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(Diptera: Diopsoidea)**

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A revision of the family Syringogastridae (Diptera: Diopsoidea)

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Abstract

The New World family Syringogastridae (Diptera, Acalyptratae) with the single genus *Syringogaster* is revised. Eleven new extant species are described in four newly recognized species groups to give a total of 20 extant species (*S. brachypecta*, *S. apiculata* and *S. tenuipes* in the *rufa*-group; *S. atricalyx*, *S. figurata*, *S. plesioterga*, and *S. dactylopleura* in the *figurata*-group; and *S. nigrithorax*, *S. brunneina*, *S. sharkeyi* and *S. palenque* in the *brunnea*-group; Marshall & Buck are the authors of all extant new species). The *craigi*-group includes two new fossil species, *S. miocenecus* Grimaldi and *S. craigi* Grimaldi, each described on the basis of a unique Miocene (ca. 17 myo) amber specimen from the Dominican Republic. Morphological and molecular characters are used to estimate phylogenetic relationships among species of Syringogastridae, and between Syringogastridae and related diopsids. The fossil species appear to form the sister group to the Central and South American *figurata* group, and reveal Antillean extinction of the family from earlier in the Tertiary.

Key words: Diptera, Syringogastridae, *Syringogaster*, Diopsidae, revision, phylogeny, key

Introduction

The Syringogastridae is a highly distinctive Neotropical family of ant-like flies characterized by a petiolate abdomen, a long and collar-like prothorax, a swollen and spinose hind femur, and reduced head chaetotaxy. Prado (1969) described the family for nine species in the single genus *Syringogaster* Cresson, six of which were new species he described from Brazil. Two of the remaining three species (*S. brunnea* Cresson, *S. rufa* Cresson) were known definitively only from Central America. The other species tentatively included in the family by Prado (1969) was *Megamerina fulvida* Bigot, known only from the type, which was not examined by Prado. This species is here transferred to the Richardiidae as *Odontomera fulvida* (Bigot), **new combination**. Feijen (1989) described an additional species (*Syringogaster subnearctica*) from Mexico, and made a detailed case for a sister-group relationship between the Syringogastridae and the Centricidae Feijen, 1983, the latter of which is currently considered to be part of the Diopsidae (Meier & Hilger, 1999; Baker *et al.* 2001; Meier & Baker, 2002; Kotrba, 2004). In the present revision eleven new extant species are described, and two new species are described from Miocene amber of the Dominican Republic.

The late G.C. Steyskal was working towards a revision of the family prior to his death in 1996. Many of the specimens labeled by Steyskal as types of new species were destroyed by dermestid beetles, but where possible we have used Steyskal's manuscript names and species concepts.

Distribution: The genus *Syringogaster* occurs throughout tropical areas of the Neotropical region with exception of the Antilles, from which they are known only through the fossil record (Dominican amber). The northernmost extant record is from Tamazunchale, San Luis Potosí, Mexico (see under *S. subnearctica*), the southernmost record is from Eldorado, Misiones, Argentina (an unassociated female similar to *S. carioica*, AMNH).

Biology: Almost nothing is known about the biology of Syringogastridae, and the larvae remain unknown. We have attracted specimens to low foliage sprayed with diluted maple syrup in Costa Rica and we have observed apparent mating aggregations of *S. rufa* on the upper surfaces of broad leaves on the Osa Peninsula of Costa Rica. Females observed in mating aggregations had swollen abdomens, possibly replete with honeydew, and we have seen various species at extrafloral nectaries. Adult *Syringogaster* are frequently found on broadleaved foliage in small openings in primary rainforest, sometimes on the undersides of leaves. When disturbed they hover for brief periods in a characteristic flight pattern similar to that we have noted for *Asteia beata* Aldrich (Asteiidae) in North America, and then return to the leaf surface. As noted by Papavero (1964), syringogastrids walking on leaves are strikingly similar to ants (especially *Pseudomyrmex* Lund) that often occur on the same leaf surfaces. They resemble ants in movement, size and shape (with the latter similarity enhanced by wing pigmentation), and can be difficult to distinguish from ants until they take flight.

Although relatively rare in collections, syringogastrids can be locally abundant and often occur in multi-species assemblages. We recently observed large numbers of *S. brunneina* on low, lush vegetation flanking a