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SYRPHID LARVAE (DIPTERA: SYRPHIDAE) LIVING IN *ULMUS PUMILA* L. IN KOMSOMOLSK-ON-AMUR

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Larvae of third stage and pupariums of five hover-flies species: *Myolepta vara* (Panzer), *Brachyopa primorica* Mutin, *B. violovitshi* Mutin, *Mallota eurasiatica* Stackelberg and *Ceriana nigerrima* Violovitsh found in *Ulmus pumila* L. are described for the first time.

KEY WORDS: Hover-flies, Syrphidae, larva, *Ulmus pumila*, xylophagous insects.

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Описываются личинки третьего возраста и пуларии 5 видов мух-журчалок: *Myolepta vara* (Panzer), *Brachyopa primorica* Mutin, *B. violovitshi* Mutin, *Mallota eurasiatica* Stackelberg и *Ceriana nigerrima* Violovitsh, обнаруженные на ильме низком (*Ulmus pumila* L.).

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INTRODUCTION

The majority of saprophagous larvae of hover-flies are related with wood plants. Some of them (*Temnostoma* spp.) feed enough ward dead wood, forming their own passageways (Krivosheina & Mamaev, 1962). Others develop in accumulations of decaying sap of damaged trees (*Brachyopa*, *Ferdinandea*) or decaying wet wood (*Myathropa*, *Criorhina*), many species inhabit in rot-holes or passageways of other xylophagous insects (Rotheray, 1996; Zimina, 1957). An association of the larvae with concrete species of tree is not usually observed. Nevertheless a knowledge about xylophagous insects of one or other species of wood plant has large practical importance. Ten species were known as the inhabitants of *Ulmus* spp. up to present (Rotheray, 1993; Krivosheina et al., 1967; Krivosheina, 1974; Mamaev, 1972, 1974). We observed the trunks of *Ulmus pumila* L. for the study of xylophagous syrphids in Komsomolsk-on-Amur during 1995-1997 and found the larvae of five species, which are described below. Morphological terms are used mainly according to G. Rotheray (1993) and J.C. Hartley (1961). Larvae of hover-flies inhabit as a rule the old trees with damages of the bark or wet rot-holes. We do not find any syrphids in entirely dead trees. All larvae were collected in the late autumn or early spring.

DESCRIPTION OF LARVAE AND PUPARIUMS

Myolepta vara (Panzer, 1796)

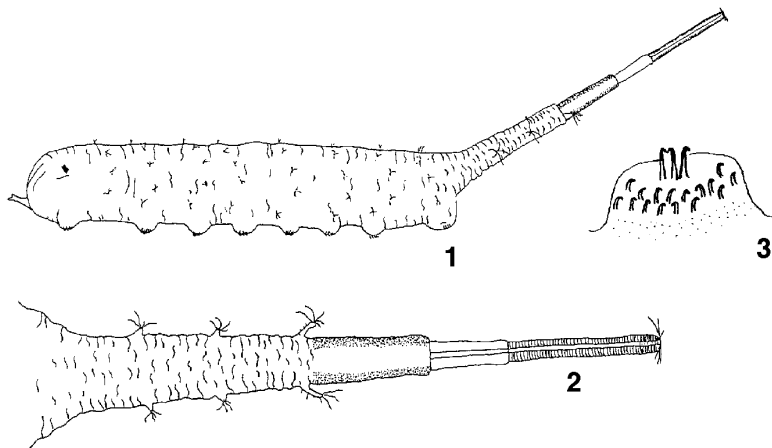
Figs 1-3

LARVA. Length 11-12 mm, width 2.5 mm. Body cylindrical, yellowish-white and more dark posteriorly with short subpressed colourless pilose; posterior part of body with more distinct pilose; posterior part of anal segment narrow elongate (Fig. 1). Dorsal tubercles weakly developed; lateral ones with 1-3 thin colourless pile; abdominal segments 7 and 8 with more distinct lateral tubercles. Anterior fold with small distinct colourless spicules. Mesothoracal prolegs with a few large crochets on apex and numerous rather small ones around them; central crochet double and largest. Abdominal prolegs with tuft of large crochets on apex and 3 indistinct arcuate rows of crochets; two inner ones with up to 6-8 longer crochets; third row consists of very small crochets (Fig. 3). Anal segment wrinkled, except apical part behind third pair of lappets; first and second pairs of lappets small, with 3-4 long setae; hind pair of lappets dactylic, with 4-5 long colourless setae (Fig. 2). Anterior spiracles small and short. Posterior respiratory process telescopic; its apical part (2.2 mm) contrasted, brown, with 8 thin long colourless terminal setae. Posterior spiracles small, narrow.

PUPARIUM. All characters like larva including chitinous armature and vestiture, kept. Surface brownish; posterior respiratory process darker apically.

MATERIAL. Two larvae from wet rot-hole, 17.IX 1995 (V. Mutin).

BIOLOGY. Larvae grow into wet rot-hole, hibernate in 3rd stage, pupate in spring. Stage of pupa lasts 10-12 days.

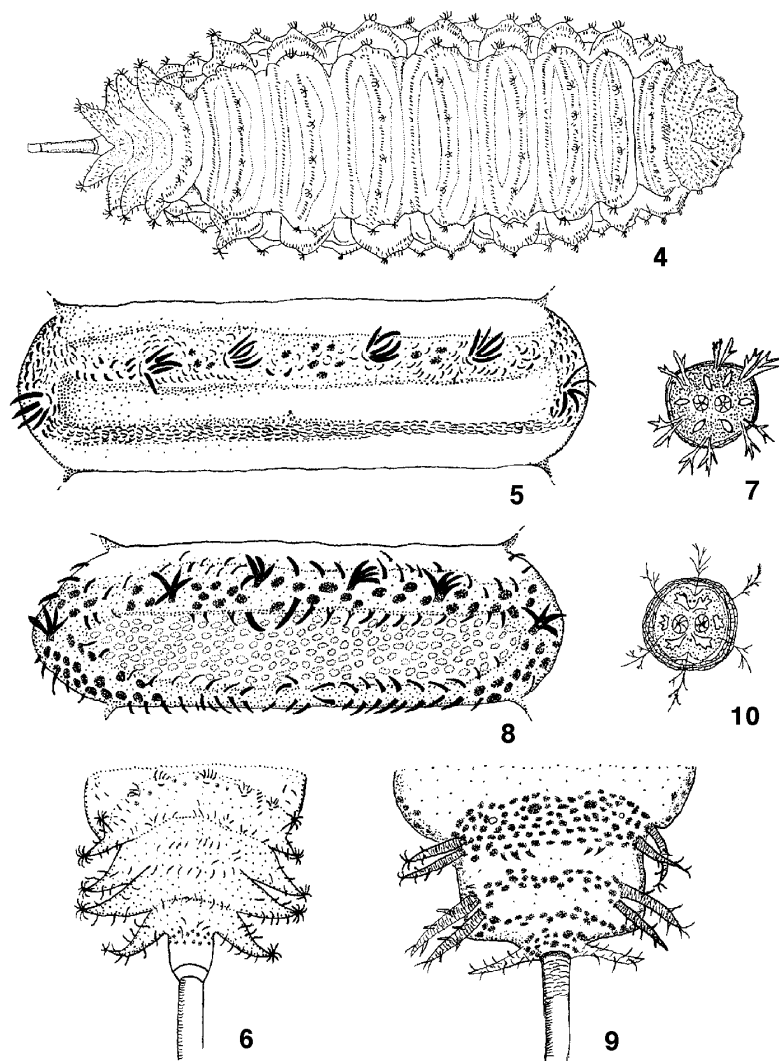


Figs 1-3. *Myolepta vara*: 1) larva, lateral aspect; 2) anal segment and posterior respiratory process, dorsal aspect; 3) abdominal proleg, ventral aspect.

***Brachyopa primorica* Mutin, 1998**

Figs 4-7

LARVA. Length 12-14 mm, width 4 mm. Body brownish, flattened dorso-ventrally, tapering anteriorly and posteriorly, dorsal surface convex; posterior respiratory process rather long; its length 1.6-1.8 mm; cuticle of folds with brown blotches, stout dark setae and distinct lateral and sublateral papillae (Fig. 4). First thoracal segment narrowest; its width about 2 times as wide as its length. Width of following segments greatly more than their length. Dorsal surface of abdominal segments with depression restricted by anterior and posterior transversal ribs (integumental folds). Anterior integumental fold with four small papillae crowned tuft of 5-8 large setae and a few short setae between them (Fig. 5). Less distinct posterior integumental fold coated with rather short dense setae. Ventral surface of abdominal segments with numerous transversal integumental folds covered with short brown setae and small blotches and sublaterally with indistinct prolegs coated with rather long single setae and with double seta on apex. Anal opening restricted by anterior and posterior transversal folds with well separated long double setae. Lateral and sublateral papillae crowned by tuft of 7-9 long curved setae. Anal segment consists of three broad and flat folds coated in rare long setae and small rare dark blotches; the 1st and 2nd ones with 2 pair and the 3rd one with a single pair of lappets (Fig. 6). Two anterior pairs of lappets located almost at vertical flatness; each anterior lappet short and closely adjacent to following one. Anterior spiracle small, brownish, retractile, rather thickened apically, with a pair of narrow openings. Posterior respiratory process shining brownish, with 6 double branched terminal subpressed setae; apical part (0.3 mm) of process weakly isolated. Spiracular openings small; disc with oval slits (Fig. 7).



Figs 4-7. *Brachyopa primorica*: 4) larva, dorsal aspect; 5) abdominal segment, dorsal aspect; 6) anal segment, dorsal aspect; 7) disc of posterior spiracles, frontal aspect; 8-10) *B. violovitshi*: 8) abdominal segment, dorsal aspect; 9) anal segment, dorsal aspect; 10) disc of posterior spiracles, frontal aspect.

PUPARIUM. All characters like larva. Surface dark-grey or grey brown. Anterior spiracle (0.5 mm) yellow, conoid, rather bent backward, with irregular facets and a single tracheal opening (Hartley, 1961). Posterior respiratory process brown or redish-brown, slightly hitched up.

MATERIAL. 1 larvae under pies of bark, X 1995 (V. Mutin); 10 larvae in chaps of bark among dried decaying sap, 12.IV 1996 (D. Gritskevich); 11 larvae, in the same place and in sap-soaked soil at the base of the sap-run, 30.IX 1997 (A. Sivova).

BIOLOGY. Larvae inhabit the decaying sap runs and in sap-soaked soil at the base of the sap-run, hibernate in 3rd stage under bark and its chaps or on surface of soil, pupate in spring. Stage of pupa lasts about 5 days. Adults emerge from the second half of May to beginning of June.

***Brachyopa violovitshi* Mutin, 1985**

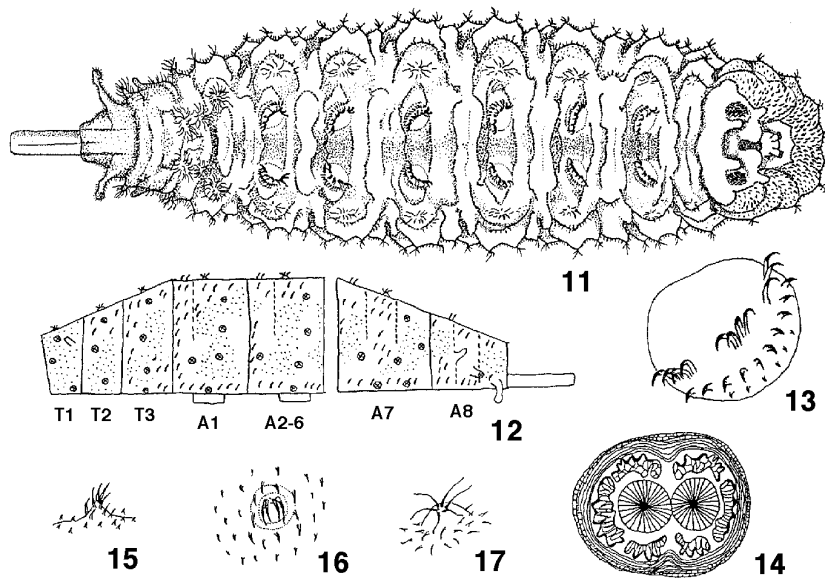
Figs 8-10

LARVA. Length 8-9 mm, width 3.2-3.5 mm. Body yellowish-brown, flattened dorso-ventrally, tapering anteriorly and posteriorly, distinctly convex dorsally. Posterior respiratory process distinct; its length about 1 mm. Width of the first thoracal segment 2 times as wide as its length; each abdominal segment 4 times as wide as its length. Prothorax with dense short strong setae ventrally and rare stronger setae and dense large blotches dorsally. Dorsal papillae of prothorax indistinct; sensillae with short setae. Anterior dorsal transversal rib (anterior integumental fold) of abdominal segments with rare rather large brownish blotches and restricted by transversal rows of strong curved setae anteriorly and posteriorly, with four papillae crowned by sensilla with up to 2-5 long black setae (Fig. 8). Posterior dorsal transversal rib (posterior integumental fold) of abdominal segments with dense and rather strong setae formed 2 close rows. Dorsal depression of abdominal segments without setae or distinct blotches. Conjugation of anterior and posterior folds melts to sublateral bend fold with rare blotches and two large papillae which restricted by rare setae. Sublateral depression with small and rare blotches. Ventral surface of abdominal segments with rather uniform transversal rows of backwardly directed small setae. Weakly developed abdominal prolegs with rather long setae and one sensilla on short papilla; each sensilla with a pair of long setae. Anal segment consists of three folds with large brown blotches; the 1st and 2nd ones with 2 pair and the 3rd one with a single pair of distinct lappets (Fig. 9). Anterior spiracle short, brown, retractile, narrower in middle part. Posterior respiratory process red-brown, with weakly isolated apical part armed with crown of pale short branched pile. Basal third of posterior respiratory process with transversal dark rugosity. Posterior spiracle small; disc with dendritic openings (Fig. 10).

PUPARIUM. All characters like larva including papillae, setae and blotches. Surface of puparium brown. Anterior spiracle conical, covered by irregular facets with a single tracheal opening. Posterior respiratory process dark brown.

MATERIAL. 3 larvae, in chaps of bark among dried decaying sap, 30.IX 1997 (V. Mutin, A. Sivova).

BIOLOGY. Larvae inhabit the decaying sap runs on trunks, hibernate in 3rd stage under bark and its chaps or into superficial layer of soil, pupate in spring. Stage of pupa lasts about 5 days. Adults emerge from May to the beginning of June.

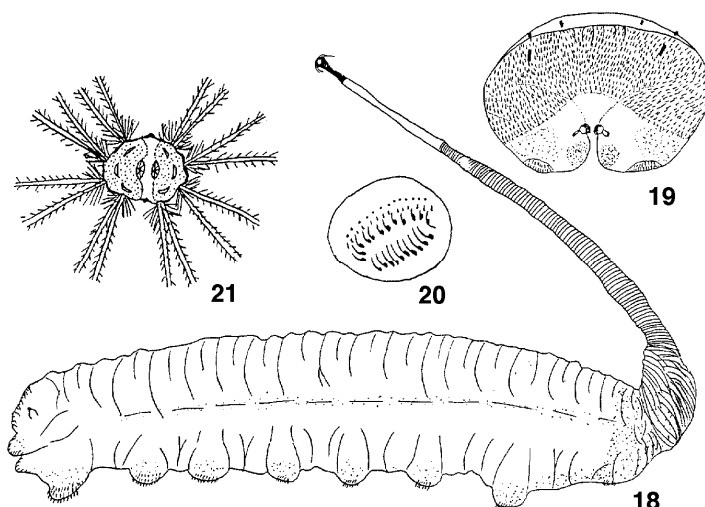


Figs 11-17. *Ceriana nigerrima*. 11) whole larva, ventral aspect; 12) chaetotaxy maps, lateral aspect; 13) abdominal proleg, ventral aspect; 14) disc of posterior spiracles, frontal aspect; 15) dorsal papilla of abdominal segment, lateral aspect; 16) dorsal papilla of abdominal segment, dorsal aspect; 17) lateral papilla of abdominal segment; lateral aspect. A1-8 – abdominal segments; T1-3 – thoracal segments.

***Ceriana nigerrima* Violovitsh, 1974**

Figs 11-17

LARVA. Length 13-18 mm, width 3-4 mm. Body brownish-yellowish with distinct segmentation, cylindrical, rather narrowed posterad to respiratory process with setae of variable length and density, mesothoracic and abdominal prolegs well developed; dorsal and lateral papillae usually with 4-6 long curved pale setae on apex, which are surrounded by numerous shorter erect setae (Fig. 15-17); posterior respiratory process well developed, untelesopic, near 1.5 mm length (Fig. 11, 12). Anterior fold with short dense strong spicules; behind of field of spicules there is transversal row of four small papillae crowned by black short directed backwards setae. The mesothoracic prolegs with four arcuate rows of darkened apically crochets; anterior row formed by 9-11 longest and strong crochets; 2nd row by 10-14 shorter ones; 3rd row formed by 20 small ones; 4th row consists of 7-10 smallest ones. Abdominal prolegs with three curved rows of crochets; anterior row formed by 9-11 long, strong and darkened apically crochets; middle row consisted of 10-12 shorter ones; third row formed by 6-7 small ones (Fig. 13). Anal segment with three pairs of setite lappets; posterior pair of lappets longer, distinctly thickened apically. Anterior spiracle short, brown, curved backward and dilated



Figs 18-21. *Mallota eurasiatica*. 18) larva, lateral aspect; 19) thorax, anterio-lateral aspect; 20) abdominal proleg, ventral aspect; 21) disc of posterior spiracles, frontal aspect.

basally. Posterior respiratory process brown, darker apically; spiracular openings large; disc with three pairs of large slits (Fig. 14).

PUPARIUM. Brown; all characters like larva, posterior respiratory process rather hitched up.

MATERIAL. 12 larvae, under bark in sap ran, 18.IV 1996 (D. Gritskevich); 7 larvae in the same place, 30.IX 1997 (V. Mutin, A. Sivova).

BIOLOGY. Larvae inhabit the decaying sap hidden under the bark, sap runs and wet rot-holes; hibernate in 3rd stage under bark, stage of pupa lasts 12-14 days. Adult emerge from second half of May to the first half of June.

***Mallota eurasiatica* Stackelberg, 1950**

Figs 18-21

LARVA. Length without telescopic tube 18-19 mm, width 4-5 mm; body whitish with rather well segmentation, cylindrical, with thin pale pile, with distinct prolegs and very long telescopic respiratory process (Fig. 18). Anterior fold with uniform regular spicules (Fig. 19). All segments with numerous grooves forming secondary segmentation. Secondary folds with transverse rows of very small papillae. Thoracical segment 2 with a pair of rounded prolegs armed by four indistinct rows of variable size crochets. Abdominal segments rather distinct, with secondary folds and six pairs of prolegs which armed by 4-5 arcuate rows of crochets darked apically; inner row formed by 8-12 long crochets, second row formed by 8-11 shorter ones, following rows formed by small dark ones (Fig. 20). Segment 7 with indistinct row of ventral tubercles anterad anal opening. Anal segment very long and narrow posteriorly, with a pair of very small lappets before retractive part of the segment. Anterior spiracle brown, elongated,

slightly curved backwards, strongly retractile. Posterior respiratory process from whitish-yellow basally to brown apically, near 15-16 mm length. Apical part of posterior respiratory process dark brown, with crown of 8 long brownish double subpressed terminal setae. Posterior spiracle with simple slits (Fig. 21).

PUPARIUM. Puparium keeps mainly all larval characters; brown, shorter than larva, flat ventrally, without distinct segmentation. Anterior spiracle longer than one of larva, covered by numerous small irregular facets with opening of trachea. Posterior respiratory process dark brown.

MATERIAL. 10 larvae, under bark in sap ran and into rot-holes, 18.IX 1995 (V. Mutin); 16 larvae, in the same conditions, 18.IV 1996 (D. Gritskevich); 7 larvae, in the same conditions, 30.IX 1997 (V. Mutin, A. Sivova).

BIOLOGY. Larvae inhibit the decaying sap hidden under the bark and wet rot-holes; hibernate in 3rd stage under bark; stage of pupa lasts 10-13 days. Adult emerge from second half of May to the first half of June.

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