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N. P. Krivosheina, M. G. Krivosheina. TO BIOLOGY OF SOLDIER-FLIES OF THE GENUS *BERIS* LATREILLE, 1802 (DIPTERA, STRATIOMYIDAE) WITH THE DESCRIPTION OF LARVA OF *BERIS CRASSITARSIS* NAGATOMI ET TANAKA, 1972. – Far Eastern Entomologist. 2014. N 282: 7-12.

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Summary. The data on the habitats of larvae of *Beris strobli* Dušek et Rozkošný, 1968, *B. heptapotamica* Pleske, 1926, and *B. crassitarsis* Nagatomi et Tanaka, 1972 are presented for the first time. New additional data for *B. fuscipes* Meigen, 1820 are discussed. The larva of *B. crassitarsis* is described.

Key words: Diptera, Stratiomyiidae, *Beris*, biology, larvae.

Н. П. Кривошеина, М. Г. Кривошеина. К биологии мух-львинок рода *Beris* Latreille, 1802 (Diptera, Stratiomyiidae) с описанием личинки *Beris crassitarsis* Nagatomi et Tanaka, 1972 // Дальневосточный энтомолог. 2014. N 282. С. 7-12.

Резюме. Впервые приводятся данные по образу жизни личинок львинок *Beris strobli* Dušek et Rozkošný, 1968, *B. heptapotamica* Pleske, 1926 и *B. crassitarsis* Nagatomi et Tanaka, 1972. Обсуждаются дополнительные данные по экологии *B. fuscipes* Meigen, 1820. Дано описание личинки *B. crassitarsis***.**

INTRODUCTION

The genus *Beris* Latreille, 1802 includes 31 Palaearctic species (Woodley, 2001). The data on the biology of this genus are incomplete; the larvae of six species only are known (Rozkošný, 1982).

Generally soldier flies of this genus prefer moist substrata. Imagoes of some species, for example, *Beris morrisii* Dale, 1841 and *B. fuscipes* Meigen, 1820 were recorded on grass and leaves near water springs. Imagoes of *B. vallata* (Forster, 1771) were captured on leaves of shrubs near water reservoires and leaves of aquatic plants. The development of *Beris* larvae occurs typically in decomposing plant substrata like decaying leaves and mosses. For example the development in these substrata was registered for larvae of *B. vallata* (Forster, 1771). Larvae of *B. chalybeata* (Forster, 1771) live under close conditions – in moss, in garden soil and in decaying leaves in forests. Pupae of *B. clavipes* (Linnaeus, 1767) were discovered in moist moss. Larvae of *B. geniculata* Curtis, 1830 were collected in soil around roots of *Angelica* sp. (Rozkošný, 1982). Larvae of *B. morrisii* Dale, 1841 develop in decaying organic materials, besides they were discovered in tunnels of syrphid flies *Cheilosia himantopus* Panzer, 1798 [=*Ch. canicularis* (Panzer, 1801)] inside stem bases of Compositae plants – *Petasites* sp. (Dušek & Rozkošný, 1963). The data on the development of *B. fuscipes* Meigen, 1820 larvae under the bark of tree trunk laying in stream were stated by Lenz (1923). All these data were confirmed in the subsequent publications (Rozkošný, 1982; Woodly, 1981;

Krivosheina *et al*., 1986). We collected larvae of *Beris* many times in strongly decomposed loose fruiting bodies of polyporous fungi and other moist substrata (Mamaev *et al*., 1977). This work is based on our collecting and rearing larvae from fungi and wood from various regions of Russia and neighboring countries. The data on the habitats of larvae of *B. strobli* Dušek et Rozkošný, 1968, *B. heptapotamica* Pleske, 1926 and *B. crassitarsis* Nagatomi et Tanaka, 1972 are presented for the first time and new additional data for *B. fuscipes* Meigen, 1820 are discussed.

Larvae of *B. heptapotamica* Pleske, 1926 were discovered in red moist wood of walnut *Juglans regia* L. growing in valleys in Kirgizia mountain region (Sary-Chelek Nature Preserve, Arkit). Larvae of *B. strobli* Dušek et Rozkošný, 1968 were registered many times in red wood of birch in wasp's nests as well as under the bark and inside wood of fallen larch trunks (Tuva, West Tannu-Ola Khrebet, Shagonar suburbs) in June-July 1974. However the emergence of imagoes from these larvae happened in February 1975 only. Larvae of *B. fuscipes* Meigen, 1820 were discovered in red wood of asp and in birch trunks in wasp's tunnels in June (Gorny Altai, Artybash, bank of Teletskoe Lake), imagoes were collected on wood side near lake, imagoes appeared on fallen trunks of birch after dissection of bark while collecting larvae.

DESCRIPTION OF LARVAE

***Beris crassitarsis* Nagatomi et Tanaka, 1972**
Figs 1–13

MATERIAL. **Russia**: Primorskii krai, 60 km south-east Ussuriisk, Ussuriiskii Nature Reserve, 10 larvae, 4 pupae, 26.X 1968; 5.IX 1968 (vial No 21); 7.IX 1968 (vial No 48); 26.IX 1968 (vial No 130), leg. N.P. Krivosheina; Kunashir Island: 1 larvae, 1 pupae, 1.X 1972, emergence 23.IV 1973 (vial No 270), leg. N.P. Krivosheina.

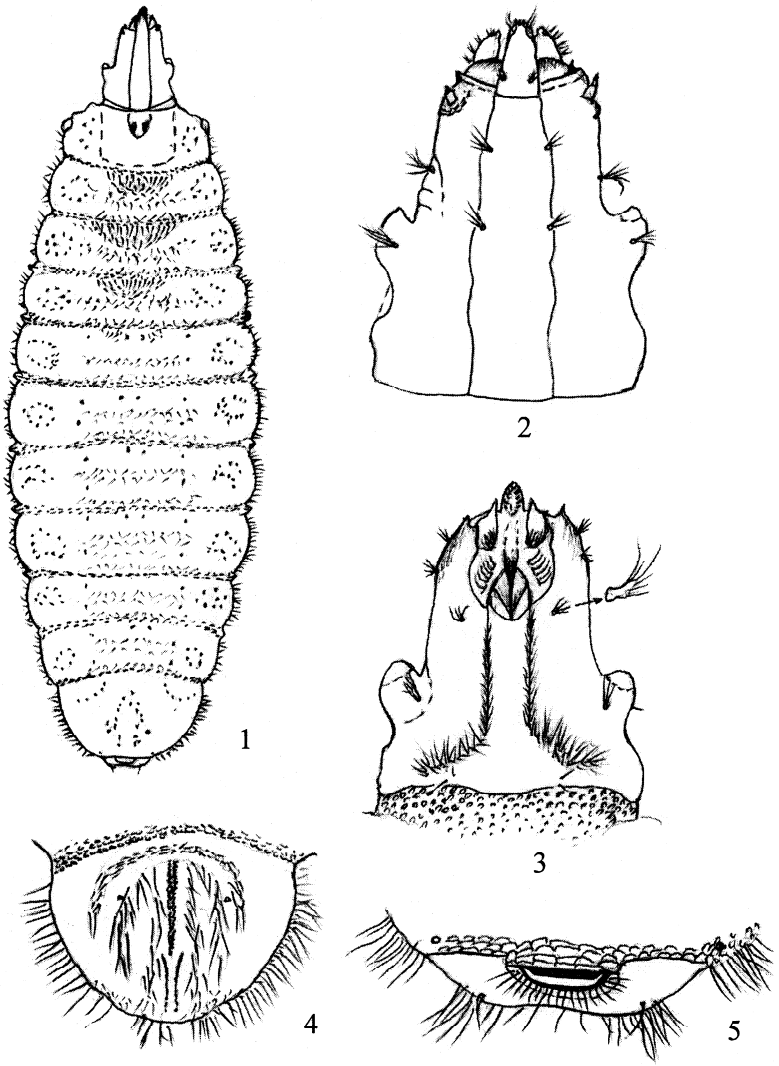
LARVAE. Body light-brown to dark brown in thick pubescence of light hairs and small groups of dark spots on integument.

Head with well developed ocellar projections, ocelli directed forward and are posited behind the middle of head (Figs. 1–3). Anterior part of head in front of eyes narrow with parallel lateral sides. Head is broaded significantly behind eyes. Frontoclypeal part is bordered by deep longitudinal furrows, not reaching the border with thoracic segments. Lateral sides of cranium ventrally are divided by narrow median stripe, posterior margins of the head capsule diverge under obtuse angle at the level of posterior margin of ocellar projection. The head capsule ventrally with dense light marginal hairs. Frontoclypeus with 2 pairs of dorsal setae, the posterior pair is at the level of ocellar projections. All setae of head, including those behind eyes, are united in tufts. The part of head capsule submerged inside prothorax is massive, not narrowed, rounded posteriorly; its length is about 2/3 of its external part. Antennae are relatively short, their length slightly exceeding their width (Fig. 13).

Body elongate, slightly broaded at median part, segments transverse, short, almost 4 times as wide as long. The length of the largest VIII abdominal segment is less than its width (about 3/4). Lateral sides of intersegmental folds of abdominal segments I-VII with 2 distinct rounded tubercles, becoming cone-like posteriorly (Figs. 1, 10).

Integument dorsally is formed by closely situated brownish plates. Darker and almost black plates are situated in intersegmental folds and form arch-rows. Same single plates are present in middle parts of segments, on some segments they are regulated in certain patterns: dark plates of prothorax are united in 3 groups, one central and two lateral; last body segment with 2 arched lateral spots anteriorly and 2 stripes medially. Ventral surface of the body is

lighter and without distinct dark plates (Fig. 4). Besides anterior part of segments I-IV dorsally with transverse band formed by flat silvery haires (Fig. 9) and a row of light hairs (Fig. 9). 1-2 light long setae are present on the margins of bands. The following segments are with rare silvery hairs. Ventral side of segments with dense transverse bands of light hairs, lateral side – with dense erect hairs.

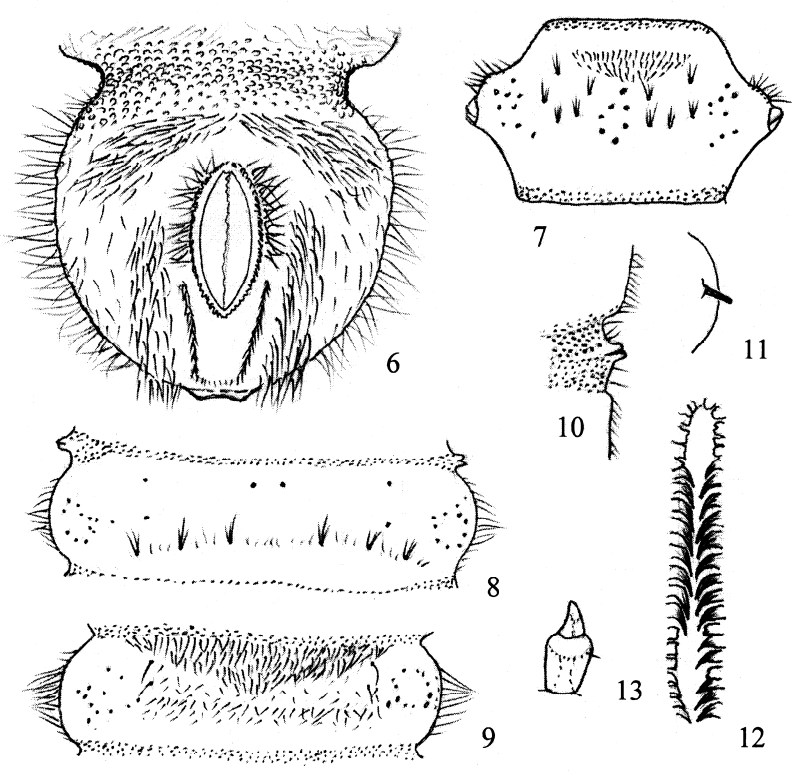


Figs. 1–5. *Beris crassitarsis*, larva: 1 – body, dorsal view; 2 – sternal plate of head dorsally; 3 – external part of head ventrally; 4 – last body segment ventrally; 5 – body end dorsally.

Segments III-X with 3 pairs of dorsal setae, represented by 1 long seta and group of short hairs, regulated in transverse row (Fig. 8). One pair of additional small setae is developed on segment II. Prothorax with 2 rows of setae: anterior row consists of 2 ungrouped setae at each side, posterior row – of 3 setae at each side (Fig. 7).

Posterior segment dorsally with 1 pair of small simple setae in posterior half of the segment. Besides 2 small setae are situated at the level of stigmal split laterally and 2 setae are behind it at the level of tufts of hairs (Fig. 5).

Ventral side of the posterior segment with long anal split representing more than a half of segment. Its border is with close to each other plates forming 1 row, median plates with conical projection (Figs. 6, 12). Dense light hairs (Fig. 6) form arched row in front of anal split, as well as rows of dense setae at its borders in anterior half and parallel rows at some distance from anal split. The ends of these rows prolong over the margin of segment and form tufts. Narrow welts of short setae almost reaching the end of the segment, adjoin to posterior half of anal split.



Figs. 6–13. *Beris crassitarsis*, larva (6-10, 11, 12) and pupa (11): 6 – last body segment ventrally; 7 – prothorax dorsally; 8 – abdominal segment V dorsally; 9 – thoracic segment II dorsally; 10 – lateral part of intersegmental fold between abdominal segments I-II; 11 – spiracle on abdominal segment II of pupa; 12 – cuticular structures of anal opening; 13 – antenna.

The pubescence typical for *Beris* larvae and some genera of the subfamily is not developed in other subfamilies (Krivosheina, 1976, 1977). Dense pubescence masks integument structure and dorsal setae. The picture of dark spots is clear after KOH treatment. However this method causes the loss of setae. Besides the pubescence may be destroyed. All these cause many difficulties for the determination by the position of hairs on integument.

The larvae of the investigated species differ from known larvae of *Beris*. Larvae of *B. crassitarsis* differ from *B. geniculata* by relatively narrow head and branched seta behind eyes. Median part of anal segment around anal split is slightly projecting over segment surface. *B. crassitarsis* is close to *B. chalybeata* by the pubescence of ventral side of the last segment, but its 2 pairs of dorsal setae simple, not branched.

BIOLOGY. The species was registered many times in Primorskii krai repeatedly on the territory of reserves "Ussuriiskii" and "Kedrovaya Pad" during 1964-1969. The highest abundance of species was registered in 1968. It is possible to suppose that this happened because of rainy summer and high humidity of forest substrata in the year. Larvae are trophically connected with fruiting bodies of aphilloforus fungi – Hydnaceae and Polyporaceae. They proved to be endobionts of fruiting bodies of *Mycoleptodonoides vassiljevae* Nikol. and sulphur polypore *Laetiporus sulphureus* (Fr.) Bond. et Sing. The former grows on various dead trees (*Ulmus* sp., hornbeam, maple, birch) (Lubarsky & Vasil'eva, 1975), the latter fungus is common on oaks; on the territory of the Russian Far East it grows on alive as well as on dead trunks and stumps of various coniferous and deciduous trees.

The larvae were collected in the Ussuriiskii Reserve in fruiting bodies of *M. vassiljevae* Nikol. growing on *Ulmus* sp. Larvae developed in moist fungus together with larvae of Mycetophilidae and Limoniidae. Besides fungi the larvae were found on dissected blocks of *Ulmus* sp. trunks devoid of bark lying on ground on riverside. Some of these moist blocks of trunks were settled by Axymyiidae and Syrphidae (*Temnostoma* sp.) larvae. Remains of bark were dark with mycelium film. Larvae of *Beris* were found on the lower side of blocks together with Scatopsidae (*Ectaetia subclavipes* Krivosheina, 2002) and Psychodidae (*Psychoda lobata* Tonnoir, 1940).

Second series of larvae was collected on Kunashir island in lying on moist soil fruiting bodies of *Laetiporus sulphureus* (Fr.) Bond. et Sing. Larvae inhabited fungus together with larvae of Anisopodidae (*Sylvicola matsumurai* Okada, 1935, *S. japonicus* (Matsumura, 1915)), Scatopsidae (*Ectaetia subclavipes* Krivosheina, 2002) and Limoniidae (*Metalimnobia lanceolata* Savchenko, 1983, *Achyrolimonia basispina* (Alexander, 1924)).

DISTRIBUTION. Russia (Primorskii krai, Sakhalin, Kunashir), Japan (Hokkaido, Honshu).

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