

A REVIEW OF THE PALAEARCTIC SPECIES OF THE  
LEPTOMORPHUS QUADRIMACULATUS (MATSUMURA)  
GROUP (DIPTERA: MYCETOPHILIDAE)

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Four species of the *Leptomorphus quadrimaculatus* species group were recognized. *Leptomorphus quadrimaculatus* (MATSUMURA, 1916) is known from Japan and the Russian Far East, *L. forcipatus* LANDROCK, 1918 sp. restit. from Central Europe, *L. subforcipatus* sp. n. from Russia and Finland, and *L. talyshensis* sp. n. from Azerbaijan.

Key words: Sciaroidea, Mycetophilidae, *Leptomorphus*, taxonomy, new species, lectotype designation, review

## INTRODUCTION

The genus *Leptomorphus* CURTIS, 1831 comprises 27 described species of relatively large and brightly coloured fungus gnats (Diptera: Mycetophilidae). In the Catalogue of the Palaearctic Diptera (MATILE 1988), four species of *Leptomorphus* belonging to two subgenera are listed, one Eastern-Palaearctic species in the subgenus *Diomonus* Walker, 1848 and three species (2 European and 1 Japanese) from *Leptomorphus* s. str. Of the two European species, *L. (L.) walkeri* CURTIS, 1831 is relatively common and widely distributed, while the second, *L. (L.) quadrimaculatus* (MATSUMURA, 1916), is rather rare and little known.

We have recently recognized that our material of “*L. quadrimaculatus*“ consists of several closely related species, separable on coloration and details of the male terminalia. The study of the type and other Central-European material of *Leptomorphus forcipatus* LANDROCK, 1918, hitherto considered as a synonym of *L. quadrimaculatus*, revealed that this species is valid and different not only from the true *quadrimaculatus*, but also from two other similar species, one from European Russia and the second from Azerbaijan.

All the species recognized within the *quadrimaculatus* species group are described below and their male and female terminalia figured.

## MATERIAL AND METHODS

Altogether 39 specimens (both dried and stored in ethanol) from institutional and private collections have been examined. Male and female terminalia were macerated and cleared in 10 per cent potassium hydroxide, neutralized in acetic acid and placed in a pinned microvial filled with glycerol, or were left in ethanol. The terminology principally follows SÖLI (1997).

Collections examined: IEE – A. N. Severtsov Institute of Ecology and Evolution, Moscow, Russia; MMB – Moravian Museum, Brno, Czech Republic; JŠ – Collection of JAN ŠEVČÍK, Ostrava, Czech Republic; PCH – Collection of PETER CHANDLER, Melksham, United Kingdom.

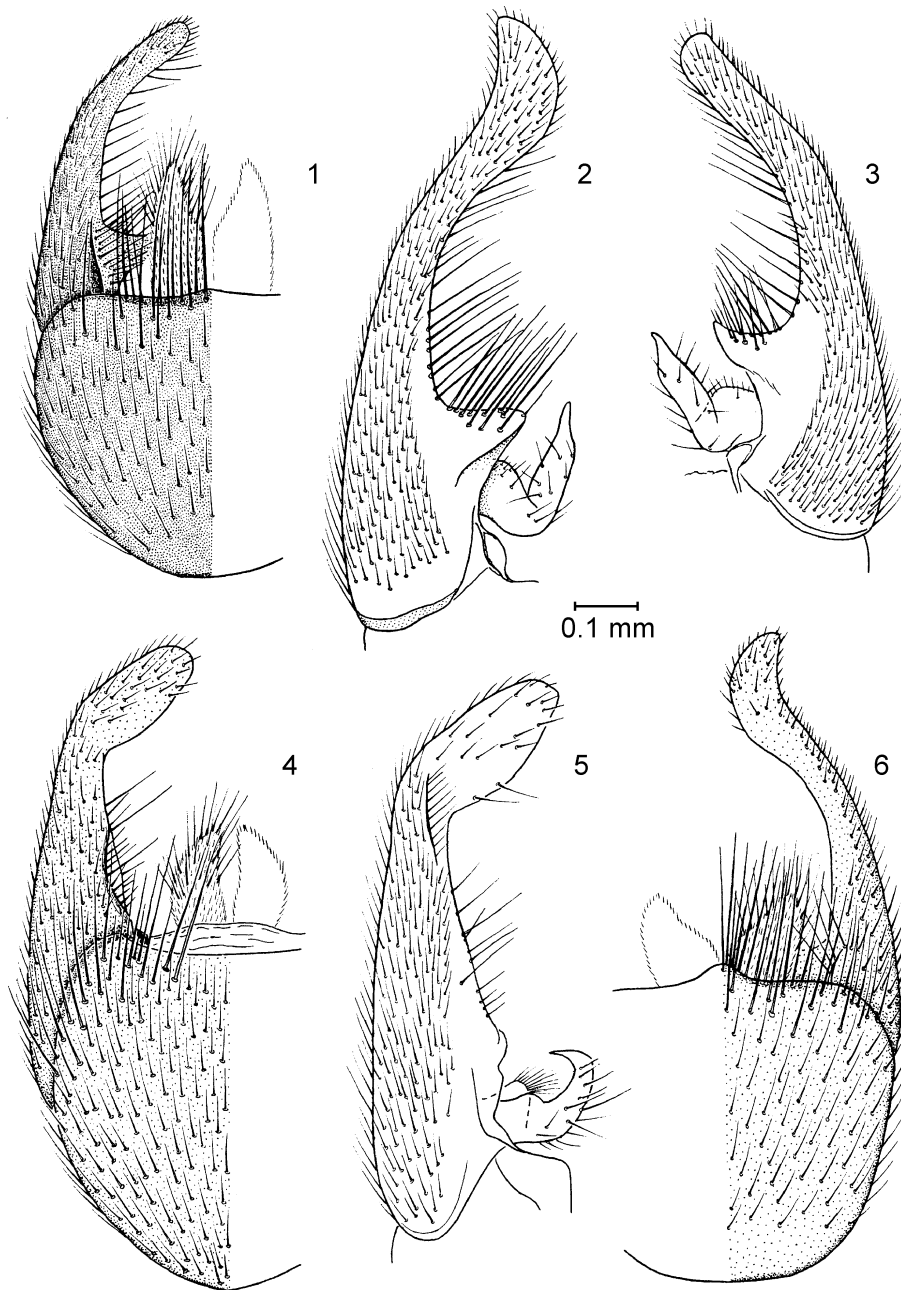
SURVEY OF THE PALAEARCTIC SPECIES OF THE L.  
QUADRIMACULATUS GROUP*Leptomorphus forcipatus* LANDROCK, 1918 **sp. restit.**  
(Figs 7, 10, 15–18)

*Leptomorphus forcipatus* LANDROCK, 1918: 107 (as var. of *walkeri* CURTIS, 1831).

Type material examined. Lectotype (herewith designated) ♂, labelled: “Árvaváralja” (= Slovakia, Oravský Podzámok, District Dolný Kubín), “Kertész”, “24.vi.1914” (reverse of the same label), “Collectio K. Landrock, K Czižek, D. Jacentkovský” (MMB). The lectotype is designated to elucidate the identity and fix the status of this species.

Other material examined. Czech Republic, Bohemia, Šumava Mts., Rokytická slať, peat-bog, 16.6.–21.7.1999, 1 ♂, M. Barták & Š. Kubík leg., Malaise trap (JŠ); Moravia & Silesia, Hrubý Jeseník Mts, Vrbno pod Pradědem env., Jelení Bučina Nature Reserve, maple-beech forest, 21.7.–24.9.1998, 1 ♂, yellow dishes filled with ethylene glycol (JŠ); Podyjí National Park, Horní Břečkov, 27.5.–7.6.2001, 1 ♂, M. Barták & Š. Kubík leg., Malaise trap (JŠ); Suchdol nad Odrou, Suchdolský les forest, 24.7.2002, 1 ♂, ex larva, collected on the lower side of *Stereum subtomentosum* (JŠ); Šilheřovice, Černý les Nature Reserve, beech forest, 1.–16.6.1998, 2 ♂♂, yellow dishes filled with ethylene glycol (JŠ, IEE). Poland, Cisna, 19.9.1991, 1 ♂, A. E. Stubbs leg. (PCH). Slovakia, Bukovské vrchy Mts, Nová Sedlica, 24.8.2001 (ex 26.8.2001), 1 ♂ 1 ♀ in copula, reared from pupae collected on the lower side of *Stereum hirsutum* (JŠ); Bukovské vrchy Mts, Uličské Krivé, Rožok National Nature Reserve, virgin beech forest, 23.8.–14.10.2001, 1 ♂, yellow dishes filled with ethylene glycol (JŠ).

Description. Male. Head mostly brown, clypeus light brown with long pale setae, palpus yellow. Antenna: flagellum dark brown, scapus yellow, pedicel brownish yellow, sixth flagellomere twice as long as broad. Thorax two-coloured, mesonotum with three dark brown wide longitudinal stripes, front corners, lateral and hind margins of mesonotum yellow, with dark oval spot above base of wing. Scutellum yellowish, dorsocaudally brown. Mediotergite yellow with brown medial posterior area. Laterotergite and preepisternum 2 yellowish, with ventral margin brown. Wing length 7.6–7.8 mm, wing with dark central spot, extending from Sc to stem of M fork, preapical band extending back to wing margin, clouds present also between branches of Cu fork and behind Cu2, stem of M fork 3 times as long as rm, base of Cu fork before base of r-m. Halteres yellow with brown knobs. Legs yellowish, first tarsomere 1.7 times as long as fore tibia, fore tibia with 9–10 a, 4–6 d, 5 pd, 7–8 p, 5–9 pv,



**Figs 1–6.** *Leptomorphus* WALK.: 1, 3 – *L. quadrimaculatus* (Russia, Lazo); 2, 6 – *L. subforcipatus* sp. n. (holotype); 4, 5 – *L. talyshensis* sp. n. (holotype): 1, 4, 6 = male terminalia (dorsal view); 2, 3, 5 = gonostylus (ventral view)

numerous v, arranged in 2 irregular rows; mid tibia with 9–12 a, 6 d, 7–11 pd, 9–10 p, 3–5 pv, 4–7 v; hind tibia with 9–14 a, 11–13 d, 12–13 pd, 11–12 p, 7 v, 4–7 av. Abdomen brownish yellow, apically darker. Tergites 1 to 6 brownish yellow, T2 basally brown, T6 caudally brown, T7 dark brown.

Terminalia yellow (Figs 7, 10, 15, 16).

Female. Similar to male in coloration. Terminalia yellow (Figs 17, 18).

Distribution. This species is reliably known only from the Czech Republic, Slovakia and Poland. At present, there is no voucher specimen of *L. forcipatus* from Hungary (MATILE 1988, erroneously recorded by PAPP & ŠEVČÍK 2001) and the records (both as *L. quadrimaculatus*) from Switzerland (CHANDLER 1998) and Russian Karelia (POLEVOI 2001) should be verified.

Biology. Larva found on the lower side of the fruit body of *Stereum hirsutum* and *S. subtomentosum*, where also pupation takes place. The mating was observed immediately after emerging from pupa and lasted several hours (in the laboratory conditions).

Remarks. *L. forcipatus* is close to *L. subforcipatus* sp. n., from which it differs in the shape of gonostylus. We prefer to designate the specimen from LANDROCK's collection as a lectotype, because LANDROCK (1918) did not state the number of specimens examined. The lectotype male is from northeastern Slovakia, not Hungary as considered by previous authors. The lectotype differs slightly from the other specimens, mainly in the shape of caudal margin of T9, but it is probably only intraspecific variability.

*Leptomorphus quadrimaculatus* (MATSUMURA, 1916)  
(Figs 1, 3, 8, 12)

*Boletina quadrimaculatus* MATSUMURA, 1916: 440;

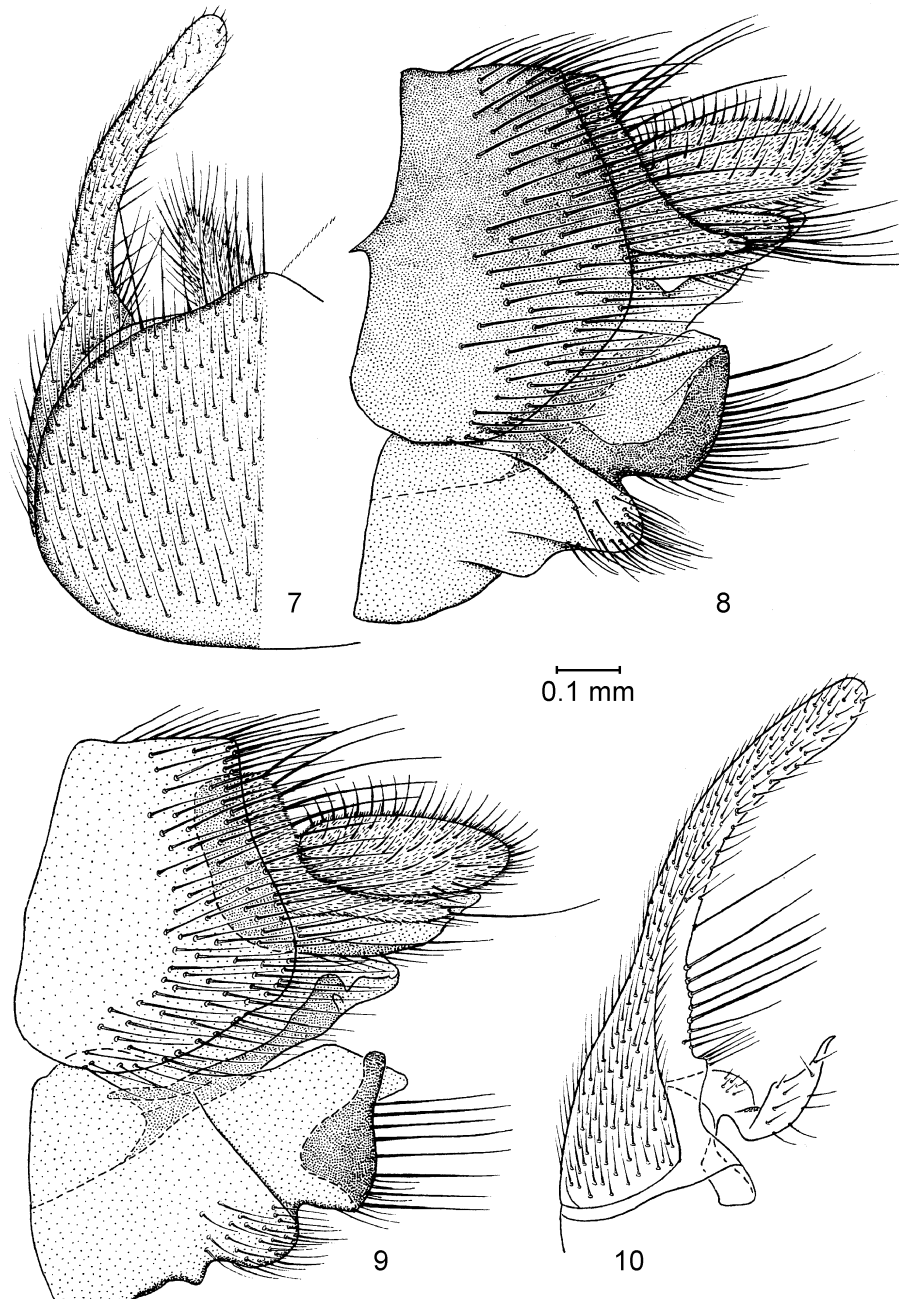
*Lepitomorphus 4-maculata*, OKADA, 1936: 99 (lapsus calami);

*Lepitomorphus 4-maculatus*, OKADA, 1939: 302.

Material examined. Russia: Primorsky Reg., Lazo, Sokolchi, 11.VII.1979, 5 ♂♂, 4 ♀♀, Zaitzev leg.; the same data, 21.VII.1979, 1.VIII.1979, 2 ♂♂, Zaitzev leg.; Primorsky Reg., Kedrovaya Pad Reserve, IX.1960, 1 ♂, 1 ♀, Krivosheina leg.; Khabarovsk Reg., Bychikha, 3.VII.1975, 1 ♂, Mamaev leg.; Tuva, Ishtii-Hem, 13.VIII.1979, 1 ♂, Krivosheina leg. (IEE).

Description. Male. Head dark brown, palpus yellow; antenna dark brown, sixth flagellar segment twice as long as broad. Thorax dark brown, mesonotum shining. Wing length 6.5–8 mm, wing with dark central spot extending from Sc to stem of M fork, preapical band extending back to wing margin, clouds present also between branches of Cu fork and behind Cu2; stem of M fork 2.5 times as long as rm, base of Cu fork before base of rm. Halteres with brownish knobs. Legs yellow, basal parts of first and hind coxae dark, first basitarsus twice as long as fore tibia; fore tibia with 14–15 a, 6–7 d, 7–12 pd, 12–14 p, numerous v, arranged in irregular rows; mid tibia with 14–15 a, 11–13 d, 14–21 pd, 14 p, 5–8 v, 10–11 av; hind tibia 19–20 a, 18–21 d, 21–23 pd, 18–20 p, 7–10 pv, 14 v. Abdomen shining dark brown. Terminalia brown.

Female. Similar to male in coloration. Ovipositor light brown, cerci yellow.



**Figs 7–10.** *Leptomorphus* WALK.: 7, 10 – *L. forcipatus* (Czech Republic, Šilheřovice); 8 – *L. quadrimaculatus* (Russia, Lazo); 9 – *L. subforcipatus* sp. n. (Russia, Moscow region): 7 = male terminalia (dorsal view); 8, 9 – female terminalia (lateral view); 10 = gonostylus (ventral view)

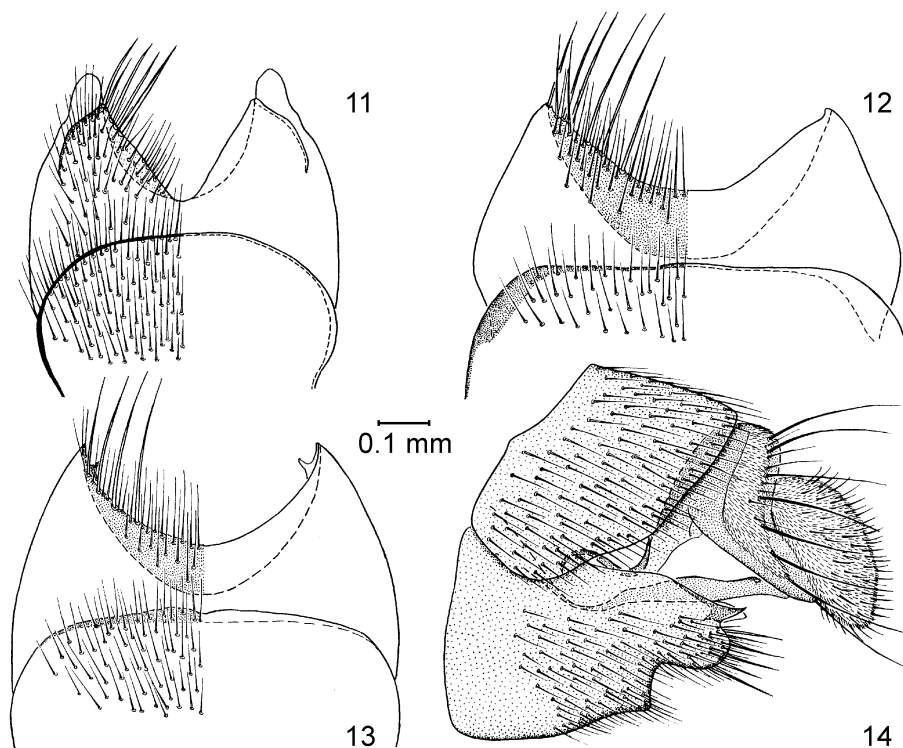
**Leptomorphus subforcipatus** sp. n.  
(Figs 2, 6, 9, 13)

*Leptomorphus forcipatus*, KRIVOSHEINA, ZAITZEV, YAKOVLEV, 1986, fig. 36, 6;

*Leptomorphus quadrimaculatus*, ZAITZEV, 1994 (part), fig. 54, 4; Zaitzev, 1999, fig. 99, 5.

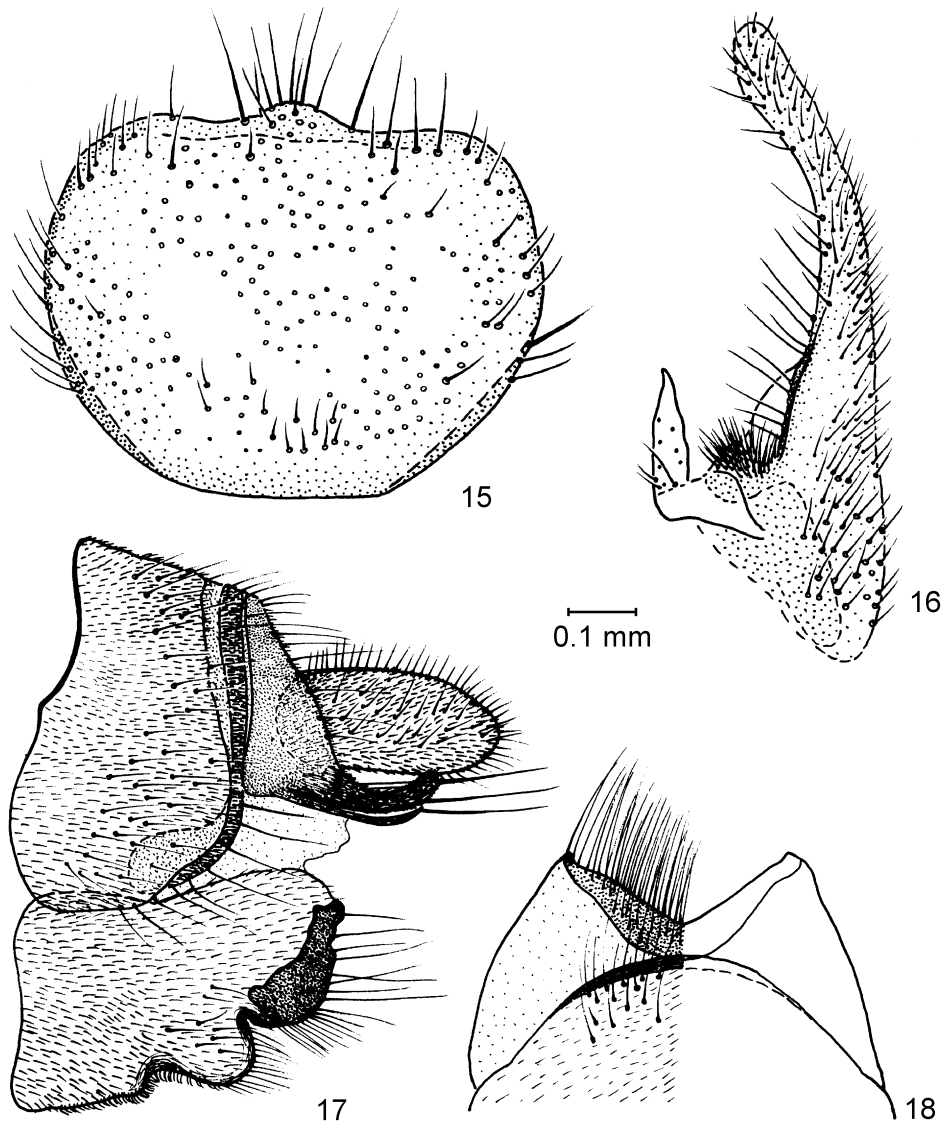
Material examined. Holotype ♂: Russia, Moscow Reg., Pavlovskaya Sloboda, 10.VII.1982, Zaitzev leg. (IEE). Paratypes. Russia: 4 ♂♂, 1 ♀, with the same data; 3 ♂♂, Moscow Prov., Ovrazhki, 30.VII.1984, Zaitzev leg.; 1 ♂, Moscow Reg., Anikeevka, 15.IX.1982, Zaitzev leg.; 1 ♂, Kostroma Prov., Ugory, 8.IX.1981, Zaitzev leg.; 1 ♂, Karelia, Tolvoyarvi, 29.VI–2.VII.1998, Tietäväinen leg.; Finland, 1 ♂, Ilomantsi, Tapionaho, 7–28.VII. 1993, Yakovlev leg. (IEE).

Description. Male. Head dark brown, clypeus light brown or yellow, palpus yellow; antenna dark brown, scapus and pedicel yellow, sixth flagellar segment twice as long as broad. Thorax two-coloured, mesonotum shining dark brown with yellow hind corners, scutellum brown, mediotergite yellow with brown central area, laterotergite yellowish brown. Wing length 6–8 mm, wing with dark



**Figs 11–14.** *Leptomorphus* WALK.: 11, 14 – *L. talyshensis* sp. n. (paratype); 12 – *L. quadrimaculatus* (Russia, Lazo); 13 – *L. subforcipatus* sp. n. (Russia, Moscow region): 11–13 = female sternite 8 (ventral view); 14 = female terminalia (lateral view)

central spot, extending from Sc to stem of M fork, preapical band extending from Sc to stem of M fork, preapical band extending back to wing margin, clouds present also between branches of Cu fork and behind Cu2, stem of M fork 2.5 times as long as rm, base of Cu fork before base of rm. Halteres with brownish knobs. Legs yellow, first tarsomere 1.5 times as long as fore tibia, fore tibia with 9–10



**Figs 15–18.** *Leptomorphus forcipatus* LANDROCK: 15–16 = lectotype, male terminalia: 15 = tergite 9 (dorsal view); 16 = gonostylus (ventral view); 17–18 = Slovakia, Nová Sedlica, female terminalia: 17 = lateral view; 18 = sternite 8 (ventral view)

a, 4–6 d, 5 pd, 7–8 p, 5–9 pv, numerous v, arranged in 2 irregular rows; mid tibia with 9–12 a, 6 d, 7–11 pd, 9–10 p, 3–5 pv, 4–7 v; hind tibia with 9–14 a, 11–13 d, 12–13 pd, 11–12 p, 7 v, 4–7 av. Abdomen brown. Terminalia yellowish brown.

Female. Similar to male in coloration. Ovipositor yellow.

Remark. This species is very close to *L. quadrimaculatus* (MATSUMURA), from which it differs in the coloration of thorax and in the shape of gonostylus.

### **Leptomorphus talyshensis** sp. n.

(Figs 4, 5, 11, 14)

Material examined. Holotype ♂: Azerbaijan, Avrora, 13.V.1980, Zaitzev leg. Paratypes: ♂, ♀, with the same data (IEE).

Description. Male. Head yellow, vertex light brown, clypeus and palpus yellow, antennae with sixth flagellar segment twice as long as broad. Thorax two-coloured; mesonotum shining dark brown with yellow lateral parts, laterotergite yellow with brownish lower margin, pleuron yellow. Wing length 7 mm, wing with dark central spot, starting from Sc and ending behind stem of M fork, apical part of wing darkened, clouds present also between branches of Cu fork and behind Cu<sub>2</sub>; stem of M fork 3.5 times as long as rm, base of Cu fork under base of rm. Halteres with brown knobs. Legs yellow, first tarsomere twice as long as fore tibia, fore tibia with 6–8 a, 2 d, 1–3 pd, 5 p, 6 pv, 15 v; mid tibia with 16 a, 8 ad, 5 d, 8 pd, 6 p, 3–4 v; hind tibia with 8 a, 10 ad, 8 d, 6 pd, 4 p, 4 v. Abdomen two-coloured, tergites 1–5 yellow with dark brown hind margins, tergite 6 dark brown with narrow yellow fore margin. Terminalia yellow.

Female. Similar to male in coloration. Ovipositor yellow.

Remarks. This species is close to *L. forcipatus* LANDROCK, from which it differs mainly in the coloration of abdomen and in the shape of gonostylus.

### KEY TO SPECIES

- 1 Wing with dark central spot extending from Sc to stem of M fork and pre-apical band extending back to wing margin. Base of Cu fork before base of rm. Abdomen shining dark brown 2
- Wing with dark central spot starting from Sc and ending behind stem of M fork. Base of Cu fork under base of rm. Abdomen two-coloured, tergites 1–5 yellow with dark brown hind margins. Male terminalia as on Figs 4, 5; ovipositor as on Figs 11, 14 *L. talyshensis* sp. n.
- 2 Thorax unicolorous dark brown. Male terminalia as on Figs 1, 3; ovipositor as on Figs 8, 12 *L. quadrimaculatus* (MATSUMURA)



- Thorax two-coloured, mesonotum dark brown with yellow hind corners, pleurae yellow or light brown, mediotergite yellow with brownish central area 3
- 3 Gonostylus with distinct triangular projection directed medially (Fig. 2)  
*L. subforcipatus* sp. n.
- Gonostylus without triangular projection directed medially (Fig. 10)  
*L. forcipatus* LANDROCK

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