



Descriptions of mature larvae and pupae of the genus *Larinus* (Coleoptera: Curculionidae, Lixinae)

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Abstract

Descriptions of mature larvae of four species of the genus *Larinus* Dejean, 1821 are given: larvae of *L. (Larinomesius) obtusus* Gyllenhal, 1835 and *L. (Phyllonomeus) turbinatus* Gyllenhal, 1836 are described for the first time, and larvae of *L. (s. str.) pollinis* (Laicharting, 1781) and *L. (Phyllonomeus) sturnus* (Schaller, 1783) are described for the first time in detail. A revised identification key for the mature larvae and a new key for pupae are presented.

Key words: taxonomy, morphology, larva, pupa, chaetotaxy, key, Coleoptera, Curculionidae, Lixinae, *Larinus*, Palearctic region

Introduction

The curculionid genus *Larinus* Dejean, 1821, belonging to the tribe Lixini Schoenherr, 1823, includes approximately 180 species (Csiki 1934; Ter-Minassian 1967; Gültekin 2006). Approximately 140 species are known in the Palearctic (Gültekin 2006), with 60 of these species being known in Europe (Mazur 2001; Alonzo-Zarazaga 2009). A further 40 species are recorded from the Ethiopian region, only three species from the Oriental region, four introduced species from the Nearctic region (Smreczyński 1968; McClay 1988; Gültekin 2006), and one in New Zealand (Woodburn & Briese 1996; Gültekin 2006). *Larinus* is distinguished from other Cleoninae by the following features: a stocky and slightly oblate dorso-ventrally body, black in color, and sparsely hairy (Smreczyński 1968; Freude et al. 1983). Presently, the actual systematic position of this genus has been assigned in the world Catalogue of Alonso-Zarazaga & Lyal (1999) according to Csiki (1934). *Larinus* is divided into four subgenera: *Larinus* Dejean, 1821; *Cryphopus* Petri, 1907; *Larinomesius* Reitter, 1924 and *Phyllonomeus* Gistel, 1856 (Ter-Minassian, 1967; Alonso-Zarazaga & Lyal 1999).

Knowledge of the morphology of immature stages in *Larinus* species is very poor. Scherf (1964) provided only brief descriptions and very simple drawings of larva and pupa of three species: *L. (s. str.) pollinis* (Laicharting, 1781), *L. (Phyllonomeus) jaceae* (Fabricius, 1775) and *L. (Phyllonomeus) sturnus* (Schaller, 1783). The next description of immature stages in *Larinus* species was made by Nikulina et al. (2004) for *L. (s. str.) latus* (Herbst, 1783) and Lee & Morimoto (1988) for *L. (Phyllonomeus) meleagris* Petri, 1907.

Larinus species have a large diversity of habitat preferences. Some of them are associated with xerothermic communities, while others inhabit wet meadows, pasture or weedy communities (Koch 1992; Burakowski et al. 1993). The studied species are generally monophagous or oligophagous and associated with plants from the family Asteraceae, genera: *Arctium* L., *Carduus* L., *Carlina* L., *Centaurea* L., *Cirsium* Mill., *Onopordum* L. (Koch 1992). All of them are regarded as rare and endangered in Europe, e.g. Germany (Sprick et al. 2003; Schneider 2004; Bayer & Winkelmann 2005), Czech Republic (Benedikt & Strejček 2005) and Poland (Kubisz et al. 1998; Pawłowski et al. 2002). The majority of *Larinus* species can be considered as a potential biological control agents against weeds (Nikulina et al. 2004; Seastedt et al. 2007).