

Welcome to the Vesta Fiesta: Taxonomic Review of the Genus *Vesta* Laporte, 1833

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Introduction

The genus *Vesta* Laporte 1833 is a taxonomic mystery:

- Remarkably disjunct distribution with 21 Oriental and 10 Neotropical species spanning South and Central America
- Traditionally characterized by large serrate or flabellate antennae, a trait with questionable taxonomic value
- Presently diagnosed by fused labrum, a trait that supports placement in the Photurinae subfamily (see Martin et al. 2019)
- Preliminary results of an ongoing taxonomic review of the genus

Implications

- *L. bella* and *L. discolor* should be moved to *Vesta* due to similarity in aedeagus and pygidium traits (including ejaculatory duct poking through ventral plate, a trait common to all *Vesta*)
- *V. rubricollis*, a junior synonym to *V. thoracica*, should be resurrected as a separate species due to differences in morphology, size, and distribution (Central vs. South America)
- *L. bella*, *V. thoracica*, and *V. rubricollis* are distinguishable by antennae and pronotum traits
- Preliminary results suggest two distinct clades of Neotropical *Vesta*, the “True *Vesta*” (morphologically similar to Oriental *Vesta*; shown below), with wider distributions and a separate “Novel” clade with narrower distributions and distinct morphologies (see maps)

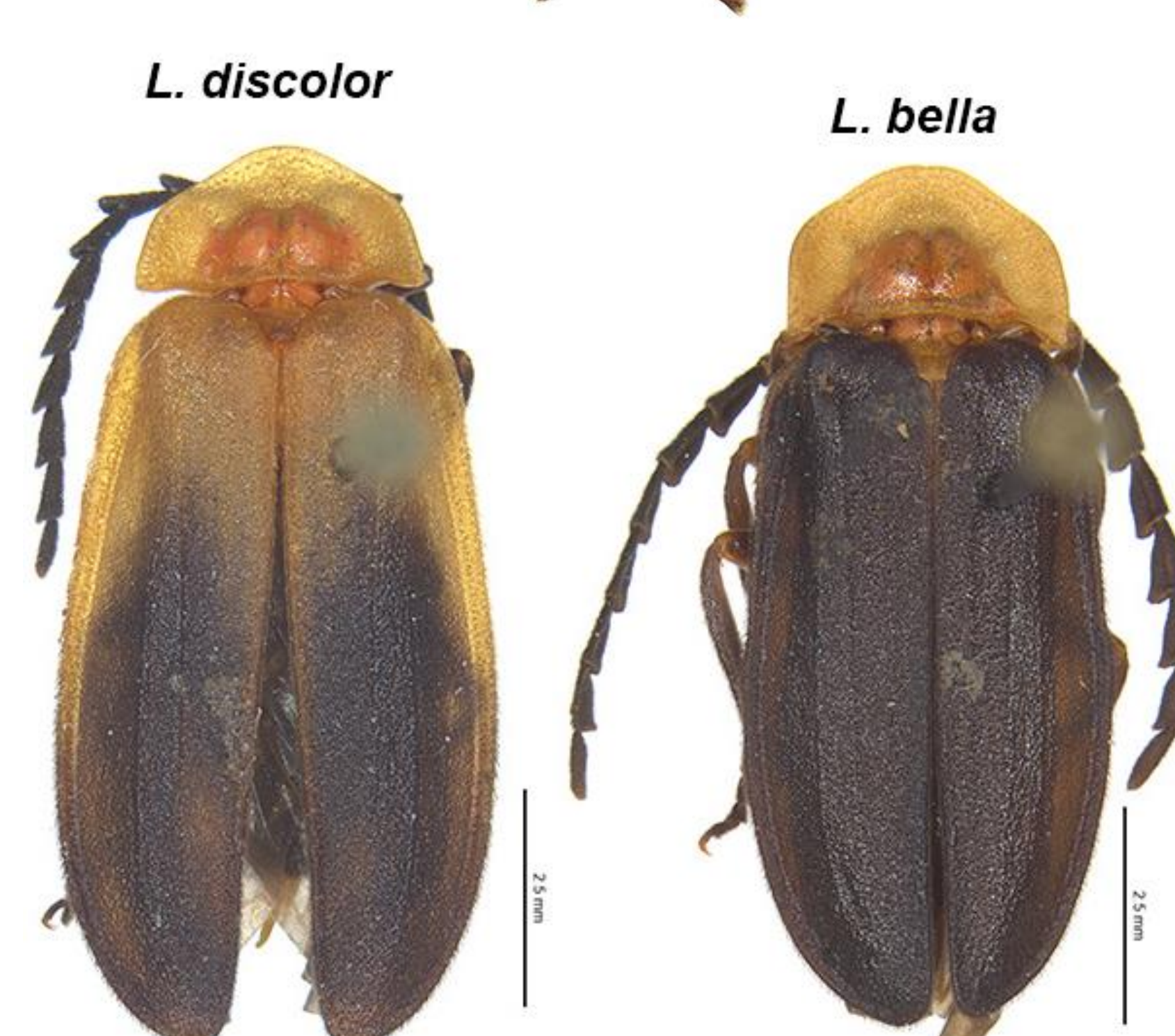
Materials and Methods

- Terminology follows Vaz et al. 2020
- Dominion shapefile from Morrone 2014

200 specimens examined from the following collections: Smithsonian Institution's National Museum of Natural History (USNM; M. Branham), University of Florida (UOF; M. Branham), University of Georgia Collection of Arthropods (UGCA; J. McHugh), NC State University Insect Museum (NCSU; R. Blinn), Florida State Collection of Arthropods (FSCA; P. Skelley), Louisiana State Arthropod Museum (LSAM; V. Bayless), California Academy of Sciences (CAS; C. Grinter)

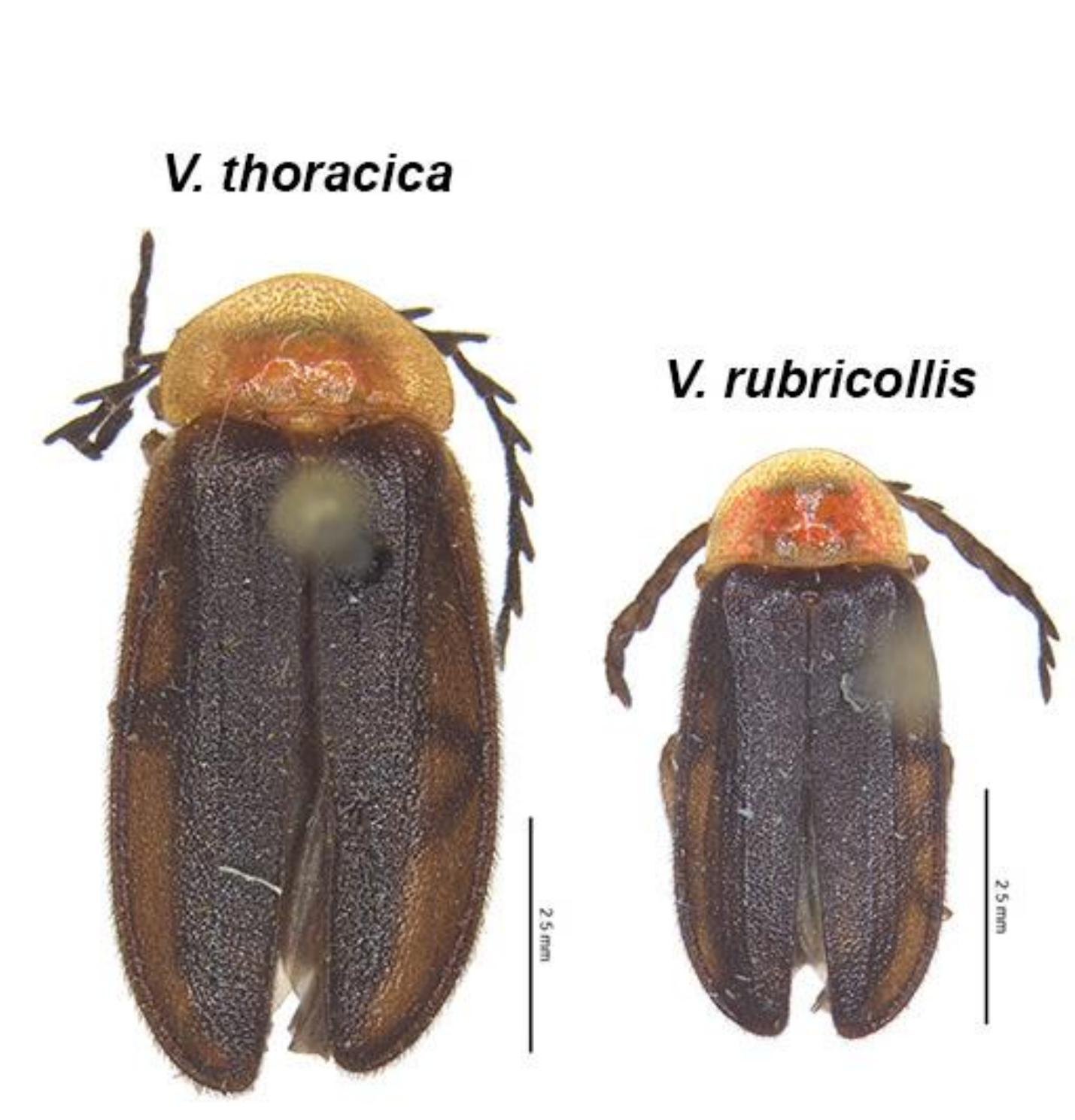
Comparison of “True” *Vesta* Species

Fig 1: Morphological comparison of “True *Vesta*”, including the type species, *V. chevrolati*: head, pronotum, scutellum, pygidium, sternal VIII, aedeagus, and antennae



L. bella and *L. discolor* are currently in the genus *Lucidota*, but should be moved to *Vesta*. Similarities include:

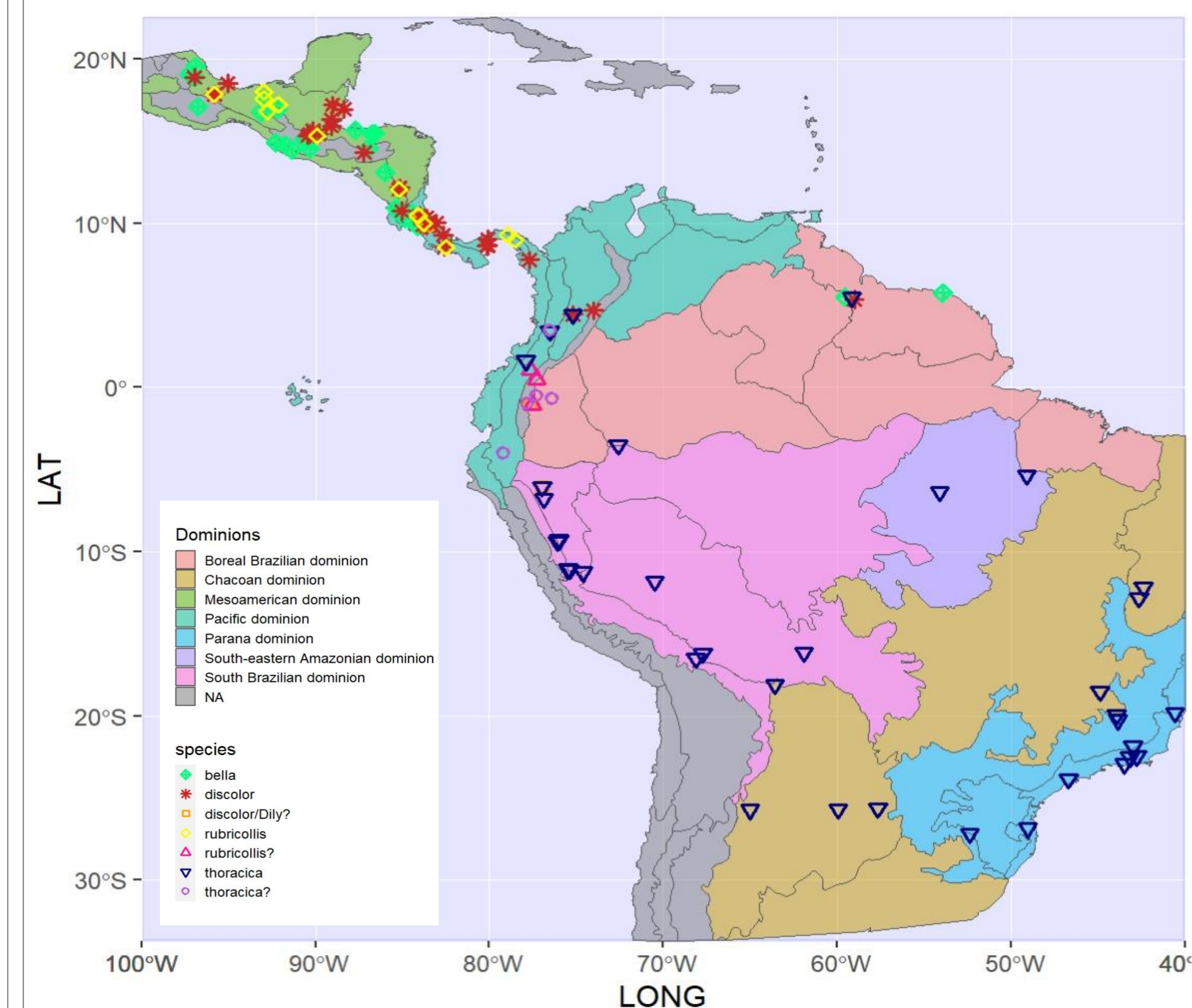
- Ejaculatory duct poking through the ventral plate of the aedeagus (a novel trait found across *Vesta*)
- Pygidium shape, pronotum shape, and a fused frons/labrum



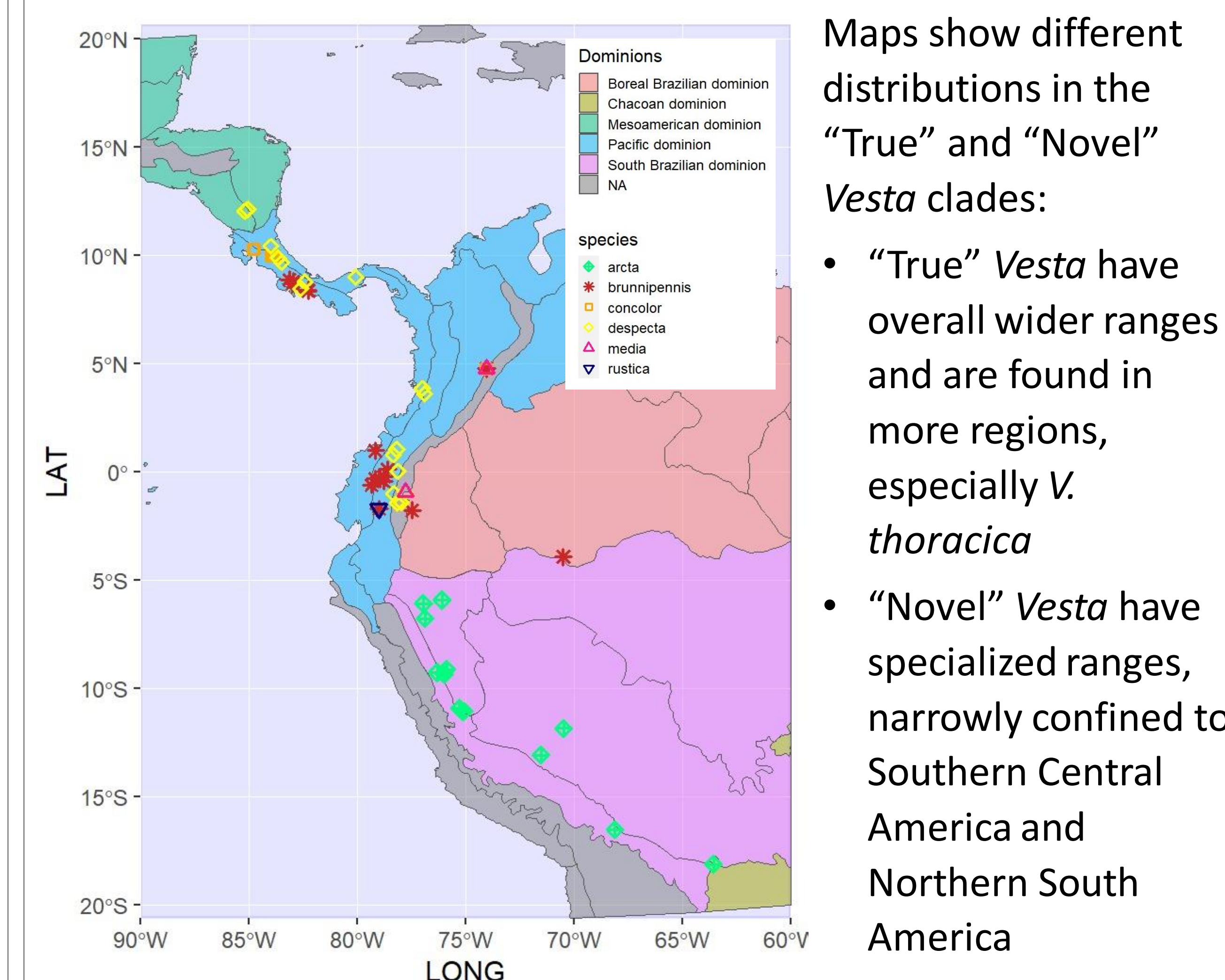
V. thoracica and *V. rubricollis* are currently synonymized, but *V. rubricollis* should be resurrected as a separate species. Differences include:

- Morphological differences (terminalia, pronotum, antennal sockets, and flabellae)
- Size (*V. rubricollis* is consistently much smaller than *V. thoracica*)
- Distribution (*V. rubricollis* is consistently in Central America, while *V. thoracica* is spread throughout South America, see Map 1)
- Both species distinguishable from *L. bella* by flabellate antennae (vs. serrate) and thinner pronotums

Map 1: “True” *Vesta*: wider, generalist distributions



Map 2: “Novel” *Vesta*: narrower, specialist distribution



Maps show different distributions in the “True” and “Novel” *Vesta* clades:

- “True” *Vesta* have overall wider ranges and are found in more regions, especially *V. thoracica*
- “Novel” *Vesta* have specialized ranges, narrowly confined to Southern Central America and Northern South America