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Morphology and identification of the pupae of several species of soil-dwelling broad-nosed weevils from Central Europe (Coleoptera, Curculionidae, Entiminae)

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Abstract

The pupae of *Otiorhynchus* (*Arammichnus*) *dieckmanni* Magnano, 1979, *O.* (s.str.) *tenebricosus* (Herbst, 1784) form *lugdunensis* Boheman, 1843, *Peritelus sphaeroides* Germar, 1824, *Strophosoma* (*Neliocarus*) c.f. *sus* Stephens, 1831 and *Tanymecus* (s. str.) *palliatus* (Fabricius, 1787) are described and illustrated for the first time. The pupae of *Barypeithes* (*Exomias*) *pellucidus* (Boheman, 1834), *Brachyderes* (s. str.) *incanus* (Linnaeus, 1758), *Liophloeus* (s. str.) *tessulatus* (Müller, 1776), *Phyllobius intrusus* Kôno, 1948 (= *Parascythopus exsulans* Heijerman & Magnano, 2000) and *Phyllobius* (s. str.) *pyri* (Linnaeus, 1758) are redescribed and illustrated. Characteristic features including chaetotaxy, habitus and measurements are given. Pupae of the genera *Peritelus*, *Strophosoma*, and *Tanymecus* are described for the first time. Keys to the pupae of 14 genera of broad-nosed weevils, and to several species of *Phyllobius* and *Otiorhynchus* are also presented.

Key words: Coleoptera, Curculionidae, broad-nosed weevils, morphology, chaetotaxy, pupa, key, species and generic identification

Introduction

Curculionidae (sensu stricto) include circa 48.000 species and aside from Staphylinidae are one of the most speciose animal families (Anderson 1993, 1995; Grebennikov & Newton 2009). The globally distributed subfamily Entiminae (broad-nosed weevils) is the largest curculionid group and includes 55 tribes (21 in Europe) such as Otiorhynchini, Peritelini, Phyllobiini, Polydrusini, Sitonini and Tanymecini (Morris 1997, Alonso-Zarazaga & Lyal 1999, Alonso-Zarazaga 2012).

In adult weevils, the presence of a broad rostrum (short nose), usually with robust mandibles and scars left by deciduous mandibular processes, is the best recognizable feature of this subfamily (Anderson 2002, Marvaldi & Lanteri 2005). Entiminae are characterized by a large diversity in body size, flight ability, time of activity and host plant use. Many Entiminae are habitat specialists of xerothermic grasslands and steppe biotopes (especially many small-sized species), coastal cliffs, mountain biotopes or different forest types. A relatively small number of species can be found in anthropogenic habitats such as nurseries, tree nurseries, gardens and cultivated fields, and some of these are known as serious pests being the subjects of a rather large number of studies (e.g. Mühle & Fröhlich 1951; Bogs & Braasch 1988; Schroeder et al. 1995; Van Tol et al. 2004; Sprick 2012a; Sprick & Stüben 2012).

The vast majority of broad-nosed weevils are polyphagous. Oligophagous species are rare (but frequent in Sitonini), and monophagous species are an exception. Their mode of larval feeding is similar; usually larvae live in the soil and feed from tender or even stronger roots, where some also may hide in cavities derived from feeding. A few species enter the roots or root nodules (*Sitonini*). Pupation takes place in the soil.

In some species the overwintering stage can be the adult, larva or both, egg and adult or egg, larva and adult or - in *Charagmus griseus* (Fabricius, 1775) - can comprise all stages (Dieckmann 1980). Most of the species have

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chance to use the rearing cages in the climate chamber. A perfect care of plants and weevils was realized by Kerstin Könnecke, Sabine Schamlott and Dr. Ursula Baur.

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