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Spring 2020

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Recommended Citation

Vaughn, Samantha C.; Lawhorn, Kane A.; Gora, Evan M.; and Yanoviak, Steve P., "Lightning damage stimulates beetle activity in a tropical forest" (2020). *Undergraduate Arts and Research Showcase*. 22. <https://ir.library.louisville.edu/uars/22>

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Lightning damage stimulates beetle activity in a tropical forest

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Background

- Canopy gaps are a common type of disturbance in tropical forests
- Lightning is a major cause of large-tree mortality in tropical forests, creating canopy gaps with dead standing wood
- The goal of this study was to determine if wood-boring beetle abundances were higher in trees struck by lightning versus unaffected, normal trees

Methods

- Flight intercept traps were hung in the subcanopy of 8 trees (4 lightning struck trees and 4 unaffected trees) on Barro Colorado Island (BCI) Panama
- Beetles were sorted and identified to subfamily level
- Platypodinae (pinhole borers) and Scolytinae (bark beetles) abundances were compared between struck and unaffected trees

Results

- 377 Platypodinae and 1,288 Scolytinae specimens were collected in total
- Platypodinae abundances were higher in struck trees versus normal trees (Fig. 1)
- Scolytinae abundances were higher in struck trees versus normal trees (Fig. 2)



Figure 3. Platypodinae beetle specimen



Figure 4. Scolytinae beetle specimen



Figure 5. Lindgren Funnel (Flight intercept trap)



Figure 6. Identifying beetle specimens to subfamily level

Platypodinae Abundance by Tree Type

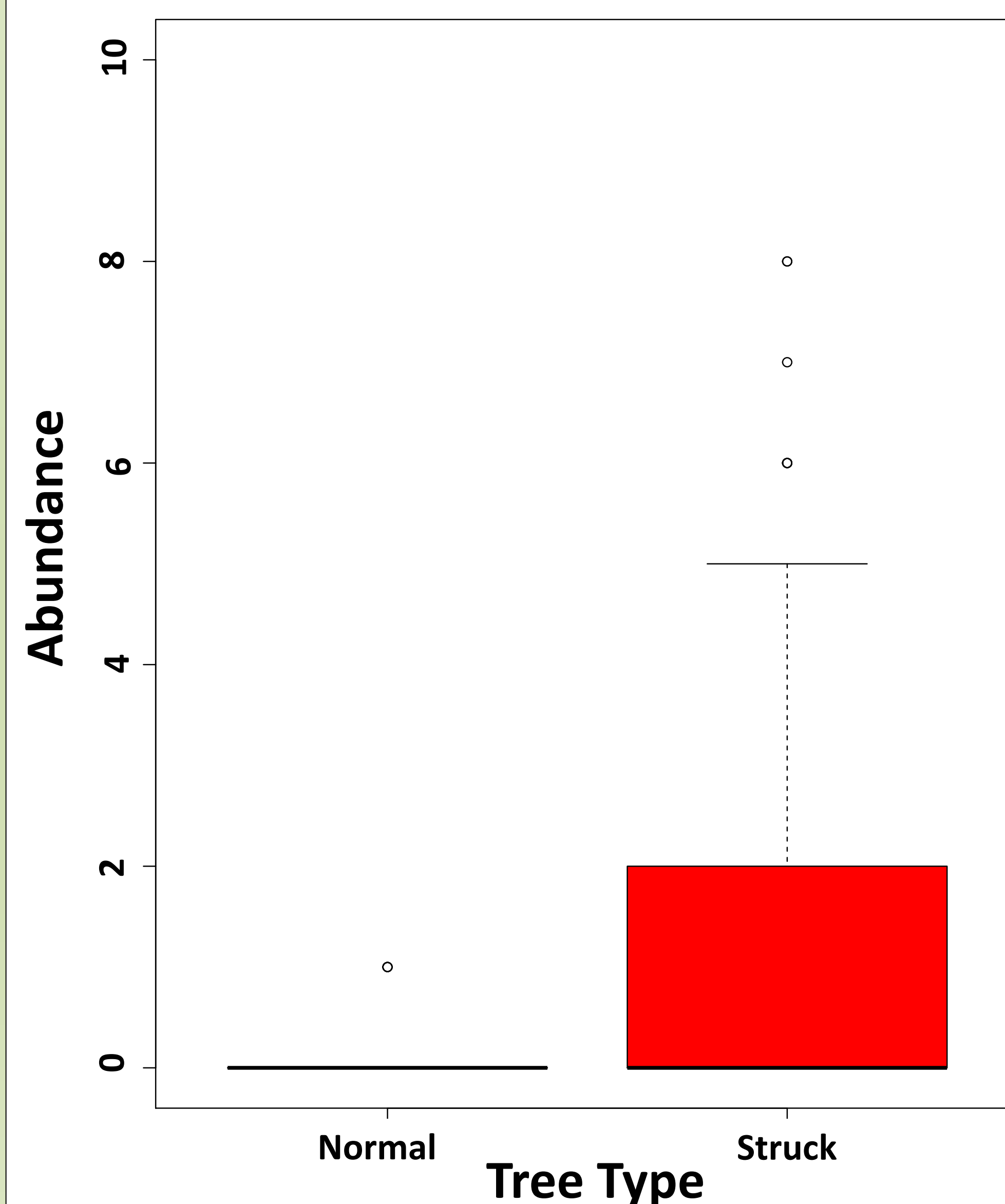


Fig. 1. Platypodinae abundance in normal and struck trees
($t = 5.51$, $df = 135$, $p < 0.001$)

Scolytinae Abundance by Tree Type

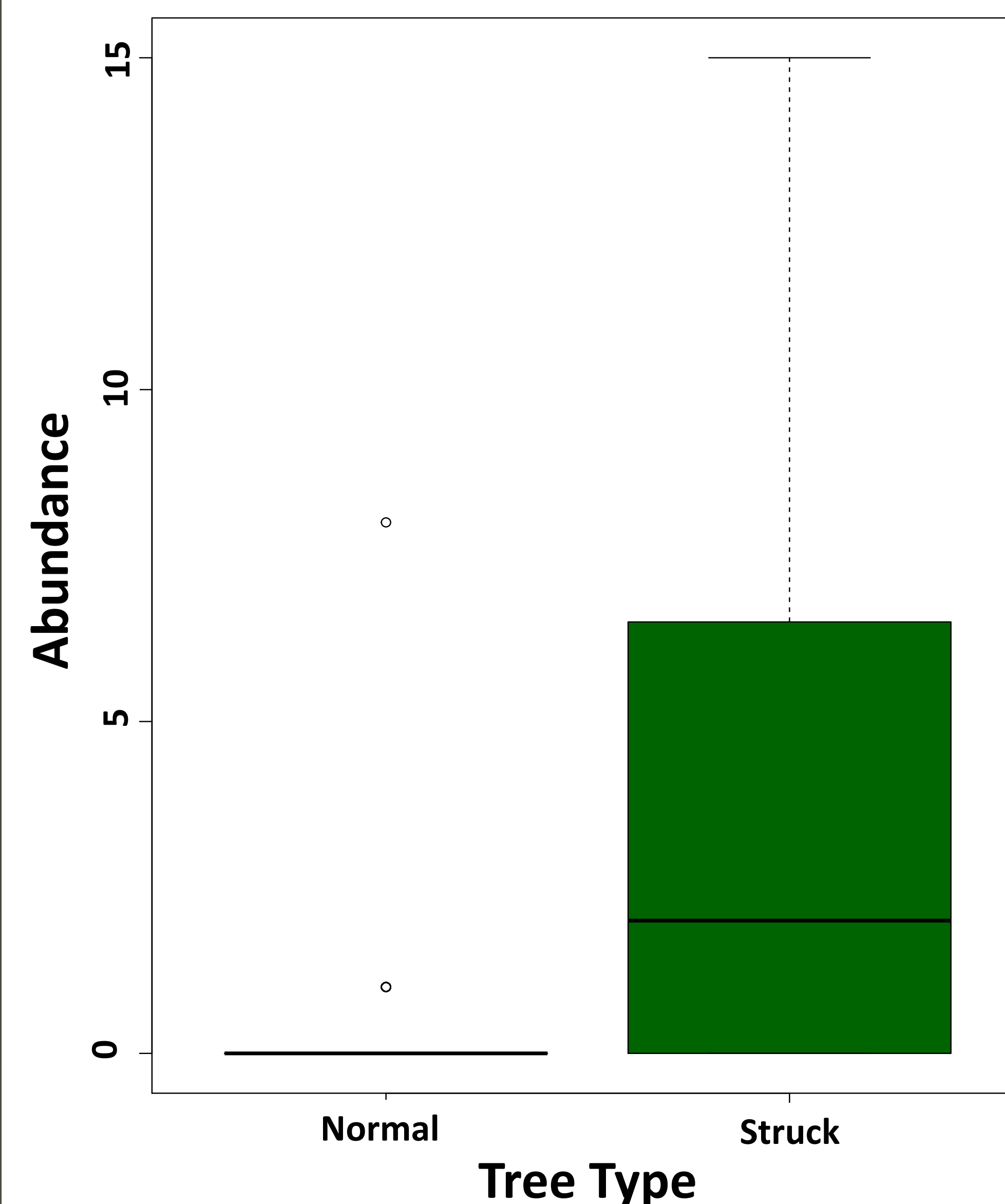


Fig. 2. Scolytinae abundance in normal and struck trees
($t = 5.17$, $df = 113$, $p < 0.0001$)

Conclusions

- These results suggest that lightning-damaged trees attract wood-boring beetles
- Other common families (Cerambycidae) qualitatively showed similar patterns
- Future Research:
 - Explore how lightning-caused disturbance affects beetle diversity
 - Determine how lightning gaps differ ecologically from other gap types

Acknowledgments

Cesar Gutierrez assisted with field work. We thank the staff of the Smithsonian Tropical Research Institute for logistical assistance. This project was supported by National Science Foundation grant DEB-1354060 to SY.