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The Larvae of European Ascalaphidae (Neuroptera)

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Abstract

The larvae of all the European genera of Ascalaphidae are compared for the first time, highlighting the differential characters for identification purposes. The larva of the genus *Ascalaphus* is described for the first time while those of *Puer*, *Bubopsis* and *Deleproctophylla* are deeply revised. Actually, the larvae of *Ascalaphus festivus* (Rambur), *Puer maculatus* (Olivier), *Bubopsis agrionoides* (Rambur), *Deleproctophylla australis* (Rambur), *Libelloides latinus* (Lefebvre), *Libelloides corsicus* (Rambur) and *Libelloides siculus* (Angelini) are described or accurately depicted for the first time. The known larvae of the genus *Libelloides* are reviewed.

Key words: Myrmeleontiformia, larval morphology, identification, Mediterranean, Western Palaearctic

Introduction

The family Ascalaphidae comprises the most visually remarkable members of the order Neuroptera due to large dimensions, aerial predatory behaviour and dragonfly-like (or even butterfly-like) habits, allowing an immediate recognition also for occasional observers. Otherwise they are one of the more poorly known families of the order in respect to biology, ecology and especially larval morphology. This discrepancy appears particularly noteworthy considering that it is a fairly large family (ca. 430 species) widely distributed in tropical and temperate areas of the world (U. Aspöck & H. Aspöck 2007). The most comprehensive modern accounts on ascalaphid larvae are a series of works by Henry (1976, 1977, 1978a, 1978b), mostly dealing with the American fauna and Tjeder (1992), who described a considerable number of African larvae but he was unfortunately unable to associate them with the respective species. The state of knowledge of the larvae of European species is surprisingly poor and inadequate, as only two recent studies exist: Rousset (1973), comparing three *Libelloides* species, and Pieper & Willmann (1980), on the larvae of some Balkan taxa. Older accounts on the larvae, such as Hagen (1873), van der Weele (1909) and Navás (1915), despite offering interesting insights, are often inaccurate and the identifications are not rarely doubtful or wrong. The insufficient knowledge of the larvae is also a serious obstacle to understand the reciprocal relationship within Ascalaphidae and related families, as larval morphology has a fundamental role in the phylogeny and classification of Neuroptera (U. Aspöck 1992; U. Aspöck *et al.* 2001; Beutel *et al.* 2010; Winterton *et al.* 2010).

The aim of this research, the result of three years of field samplings, is providing for the first time comparative descriptions and an identification key to all the European genera of Ascalaphidae, including some poorly known and rare species.

Material and methods

Ascalaphid larvae are notably difficult to find in the field due to their camouflaging behaviour and low population densities, therefore most species were obtained from eggs laid in captivity by field-collected adult females.

questioned and an accurate study of larval characters is potentially an important clue to solve these problems. A clear example is represented by the *Libelloides ictericus*-group: most authors considered *L. corsicus* and *L. siculus* as subspecies of *L. ictericus* exclusively on the similar pattern of the wings (McLachlan 1876; van der Weele 1909; H. Aspöck *et al.* 1976; H. Aspöck *et al.* 1980; H. Aspöck *et al.* 2001). The noticeable differences between the larvae of these three species, comparable to those observed in other congeners, undoubtedly warrant them a specific status as also confirmed by biogeography. Finally, larval biology and ecology still remain poorly known topics in great need of accurate investigations in the field.

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