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The oral examination of the doctoral thesis titled  
**The New World diversification and origins of the  
Buckeye butterflies (genus Junonia,  
Nymphalidae: Nymphalini)**

will be held on

**Tuesday, June 21, 2022 at 10:00 AM (CST)**

**See zoom link in email**

## Examining Committee

**Advisor:** Dr. Jeffrey Marcus, Biological Sciences

### Examiners:

Dr. Colin Garroway, Biological Sciences

Dr. Jillian Detwiler, Biological Sciences

Dr. Jason Gibbs, Entomology

Investigations, Invited Member

### External Examiner:

Dr. Rebecca Simmons,

Biology, University of North

Dakota

## Thesis Abstract

The New World buckeye butterflies (genus *Junonia*) are valuable experimental model organisms, but the taxonomy of this group has been problematic and contentious. I have clarified the taxonomy of the *Junonia* species in the Western Hemisphere using molecular and morphological data from contemporary and museum collections, with a focus on the South American *Junonia* species. To do this, I have developed and validated a restriction-digest based digest mode of mitochondrial genotyping for use with both contemporary and historical specimens. An improved taxonomy will encourage and support further comparative biology research in *Junonia*. I have also explored the hypothesis that *Junonia* populations in the New World comprise a ring species, but this notion is not valid as geneflow between species is ongoing and contrary to the predictions of the ring species hypothesis, no discontinuity in gene flow was detected based on mitochondrial genotype data. To clarify the relationships among *Junonia* species and address the issue of the origins of the New World *Junonia*, an extensive molecular phylogenetic analysis was completed using both full mitogenome and nuclear rRNA repeat sequences. Like previous molecular phylogenies based on much smaller data sets, the species level relationships of the New World *Junonia* were inconclusive because they were obscured by recent divergence of lineages and gene flow between species. Based on full mitogenome and rRNA repeat phylogenies, I was able to add additional support for a trans-Pacific route of Asian species responsible for the New World *Junonia* diversification, though some data suggest that genetic contributions from trans-Atlantic migrants from other *Junonia* lineages is also possible. The New World *Junonia* may be an example of lineage hybridization contributing to rapid diversification and adaptive radiation.