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LISPE (DIPTERA, MUSCIDAE) OF THE PALAEARCTIC REGION

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Abstract. The Palaearctic fauna of *Lispe* is reviewed. The paper consists of 4 parts. (1) The alphabetical list of 65 taxa of the Palearctic fauna is given with references, distribution data and, where necessary, taxonomic remarks. (2) A complete identification key for *Lispe* of the Palaearctic region. (3) Review of the *L. caesia* group and key for the Palaearctic species of the group. (4) Separate key for the Palaearctic species of the *L. palposa* and *L. rigida* groups. The paper is illustrated with 50 figures. *Lispe astakhovi* **sp. nov.** is described. Four new synonymies are offered: *Coenosia atra* Meigen, 1830 = *Lispe armeniaca* Canzoneri & Meneghini, 1972, **syn. nov.**; *L. leucospila* Wiedemann, 1830 = *L. albipuncta* Shinonaga, 2010, **syn. nov.**; *L. ochracea* Becker, 1910 = *L. subbivittata* Mou, 1992 **syn. nov.**; *L. patellitarsis* Becker, 1914 = *L. hirsutipes* Mou, 1992, **syn. nov**.

Keywords: Diptera, Muscidae, *Lispe*, Palearctic, identification key, review, new species, synonymy.

LISPE (DIPTERA, MUSCIDAE) ПАЛЕАРКТИЧЕСКОГО РЕГИОНА

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Аннотация. Представлен полный обзор палеарктической фауны *Lispe*. Работа состоит из четырех частей. (1) Алфавитный список 65 палеарктических таксонов со ссылками на публикации, распространением и, где требуется, с заметками по таксономии. (2) Определительный ключ для палеарктической фауны *Lispe*. (3) Обзор группы видов *L. caesia* и определительный ключ для палеарктических видов этой группы. (4) Отдельный ключ для палеарктических видов групп *L. palposa* и *L. rigida*. Приведены 50 иллюстраций. Описан вид *Lispe astakhovi* **sp. nov**. Предложены 4 новых синонима: *Coenosia atra* Meigen, 1830 = *Lispe armeniaca* Canzoneri & Meneghini, 1972, **syn. nov.**; *L. leucospila* Wiedemann, 1830 = *L. albipuncta* Shinonaga, 2010, **syn. nov.**; *L. ochracea* Becker, 1910 = *L. subbivittata* Mou, 1992 **syn. nov.**; *L. patellitarsis* Becker, 1914 = *L. hirsutipes* Mou, 1992, **syn. nov**.

Ключевые слова: Diptera, Muscidae, *Lispe*, Палеарктика, ключ, обзор, новый вид, синонимия.

INTRODUCTION

There are about 150 species of *Lispe* Latreille 1796 worldwide. The genus probably originated in the southern part of the Palaearctic region, where it shows the most impressive diversity. In my previous papers on *Lispe* (Vikhrev 2012a; 2012b; 2012c; 2014; 2015; 2016; Vikhrev, Ge, Zhang 2016 (available in open access here: https://archive.org/details/PapersOnDiptera), most part of the world fauna was revised. In the above cited publications, I made taxonomic revisions of species-groups of the genus worldwide, while in the present paper I address the more familiar geographical approach and offer the review of *Lispe* of the Palaearctic region. It is time to do that because the only revision and a complete key for the Palaearctic *Lispe* was published almost 60 years ago (Hennig 1960). Hennig's revision included 44 taxa (41 species and 3 subspecies). Catalogue of Palaearctic Diptera (Pont 1986) includes 52 taxa (48 species and 4 subspecies), of which only 39 species I regard as valid presently. Since then, several species were described, synonymized, renamed or recorded for the region; as a result, the total number of Palaearctic taxa considered in the present publication rises to 65 (57 valid species and 2 subspecies; 4 new synonymies; 2 species excluded from the Palaearctic fauna). In the list, species and subspecies included in the identification key are shown in bold italics, while those not included are shown in plain italics. The Palaearctic region as assumed in this paper incudes: Europe; N Africa (from Morocco to Egypt) and most of Asia: Central Asia northwards of the southern foothills of the Himalayas at 2000 m asl, SW Asia westward of the Indus River, with most of Arabian Peninsula included except for Yemen, East Asian lowlands northwards of 31°N.

The paper consists of 4 parts:

I. The alphabetical list of species. The majority of them are only briefly mentioned in the list with references to previous papers, where discussions of taxonomy and examined material were given. In some cases, new examined material with new records from the Palaearctic region added. The minority of the listed species (the greater part of the *Lispe caesia* group in a broad sense), which I have not considered before, are presented in more detail.

II. Identification key for *Lispe* of the Palaearctic region.

III. Discussion of the taxonomy of the *L. caesia* group and identification key for the group.

IV. An identification key for *L. palposa* and *L. rigida* groups.

MATERIAL AND METHODS

The specimens examined are deposited in the following museums:

BMNH—Natural History Museum, London, UK;

MBFU—Museum of Beijing Forestry University, Beijing, China;

MNHN—Muséum national d'Histoire naturelle, Paris, France;

TAUI—Tel-Aviv University, Israel;

ZIN—Zoological Institute, Saint Petersburg, Russia;

ZMHU—Museum für Naturkunde, Humboldt–Universität zu Berlin, Germany;

ZMUM—Zoological Museum of Moscow University, Russia.

Geographical coordinates are given in the decimal degrees format.

The following generally accepted abbreviations for morphological structures are used: *f1*, *t1*, *f2*, *t2*, *f3*, *t3* = fore-, mid-, hind- femur or tibia respectively; *ac*—acrostichal setae; *dc*—dorsocentral setae; *prst*—presutural; *post*—postsutural; *a*, *p*, *d*, *v* = anterior, posterior, dorsal, ventral seta(e).

The abbreviation for the tarsi as *tar* followed by a pair of digits separated by a hyphen was proposed by Vikhrev (2011): 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.

Illustrations are original unless otherwise indicated. Since I have to reference numerous figures of this paper as well as those from lit-

erature (some of the latter reproduced in the former, with different numeration), to avoid confusion I capitalize the first letter (Fig. or Figs) for figures in this paper but use the lower case letter (fig. or figs) in literature references to figures published elsewhere.

I. Alphabetic list of *Lispe* of the Palaearctic region with references and comments

Lispe aceponti Vikhrev, 2015

Lispe aceponti Vikhrev, 2015 (Vikhrev 2015)

Material examined: see Vikhrev (2015).

Distribution. Described from the western part of India: Goa, Gujarat, Orissa, Rajasthan states and Sri Lanka, probably present in southern Pakistan and Iran.

Lispe aquamarina Shinonaga & Kano, 1983

Lispe aquamarina Shinonaga & Kano, 1983 (Shinonaga 2003; Zhang et al. 2016)

Material examined: CHINA, *Liaoning* prov., Dalian, 38.864°N 121.549°E, D. Zhang, 11 August 2003, 5♂, 2♀ (MBFU and ZMUM).

Distribution. S Japan and China, Liaoning prov.

Lispe apicalis Mik, 1869

Lispe comitata Becker, 1904 (Hennig 1960; Vikhrev 2015)

Lispe apicalis Mik, 1869 (Vikhrev 2015)

Material examined: see Vikhrev (2015).

New records: KAZAKHSTAN, *Almaty* reg., Kapchagay Reservoir env., 43.7°N 77.2°E, 22–28 May 2016, N. Vikhrev, 5♂ (ZMUM). UZBEKISTAN, *Bukhara* reg.: 25 km SE of Bukhara, 39.574°N 64.72°E, 21 June 2019, E. Makovetskaya, 3♂, 1♀; Tudakul Lake, 39.80°N 64.74°E, 21 June 2019, E. Makovetskaya, 1♂ (ZMUM).

Distribution. Palaearctic region from Morocco to Central Asia. The westernmost and southernmost record is 28.528°N 10.947°W (SW Morocco); the easternmost records are China: Inner Mongolia prov., Ejin Banner (≈41.7°N 100.3°E) and Xinjiang prov., Burqin (≈48.7°N 87.0°E) (Zhang et al. 2005); the northernmost — 51.21°N (NW Kazakhstan).

Lispe armeniaca Canzoneri & Meneghini, 1972

Figs 1–3

Synonymy. Type locality: Armenia, eastern vicinities of Yerevan (≈40.1°N 44.6°E). The species was described from 2 females; according to the authors, it is related to *L. kowarzi* (Canzoneri, Meneghini 1972). Due to kind help of Dr. Marco Uliana, the curator of the Entomology section at the Natural History Museum of Venice, Italy, I received the quality images of the holotype (Figs 1–3), which show that it is female of *Coenosia atra*. So, *Coenosia atra* Meigen, 1830 = *Lispe armeniaca* Canzoneri & Meneghini, 1972, **syn. nov**, this taxon is excluded from the Palaearctic *Lispe*.

Lispe assimilis Wiedemann, 1824

Lispe cyrtoneurina Stein, 1900 (Vikhrev 2012b)

Lispe modesta Stein, 1913 (Vikhrev 2012b)

Lispe inexpectata Canzoneri & Meneghini, 1966 (Pont 1986)

Figs 1–3. *Lispe armeniaca* Canzoneri & Meneghini, 1972, female holotype = *Coenosia atra* Meigen, 1830: *1* — dorsal view; *2* — lateral view; *3* — labels (photo: Marco Uliana)

Рис. 1–3. *Lispe armeniaca* Canzoneri & Meneghini, 1972, самка, голотип = *Coenosia atra* Meigen, 1830: *1* — вид сверху; *2* — вид сбоку; *3* — этикетки (фото: Marco Uliana)

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Lispe assimilis Wiedemann, 1824 (Vikhrev 2012b; Pont 2019)

Material examined: see Vikhrev (2012b).

Distribution. Palaearctic: S Europe, N Africa, Western Asia, Pakistan. Also: Afrotropical region; Oriental region except for NE part, Australia.

Lispe astakhovi sp. nov.

http://zoobank.org/NomenclaturalActs/FA0E722D-7C9B-43CF-9A84-CA8572B896C9

Figs 4–7

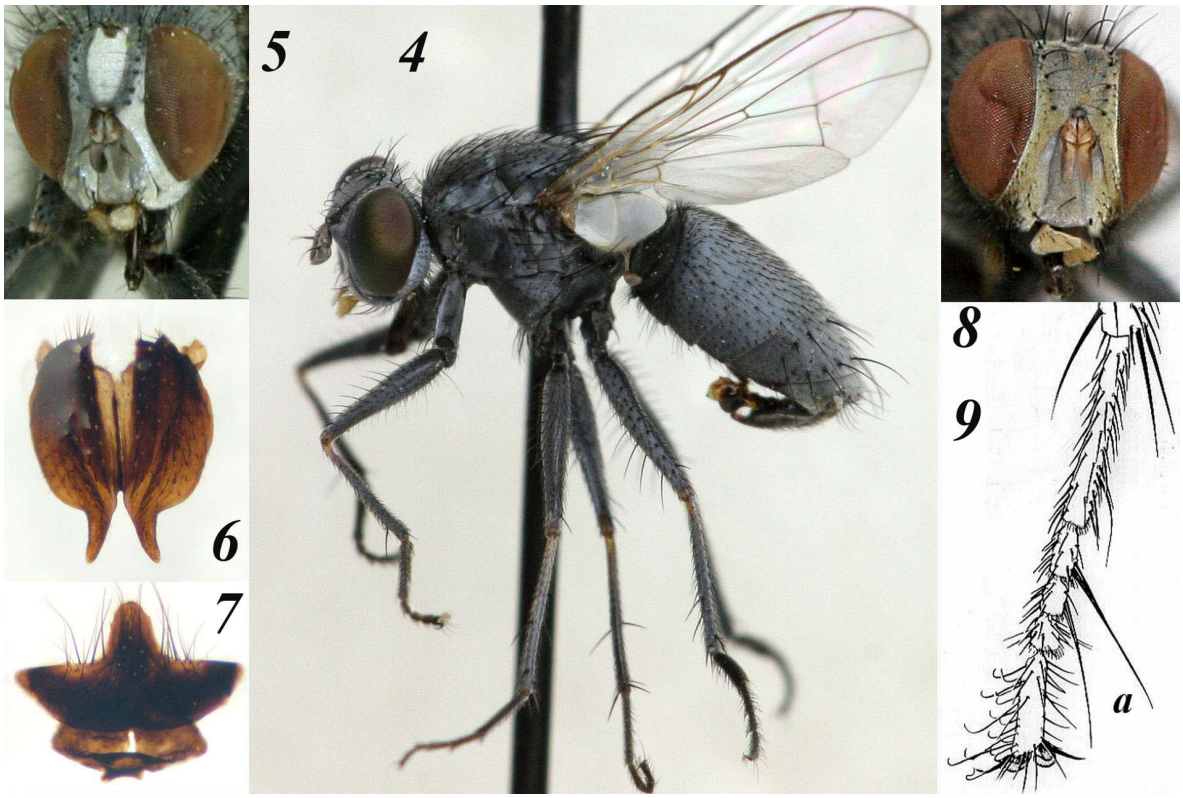
Type material. Holotype, ♂, INDIA, *Rajasthan* state, Sambhar salt lake, 26.92°N 75.19°E, 24 February 2011, N. Vikhrev. Paratypes 3♂, 9♀: INDIA, same data as the holotype, 1♂, 9♀; UZBEKISTAN, *Bukhara* reg.: 25 km SE of Bukhara, 39.574°N 64.72°E, 21 June 2019, E. Makovetskaya, 1♂; 65km SW of Bukhara, 39.305°N 63.873°E, 22 June 2019, E. Makovetskaya, 1♂ (all ZMUM).

Description. Male (Fig. 4), body length 5.5–6 mm.

Head. Frontal triangle broad, with convex margins, densely white dusted, the rest of interfrontalia dark, with thin whitish dusting (Fig. 5). Fronto-orbital plates whitish, dusted, with 5 inclinate and 5–7 setulae in outer row. Parafacials with 4–5 fine hairs in lower part. Face and parafacials white, occiput grey. Antenna black, postpedicel falling of mouth margin by almost its own length. Aristal hairs hardly longer than half width of antenna. Vibrissae weak, slightly shorter than distance between them. Palpi yellow with outer surface densely whitish dusted.

Thorax evenly grey dusted with rather indistinct presutural whitish median vitta. *dc* 2+3, all strong. Meron bare, anepimeron with 10–12 setulae. Wing clear, calypters white, halter yellow.

Legs dark with yellowish knees and bases of tibiae. Femora with distinct ventral spines



Figs 4–9. *L. astakhovi* **sp. nov.** (*4–7*): *4* — the holotype, general view, lateral; *5* — the holotype, head, anterior view; *6* — cercal plate; *7* — sternite 5; *L. marina*, male (*8–9*): *8* — head, anterior view; *9* — mid tarsus, anterior view (from Bergerard 1995)

Рис. 4–9. *L. astakhovi* **sp. nov.** (*4–7*): *4* — голотип, общий вид сбоку; *5* — голотип, спереди; *6* — церки; *7* — стернит 5; *L. marina*, самец (*8–9*): *8* — голова, спереди; *9* — средняя лапка, спереди (по Bergerard 1995)

placed in 1–2 irregular rows. Hind coxa with seta on posterior surface. *f1* with a row of fine *av* setae. *t1* without *p* seta. *f2* with *a* setae at basal half, 2 preapical *pd*, 5 fine *v* setae in basal half. *t2* with 1 *ad* and 1 *p* setae. *f3* with 4 strong *av* setae at apical half and 3–4 long *pv* setae in basal half. *t3* in apical third with 1 strong *ad* and 2 shorter *av*, ground setulae slightly elongated on *a* surface. *tar3-1* unmodified, about 3 times as long as wide; with a typical dense brush of hairs on *pv* surface and with a row of 6 *av* setae, these 2 times as long as *tar3-1* width.

Abdomen evenly light grey dusted, without typical for *L. caesia* group dark pattern. Cercal plate—Fig. 6; sternite 5—Fig. 7.

Female differs from male as follows: body length 5–7 mm. Dusting of frons and face yellowish, dusting of thorax more yellowish-grey. Spines on femora stronger. *f3* with 2–3 *av* in apical half. Out of 9 females, 4 specimens have *p* seta on right or left *t1*, but never on both fore tibiae.

Diagnosis. Male genitalia and general appearance are similar to those of W Palaearctic *L. halophora*, the differences are as follows:

— *t3* with 1 *ad* and 2 *av*. *t1* without *p* seta. Abdomen evenly light grey dusted, without dark pattern. Palpi yellow . . . . . ***astakhovi* sp. nov.**

— *t3* without *ad*, with 3–4 *a*, 8–9 *av* spinulose setae. *t1* with *p* seta. Abdomen with typical for *L. caesia* group dark pattern: black dorsal spots on posterior part of tergite 4 fused with antero-lateral spots on tergite 5. Palpi dirty brown . . . . . ***halophora*** Becker

Males of sympatric *L. caesia* and *L. odessae* have modified hind tarsus, while in *L. astakhovi* sp. nov. *tar3-1* is simple.

Females are similar to sympatric *L. odessae*, see the key below to distinguish these species.

Etymology. Named in the memory of Russian dipterologist (Asilidae expert) Dmitry Astakhov, who tragically died in a car accident in September 2019.

Lispe bengalensis Robineau-Desvoidy, 1830

Figs 18–20, 48

Lispe tetrastigma Schiner, 1868 (Hennig 1960)
Lispe armipes Becker, 1903 (Hennig 1960)
Lispe berlandi Seguy, 1940 (Pont 1986)
Lispe bengalensis Robineau-Desvoidy, 1830 (Pont 1986; Pont 1991; Pont 2019)

Type material examined: Syntypes, 6♂ and 3♀ of *Lispe armipes* Becker, 1903: EGYPT, Damiette (31.4°N 31.9°E), 24 March 1899 (ZMHU). Holotype ♂ and 2♀ paratypes of *Lispe berlandi* Seguy, 1940: MOROCCO, Rio de Oro (*Dakhla-Oued Ed-Dahab* prov.), Villa Cisneros (= Dakhla, 23.8°N 15.9°W), June 1939, M. L. Berland (MNHN).

Material examined (all ZMUM): AUSTRALIA: *QLD*, Gladstone env., 23.82°S 151.15°E, 26–27 January 2013, N. Vikhrev, 5♂, 2♀; *VIC*, Eagle Point, 37.88°S 147.68°E, salt lagoon, 15 February 2013, N. Vikhrev, 1♂. CAMBODIA, *Kep* prov., Kep env., former "salt fields", 10.50°N 104.33°E, 7 December 2010, N. Vikhrev, 1♀. INDIA, *Andhra Pradesh* st.: Kakinada env., Samalkot saltish lake, 16.99°N 82.27°E, 1–2 February 2014, K. Tomkovich, 5♂, 1♀; *Goa* st., Calangut env., 15.5°N 73.8°E, 20 January 2008, N. Vikhrev, 5♂, 4♀; *Gujarat* st., Jamnagar env., 22.54°N 70.04°E, mangrove, 13 October 2012, K. Tomkovich, 20♂, 15♀; Somnath env., 20.88°N 70.41°E, 7 November 2012, K. Tomkovich, 11♂, 20♀; *Orissa* st., Chilika Lake, 19.68°N 85.18°E, 4–9 February 2014, K. Tomkovich, 3♀. INDONESIA, *W Papua* prov., Merauke env., 8.55°S 140.43°E, 9–15 December 2014, N. Vikhrev, 2♂, 2♀. MADAGASCAR, Toliara env, 23.20°S 43.62°E, 12–19 November 2012, A. Medvedev, 2♂. MALAYSIA, Borneo, *Sabah* state., Kota Kinabalu, 5.99°N 116.09°E, 26–30 December 2011, N. Vikhrev, 3♂, 2♀; Beringgis beach, 5.79°N 115.99°E, 19–26 February 2014, N. Vikhrev, 1♂, 1♀. SENEGAL, Sine-Saloum estuary, 14.1°N 16.7°W, 2–6 March 2007, N. Vikhrev, 3♂, 1♀. SRI LANKA, Marawila env., 7.440°N 79.816°E, 26–31 December 2012, N. Vikhrev, 1♂. THAILAND: *Phuket* prov., 8.063°N 98.277°E, 21–26 February 2009, N. Vikhrev, 7♂, 3♀. TANZANIA: *Lindi* reg., Lindi env, 10.03°S 39.68°E, 23–26 December 2015, N. Vikhrev, 8♂, 4♀; *Mtwara* reg., Mtwara env, 10.30°S 40.15°E, 21–22 December 2015, N. Vikhrev, 1♂; *Pwani* reg., Bagamoyo env., Ruvu R. mangrove, 6.40°S 38.87°E, 15 September 2012, D. Gavryushin, 1♂, 3♀.

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Distribution. In Palaearctic is known from Egypt and Morocco. Widespread near seashores from Africa to Australia.

Lispe baluchistanensis Shinonaga, 2010

Type locality: Pakistan, Balochistan reg., Khuzdar (27.8°N 66.6°E)

Remarks. The difference between *L. baluchistanensis* and *L. nana* is not clear from the description. The species is not included in the key.

Lispe bivittata Stein, 1909

Lispe nigrifacies Becker, 1914

Lispe haha Snyder, 1965

Remarks. As discussed in Vikhrev (2012c; 2014), the Palaearctic records of *Lispe bivittata* Stein, 1909 (Hennig 1960; Pont 1991) were misidentifications of *Lispe ochracea* Becker, 1910 = *Lispe subbivittata* Mou, 1992 syn. nov. New synonymy is discussed below under *L. ochracea*. Here I stress the fact that *Lispe bivittata* is excluded from the Palaearctic list as an Oriental species.

Distribution. Widespread in the Oriental region: India: Assam and Uttarakhand; Myanmar, Shan; Thailand: Kanchanaburi, Mae Hong Son, Nakhon Ratchasima and Phuket; Cambodia; Vietnam, Lao Cai; Indonesia, Java; Taiwan; Japan, Bonin Islands.

Lispe brunnicosa Becker, 1904

Lispe brunnicosa Becker, 1904 (Hennig 1960; Vikhrev 2012c)

Material examined: see Vikhrev (2012c).

New records: CHINA, *Xinjiang* prov.: Aerjin (=Altyn-Tagh) Mts (≈38.9°N 92.1°E), 27 August 1988, X. Zhang, 1♂; S of Fuyun (=Koktokay), Kalamaili Nat. Res. (≈46.0°N 89.5°E), 23–26 May 2014, D. Zhang, 3♂; 25 May 2015, M. Zhang, 1♀ (all MBFU). KAZAKHSTAN, *Almaty* reg., Kapchagay Reservoir env., 43.7°N 77.2°E, 22–28 May 2016, N. Vikhrev, 1♂ (ZMUM). MONGOLIA: *Bayankhongor* prov., N bank Orog-Nur L. (45.08°N 100.55°E), salt marsh, I. Kerzhner, 15–16 August 1967, 1♂, 4♀ (ZIN); *Uvs* prov., 50 km E of Ulangom (49.99°N 92.75°E), 10–11 July 1967, M. Kozlov, 1♂, 2♀ (ZIN).

Distribution. E Palaearctic, occurring southern of 50°N: China: Sichuan and Xinjiang prov.; Kazakhstan: Almaty, Atyrau and Kyzylorda reg.; Mongolia: Bayankhongor and Uvs prov.; Russia, Volgograd reg.

Lispe caesia Meigen, 1826

Fig. 49

Lispe microchaeta Seguy, 1940

Lispe caesia microchaeta Seguy, 1940 (Hennig 1960)

Lispe caesia Meigen, 1826 (Hennig 1960; Zhang et al. 2016; Vikhrev et al. 2016)

Material examined: see Vikhrev et al. (2016).

New record: RUSSIA, *Tuva* reg., Dus-Khol salt lake, 700 m asl, 51.36°N 94.45°E, 2–5 July 2017, N. Vikhrev, 6♂, 7♀ (ZMUM), the easternmost record.

Distribution. Europe, N Africa, Near East, SE of European Russia and W Siberia, although rather uncommon in the north-eastern part of the range.

Lispe candicans Kowarz, 1892

Figs 10–15

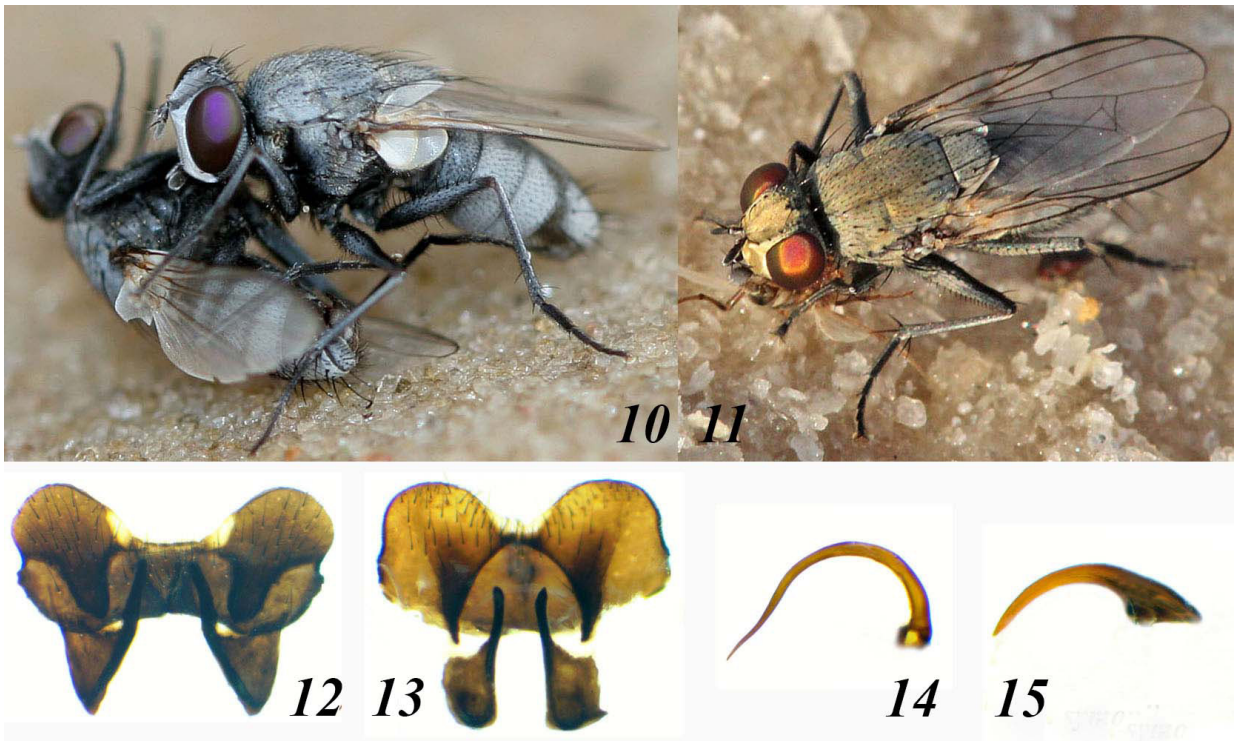
Lispe obscurior Strobl, 1883, type locality: Croatia, Zadar, 44.2°N 15.2°E, type specimens lost (Hennig 1960)

Lispe uroleuca Pandelle, 1899, type locality: France, Aude, 42.9°N 3.0°E, type in MNHN (Hennig 1960)

Lispe simonyii Becker, 1910, type locality Yemen, Sokotra. Status of this taxon is doubtful as discussed in Remarks below.

Lispe candicans Kowarz, 1892 (Hennig 1960; Zhang et al. 2016)

Material examined: ALGERIA, Biskra, April 1905, 8♂, 5♀ (ZMHU). EGYPT, *Sinai*: Yamit (31.28°N 34.16°E), 14 July 1981, A. Valdenberg, 2♂; Nabq (28.20°N 34.43°E), 23 March 1981, A. Freidberg, 1♂, 2♀; 13 March 1982, I. Yarom, 2♂, 1♀ (TAUI). GREECE, Athens, 3♂, 2♀ (ZMHU). INDIA, *Gujarat* st.: Naliya env., 23.3°N 68.7°E, 4 October 2012, K. Tomkovich, 2♂; Narajan, 23.67°N 68.53°E, 7–9 October 2012, K. Tomkovich, 18♂, 13♀; Mandvi env., 22.821°N 69.364°E, 10–12 October 2012, K. Tomkovich, 1♀ (ZMUM). ISRAEL: Ma'agan Michael (32.56°N 34.91°E), 17 June 1981, A. Valdenberg, 2♀ (TAUI). MOROCCO, *Tan-Tan* prov., salt lagoon, 28.204°N 11.779°W, 10 May 2012, N. Vikhrev, 6♂, 3♀ (ZMUM). MOZAMBIQUE, F. Muir, 1♂ (ZMHU). OMAN, Al Hikman Peninsula, 20.74°N 58.70°E, 22 November 2011, P. Tomkovich, 2♀ (ZMUM). SENEGAL, Sine-Saloum estuary (14.08°N



Figs 10–15. *L. candicans*: *10* — male with another male as prey (Senegal); *11* —f emale (Spain, photo Piluca Alvarez); *12* — sternites 5–6, West African male; *13* — sternites 5–6, Indian male; *14* — surstylus, West African male; *15* — surstylus, Indian male

Рис. 10–15. *L. candicans*: *10* — самец, поедающий другого самца (Сенегал); *11* — самка (Испания, фото Piluca Alvarez); *12* — стерниты 5–6, самец из Западной Африки; *13* — стерниты 5–6, самец из Индии; *14* — сурстиль, самец из Западной Африки; *15* — сурстиль, самец из Индии

16.67°W), 3 March 2007, N. Vikhrev, 6♂ (ZMUM). SPAIN: (*Canary Islands* prov.), Lanzarote Island, 1890, Simony, 1♂, 1♀ (ZMHU); *Zaragoza* prov., Monegros, 27 August 2008, J. Almeida, 3♀ (ZMUM).

Distribution. Palaearctic: the Mediterranean coast of Europe, Canary Islands, NW Africa, Middle East; Afrotropical: Yemen, Senegal, Mozambique; Oriental: India (Gujarat).

Remarks. In specimens of *L. candicans* from western localities (Spain, Morocco, Senegal), the frons is densely whitish dusted (usually silvery-white in males (Fig. 10), yellowish in females (Fig. 11)), so the borders between the fronto-orbital plates, the frontal vitta and frontal triangle are hardly distinct. Specimens with less dusted frons and clearer frontal borders are in minority. However, in the East (Middle East and India (Gujarat)) the overwhelming majority of specimens have a less dusted frons. The syntypes of *Lispe simonyii* Becker, 1910 described from Sokotra have "eastern" frontal pattern. I did not find any reliable character to distinguish West African and Indian females (which I have in large series), males differ as follows:

—Vibrissae weak. Surstylus longer and more curved as mammoth tusk (Fig. 14). Sternites 5–6 on internal view as on Fig. 12 ..... West African males

—Vibrissae stronger. Surstylus shorter and less curved as elephant tusk (Fig. 15). Sternites 5–6 on internal view as on Fig. 13 ..... Indian males

These differences would be enough to regard *L. simonyii* as a valid species, but there is a problem. Nobody examined the genitalia of the true *L. candicans* from the east part of Mediterranean coast (type locality Greece, Aegina Island, 37.7°N 23.5°E, type lost) or of the syntype of *L. simonyii*. It is unknown which form inhabits the Middle East. I was able to examine the genitalia of a single male from Nabq in S Sinai. Its sternites 5–6 are of Indian type, but the

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surstyli are reduced to small protrusions, quite different from the tusk-shape of both Moroccan and Indian specimens. (Note that Nabq is 1500 km from Aegina and 4500 km from S Morocco.) So, at present our knowledge about the variability of the genitalic structures of this *Lispe* is absolutely insufficient. For the time being I prefer to regard *L. candicans* in a broad sense and postpone the decision on the taxonomic status of *L. simonyii*.

Lispe cilitarsis Loew, 1856
Fig. 26

Lispe cilitarsis Loew, 1856 (Vikhrev 2012b; Vikhrev 2014)
Material examined: see Vikhrev (2012b; 2014).
Distribution. Palaearctic: N Africa, Israel, Arabian Peninsula. Afrotropical: Ethiopia.

Lispe cinifera Becker, 1904
Lispe seticincta Becker, 1904 (Hennig 1960)
Lispe cinifera Becker, 1904 (Hennig 1960; Vikhrev 2015)
Material examined: see Vikhrev (2015).
Distribution. Palaearctic, Central Asia: China: Gansu, Qinghai, Sichuan and Xinjiang prov.; Kazakhstan, E Kazakhstan prov.; Kyrgyzstan, Naryn reg.; Turkmenistan, Ahal reg.

Lispe consanguinea Loew, 1858
Lispe consanguinea Loew, 1858 (Vikhrev 2014)
Material examined: see Vikhrev (2011; 2014).
Distribution. Throughout the Palaearctic between 62°N and 38°N, mainly sandy beaches of large rivers.

Lispe draperi Séguy, 1933
Lispe draperi Séguy, 1933 (Vikhrev 2011; Vikhrev 2014)
Material examined: see Vikhrev (2011; 2014).
Distribution. Algeria (type locality) and Morocco.

Lispe elegantissima Stackelberg, 1937
Figs 39–41

Lispe elegantissima Stackelberg, 1937 (Hennig 1960; Vikhrev 2012a; Vikhrev 2014)
Material examined: see Vikhrev, 2014.
New records: CHINA, *Xinjiang* prov., Beitun(zhen) (47.36°N 87.82°E), 21 July 2007, D. Zhang, 1♂, 1♀ (MNHN). UZBEKISTAN, *Bukhara* reg., Tudakul Lake, 39.80°N 64.74°E, 21 June 2019, M. Piwszynski, 1♀ (Nicolaus Copernicus University, Torun, Poland).
Distribution. Palaearctic, Central Asia, China, Xinjiang prov.; Kazakhstan, Kyzylorda reg.; Tajikistan, Khatlon reg.; Turkmenistan: Dashoguz and Lebap reg.; Uzbekistan, Bukhara reg. Recorded from 58°E to 88°E, from 37°N to 48°N.

Lispe elkantarae Becker, 1907
Lispe elkantarae Becker, 1907 (Hennig 1960; Vikhrev 2015)
Material examined: see Vikhrev (2015).
Distribution. SW Palaearctic: Algeria; Morocco; Turkey.

Lispe emdeni Vikhrev, 2012
Lispe emdeni Vikhrev, 2012 (Vikhrev 2012a; Vikhrev 2014)
Material examined: see Vikhrev (2014).
Distribution. Known from Ethiopia, Amhara region and India: Rajasthan, Madhya Pradesh and Gujarat states. Thus, *L. emdeni* may present as well between Ethiopia and India, i.e. in Middle East and Pakistan in proper habitats, which are big stones in or along slow, seasonally dried streams.

Lispe ezensis Shinonaga & Kano, 1983
Lispe ezensis Shinonaga & Kano, 1983 (Shinonaga 2003; Vikhrev 2015)
Material examined: see Vikhrev (2015).
Distribution. Japan, Hokkaido and Russia, Primorsky reg.

Lispe flavicincta Loew, 1847
Lispe flavicincta Loew, 1847 (Hennig 1960; Vikhrev 2015)
Material examined: see Vikhrev (2015).
New record: KAZAKHSTAN, *Almaty* reg., Kapchagay Reservoir env., 43.7°N 77.2°E, 22–28 May 2016, N. Vikhrev, 1♂ (ZMUM).
Distribution. Known from Europe to Central Asia.

Lispe flavicornis Stein, 1909
Fig. 17

Lispe flavicornis Stein, 1909 (Pont 1991; Zhang et al. 2016)
Material examined: CAMBODIA, *Kep* prov., Kep env., former "salt fields", 10.50°N 104.33°E, 7 December 2010, N. Vikhrev, 10♂,

Figs 16–17. *16 — L. marina*, male (photo: Rui Andrade); *17 — L. flavicornis*, male with prey (Dolichopodidae, (*Amblypsilopus*?))

Рис. 16–17. *16 — L. marina*, самец (фото: Rui Andrade); *17 — L. flavicornis*, самец с добычей (Dolichopodidae, (*Amblypsilopus*?))

8♀(ZMUM). INDIA, *Andhra Pradesh* st.: Kakinada env., Samalkot saltish lake, 16.99°N 82.27°E, 1–2 February 2014, K. Tomkovich, 2♂; Bapatla env., Suryalanka salt lake, 15.85°N 80.52°E, 19–21 February 2014, K. Tomkovich, 10♂, 4♀, *Gujarat* st., Jamnagar env., 22.54°N 70.04°E, mangrove, 13 October 2012, K. Tomkovich, 1♂ (ZMUM). INDONESIA, *Papua* prov., Merauke env., 8.55°S 140.43°E, 9–15 December 2014, N. Vikhrev, 8♂, 5♀ (ZMUM). MALAYSIA, Borneo, *Sabah* state., Kota Kinabalu, 5.99°N 116.09°E, 26–30 December 2011, N. Vikhrev, 14♂, 12♀; Beringgis beach, 5.79°N 115.99°E, 19–26 February 2014, N. Vikhrev, 8♂, 2♀ (ZMUM). THAILAND, *Phuket* prov., 8.063°N 98.277°E, 21–26 February 2009, N. Vikhrev, 12♂, 10♀ (ZMUM). TANZANIA: *Lindi* reg., Lindi env., 10.03°S 39.68°E, 23–26 December 2015, N. Vikhrev, 3♂, 2♀; *Mtwara* reg., Mtwara env., 10.30°S 40.15°E, 21–22 December 2015, N. Vikhrev, 11♂, 10♀, *Pwani* reg., Ruvu R. mangrove, 6.40°S 38.87°E, 15 September 2012, D. Gavryushin, 2♀, (all ZMUM).

Distribution. Palaearctic: Oman. Widespread near seashores from Africa to New Guinea.

Lispe flavinervis Becker, 1904

Lispe flavinervis Becker, 1904 (Hennig 1960; Vikhrev 2015)

Material examined: see Vikhrev (2015).

New record: RUSSIA, *Tuva* reg., Dus-Khol salt lake, 700 m asl, 51.36°N 94.45°E, 2–5 July 2017, N. Vikhrev, 9♂, 2♀ (ZMUM).

Distribution. Palaearctic from E Europe to China, to the north till 55°N.

Lispe freidbergi Vikhrev, 2012

Lispe freidbergi Vikhrev, 2012 (Vikhrev 2012c)

Material examined: see Vikhrev (2012c).

Distribution. Known for Egypt (Sinai) and Israel (Negev).

Lispe frigida Erichson, 1851

Lispe canadensis Snyder, 1954 (Hennig 1960)

Lispe frigida Erichson, 1851 (Vikhrev 2015)

Material examined: see Vikhrev (2015). The true identity of *L. frigida* and synonymy of *L. canadensis* were discussed in Vikhrev (2015).

Distribution. A Holarctic circumpolar species.

Lispe halophora Becker, 1903

Fig. 47

Lispe halophora Becker, 1903 (Hennig 1960; Zhang et al. 2016)

Type material examined: Syntypes 4♂, 1♀, EGYPT, Alexandria [near El Meks = Al Max, 31.15°N 29.86°E, on the bank of a salt lake, 3 May 1899] (ZMHU).

Material examined: ALGERIA, Biskra, April 1905, 2♂, 3♀ (ZMHU). ISRAEL, Eilat env., 29.57°N 34.97°E, 24 November 2011, N. Vikhrev, 10♂, 10♀ (ZMUM). EGYPT, *Sinai*, Al-Bardawil (≈31.1°N 33.3°E), 25 August 1967, Margalit, 1♂ (TAUI). MOROCCO, *Tan-Tan* prov., salt lagoon, 28.204°N 11.779°W, 10 May 2012, N. Vikhrev, 36♂, 23♀ (ZMUM).

Distribution. SW Palaearctic from Morocco to Israel.

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Lispe hebeiensis Ma & Tian, 1993

Lispe hebeiensis Ma & Tian, 1993 (Vikhrev 2015)

Material examined: see Vikhrev (2015).

New record: IRAN, *Markazi* prov., Arak env., Salt Lake S bank, 34.15°N 49.81°E, 1660 m asl, 18–30 May 2017, O. Kosterin, 3♂, 2♀ (ZMUM).

Distribution. Known from E Europe (the westernmost record in Greece) to Far East (China: Hebei, Liaoning prov., Russia, Zabaikalsky reg.) The northernmost record is 54.88°N.

Lispe hydromyzina Fallen, 1825

Lispe hydromyzina Fallen, 1825 (Hennig 1960; Vikhrev 2015)

Material examined: see Vikhrev (2015).

Distribution. Known only from the Atlantic seashore in W Europe.

Lispe kowarzi Becker, 1903

Lispe kowarzi kowarzi Becker, 1903

Fig. 34

Lispe pakistanensis Shinonaga & Afzal, 1989 (Vikhrev 2012c)

Lispe kowarzi kowarzi Becker, 1903 (Vikhrev 2014)

Material examined: see Vikhrev (2012c; 2014).

Distribution. S Palaearctic from Morocco to Pakistan, the northernmost record: Turkey, Antalya prov., Manavgat env., 36.76°N 31.45°E. Also known from Afrotropical and Oriental regions.

Lispe kozlovi Vikhrev, 2012

Lispe kozlovi Vikhrev, 2012 (Vikhrev 2012c)

Material examined: see Vikhrev (2012c).

Distribution. E Palaearctic to the north of 50°N. Known from W Siberia (Khakassia and Omsk reg.) and Kazakhstan (W. Kazakhstan reg.). Seems to be distributed further north than the closely related *L. brunnicosa*.

Lispe lanceoseta Wang & Fan, 1981

Figs 21–22

Lispe lanceoseta Wang & Fan, 1981 (Xue, Zhang 2005; Zhang et al. 2016)

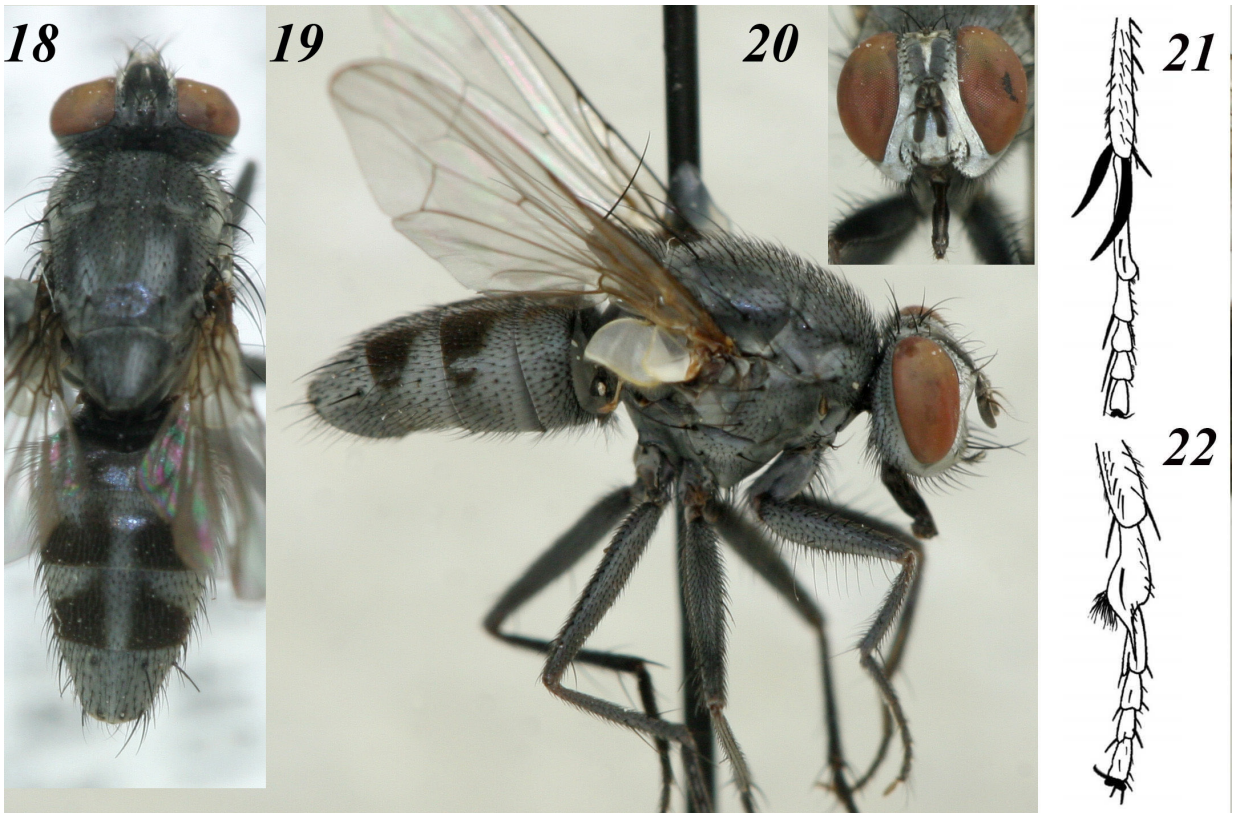
Material examined: UZBEKISTAN, *Bukhara* reg., 65 km SW of Bukhara, 39.305°N 63.873°E, 22 June 2019, E. Makovetskaya, 1♂. TAJIKISTAN, *Khatlon* reg., Pobeda env., Kyzylsu R., 37.41°N 69.34°E, 9 June 2010, K. Tomkovich, 2♀ (ZMUM).

Distribution. Known from the type locality: China, Shanxi pr., Hequ County (39.3°N 111.2°E) and from Tajikistan, Khatlon reg. and Uzbekistan, Bukhara reg.

Remarks. Male of *L. lanceoseta* is unmistakable due to modified mid tibia and hind tarsus, but identification of female is not as easy. Recently Zhang et al. (2016) gave redescription of *L. lanceoseta*, here I give my redescription to clarify or correct several points.

Male body length 4 mm. *Head* with frontal triangle and frontal-orbital plates densely greyish-white dusted, border with black frontal vitta very distinct. Frontal triangle reaches fore margin of frons, slightly convex in apical half, frontal vitta narrow all along, narrower than fronto-orbital plates. Antenna dark, densely grey dusted, postpedicel and arista remarkably short: postpedicel hardly longer than pedicel, arista as long as width of postpedicel. Aristal hairs longer than the width of postpedicel. Vibrissae absent. Palpi whitish-yellow. *Thorax* densely brownish-grey dusted. Anepimeron with 4–5 hairs, meron bare, *dc* 2+4 (not 2+3 as in Zhang et al. (2016)), rather weak. *Legs* dark except for yellowish knees. Ventral spines on femora absent. Hind coxa without seta on posterior margin. *t1* without submedian setae; *t2* with 1 *ad* and 1 *pd* both weak and short; at apex *t2* with modified willowleaf-like, elongated *av* and *pv* setae (Fig. 21); *f3* in basal 3/4 with a row of 6–7 *av* setae (longer than femur width); *tar2-2* to *tar2-5* yellow, especially on inner surface; *t3* with 1 *ad*; *tar3-1* modified, widened and flattened, with pointed apex; *tar3-2* narrowed basally (Fig. 22). *Abdomen* evenly grey dusted with black apex.

Female differs as follows. Body length 5.5 mm. Frontal triangle and frontal-orbital plates yellowish dusted, border with black frontal vitta less distinct. Postpedicel and arista longer than in male: postpedicel 1.5x as long as pedicel, arista as long as length of postpedicel. Vibrissae medium strong. Tibiae yellowish at base. *t2* without modified setae at apex. *f3* with 2 *av* in apical 1/3. Hind tarsus not modified. Apex of abdomen not black.



Figs 18–22. *L. bengalensis*, male (*18–20*): *18* — dorsal view; *19* — lateral view; *20* — head; *L. lanceoseta*, male (*21–22*) (from Zhang et al. 2016): *21* — mid leg; *22* — hind leg
Рис. 18–22. *L. bengalensis*, самец (*18–20*): *18* — вид сверху; *19* — вид сбоку; *20* — голова; *L. lanceoseta*, самец (*21–22*) (из Zhang et al. 2016): *21* — средняя нога; *22* — задняя нога

The relationship of *L. lanceoseta* is not clear. Zhang et al. (2016) placed it in the *L. caesia* group. Slightly broadened frontal triangle; modified *tar3-1* and bare meron provide formal reasons to agree with this opinion. However, the bare inner margin of hind coxa; the absence of *av* seta(e) on *t3* and velvety black postabdomen in male indicate possible relation to the *L. palposa* group. So far, I am inclined to follow Zhang et al. (2016) opinion.

Lispe leucocephala Loew, 1856

Lispe frontalis Zielke, 1972 (Zhang et al. 2016)
Lispe leucocephala Loew, 1856 (Hennig 1960; Zhang et al. 2016)

Type material examined: Syntypes, 2♂, 1♀ of *L. leucocephala*: EGYPT, Suez, coll. Frauenfeld (ZMHU). Holotype *L. frontalis* ♂: MADAGASCAR, (*Boeny* reg.) Amborovy (15.66°S 46.33°E), 28 June 1958, F. Keiser (MNHN).

Material examined: EGYPT, *Sinai*, Nabq (28.09°N 34.43°E), 23 March 1981, A. Freidberg, 1♂; Yamit (31.28°N 34.16°E), 14 July 1981, A. Valdenberg, 1♀ (TAUI). INDIA, *Gujarat* state: Mandvi env., 22.821°N 69.364°E, pools on sandy beach, 10–12 November 2012, K. Tomkovich, 9♂, 15♀ (ZMUM).

Distribution. Known from seashores: Egypt, India, Madagascar.

Lispe leucospila Wiedemann, 1830

Coenosia leucospila Wiedemann, 1830.
Lispe leucospila Wiedemann, 1830 (Lyneborg 1970)
Lispe eidsvoldica Malloch, 1925 (Vikhrev 2014)
Lispe leucospila sinica (Hennig 1960)
Lispe sinica Hennig, 1960 (Pont 1986; Shinonaga 2003; Xue, Zhang 2005)
Lispe albipuncta Shinonaga, 2010 **syn. nov**.
Lispe leucospila Wiedemann, 1830 (Vikhrev 2011; Vikhrev 2014; Pont 2019)

Material examined: see Vikhrev (2014).

New records: CHINA: *Beijing*, Olympic Park, 40.01°N 116.39°E, 16 September 2016, N. Vikhrev, 1♀ (ZMUM); *Guandong* prov., Tsisin'yan' (≈23°N 113°E), 29 November 1959, B.Rodendorf, 2♂ (ZIN); Ven'tsuan'

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(≈23°N 113°E), 1 December 1959, B. Rodendorf, 5♂, 3♀ (ZIN). MONGOLIA: *Bayankhongor* prov., N bank Orog-Nur L. (45.08°N 100.55°E), salt marsh, I. Kerzhner, 15–16 August 1967, 1♂, 4♀ (ZIN); *Uvs* prov., 50 km E of Ulangom (49.99°N 92.75°E), 10–11 July 1967, M. Kozlov, 1♂, 2♀ (ZIN). RUSSIA, *Primorsky* reg.: Novo-Kachalinsk, Khanka L. (45.1°N 132.0°E), 8 September 1978, A. Zinovjev, 2♀, (ZIN), the northernmost locality known; Vladivostok, Sedanka (43.2°N 132.0°E), 18 September 1978, A. Zinovjev, 1♀ (ZIN); Kedrovaya Pad NR, Kedrovka R. (43.09°N 131.58°E), 20 September 1978, A. Zinovjev, 1♀ (ZIN).

Distribution. East Asia and Australia. Distributed in the triangle: W India (Gujarat, Rajasthan) and Pakistan; Far East (NE China, Japan, Honshu, Russia, Primorsky reg.); E Australia.

Synonymy. *Lispe albipuncta* Shinonaga, 2010, type locality: Pakistan, Khyber Pakhtunkhwa prov., D. I. Khan (31.8°N 70.9°E). The type locality is westward from Indus River and therefore belongs to the Palaearctic region. According to the description (Shinonaga 2010, 103 and Fig. 35) *L. albipuncta* entirely fits *L. leucospila* with a reduced wing pattern. According to the discussion in Vikhrev (2014) the reduced wing pattern is typical for specimens of *L. leucospila* from the western parts of the range (India: Gujarat and Rajasthan), so *Lispe albipuncta* Shinonaga, 2010 = *Lispe leucospila* Wiedemann, 1830 **syn. nov**.

Lispe litorea Fallen, 1825

Lispe litorea Fallen, 1825 (Hennig 1960; Vikhrev 2015)

Material examined: see Vikhrev (2015).

Distribution. Known only from the shores of the Atlantic seas in NW Europe.

Lispe loewi Ringdahl, 1922

Fig. 46

Lispe loewi Ringdahl, 1922 (Hennig 1960; Vikhrev 2015)

Material examined: see Vikhrev (2015).

New records: RUSSIA, *Rostov* reg., Rostov-on-Don, 47.288°N 39.693°E, 11 October 2019, Yu. Palamarchuk, 1♀ (by photo). UZBEKISTAN, *Bukhara* reg.: 25 km SE of Bukhara, 39.574°N 64.72°E, 21 June 2019, E. Makovetskaya, 2♂, 2♀; Tudakul Lake, 39.80°N 64.74°E, 21 June 2019, E. Makovetskaya, 3♂, 3♀; 65km SW of Bukhara, 39.305°N 63.873°E, 22 June 2019, E. Makovetskaya, 7♂, 8♀ (ZMUM).

Distribution. Widespread in coastal marshes and at banks of inland salt basins. Common in West Palaearctic, to the east known till Central Asia and Central Siberia. Probably this is the most southerly distributed species in *Lispe palposa* group: listed for Sudan (Pont 1986) and collected in S Morocco, 28.204°N 11.779°W.

Lispe longicollis Meigen, 1826

Figs 23, 24

Lispe longicollis Meigen, 1826 (Hennig 1960; Vikhrev 2012b; Vikhrev 2014)

Material examined: see Vikhrev (2012b; 2014).

New records: KAZAKHSTAN, *Almaty* reg., Kapchagay Reservoir env., 43.7°N 77.2°E, 22–28 May 2016, N. Vikhrev, 2♂, 1♀ (ZMUM). RUSSIA, *Tuva* reg., Dus-Khol salt L., 700 m asl, 51.36°N 94.45°E, 2–5 July 2017, N. Vikhrev, 1♀ (ZMUM). UZBEKISTAN, *Bukhara* reg.: Tudakul Lake, 39.80°N 64.74°E, 21 June 2019, E. Makovetskaya, 3♂, 4♀; 65 km SW of Bukhara, 39.305°N 63.873°E, 22 June 2019, E. Makovetskaya, 10♂, 2♀ (ZMUM).

Distribution. Palaearctic. Known from W Europe to Far East. The northern limit of distribution is around 55°N. Common in Turkey and Iran, but records from Israel and N Africa probably are misidentified *L. cilitarsis*.

Lispe marina Becker, 1913

Figs 8, 9, 16

Lispe lanzarotensis Baez, 1978 (Pont 1986)

Lispe marina Becker, 1913 (Hennig 1960; Bergerard 1995)

Type material examined: Syntypes of *L. marina*, 3♀: FRANCE, Arcachon, 3–8 June 1911, (ZMHU). Paratypes *L. lanzarotensis*, 1♂, 1♀: SPAIN, *Canary Islands* reg., Lanzarote Island, La Santa (29.11°N 13.66°W), 5 September 1976, M. Baez, (BMNH).

Material examined: MOROCCO, *El Jadida* prov., Oualidia lagoon, 32.746°N 9.024°W, 30 April 2012, N. Vikhrev, 12♂, 3♀ (ZMUM). PORTUGAL, Obidos (municipality 39.4°N

Figs 23–26. *L. longicollis* subgroup: *23 — L. longicollis*, female; *24 — L. longicollis*, cercal plate; *25 — L. microptera*, cercal plate; *26 — L. cilitarsis*, cercal plate

Рис. 23–26. Подгруппа видов *L. longicollis*: *23 — L. longicollis*, самка; *24 — L. longicollis*, церки; *25 — L. microptera*, церки; *26 — L. cilitarsis*, церки

9.2°W), 20 September 2012, R. Arande, 1♀ (https://diptera.info/forum/viewthread.php?forum_id=5&thread_id=50900).
Distribution: Atlantic coast: France, Morocco, Portugal, Spain (Canary Islands).

Lispe microptera Seguy, 1937
Fig. 25

Lispe microptera Seguy, 1937 (Vikhrev 2012b; Vikhrev 2014)
Material examined: see Vikhrev (2012b; 2014).
Distribution: Palaearctic: Pakistan (type locality). India: Andhra Pradesh, Gujarat, Orissa, Rajasthan states; Sri Lanka.

Lispe melaleuca Loew, 1847
Lispe melaleuca Loew, 1847 (Hennig 1960; Vikhrev 2015)
Material examined: see Vikhrev (2015).
New records: KAZAKHSTAN, *Almaty* reg., Kapchagay Reservoir env, 43.7°N 77.2°E, 22–28 May 2016, N. Vikhrev, 3♂, 8♀ (ZMUM). RUSSIA, *Tuva* reg., Dus-Khol salt L., 700 m asl, 51.36°N 94.45°E, 2–5 July 2017, N. Vikhrev, 1♀ (ZMUM).
Distribution. *L. melaleuca* inhabits the Palaearctic from W Europe to E Siberia (the easternmost record is in Zabaykalsky reg., 51.42°N 116.25°E). In E Europe and Siberia the northern border of distribution of *L. melaleuca* is situated along 54°N–55°N.

Lispe nana Macquart, 1835
Fig. 27

Lispe nana Macquart, 1835 (Hennig 1960; Vikhrev 2014)
Material examined: see Vikhrev (2014).
New record: UZBEKISTAN: *Samarkand* reg.: 25 km SW of Samarkand, 39.503°N 66.660°E, 950 m asl, 27 June 2019, E. Makovetskaya, 3♂, 5♀; *Bukhara* reg.: 25 km SE of Bukhara, 39.574°N 64.72°E, 21 June 2019, E. Makovetskaya, 1♂ (ZMUM).
Distribution. Palaearctic from Canary to Central Asia. North-west of Oriental and North of Afrotropical regions.

Lispe neimongola Tian & Ma, 2000
Lispe neimongola Tian & Ma, 2000 (Vikhrev 2015)
Material examined: see Vikhrev (2015).
New record: UZBEKISTAN, *Bukhara* reg., 65km SW of Bukhara, 39.305°N 63.873°E, 22 June 2019, E. Makovetskaya, 1♂ (ZMUM).
Distribution. Palaearctic species so far known from 38°N to 52°N and from 43°E to 114°E.

Lispe nivalis Wiedemann, 1830
Fig. 29

Lispe nivalis Wiedemann, 1830 (Vikhrev 2012c; Vikhrev 2014)
Material examined: see Vikhrev (2012c; 2014).
Distribution. S-W Palaearctic: Spain, Portugal, N Africa, Arabian Peninsula. Widespread in Africa.

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Lispe nuba Wiedemann, 1830

Lispe nuba Wiedemann, 1830 (Vikhrev 2012b)
Material examined: see Vikhrev (2012b).
Distribution. Palaearctic: Egypt and Israel. Widespread in Africa.

Lispe nubilipennis Loew, 1873
Figs 36–38

Lispe nubilipennis Loew, 1873 (Hennig 1960; Vikhrev 2012a; Vikhrev 2014)
Material examined: see Vikhrev (2014).
Distribution. Palaearctic, Caspian Lowland: Kazakhstan (W Kazakhstan reg.); Russia (Astrakhan, Kalmykia, Orenburg, Rostov, Volgograd regions).

Lispe ochracea Becker, 1910

Lispe bivittata Stein, 1909 (Hennig 1960; Pont 1991) misidentification
Lispe bivittata spp. *subbivittata* Mou, 1992 (Xue, Zhang 2005)
Lispe subbivittata Mou, 1992 (Vikhrev 2012c; Vikhrev 2014)
Lispe subbivittata Mou, 1992 **syn. nov**.
Material examined: see Vikhrev (2012c; 2014).
New record: INDIA, *Gujarat* st.: Bhuj env., 23.25°N 69.66°E, 2–3 October 2012, K. Tomkovich, 10♂, 5♀; Junagadh (21.52°N 70.46°E) env., 20–30 October 2012, K. Tomkovich, 4♂, 3♀ (ZMUM).
Discussion. In previous publications (Vikhrev 2012c; Vikhrev 2014) I didn't agree with synonymy (Hennig 1960) *L. ochracea* of described from Sokotra and the Oriental *L. bivittata*. However, I considered this taxon under the name *L. subbivittata* because the type female of *L. ochracea* was not found in Vienna. While working on this paper, I was again faced with the need to somehow solve this problem and now I decided to propose the synonymy *Lispe ochracea* Becker, 1910 = *Lispe subbivittata* Mou, 1992 **syn. nov**. First, Becker (1910) in his description makes it clear that the type female *L. ochracea* has characteristic submedian *av* seta on *f3*. Second, the type material of *L. subbivittata* was not re-examined after the description as well.
Distribution. Widely distributed in Palaearctic from Egypt to NE China (Liaoning), also recorded from Saudi Arabia, Oman and Iran. Afrotropical records: Ethiopia, Sudan, Yemen. In the Oriental region is common in India: Andhra Pradesh, Gujarat, Orissa, Rajasthan and Uttarakhand states. In Uttarakhand *L. ochracea* is sympatric with the related *L. bivittata*.

Lispe odessae Becker, 1904
Fig. 50

Lispe odessae Becker, 1904 (Hennig 1960)
Lispe caesia Meigen, 1826: misidentification by Canzoneri & Meneghini (Vikhrev et al. 2016)
Lispe caesia Meigen, 1826 (Pont 1986)
Lispe caesia microchaeta Séguy, 1940 (Zhang et al. 2016)
Lispe odessae Becker, 1904 (Vikhrev et al. 2016)
Material examined: see Vikhrev et al. (2016).
New record: RUSSIA, *Tuva* reg., Dus-Khol salt L., 700 m asl, 51.36°N 94.45°E, 2–5 July 2017, N. Vikhrev, 3♂ (ZMUM).
Distribution. Palaearctic, from E Europe to

Figs 27–28. *27 — L. nana*, female (photo: Maherjos, diptera.info); *28 — L. pectinipes*, female
Рис. 27–28. *27 — L. nana*, самка (фото: Maherjos, diptera.info); *28 — L. pectinipes*, самка

Asian Far East: China: Liaoning and Xinjiang prov.; Kazakhstan: Kyzylorda and W. Kazakhstan reg.; Mongolia, Omnogovi prov.; Russia: Astrakhan, Kalmykia, Orenburg, Tuva and Volgograd reg.; Turkmenistan, Mary reg.; Ukraine, Odessa reg. Inland salt basins and estuaries at sea shores.

Lispe orientalis Wiedemann, 1824

Lispe orientalis Wiedemann, 1824 (Hennig 1960; Vikhrev 2014)

Material examined: see Vikhrev (2011; 2014).

Distribution. In Palaearctic known from: Egypt (Sinai), Israel, Turkey, Russia (Krasnodar and Primorsky reg.), Iran, Azerbaijan, Pakistan, Tajikistan, Korea, widespread in China. Widespread in highland localities in the Oriental region. *L. orientalis* prefers dirty, organically polluted water.

Lispe patellitarsis Becker, 1914

Figs 31–33

Lispe hamanae Hori & Kurahashi, 1966 (Zhang et al. 2016)

Lispe hirsutipes Mou, 1992 **syn. nov.**

Lispe patellitarsis Becker, 1914 (Shinonaga 2003; Zhang et al. 2016)

Type material examined: Syntype *Lispe patellitarsis* Becker, 1914, 1♂, TAIWAN Formosa, Anping, May 1912, H. Sauter (ZMHU).

Material examined: CHINA, *Liaoning* prov., Jinzhou, Longqi Bay, 40.888°N 121.222°E, 9–12 August 2014, Xinyu Li, 4♂, 4♀ (MBFU, ZMUM). TAIWAN, Formosa, H. Suater, 4♂, 4♀ (ZMHU).

Distribution. E Palaearctic: seashores from NE China (Liaoning), Korea and Japan to Taiwan.

Remarks. I found some errors in the redescription of *L. patellitarsis* given in Zhang et al. (2016): *dc*: 0+2, not 0+1 (1); ♂ *t3* with 1 *ad* and 1 *av*, these setae are placed in the apical half of tibia, but they are submedian, not preapical (2); "frontal triangle distinctly broad"—actually frontal triangle narrow (3).

Synonymy. *Lispe hirsutipes* Mou, 1992 was described from China, Liaoning prov. According to Zhang et al., 2016, they neither got the type specimens from Jinzhou Municipal Health and Anti-epidemic Station, where the type material should be deposited, nor could contact the author. In the MBFU collection there is a series of *L. patellitarsis* from Liaoning prov., Jinzhou, Longqi Bay, i.e. from the type locality of *L. hirsutipes*. The only considerable difference between these taxa is that in *L. hir-*

Figs 29–30. *29—L. nivalis*, male; *30—L. rigida*, male

Рис. 29–30. *29 — L. nivalis*, самец; *30 — L. rigida*, самец

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sutipes the wing is described as clear at the apical part. Even if so, the wing pattern of the related *L. flavicornis* shows the same variability: males with either spotted and clear wings being recorded. That is why I regard *Lispe patellitarsis* Becker, 1914 = *Lispe hirsutipes* Mou, 1992 = **syn. nov.**

Lispe parcespinosa Becker, 1900

Lispe frigida Erichson, 1851 (Hennig 1960) misidentification
Lispe parcespinosa parcespinosa Becker, 1900
Lispe bohemica Becker, 1904 sensu Snyder (Vikhrev 2015)
Lispe parcespinosa parcespinosa Becker, 1900 (Vikhrev 2015)
Material examined: see Vikhrev (2015).
Distribution. In the Palaearctic known from the upper course of the Yenisey and Pechora Rivers; in the Nearctic from Canada: Quebec, Northwest Territories and Nunavut. Seems to be a Holarctic circumpolar subspecies.
Lispe parcespinosa appendibacula Xue & Zhang, 2005
Lispe parcespinosa appendibacula Xue & Zhang, 2005 (Vikhrev 2015)
New record: CHINA, *Xinjiang* prov., Qiakuertu, 46.34°N 89.54°E, 27 August 2009, D. Zhang, 2♂ 7♀ (MBFU).
Material examined: see Vikhrev (2015).
Distribution. Known from N China: Liaoning and Xinjiang prov. and Mongolia.
Lispe parcespinosa bohemica Becker, 1904
Lispe parcespinosa bohemica Becker, 1904 (Vikhrev 2015)
Material examined: see Vikhrev (2015).
Distribution. Known from the Wisla and Volga River basins in Central and East Europe.
Remarks. The taxonomy of the above listed subspecies *L. parcespinosa* was discussed in Vikhrev (2015). Comparing the variability in *L. parcespinosa* with that in other *Lispe*, it seems more reasonable to regard it as a single species, and in the present paper I treat *L. parcespinosa* in this broad sense.

Lispe pectinipes Becker, 1903

Fig. 28

Lispe leucospila Wiedemann, 1830 (Hennig 1960), misidentification
Lispe leucospila Wiedemann, 1830 (Shinonaga 2003; Xue, Zhang 2005)
Lispe pectinipes Becker, 1903: (Lyneborg 1970, 43; Vikhrev 2014)
Material examined: see Vikhrev (2014).
Distribution. SW Palaearctic from Morocco and Canary to Pakistan. The northernmost known locality is Russia, Krasnodar reg., Sochi, 43.4°N. A widespread Afrotropical species ranging from Ethiopia to Namibia. A widespread Oriental species from India to Indochina.

Lispe pygmaea Fallen, 1825

Fig. 35

Lispe aureola Shinonaga, 2014 (Vikhrev 2016)
Lispe japonica Shinonaga, 2014 (Vikhrev 2016)
Lispe pygmaea Fallen, 1825 (Hennig 1960; Vikhrev 2016)
Material examined: see Vikhrev (2016).
Distribution. Whole Palaearctic from south to about 60°N; recently introduced in Japan and Hawaiian Oahu Island (Vikhrev 2016). Afrotropical: Sudan and Ethiopia; Oriental: India.

Lispe rigida Becker, 1903

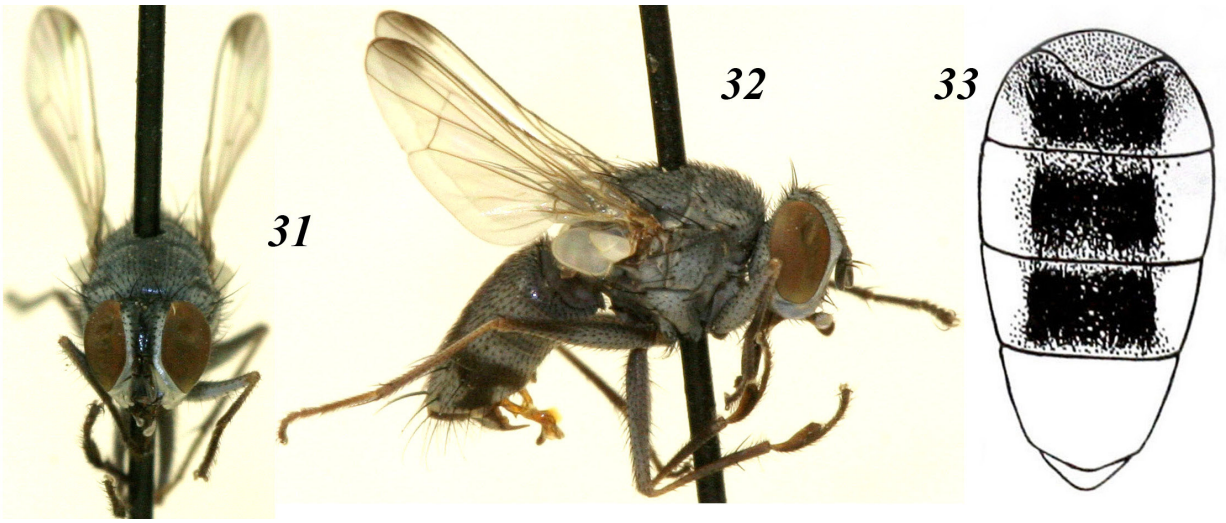
Fig. 30

Lispe rigida Becker, 1904 (Hennig 1960; Pont 1991; Vikhrev 2012c)
Material examined: see Vikhrev (2012c).
New record: UZBEKISTAN, *Bukhara* reg.: 25 km SE of Bukhara, 39.574°N 64.72°E, 21 June 2019, E. Makovetskaya, 3♂; Tudakul Lake, 39.80°N 64.74°E, 21 June 2019, E. Makovetskaya, 1♂, 1♀; 65k m SW of Bukhara, 39.305°N 63.873°E, 22 June 2019, E. Makovetskaya, 1♂; 50 km NW Bukhara, 40.107°N 64.015°E, 20 June 2019, E. Makovetskaya, 1♂ (ZMUM).
Distribution. Known from Morocco, Egypt, Israel, Iran, India (Rajasthan), Turkmenistan and Uzbekistan.

Lispe scalaris Loew, 1847

Figs 42–44

Lispe persica Becker, 1904 (Vikhrev 2012a)
Lispe scalaris ssp. *maroccana* Canzoneri & Meneghini, 1966 (Vikhrev 2014)
Lispe scalaris Loew, 1847 (Hennig 1960; Vikhrev 2014)
Material examined: see Vikhrev (2014).
Distribution. Palaearctic: from Morocco to Central Asia; Oriental: India; Afrotropical.



Figs 31–33. *L. patellitarsis*: *31* — male syntype anterior view; *32* — male syntype lateral view; *33* — abdominal pattern (from Shinonaga 2003)

Рис. 31–33. *L. patellitarsis*: *31* — самец, синтип, спереди; *32* — самец, синтип, сбоку; *33* — окраска брюшка (из Shinonaga 2003)

Lispe septentrionalis Xue & Zhang, 2005

Lispe septentrionalis Xue & Zhang, 2005 (Vikhrev 2015)

Material examined: see Vikhrev (2015)

New material examined: CHINA, *Liaoning* prov., Shenyang, Laodong Park, 41.782°N 123.332°E, 7 June 2003, D. Zhang, 3♂ paratypes (MBFU).

Distribution. Russia, Primorsky reg. and China: Hebei, Heilongjiang and Liaoning prov.

Lispe sericipalpis Stein, 1904

Lispe quaerens Villeneuve, 1936 (Hennig 1960; Vikhrev 2011)

Lispe tienmuensis Fan, 1974 (Ge et al. 2016)

Lispe fanjingshanensis Wei, 2006 (Ge et al. 2016)

Lispe sericipalpis Stein, 1904 (Vikhrev 2014; Ge et al. 2016)

Material examined: see Vikhrev (2011; 2014).

New record: UZBEKISTAN, *Samarkand* reg.: 25 km SW of Samarkand, 39.503°N 66.660°E, 950 m asl, 27 June 2019, E. Makovetskaya, 1♂, 1♀; Urgut env., Zarafshan Range, 39.377°N 67.173°E, 1100 m asl, 24 June 2019, E. Makovetskaya, 2♀ (ZMUM).

Distribution. In Palaearctic known from: S Europe, Russia (Krasnodar reg.), Israel, Turkey, Iran, Azerbaijan, Pakistan, Tajikistan, Uzbekistan, widespread in China. Widespread in highland localities in the Oriental region. *L. sericipalpis* is a typical species of fast mountain streams.

Lispe superciliosa Loew, 1861

Lispe superciliosa superciliosa Loew, 1861

Fig. 45

Lispe superciliosa cancellata Canzoneri & Meneghini, 1966 (Vikhrev 2015)

Lispe superciliosa superciliosa Loew, 1861 (Hennig 1960; Vikhrev 2015)

Material examined: see Vikhrev (2015).

Distribution. The West Palaearctic subspecies extending from Central Europe to W Siberia until the Yenisey R.

Lispe superciliosa monochaita Mou et Ma, 1992

Lispe litorea Fallen, 1825 (Xue & Zhang 2005) misidentification

Lispe monochaita Mou et Ma, 1992 (Xue, Zhang 2005)

Lispe superciliosa monochaita Mou et Ma, 1992 (Vikhrev 2015)

Material examined: see Vikhrev (2015).

Distribution. The East Palaearctic subspecies ranging from the Yenisei R. to Far East (China, Mongolia, Russia).

Lispe tarsocilica Xue & Zhang, 2005

Lispe tarsocilica Xue & Zhang, 2005 (Vikhrev 2015)

Material examined: see Vikhrev (2015).

New record: RUSSIA, *Tuva* reg., Dus-Khol

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Figs 34–35. *34 — L. kowarzi*, female; *35 — L. pygmaea*, female (photo: Yu. Palamarchuk)
Рис. 34–35. *34 — L. kowarzi*, самка; *35 — L. pygmaea*, самка (фото: Ю. Паламарчук)

salt L., 700 m asl, 51.36°N 94.45°E, 2–5 July 2017, N. Vikhrev, 11♂, 8♀ (ZMUM).
Distribution. China, Hebei prov.; Mongolia, Bayankhongor prov.; Russia: Tuva and Zabaykalsky reg.

Lispe tentaculata De Geer, 1776

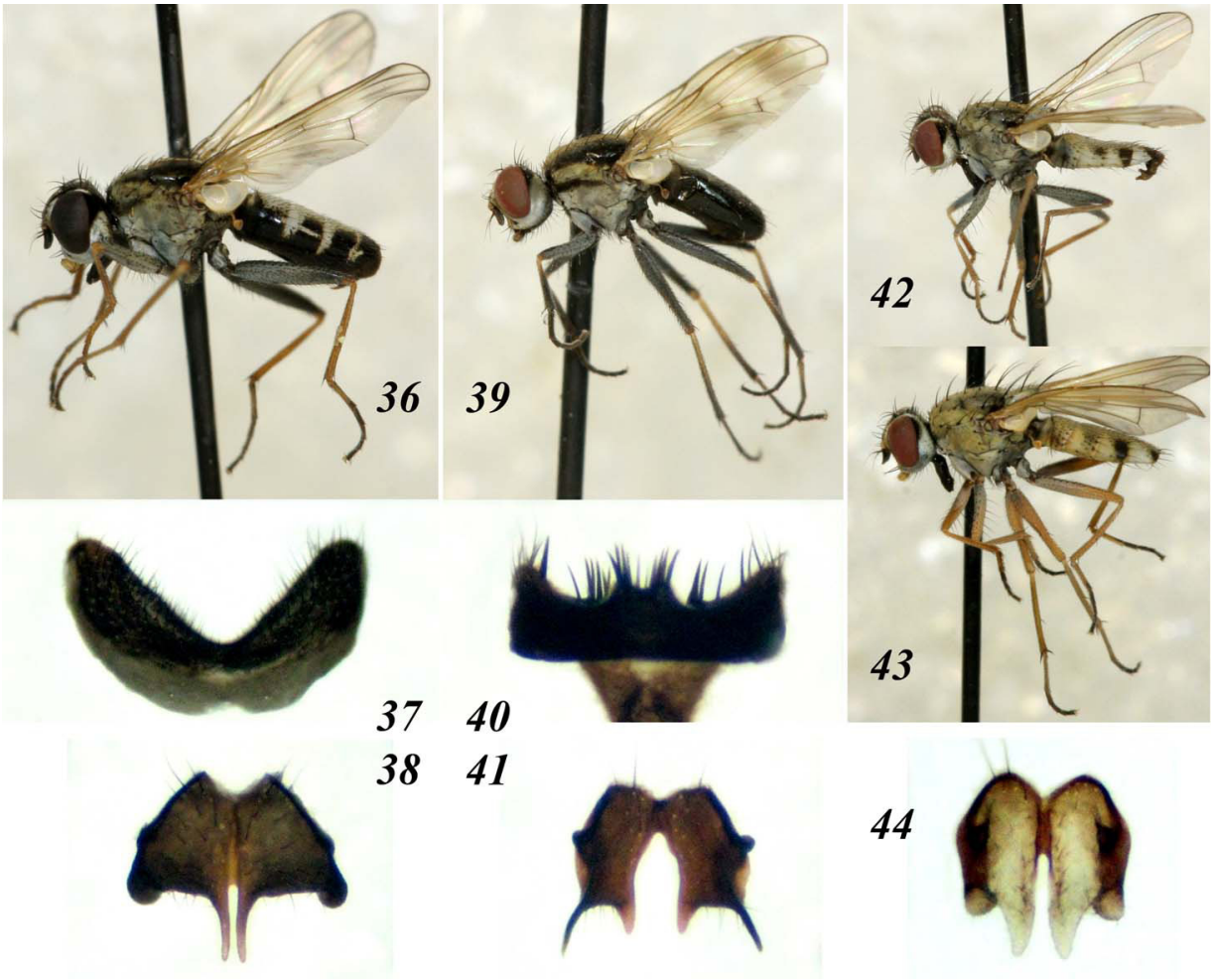
Lispe alpinicola Zhong, Wu & Fan, 1981 (Vikhrev 2014; Ge et al. 2016)
Lispe tentaculata De Geer, 1776 (Hennig 1960; Vikhrev 2011; Vikhrev 2014; Ge et al. 2016)
Material examined: see Vikhrev 2011; 2014).
Distribution. Whole Palaearctic except the Maghreb where replaced by closely related *L. draperi*. The northern distributional limit is well beyond the Arctic Circle. Afrotropical (Ethiopia), Oriental (N India) and Nearctic.
Remarks. Ge et al. (2016) do not agree with synonymy *L. tentaculata* De Geer, 1776 = *L. alpinicola* Zhong, Wu & Fan, 1981.

Lispe uliginosa Fallen, 1825

Lispe cotidiana Snyder, 1954 (Vikhrev 2015)
Lispe neouliginosa Snyder, 1954 (Vikhrev 2015)
Lispe uliginosa Fallen, 1825 (Hennig 1960; Vikhrev 2015)
Material examined: see Vikhrev (2015).
New record: RUSSIA, *Yamalo-Nenets* reg., 10 km NE of Salekhard, shore of Ob' R., 66.6°N 66.8°E, 16–19 July 2019, N. Vikhrev, 2♂ (ZMUM).
Distribution. A widespread Holarctic species. To the north extends till Arctic Circle.

II. Identification key for *Lispe* of the Palaearctic region, ♂ and ♀

1. *t2* with submedian *ad* seta(e) **2**
— *t2* without submedian *ad* seta (though *av* seta sometimes present in *L. longicollis* group) **8**
2. Scutum and abdomen shining black, without dusting (Fig. 34). Legs black, but *tar1-2* to *tar1-5* red. *t3* with strong submedian *pd*. *dc* 1 + 2–3 (anterior *post dc* weak if present). Small (body length 4–5 mm) species. Antenna remarkably long. *t1* with *p* . . . . . ***kowarzi kowarzi*** Becker, 1903
— Scutum and abdomen with distinct grey dusting. Fore tarsus not modified as above. *t3* without *pd* **3**
3. *dc* 2+4, weak. ♂ unmistakable due to modified mid and hind legs (Figs 21–22). ♀: body length 5.5 mm; *t1* without seta; *t3* with 1 *ad*; all tibial setae weak and short; palpi yellow; hind coxa bare on inner posterior surface; frontal triangle very distinct, large, wide; postpedicel very short . . . . . ***lanceoseta*** Wang & Fan (see also key for *L. caesia* group, part III)
— 2+3 *dc* (except *L. ezensis*), all strong. Other character not as above **4**
4. Frontal triangle broad, with convex margins, densely silvery-white dusted (like that in Fig. 5). Hind coxa with seta on inner posterior surface. Femora usually with ventral rows of short spines. Meron bare . . . . . ***L. caesia* group**, part (see key for *L. caesia* group, part III)



Figs 36–44. *L. scalaris* group: *L. nubilipennis* (*36–38*): *36* — male, overall view; *37* — sternite 5; *38* — cercal plate; *L. elegantissima* (*39–41*): *39* — male, overall view; *40* — sternite 5; *41* — cercal plate; *L. scalaris* (*42–44*): *42* — typical male, overall view; *43* — female, yellow-leg form, overall view; *44* — cercal plate

Рис. 36–44. Группа *L. scalaris*: *L. nubilipennis* (*36–38*): *36* — самец, общий вид; *37* — стернит 5; *38* — церки; *L. elegantissima* (*39–41*): *39* —самец, общий вид; *40* — стернит 5; *41* — церки; *L. scalaris* (*42–44*): *42* — типичный самец, общий вид; *43* — самка, форма с желтыми бедрами, общий вид; *44* — церки

— Frontal triangle of usual shape, frons not densely silvery-white dusted (except *L. hydromyzina*). Hind coxa usually bare on inner posterior surface. Femora without ventral spines. Meron with setulae (except *L. cinifera*, *L. elkantarae* and *L. rigida*) **5**

5. *t3* with *ad* seta and without *av*. Tibiae dark, at most basally yellowish . . . . . ***L. palposa*** and ***L. rigida* groups** (see key for *L. palposa* and *L. rigida* groups, part IV)

— *t3* with *av* and *ad* setae. Tibiae yellow . . . . **6** (*L. uliginosa* group; Vikhrev 2015, 240–243; figs 34–36; 39–41)

6. *t3* with several additional *ad* setae of various length. *t1* with *d* seta in apical 1/3. ♂: Cercal plate with rounded apex. ♀: *f3* with 1–2 *av* in basal 1/3 and 1(2) *av* near middle . . . . . ***uliginosa*** Fallen

— *t3* with single submedian *ad* setae. *t1* without *d* seta. ♂: cercal plate with pointed apex. ♀: *f3* at most with 1 *av* near middle **7**

7. ♂: *f3* without strong ventral setae, only weak *av* and *pv* at apex and some fine setulae may present near base. Fore tarsus remarkably modified: *tar1-5* to *tar1-2* shortened and broadened; *tar-5* to *tar1-3* black, *tar1-4* bicolour, *tar1-1* yellow. ♀: *f3* with-

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Figs 45–46. *45 — L. superciliosa superciliosa*, female (photo: D. Gavryushin); *46 — L. loewi*, female (photo: Yu. Palamarchuk)

Рис. 45–46. *45 — L. superciliosa superciliosa*, самка (фото: Д. Гаврюшин); *46 — L. loewi*, самка (фото: Ю. Паламарчук)

out submedian *av* . . . . . ***melaleuca*** Loew

— ♂: *f3* in basal 2/3 with *av* and *pv* rows of 6–7 strong setae. Fore tarsus slightly modified: *tar1-2* to *tar1-5* less shortened and broadened than in *L. melaleuca*; *tar1-1* to *tar1-3* dark dorsally and yellowish ventrally, *tar1-4* and *tar1-5* entirely dark. ♀: *f3* with 1 submedian *av* . . . . . ***septentrionalis*** Xue & Zhang

8. Vein M distinctly curved forward at apex. *t3* with 3 strong submedian setae: *av*, *ad* and *pd* (except ♂ *L. microptera* and *L. cilitarsis* without or with very weak *av*, but with modified hind tarsi). (2+4 *dc*: medium, medium + weak, weak, strong, strong.) . . . . . **9** (*L. longicollis* group; Vikhrev 2012b; 2014)

—Vein M not curved forward at apex. *t3* with at most 2 submedian setae: *av* and *ad* or *ad* and *pd*, or *t3* with only 1 seta **13**

9. Meron bare. *t2* without ventral seta. ♂: hind tarsus not modified . . . . . **10** (*L. assimilis* subgroup Vikhrev 2012b)

— Meron setulose above hind coxa. *t2* with *av* or *v* seta (except some specimens of *L. microptera*). ♂: hind tarsus modified: curved and with long ventral hairs (except *L. longicollis*) . . . . . **11** (*L. longicollis* subgroup Vikhrev 2012b; 2014)

10. ♂: *f1* ventrally with a dense brush of setulae placed in about 5 rows in basal half of femur and in 1–2 rows in apical half. *f2* in basal 1/3 with a brush of ventral setae 1.5–2x as long as femur width. ♀: *f1* ventrally with 2–3 rows of fine setulae . . . . . ***nuba*** **Wiedemann**

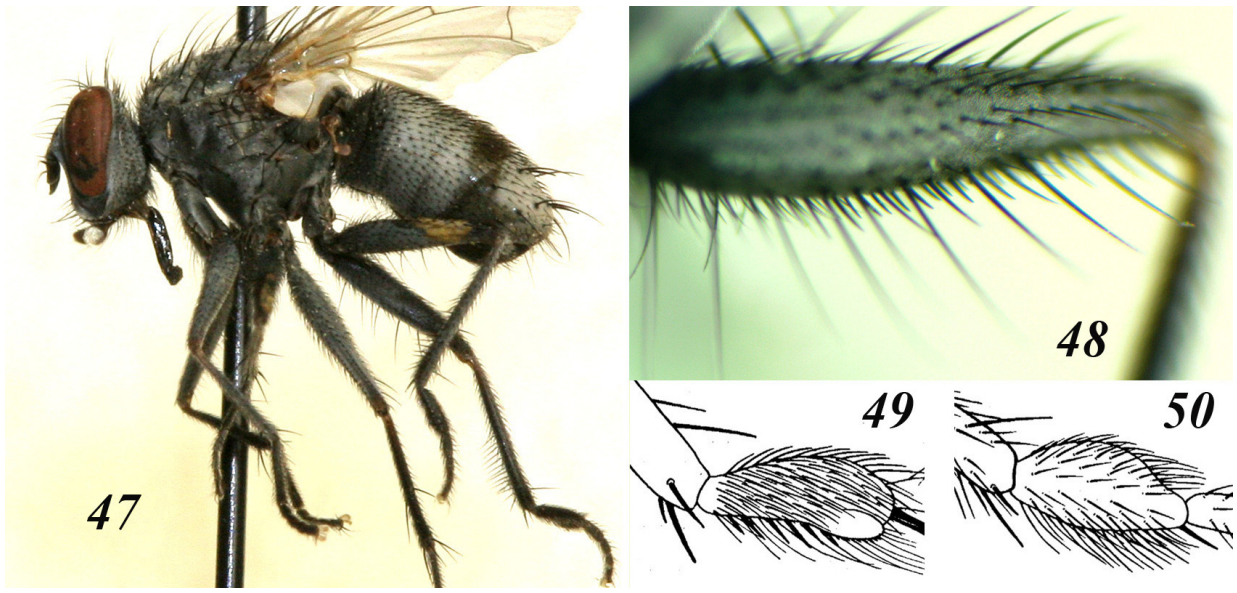
— ♂: *f1* ventrally unmodified, without dense brush of setulae. *f2* with only short ventral setae. ♀: *f1* bare on ventral surface apart from usual row of *av* setae . . . . . ***assimilis*** **Wiedemann**

11. ♂: hind tarsus unmodified. *t3* with strong *av*. Cercal plate — Fig. 24. ♀: *f3* with both submedian and apical *av* setae. Eurasia northward of 35°N . . . . ***longicollis*** Meigen (Fig. 23)

— ♂: hind tarsus modified, curved and with elongated hairs. *t3* with *av* weak or absent. ♀: *f3* with only submedian or apical *av* setae. Palaearctic southward of 32°N **12**

12. ♂: *t2* with always with *p* and *v* setae. Mid tarsus modified, tarsomeres with elongated *p* setulae. *f3* in basal 1/4 with 1–2 fine *pv* and 1 apical *av*. Hind tarsus modified: *tar3-1* with complete *a* and *v* rows of setulae. Cercal plate—Fig. 26. ♀: *f3* with apical *av*, without median *av*. *t2* always with *v* seta. Africa and Near East . . . . . ***cilitarsis*** Loew

— ♂: *t2* with 1 *p* only, *v* seta absent. Mid tarsus unmodified. *f3* in basal half with 4–5 long (2x femur width) *pv* and 1 short *av* in basal half, apical *av* absent. Hind tarsus modified: *tar3-1* with tufts of *v* setulae at base and apex, *tar3-2* with a complete row of *v* setulae. Cercal plate—Fig. 25. ♀: *f3* with-



Figs 47–50. *47 — L. halophora*, male; *48 — L. bengalensis*, ventral spines on *f1*; *49 — L. caesia*, male *tar3-1*; *50 — L. odessae*, male *tar3-1* (*49–50*, from Hennig 1960, 404: textfigg 100 and 98)

Рис. 47–50. *47 — L. halophora*, самец; *48 — L. bengalensis*, вентральные шипики на *f1*; *49 — L. caesia*, *tar3-1* самца; *50 — L. odessae*, *tar3-1* самца (*49–50*, по Hennig 1960, 404: textfigg 100 and 98)

out apical *av*, with or without median *av*. *t2* usually without *v* seta. Pakistan, India ..... ***microptera*** Seguy

13. Hind coxa with seta on inner posterior surface. *t1* with *p* seta, except *L. aquamarina* ..... ***L. caesia* group**, part (see key for *L. caesia* group, part III)

— Hind coxa bare on inner posterior surface **14**

14. Femora with ventral rows of short spines (Fig. 19). Tergites 3 and 4 with paired trapezoid dark spots, tergites 1+2 and 5 without dark spots (Figs 18–19). *dc*: 0+2. (Frontal triangle narrow, whitish (Fig. 20); palpi black; *t2* with 1 *p*; *t3* with 1 *ad* and 1 *av*.) ..... ***bengalensis*** Robineau-Desvoidy (this species is also included in the key for *L. caesia* group)

— Femora without ventral spines. Abdominal pattern not as above **15**

15. *t1* with *p* seta. Only 1 strong *prst dc* on the position of 2nd *prst dc* as in Fig. 28. (*t2* with 1 *p*; *t3* with 1 *ad*, 1(2) *av* and a row of *pv* setulae in apical half in males) ..... **16** (*L. leucospila* group; Vikhrev 2014)

— *t1* without *p* seta. *dc* not as described ... **17**

16. Disc of scutum densely dusted, with rather narrow brown median vitta from neck to tip of scutellum, submedian vittae hardly distinct. Wing hyaline. ♂: *t3* with 8–11 longer *pv* setae. Abdomen dull black, with wide lateral whitish-grey vittae (uninterrupted or sometimes interrupted by a black stripe on posterior part of tergite 4). ♀: Abdomen densely grey dusted, only dorsally with black spots ..... ***pectinipes*** Becker (Fig. 28)

— Disc of scutum dusted only in lateral part, with wide, glossy black, distinct median and submedian vittae, disc of scutellum entirely glossy black. Wing with more or less distinct dark pattern. ♂: *t3* with 5–6 shorter *pv* setae. Abdomen black with separated whitish lateral spots. ♀: Abdomen entirely glossy black, only small paired whitish lateral spots present ..... ***leucospila*** Wiedemann

17. *t3* without *pd*, with 1 *ad* only. Meron bare. Small species **18**

— *t3* with 1 *ad* and 1(weak) *pd*. Meron with hairs except *L. nana* and *L. freidbergi*. Mainly medium size species **22**

18. 0+1 *dc*. Vibrissae inserted on half distance between mouth margin and tip of antenna.

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Mid and fore trochanters yellow, contrasting with densely grey dusted femora. (♂: mid tarsus modified: *tar2-1* with 2 strong *v* setae in apical 1/3. *f3* in basal half with a sparse row of 3–4 long backcurved *v* setae.) .... ***aceponti*** Vikhrev (Vikhrev 2015)

— 2+3 *dc*. Vibrissae inserted at mouth margin. Trochanters concolour with femora.... **19**

19. Palpi only slightly widened at apex. Occiput and thorax evenly densely grey dusted; abdomen grey dusted with vague dark spots (Fig. 35). *ac* hairs in 3–4 rows. Postpronotal lobes without strong spinules ..... ***pygmaea*** Fallen

— Palpi distinctly widened at apex. Occiput, thorax and abdomen always with shining black area. *ac* hairs in 2 rows. Postpronotal lobes on the anterior and inner parts with strong spinules ..... **20** (*L. scalaris* group; Vikhrev 2014)

20. Wing not darkened. Abdomen with shining black area less extensive, ventral and lateral parts of tergites 1+2 and 3 always dusted (Figs 42–43). Scutum often without distinct shining vittae, or vittae present, but less distinct. ♂ *f2* ventrally without setae. Cercal plate — Fig. 44 .... ***scalaris*** Loew

— Wing more or less distinctly darkened (as shown in Figs 36 and 39). Abdomen with extensive shining black area, at least ventral and lateral parts of tergites 1+2 and 3 partly shining black (Figs 36 and 39). Scutum always with distinct wide shining vittae. ♂: *f2* ventrally with setae **21**

21. Wing distinctly darkened (Fig. 39). Anepisternum with black shining stripe (Fig. 39). Abdomen with black area more extensive, ventral and lateral surfaces entirely black. Tibiae darkened in apical half. Body length 3.8–4.4 mm. ♂: *f3* with *pv* setae in basal half. Cercal plate — Fig. 41; sternite 5 in Fig. 40 .... ***elegantissima*** Stackelberg

— Wing less distinctly darkened (Fig. 36). Anepisternum without black shining stripe (Fig. 36). Abdomen with black area less extensive, laterally with separated black shining spots. Tibiae yellow. Body length 4.8–5.1 mm. ♂: *f3* without *pv* setae. Cercal plate—Fig. 38; sternite 5—Fig. 37 ..... ***nubilipennis*** Loew

22. Strong *dc* setae reduced to 0+2. Disc of scutum mostly shining black, with only thin dusting. Scutellum with hairs at apex below ..... **23** (*L. nivalis* group; Vikhrev 2014)

— Dorsocentral setae not reduced 2+4, 2+3 or 1+4 *dc*. Disc of scutum with dense dusting. Scutellum bare at apex below (except *L. tentaculata* and *L. draperi*) **24**

23. Notopleuron bare on area between strong notopleural setae. Anepimeron with 4–8 hairs usually placed in a single horizontal row or almost so. Meron bare below spiracle (and with 2–3 hairs above hind coxa). ♂: *f3* with 3(4) long submedian *pv* setae, the distal one the longest; 1–2 submedian *av*. Fore coxa with a dense tuft of long curved setae posteriorly. *t3* on *a* surface with only 1 strong submedian *ad* seta. *tar3-1* unmodified. ♀: *f3* without submedian *av* setae ..... ***nivalis*** Wiedemann (Fig. 29)

— Notopleuron with 1 to several setulae on area between strong notopleural setae. Anepimeron with 10–15–20 hairs placed in about 3 rows and occupying a rounded area. Meron with 1–2 hairs just below spiracle (and with 2–3 hairs above hind coxa). ♂: *f3* without submedian *pv* setae; with 1 submedian *av*. Fore coxa without long setae posteriorly. *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. ♀: *f3* with 1 strong submedian *av* setae ..... ***ochracea*** Becker

24. Meron bare. Always 2+3 strong *dc*. ...**25**

— Meron with hairs above hind coxa. *dc* 1+4 or 2+4 (2+3 *dc* only in ♂ *L. tentaculata* and *L. draperi* with modified fore tarsus) ... **26** (*L. tentaculata* group; Vikhrev 2014)

25. *ac* hairs in 3 rows. Postpronotal lobes with spinulose setae on anterior part. W Palaearctic eastwards to Central Asia. ♂: *f3* with 2–3 fine *v* setae. Abdominal tergite 3 with a small rounded knob-like process at each ventral fore-marginal corner (visible on not dissected abdomen) .... ***nana*** Macquart (Fig. 27)

— *ac* hairs in 5–7 rows. Postpronotal lobes with usual setulae. Known from Sinai and Negev. ♂: *f3* with complete *av* and *pv* rows of spine-like setae of irregular length. Abdominal tergite 3 unmodified ..... ***freidbergi*** Vikhrev (Vikhrev 2012c, figs 8–10)

26. *dc* 2+4 or 2+3, all strong (except *L. consanguinea* with 2 anterior pairs of *post dc* weak). ♂: fore tarsus modified: mainly yellow, *tar1-1* shortened and on *p* side with a finger-like yellow process with black apex **27**

— *dc* 1+4, only posterior pair of *prst dc* present, 2 anterior pairs of *post dc* weak to hardly distinct. ♂: fore tarsus unmodified or modified (*L. emdeni*) but not yellow **29**

27. *f3* without strong submedian *av* seta(e). Scutellum bare below at apex. *dc* 2+4(3), 2(1) anterior pairs of *post dc* weak. *t2* and *t3* yellow. ♀: 2nd and 3rd *post dc* never approximated, median pruinose patch on scutum always absent .... ***consanguinea*** Loew

— *f3* with 1–3 strong submedian *av*. Scutellum with some fine hairs below at apex. *t2* and *t3* dark or yellow. ♂: 2+3 *dc*. ♀: 2+4 *dc*, all strong, 2nd and 3rd *post dc* approximated, a median pruinose patch at level of 2nd and 3rd *post dc* present. (Rarely ♀ specimens have *dc* seta as in ♂) **28**

28. Tibiae dark, only knees yellow. *f3* usually with 2–3 long submedian *av* and 2–4 weak but distinct *av* in basal half. Widespread including E Africa and Canary Islands, but absent in the Maghreb region. ♂: sternite 5 — Vikhrev 2014, fig. 16 .... ***tentaculata*** De Geer

— posterior tibiae at least in basal half yellowish, usually both *t2* and *t3* entirely yellow. *f3* usually with only 1 long submedian *av*, *av* setae in basal half indistinct. Maghreb region only. ♂: sternite 5 — Vikhrev 2014, fig. 15 ..... ***draperi*** Séguy

29. *prst ac* in 3 rows. *f3* with apical *pv* seta. Occiput with black undusted area in upper part. Body length 4–4.5 mm ♂: Fore tarsus modified: *tar1–2* to *tar1–4* shortened, *tar1–1* on *p* surface with flat apical process ..... ***emdeni*** Vikhrev (Vikhrev 2012a)

— *prst ac* in 5–7 rows. *f3* without apical *pv* setae. Occiput evenly grey dusted. Body length 5–7 mm. ♂ fore tarsus simple **30**

30. Body length 5–6 mm; palpi black; *prst ac* in 4–5 rows; ♂: *f3* with only 1 *v* seta at base ..... ***sericipalpis*** Stein

— Body length 6–7 mm. Palpi yellow. *prst ac* in 6–7 rows. ♂: *f3* with complete rows of *av* and *pv* setae .... ***orientalis*** Wiedemann

III. *Lispe caesia* group

I only partly considered the *Lispe caesia* group in previous papers. The *L. caesia* group was proposed by Hennig (1960) for 6 Palaearctic taxa: *L. caesia caesia* Meigen, 1826; *L. caesia microchaeta* Seguy, 1940; *L. candicans* Kowarz, 1892; *L. halophora* Becker, 1903; *L. leucocephala* Loew, 1856 and *L. odessae* Becker, 1904. Hennig (1960) wrote that the *L. caesia* group is one of the most clearly bordered and pointed out its following diagnostic characters: (1) frontal triangle broad, with convex margins; (2) femora with ventral rows of short spines; (3) abdomen with characteristic pattern. However, there is an evident discrepancy in Hennig's approach to the *L. caesia* group: he included in the group *L. leucocephala,* which has neither spines on femora, nor the typical abdominal pattern, while he did not include in the group *L. marina,* which has all the diagnostic characters except broad frontal triangle. In the recent review of the *L. caesia* group, Zhang et al. (2016) included in the group several other species with narrow frontal triangle (again except for the unlucky *L. marina*), but did not give any substantiation of this. Zhang et al. (2016) included in the *L. caesia* group the following Palaearctic taxa: 5 out of 6 Hennig's taxa (except for *L. odessae* previously synonymized to *L. caesia*) and 6 new taxa: *L. aquamarina* Shinonaga & Kano, 1983; *L. flavicornis* Stein, 1909; *L. hirsutipes* Mou, 1992; *L. lanceoseta* Wang & Fan, 1981; *L. palawanensis* Shinonaga & Kano, 1989; *L. patellitarsis* Becker, 1914. Later, Chinese colleagues and I (Vikhrev et al. 2016) refuted the groundless synonymy of *L. odessae*, but syn-

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onymized *L. c. microchaeta* to *L. c. caesia*. In the present paper *L. palawanensis* known from Philippines is excluded as a non-Palaearctic species and *L. hirsutipes* is excluded as synonym. Three species, *L. bengalensis* Robineau-Desvoidy, 1830; *L. marina* Becker, 1913 and *L. astakhovi* sp. nov. are included here in the *L. caesia* group for the first time. Thus, in the present paper 11 Palaearctic species of the *L. caesia* group are considered in total.

I suppose that characters offered by Hennig for the *L. caesia* group are really apomorphic, because they do not occur among other species of *Lispe*. I add one more character: hind coxa with seta on inner posterior margin. (It should be mentioned that the seta on the hind coxa occurs also in three species of *Lispe* belonging to the *L. palposa* group.) This seta on the hind coxa is absent in several species distributed in Australia and Sundaland and in Paleotropical *L. bengalensis*. Pont (2019) proposed to include several Australian species with bare hind coxa in a separate *L. cana* group, but I am inclined to regard these *Lispe* as belonging to the *L. caesia group*. According to so far unpublished molecular data on phylogeny of *Lispe* obtained by Zhang Dong, his co-workers and me, at least *L. bengalensis* is closely related to other Palaearctic species of the *L. caesia* group.

So, the *L. caesia* group has the following set of characters:

1. Femora with ventral rows of short spines (more distinct in females, less so in males) (Fig. 48).

2. Abdomen with characteristic pattern: black dorsal spots on posterior part of tergite 4 fused with antero-lateral spots on tergite 5 (see Fig. 47 or Zhang et al. 2016: Figs 8 a and e).

3. Frontal triangle broad, with convex margins; often the frons is evenly and densely silvery-white (Fig. 5) or yellow dusted so frontal triangle is hardly distinct.

4. Hind coxa with seta on inner posterior margin (absent in *L. bengalensis* and *L. lanceoseta*).

5. As to the current knowledge, all species are active predators on imago of other Diptera (Figs 10 and 17). This habit is not common in *Lispe*, the only other example of obligatory predation on Diptera imago is *L. geniseta* Stein, 1909 (Vikhrev 2016). Typically, *Lispe* hunt on soft insect larvae (like Chironomidae larvae) or (and) feed on invertebrate carrion. The active hunting is closely associated with the presence of ventral spines on femora; the stronger development of spines in female sex shows that its function is not mating but hunting.

6. All species are confined to salt water (from brackish to hypersaline), they inhabit either seashores or inland salt basins.

7. Male genitalia with rather uniform, heart-shaped cercal plate but the shape of surstyli is often characteristic. The inner side of sternite 5 has a pair of internal sclerites, the shape of which is usually characteristic for species.

8. Male *tar3-1* is often modified (Figs 17, 22, 49, 50).

9. Meron is bare in all Palaearctic species (setulose in several species from Australia (see: Pont 2019) and Sundaland).

10. The *L. caesia* group is distributed in warm regions of the Old World. The northernmost species is *L. caesia* which extend till 56°N along the Atlantic coast; in W Siberia *L. caesia* and *L. odessae* are recorded at 51.3°N. No wonder that Bering Land Bridge was too cold for the species of the *L. caesia* group to spread to America.

Only the minority of species of the *L. caesia* group kept all these characters, while the majority lost some of them.

Identification key for *Lispe caesia* group

♂

1. *t2* with *ad*. Frontal triangle never narrow **2**
— *t2* without *ad*. Frontal triangle narrow or wide **6**
2. *t1* without *p* seta. Palpi always yellow. E Palaearctic **3**
— *t1* with *p* seta. Palpi dark or yellow. Mostly W Palaearctic **4**
3. *tar3-1* modified as in Fig. 22, apical setae on *t2* willowleaf-like as in Fig. 21. *t3* without *av* setae. *dc* 2+4. Hind coxa bare on pos-

terior margin. Postabdomen velvety black . . . . . ***lanceoseta*** Wang & Fan

— *tar3-1* and apex of *t2* unmodified. *t3* with 2(1) *av* in apical half. *dc* 2+3. Hind coxa with seta on posterior margin. Abdomen evenly light grey dusted, without dark pattern. (Male terminalia — Figs 6, 7) . . . . . ***astakhovi* sp. nov.**

4. *tar3-1* unmodified. *t3* with 3–4 *a*, 8–9 *av* spinulose setae (Fig. 47) . . . . ***halophora*** Becker

— *tar3-1* modified. *t3* without or with 1–2 *av* **5**

5. *t3* without *av* setae (but with a row of fine elongated setulae). *tar3-1* diamond-shaped as in Fig. 50. Frontal triangle and face silvery-white dusted, without yellowish tint. Palpi yellow. Male terminalia, see Vikhrev et al. 2016, figs 8, 9 . . . . . ***odessae* Becker**

— *t3* with 2(1–3) *av* setae. *tar3-1* with ventral rounded process in apical half as in Fig. 49. Frontal triangle and face yellowish-white to deep yellow dusted. Palpi blackish, rarely dirty yellow. Male terminalia, see Vikhrev et al. 2016, figs 4, 5 . . . . . ***caesia* Meigen**

6. *t1* without *p* seta. (*t3* with 1 *ad* and 1 *av*. Ventral spines on femora distinct and strong (Fig. 48)) **7**

— *t1* with *p* seta **8**

7. Hind coxa without seta on inner posterior surface. Frontal triangle narrow (Fig. 20). Vibrissae very strong. Palpi dark, narrow. Hind tarsus unmodified. Tergites 3 and 4 with paired trapezoid dark spots, tergites 1+2 and 5 without dark spots (Figs 18–19). *dc*: 0+2 . . . ***bengalensis*** Robineau-Desvoidy

— Hind coxa with seta on inner posterior surface. Frons evenly silvery, borders between fronto-orbital plates, frontal vitta and frontal triangle hardly distinct. Vibrissae weak. Palpi whitish-yellow, strongly widened. *tar3-1* with large apically pointed process. Abdomen with typical *L. caesia* pattern. *dc*: 2+3, all strong . . . ***aquamarina*** Shinonaga & Kano (see Zhang et al. 2016, figs 5 a–e)

8. Strong *dc*—2+3. Frontal triangle narrow (though in *L. marina* may be badly distinct). Vibrissae strong. Palpi yellow **9**

— Strong *dc*—0+2; in *L. candicans* anterior *dc* pairs are weak but distinct, so *dc* setae may be described as 2+4; in *L. leucocephala* and *L. patellitarsis* anterior *dc* pairs are hardly distinct, so *dc* setae may be described as 0+2 or 2+4 depend on specimen **10**

9. Mid tarsus modified: *tar2-2* and *tar2-3* with long *a* seta each, *tar2-5* with a row of fine *p* hairs (Fig. 9). Hind tarsus not modified. Frons yellow dusted, narrow frontal triangle hardly distinct (Fig. 8). Postpedicel mostly dark. *t3* with 1 *ad* and 2 *av* setae. Wing unspotted . . . . . ***marina*** Becker (Fig. 16)

— Mid tarsus not modified. Hind tarsus modified, *tar3-1* widened. Fronto-orbital plates whitish dusted, frontal vitta dark, frontal triangle white to yellow. Antenna entirely yellow. *t3* with only 1 *av*. Wings with dark apex . . . . . ***flavicornis*** Stein (Fig. 17)

10. Hind tarsus unmodified. Body length 6.5–8 mm. Femora with strong ventral spines. Frons whitish dusted . . . ***candicans*** Kowarz (Figs 10, 12–15)

— *tar3-1* modified. Body length 4–5.5 mm. Ventral spines on femora weak or absent **11**

11. Frons evenly silvery, borders between fronto-orbital plates, frontal vitta and frontal triangle hardly distinct. Vibrissae absent. Antenna remarkably short. Wings clear. Abdomen evenly grey, unmarked. *t3* without *ad* . . . . . ***leucocephala*** Loew (see Zhang et al. 2016, figs 23–24)

— Fronto-orbital plates whitish dusted, frontal vitta matt black, frontal triangle glossy black (Fig. 31). Vibrissae present. Antenna of normal length. Wings with dark apex (Figs 31–32). Abdomen with dark pattern (Fig. 33). *t3* with 1 *ad* . . . . . ***patellitarsis*** Becker

♀

1. *t2* with *ad* **2**

— *t2* without *ad* **6**

2. Hind coxa without seta on inner posterior surface. *dc*: 2+4. *t1* without seta. *t3* with 1 *ad*. All tibial setae weak and short. Femora without ventral spines. Palpi yellow . . . . . ***lanceoseta*** Wang & Fan (see Zhang et al. 2016, figs 22 a–c)

— Hind coxa with seta on inner posterior surface. *dc*: 2+3. *t3* with 1 *ad* and 1–2 *av*. Fe-

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mora with ventral spines. Frontal triangle always broad with convex margins **3**

3. Palpi yellow, at most whitish dusted. Mostly E Palaearctic **4**

— Palpi black to brown. Mostly W Palaearctic **5**

4. *t1* without *p* seta (sometimes short seta present on one tibia). *t3* with 2 *av* at least on one side. *f3* in apical half with 2–3 *av*. Abdomen usually without distinct pattern on tergite 4 . . . . . ***astakhovi* sp. nov.**

— *t1* with *p* seta. *t3* with 1 *av* at least on one side. *f3* in apical half with 1–2 *av*. Abdomen with a pair of dark spots on tergite 4 . . . . . ***odessae*** Becker

5. Palpi usually black. *t3* with 1 *av*. *f3* with only 1 *av* seta beyond middle, preapical *av* absent. … ***caesia*** Meigen

— Palpi brown. *t3* with 2 *av* at least on one side. *f3* with 2 *av* setae: submedian and preapical . . . . . ***halophora*** Becker

6. Hind coxa without seta on inner posterior surface. (*t1* without *p* seta. Frontal triangle narrow. Femora with remarkably strong ventral spines. Tergites 3 and 4 with paired trapezoid dark spots.) Paleotropical . . . . . ***bengalensis*** Robineau-Desvoidy

— Hind coxa with seta on inner posterior surface. *t1* with *p* seta, except *L. aquamarina*. **7**

7. *dc*: 2+3, all strong **8**

— Strong *dc* – 0+2; in *L. candicans* anterior *dc* pairs are weak but distinct, so *dc* setae may be described as 2+4; in *L. leucocephala* and *L. patellitarsis* anterior *dc* pairs are hardly distinct, so *dc* setae may be described as 0+2 or 2+4 depend on specimen **10**

8. *t1* without *p* seta. Antenna entirely dark. Palpi brown. Temperate zone of Pacific coast . . . . ***aquamarina*** Shinonaga & Kano (see Zhang et al. 2016, fig. 7)

— *t1* with *p* seta. Pedicel and base of postpedicel yellow. Palpi yellow **9**

9. Parafacial with a complete row of hairs. *t3* with 1 *ad* and 2 *av* setae. Temperate zone of Atlantic coast . . . . . ***marina*** Becker

— Parafacial bare in upper half. *t3* with 1 *ad*, and 1 *av* setae. Paleotropical . . . . ***flavicornis*** Stein (see Zhang et al. 2016, fig. 16)

10. Femora with strong ventral spines. Body length 6.5–8.5 mm. (Palpi dark. Frons densely to moderately whitish or yellowish dusted. *t3* with 1 *ad* and 0–1 *av*.) . . . . . ***candicans*** Kowarz (Fig. 11)

— Femora without ventral spines. Body length less than 6 mm. *t3* with 1 *ad* and 0–1 *av* **11**

11. Frons evenly silvery, borders between fronto-orbital plates, frontal vitta and frontal triangle hardly distinct. Antenna remarkably short. Palpi yellow. Abdomen evenly grey, unmarked. Vibrissae weak . . . . . ***leucocephala*** Loew (see Zhang et al. 2016, fig. 25)

— Fronto-orbital plates and frontal triangle whitish-yellow dusted, frontal vitta black. Antenna of normal length. Palpi darkened. Abdomen with distinct pairs of dark spots on tergites 3 and 4 . . . . . ***patellitarsis*** Becker (see Zhang et al. 2016, fig. 29)

IV. *Lispe palposa* and *Lispe rigida* groups

The identification key for *L. palposa* and *L. rigida* groups is also placed in the separate chapter for the following reasons:

a. These groups have characteristic tibial chaetotaxy (*t2* with 1 or more *ad* seta(e); *t3* with 1 *ad* seta, without *av* or *pd*) which differs from those of other *Lispe*.

b. *L. palposa* and *L. rigida* groups include together 22 taxa, i.e. more than 1/3 of all Palaearctic *Lispe*. The presence of these taxa in the general key would make it too large and inconvenient for using.

c. The general key is organized for both sexes together, while in the key for *L. palposa* and *L. rigida* groups males and females should be considered separately.

Identification key for *Lispe palposa* and *Lispe rigida* groups

♂

1. *tar3-1* modified: shortened and laterally flattened; at apex with long finger-like ventral process. Katepimeron with 2–3 setulae at posterior part. Apex of abdomen is laterally dorsally pointed and ventrally with a notch. *t3* with long *v* setulae near apex. (see Vikhrev 2012c, figs 19–20, 22–30) **2**

— *tar3-1* without long finger-like ventral process. Katepimeron bare. Apex of abdomen not as above **3**

2. *tar3-1* distinctly shorter than *tar3-2*; finger-like protuberance on *tar3-1* shorter and more curved (Vikhrev 2012c, 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: (Vikhrev 2012c, figs 25–27) . . . . . ***brunnicosa*** Becker

— *tar3-1* about as long as *tar3-2*; finger-like protuberance on *tar3-1* longer (Vikhrev 2012c, fig. 24). *f2* without strong setae on ventral surface, though some fine setulae present. Cercal plate and sternite 5: (Vikhrev 2012c, figs 28–30) . . . . . ***kozlovi*** Vikhrev

3. Hind coxa with seta on inner posterior side. *t2* with additional *ad* setae or with dense setae on *v* surface **4**

— Hind coxa bare on inner posterior side. *t2* with only 1 *ad* seta (except in some specimens of *L. apicalis*) and without dense setae on *v* surface **7**

4. Vibrissae absent. Parafacials without dark spot in upper part. Chaetotaxy of *t2*: 1 *ad* seta placed distinctly above middle; 1(2) *p* seta(e) short and weak, also placed above middle; *v* surface at apical half 1–2 strong spine-like seta(e) and a row of longer fine setae (Vikhrev 2015, fig. 17). *tar2-1* with long fine curled ventral setae at base . . . . . ***loewi*** Ringdahl

— Vibrissae present. Parafacials with dark spot in upper part. *t2* with *ad* and *pd* setae placed below middle; *v* surface bare (but 1 strong *pv* present in *L. superciliosa superciliosa*), *tar2-1* without long seta at base **5**

5. *t3* with *ad* strong and very distinct. *tar2-1* to *tar2-3* with long (longer than tarsus width) setulae on *a* surface (Vikhrev 2015, fig. 13). Vibrissae strong (2.5–3x as long as distance between vibrissae). Mid tarsus about half as long as *t2*. *t1* with fine but distinct *pv* seta below middle. *f3* with 10–12 *av* setae . . . . . ***litorea*** Fallen

— *t3* with elongated *ad* setulae, but without distinct *ad* seta. *tar2-1* to *tar2-3* with only usual short hairs (Vikhrev 2015, fig. 14). Vibrissae rather weak (1.5–2x as long as distance between vibrissae). Mid tarsus almost as long as *t2*. *t1* without *pv*, with or without *v* in apical 1/4. *f3* with 6–8 *av* setae . . . . . **6** (***superciliosa*** Loew)

6. *t2* with strong *pv* seta. *t1* with short but distinct *v* in apical 1/4–1/5 (Vikhrev 2015: fig. 18). Europe–W Siberia . . . . . ***superciliosa superciliosa*** Loew

— *t2* without *pv*. *t1* without *v* near apex. E Siberia – Far East . . . . . ***superciliosa monochaita*** Mou & Ma

7. *t2* with 1 strong *pv* seta, also with 1 *ad* and 1 *pd* below middle. Hind tarsus shortened and strongly depressed laterally (Vikhrev 2015: fig. 9). All frontal setae (about 10) backward directed (Vikhrev 2015: fig. 31). (Abdominal tergites 3 to 5 evenly grey dusted, without distinct black pattern. Frons relatively narrow and narrowed in lower part. Parafacials without dark spot in upper part. *t1* without *p*. *f3* with 7–8 *av* setae.) . . . . . ***hebeiensis*** Ma & Tian

— *t2* without *pv*. Hind tarsus not or less depressed laterally. Only 2 upper frontal setae are reclinate, 4–5 lower setae are inclinate **8**

8. Abdomen ventrally with dense brush of setae. Abdominal tergites with large black shining areas. Vibrissae strong. *t1* without *p* seta **9**

— Abdomen without dense brush of ventral setae, abdominal tergites mostly dense grey dusted, with small dark spots **10**

9. Palpi small, yellow. Sternites 3 and 4 with long setae, tergites 3 and 4 also long-haired along ventral margin (Fig. 30). Meron bare. Thoracic and abdominal spiracles small. Apex of abdomen without whitish midspot. Terminalia: Vikhrev (2012c, figs 31, 32). Saline water; S Palaearctic . . . . ***rigida*** Becker

— Palpi wider, dirty-brown, Sternite 2 with long setae. Meron with setulae above hind coxa. Thoracic and abdominal spiracles remarkably enlarged. Apex of abdomen black with whitish midspot. North of Holarctic. (Vikhrev 2015, figs 24–26) . . . . . ***frigida*** Erichson (= ***canadensis*** Snyder)

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10. Vibrissae indistinct or very weak (*L. flavicincta*), shorter than distance between vibrissae bases. Smaller species (usually 4.5–6.5 mm) **11**
— Vibrissae strong (rather weak in *L. neimongola*), always distinctly longer than distance between vibrissa bases. Larger species (6–8 mm) **15**
11. *tar2-4* at apex with anterior blunt projection subequal in length to *tar2-5* (Vikhrev 2015, figs 15, 16). Parafacials bare in upper 2/3. Either parafacials with a dark spot in upper part or frons evenly silvery-whitish dusted **12**
— *tar2-4* without such projection. Parafacials with a complete row of setulae and without dark spot in upper part. Frons not silvery-whitish dusted **13**
12. Frons and fronto-orbital plates evenly whitish dusted, almost unicolourous, frontal triangle wide, whitish dusted, hardly distinct from whitish frons (Vikhrev 2015, fig. 33). Parafacials without dark spot in upper part. Antennae and arista remarkably short. Palpi yellow. *t1* with short but distinct *p* below middle. *t3* with *ad* seta weak, not very distinct among *ad* setulae. Thorax and abdomen evenly light-grey dusted, without black stripes or spots . . . . . ***hydromyzina*** Fallen
— Frons dark, parafacials with dark spot in upper part, frontal triangle distinct (Vikhrev 2015, fig. 32). Antennae longer. Palpi dark brown to yellow. *t1* without *p*. *t3* with *ad* distinct. Thorax and abdomen not evenly light-grey dusted, with black stripes and spots . . . . . ***parcespinosa*** Becker
13. *f3* with a complete row of about 12 strong and long *av* setae. Hind tarsus (Vikhrev 2015, fig. 7): *tar3-5* narrowed and long, about as long as *tar3-4* and *tar3-3* together. (Meron with setulae above hind coxa. *f2* with a complete row of rather strong ventral setae. *t3* with *ad* seta much stronger than elongated setulae in *ad* row. Wing not darkened.) . . . . . ***flavicincta*** Loew
— *f3* with 3–5 less strong *av* setae in apical half only. Hind tarsus (Vikhrev 2015, fig. 6): *tar3-5* as wide as *tar3-4* and shorter than *tar3-4* and *tar3-3* together **14**
14. Wings darkened antero-apically around R_{4+5} and R_{2+3} (in specimens from Morocco darkening may be hardly distinct). Meron with setulae above hind coxa. *t3* with *ad* seta much stronger than elongated setulae in *ad* row. Cercal plate: Vikhrev (2015, fig. 1) . . . . . ***apicalis*** Mik
— Wings not darkened. Meron bare above hind coxa. *t3* with *ad* seta hardly distinct, longer but about as strong as other elongated setulae in *ad* row. Cercal plate: Vikhrev (2015, fig. 2) . . . . . ***elkantarae*** Becker
15. Mid tarsus modified: *tar2-1* shortened (shorter than *tar2-4* and *tar2-3* together), with a tuft of 10–12 long waved *v* setae at base (Vikhrev 2015, fig. 20); *tar2-1* to *tar2-3* each with several elongated *a* setulae. (Postpronotal lobe, anepisternum, katepisternum and lateral surface of abdomen (often dorsal surface too) with distinct yellow tint (Vikhrev 2015, figs 19, 21). *t1* with *p* seta short but strong. *t2* with only 1 *pd* setae. Parafacials with dark spot in upper part.) . . . . . ***tarsocilica*** Xue & Zhang
— Mid tarsus not modified **16**
16. Meron bare above hind coxa. Frons narrowed as on Vikhrev (2015: fig. 30). *f3* with several long *pv* in basal third. Hind tarsus with pulvillus longer than half length of claw. (Parafacials without dark spot in upper part. *t1* without *p* seta. Large species.) . . . . . ***cinifera*** Becker
— Meron with hairs above hind coxa. Frons wider (Vikhrev 2015, figs 22, 29). *f3* without *pv*. Hind tarsus with pulvillus reduced shorter than half length of claw **17**
17. *dc* 2+4. (*t1* without *p* seta. Far East.) . . . . . ***ezensis*** Shinonaga & Kano
— *dc* 2+3 . . . . . **18**
18. *t1* with fine *pd* seta and with *d* setulae elongated (as long as tibia width). *f2* without strong *av* setae, at most with fine hairs at base (do not confuse with *a* setae). Vibrissae strong. Mid tarsus Vikhrev (2015, fig. 12): *tar2-5* thick and short. Body length 7–7.5 mm . . . . . ***flavinervis*** Becker
— *t1* without *pd* seta or elongated *d* setulae. *f2* in basal half with 4–6 strong *av* setae 1–1.5x as long as femur width (Vikhrev 2015, fig. 22). *f3* without *pv*. Vibrissae usu-

ally weak. Mid tarsus Vikhrev (2015, fig. 11): *tar2-5* thin and long. Body length 6–6.5 mm ..... ***neimongola*** Tian & Ma

♀

1. Katepimeron with 2–3 setulae in posterior part. (Meron also setulose. Palpi rather narrow and pure yellow. Thorax and abdomen only thinly brown dusted, partly shining. Body length about 7 mm. Central Asia.) ..... ***brunnicosa*** Becker or ***kozlovi*** Vikhrev
— Katepimeron bare **2**
2. Meron bare. Abdomen without median vitta, but with pairs of large, black, trapezoid spots on tergites 3 and 4. *f3* with only 1 *av* near apex and with 2–3 long (1.5x femur width), fine *pv* in basal half. Palpi remarkably narrow compared to species of *L. palposa* group, pure yellow. (Small, body length about 5 mm. Hind coxa bare on inner posterior margin. Morocco to south of Central Asia.) ..... ***rigida*** Becker
— Meron setulose (except *L. elkantarae* and *L. cinifera*, with abdomen with median vitta and without lateral spots). Abdomen without the above described pattern. *f3* not as described above **3**
3. Hind coxa with seta on inner posterior margin. *t2* with more than 1 *ad* setae. Palpi wider, black to yellow **4**
— Hind coxa bare on inner posterior margin. *t2* with only 1 *ad* setae **7**
4. *t2* with 1 strong *pv* seta. *t1* with short but distinct *v* in apical 1/4–1/5. (Parafacials with dark spot in upper part at level of insertion of antenna. Besides above mentioned 1 *pv*, *t2* with only 1 *pd* and several *ad* setae, 1–2 of which much longer than other. *f3* with 5–6 *av*. Abdominal tergites 3–5 with a broadly triangular dark median spot; paired lateral dark spots from very conspicuous to almost indistinct. Europe to W Siberia (till Yenisey River). River banks or freshwater to brackish lakes.) ..... ***superciliosa superciliosa*** Loew (Fig. 45)
— *t2* without *pv* seta. *t1* without short *v* in apical 1/4–1/5, but usually with *p* seta slightly below middle **5**
5. Parafacials without dark spot in upper part. *t2* with 2 medium strong *ad* and 3 short *pd*, either *ad* and *pd* widely separated, upper *ad* and *pd* set above middle of tibia. (*f3* with 4–5 *av*. *t1* with *p* slightly below middle. Abdomen with conspicuous dark midline.) Widespread in Palaearctic; the southernmost species of *L. palposa* group, recorded till 28°N. Salt lakes or saline sea shore marshes ..... ***loewi*** Ringdahl (Fig. 46)
— Parafacials with a dark spot in upper part at level of antenna. *t2* with 3–4 *ad* and 1–2 *pd*, all setae on *t2* densely set below middle, *ad* setae of different length, 1(2) *ad* much longer than other **6**
6. *t1* with *p* seta. *f3* with 7–9 *av*. Abdomen with dark midline inconspicuous. Seashore marshes of W Europe ..... ***litorea*** Fallen
— *t1* without *p*. *f3* with 4–5 *av*. Abdomen with a conspicuous dark midline. East Palaearctic from Yenisey River to Far East. River banks or freshwater to saltish lakes ..... ***superciliosa monochaita*** Mou & Ma
7. *t2* with 1 strong *pv* seta in addition to 1 *ad* and 1 *pd*. (Abdominal tergite 4 with a pair of postero-lateral spots, otherwise tergites 3 to 5 evenly grey dusted, without distinct black pattern, rarely indistinct dark midline present. Antenna short, arista short haired, about as long as postpedicel. Parafacials without dark spot in upper part. *t1* without *p*. *f3* with 4–7 *av* setae. Palpi brown to black.) E Europe to Far East ..... ***hebeiensis*** Ma & Tian
— *t2* without *pv* **8**
8. *t1* with *p* seta **9**
— *t1* without *p* seta **10**
9. Frons and fronto-orbital plates evenly whitish dusted, almost concolour, wide frontal triangle hardly distinct. Parafacials without dark spot in upper part (Vikhrev 2015, fig. 33). Antenna and arista remarkably short. Thorax and abdomen almost evenly light-grey dusted. Small species, body length 5–6 mm. Sea shores of W Europe ..... ***hydromyzina*** Fallen
— Frons black, frontal triangle of typical shape, distinct, parafacials with dark spot in upper part (Vikhrev 2015, fig. 29). Antennae and arista longer. Thorax and abdomen brown-grey dusted, with distinct dark pat-

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tern. Large species, body length 6–8 mm. Inland regions of E Europe and Asia .... ***flavinervis*** Becker or ***tarsocilica*** Xue & Zhang

10. Frons narrowed (Vikhrev 2015, fig. 30). Meron bare above hind coxa. *f3* with several long *pv* in basal third. Hind tarsus with pulvilli longer than half length of claw. Parafacials without dark spot in upper part. *t1* without *p* seta. Large species, body length 7–8 mm ..... ***cinifera*** Becker

— Frons wide (as on Vikhrev 2015, fig. 29) **11**

11. Thoracic and abdominal spiracles strongly enlarged (Vikhrev 2015, fig. 24, 25, 26). Parafacials with dark spot in upper part. Holarctic, from 60°N and northern .... ***frigida*** Erichson (= ***canadensis*** Snyder)

— Thoracic and abdominal (Vikhrev 2015, fig. 27) spiracles not enlarged. Parafacials without dark spot in upper part. Palaearctic from 55°N and southern **12**

12. Abdominal tergites 3 to 5 with characteristic pattern: median and a pair of submedian vittae (Vikhrev 2015, fig. 28) ..... ***flavicincta*** Loew

— Abdomen without such pattern **13**

13. *dc* 2+4. Far East... ***ezensis*** Shinonaga & Kano

— *dc* 2+3 ..... **14**

14. *t2* with *ad* seta almost as long as distance from its insertion to apex of tibia. Hind tarsus with pulvilli longer than half length of claw. (Palpi yellow.) **15**

— *t2* with *ad* seta shorter hardly longer than half distance from its insertion to apex of tibia. Hind tarsus with pulvilli shorter than half length of claw **16**

15. Meron bare above hind coxa. Algeria and Morocco ..... ***elkantarae*** Becker

— Meron with several hairs above hind coxa. From Maghreb to Central Asia..... ***apicalis*** Mik

16. Parafacials with 1 sparse row of hairs. *t2* with 1 strong *ad* only. Apex of abdomen always grey. Sand beaches along big rivers ..... ***parcespinosa*** Becker

— Hairs on upper half of parafacials in 2 rows. *t2* usually with 2–3 short setae above strong *ad*. Apex of abdomen usually orange-yellow. Brackish lakes ... ***neimongola*** Tian & Ma

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