

A New lineage of Lucidotini Firefly with New Genitalic structures (Coleoptera: Lampyridae)

Makayla Humphrey; Dr. Luiz Lima Da Silveira
Western Carolina University

ABSTRACT

Herein, I construct a morphological atlas that describes and compares the aedeagal parts of a potential new species within the context of the Lucidotini tribe. A phylogeny based on extensive morphological data will explore the relationships among the 3 taxa in this hypothesized new lineage and the remaining Lucidotini, to test the hypothesis that they form a clade and reveal their affinities. The three taxa investigated in this study are *Photinus armatus* from Panama, an undetermined male from Ecuador, and an undetermined male from Costa Rica.



INTRODUCTION

Lucidotini is a diverse tribe in the Lampyridae family that currently has the Phosphaenina clade as the most basal group. This study seeks to understand the placement of a new lineage in the Lucidotini tribe while testing the hypothesis that this is an early branch within the Lucidotini tribe, basal to the Phosphaenina clade. Recently studied specimens from Central and South America were found to belong to a new taxon yet to be described, which shares unusually enlarged terminal palpomeres and complex, novel genitalic structures. These genitalic characters are not only in currently undescribed species but have been found in *Photinus armatus*, which motivated this phylogenetic study under development.

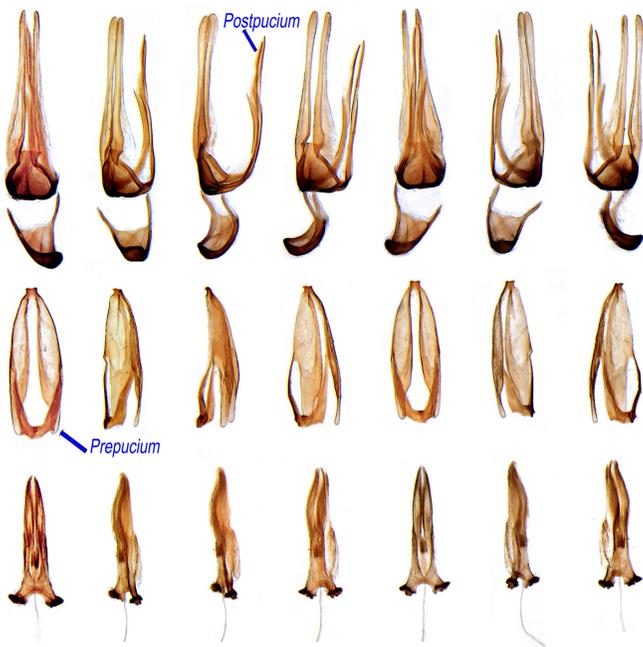


Figure 2: *Photinus armatus* dissected and imaged by Dr. Luiz Lima Da Silveira. Blue arrows label the new genital characters found on *P. armatus*.

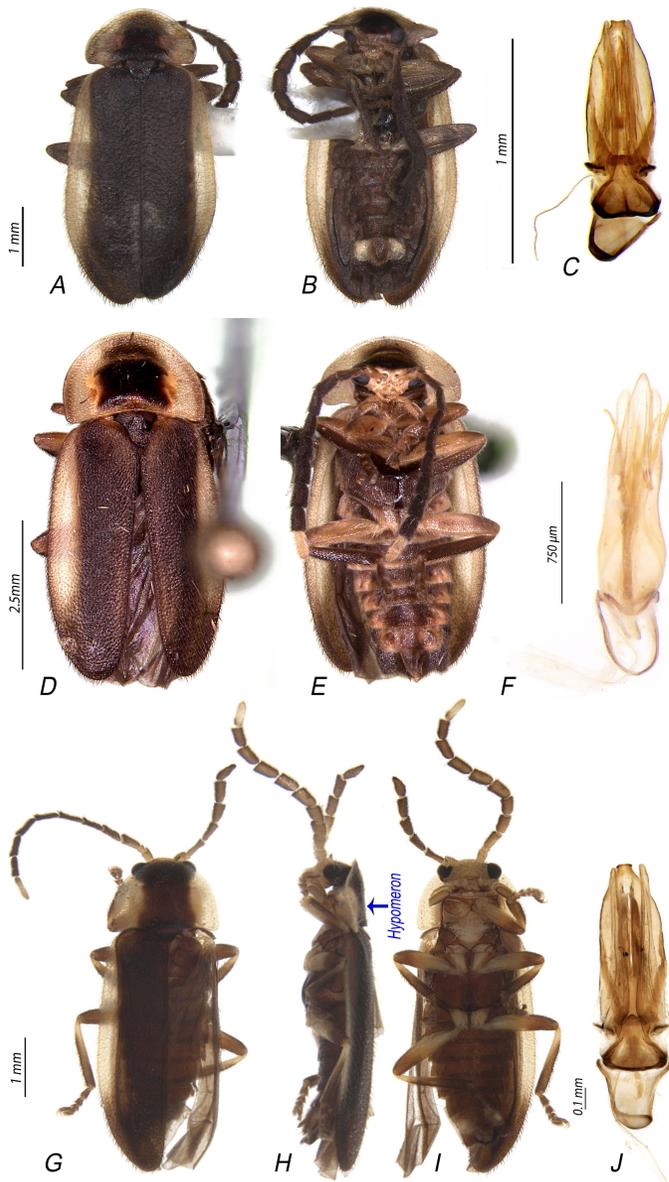


Figure 1: *Photinus armatus* (A-C), undetermined male from Ecuador: Unknown #26 (D-F), undetermined male from Costa Rica: Unknown #34 (G-I). Blue arrow labels the shallow hypomeron seen across all three specimens.



Figure 3: Abdominal plate of the undetermined male from Costa Rica.

RESULTS

This new lineage is monophyletic and is a basal lineage within the Lucidotini tribe. The characteristics that this lineage shares with the Phosphaenina clade are:

- dorsal joint in the phallus
- medially split phallus
- well-developed corners of the pygidium
- no tibial spurs

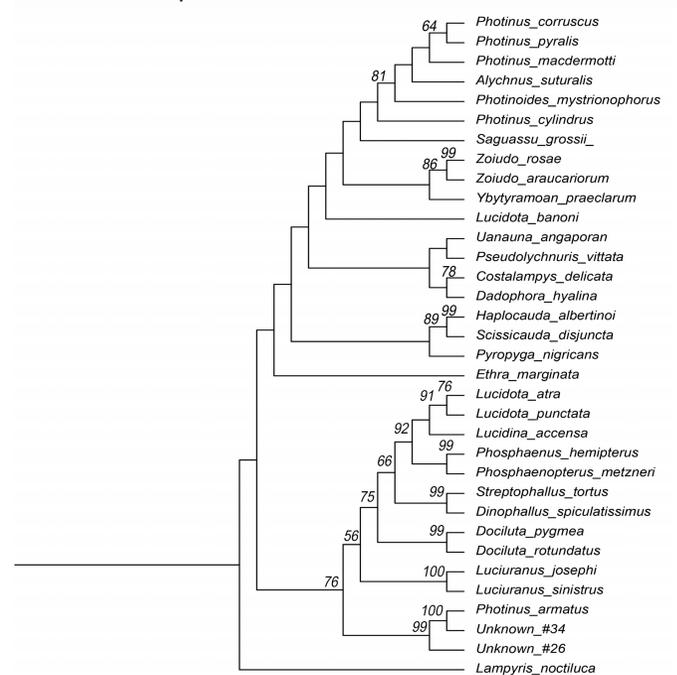


Figure 4: Maximum Parsimony with implied weights ($k=1$) with symmetric resampling support. $k=1$.

CONCLUSIONS

The lineage represented herein has proven to be a monophyletic group thus far with moderate support for its placement in the Lucidotini tribe. This study is ongoing and continues to seek taxa to further investigate the relationship of this lineage to other established clades. This lineage has likely gone unnoticed due to biases against research expeditions within the tropics, the need for revisionary work, and a lack of funding for taxonomic careers.

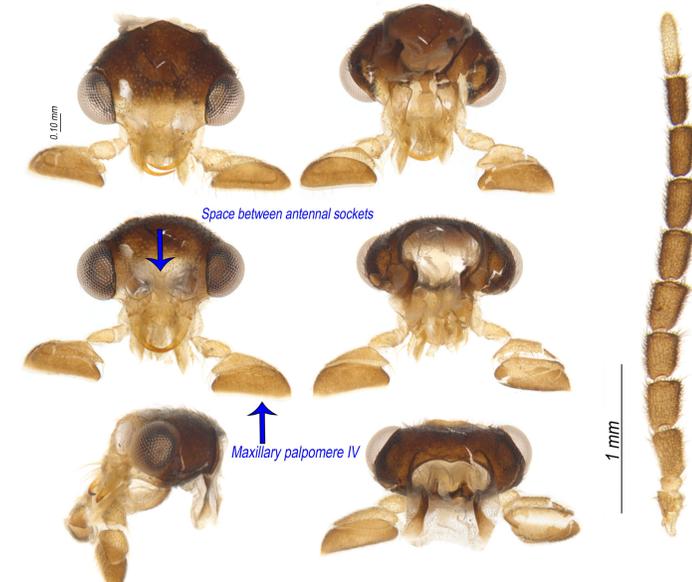


Figure 5: Head plate of the undetermined male from Costa Rica.

FUTURE WORK

- Investigate the conspecific females and larvae of this lineage.
- Continue to expand this study by adding new taxa that are representative of all neotropical lineages, and constructing a hybrid matrix with molecular characters.
- Continue to reach out to collections via email and in-person visits when possible to investigate the occurrence of this lineage.
- Further dissect and image new taxa added to this study.

ACKNOWLEDGEMENTS

We would like to thank Western Carolina University, University of Georgia, and the National Science Foundation for their continued support throughout this project. We would also like to thank Lucas Campello-Gonçalves for allowing us to use his unpublished matrix as the backbone for this project.

