



A reevaluation of the generic limits of *Pnigalio* Schrank (Hymenoptera: Eulophidae) based on molecular and morphological evidence

MARCO GEBIOLA^{1,2,4}, UMBERTO BERNARDO² & ROGER A. BURKS³

¹Dipartimento di Entomologia e Zoologia Agraria, Università degli studi di Napoli "Federico II", Via Università 100 - 80055 Portici, Napoli, Italy. E-mail: marco.gebiola@unina.it

²CNR - Istituto per la Protezione delle Piante - Sezione di Portici, Via Università 133 - 80055 Portici, Napoli, Italy. E-mail: bernardo@ipp.cnr.it

³Department of Entomology, University of California, Riverside, CA 92521, United States. E-mail: burks.roger@gmail.com

⁴corresponding author

Abstract

Ratzeburgiola Erdős is a small but phylogenetically interesting genus exhibiting a combination of characters once used to define both the former tribes Elachertini and Eulophini of the subfamily Eulophinae (Hymenoptera: Chalcidoidea: Eulophidae). It was once classified in the tribe Elachertini with genera having scutellar grooves and complete notauli, but in some characters it resembles the genus *Pnigalio* Schrank from the former tribe Eulophini. As part of a revision of *Pnigalio* we investigated the phylogenetic relationships between *Ratzeburgiola* and *Pnigalio* using both morphological and molecular data. Based on our results we synonymize *Ratzeburgiola* under *Pnigalio* **n. syn.**, transfer its two included species to *Pnigalio* as *P. cristatus* (Ratzeburg) **comb. n.** and *P. incompletus* (Bouček) **comb. n.**, and reassess the phylogenetic and taxonomic value of morphological characters traditionally considered important at the genus level.

Key words: Chalcidoidea, Eulophinae, *Ratzeburgiola*, phylogeny, synonymy, taxonomy

Introduction

Ratzeburgiola Erdős, 1958 (Hymenoptera: Eulophidae) is a small genus erected for a remarkable species that showed affinities with both the subfamilies Elachertinae and Eulophinae. It currently consists of the type species, *R. cristata* (Ratzeburg), and *R. incompleta* Bouček in Europe, but based on our study there is a third, undescribed species in the Nearctic region. Erdős (1958) considered that the species he designated as the type species of his new genus was the same as *Entedon cristatus* Ratzeburg (1848), though his identification was questioned by Askew (1967, 1968). The type of *E. cristatus* is lost and Thomson (1878) had previously transferred the name to *Elachertus* Spinola and synonymized it with *Elachertus inunctus* Nees. According to Bouček and Askew (1968) the synonymy of *Entedon cristatus* with *Elachertus inunctus* cannot be excluded, but in any case *E. cristatus sensu* Erdős is different from *E. inunctus*.

Ratzeburgiola cristata possesses complete notauli (notaular or parapsidal furrows in Bouček 1959 and 1969, see Gibson 1985 and Menke 1993 for a comprehensive discussion of the taxonomic confusion regarding this morphological feature), which was once used as justification for placing *Ratzeburgiola* in the Elachertini along with other eulophines having complete notauli. However, Erdős' description (1958) of *R. cristata* states that the first three funicular segments of the male antennae are branched, which is a trait more commonly found in Eulophini *sensu* Bouček (1988).

Erdős (1958) considered *Ratzeburgiola* to be very close to *Elachertus*, and therefore placed it in the tribe Elachertini. Bouček and Askew (1968) stated that *Ratzeburgiola* "is an intergrade between Elachertinae and Eulophinae," but Askew (1968) keyed *Ratzeburgiola* within genera of Elachertinae, which was considered a separate subfamily at the time. Bouček (1988) reduced Elachertinae to tribal status within Eulophinae, citing a