

Description of the larva of *Maladera renardi* (Ballion) (Coleoptera: Scarabaeidae) from the Russian Far East

SHABALIN Sergey A.¹, FANG Hong²ⓧ, GAO Chuanbu², HU Jiayuan²

1. Institute of Biology and Soil Science FEB RAS, Vladivostok-22, 690022, Russia

2. College of Plant Protection, Shenyang Agricultural University, Shenyang, Liaoning 110161, China

Abstract: The larva of the *Maladera renardi* (Ballion, 1871) (Coleoptera: Scarabaeidae) has not yet been known. The third instar larva of *Maladera renardi* (Ballion) is described and illustrated for the first time. The larva of *Maladera renardi* (Ballion) differs from other known larvae of the genus *Maladera* Mulsant et Rey, 1871 from the Russian Far East by teges of raster covering the distal 2/3 of the ventral surface of last abdominal segment and palidium with 23–24 pali. A key to the known larvae of the genus *Maladera* from the Russian Far East is given.

Key words: Polyphaga; Scarabaeoidea; key; taxonomy

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俄罗斯远东赤褐玛绢金龟幼虫形态记述（鞘翅目：金龟科）

SHABALIN Sergey A.¹, 方红²ⓧ, 高传部², 胡佳媛²

1. 俄罗斯科学院远东分院生物与土壤科学研究所, 符拉迪沃斯托克 690022, 俄罗斯; 2. 沈阳农业大学植物保护学院, 辽宁 沈阳 110161

摘要: 通过饲养获得赤褐玛绢金龟 *Maladera renardi* (Ballion, 1871) 幼虫, 详细描述了 3 龄幼虫的形态特征。文中列出了俄罗斯远东地区 3 种玛绢金龟属幼虫的分种检索表。

关键词: 多食亚目; 金龟总科; 检索表; 分类

Introduction

Four genera of the subfamily Sericinae are known in the Russian Far East: *Maladera* Mulsant et Rey, 1871, *Serica* MacLeay, 1819, *Sericania* Motschulsky, 1860, and *Nipponoserica* Nomura, 1973. Larvae of the genus *Maladera* are known for *M. orientalis* (Motschulsky, 1858) and *M. castanea* (Arrow, 1913). Medvedev described the larva of *M. renardi* (Ballion, 1871) without providing clear diagnostic features and drawings. In this study we provide the first description of the third larval instar of *M. renardi* (Ballion). A key to known larvae of the genus *Maladera* from the Russian Far East is given. In compiling this key, we have used data about the larva of *Maladera orientalis* by Sun and Zhang (1982).

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ⓧCorresponding author, E-mail: phoridae@163.com

Our larval description of *M. renardi* is based on two third-instar, one second-instar, and three first-instar larvae reared from five beetles found in vicinity of Vladivostok on 15 May 2010 by S. A. Shabalin. Specimens are deposited in Institute of Biology and Soil Science (Vladivostok).

Description

Genus *Maladera* Mulsant et Rey, 1871

Maladera Mulsant et Rey, 1871: 599. Type species *Scarabaeus holosericeus* Scopoli, 1772, by monotypy.

Maladera: Medvedev, 1952: 128; Kalinina, 1989: 419; Ahrens, 2006: 237; Kim, 2011: 168.

Maladera renardi (Ballion, 1871) (Figs. 1–5)

Serica renardi Ballion, 1871 [1870]: 339. Type locality: "Wladiwostok" [Russia, Vladivostok].

Maladera (Maladera) renardi: Medvedev, 1952: 135; Nomura, 1967: 52; Kalinina, 1978: 52; Nikolajev, 1980: 86; Stebnicka, 1980: 254; Nikolajev, 1982: 285; Nikolajev, Puntsagdulam, 1984: 251; Kalinina, 1989: 419; Nikolajev, 2002: 99; Ahrens, 2006: 236; Ahrens, 2007: 21; Gusakov, 2009: 130; Bezborodov, Zinchenko, 2010: 46.

Maladera renardi: Kim, Lee, 1997: 123; Hua, 2002: 162; Kim, Kim, 2003: 84; Bezborodov, 2006: 309; Bezborodov, 2009: 140; Bezborodov, Shabalin, 2010: 55; Shabalin, 2011: 69; Kim, 2011: 176; Shabalin, Bezborodov, 2012: 269.

Serica sibirica Brenske, 1897: 372. Type locality: "Vladivostok" [Russia, Vladivostok]. Synonymized by Medvedev 1952: 135.

Serica nakayamai Murayama, 1938: 16. Type locality: "Suigen" [Korea, Seoul]. Synonymized by Nomura, 1967: 52.

The third instar larva:

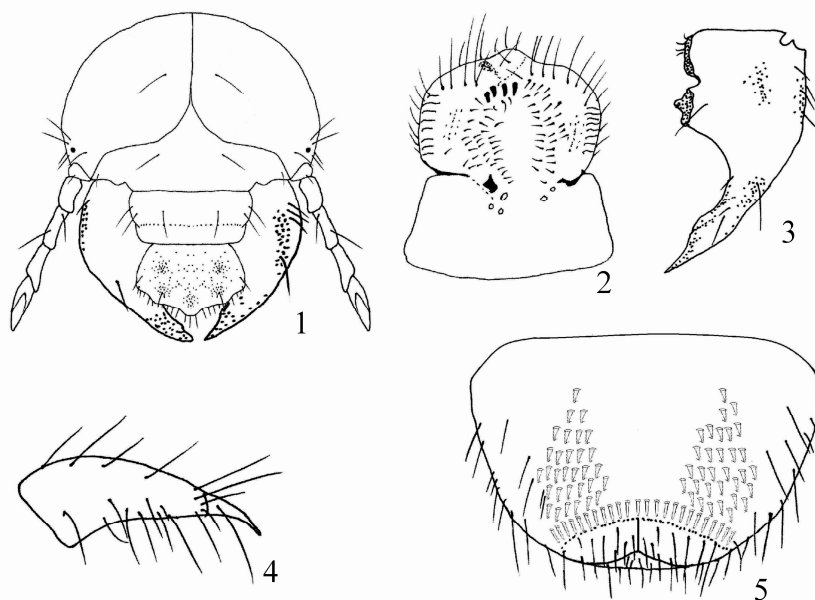
Typical C-shaped melolonthid-looking larva, body rather small, uniformly cylindrical, markedly elongate and slender, without dorsal expansions. Pubescence yellowish.

Head (Fig. 1). Maximum width of head capsule 1.7–1.8 mm. Cranium color light yellow. Surface polished. Frons with single posterior frontal seta and single exterior frontal seta on each side. Epicranium with 1 dorsoepicranial seta, 5 lateral external epicranial setae on each side. Epicranial suture complete. Fronto-clypeal suture present, well-marked. Ocelli present. Antennae 4-segmented. Second segment with 2 setae. First segment shorter than others. Fourth segment with sensorial area on top. Clypeus with 1 central seta and 2 lateral setae on each side. Labrum trilobed, with 3 depressions on central part; on each side: 1 internal seta, and on posterior part 1 lateral seta; median lobe of labrum with five anterior setae. Epipharynx (Fig. 2) with haptomerum entire and prominent. Haptomerum with 4 wide, sharply pointed heli and 6–8 sensilla. Epizygom absent. Chaetoparia with many sensilla; right chaetoparia with 34–36 spine-like setae; left chaetoparia with 30–33 spine-like setae. Acanthoparia carrying about two dozen setae, with 3–4 anterior coarse and cultriform, the rest straight and decreasing in size posteriorly. Acroparia with 5–6 long setae on each side. Acropariae are large apical region occupying between one-fifth and one-sixth of entire epipharyngeal surface; united region subtriangular in outline, with antero-lateral free margins following corresponding part of labrum, thus projecting somewhat anteriorly and having a series of three obtuse dilations on

each side, posterior limitation not distinct. Plegmatium well-developed, consisting of a nearly transverse, long, sinuous, and interrupted plegmatia, no distinct proplegmatium. Proplegmatium is elevated. Pedium somewhat longer than wide, somewhat asymmetrical and bent to the right. Dexiotorma curved. Haptolachus complete, with crepis and nesium. Mandibles asymmetrical. Right mandible with 1 apical, acute scissorial tooth followed by 1 wide scissorial blade. Molar area wide, pedunculate. Left mandible (Fig. 3) with 1 apical, acute scissorial tooth and 1 wide scissorial blade, with the border widely sinuate. Molar area complex, bilobed, apical molar lobe, short, transverse and depressed, basal molar lobe wide, dorso-longitudinally compressed. Maxilla with separate galea and lacinia; uncus of galea longer and wider than the uncus of lacinia. Galea with 1 well-developed terminal uncus. Lacinia with 3 terminal unci fused at bases.

Thorax. Pro- meso- and metanota without sclerotized lateral areas. Scutella of meso- and metathorax bare. Legs 4-segmented, increasing in length slightly from prothoracic to metathoracic pair. Short setae on all segments of each leg. Each leg with long terminal claw; each claw with one seta (Fig. 4).

Raster (Fig. 5). Palidium with a single transverse, slightly bent row of 23–24 flattened pali. Tegilla composed of 62–66 short hamate setae, covering maximally the distal 2/3 of the venter of the last abdominal segment. Anal slit Y-shaped, lateral arms of anal slit oriented dorsally, stem about twice as long as the arms. Ventral anal lip divided into two lobes, lobes approximately twice as long as wide, with numerous setae.



Figures 1–5. Third-instar larva of *Maladera renardi*. 1. Head capsule; 2. Epipharynx; 3. Left mandible, dorsal view; 4. Terminal claw; 5. Raster.

Distribution. China (Heilongjiang, Jilin, Liaoning); Russia (Amurskaya Oblast', Jewish Autonomous Region, Khabarovskii krai, Primorskii krai, Sakhalin, Kunashir), Mongolia,

Korea (Hamgyeongbuk-do, Yanggang-do, Jagang-do, Hamgyeongnam-do, Pyeonganbuk-do, Pyeongannam-do, Hwanghaebuk-do, Hwanghaenam-do, Gangwon-do, Seoul, Chungcheongbuk-do, Chungcheongnam-do, Gyeongsangbuk-do, Jeollabuk-do, Gyeongsangnam-do, Jeollanam-do), Japan (Honshu, Shikoku, Kyushu).

Key to known larvae of genus *Maladera* from the Russian Far East

1. Dexiotorma direct as a line 2
- Dexiotorma undulate *M. orientalis* (Motschulsky)
2. Teges of raster covering the distal half of the ventral surface of last abdominal segment. Palidium with 24–28 pali *M. castanea* (Arrow)
- Teges of raster covering the distal 2/3 of the ventral surface of last abdominal segment. Palidium with 23–24 pali *M. renardi* (Ballion)

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