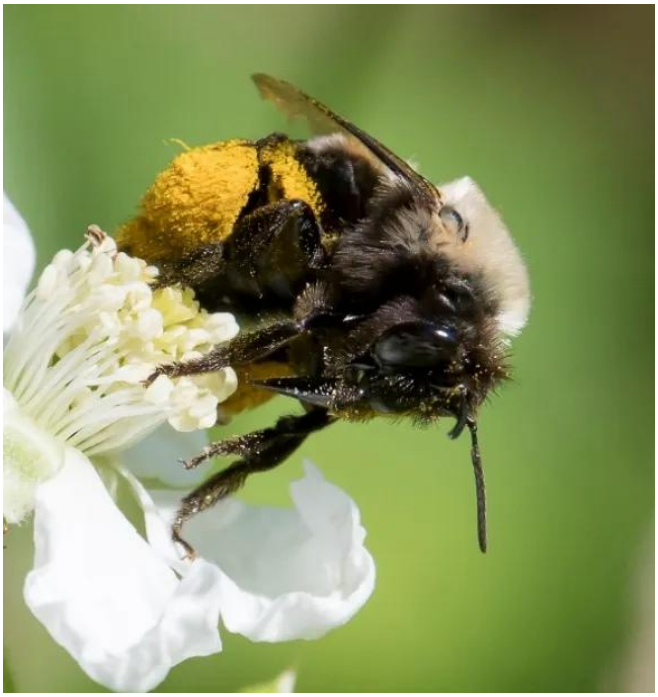

Figure 4. Adult female southeastern blueberry bee, *Habropoda laboriosa*, collecting pollen on her hind legs.
Credit: Photo by Pamela Cowart-Rickman, pcowartrickmanphoto, some rights reserved (CC BY-NC); https://www.inaturalist.org

Figure 5. Hind leg of adult female southeastern blueberry bee, *Habropoda laboriosa*. The red arrow is pointing to the two apical spurs.
Credit: H. Glenn Hall, https://entnemdept.ufl.edu/hallg/melitto/Intro.htm

Life Cycle and Biology

Habropoda laboriosa overwinter in underground nests and emerge as adults in spring to coincide with the blooming of plants in the genus *Vaccinium* (Cane 1994; Michener 2007). The males emerge first, and patrol nesting sites inhabited by multiple females while waiting for females to emerge (Cane 1994). Mating occurs once females emerge. The female will locate a nest site, usually in sandy soils near *Vaccinium* plants. Females may nest together in groups (gregariously) (Danka et al. 2019). Each nest contains an average of two brood cells lined with a waxy secretion that is thought to prevent microbial invasion of the pollen provisions as well as to maintain acceptable humidity levels within the brood cell. Each cell contains a single egg and pollen to feed the developing larvae (Cane 1994). Larvae develop inside the enclosed cell but do not spin cocoons (Michener 2007).

Economic Impact

Both male and female adult *Habropoda laboriosa* are important pollinators of blueberry flowers in the genus *Vaccinium*. They are capable of buzz pollination, or floral sonication, that the blueberries require (Cane and Payne 1988). The bee vibrates its flight muscles while holding the flower to create a buzzing sound that causes the flower to release pollen. Each female *Habropoda laboriosa* can visit as many as 50,000 *Vaccinium* flowers. A typical female blueberry bee accounts for approximately 6,000 blueberries in her lifetime, valued at $20.00 in 1997 (Cane 1997), or nearly $40.00 in 2024. *Habropoda laboriosa* bees are more effective pollinators of cultivated blueberries than are honey bees (*Apis mellifera*) (Danka et al. 2019). Recent explorations of the relationship between bee density and fruit set in blueberries have uncovered an overall low density of wild bee pollinators in cultivated blueberries (Mallinger et al. 2021). Phenology, or the timing of emergence, may not coincide well between *Habropoda laboriosa* and the blooming of cultivated blueberries. Since males emerge first and do not collect pollen to provision a nest, there is some concern that males do not effectively pollinate blueberries. Although there is no clear evidence for cultivated blueberries, research on the pollination of another species, Carolina jessamine (*Gelsemium sempervirens*), showed males to be as effective as females in pollination (Pascarella 2010).

Management

Since *Habropoda laboriosa* are such efficient pollinators of blueberry plants, their presence should be encouraged. The species will nest in exposed sandy soil near blueberry plants (Cane 1994). However, females will become disoriented and lose the ability to locate their nests if the landscape is disturbed, so alterations to the landscape should be minimized (Cane 1994). No parasitic bee species were found to affect *Habropoda laboriosa*, but infestations of Argentine ants, *Iridomyrmex humilis*, did cause females to abandon their nests (Cane 1994). Thus, pest management strategies that control ants without disturbing bees may be considered if trying to preserve *Habropoda laboriosa* within a defined property. More research must be conducted to determine the feasibility of introducing *Habropoda laboriosa* to blueberry fields (Cane 1994). Protection of natural habitats and cultivated blueberry fields is crucial to the conservation of *Habropoda laboriosa*, as decreases in both habitat types led to decreases in pollen collection and body size of the species (Anderson et al. 2024). Other crops, such as peaches, can support *Habropoda laboriosa*, but the prevalence of the species depends on the diversity of habitats existing around the orchards (Tayal et al. 2024). Since *Habropoda laboriosa* relies heavily on blueberry plants, the spring emergence of the bee must coincide with the blueberry blooming period to ensure the success of both species. Changes in the phenology of one or both species may prevent the alignment of flowering and bee emergence, potentially causing a decline in *Habropoda laboriosa* (Weaver and Mallinger 2022).

Figure 2 Credits

Habropoda laboriosa @ American Museum of Natural History, Bee Specimen Record (116); American Museum of Natural History, Bee species (26); Bee Biology and Systematics Laboratory (18); Ellison Orcutt, Virginia Department of Conservation and Recreation, Division of Natural Heritage (14); Cornell University Insect Collection (8); David Biddinger, Penn State Fruit Research and Extension Center (15); Global Biodiversity Information Facility (90) [Illinois Natural History Survey (87); Snow Entomological Museum Collection (3); Entomology Collection (3) accessed through the GBIF Data Portal. Each record tells when. See dataset links for citations & terms of use.]; iNaturalist (95); Snow Entomology Collection, University of Kansas (151); Rob Jean, Environmental Solutions and Innovations (5); Rutgers University Arthropod Collection (2); Tai Roulston Blandy Experiment Farm Bee Database (4); University of Connecticut Insect Collection (14); United States Geological Survey, Sam Droege (602)

Selected References

Anderson SE, Hahn P, Gonzalez G, et al. 2024. Land-use change alters specialist bee diet and drives body size declines. Landsc Ecol. 39(6). https://doi.org/10.1007/s10980-024-01893-1

Borror DJ, White RE. 1970. A field guide to insects. America north of Mexico. Houghton Mifflin. Boston.

Cane JH. 1994. Nesting biology and mating behavior of the southeastern blueberry bee, *Habropoda laboriosa* (Hymenoptera, Apoidea). J Kans Entomol Soc. 67(3).

Cane JH, Payne JA. 1988. Foraging ecology of the bee *Habropoda laboriosa* (Hymenoptera: Anthophoridae), an oligolege of blueberries (Ericaceae: Vaccinium) in the southeastern United States. Annals of the Entomological Society of America. 81(3). https://doi.org/10.1093/aesa/81.3.419

Danforth BN, Minckley RL, Neff JL. 2019. The Solitary Bees: Biology, Evolution, Conservation. Princeton, NJ: Princeton University Press. https://doi.org/10.2307/j.ctvd1c929

Danka RG, Sampson BJ, Villa JD. 2019. Association between Density of Foraging Bees and Fruit Set in Commercial Fields of Rabbiteye Blueberries (Ericales: Ericaceae) in Louisiana and Mississippi. J Econ Entomol. 112(3). https://doi.org/10.1093/jee/toz005

Mallinger R, Ternest JJ, Naranjo SM. 2021. Blueberry Yields Increase with Bee Visitation Rates, but Bee Visitation Rates Are Not Consistently Predicted by Colony Stocking Densities. J Econ Entomol. 114(4). https://doi.org/10.1093/jee/toab111

Michener CD. 2007. The bees of the world, 2nd edition. Johns Hopkins University Press. https://doi.org/10.56021/9780801885730

Mitchell TB. 1962. Bees of the eastern United States: Volume 2, Part C. Bees of the Eastern United States.

Pascarella JB. 2007. Foraging patterns of the southeastern blueberry bee *Habropoda laboriosa* (Apidae, Hymenoptera): Implications for understanding oligolecty. J Apic Res. 46(1). https://doi.org/10.1080/00218839.2007.11101362

Pascarella JB. 2010. Pollination biology of *Gelsemium sempervirens* L. (Ait.) (Gelsemiaceae): Do male and female *Habropoda laboriosa* F. (Hymenoptera, Apidae) differ in pollination efficiency? J Apic Res. 49(2). https://doi.org/10.3896/IBRA.1.49.2.05

Tayal M, Wilson C, de la Plata ZM, et al. 2024. Bee Diversity and Abundance During Peach Bloom in South Carolina, United States. Journal of Applied Entomology. 149(1). https://doi.org/10.1111/jen.13353

Weaver SA, Mallinger RE. 2022. A specialist bee and its host plants experience phenological shifts at different rates in response to climate change. Ecology. 103(5). https://doi.org/10.1002/ecy.3658

[1] This document is EENY-827, one of a series of the Department of Entomology and Nematology, UF/IFAS Extension. Original publication date April 2026. Visit the Ask IFAS website at https://ask.ifas.ufl.edu for the currently supported version of this publication.

[2] Andrew J. Ryan, master's program graduate, Department of Entomology and Nematology; Cody Prouty, laboratory technician, Department of Entomology and Nematology; Cameron J. Jack, assistant professor, apiculture, Department of Entomology and Nematology; UF/IFAS Extension, Gainesville, FL 32611.