



A morphological study of the antennae of *Pheidole* spp., *Hypoponera* spp., and *Strumigenys* spp.

Abstract

This is a preliminary study of leaf-litter ant antennae including a detailed analysis of the basic structures of the antennae of 3 genera of leaf-litter ants, *Pheidole* spp., *Hypoponera* spp. and *Strumigenys* spp. The ants were collected from the debris and rotting wood on the forest floor at The Big Thicket, National Preserve near Saratoga, Texas. After separating the ants from the leaf-litter, micrographs were taken of the antennae of the each genera of the ants. Detailed comparison of the antennae from each genus was made. Similarities and differences were record for each genus group. This study found that the specimens within each genus had lengths and widths of the antennae, scape, and club segments that were all similar to each other. Data was used to discuss possible future research projects.

Introduction

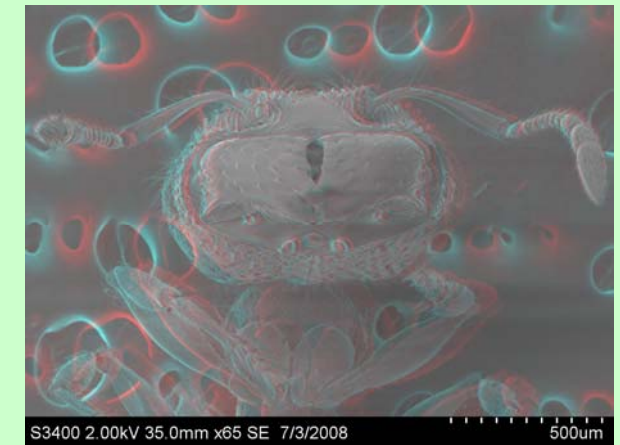
Ants are in a very unique family of insects Formicidae. Bees, wasps and termite are also a part of this family. Ants are social insects. Humans have had a fascination with ants throughout time (1). This is partly because of the social similarities we share. Like humans ants are social animals. They are also the most successful of all the social societies. Though fire ants are a pest that comes to mind easily, the truth is that ants are very beneficial to humans and other organisms (1). Ants aid the decomposition rate of organic substances. They also prey on the parasites of plants. There is much to learn about ants and their niche in the ecosystem. Understanding the morphology of ants is where we start. It is also may be used in identification of ant genera(3).



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Methods

Ants were collected from leaf-litter at 3 locations in the Lance Rosier Unit of The Big Thicket National Preserve, near Saratoga, TX. The leaf-litter was placed in a litter sifter to eliminate large debris. Samples of leaf-litter were placed in Winkler traps for a minimum of 24 hours and were collected and preserved in 70% isopropyl alcohol. The Winkler trap separates organisms from leaf-litter (4). Ants from three genera were identified and examined using a Scanning Electron Microscope (Hitachi, S-3400). Micrographs were taken of the ant antennae. The antennae from three samples from each genus were measured for comparison. Micrographs of the whole antenna, scape and the funiculus were taken and the measurements were compared. The relationship between the length of the antennae, the scape, funiculus and the club was studied. The number of segments on the club and the relationship between different ants within each genus of ants was also studied.



Discussion

This study found that the specimens within each genus had lengths and widths of the antennae, scape, and club segments that were all similar to each other. The funiculus length compared to the scape length varied a lot. Various observations were noted during this experiment. Holes on the club segments were observed on the *Pheidole* spp. and the *Hypoponera* spp. (figure 6) Possible studies could determine the purpose of these holes or to confirm if these holes are only present on the club segments. Bristles were observed on the antennae and head of *Strumigenys* spp. (figure 7) Studies could be done to discover the purpose for these bristles. *Hypoponera* spp. may have a 4 or 5 segmented club which is unusual for most species of ants. (figure 8) Future studies could be done to confirm the number of club segments for this species.

Literature Cited

1. Wheeler, Willim Morton (1965), *Ants: Their Structure Development and Behavior*, Columbia UP, New York.
2. Holldobler and Wilson, (1990), *The Ants*, Harvard UP, Cambridge.
3. Fisher, Brian L. and Cover P. Stefan, (2007), *Ants of North America: A Guide to the Genera*.
4. Clark, Scott, www.santetraps.com

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