

## Final report

### Thicket of Diversity Grant ToD 2014-2017

**Project Title:** Ant community dynamics in the Big Thicket National Preserve

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This Thicket of Diversity (ToD) grant supported research from 2014 to 2017, with a no-cost extension until 2018. During that time, the grant supported research by three Rice undergraduate students (Gabriela Zambrano, Meghan Hager, and Cassidy Kempf). The results of these studies are currently being described for publication (we anticipate publishing two research papers based on the work supported by this grant). Furthermore, the initial data collected during this project was used to support a grant proposal to the National Science Foundation RAPID program, which was funded (DEB-1811225; \$100,000). An overview of the work supported by the ToD grant is provided here.

#### Summary of Collections:

- Sampling occurred between May 2014 and October 2016 at 12 different units of the Big Thicket National Preserve and in areas just outside the preserve.
- Collections contain a total of 3152 individual ant specimens, corresponding to at least 33 distinct species. All ant specimens have been processed and are either mounted on pins or kept in 70% ethanol at Rice University. All specimens will be deposited in the entomology collection at Sam Houston State University.

#### Main Findings:

- Non-native ants are found in every sampled unit of the Big Thicket National Preserve. Three nonnative species, the tawny crazy ant (*Nylanderia fulva*), the red imported fire ant (*Solenopsis invicta*), and *Pheidole obscurithorax*, were found to be among the five most abundant species in the entire preserve. Our work is the first to document the presence of *N. fulva* inside the Big Thicket National Preserve. Native ant species richness and diversity decreased as the proportion of nonnative ants increased. No significant seasonal or annual variation was detected in the overall ant communities.
- The diversity, species richness, and proportion of native ants are higher inside versus outside the preserve, and increase within the preserve with distance from the edge.
- Sites where *N. fulva* are present contain almost no other ant species.
- Thorough sampling of ant species in the Big Thicket National Preserve should include multiple collection methods, such as leaf litter extraction, baiting, manual collecting, and pitfall traps. Of these techniques, the single most effective method is pitfall sampling.