

## Four new species of *Lispe* Latreille, 1796 (Diptera: Muscidae) with taxonomic notes on related species

### Четыре новых вида *Lispe* Latreille, 1796 (Diptera: Muscidae) и таксономические заметки по родственным видам

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KEY WORDS: *Lispe kowarzi*, *Lispe asetopleura*, *Lispe freidbergi*, *Lispe hennigi*, *Lispe subbivittata*, *Lispe nivalis* group, *Lispe kozlovi*, *Lispe brunnicosa*, *Lispe rigida* group, Muscidae, Diptera, new species, new synonym.

КЛЮЧЕВЫЕ СЛОВА: *Lispe kowarzi*, *Lispe asetopleura*, *Lispe freidbergi*, *Lispe hennigi*, *Lispe subbivittata*, *Lispe nivalis*, *Lispe kozlovi*, *Lispe brunnicosa*, *Lispe rigida*, Muscidae, Diptera, новый вид, новый синоним.

ABSTRACT. *Lispe asetopleura* sp.n. is described, the taxonomic notes on the related *Lispe kowarzi* Becker, 1903 are given; the new synonym is proposed: *Lispe kowarzi* Becker, 1903 = *Lispe pakistanensis* Shinonaga & Afzal, 1989 syn.n. *Lispe freidbergi* sp.n. is described from Near East. *Lispe hennigi* sp.n. is described, the taxonomic notes and identification key for the related species (*Lispe nivalis* group) are given. *Lispe kozlovi* sp.n. is described, the taxonomic notes and identification key for the related species (*Lispe rigida* group) are given.

РЕЗЮМЕ. Описан *Lispe asetopleura* sp.n., рассмотрены таксономические проблемы родственного вида *Lispe kowarzi* Becker, 1903 и предложен новый синоним: *Lispe kowarzi* Becker, 1903 (= *Lispe pakistanensis* Shinonaga & Afzal, 1989 syn.n.). *Lispe freidbergi* sp.n. описан с Ближнего Востока. Описан *Lispe hennigi* sp.n., рассмотрена таксономия и дана определительная таблица для родственных видов (*Lispe nivalis* группа). Описан *Lispe kozlovi* sp.n., рассмотрена таксономия и дана определительная таблица для родственных видов (группа *Lispe rigida*).

#### Introduction

My estimation is that there are 200 or slightly less species of *Lispe* Latreille worldwide, mainly from warm regions of the Old World. The Holarctic species of *Lispe* were divided by Hennig [1960] into 6 species groups: *L. tentaculata* group, *L. palposa* group, *L. uliginosa* group, *L. caesia* group, *L. longicollis* group, *L. scalaris* group and several species with unclear rela-

tionship. Recently two more species-groups of *Lispe* were proposed and considered: *L. leucospila* group [Vikhrev, 2011a] and *L. pygmaea* group [Vikhrev, 2012]. Four new species of *Lispe* from different regions are described in this paper: *L. asetopleura* sp.n. (Ethiopia and Cameroon), *L. freidbergi* sp.n. (Near East), *L. hennigi* sp.n. (Thailand), *L. kozlovi* sp.n. (Russia, S Siberia and Kazakhstan). The four described species are not closely related to each others and have only few known related species each, but two new species-groups are proposed in this paper: *L. nivalis* group and *L. rigida* group. The taxonomy of more than 10 species of *Lispe* is considered and I hope that this paper will clarify at least a small part of the large genus *Lispe*.

#### Material and methods

The majority of the specimens studied are in the Zoological Museum of Moscow University, in this case not indicated in text. Other collections are abbreviated as follows: ISEA — Institute of Systematics and Ecology of Animals, Novosibirsk; TAUI — Tel-Aviv University, Israel; ZIN — Zoological Institute, St.-Petersburg.

Localities (where possible) are given in a form: country, administrative region, geographical coordinates, the latter are given in the Decimal Degrees format.

Abbreviations. In the collector names N. Vikhrev is abbreviated as NV. The following generally accepted abbreviations for morphological structures are used: *f1*, *t1*, *f2*, *t2*, *f3*, *t3* = fore-, mid-, hind- femur or tibia; *ac* = acrostichal setae; *dc* = dorsocentral setae; *a*, *p*, *d*, *v* =

anterior, posterior, dorsal, ventral seta(e); *prst* — presutural, *post* — postsutural.

The abbreviation for the tarsi as *tar* followed by a pair of digits separated by a hyphen was proposed by Vikhrev [2011b]: the first digit (1 to 3) gives the leg number and the second digit (1 to 5) the number of the tarsal segment. For example, *tar1-4* = 4-th segment of fore tarsus; *tar3-1* = hind basitarsus.

### 1. *Lispe asetopleura* sp.n. and taxonomic notes on *Lispe kowarzi* Becker, 1903

#### *Lispe asetopleura* sp.n.

Figs 1–3.

Holotype ♂, **Ethiopia**: *Oromia* reg., Langano Lake, 1590 m asl, 7.646°N 38.706°E, 13–15.III.2012, NV.

Paratypes, 19♂♂, 9♀♀. **Cameroon**: *Northwest* reg., Bamenda env., [H° 6.01°N 10.35°E], 1200 m asl, 18.XI.1987, F.Kaplan (TAUI). **Ethiopia**: *Amhara* reg.: 1♂, 1♀, Blue Nile R., 1070 m asl, 10.08°N 38.19°E, 31.VII.2012, NV; *Oromia* reg.: 9♂♂, 1♀, Ziway L., 1640 m asl, 7.91°N 38.73°E, 11–13.III.2012, NV; 6♂♂, 6♀♀, Langano L., 1590 m asl, 7.646°N 38.706°E, 13–15.III.2012, NV; 1♂, 1♀, Awasa L., 1690 m asl, 7.079°N 38.478°E, 15–16.III.2012, NV.

DESCRIPTION. Male, body length 3.5–4.0 mm.

**Head.** Frons 0.4 of head width, distinctly narrowed at anterior quarter. Fronto-orbital plates glossy-black in posterior third, math black in middle third, whitish dusted in anterior third; interfrontalia matt black; frontal triangle wide, glossy-black. Fronto-orbital plates with 2 pairs of inclinate, 1 pair of reclinate setae and with an outer row of fine setulae. Parafacials whitish dusted, narrow, with a row of setulae. Cheeks whitish dusted, 1.5 times as wide as antenna width. Occiput grey dusted, with a pair of large glossy-black spots in upper half. Antenna black, unusually long (almost equal to distance to mouthmargin), aristal hairs longer than antenna width. Vibrissae strong, palpi yellow.

**Thorax** black, lower pleura thinly grey dusted, upper pleura, scutellum and disc of scutum glossy black excluding a small and not very distinct whitish dusted spot at level of humeral calli. Thoracic setae weak: *prst ac* in 3–4 rows; *dc* 0+1; postpronotal 1 weak; intraalars absent; supraalars 1+1, the presutural one weak; notopleural 2, posterior seta 2 times shorter than anterior one; katapisternal setae — 1:1:1, arranged in equilateral triangle; meron bare. Anepimeron bare: “*Lispe* setulae” entirely absent. Wing distinctly blackish, vein M straight, calypters whitish, halter black.

**Legs** mostly black with whitish dusting, but fore tarsus from apex of *tar1-1* to *tar1-5* yellow; *t2* and mid tarsus yellow (except brownish *tar2-5*); *t3* and hind tarsus dirty yellow (except blackish *tar3-5*). *f1* with *pd* row and 3–4 short *pv* at apex; *t1* compressed laterally, with strong *pv* seta; *f2* with short submedian *a*, with 1 apical and 1 preapical *pd* setae; *t2* with strong *ad* and *pd*; *f3* with a short *ad* row; *t3* with *av*, *ad* and *pd* setae. Pulvilli small.

**Abdomen** glossy black with small white lateral spots on anterior margin of tergites 3 to 5. Sternite 5

(Fig. 2), weakly sclerotized, cercal plate as shown in Fig. 3.

**Female** differs from male as follows: body size 4–4.5 mm; whitish spot on anterior part of scutum more distinct; *t3* blackish, abdomen ovate.

**DIAGNOSIS.** *Lispe asetopleura* sp.n. is obviously related to *Lispe kowarzi* Becker, 1903, detailed differences are given in the identification keys below (see Remarks).

**ETYMOLOGY.** The name indicates that characteristic *Lispe*-setulae on anepimeron (= pteropleura) are entirely absent in this species.

**DISTRIBUTION.** So far known from Ethiopia and Cameroon.

#### *Lispe kowarzi* Becker, 1903

Figs 4–7.

*Lispe kowarzi* Becker, 1903: 116. Type locality: Egypt: Cairo, Asyut, Aswan, Faiyum.

*Lispe pallitarsis* Stein, 1909: 259. Type locality: Indonesia: Java, Semarang.

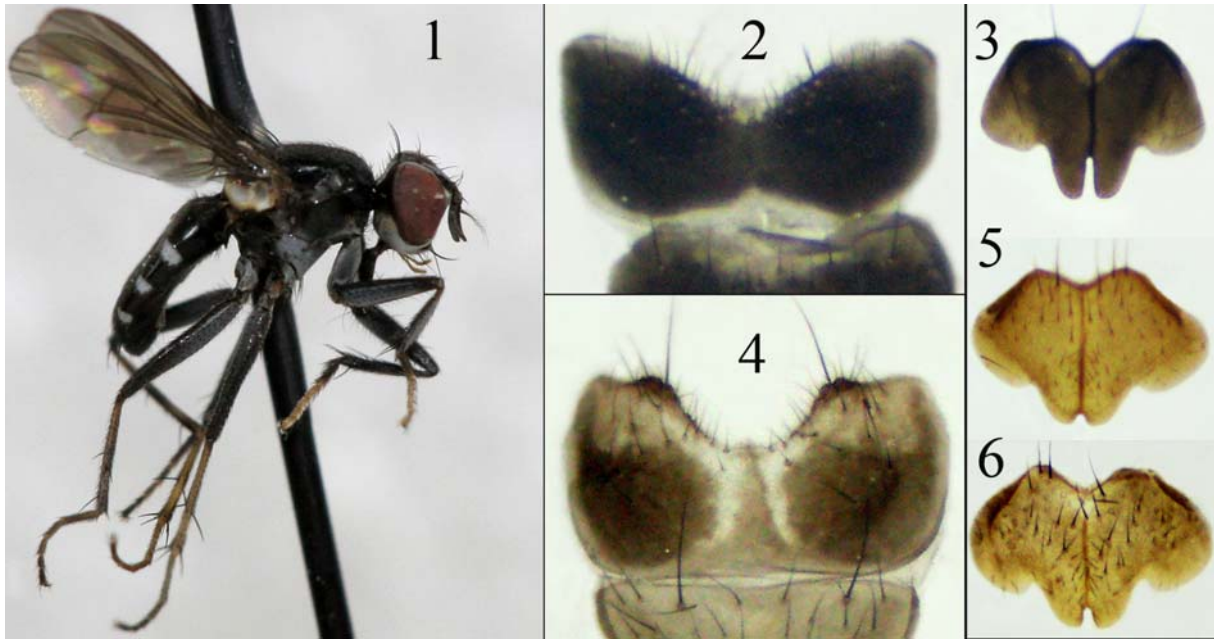
*Lispe pakistanensis* Shinonaga & Afzal, 1989: 91, **syn.n.** Type locality: Karachi, Pakistan.

**MATERIAL EXAMINED.** **Cambodia**: *Kep* prov., Kep, 10.50°N 104.33°E, 06.XII.2010, NV, 1♂, 2♀; *Koh Kong* prov., Koh Kong env., 11.6°N 103.0°E, 28.XI–04.XII.2010, NV, 1♀. **India**: *Goa* state, 26.II.2008, K.Tomkovich, 1♂, 1♀; *Rajasthan* state, Sawai Madhopur env., 26.02°N 76.38°E, 26.II.2011, NV, 2♀♀; *Uttarakhand* state, Haridwar, 29.96°N 78.19°E, 10.IX.2011, NV, 1♂. **Iran**: Sistan (presently *Sistan and Baluchestan* prov., 27°N 61°E), V.1898, N. Zarudnyi, 4♂♂(ZIN). **Israel**: Kinneret L. env., 27.X.2011, NV, 8♂♂, 1♀. **Malaysia**, Borneo: *Sabah* prov., Kota Kinabalu env., 28.XII.2011, NV, 6♂♂, 2♀♀. **Morocco**: *Essaouira* prov., 25.III.2009, NV, 1♀. **Myanmar**: *Shan* state, Inle L., 30.XI.2009, NV, 1♀. **Senegal**: *Fatick* reg., Sine-Saloum estuary (14.1°N 16.7°W), 2–6.III.2007, NV, 3♀♀. **Thailand**: *Chanthaburi* prov., Khao Khitchakut env., 04.XI.2009, NV, 1♂, 1♀; *Chonburi* prov., Pataya env., XI–XII.2006–09, NV, 28♂♂, 14♀♀; *Mae Hong Son* prov., Pai env., 11.XI.2009, 2♂♂; *Phuket* prov., 14.II.2009, NV, 1♂, 3♀♀; *Rayong* prov., Ban Phe, 08.XII.2008, NV, 1♀; *Trat* prov., Ko Chang Isl., 14.XII.2011, NV, 1♀. **Turkey**: *Antalya* prov., Manavgat env., IX–X.2006–09, NV, 11♂♂, 9♀♀.

**DISTRIBUTION.** Widespread in S Palearctica and Oriental region.

**REMARKS.** *L. kowarzi* is distributed throughout a wide area from N-W Africa in the West to Indonesia in the East. All examined specimens have anepimeron with 1–3 setulae above the posterior katapisternal seta, though these setulae are not easily visible against the background of the black pleura. All examined males have the ventral setae on posterior femora always present and strong: *f2* with 3–4 long ventral setae on the basal half, *f3* with 2 *pv* setae, in basal the half and beyond middle. So, *L. kowarzi* is always reliably differs from the related Afrotropical *L. asetopleura* sp.n. But the intraspecific variability of *L. kowarzi* is significant and obviously correlates with geography, so that the species may be divided into two subspecies: the Western one, *L. kowarzi kowarzi* Becker, 1903 and the Eastern one, *L. kowarzi pallitarsis* Stein, 1909.

*L. kowarzi kowarzi* is represented by specimens collected in N. India, Pakistan (as *L. pakistanensis* [Shinonaga, Afzal, 1989]), Turkey, Israel, Morocco



Figs 1–6. *Lispe* spp. 1–3. *Lispe asetopleura* sp.n., ♂: 1 — holotype; 2 — sternite 5; 3 — cercal plate. 4–6. *Lispe kowarzi* Becker, ♂: 4 — sternite 5; 5 — cercal plate, specimen from Turkey, Antalya; 6 — cercal plate, specimen from Thailand, Chonburi.

Рис 1–6. *Lispe* spp. 1–3. *Lispe asetopleura* sp.n., ♂: 1 — голотип; 2 — стернит 5; 3 — церки. *Lispe kowarzi* Becker, ♂: 4 — стернит 5; 5 — церки, экземпляр из Турции, Анталия; 6 — церки, экземпляр из Таиланда, Чонбури.

and Senegal: *dc* 1+3 (1+2), only anterior postsutural pair is weak (Fig. 7); katapisternals 1:1:1 all strong; abdomen without white spots (in males rather indistinct spots on tergite 4 is sometimes present); all setae on head, thorax and legs stronger. *L. kowarzi pallitarsis* is represented by specimens collected in Thailand, Cambodia and Malaysian Borneo: *dc* reduced to 0+1 (or 0+2, in this case the anterior pair is very weak); anterior katapisternal reduced or hair-like if present, lower katapisternal usually hair-like; abdomen with whitish spots in both sexes; all setae on head, thorax and legs weaker. The scanty material from S. India and Myanmar seems has intermediate characters. Palpi in both subspecies are usually blackish, but may be dirty-yellowish. Male terminalia of 6 specimens were examined, those of *L. kowarzi kowarzi* and *L. kowarzi pallitarsis* look similar (Figs 5, 6) and similar to drawings given by Hennig [1960: textfig. 121 and plate XX, fig. 400]. So far I prefer to treat *L. kowarzi kowarzi* and *L. kowarzi pallitarsis* as subspecies of *L. kowarzi* Becker, 1903.

Both subspecies of *L. kowarzi* may be distinguished from *L. asetopleura* sp.n. as follows:

- Anepimeron bare: “*Lispe setulae*” entirely absent; *t2* yellow or dirty yellow in female. ♂: *f2* and *f3* without ventral setae; cercal plate deeply divided (Fig. 3); sternite 5 smaller, subtriangular in shape (Fig. 2). ♀: scutum with whitish dusted spot anteriorly; palpi yellow ..... *asetopleura* sp.n.
- Anepimeron with 1–3 setulae above posterior katapisternal seta; *t2* dark, at most translucent reddish. ♂: *f2* with 3–4 long ventral setae on basal half, *f3* with 2 *pv* setae, in

basal half and beyond middle; cercal plate divided on very apex only (Figs 5–6); sternite 5 bigger, subquadrate in shape (Fig. 4). ♀: scutum entirely glossy black, palpi black to dirty-yellowish ..... *kowarzi* Becker

It is much easier to distinguish females of *L. asetopleura* sp.n. from females of the *L. kowarzi kowarzi* distributed in North Africa and Western Asia, the regions adjacent to Sub-Saharan Africa from where *L. asetopleura* sp.n. is known. In addition to the characters given above:

- 0+1 strong *dc*; abdomen with distinct white lateral spots on anterior margin of tergites 3 to 5 ..... ♀ *asetopleura* sp.n.
- 1+2 strong *dc*; abdomen evenly black, without white spots ..... ♀ *kowarzi kowarzi* Becker

SYNONYMY. *Lispe pakistanensis* Shinonaga & Afzal, 1989 belongs to the *L. kowarzi kowarzi* which has 1+2 *dc* and the abdomen entirely black, its description fits *L. kowarzi*. Diagnosis (Remarks) “metallic black body and very long 3rd antennal segment” [Shinonaga & Afzal, 1989: 92] also fits *L. kowarzi*. So, *Lispe kowarzi* Becker, 1903 = *Lispe pakistanensis* Shinonaga & Afzal, 1989, **syn.n.**

## 2. *Lispe freidbergi* sp.n.

*Lispe freidbergi* sp.n.

Figs 8–10.

Holotype ♂: **Egypt: Sinai**, Ein Shinar, 2000 m als, (28.52°N 33.94°E), 24.IV.1998, F.Kaplan & A.Freidberg (TAUI).



Fig. 7. ♂ *Lipse kowarzi kowarzi* Becker with prey *Allotrichoma* (Ephydriidae), Turkey, Antalya prov.

Рис. 7. ♂ *Lipse kowarzi kowarzi* Becker с жертвой *Allotrichoma* (Ephydriidae), Турция, пров. Анталия.

Paratypes, 5♂♂, 5♀♀. **Egypt: Sinai:** 1♂, Catherine Mt. env.: Wadi Tlach, 1500 m asl (H°28.58°N 33.92°E), 15.VII.1974, F.Kaplan; 1♂, 1♀, Ein Shinar, 2000 m als, (28.52°N 33.94°E), 11.VII.1969, A.Freidberg, 1♀, Ein Shinar, 2000 m als, (28.52°N 33.94°E), 24.IV.1998, F.Kaplan & A.Freidberg; 1♂, 1♀, Wadi El Arbain, 2000 m asl, (28.526°N 33.962°E), 14.VII.1974, F.Kaplan, 27.VIII.1975, D.Gerling; 1♂, "Sinai W Harza", 12.IV.1981, T.Furman (TAUI and ZMUM). **Israel:** 2♀♀, Negev, Ramon Mt. env., 30.5°N 34.6°E, 950 m asl, 02.V.1995, M.Irwin (TAUI).

**DESCRIPTION.** Male, body length 6–6.5 mm.

**Head** densely whitish dusted. Fronto-orbital plates densely whitish to yellow-whitish dusted, with 4 inclinate and 2 reclinate setae and an outer row of setulae. Interfrontalia blackish, frontal triangle rather indistinct, subshining black, narrow in anterior half. Face and parafacials yellowish, cheeks whitish, occiput whitish-grey dusted. Antenna: pedicel yellow(ish); postpedicel black; arista long plumose in basal part, the longest hairs twice as long as antenna width. Vibrissae strong. Palpi yellow, remarkably enlarged, about as long and wide as length of antenna.

**Thorax.** Pleura densely grey dusted, scutum brownish-grey dusted with 3 narrow black vittae: median one and 2 submedian along dorsocentrals. Thoracic setae: *dc* 2+3, *pstr ac* hairs in 4 rows, postpronotal 2, intraalars 1+2, supraalars 1+1. Katepisternals 1:2, anepimeron with 5 setulae, meron bare. Wings hyaline, with yellowish veins, the vein M not curved.

**Legs** colour: femora black densely grey dusted, knees and tibiae yellow, tarsi black on dorsal surface and yellow on ventral surface. *f1* with complete rows of 8 *pd* and 12–13 *pv* setae. *t1* without setae except preapicals. *f2* ventrally with 2 complete *av* and *pv* rows of

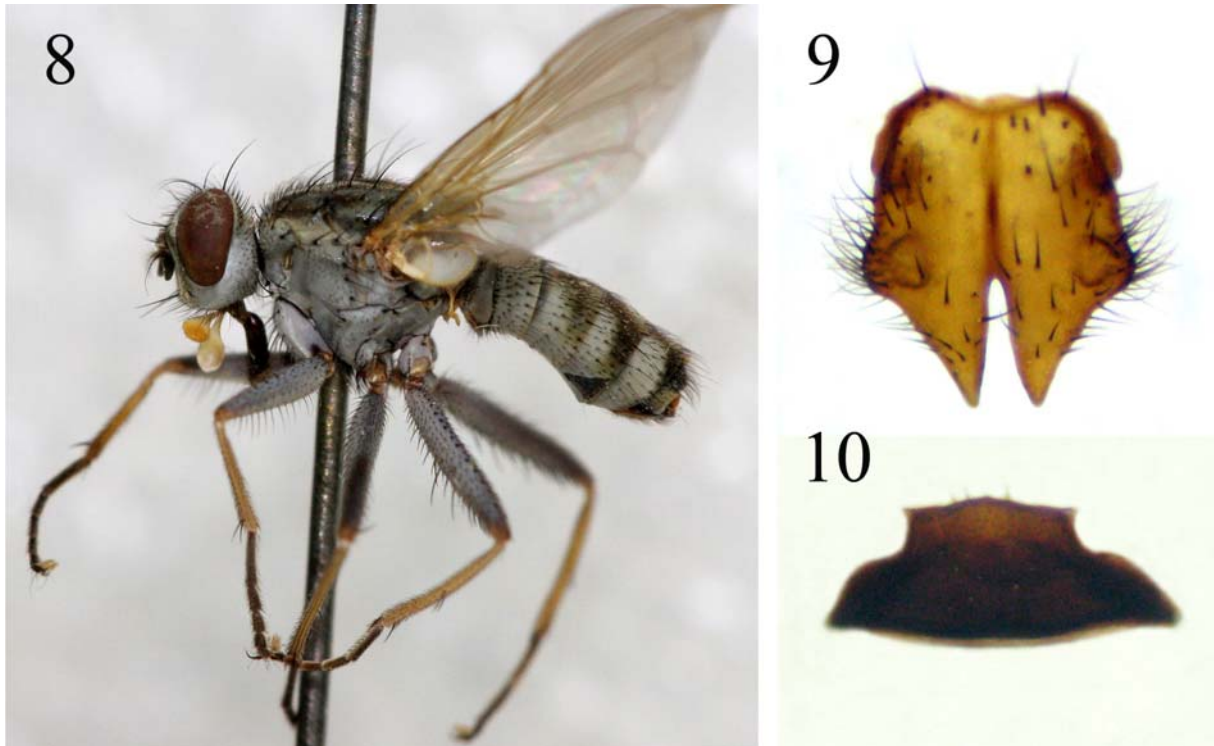
short but strong spine-like setae and with 1 *pd* preapical. *t2* with 1 submedian *p* seta. *f3* with 2 rows of *av* and *pv* spine-like setae, these setae are twice longer than the similar setae on *f2* and look somewhat irregularly placed, 2 setae in *av* row beyond middle are much longer than others, at least as long as femur width. *t3* with submedian *ad* and *pd*. Hind coxa bare on inner posterior surface. Pulvilli of all legs large, as long as length of last tarsomer.

**Abdomen** densely grey dusted, tergites 3 to 5 with paired L-shaped more or less fused spots, the pattern is more distinct on tergite 4, more vague on tergite 3. Dorsal setulae on tergites 6 and 5 elongated. Sternite 5 — Fig. 10; cercal plate — Fig. 9.

**Female** differs from male as follows: *f2* and *f3* without ventral rows of spine-like setae (though some females have on *f3* 2 *av* setae beyond middle more or less elongated).

**DIAGNOSIS.** The main diagnostic characters of *L. freidbergi* sp.n. are: unusually large palpi; pedicel yellowish; arista long plumose; body densely grey dusted; all tibiae entirely yellow; *t1* without setae, *t2* with 1 *pd*, *t3* with 1 *ad* and 1 *pd*; posterior femora without strong setae in female; posterior femora with 2 rows of ventral spine-like setae in male; structure of male genitalia.

*L. freidbergi* sp.n. is probably related to *L. nana* Macquart, 1835 and recently described *L. emdeni* Vikhrev, 2012. These species share the following characters: large palpi; the yellow(ish) colour of tibiae; the tibial chaetotaxy; the general abdominal pattern (the abdominal pattern of *L. emdeni* is very similar to that of *L. freidbergi* sp.n.); the general shape of cercal



Figs 8–10. *Lispe freidbergi* sp.n., ♂: 8 — paratype; 9 — cercal plate; 10 — sternite 5.  
 Рис 8–10. *Lispe freidbergi* sp.n.: ♂: 8 — паратип; 9 — церки; 10 — стернит 5.

plates. *Lispe flavipes* Stein, 1913 described from 2 females collected in South Africa, Willowmore (H+33.29°S 23.49°E) [Stein, 1913], the dry area situated on about 850 m asl, seems to be another related species. These two species share the following characters: a yellow pedicel; at least the tibiae is yellow; the absence of ventral setae on *f2* and *f3* in females; the general abdominal pattern. Pont [1991] reported the female of undetermined *Lispe* sp., collected in Saudi Arabia, Riaydh env. (again hilly desert) and related to *L. flavipes*. Both *L. flavipes* and *Lispe* sp. from Riaydh differ from *L. freidbergi* at least by the mostly yellow femora and absence of *av* seta on *t3*.

Males of *L. freidbergi* sp.n. have two rows of ventral spines on the posterior femora, females have all the femora ventrally bare. The ventral femoral spines are also present in most species of the *Lispe caesia* species group, but in this group the ventral spines are more developed in female sex and present on the fore femur, too. Species of the *Lispe caesia* group are active hunters on adult Diptera and they use ventral spines for capturing prey, in this case both sexes need the armed femora, including the fore femur. Thus, ventral spines of *L. freidbergi* sp.n. are probably used only for holding of female by a male.

ETYMOLOGY. The new species is named in honour of Dr. Amnon Freidberg (TAUI).

DISTRIBUTION. So far known from Egypt (Sinai) and Israel (Negev).

### 3. *Lispe hennigi* sp.n. and taxonomic notes on *Lispe nivalis* group

#### *Lispe nivalis* species-group

Four species listed below, *L. bivittata*, *L. nivalis*, *L. subbivittata* and *L. hennigi* sp.n. form the well defined *Lispe nivalis* species-group. This group is related to Hennig's [1960] *Lispe tentaculata* group, both groups sharing the following characters: arista long plumose; vibrissae strong; *t1* without *p* seta; *t2* with 1 *p* seta only; *t3* with strong *ad* and weak *pd*, without *av*; scutellum usually with hairs at apex below (in *Lispe tentaculata* group these hairs present in *L. tentaculata* (De Geer, 1776) and *L. draperi* Séguy, 1933); meron with hairs above hind coxa; fresh water habitats.

The *L. nivalis* group differs from the *L. tentaculata* group as follows:

- disc of scutum mostly shining black, with only thin dusting; strong dorsocentral setae reduced to 0+2; sternite 5 membranose, reduced to a pair of small sclerites with weak sclerotization (Fig. 18); cercal plate small, of pincers-like shape (Fig. 14–17) ..... *L. nivalis* group
- disc of scutum with dense dusting; dorsocentral setae not reduced, 2+4, 2+3 or 1+4; sternite 5 not reduced, with strong sclerotization; cercal plate bigger, not of pincers-like shape ..... *L. tentaculata* group



Figs 11–13. *Lise nivalis* species-group: 11 — *Lise hennigi* sp.n., ♂ holotype; 12 — *Lise nivalis* Wiedemann, ♂; 13 — *Lise subbivittata* Mou, ♂.

Рис 11–13. *Lise nivalis* species-group: 11 — *Lise hennigi* sp.n., ♂ голотип; 12 — *Lise nivalis* Wiedemann, ♂; 13 — *Lise subbivittata* Mou, ♂.

#### *Lise bivittata* Stein, 1909

Fig. 14.

*Lise bivittata* Stein, 1909: 262. Type locality: Semarang (Java, Indonesia).

*Lise ochracea* Becker, 1910: 150. Type locality: Sokotra (Yemen).

*Lise nigrifacies* Becker, 1914: 83. Type locality: Formosa (Taiwan).

*Lise haha* Snyder, 1965: 266. Type locality: Haha-jima Isl. (26.67°N 142.15°E), Japan.

MATERIAL EXAMINED. **Cambodia:** Koh Kong prov., Koh Kong env., 11.6°N 103.0°E, 01.XII.2010, NV, 1♂. **India:** **Uttarakhand,** Haridwar, 29.96°N 78.19°E, 10.IX.2011, NV, 3♂♂, 2♀♀, Rishikesh env., 29.976°N 78.209°E, 12–16.IV.2012, K.Tomkovich, 4♂♂, 3♀♀. **Myanmar:** Shan state, Inle L. env., 20.66°N 96.96°E, 26–30.XI.2010, NV, 1♂. **Thailand:** **Mae Hong Son** prov., Pai env., 25.XI.2010, NV, 13 ♂♂, 3♀♀; **Nakhon Ratchasima** prov., Khao Yai NP, 14.43°N 101.37°E, 11.II.2009, NV, 2♂♂, 3♀♀; **Phuket** prov., 08.087°N 98.368°E, 19.II.2009, NV, 16 ♂♂, 3♀♀. **Vietnam:** **Lao Cai** prov., Sapa env., 18.IV.2012, A.Ozerov, 1♂, 1♀.

DISTRIBUTION. Widespread in the Oriental region from India to Bonin Islands .

#### *Lise nivalis* Wiedemann, 1830

Figs 12, 15.

*Lise nivalis* Wiedemann, 1830: 659. Type locality: Cape of Good Hope, South Africa.

*Lise elephantina* Becker, 1903: 117. Type locality: Aswan (Egypt).

MATERIAL EXAMINED. **Ethiopia:** **Amhara** reg.: Blue Nile R., 1070 m asl, 10.08°N 38.19°E, 31.VII.2012, NV, 10♂♂; Tana L. env., 1800 m asl, 11.54°N 37.39°E, 2–4.VIII.2012, NV, 6♂♂, 2♀♀; Karakore env., 1500 m asl, 10.375°N 39.933°E, 08.VIII.2012, NV, 4♂♂, 2♀♀; **Oromia** reg.: Ziway L., 1640 m, 7.91°N 38.73°E, 11.III.2012, N.Vikhrev, 1♂, 1♀; Langano L., 1590 m, 7.646°N 38.706°E, 15.III.2012, N.Vikhrev, 1♂, 1♀; Debre Libanos, 2500 m asl, 9.732°N 38.816°E, 29–30.VII.2012, NV, 3♀♀; Dedre Zeit, Hora L., 1900 m asl, 8.757°N 38.993°E, 10.VII.2012, NV, 5♂♂, 2♀♀. **Morocco:** **Essaouira** prov., 23.III.2011, A.Gusakov, 2♂♂; 1–5.V.2012, NV, 13♂♂, 8♀♀; **Ouarzazate** prov., 12.V.2012, NV,

1♂, 2♀♀, **Tan-Tan** prov., Draa R., 28.528°N 10.947°W, 11.V.2012, NV, 4♂♂. **Portugal:** Viseu distr., Póvoa Dão, J.Almeida, 10.VIII.2010, 1♂. **Spain:** **Canary** Islands, Tenerife, Buenavista, temporary pool, 25–26.III.2011, NV, 16♂♂, 11♀♀.

DISTRIBUTION. SW Palaearctics and Afrotropical region .

#### *Lise subbivittata* Mou, 1992

Figs 13, 16.

*Lise bivittata* spp. *subbivittata* Mou, 1992: 376. Type locality: Laoning prov., N-E China.

*Lise subbivittata* Mou, 1992, stat.n.

MATERIAL EXAMINED. **Ethiopia:** **Amhara** reg., Blue Nile R., 1070 m asl, 10.08°N 38.19°E, 31.VII.2012, NV, 1♀. **India:** **Rajasthan** state: Jaipur env., 26.96°N 75.85°E, 22.II.2011, 5♂♂, 1♀; Sambhar env., 26.92°N 75.19°E, 24.II.2011, 6♂♂, 3♀♀; Sawai Madhopur env., 26.02°N 76.38°E, 25.II.2011, 2♂♂, 2♀♀; Chambal R., 25.85°N 76.56°E, 26.II.2011, 2♂♂, 3♀♀; Akbarpur env., 27.46°N 76.54°E, 02.III.2011, 3♂♂, 1♀, all collected by NV; **Uttarakhand** state, Rishikesh env., 29.976°N 78.209°E, 12–16.IV.2012, K.Tomkovich, 1♂, 2♀♀.

DISTRIBUTION. Needs to be clarified, discussed below.

#### *Lise hennigi* sp.n.

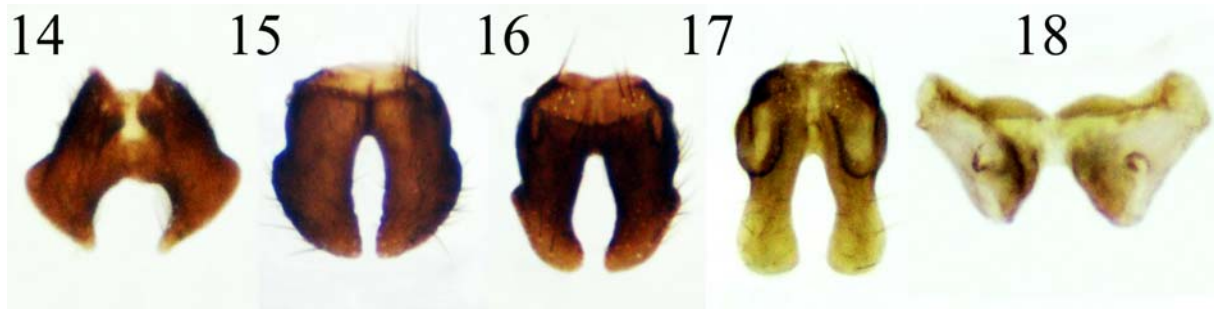
Figs 11, 17, 18.

Holotype ♂: **Thailand:** **Mae Hong Son** prov., 19.57°N 98.28°E, 650 m asl, 20–25.XI.2010, NV.

Paratypes: 1♂, 2♀♀, the same label.

DESCRIPTION. Male, body length 5.5–6 mm.

**Head** dark, densely dusted. Fronto-orbital plates blackish in upper half, densely yellow-whitish dusted in lower half, with 3 inclinate and 2 reclinate setae and an outer row of setulae. Interfrontalia blackish, frontal triangle not reaching lunula. Face and parafacials yellowish, cheeks whitish-yellow, occiput grey dusted. Antenna black, arista long plumose with the longest



Figs 14–18. *Lispe nivalis* species-group. 14–17 — Cercal plates: 14 — *L. bivittata* Becker; 15 — *Lispe nivalis* Wiedemann; 16 — *Lispe subbivittata* Mou; 17 — *Lispe hennigi* sp.n. 18 — sternite 5, *Lispe hennigi* sp.n.

Рис 14–18. *Lispe nivalis* species-group. 14–17 — Церки: 14 — *L. bivittata* Becker; 15 — *Lispe nivalis* Wiedemann; 16 — *Lispe subbivittata* Mou; 17 — *Lispe hennigi* sp.n. 18 — стернит 5, *Lispe hennigi* sp.n.

hairs twice as long as antenna width. Parafacial with a row of setulae. Vibrissae medium long, palpi moderately widened, dark, but yellow in basal third.

**Thorax.** Scutum brownish-black with a pair of grey vittae between ac and dc rows, pleura and humeral calli densely grey dusted, scutellum grey dusted with blackish apex. Thoracic setae: *prst ac* in 3 irregular rows; 0+2 strong *dc* (or 1+4 *dc*, considering hardly distinct anterior pairs); postpronotal 2; intraalars absent; supraalars 1+1, the presutural one weak; notopleural 2, otherwise notopleura bare; katapisternal setae – 1:2; anepimeron with 5–6 setulae arranged in 1 row or almost so; meron with 3–5 setulae above hind coxa; scutellum with setulae below at apex. Wing hyaline, slightly brownish, vein M straight, calypters whitish-yellow, halteres light brown.

**Legs** black with grey dusting, but *t2* and basal half of *t3* dirty yellow. Fore coxa with a tuft of long, apically curved setae at apex of posterior surface, *f1* with complete rows of *pd* and about 7 *pv* setae. *t1* without setae except preapicals. *f2* with 2 *pd* setae at apex and in apical quarter. *t2* with 1 submedian *p* seta. Hind coxa bare on inner posterior surface. *f3* with long median *av* and short *av* in basal third; with long median *pv* (slightly basad than long *av*) and *pv* preapical. *t3* with submedian *ad* and short *pd*. Pulvilli small.

**Abdomen** widened at middle and with an obtuse apex. Tergites 1+2 to 5 each with large white anterolateral spots. Dorsal surface: tergite 1+2 grey dusted; tergites 3 to 5 with a pair of large dark spots and grey median vitta. Sternite 5 membranose, reduced to a pair of sclerites with weak sclerotization (Fig.18); cercal plate as in Fig.17.

**Female.** Differs from male as follows: fore coxa without tuft of long setae; *f3* without median *av* and *pv* setae; tergite 5 dorsally whitish-grey; abdomen of typical shape.

**DIAGNOSIS.** See the identification key below.

**ETYMOLOGY.** The new species is named in honour of Willi Hennig, a German biologist, the founder of phylogenetics systematic (cladistics) and a distinguished expert in Muscoidea.

**DISTRIBUTION.** So far known only from Thailand, Mae Hong Son province.

**TAXONOMIC NOTES ON *L. bivittata* AND *L. subbivittata*.** It is clear from the identification key given below that *Lispe bivittata* Stein, 1909 and *Lispe subbivittata* Mou, 1992 may be reliably distinguished in both sexes. In Xue & Zhang [2005] females with strong submedian *av* seta on *f3* were correctly associated with males of *L. subbivittata* with about 20 longer *av* to *ad* setulae on apical half of *t3*; females without median *av* on *f3* were associated to males of *L. bivittata* with only 5–6 shorter *ad* setulae on apical half of *t3*; that is the only source with correct main diagnostic characters for these two species I know. *L. bivittata* (as well as *L. nigrifacies* Becker, 1914 and *L. haha* Snyder, 1965) was described from South-East Asia, all my specimens from Cambodia, Myanmar, Thailand (from North to South) and Vietnam also exclusively belong to *L. bivittata*. In North India (Uttarakhand) both species are present; but in the winter season only *L. subbivittata* was recorded from West India (Rajasthan). *L. subbivittata* was described from North-East China and according to Pont [1991] is present in Near East: recorded from Iran, Saudi Arabia, Oman, Sokotra, Egypt and Sudan (as *L. bivittata* with *av* on *f3* in female). The only female specimen from Ethiopia entirely fits *L. subbivittata*. Hennig [1960: 421] seems to have considered *L. bivittata* and *L. subbivittata* as the same species: in his redescription of *L. bivittata* the male type had only 5 *ad* setulae on *t3* below the strong *ad*, that fits *L. bivittata*; but female has strong submedian *av* on *f3*. It is not clear from Hennig [1960] which female specimens were examined.

There is a taxonomic problem with *Lispe ochracea* Becker, 1910 which was described from a single female from Sokotra. According to Becker's [1910] original description, the female type has *f3* with strong median *av* seta, so it is possible that *L. ochracea* is not a synonym of *L. bivittata*, but *L. subbivittata* is a synonym of *L. ochracea*. In 2011 I asked Dr. T. Galinskaya who visited Naturhistorisches Museum, Vienna to look for the type of *L. ochracea* but the type was not found. Without examination of the type I am not ready to call in question the generally accepted synonymy of *L. ochracea* to *L. bivittata*. For this reason the name *Lispe subbivittata* Mou, 1992 is used in this paper, though I'm not sure that it is the oldest name.



Figs 19–21. *Lispe rigida* species-group. 19 — *L. brunnicosa* Becker, ♂ holotype with labels; 20 — *L. kozlovi* sp.n., ♂ holotype; 21 — *L. rigida* Becker, ♂.

Рис 19–21. *Lispe rigida* species-group. 19 — *L. brunnicosa* Becker, ♂ голотип с этикетками; 20 — *L. kozlovi* sp.n., ♂ голотип; 21 — *L. rigida* Becker, ♂.

#### IDENTIFICATION KEY FOR *LISPE NIVALIS* SPECIES-GROUP

♂♂

1. *f3* with 1 or 3 strong submedian *pv* setae; fore coxa with a tuft of long setae posteriorly; anepimeron with 5–8 hairs placed in a single horizontal row or almost so; *t3* without *ad* setulae at apical half ..... 2
- *f3* without strong *pv* setae except for preapical one; fore coxa without long setae posteriorly; anepimeron with 11–15 hairs placed in 3–5 rows and occupying a rounded area; *t3* with *ad* setulae at apical half below strong *ad* seta ..... 3
2. *f3* with 3 strong *pv* setae in basal half; abdomen shining black except 3 pairs of lateral white spots; abdomen of a normal shape with a pointed apex; cercal plate — Fig. 15 ..... *nivalis* Wiedemann
- *f3* with 1 strong submedian *pv* setae; abdomen with whitish-grey dusting; abdomen widened on segments 3 to 5, with an obtuse apex; cercal plate — Fig. 17, sternite 5 — Fig. 18 ..... *hennigi* sp.n.
3. *t3* below strong *ad* with a dense brush of about 20 setulae on *ad*, *a* and *av* surfaces; *tar3–1* with dense short curved setulae on *av* surface; notopleuron with 1–3 setulae on area between strong notopleural setae; cercal plate — Fig. 16 ..... *subbivittata* Mou
- *t3* below strong *ad* with a sparse row of 5–6 *ad* setulae; *tar3–1* without curved *av* setulae; notopleuron bare on area between strong notopleural setae; cercal plate — Fig. 14 ..... *bivittata* Stein

♀♀

1. *f3* with 1 strong submedian *av* setae; notopleuron with 1 to several setulae on area between strong notopleural setae ..... *subbivittata* Mou
- *f3* without *av* setae; notopleuron bare on area between strong notopleural setae. .... 2
2. anepimeron with 5–6 hairs placed in a single horizontal row or almost so ..... 3

- anepimeron with 11–15 hairs placed in 3–5 rows and occupying a rounded area ..... *bivittata* Stein
- 3. presutural *ac* in 4 rows; Africa, Near East ..... *nivalis* Wiedemann
- presutural *ac* in 3 rows; South-East Asia ..... *hennigi* sp.n.

#### 4. *Lispe kozlovi* sp.n. and taxonomic notes on *Lispe rigida* group

##### *Lispe rigida* species-group

In my opinion, the three species listed below, *L. brunnicosa*, *L. rigida* and *L. kozlovi* sp.n. form the *Lispe rigida* species-group. This group is related to Hennig's [1960] *Lispe palposa* group, both groups sharing the following characters: *dc* 2+3; *t2* with 1 *ad* and 1 *pd* setae; *t3* with strong *ad*, without *av* in both sexes, saltish to salted water. The *L. rigida* group differs from the *L. palposa* group as follows:

- vibrissae long; palpi small and pure yellow; thoracic setae long; body less dusted; ♂: apex of abdomen somewhat laterally flattened and dorsally pointed, evenly black, without whitish midspot (Fig. 19, 20); halves of cercal plate not conjoined with each other at all, cercal plate about equally wide all along except the very apex (Figs 25, 28, 31); ♀: preapical *d* on *t3* almost as long as *tar3–1* ..... *L. rigida* group
- vibrissae absent to medium strong; palpi bigger and dark or yellow, in latter case dirty-yellow; thoracic setae shorter; body less dusted; ♂: apex of abdomen not flattened and not pointed, black, with a whitish midspot; halves of cercal plate conjoined with each other in basal half, cercal plate with wide basal half and narrow apical half; ♀: preapical *d* on *t3* at most half as long as *tar3–1* ..... *L. palposa* group



*L. brunnicosa* and *L. kozlovi* sp.n are obviously related species, *L. rigida* is distinctly the most deviant. *L. rigida* has the most southern distribution, specimens were collected from 27°N to 38.5°N, *L. brunnicosa* was collected between 46.8°N to 48.5°N (except type series from 32°N, but in this case from about 3500 m asl), *L. kozlovi* sp.n. is the northernmost species which was collected from 51.2°N to 54.9°N.

*Lispe brunnicosa* Becker, 1904

Figs. 19, 22, 23, 25, 26, 27.

*Lispe brunnicosa* Becker, 1904 Type locality: China, Sichuan prov., about 32.0°N, 99.5°E (see Notes on type locality).

*Lispe diminuata* Becker, 1913 (Hennig, 1960, Textfig. 99, 148). Type locality: Pamir Mountains. (The Pamir Mountains are a mountain range in Central Asia, mostly in Gorno-Badakhshan region of Tajikistan and Badakhshan region of Afghanistan, but also in N-W Pakistan, S-E Kyrgyzstan and extreme West of China, so the type locality of *L. diminuata* is uncertain.)

MATERIAL EXAMINED. Holotype, ♂ (ZIN). The holotype of *L. brunnicosa* is in a good condition. The holotype has the label in Russia transliterated as: "r. Dza-chu, 11000' / Kam, bas. Goluboy / Kozlov, ser. IV 01" (Fig. ), that means "Dza-chu [river], 11000 [feet asl], Kham, Golubaya [river] bas[in], Kozlov [leg.], mid April [19]01 = China, Sichuan prov., H°32.0°N 99.5°E. Identification labels by Becker, Hennig and Pont.

**Kazakhstan:** *Atyrau* reg., Ural River bank, 46.95°N 51.73°E, 21.V.2011, K.Tomkovich, 1♂; *Kyzylorda* reg., Aralsk salt lake, 46.79°N 61.67°E, 12.V.2011, K.Tomkovich, 2♂♂, 5♀♀. **Russia:** *Volgograd* reg., salt pool, 48.465°N 44.570°E, 08.VI.2012, N.Vikhrev, 1♂.

NOTE ON THE TYPE LOCALITY. The fly was collected by the 1899–1901 expedition of the famous Russian explorer Petr Kuzmich Kozlov to the Central Asia (either by him personally or by his staff). Detailed information on this expedition is found in his own book, republished in 1947 [Kozlov, 1947]. 'Golubaya' means in Russian 'blue' and it was the commonly accepted translation of Yangtze, the name of the well known great Chinese river. The Dza-chu (*Zā Qū*) is a well known name of the riverhead of the great Mekong River, used so in the cited book, and it was indeed visited by this expedition. However, the Mekong cannot be in the Yangtze basin and it was visited by the expedition in the previous year of 1900, within the period September 8 – November 15 (all the dates are given here in the Julian calendar, as in the label and the book cited). On the other hand, the expedition indeed spent April 1901 in the upper Yangtze basin. Namely, first 15 days of April it camped at Bana-Dzhun village, astronomically located by P.K. Kozlov at 31°59'55"N, 99°22'02"E and elevation estimated as 12020 feet above sea level, that is slightly higher than specified in the label. Between April 15 and 25, the expedition descended downstream the Ser-chu River and then Yalong (*Yí lóng jiāng*) River, the Yantze left tributary, to Sanka village and then ascended upstream the Den-chu River up to the Bimu-La Pass. We may suppose that the fly was collected at the Den-chu River, the name of which was confused with Dza-chu on the label. In a Soviet era atlas published in 1954, the name Dza-Chu is applied both to the upper Mekong and to some river

in the upper Yalong River basin or to the upper Yalong itself; however this name is not mentioned for the Yalong in Kozlov [1947]. The Sanka village would be best approximation of the place implied by the label but we failed to find it on the modern maps. The type locality of *L. brunnicosa* may be accepted as the upper Yalong basin roughly at 32.0°N 99.5°E in the eastern edge of the Tibet-Qinghai Plateau, presently in Sichuan Province of China.

REMARKS. The synonymy of *L. diminuata* to *L. brunnicosa* was proposed by Hennig [1960]. The structure of hind tarsus of the holotype of *L. brunnicosa* is similar to that of *L. diminuata* given by Hennig [1960] (Fig. 22, 23) and differs from hind tarsus of *Lispe kozlovi* sp.n. (Fig. 24).

DISTRIBUTION. China, Sichuan; Kazakhstan, Atyrau and Kyzylorda region; Russia, Volgograd region. New for Kazakhstan; new for Russia and for Europe.

*Lispe rigida* Becker, 1903

Figs 21, 31, 32.

*Lispe rigida* Becker, 1903: 115. Type locality: Egypt, Alexandria.

MATERIAL EXAMINED. Syntypes, **Egypt:** Alexandria, 1♂, 1♀ (with identification labels by Becker, Kowarz, Hennig & Pont, as syntypes labeled by A.C.Pont in 2000) (ZIN).

**Egypt:** *Sinai*, Qzaima, 24.V.1981, A.Freidberg, 1♂, 4♀♀ (TAU); *Red Sea* reg., El Gouna, 27.39°N 33.68°E, 15.I.2012, N.Vikhrev, 1♂. **India:** *Rajasthan* state, Sambhar salt-Lake, 26.916°N 75.190°E, 23.III.2011, N.Vikhrev, 3♂♂, 3♀♀. **Israel:** Eilat env., 29.57°N 34.97°E, 24.X.2011, N.Vikhrev, 11♂♂, 1♀. **Morocco:** *Ouarzazate* prov., Ouarzazate env., 30.97°N 6.75°W, 12.V.2012, NV, 1♀. **Turkmenistan:** *Mary* prov., Repetek (38.565°N 63.177°E), 04 and 12.V.1990, A.Ozerov, 2♀♀.

DISTRIBUTION. Was known for Egypt, Iran, Morocco and Saudi Arabia [Pont, 1991]. New records for India, Israel and Turkmenistan.

*Lispe kozlovi* sp.n.

Figs 20, 24, 28–30.

Holotype ♂: **Russia:** *Khakassia* reg., Maloe Spirinskoe Lake (saltish), 54.422°N 90.147°E, 26.VI.2011, K.Tomkovich;

Paratypes, 6♂♂, 5♀♀. **Russia:** *Khakassia* reg.: 3♂♂, 4♀♀, the same label as Holotype; **Omsk** reg., 2♂, 1♀, Omsk, salt lake, 54.886°N 73.348°E, 19.VII.2011, O.Kosterin. **Kazakhstan:** *W. Kazakhstan* reg., 2♂♂, Derkol River, 51.153°N 50.453°E, 26.VIII.2012, K.Tomkovich.

Other material. So far I think that females of *L. kozlovi* sp.n. and females of *L. brunnicosa* can not be distinguished reliable enough, so females collected without males were tentatively identified as *L. kozlovi* sp.n. and were not included in the type series. **Kazakhstan:** Akmola prov., Shortandy env.(51.7N 71.0E), 20.VII–16.IX.1938, B.Kuzin, 3♀♀; **Russia:** Bashkortostan, Irgizly [52.96°N 57.02°E], 24.VI.1899, Jacobs & Schmidt, 1♀ (with Hennig's identification label "*L. brunnicosa*?") (ZIN); Novosibirsk reg., Karasuk distr., [53.6°N 77.8°E], 28.VI.2002, A.Barkalov, 1♂ (ISEA); Orenburg reg., Ural R. env., 51.61°N 54.34°E, 28.VIII.2012, K.Tomkovich, 1♀.

DESCRIPTION. Male, black, with thin dusting, body length 6–7 mm.

*Head.* Interfrontalia brown, fronto-orbital plates and lower half of frontal triangle brown with thin golden



Figs 22–32. *Lispe rigida* species-group. 22–24 — ♂ hind tarsus, posterior view: 22 — *L. diminuta* Becker (from Hennig, 1960: 404, Textfigg 99), 23 — *L. brunnicosa* Becker, 24 — *L. kozlovi* sp.n. 25–27 — *L. brunnicosa* Becker: 25 — cercal plate, dorsal; 26 — cercal plate, lateral; 27 — sternite 5. 28–30 — *L. kozlovi* sp.n.: 28 — cercal plate, dorsal; 29 — cercal plate, lateral; 30 — sternite 5. 31–32 — *L. rigida* Becker: 31 — cercal plate, dorsal; 32 — sternite 5.

Рис 22–32. *Lispe rigida* species-group. 22–24 — ♂ задняя лапка, вид сзади: 22 — *L. diminuta* Becker (по Hennig, 1960: 404, Textfigg 99), 23 — *L. brunnicosa* Becker, 24 — *L. kozlovi* sp.n. 25–27 — *L. brunnicosa* Becker: 25 — церки, дорсально; 26 — церки, латерально; 27 — стернит 5. 28–30 — *L. kozlovi* sp.n.: 28 — церки, дорсально; 29 — церки, латерально; 30 — стернит 5. 31–32 — *L. rigida* Becker: 31 — церки, дорсально; 32 — стернит 5.

dusting, upper parafacials golden, the rest of parafacials, face and cheeks white, occiput grey. Fronto-orbital plates with about 6 inclinate, 2 reclinate setae and outer row of long proclinate setulae, parafacials with 2–4 hairs in lower half only. Antenna black, arista with hairs about as long as antenna width. Vibrissae strong. Palpi pure yellow without dusting, about 1.5 times as large as width of antenna.

**Thorax** black with thin brownish dusting. Scutum, scutellum and pleura look black or blackish with brown dusting depending on angle of view. Thoracic setae remarkably long: *dc* 2+3 all strong, *pstr ac* hairs in 3 rows, 2 postpronotal, intraalars 1+2, supraalars 1+2. Katepisternals 1:2; anepimeron with about 15 setulae on the rounded area; katepimeron with 2–3 setulae, meron with 4–5 hairs above hind coxa; scutellum with hairs at apex below. Wings hyaline, brownish, the area around the apex of vien R2+3 darkened due to more dense microtrichia; veins brownish; the vein M not curved; calypteres yellowish, halteres brown.

**Legs** black, only knees slightly reddish. *f1* with complete rows of *pd*; apical half of *pv* surface with 5–6 shorter but strong and straight setae; basal half of *pv* surface with 12–13 long, fine and apically curved setae. *t1* without setae except preapicals. *f2* in basal half with a row of *a* setae; 2 *pd* preapicals; ventral surface with short (shorter than tibia width) and fine irregular setulae. *t2* at middle with 1 *ad* and 1 *pd* setae. *f3* with 3 unusually long *av* setae in apical half; with common *ad* row and 1 *pd* at apex. *t3* with strong submedian *ad* and long preapical *d* and *pd* setae; setulae in *ad* row and

apical 2/3 of *av* row remarkably elongated. Hind tarsus modified (Fig. 24): *tar3-1* shortened, laterally flattened, at apex with long finger-like *pv* protuberance, with long straight setae on *av* surface; *tar3-2* shortened, laterally flattened, with long straight setae on *av* surface. Hind coxa bare on inner posterior surface, pulvilli small.

**Abdomen** dark with thin brownish-grey dusting. Tergite 1+2 dusted, tergites 3 to 5 each with a pair of large vague blackish spots fused on tergite 5, fused or not on tergites 3 and 4. Apex of abdomen somewhat laterally flattened and dorsally pointed, evenly black, without whitish midspot. Cercal plate — Figs 28, 29; sternite 5 — Fig. 30.

**Female** differs from male as follows: body size 6.5–7.5 mm; parafacials with hairs all along; *t3* without elongated setulae (or *ad* row slightly elongated); wing around the apex of vien R2+3 not darkened; hind tarsus unmodified; abdominal pattern consists of paired lateral spots and median spot on tergites 3 to 5, these spots vague, more or less fused and usually distinct under acute angle only; apex of abdomen not flattened laterally and not pointed dorsally.

DIAGNOSIS: see the identification key below.

ETYMOLOGY. The new species is named in honour of Petr Kuzmich Kozlov, a Russian geographer, explorer of Central Asia, discoverer of Khara-Khoto Tangut city and collector of several *Lispe* species described by Becker.

DISTRIBUTION. Russia: Khakassia and Omsk regions and Kazakhstan: W. Kazakhstan region.

IDENTIFICATION KEY FOR *LISPE RIGIDA* GROUP

1. Meron bare above hind coxa, katepimeron bare; anepimeron with only 4–7 setulae placed in a single row or almost so; scutum with densely dusted; small species, body size 5–5.5 mm (♂) or 5–6 mm (♀). ♂: hind tarsus unmodified; wing not darkened; sternites 3 and 4 densely long-haired; terminalia: Figs 31–32. ♀: abdomen with distinct paired spots ..... *rigida* Becker
- Meron with 4–6 setulae above hind coxa, katepimeron with 2–3 setulae, anepimeron with about 15 setulae placed in 3 horizontal rows; scutum thinly dusted, subshining; bigger species, body size 6–7 mm (♂) or 6.5–7.5 (♀); ♂: hind tarsus modified wing darkened at apex of R2+3; sternites 3 and 4 long-hairs. ♀: abdomen with rather vague spots, the pattern consists of paired lateral and median spots ..... 2
2. ♂: *tar3-1* distinctly shorter than *tar3-2*; *tar3-1* and *tar3-2* together distinctly shorter than the remaining segments (3 to 5) of hind tarsus; finger-like protuberance on *tar3-1* shorter and more curved (Figs 22–23); *f2* in basal half with a row of 5–6 short strong spine-like setae and with 2–4 twice as long (about 1.5 times as long as femur width) less strong setae apicad; cercal plate and sternite 5: Figs 25–27. ♀: *prst ac* in 4 rows; abdomen more dusted, abdominal spots less vague, less fused, more distinct ..... *brunnica* Becker
- ♂: *tar3-1* about as long as *tar3-2*; *tar3-1* and *tar3-2* together at least as long the remaining segments (3 to 5) of hind tarsus; finger-like protuberance on *tar3-1* longer (Fig. 24); *f2* without strong setae on ventral surface, though some fine setulae present; cercal plate and sternite 5: Figs 28–30. ♀: *prst ac* in 3 rows; abdomen less dusted, abdominal pattern less distinct ..... *kozlovi* sp.n.

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