



A revision of the Neotropical caddisfly genus *Rhyacopsyche*, with the description of 13 new species (Trichoptera: Hydroptilidae)

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Abstract

The Neotropical genus *Rhyacopsyche* Müller, 1879, was last reviewed in 1971 when 5 species were known. Since that time, the genus has gradually grown to 13 species: *R. andina* Flint, 1991 (Colombia, Peru, Venezuela), *R. chichotla* Bueno & Hamilton, 1986 (Mexico), *R. duplicispina* Flint, 1996 (Tobago), *R. hagenii* Müller, 1879b (Argentina, Brazil, Uruguay), *R. jimena* Flint, 1991 (Colombia), *R. matthiasi* Flint, 1991 (Colombia), *R. mexicana* (Flint, 1967) (Costa Rica, Guatemala, Mexico, Nicaragua), *R. mutisi* Mey & Joost, 1990 (Colombia), *R. obliqua* Flint, 1971 (Mexico), *R. peruviana* Flint, 1975 (Ecuador, Peru), *R. torulosa* Flint, 1971 (Costa Rica, Guatemala), *R. turrialbae* Flint, 1971 (Costa Rica), and *R. yatay* Angrisano, 1989 (Argentina). Thirteen new species are described and illustrated: *R. benwa* (Bolivia, Ecuador, Peru), *R. bulbosa* (Brazil), *R. colei* (Venezuela), *R. colombiana* (Colombia), *R. colubrinosa* (Ecuador, Peru), *R. dikrosa* (Brazil), *R. flinti* (Venezuela), *R. hasta* (Peru), *R. intraspira* (Peru), *R. otarosa* (Venezuela), *R. patulosa* (Brazil), *R. rhamphisa* (Colombia, Costa Rica), and *R. tanylobosa*. (Ecuador, Peru, Venezuela). The distribution of *Rhyacopsyche* is widened to include Bolivia and Nicaragua. Detailed illustrations are presented for all species as well as diagnoses, descriptions, and a taxonomic key.

A species level phylogenetic analysis using PAUP* 4.0b 10 was performed. A heuristic search was conducted based on 20 morphological characters of the male genitalia, with species of *Ochrotrichia* and *Metrichia* used as outgroups. A strict consensus of 23 equally parsimonious trees is presented. The analysis revealed 3 characters supporting the monophyly of *Rhyacopsyche*. The monophyly of 1 of the 2 previously established species groups, the *turrialbae* group, is supported.

Key words: Trichoptera, Hydroptilidae, Ochrotrichiini, *Rhyacopsyche*, new species, Neotropical, taxonomy, revision, key, phylogeny

Introduction

The caddisflies known as the Hydroptilidae comprise a cosmopolitan family of 68 genera and at least 1700 described species (Morse 2006). Virtually all hydroptilid larvae exhibit a type of hypermetamorphosis in that the 1st–4th larval instars are free-living and morphologically distinct from the case-constructing 5th instar (Marshall 1979). The family consists of 2 subfamilies, the more ancestral Ptilocolepinae and the more derived Hydroptilinae, the latter containing the vast majority of species. The Hydroptilinae is further divided into 6 tribes; the genus *Rhyacopsyche* is placed in the tribe Ochrotrichiini along with *Metrichia*, *Ochrotrichia* (Marshall 1979), and *Paratrachia* (Angrisano 2002). Angrisano (1995) created the subgenus *Paratrachia* to include *Ochrotrichia* (*P.*) *cebollati*. After *Ochrotrichia* and *Metrichia* were raised to generic level (Wiggins 1996, Flint & Bueno 1998) Angrisano (2002) also raised *Paratrachia* to generic status. These 4 genera possess a mesoscutellum with a transverse suture, a metascutellum that is pentagonal or convexly subtriangular, 3 ocelli, and male genitalia with an inferior appendage that is generally well developed and elongate (Marshall 1979, Angrisano 1995). Harris & Armitage (1997) also include *Nothotrichia*, *Maydenoptila*, and *Caledonotrichia* in Ochrotrichiini but provided no data to support this classification.

Rhyacopsyche larvae construct a purse case often partially covered with sand grains, with or without a long silken attachment stalk (Flint 1991). The pupal cases are rigidly attached to substrate by a short stalk or held to the substrate along the ventral border (Angrisano 2002). A few species, *R. hagenii*, *R. mutisi* and *R. mexicana* construct a long thread to anchor their case to the substrate; however, *R. yatay* lacks this attachment stalk and also differs in possessing 2 dorsal openings (Angrisano 2002). A few cases with long attachment stalks from Brazil examined during this study revealed larvae of an undetermined genus most likely belonging