



## Taxonomic revision of *Rhyacophila aquitanica* (Trichoptera: Rhyacophilidae), based on molecular and morphological evidence and change of taxon status of *Rhyacophila aquitanica* ssp. *carpathica* to *Rhyacophila carpathica* stat. n.

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### Abstract

A taxonomic revision of *Rhyacophila aquitanica carpathica* Botoșaneanu, 1995, is proposed based on molecular results and previously described morphological differences. Genitalia of *R. aquitanica* McLachlan, 1879, and *Rhyacophila carpathica* Botoșaneanu stat. n. are redrawn here to facilitate the distinction of the two entities. While the morphological and ecological characteristics of the two species show many similarities, the nucleotide sequences of the two species are very different, even when compared to those of *Rhyacophila tristis* Pictet, 1834, suggesting a distant allopatric speciation event.

**Key words:** allopatric speciation, sister species, Massif Central, Carpathians, mountain species

### Introduction

The *Rhyacophila tristis* Group sensu Schmid (1970) is one of the few exclusively European species groups of *Rhyacophila* (Kumanski 1998). The Group is characterized by a high number of species with restricted areas of distribution. Only a few species of the Group (like *R. tristis*) have large distribution areas. The *R. tristis* Group is represented by 18 known species and a subspecies, but recent descriptions of new species (e.g., Sipahiler 1996, Kumanski 1998), some with restricted distributions, suggest that the Group may be even more species-rich.

*Rhyacophila aquitanica* McLachlan, 1879, was described from a male; the female and larva are still poorly known at present. The strong similarities of *R. aquitanica* and *R. tristis* females were noted by Malicky (2004). There are several works addressing differences between the larvae of the two species (referenced by Pitsch 1993), but their distinction is still problematic (Waringer & Graf 1997). Consequently, the correct determination of *R. aquitanica* and *R. tristis* females and larvae has proven problematic over the years, resulting in a number of misidentifications. However, the morphological differences in the male genitalia of *Rhyacophila aquitanica* and *R. tristis* were clearly described by Schmid (1970), such that the distinction of the males of these two species can be accomplished without mistakes. Botoșaneanu (1995) expressed doubts concerning the identity of Carpathian populations of *R. aquitanica* and described the subspecies *R. aquitanica carpathica* based on shape differences of the 10th abdominal segment among western European and Carpathian populations. Botoșaneanu provided drawings of the male genitalia based on the holotype of *R.*