

## SL 701

Phylogeny of the tribe Trypetini (Diptera: Tephritidae): testing morphological hypotheses based on molecular data

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Based on a comparative morphological study of world-wide taxa, the tribe Trypetini is narrowly delimited as a monophyletic group with two newly defined subtribes, Trypetina and Chetostomatina. A total of 285 species in 29 genera of Trypetina and 69 species in seven genera of the Chetostomatina are recognized. The species of Trypetini have been previously placed in many loosely defined genera of the subfamily Trypetinae. This confusion has largely been clarified by this study through phylogenetic analysis of the majority of nominal taxa. A key to genera and monophyletic demarcations of supraspecific taxa are also provided.

The subtribe Trypetina includes all the known leaf-mining tephritids and some other tephritids of different larval feeding behavior, including stem-mining, fruit-feeding, seed-feeding, and leaf-petiole mining. I believe that the majority of genera are defined reasonably but the relationships among many of them are still unresolved. All the known leaf-mining genera except *Hoplandromyia*, *Euleia* and *Pseudhemilea* are included within a single monophyletic group (the *Trypeta* group). Another monophyletic group includes *Chenacidiella*, *Vidalia*, and *Hoplandromyia*, (the *Vidalia* group). The subtribe Chetostomatina includes seven genera, whose larvae are mostly fruit-feeders. Except for the Neotropical genus *Parastenopa* and an unnamed new genus, the Chetostomatina is further characterized by an unusual sagittally flattened and ventrally serrate aculeus tip.

Some of the above morphological hypotheses were also tested using mitochondrial 16S ribosomal RNA gene. Phylogenetic information was extracted from this data set using neighbor-joining and maximum parsimony methods and compared to a phylogenetic hypothesis proposed from the morphological literature. My molecular data positively confirmed the following relationships: (1) monophyly of the tribe Trypetini ; (2) monophyly of the *Chetostoma* group; (3) monophyly of the *Trypeta* group; and (4) non-monophyletic nature of the previous concept of *Hemilea*. I suggest that more sensitive genetic markers with less A+T bias are needed to bring about finer resolution within the tribe Trypetini, and additional tephritid lineages should be sampled to identify the sister-group relationship of the tribe Trypetini.