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DESCRIPTION THE LARVA OF THE TIGER BEETLE *POGONOSTOMA MAJUNGANUM* (COLEOPTERA, CICINDELIDAE)

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Description of the Larva of the Tiger Beetle *Pogonostoma majunganum* (Coleoptera, Cicindelidae). Putchkov A. V., Dolin V. G. – The 2nd and 3rd instar larvae of *Pogonostoma majunganum* Jeannel, 1946 reared to imago are described. Brief ecological data and comparative discussion are given.

Key words: Coleoptera, Cicindelidae, *Pogonostoma*, larva, description, ecology, Madagascar.

Описание личинок скакуна *Pogonostoma majunganum* (Coleoptera, Cicindelidae). Пучков А. В., Долин В. Г. – Описаны личинки 2-го и 3-го возрастов *Pogonostoma majunganum* Jeannel, 1946 с о. Мадагаскар. Приведены короткие экологические сведения и сравнительный таксономический анализ известных личинок рода *Pogonostoma*.

Ключевые слова: Coleoptera, Cicindelidae, *Pogonostoma*, личинка, описание, экология, Мадагаскар.

An endemic for Madagascar tiger beetle genus *Pogonostoma* Klug, 1835 is represented by almost 90 species attributed to 6 subgenera. As compared to the adults, the larvae of this genus still remain little known. The larvae of *Pogonostoma* sp. collected by Vadon in the forests in the vicinity of Antongil gulf were tentatively attributed by R. Jeannel (1946) to one of the three species: *cyanescens* Klug, 1835, *caeruleum* Castelnau & Gory, 1837 or *chalybaeum* Klug, 1835. This material has been forwarded for examination to F. J. Van Emden (1935), but no genus description appeared since then. However, the use of this material (deposited in the Deutsches Entomologisches Institut, Eberswalde) allowed to incorporate numerous larval *Pogonostoma* characteristics in a key to major of Cicindelidae of genera of the World (Putchkov, Arndt, 1994). During the collecting trip to Madagascar (November 20, 2001–January 15, 2002) one of the authors (VGD) succeeded not only to collect a series of the *Pogonostoma* larvae, but also to rear some adults. Subsequently, the species was determined by F. Cassola as *P. majunganum* Jeannel, 1946. A description of the 2nd and 3rd instar larvae of this species are given below.

The morphological terminology used here are as in previously published descriptions of the tiger beetle larvae (Knisley, Pearson, 1984; Putchkov, Cassola, 1994). The terms are abbreviated as follows: L – total length; FL – head length (from nasale top to end of epicranial suture); FW – head width; PNL – length of pronotum (along medial line); PNW – width of pronotum (at anterior angles); PN1 – half of pronotum; PNM – pronotum medial line; PNa – anterior angles of pronotum; A1, A2 – 1st and 2nd antennal segments; T3 – 3rd abdominal tergite; CT5 – caudal, CTL5 – lateral, AT5 – apical tergite of the 5th abdominal segment; MH – medial hooks; IH – inner hooks of 5th abdominal segment; EU9 – 9th abdominal tergite; PY – pygopod. The sizes are given in millimetres.

Pogonostoma majunganum Jeannel, 1946

Material. N–W Madagascar, National Park Ankarafantsika, 27 specimens of 3rd and 2 specimens of 2nd instar larvae, 6–10.01.2002 (Dolin) (SIZK).

Third instar larva. Measurements: L – 15.5–19.5; FW – 1.90–1.94; FL – 1.16–1.17; PNW – 1.98–2.04; PNL – 1.22–2.26.

Head above almost black, with slight greenish metallic reflection. Appendages of head brown, their apices and mandibles dark brown. Head wide, its maximal width at

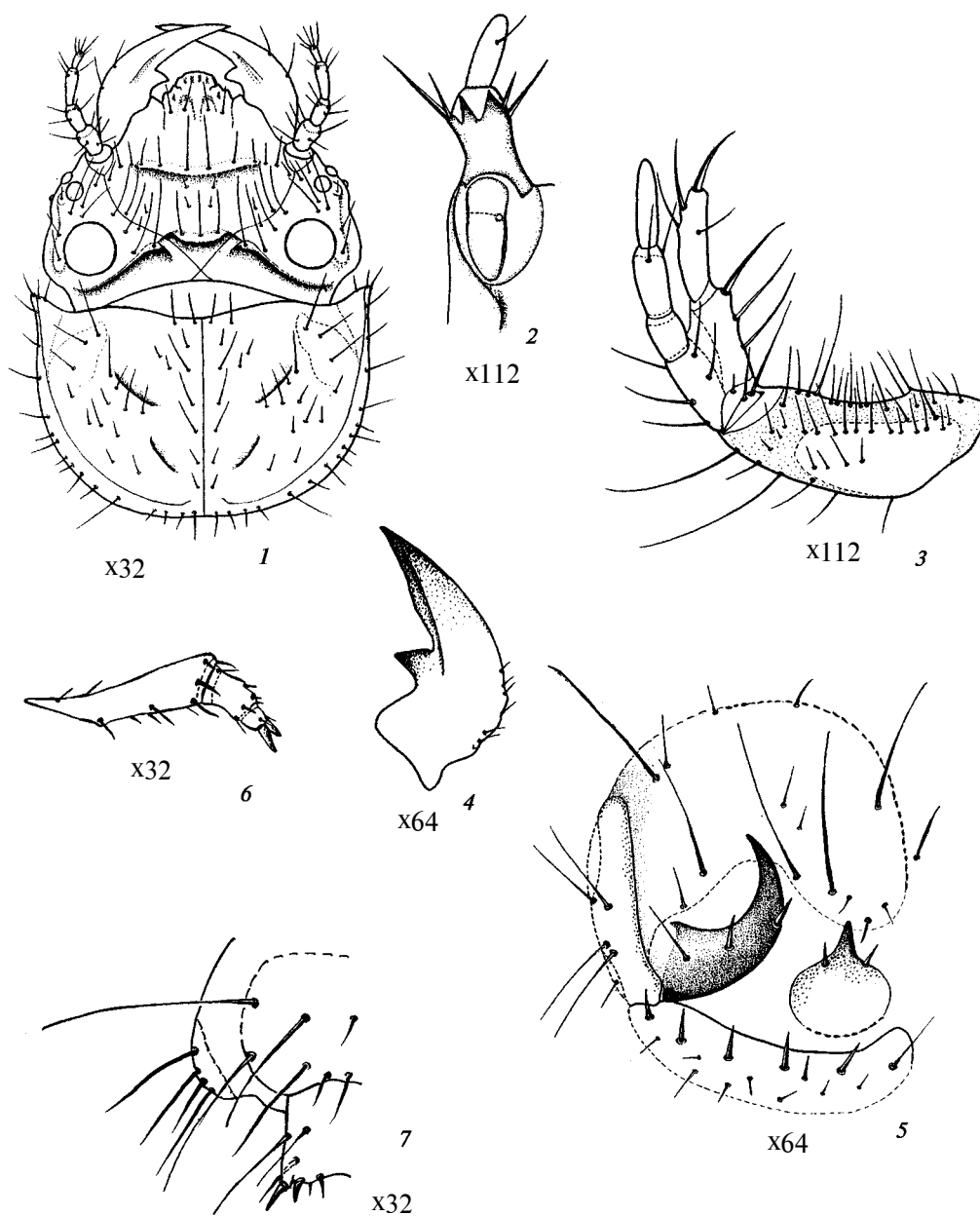


Fig. 1. *Pogonostoma majunganum*, 3rd instar larva: 1 – head and pronotum (dorsally); 2 – labium (left side, ventrally); 3 – maxilla (right, dorsally); 4 – mandible (right, dorsally); 5 – mid leg (lateral view); 6 – 5th abdominal segment (left side, dorsal view); 7 – 9th abdominal segment and pygopod (left side, dorsal view).

Рис. 1. *Pogonostoma majunganum*, личинка 3-го возраста: 1 – голова и пронотум (дорсально); 2 – нижняя губа (левая сторона, вентрально); 3 – максилла (правая сторона, дорсально); 4 – мандибула (правая сторона, дорсально); 5 – средняя нога (вид сбоку); 6 – 5-й брюшной сегмент (левая сторона, дорсально); 7 – 9-й брюшной сегмент и пигопод (левая сторона, дорсально).

rounded posterior angles level, slightly narrowed backwards (fig. 1, 1). Nasale narrow, narrower than mandible bases, slightly trapezoid, with slight longitudinal grooves. Frontal plate with well expressed transverse medial keel, slightly bucket-like. Basal teethes large. 1st labial palpus with 6 chaetae at apex, of which 2 central shortened, sclerotized and widened (fig. 1, 2). Linear ratio of its 1st and 2nd segment length – 1.1 : 1.0. 2nd segment with 1 thin chaeta slightly over its middle. Palpiger area divided, lower of them

is almost two times longer than upper (fig. 1, 2). Maxilla habitually as in tribe Cicindelini. Cardo almost triangular. Stipes wide, with small smoothed tubercle (tooth) almost at internal margin base (fig. 1, 3). Its internal side with two chaetae rows. 1st galea segment with 3 chaetae at internal margin: two last stronger. 2nd galea segment with 4 chaetae: first spine-like and longer. Ratio of maxillar segments length 1 : 2 : 3 : 4—1.3 : 1.1 : 1.6 : 1.0. Mandible moderately long (fig. 1, 4). A1 with 5–6, A2 with 4–5 chaetae. 1st antennal segment almost 1.5 times as wide as 2nd. U-shaped ridge of frons, with 3 chaetae, sharply skewed backwards, not clearly joined with occipital ridge. Chaetae long, thin, reddish. Posterior (1st) stemma very large, its diameter almost in 3 times exceeds this of anterior (2nd) stemma. Epicranial suture absent.

Pronotum coloration similar to head, but lateral margin dark-brown, tops of anterior angles pale. Pronotum almost semirounded, convex (fig. 1, 1). Swellings of anterior angles not expressed, callous disk elevations weakly sculptured, divided anteriorly by two oblique grooves. Lateral margins forwards rather narrowly backlined, but widened posteriorly. Anterior angles very long, directed forwards, at apices bent, with small longitudinal keel. Anterior pronotum margin concave at middle. Pronotum membrane large and wide. Chaetae very long, thin, reddish. Chaetae of lateral margin situated sparsely, their number not exceeding 12–14. PN1 bears 20–26, PNM – 6–8; PNa – 2–4 chaetae (near half of them shorter).

Hypopleuron consisting of one large sclerite with 3–4 chaetae, and 3 small, each bearing one chaeta. Eupleuron large, as long as or slightly longer than tergites, longitudinal-ovate, with 5–6 chaetae. Tergites rectangular with 7–8 chaetae, 4 of which are long. The legs habitually similar to those in Cicindelini larvae (but not in Collyrini), as shown on figure 1, 6.

Hump flattened. Its tergites weakly sclerotized, fused along external margin, but not joined along internal margin (fig. 1, 5). CTL5 strongly longitudinal, weakly sclerotized, with 3–4 long chaetae. CT5 strongly transverse-elongated, with 7–8 spines over upper margin and 6–8 very small chaetae below. AT5 bears 5–7 long and some small chaetae. Its lateral margin, fused with lateral tergite, darkened. MH strongly sclerotized, their length in 2 times more their width at base, upper half almost semicircularly bent. Their apices slightly overlap base of apical tergite. MH with 2 (rarely 3) short spines, situated asymmetrically, and long chaeta at base. IH massive, 1.4 or more times as short as MH, their width at base equal to length. Central spine thick and long, with 2 almost symmetrical shortened spines. EU9 with 14–16 chaetae, 8 of which (4 short) situated over posterior margin (fig. 1, 7). 9th sternite with 6 long chaetae at posterior margin. PY short, dorsally with 4 long and 2 short chaetae. Its apex with 4 strong spines and 4 small chaetae at sides, two of which situated ventrally (fig. 1, 7). Central part of PY ventrally bare.

Second instar larva. Measurements: L – 10.3–10.8; FW – 0.84–0.86; FL – 1.30–1.34; PNW – 1.34–1.35; PNL – 0.83–0.86.

Differs from 3rd instar only by body size and number of chaetae on some sclerites.

1st labial segment with 5 chaetae (2 lateral long and central short). 1st galeal segment with 2 chaetae (upper stronger and longer). A2 with 4, A1 with 4–5 chaetae. 2 small tubercles between upper stemmata. Epicranial suture short. Pronotal grooves deeper than in 3rd instar. Anterior angles narrower, with exact exterior fold at apex, but marginal swelling in posterior part very wide. PN1 bearing 5–6 long and 10–12 shorter chaetae, marginal swelling with 13–14 chaetae. Anterior margin of PN slightly concave, but at middle almost straight. CT5 with 5 spines and 2–3 small chaetae. CTL5 with 2 long chaetae. Central IH spine relatively stronger and longer than in 3rd instar. EU9 posterior margin with 8 chaetae (6 almost at middle). PY ventrally bare, sometimes with 2 chaetae, displaced laterally, dorsally pygopodium surface with 4 chaetae. Apex of PY with 6 spines, strongly displaced laterally. Lateral spines very strong.

Ecological peculiarities. The larvae were collected under the bark of tree trunk in the rain forest. The larval burrows 3–4 cm long were situated 3.5–5.0 m up from the tree butt reaching the highest abundance at a level of 1.5–2 m. The number of burrows per square decimetre vary, depending on exposition, from 8 to 12; it should be noted that during the study only 3–4 burrows contained living larvae, the rest were left containing the larval exuvia. Some dead and parasitized larvae and pupae were found as well. Inhabited were mostly the trunks with wrinkled and grooved bark, mostly of *Acacia* species and mango. Among smooth-barked trees only single larvae were found in detached bark areas at an elevation of 2–2.5 m. Dependent on trunk situation, the larval burrows situated mostly on the northern side of the trunk when the tree was located on an open or less shaded place (mostly large mango trunks), or on the southern side if an *Acacia* tree was in the depth of the forest in shadow. Under strongly shaded tree trunk, the larvae have not been found.

The larval burrow passages have mostly vertical position in the bark, sometimes with some deviation left- or rightwards from vertical line depending on the grooves direction of the bark; single burrows, mostly on the smooth-barked trees occupied a position close to horizontal. The larvae were located in the anterior (upper) part of the burrow, with heads plugging the entrance. When disturbed, they immediately hide down, and in 2–3 minutes returned back to their initial position, hunting for small invertebrates moving on the bark and crossing the heads of the hidden larvae.

Comparative notes. The shape and chaetotaxy of the head, pronotum, hooks and 5th abdominal segment tergites and, especially, pygopod's spines and chaetae of the *Pogonostoma* larvae are similar to those characteristics of larvae in the South American *Ctenostoma* species. However, in *Pogonostoma* larvae lateral tergite of the 5th abdominal segment is not modified into a spine, claws are not conjoined with tarsus, and stemma 1 (posterior from above) is very large, more than 3 times as large as stemma 2 (anterior). More detailed analysis of the larvae of these genera are planned to be presented in a separate publication. From *Pogonostoma* sp. larvae collected by Vadon, the described species differs well not only by its two times smaller size (when 3rd instar larvae compared), but also by the lack of the tubercle between 1st and 2nd ocelli, more smoothed relief of the 1st thoracic tergite and more numerous chaetae on it.

Moreover, in *P. majunganum* larva, the lateral tergite of the 5th abdominal segment is weakly sclerotized, more elongated and rounded in its anterior part, caudal tergite with only one spine row, and pygopod dorsally without accessory small chaetae, the spine number on its apex is almost twice less. The size of the head and pronotum in *P. majunganum* is more than in two times smaller than in *Pogonostoma* sp. Unfortunately, the lack of a reliable material for other *Pogonostoma* larvae still prevents a reliable analysis not only of the genus as a whole, but also of its nominotypical subgenus.

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