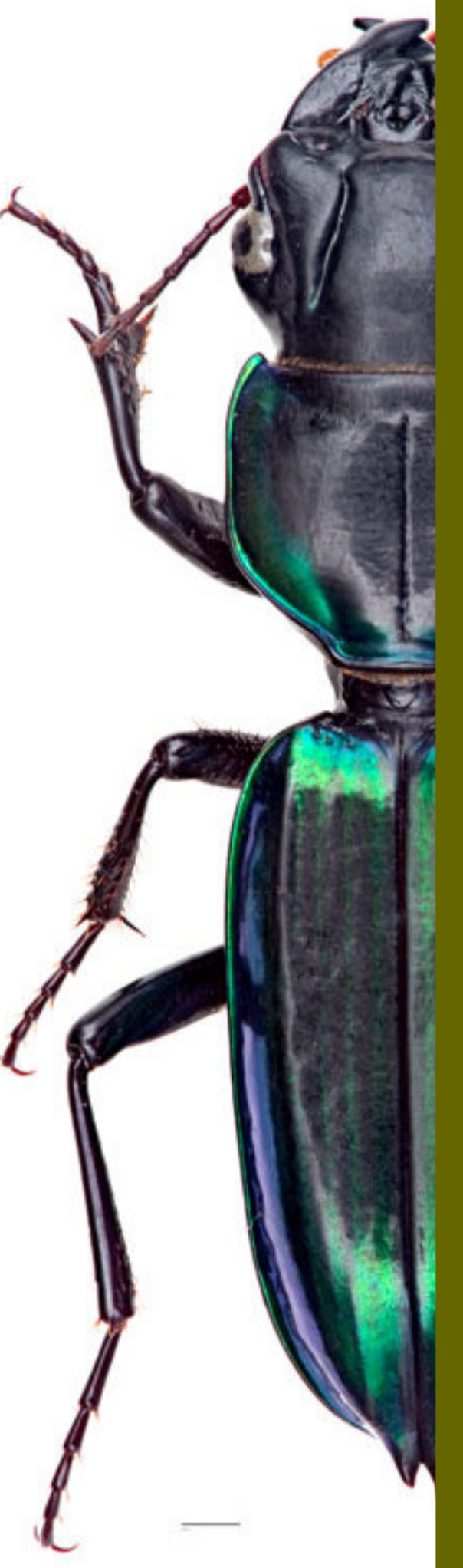
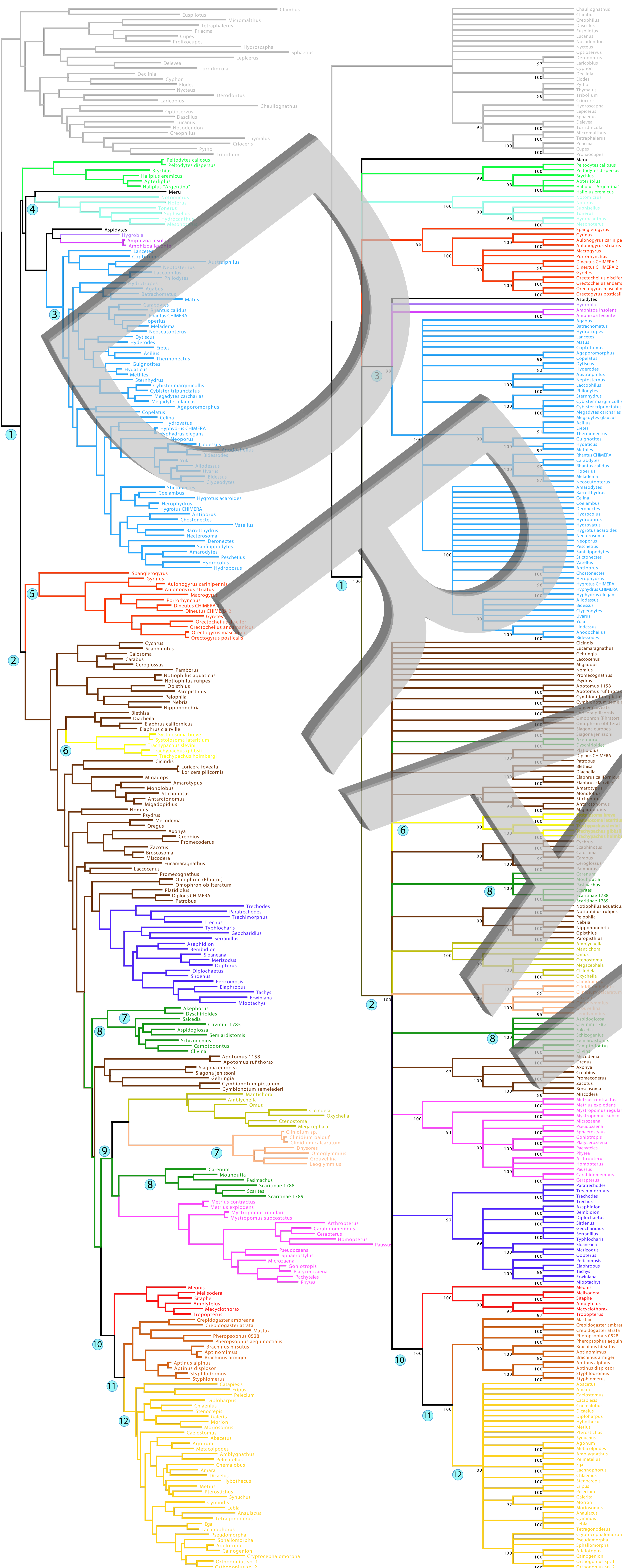


Phylogeny of Adephaga



Maximum Likelihood tree

Maximum Likelihood Bootstrap tree



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OVERVIEW

As part of the NSF-funded Beetle Tree of Life (BToL) project, we are re-examining the phylogeny of major lineages of the beetle suborder Adephaga, using six genes. Our results confirm some results from previous studies (i.e., trachypachines within Geadephaga). Two of the more notable results are the continued presence of a cicindelinae-rhysodine-paussine-scaritine clade, even with additional gene sampling, and clear refutation of the proposal that rhysodines are related to Salcediina.

METHODS

Maximum likelihood searches of a concatenated matrix of six gene fragments (18S, 28S, argK, wg, CAD2 and CAD4) and 291 terminal taxa were performed to infer Adephaga phylogeny using RAxML. Here we present the preferred tree with branch lengths and the result of our bootstrap analysis (1000 reps).

RESULTS

Higher-level relationships

- 1 Adephaga monophyletic
- 2 Geadephaga monophyletic

Relationships within Hydradephaga

- 3 Dysticidae monophyletic, in clade with Amphizoidae, Hygrobiidae, and Aspidytidae
- 4 *Meru* sister to Noteridae but weakly supported
- 5 Hydradephaga excluding Gyrinidae monophyletic in this analysis, but the placement of Gyrinidae is unclear

Relationships within Geadephaga

- 6 Trachypachines are placed as an early branching group of Geadephaga but exact placement varies depending upon the analysis. In analyses where nuclear protein coding genes or ArgK are removed they are placed as sister to rest of Geadephaga. However, this placement not strongly supported.
- 7 Rhysodines are implicated in the CRPS quartet (see 9 below) and there is no support for a relationships to *Salcedia*, which is confidently placed as a clivinine
- 8 Scaritinae is not monophyletic
- 9 CRPS quartet (Cicindelinae, Rhysodinae, Paussinae, and Scaritini) is found but weakly supported in this analysis, and is not found in all analyses
- 10 The relationship of (Moriomorhini (Brachininae, Harpalinae)) is well supported in this ML analysis, but only weakly supported in other analyses
- 11 Brachinini monophyly and its sister-group relationship to Harpalinae are strongly supported.
- 12 Harpalinae is monophyletic with strong support

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