

Contributions to the halictid fauna of the Eastern Palaearctic Region: genus *Lasioglossum* Curtis (Hymenoptera: Halictidae, Halictinae)

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The paper presents results of the taxonomic study of the bees of the genus *Lasioglossum* from the Eastern Palaearctic Region. A new subgenus, *Lasioglossum* subg. *Warnckenia* subg. n., and hitherto unknown males of *L. circularum* Fan & Ebmer, *L. ochreohirtum* (Blüthgen), and *L. zeyanense* Pesenko are described. New synonymies are established: *Halictus* subg. *Leuchalictus* Warncke, 1975 = *Lasioglossum* subg. *Sericohalictus* Pesenko, 1986, syn. n. = *Lasioglossum* subg. *Bluethgenia* Pesenko, 1986, syn. n.; *L. agelastum* Fan & Ebmer, 1992 = *L. nipponicola* Sakagami & Tadauchi, 1995, syn. n.; *L. eos* Ebmer, 1978 = *L. kasparyani* Pesenko, 1986, syn. n.; *L. leucozonium* (Schrank, 1781) = *Halictus satschauenensis* Blüthgen, 1934, syn. n., = *L. satschauenense mandschuricum* Ebmer, 1978, syn. n.; *L. occidentis* (Smith, 1873) = *L. koreanum* Ebmer, 1978, syn. n.; *L. tungusicum* Ebmer, 1978 = *Halictus tinunculus* Warncke, 1982, syn. n. The lectotypes of *Halictus carbonarius* Blüthgen (= *L. upinense*), *H. chlapovskii* Vachal (= *L. rostratum*), *H. laevifrons* Blüthgen (= *L. denticolle*), and *H. soreli* Dours (= *L. xanthopus*) are designated. *L. formosae* (Strand), *L. tungusicum* (Ebmer), and *L. xanthopus* (Kirby) are recorded for the first time from continental China, *L. formosae* and *L. subopacum* (Smith), from Vietnam, *L. chloropus* (Morawitz), from Russia (Irkutsk Prov.). A total of 38 species of the genus *Lasioglossum* were found in the Eastern Palaearctic Region. A key to all of them is given. An annotated list of species includes data for each species on its synonymy, general geographical distribution, published records from the Eastern Palaearctic Region, and the material examined.

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This paper is the fifth one of a series treating the Eastern Palaearctic Halictidae (see Pesenko, 2005a, 2005b, 2006; Astafurova & Pesenko, 2005). As defined in the first paper of the series (Pesenko, 2005a), the Eastern Palaearctic Region (in narrower understanding) is considered a part of Asia located eastwards about 90°E and northwards about 35°N in China, 32°N in Japan. This territory includes Eastern Siberia (Siberia eastwards Yenisei River, from Tuva [Tyva Republic] in the south), Russian Far East (including Sakhalin Island and the Kuril Islands), Mongolia, the north (northern half of Qinghai, Gansu and Shaanxi, Neimenggu, Ningxia, and Shanxi) and northeast (Hebei, Shandong, Liaoning, Jilin, and Heilongjiang) of China, Korean Peninsula, and Japan excluding the Ryukyu (Nansei) Islands.

In the present paper, the genus *Lasioglossum* Curtis, 1833 is accepted in the volume defined by me earlier (Pesenko, 1986), but excluding *Ctenonomia* Cameron, *Nesohalictus* Crawford, and *Lucasiellus* Cockerell, considered later sep-

arate genera (Pesenko, 2000; Pesenko et al., 2000). The genera above are only occurring in the Palaearctic Region from the “*Lasioglossum* series” of the subgenera (*Ctenonomia* and *Lasioglossum*, or their parts, *Lucasiellus* and *Nesohalictus*) of the genus *Lasioglossum* in the wider understanding (nearly 2,000 species) by Michener (2000: 356). The genus *Lasioglossum* in the volume accepted here includes about 160 species. It is a mostly Holarctic genus; only a few species inhabit South America and about 15 species are Northern Oriental in their occurrence. The Palaearctic fauna consists of 111 currently recognised species, two of which, *Lasioglossum leucozonium* (Schrank) and *L. zonulum* (Smith), are Holarctic. In the Palaearctic Region, there are three distinct centres of the species richness of the genus: Mediterranean, Central Asian, and Far Eastern (including the Northern Oriental Region).

In the Eastern Palaearctic Region, 38 species are found (including the data published in the present paper). These species belong to 5 sub-

genera: *Ebmeria* (1 species), *Lasioglossum* (16), *Leuchalictus* (18), *Lophalictus* (1), *Warnckenia* (1); for 1 species, subgeneric placement is not clarified. The subgeneric position of *L. primavera* Sakagami & Maeta from Japan (Honshu) is unclear; on this reason it is not included in the key to species below. In this key, the males of *L. exiliceps* (Vachal) and *L. leviventre* (Přez) are also not included as their descriptions by Sakagami & Tadauchi (1995) and Ebmer (1978a), respectively, are too brief and incompletely adequate (see sections “Taxonomic note” for these species in “Annotated list”).

All behaviourally known species of the genus *Lasioglossum* are solitary forms. Females construct their nests in soil, usually making long lateral furrows. All species are polylectic, except for the Euro-Siberian *L. costulatum* (Kriechbaumer), which is oligolege of *Campanula*.

Material and methods

The most part (in the total, over 4, 000 specimens) of the material examined from the Eastern Palaearctic Region is deposited at ZISP (explanation of abbreviations used see below). A significant number of bees has been provided for study from IBSV, IZB, and ZMMU. Data written on labels in Chinese (for bees from the collection of IZB) were translated into English by Prof. Wu Yanru only for presumably new species in the framework of a cooperative study of the Chinese halictids, some results of which were published earlier (Pesenko & Wu, 1991, 1997a, 1997b); for the rest Chinese species from the collection of IZB, only names of provinces are given below in “Annotated list”.

In the key to and descriptions of species below, the following abbreviations are used: S, metasomal sternum; T, metasomal tergum; e.g., T1 means tergum 1; S4, sternum 4, in metasomal (not abdominal) numeration. For description of the punctation, the following “formula” is used: interval of (typical) puncture diameters in mm and intervals of (typical) interspace widths estimated in the number of average puncture diameters (in parentheses), e.g., 28-35 mm / (2-3).

On the whole, the morphological terms used in this paper are those proposed by Michener (1944, 1965, 2000). In accordance with the terminology of the classic anatomy, I use the terms *apex* and *base*, *apical* and *basal* (end, part, etc.) only for description of such structures as protuberances, processes, projections, teeth, tubercles, lobes, etc. The terms *distal* and *proximal* (end, part, etc.) are used for descriptions of articulated structures and appendages, such as antenna, leg, gonostylus, etc., and also their parts: scape, pedicel, flagellum, flagellomere, labial palp, tibia,

femur, tarsus, tarsomere, etc. The terms *anterior* and *posterior* (also *median* and *lateral*) are used for characterisation of main sclerites of the body: pronotum, mesoscutum, scutellum, metanotum, mesepisternum, propodeum, metasomal terga and sterna, etc.; e.g., posterior margin of mesoscutum, anterior hair bands on terga, posterior areas of sterna. The word “mesad” is used here in the sense “toward the middle”. Bees are hypognathous insects. So, for characterisation of the general form of the head in frontal view and its subdivisions, like the clypeus and supraclypeal area, I use the terms *height*, *high* (not *length*, *long*) and also *upper* and *lower* (margin, part, etc.). In accordance with the current tradition, surfaces and margins of femora, tibiae and tarsomeres are described in their orientation when legs are directed downward; antennae considered as oriented forward. Natural borders do not mark all margins of some traditionally distinguished parts of the body surface. For description of these parts, with the exception of the frons and vertex, the term *area* is used, e.g., paraocular area, supraclypeal area, genal area, posterior areas of terga, etc. For description of the main (central) part of a sclerite, the term *disc* is used, e.g., punctation on mesoscutal disc, pubescence of T2 on disc, etc. I use the term *metapostnotum* for the “middle area of the propodeum” (“propodeal triangle”) after Brothers (1975, 1976).

In “Annotated list” below, species are provided with the sections “Published records” and “Material examined” including only the data from the Eastern Palaearctic Region. The information (original data) on the occurrence of species of the genus *Lasioglossum* in the region is contained in 66 publications marked by asterisk in References. The traditional term “Middle Asia” is used in Russian references as a name for the territory occupied by Turkmenistan, Uzbekistan, Tajikistan, and Kyrgyzstan combined. The words “Province”, “Autonomous Region” and “Municipality” in the names of administrative districts in China, “Aimak” in the names of administrative districts in Mongolia, “Island” for Sakhalin, Kurils (Kunashir, etc.) and Japanese Islands are omitted.

The following abbreviations are used in the text for indication of museums, institutions and private collections as depositaries for types and other material examined (curators are given in parentheses):

AMNY, American Museum of Natural History, New York, USA (J.G. Rozen and E. Quinter);

BML, Natural History Museum, London, United Kingdom (G.R. Else);

CAS, California Academy of Sciences, San Francisco, USA (W. Pulawski);

CMP, Carnegie Museum, Pittsburgh, USA;

CUI, Cornell University, Ithaca, USA (G.C. Eickwort);

DEI, Deutsches Entomologisches Institut, Eberswalde (now in Möncheberg), Germany (J. Oehlke and H.H. Dathe);

EBM, Private collection of Andreas W. Ebmer, Linz, Austria;

FSF, Forschungsinstitut Senckenberg, Frankfurt am Main, Germany (D.S. Peters and J.-P. Kopelke);

HNB, Hungarian Natural History Museum, Budapest, Hungary (J. Papp);

HUS, Faculty of Agriculture, later Entomological Institute, Hokkaido University, Sapporo, Japan (the late S.F. Sakagami);

IBSV, Institute of Biology and Soil Sciences, Russian Academy of Sciences, Vladivostok, Russia (A.S. Lelej);

IZB, Institute of Zoology, Academia Sinica, Beijing, China (Wu Yanru);

IZK, Institute of Systematic and Experimental Zoology, Polish Academy of Sciences, Krakow, Poland (M. Dylewska and W. Celary);

KMB, Alexander Koenig Museum, Bonn, Germany;

KUF, Entomological Laboratory, Kyushu University, Fukuoka, Kyushu, Japan (O. Tadauchi);

MCZC, Museum of Comparative Zoology, Harvard University, Cambridge, USA (J. Carpenter and S.R. Shaw);

MIZW, Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw (T. Hujfleit);

MNB, Museum für Naturkunde an der Humboldt Universität zu Berlin, Germany (F. Koch);

MNP, Muséum National d'Histoire Naturelle, Paris, France (J. Casevitz-Weulersse);

NMW, Naturhistorisches Museum, Wien, Austria (M. Fischer);

NRS, Naturhistoriska Riksmuseet, Stockholm, Sweden (E. Erlandsson);

OLML, Oberösterreichisches Landesmuseum, Linz, Austria (F. Gusenleitner);

PAK, Private collection of Dr. Laurence Packler, York University, North York, Canada;

SCH, Private collection of Maximilian Schwarz, Ansfelden by Linz, Austria;

SMH, Staatsmuseum in Hamburg, Germany;

UCR, University of California, Riverside, USA (S. Frommer);

UKL, Snow Entomological Museum, University of Kansas, Lawrence, USA (C.D. Michener and M.S. Engel);

USMW, U. S. National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (R.J. McGinley);

UUL, Utah State University, Logan, USA (T.L. Griswold);

ZISP, Zoological Institute, Russian Academy of Sciences, St.Petersburg;

ZMMU, Zoological Museum, Moscow University, Moscow, Russia (A.V. Antropov);

ZMUC, Zoological Museum, Calcutta University, Calcutta, India;

ZMUH, Zoological Museum, Helsinki University, Helsinki, Finland (A. Pekkarinen);

ZMUO, Zoological Museum, Oxford University, Oxford, United Kingdom (C. O'Toole);

ZSM, Zoologische Staatssammlung, München, Germany (E. Diller and K. Schunitzer).

Subgeneric classification of Eastern Palaearctic species of the genus *Lasioglossum*

Eastern Palaearctic species of the genus *Lasioglossum* belong to the following five subgenera, one of which is described here as a new.

Subgenus **Ebmeria** Pesenko

Lasioglossum subg. *Ebmeria* Pesenko, 1986. Type species: *Halictus costulatus* Kriechbaumer, 1873, by original designation.

This is a Palaearctic subgenus comprising 4 species. One species, the Euro-Siberian *L. costulatum* (Kriechbaumer), occurs in the Eastern Palaearctic Region.

Subgenus **Lasioglossum** Curtis

Lasioglossum Curtis, 1833. Type species: *Lasioglossum tricingulum* Curtis, 1833 (= *Melitta xanthopus* Kirby, 1802), by original designation.

The subgenus comprises 57 Palaearctic species, of those 17 species are recorded from the Eastern Palaearctic Region.

Subgenus **Leuchalictus** Warncke

Halictus subg. *Leuchalictus* Warncke, 1975. Type species: *Apis leucozonias* Schrank, 1781, by original designation.

Lasioglossum subg. *Sericohalictus* Pesenko, 1986, **syn. n.** Type species: *Halictus subopacus* Smith, 1853, by original designation.

Lasioglossum subg. *Bluethgenia* Pesenko, 1986, **syn. n.** Type species: *Halictus dynastes* Bingham, 1898, by original designation.

Comment on the synonymy. The monotypical subgenus *Sericohalictus* is synonymized here with *Leuchalictus*, as Ebmer & Maeta (1999) described two species from southern Japan, *L. okinawa* (from Okinawa) and *L. sakishima* (from Sakishima), which occupy an intermediate position between these subgenera. The synonymy of the monotypical subgenus *Bluethgenia* is a result of re-examination of the type species, which has shown that *L. dynastes* has no strong differ-

ences, which are sufficient for consideration of it as a separate subgenus.

This is a Holarctic subgenus comprising 35 Palaearctic species. 18 species are recorded from the Eastern Palaearctic Region.

Subgenus *Lophalictus* Pesenko

Lasioglossum subg. *Lophalictus* Pesenko, 1986. Type species: *L. acuticrista* Pesenko, 1986 (= *Halictus proximatus* Smith, 1879), by original designation.

The subgenus includes a single species widespread in the Southeastern Palaearctic and Northern Oriental Regions.

Subgenus *Warnckenia* Pesenko, subg. n.

Type species: *Melitta quadrinotata* Kirby, 1802.

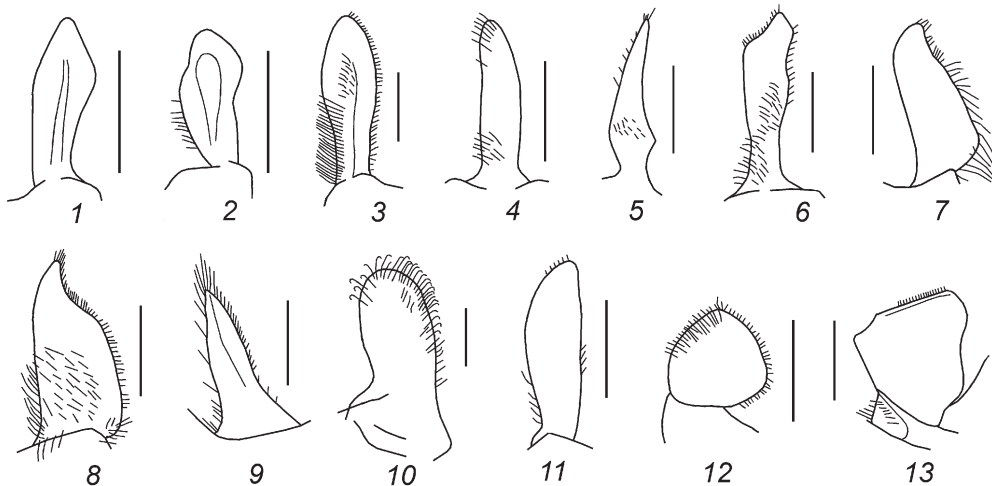
Diagnosis. The new subgenus differs from other subgenera of the genus *Lasioglossum* in the following character set: (1) posterior vertical surface of propodeum of both sexes with carina only along lower half of lateral margins, distinctly punctate, with polished interspaces (the subgenus *Warnckenia* shares these characters with the subgenus *Pallhalictus* Warncke); (2) metapostnotum roundly passing onto posterior vertical surface (except for *L. tessaranotatum*, in which the border between these surfaces is marked by a slight carina directed upward); (3) mesoscutum and metasomal terga relatively coarsely punctate; (4) mesopleura densely rugulose, dull; (5) body length 7-9 mm; (6) male gonocoxite without membranous lobe.

This is a Palaearctic subgenus comprising 5 species: Western Palaearctic *L. korbi* (Blüthgen, 1929); *L. lativentre* (Schenck, 1853); *L. quadrinotiforme* Ebmer, 1980; and *L. quadrinotatum* (Kirby, 1802); and Chinese *L. tessaranotatum* Ebmer, 1998.

Key to Eastern Palaearctic species

1. Females 2
- Males 38
- 2(1). Posterior vertical surface of propodeum along upper half or third of lateral margin without carina, roundly passing onto its lateral surfaces 3
- Posterior vertical surface of propodeum carinate along entire lateral margins 19
- 3(2). Lateral and posterior vertical surfaces of propodeum, at least in upper parts, distinctly punctate, shiny on interspaces. – Pubescence of head and mesosoma bright ochre-orange. Metapostnotum along posterior margin with weak transverse carina directed upward. Body length 7.0-7.5 mm 4
- Lateral and posterior vertical surfaces of propodeum granulate rugulose or tuberculous roughened, usually dull 4
- 4(3). Middle and hind tibiae and all tarsi rusty-yellow to red. Head longitudinally elliptical in front view, with

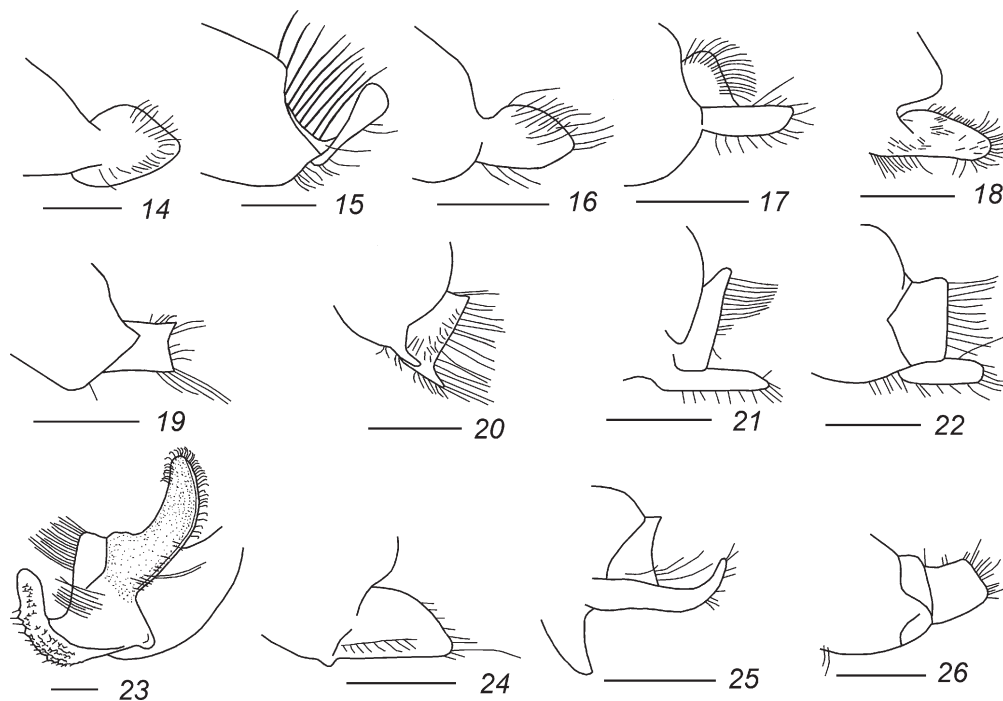
- strongly convex vertex, 1.1-1.15 times as high as wide, 0.8 times as wide as mesosoma. Body length 11-12 mm ... **L. (*Lasioglossum*) xanthopus** (Kirby)
- Legs dark. Head about as high as wide, somewhat higher than wide, or wider than high, with less convex or flattened vertex 5
- 5(4). Mesepisternum alveolate rugulose, between wrinkles nearly smooth, shiny. – T1 on posterior area polished. Body length 7.5-10.5 mm 5
- **L. (*Lasioglossum*) ebmerianum** Sakagami & Tadauchi
- Mesepisternum granulate rugulose, mat. 6
- 6(5). Metapostnotum not projecting over posterior vertical surface of propodeum as a transverse plate or carina directed backward, along posterior margin without carina directed upward, narrowly, roundly passing onto posterior vertical surface of propodeum (Figs 71, 77) 7
- Metapostnotum on posterior margin forming a short median transverse plate or carina projecting over posterior vertical surface of propodeum, or along entire posterior margin with carina directed upward (Figs 67-70, 72-76, 79) 9
- 7(6). Pubescence of head and mesosoma yellowish brown. Wing membrane strongly infuscate, brownish grey, with darker apical band. Striae of metapostnotum fine and dense, but not smoothed on posterior part. T1 with blue metallic lustre. – Head rounded triangular in front view, 1.05 times as high as wide. T1 finely densely obscurely punctate (on disc 1.5-2.0, on posterior area more finely and densely), on anterior surface and lateral nodes polished on interspaces, on rest surface finely obscurely shagreened or strigate, shiny. T1-T4 with very wide posterior areas, which are about half as long (wide) as entire terga. T3-T4 on discs with dark pubescence. Pubescence of T5 around furrow yellowish brown. Body length 11 mm. (Male unknown) 8
- **L. (*Lasioglossum*) hummeli** (Blüthgen)
- Pubescence of head and mesosoma whitish. Wings hyaline or slightly yellowish infuscate. Striae of metapostnotum low, smoothed in posterior part. T1 on disc more sparsely punctate, black, without metallic lustre 8
- 8(7). Head somewhat higher than wide. Scutellum more densely punctate (< 1). T1 on posterior half of posterior area densely punctate (1-2). Body length 8.5-9.0 mm ... **L. (*Lasioglossum*) jultschinicum** Ebmer
- Head somewhat wider than high. Scutellum more sparsely punctate (on sides of admedian line up to 2). T1 on posterior area very sparsely punctate or impunctate, polished or very finely strigate, shiny. Body length 8.5-9.0 mm 9
- **L. (*Lasioglossum*) verae** Pesenko
- 9(6). Mesoscutum more sparsely punctate (at least on posterior half of disc, 1-2 or more) 10
- Mesoscutum more densely punctate (< 1), throughout or on most surface densely shagreened, mat (except for that of *L. chloropus*, in which it is nearly throughout shiny) 13
- 10(9). Pubescence of vertex and mesosoma on dorsal surface bright, yellowish- or rusty-brown. Middle and hind tarsi dully reddish brown. Legs with yellowish hairs (except for usually brown pubescence along posterior margin of hind tibia). Mesoscutum entirely shagreened on interspaces, mat. – Head rounded triangular in front view, 0.92-0.95 times as high as wide. Metapostnotum mat, very finely and densely striate (Fig. 74). T1 on posterior area polished. Body length 8.5 mm 10
- **L. (*Lasioglossum*) ochreohirtum** (Blüthgen)



Figs 1-13. Membranous retrorse lobe of gonocoxite of *Lasioglossum* males: subgenera *Lasioglossum*, *Ebmeria*, and *Lophalictus* (left, in its plane; ventral view to genital capsule). **1, 2**, *L. chloropus* (1, lectotype; 2, male from Tajikistan: Khorog); **3**, *L. eos*; **4**, *L. jultschinicum* (paralectotype of *Halictus nigricornis* Morawitz); **5**, *L. lisa* (from Ebmer, 2002); **6**, *L. ochreohirtum*; **7**, *L. pseudofallax* (from Ebmer, 1975a); **8**, *L. tungusicum* (holotype); **9**, *L. verae* (paratype); **10**, *L. xanthopus*; **11**, *L. zeyanense*; **12**, *L. costulatum*; **13**, *L. proximatum*. Scale bar 0.25 mm.

- Pubescence of head and mesosoma white, grey-white, or grey-yellowish. Mesoscutum on most surface shiny (except for *L. lisa*, in which it is silk-mat, but mesoscutum with strong metallic glaucousness and head transversely elliptical) 11
- 11(10). Head rounded triangular in front view, higher than wide. Metapostnotum entirely dull. T1 nearly throughout impunctate, only a row of punctures before posterior area and several punctures on sides of convex part present. – Pubescence of T5 around furrow rusty-brown. Body length 9-10 mm
 **L. (*Lasioglossum*) pseudofallax** (Blüthgen)
- Head transversely elliptical in front view, not more than 0.9 times as high as wide. Metapostnotum relatively coarsely strigate, shiny or silk-shiny. T1 on disc sparsely, but distinctly punctate (1-3 or 1-6), on posterior area much more densely punctate (0.4-1.0) 12
- 12(11). Pubescence of vertex and mesosoma on dorsal surface ochre-yellow, brownish yellow, or greyish yellow. Mesoscutum throughout very finely shagreened, oil-mat, with strong metallic glaucousness. Anterior hair bands of T2-T4 narrow, medially only a little appearing from under preceding terga, band of T4 far not reaching its posterior area. Pubescence of T5 around furrow ochre-brown. Larger, body length 9.0-9.5 mm **L. (*Lasioglossum*) lisa** Ebmer
- Pubescence of head and mesosoma white. Mesoscutum black, without metallic lustre, on most surface polished between punctures, shiny. Anterior hair bands of T2-T4 very wide, band of T4 reaching its posterior area. Pubescence of T5 around furrow white or yellowish. Smaller, body length 7-8 mm
 **L. (*Lasioglossum*) fallax melanarium** (Morawitz)
- 13(9). T1 on dorsal surface more densely punctate (up to 2, sometimes 3). Head transversely elliptical in front view, 0.8-0.85 times as high as wide. Mesoscutum black, without metallic lustre. – Pubescence of head and mesosoma on dorsal surface ochre-brown. Mesoscutum entirely shagreened on interspaces, dull. Metapostnotum shiny (Fig. 75). Anterior hair bands of T2-T4 narrow, medially only a little appearing from under preceding terga, band of T4 far not reaching its posterior area. Pubescence of T5 around furrow dark brown. Body length 8.5-9.0 mm. (Male unknown) . . . **L. (*Lasioglossum*) sutshanicum** Pesenko
- T1 on dorsal surface (except for posterior area) impunctate or with very sparse punctation (2-7 and more). Head higher, usually rounded triangular in front view. Mesoscutum usually with weak green or blue metallic lustre (except for *L. leventre*) 14
- 14(13). Mesoscutum on considerable part of disc polished on interspaces, shiny (except for some *L. tungusicum* from Yakutia). Anterior hair bands of T2-T4 wide, band of T4 reaching its posterior area. T4 with long white hairs laterally and a row along anterior margin of posterior area. Pubescence of T5 around furrow rusty-brown, frequently covered with long sparse white hairs 15
- Mesoscutum throughout or nearly throughout shagreened on interspaces, dull. Anterior hair bands of T2-T4 narrow, medially only a little appearing from under preceding terga, band of T4 far not reaching its posterior area. Pubescence of T5 around furrow dark brown. – Metapostnotum finely and densely striate, silk-shiny (Fig. 67) 16
- 15(14). Head somewhat shorter than wide. Pubescence of vertex and mesosoma on dorsal surface brownish grey. Body length 9 mm
 **L. (*Lasioglossum*) chloropus** (Morawitz)
- Head somewhat higher than wide or as high as wide. Pubescence of vertex and mesosoma on dorsal surface greyish white. Body length 9 mm
 **L. (*Lasioglossum*) tungusicum** Ebmer
- 16(14). Pubescence of vertex and mesosoma on dorsal surface bright, yellowish- or rusty-brown. Middle and

- hind tarsi, sometimes also tibiae dully reddish brown. Legs with yellowish hairs (except for usually brown pubescence along posterior margin of hind tibia). – Head rounded triangular in front view, 0.95 times as high as wide. T1 on posterior area usually polished, but sometimes with weak strigation. Body length 9.5–10.0 mm **L. (*Lasioglossum*) zeyanense** Pesenko
- Pubescence of vertex and mesosoma on dorsal surface white, light yellowish grey, light grey-brown, or brown (in *L. leviventre*). Legs entirely black or brownish black, with whitish or light greyish hairs, only hind tibia along posterior margin with mixture of brown hairs 17
- 17(16). T1 on posterior area polished. Head transversely elliptical in front view, 0.95 times as high as wide. – Pubescence of head and mesosoma white. Mesoscutum throughout densely shagreened on interspaces and puncture bottoms, mat, usually with weak blue or green lustre. Metapostnotum mat, very densely, finely, and obscurely striate or nearly granulate (Fig. 69). Body length 8–9 mm **L. (*Lasioglossum*) exiliceps** (Vachal)
- T1 on posterior area finely shagreened or finely striate (inconspicuous in some individuals of *L. eos*). Head higher 18
- 18(17). Pubescence of vertex and mesosoma on dorsal surface brown. Head egg-shaped in front view, 1.05 times as high as wide. Mesoscutum regularly, finely and very densely punctate (15–20 μm / 0.2–0.4), densely shagreened on interspaces and puncture bottoms, mat, black. T3 and T4 on discs not shagreened, only punctate. Body length 9 mm **L. (*Lasioglossum*) leviventre** (Pérez)
- Pubescence of vertex and mesosoma on dorsal surface whitish. Head rounded triangular in front view, 0.95–1.0 times as high as wide. Mesoscutum nearly twice more coarsely and less regularly punctate, in middle of posterior half usually shiny on interspaces, usually with weak green metallic lustre. T3 and T4 on discs densely shagreened on interspaces. Body length 9–10 mm. – Similar to *L. tungusicum*; in addition to entirely dull mesoscutum and narrower hair bands of T2–T4 (see Couplet 15), differing from the latter in following characters: head usually shorter; metapostnotum more coarsely and sparsely striate, shinier (Fig. 68); T1 shorter, its posterior area separated from disc by weak, but distinct step, with at least markings of fine strigation; T2 on disc shagreened, dull or silk-mat (very finely and moderately densely punctate, not shagreened, shiny in *L. tungusicum*) **L. (*Lasioglossum*) eos** Ebmer
- 19(2). Metapostnotum as long as scutellum, triangular, laterally not bordered by carina, projecting backward (over posterior vertical surface of propodeum) as a sharp transverse plate (Fig. 80). Lateral surfaces of propodeum strongly converging backward, very coarsely striate. Head thick. Mesoscutum, scutellum and T1–T3 with blue metallic lustre. Mesoscutum very coarsely and relatively sparsely punctate (on disc, 30–50 μm / 1–2); punctures not deep, with flat bottoms raised backward to mesoscutum surface. Body length 9–10 mm **L. (*Ebmeria*) costulatum** (Kriechbaumer)
- Metapostnotum usually shorter, semi-lunar or trapezoidal, not projecting backward as a transverse plate. Shape of head varying. Lateral surfaces of propodeum much less converging backward. Body without metallic lustre (except for metasoma of *L. upinense*, mesoscutum of *L. mutilum* and *L. denticolle*). Mesoscutum usually more finely punctate with usual punctures 20
- 20(19). Carina running along lateral margins of posterior vertical surface of propodeum in its upper end jointed at right angle with carina running along posterior margin of metapostnotum, far from middle of propodeum (Fig. 81). Head very short, transversely elliptical in front view, 0.8–0.85 times as high as wide. – A very variable species in sculpture of mesoscutum, metapostnotum, and T1. Body brownish black. Mesoscutum densely punctate (only in middle of posterior half, up to 1), entirely or only on anterior surface and laterally shagreened. Metapostnotum semi-lunar, along entire posterior margin with high sharp carina, coarsely and not densely striate, shiny, sometimes smoothly striate and dull. T1 entirely polished, on anterior and convex surfaces impunctate, on dorsal surface and posterior area usually sparsely punctate (2–5 and more), but sometimes more densely (2–3). Body length 8.5–9.0 mm **L. (*Lophalictus*) proximum** (Smith)
- Carina running along lateral margins of posterior vertical surface of propodeum at its upper end curved mesad and not jointed with carina running along posterior margin of metapostnotum, or jointed in middle of propodeum. Head higher, as high as wide, higher than wide, or somewhat (not more than 1.1 times) wider than high 21
- 21(20). Dorsal surface of propodeum medially as long as scutellum or somewhat longer. Head significantly narrower than mesosoma, 1.2–1.3 times as high as wide. Clypeus entirely situated below eyes. – Metapostnotum triangular, not occupying entire dorsal surface of propodeum, lateral areas of latter well developed, but frequently sloped. Mesoscutum black, without metallic lustre. Head and mesosoma covered with not bright, grey-yellow-brownish pubescence. Lateral surfaces of propodeum in upper parts finely rugulose or granulate. T1 sparsely punctate. Pubescence of T5 around furrow dark brownish 22
- Dorsal surface of propodeum medially 0.3–0.8 times as long as scutellum. Head usually shorter than wide, as high as wide, sometimes higher than wide, but not more than 1.1 times. Clypeus partly situated below eyes, not more than 3/4 of its length 23
- 22(21). Smaller, body length 9.0–10.5 mm. Clypeus flattened, punctate with indistinct punctures forming shallow longitudinal furrows. Vertex very finely and densely punctate, dull. Mesoscutum dull, densely and finely punctate (on disc 20–30 μm / 0.2–0.4), densely shagreened, except for middle part. Metapostnotum granulate, with very fine and dense striae, dull (Fig. 95). Lateral surfaces of propodeum in upper parts finely granulate, dull or submat. T1 entirely with fine strigation, silk-mat, on posterior area impunctate **L. (*Leuchalictus*) rostratum** (Eversmann)
- Larger, body length 12 mm. Clypeus convex, regularly punctate with large elliptical punctures (~ 1). Vertex polished, sparsely punctate with distinct punctures, shiny. Mesoscutum shiny, punctate with very large, distinct punctures (on disc 50–70 μm / 0.5–3.0), polished on interspaces. Metapostnotum and lateral surfaces of propodeum in upper parts finely sparsely rugulose, shiny (Fig. 94). T1 polished on interspaces, shiny, on posterior area punctate. (Male unknown) **L. (*Leuchalictus*) rachifer** (Strand)
- 23(21). Metapostnotum with more or less coarse, usually longitudinal wrinkles, 0.3–0.6 times as long as scutellum, distinctly bordered from lateral surfaces of propodeum by sharp change of sculpture and frequently also by carina. Lateral surfaces of propodeum in upper parts with significantly finer sculpture than that



Figs 14-26. Gonostylus of *Lasioglossum* males: subgenera *Lasioglossum*, *Ebmeria*, and *Lophalictus*. 14-22, 24-26, left, in its plane; lateral, posterolateral or dorsolateral view to genital capsule; 15, left, together with membranous retrorse lobe of gonocoxite; lateroventral view to genital capsule. **14**, *L. chloropus* (lectotype); **15**, *L. eos*; **16**, *L. fallax melanarium*; **17**, *L. jultschinicum* (paralectotype of *Halictus nigricornis* Morawitz); **18**, *L. lisa* (from Ebmer, 2002); **19**, *L. ochreohirtum*; **20**, *L. pseudofallax* (from Ebmer, 1975a); **21**, *L. tungusicum* (holotype); **22**, *L. verae* (paratype); **23**, *L. xanthopus*; **24**, *L. zeyanense*; **25**, *L. costulatum*; **26**, *L. proximatum*. Scale bar 0.25 mm.

on metapostnotum, finely and densely reticulate rugulose or granulate, dull. – Pubescence of T5 around furrow dark brown 24

– Metapostnotum 0.7-0.8 times as long as scutellum, not bordered from lateral surfaces of propodeum or bordered by weak carina. Metapostnotum and lateral surfaces of propodeum in upper parts with uniform, coarse and sparse rugae, shiny 34

24(23). Propodeum (except for metapostnotum; Fig. 97) and anterior parts of T1-T4 covered with very dense and thick (similar to flossy threads), yellowish hairs entirely concealing integument. Genal area in upper part with rounded transverse carina arising from vertex. Pronotum with long (wide) triangular lateral lamella, longer than eye width. Anterior margin of mesoscutum deflected upward. Punctures on anterior part of mesoscutum forming dense transverse rows (furrows). – Mesoscutum and metasomal terga densely punctate, mat. Wing membrane nearly hyaline, pterostigma and veins yellowish. Body length 9.5-10.0 mm. **L. (Leuchalictus) subopacum** (Smith)

– Fibroid-like pubescence lacking; propodeum usually covered with sparse plumose erect hairs, thin appressed hairs, or with tomentum; sometimes T1 on convex surface with large lateral spot of pale thin appressed hairs (dense, in *L. alinense* and *L. scitulum*; sparse, in *L. kansuense*). Anterior bands of T2-T4 formed by dense tomentum or dense plumose appressed hairs. Genal area in upper part without trans-

verse carina. Pronotum with short (narrow) rounded lateral carina. Anterior margin of mesoscutum not deflected. Punctures on mesoscutum not forming transverse rows 25

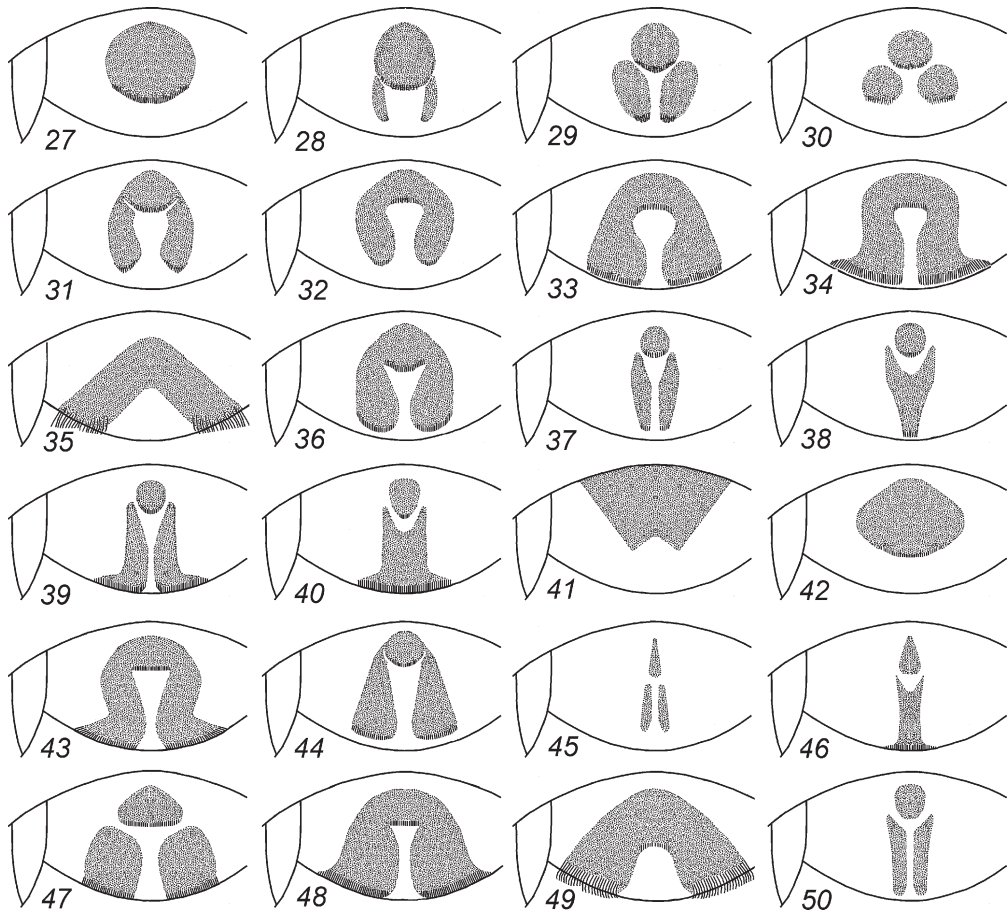
25(24). T1 on convex surface with large lateral spot of dense pale appressed hairs. – Head somewhat wider than high. Metapostnotum half as long as scutellum, with relatively coarse twisting striae (Figs 83, 96). Inner metatibial spur finely dentate. T2-T4 with continuous anterior hair bands, surface between bands and posterior area of terga covered with dense dark short pubescence 26

– T1 without spots of appressed hairs. (If lateral spots present, in *L. kansuense*, then of sparse thin hairs, metapostnotum longer and less coarsely rugose, head massive, 1.05 times as high as wide) 27

26(25). T1 on posterior half of dorsal surface, in front of posterior area, shiny, very sparsely punctate, smooth on interspaces. T2 and usually posterior area of T1 not shagreened, shiny. Metapostnotum more coarsely rugulose (Fig. 83). Body length 8.0-9.5 mm. – A very variable species in body size and sculpture of T1. Some females occupy an intermediate position between typical *L. scitulum* and *L. kansuense* **L. (Leuchalictus) scitulum** (Smith)

– T1 entirely densely shagreened, dull, and usually throughout relatively densely punctate (about 1-2, sometimes up to 3). T2 densely shagreened, dull. Metapostnotum less coarsely rugulose (Fig. 83). Body

- length 8.0-9.5 mm
- 27(25). Pronotum with very large triangular lateral lamellae as long (wide) as eye width. – Head 0.9-0.95 times as high as wide. Vertex and mesosoma on upper surface with brownish black pubescence. Mesoscutum projecting forward medially, concave on anterior margin, black, without metallic lustre, densely punctate (interspaces not more than puncture diameters). T1 on dorsal surface and posterior area regularly, densely and relatively coarsely punctate (0.2-0.6), densely shagreened on interspaces. Lateral surfaces of propodeum covered with dense tomentum. Body length 10.0-11.5 mm. Metapostnotum as in Fig. 87
- **L. (*Leuchalictus*) *alinense*** (Cockerell)
- 28(27). T1 sparsely punctate (on posterior half of dorsal surface, in front of posterior area, interspaces about 1-5 or more puncture diameters) or nearly impunctate. – Vertex and mesosoma on upper surface usually with brown pubescence. Hind tibia on outer side with yellowish pubescence, along posterior margin with brown pubescence. Metapostnotum usually rounded on posterior margin medially, not bordered by carina laterally (Figs 82, 84, 88, 89, 99) 29
- T1 more densely punctate (< 1.5, sometimes up to 3). – T1 on dorsal surface and posterior margin densely shagreened, dull. Mesoscutum densely punctate (interspaces not more than puncture diameters) 33
- 29(28). Mesoscutum more sparsely punctate, interspaces more than puncture diameters in middle of disc. – Head massive (nearly as that of *L. kansuense*), as high as wide or somewhat higher than wide. T1 not shagreened, polished on interspaces, sparsely punctate on anterior surface. Body length 9.5-10.0 mm. Metapostnotum as in Fig. 88)
- **L. (*Leuchalictus*) *harmandi*** (Vachal)
- Mesoscutum entirely densely punctate, interspaces less than puncture diameters 30
- 30(29). T1 on anterior surface dull, coarsely and densely roughened punctate; on convex surface usually with small lateral spot of sparse thin semi-erect hairs. – Head massive, with high vertex, 1.05 times as high as wide. T1 on dorsal surface finely strigate. Body length 10.5-11.5 mm. Metapostnotum as in Fig. 89
- **L. (*Leuchalictus*) *kansuense*** (Blüthgen)
- T1 on anterior and dorsal surfaces sparsely and relatively finely punctate or nearly impunctate, more or less shiny, without semi-erect hairs 31
- 31(30). T1 entirely polished on interspaces. Mesoscutum more densely punctate (interspaces everywhere less than puncture diameters). – Metapostnotum relatively coarsely rugulose, shiny (Fig. 99). Vertex between eyes and lateral ocelli very densely and finely punctate. T1 on posterior area more coarsely (20-25 µm), deeply and sparsely punctate. Wing membrane yellowish. Body length 9-10 mm
- **L. (*Leuchalictus*) *zonulum*** (Smith)
- T1 on dorsal surface and posterior area finely strigate, sometimes strigation inconspicuous. Mesoscutum moderately coarsely and densely punctate (0.5-1.0), dull 32
- 32(31). Clypeus shiny. Mesoscutum not depressed along admedian line, straight in middle of anterior margin. Metapostnotum finely and densely rugulose, submat (Fig. 82). Carina along lateral margins of posterior vertical surface of propodeum weak in upper part. Body length 10-12 mm
- **L. (*Leuchalictus*) *agelastum*** Fan & Ebmer
- Clypeus dull. Mesoscutum depressed along admedian line in anterior third, not deeply, but distinctly concave in middle of anterior margin. Metapostnotum with higher and sparser wrinkles, shiny (Fig. 84). Carina strong along entire lateral margins of posterior vertical surface of propodeum. Body length 9.5-11.0 mm. – Similar to *L. occidens* (see Couplet 7), that differing from *L. circularum* in following characters: upper part of vertex with rounded lateral transverse carina, lateral lamina of pronotum much more developed, emargination in middle of anterior margin of mesoscutum deeper, mesoscutum shinier and more coarsely punctate, T1 on dorsal surface more densely punctate
- **L. (*Leuchalictus*) *circularum*** Fan & Ebmer
- 33(28). Larger, body length 10-11 mm. T1 more regularly and very densely punctate (< 1). Mesoscutum without metallic lustre. – Very similar to *L. rostratum* (see Couplet 2) in structure and sculpture of metapostnotum and propodeum, but having somewhat shorter propodeum (Fig. 98)
- **L. (*Leuchalictus*) *upinense*** (Morawitz)
- Smaller, body length 8.5-9.5 mm. T1 on dorsal surface more finely and sparsely punctate (0.2-2.5) than on posterior area (0.1-0.5). Mesoscutum usually with weak, but distinct metallic lustre. Metapostnotum as in Fig. 91 **L. (*Leuchalictus*) *mutillum*** (Vachal)
- 34(23). Pronotum with very large triangular lateral lamellae as long (wide) as eye width or longer. Genal area in upper part with rounded transverse carina arising from vertex, sometimes this carina weakly developed. Mesoscutum projecting forward, concave in middle of anterior margin. Pubescence of T5 around furrow brown or black-brown 35
- Pronotum with less developed lateral carina. Genal area in upper part without transverse carina. Mesoscutum not projecting forward, straight in middle of anterior margin. Pubescence of T5 around furrow pale, yellowish brown, orange, or light orange-brown (except for some individuals of *L. leucozonium*, but then T1 on dorsal surface sparsely punctate and very finely and densely strigate) 36
- 35(34). Smaller, body length 8-9 mm. Head longitudinally elliptical in front view, somewhat higher than wide. Vertex and mesosoma on upper surface covered with brown pubescence. Mesoscutum with blue metallic lustre, shiny, very sparsely punctate (on disc, 1-5 or more), polished on interspaces. T1 entirely very sparsely punctate (1-3, in some places up to 5), polished on interspaces, shiny. Metapostnotum as in Fig. 85 **L. (*Leuchalictus*) *denticolle*** (Morawitz)
- Larger, body length 9.5-10.5 mm. Head rounded in front view, wider than high. Vertex and mesosoma on upper surface covered with whitish or grey-yellowish pubescence. Mesoscutum black, without metallic lustre, silk-shiny, sometimes more or less dull, moderately densely punctate (in middle of disc, 0.5-1.0, sometimes up to 2), shagreened on interspaces, usually finely. T1 on posterior area densely, on dorsal surface moderately densely punctate (0.3-1, in some places up to 3), on interspaces usually throughout finely strigate, silk-shiny. Metapostnotum as in Fig. 93 **L. (*Leuchalictus*) *occidens*** (Smith)
- 36(34). Mesoscutum relatively finely punctate (25-35 µm), shagreened on interspaces except of its middle. T1 usually, at least partly, shagreened or strigate on interspaces. Head distinctly shorter than wide. Body length 9-10 mm. Metapostnotum as in Fig. 90 **L. (*Leuchalictus*) *leucozonium*** (Schränk)
- Mesoscutum coarsely or very coarsely punctate (40-60 µm), entirely or on most of surface polished on interspaces. T1 entirely polished on interspaces. Head as high as wide or somewhat wider than high 37



Figs 27-50. Hair brush of S6 of *Lasioglossum* males: subgenus *Leuchalictus* (ventral view to sternum). 27, 28, *L. agelastum*; 29, 30, *L. alinense*; 31, 32, *L. circularum*; 33, 34, *L. denticolle*; 35, *L. discum*; 36, *L. formosae*; 37, 38, *L. kansuense*; 39, 40, *L. mutilum*; 41, *L. niveocinctum*; 42, *L. rostratum*; 43, 44, *L. occidens*; 45, 46, *L. scitulum*; 47, 48, *L. subopacum*; 49, *L. upinense*; 50, *L. zonulum*. Scale bar 0.25 mm.

37(36). Mesoscutum very coarsely and densely punctate (in middle of disc, 45-60 μm / 0.2-0.8), shagreened and dull in anterior third, with wide stripe of white tomentum along anterior margin. T3 and T4 on discs behind hair bands with rows of long pale hairs directed backward. Body length 8.0-8.5 mm. Metapostnotum as in Fig. 92

..... **L. (*Leuchalictus*) *niveocinctum*** (Blythgen)

– Mesoscutum more finely and sparsely punctate (1-5), polished, shiny, without or almost without tomentum. T3 and T4 on discs behind hair bands with short, semi-erect dark hairs. Body length 9-10 mm. Metapostnotum as in Fig. 86

..... **L. (*Leuchalictus*) *discum*** (Smith)

38(1). Posterior vertical surface of propodeum along upper half or third of lateral margin without carina, roundly passing onto its lateral surfaces. Gonocoxite with well developed membranous retrorse lobe (except for *L. fallax*, in which membranous retrorse lobe lost, but then head short, transversely elliptical in front

view, S4 and S5 with dense fringe of long white hairs)

..... 39

– Posterior vertical surface of propodeum carinate along entire lateral margins. Gonocoxite without membranous retrorse lobe (except for *L. costulatum* and *L. proximatum*)

..... 50

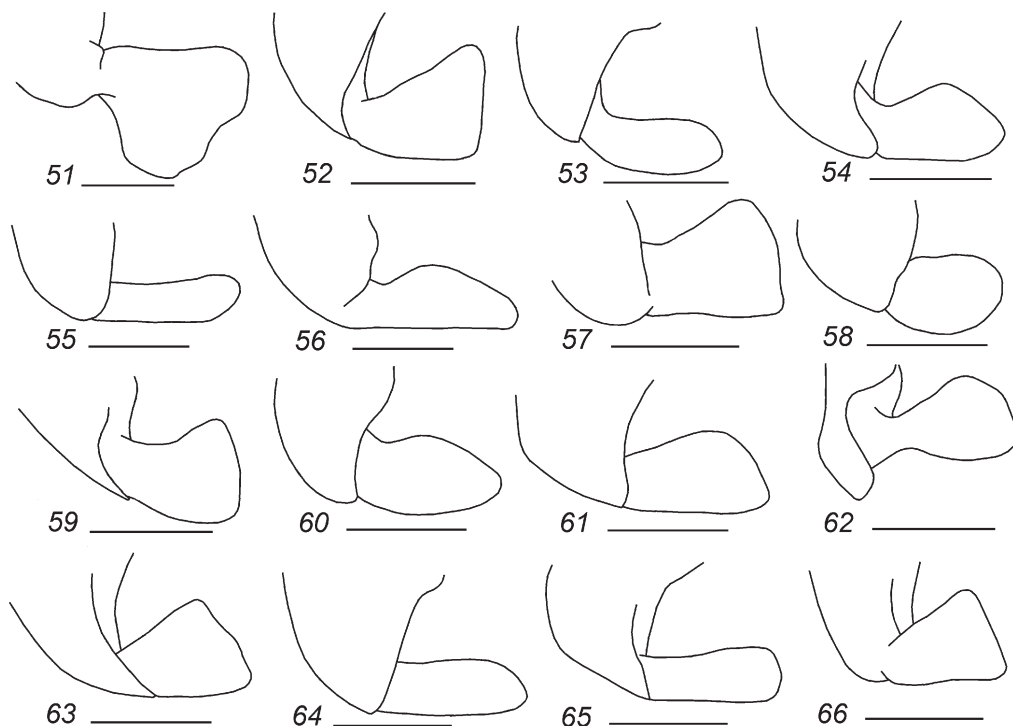
39(38). Gonocoxite without membranous retrorse lobe. Head transversely elliptical in front view, 0.83-0.85 times as high as wide; clypeus weakly projecting below eyes. S4 and S5 with dense fringe of long white hairs, these hairs on S5 1.5 times as long as those on S4. Body length 7-8 mm. – Antenna short, reaching only posterior margin of scutellum. Pubescence of head and mesosoma white. Mesoscutum moderately densely punctate (on disc, 0.3-1.5), entirely dull or shiny in middle of disc. Metapostnotum striate, shiny, ecarinate along posterior margin. T1 entirely polished or very smoothly shagreened, shiny, densely and regularly punctate (on dorsal surface and posterior area, 0.4-0.8). Anterior hair bands of T2-T5 wide, laterally reach-

- ing posterior areas of terga. Gonostylus relatively broad and short, rounded triangular (Fig. 16)
- ... **L. (*Lasioglossum*) fallax melanarium** (Morawitz)
- Gonocoxite with well developed membranous retrorse lobe. Head higher; clypeus stronger projecting below eyes. S4 and S5 without fringe of long hairs, usually with hardly noticeable pubescence 40
- 40(39). Larger, body length 11-12 mm. Head longitudinally elliptical in front view, with very high vertex, 1.1-1.2 times as high as wide. Middle and hind tarsi and hind tibia rusty-yellow to reddish. S5 with deep round median emargination. Membranous retrorse lobe of gonocoxite elongate-elliptical, nearly twice as long as wide (Fig. 10). Gonostylus large, broad at base, elongate triangular, with rounded apex curved ventrad (Fig. 23)
- ... **L. (*Lasioglossum*) xanthopus** (Kirby)
- Smaller, body length less than 10 mm. Head with flattened or moderately high vertex, wider than high, as high as wide or somewhat (up to 1.05 times) higher than wide. Legs dark (except for sometimes white yellow middle and hind tarsi). S5 straight on posterior margin or weakly emarginate. Membranous retrorse lobe of gonocoxite and/or gonostylus of other shape 41
- 41(40). Mesepisternum alveolate rugulose, nearly smooth and shiny between wrinkles (weaker than that of female). Membranous retrorse lobe of gonocoxite short, wide, rounded triangular, densely pubescent; as long as wide at base. Body length 6.5-8.5 mm. - Head 0.9 times as high as wide. Pubescence of head and mesosoma white. Legs entirely black. Mesoscutum densely punctate (< 1), at least in middle of disc shiny. T1 entirely polished, on dorsal surface very sparsely punctate, on posterior area more densely (~ 1). Anterior hair bands of T2-T5 narrow. - Gonostylus short, broad, rounded triangular **L. (*Lasioglossum*) ebmerianum** Sakagami & Tadauchi
- Mesepisternum granulate rugulose, mat. Membranous retrorse lobe of gonocoxite long and relatively narrow; 2-4 times as long as wide 42
- 42(41). Gonocoxite with short and broad rectangular apical lobe pubescent with long dense bristles, located above gonostylus and directed parallel to the latter (this lobe appears to be a basal elongation of the membranous retrorse lobe of the gonocoxite); gonostylus narrow (Figs 15, 17, 20-22). - Pubescence of head and mesosoma white. Metapostnotum relatively coarsely and sparsely strigate, shiny. Legs entirely black (in *L. tungusicum*, tibiae and tarsi dark reddish-brown). Body length 8.5-9.0 mm 43
- Gonocoxite without apical lobe; gonostylus relatively broad (Figs 14, 18, 19, 24). - Metapostnotum as long as scutellum. T1 nearly impunctate or very sparsely punctate (on dorsal surface, 1-5 or more, on posterior area, 1-3 or more). Anterior hair bands of T2-T5 narrow, on T2-T3 bands usually represented by lateral spots of sparse tomentum 47
- 43(42). Gonostylus relatively large, club-shaped (Fig. 15). Bristles of apical lobe of gonocoxite very thick and long. Metapostnotum as long as scutellum. - Head rounded triangular in front view, as high as wide or somewhat wider than high. Antenna long, reaching posterior end of mesosoma. Mesoscutum moderately densely punctate (~ 1), entirely dull or shiny in middle of disc. Metapostnotum striate, shiny, carinate along posterior margin. T1 entirely polished, shiny, moderately densely and regularly punctate (on dorsal surface and posterior area, 0.5-1.5). Anterior hair bands of T2-T5 narrow, usually appearing as lateral spots of sparse tomentum. Membranous retrorse lobe lancet-shaped (Fig. 3) **L. (*Lasioglossum*) eos** Ebmer
- Gonostylus small, less or more parallel-sided (Figs 17, 20-22). Bristles of apical lobe of gonocoxite much thinner and shorter. Metapostnotum 0.8-0.85 times as long as scutellum 44
- 44(43). Head egg-shaped in front view, with convex vertex; 1.05 times as high as wide. Mesoscutum dull, except for shiny middle of posterior half of disc. - Mesoscutum moderately densely punctate (on disc, 0.3-1.0). Metapostnotum striate, shiny, carinate along posterior margin. T1 on dorsal surface sparsely punctate (2-4), on posterior area nearly impunctate, only with a few small punctures (15 µm). Gonostylus as in Fig. 20
- ... **L. (*Lasioglossum*) pseudofallax** (Blüthgen)
- Head rounded triangular in front view, with more or less flattened vertex; as high as wide or somewhat wider than high. Mesoscutum shiny on all disc or on most surface. T1 on dorsal surface and/or posterior area much more densely punctate (except for some *L. tungusicum*) 45
- 45(44). Head 0.9 times as high as wide. Antenna long, reaching posterior margin of mesosoma. T1 on dorsal surface very densely punctate (< 1). Anterior hair bands of T2-T5 relatively narrow, laterally far not reaching posterior areas of terga. Membranous retrorse lobe of gonocoxite very narrow, lancet-shaped, 4 times as long as wide (Fig. 4). Gonostylus as in Fig. 17 **L. (*Lasioglossum*) jultschinicum** Ebmer
- Head as high as wide or somewhat wider than high. Antenna short, reaching only middle of scutellum. T1 on dorsal surface more sparsely punctate (1-3; except for some *L. verae*). Anterior hair bands of T2-T5 broad, laterally reaching posterior areas of terga. Membranous retrorse lobe of gonocoxite wider, elongate triangular, 2.0-2.5 times as long as wide at base (Figs 8, 9) 46
- 46(45). Metapostnotum carinate along posterior margin, in middle of the latter with short transverse plate directed backward and projecting over posterior vertical surface of propodeum; striae of metapostnotum not smoothed in posterior part (same as those of female). All tibiae and tarsi usually brownish black. T1 usually entirely polished on interspaces; density of its punctation varying. Membranous retrorse lobe of gonocoxite slightly concave in distal third of outer margin (Fig. 8). Gonostylus as in Fig. 21
- ... **L. (*Lasioglossum*) tungusicum** Ebmer
- Metapostnotum ecarinate along posterior margin, in middle without transverse plate directed backward, narrowly rounded passing onto posterior vertical surface of propodeum; striae of metapostnotum smoothed in posterior part (same as those of female). Legs entirely black. T1 on posterior half of posterior area finely obscurely strigate. Membranous retrorse lobe of gonocoxite straight on outer margin (Fig. 9). Gonostylus as in Fig. 22

... **L. (*Lasioglossum*) verae** Pesenko

 - 47(42). Smaller, body length 7.0-7.5 mm. Pubescence of head and mesosoma white. - Head 0.95 times as high as wide. Metapostnotum relatively coarsely and sparsely strigate, shiny. T1 on dorsal surface very sparsely and irregularly punctate (1-6). Membranous retrorse lobe of gonocoxite as in Figs 1, 2. Gonostylus as in Fig. 14 . . . **L. (*Lasioglossum*) chloropus** (Morawitz)
 - Larger, body length 7.5-9.0 mm. Pubescence of vertex and mesosoma on dorsal surface ochre-brown . . . 48

48(47). Head transversely elliptical in front view, 0.95 times as high as wide; clypeus slightly projecting below eyes.



Figs 51-66. Gonostylus of *Lasioglossum* males: subgenus *Leuchalictus* (left, in its plane; lateral, posterolateral or dorsolateral view to genital capsule). **51**, *L. agelastum*; **52**, *L. alinense*; **53**, *L. circularum*; **54**, *L. denticolle*; **55**, *L. discum*; **56**, *L. formosae*; **57**, *L. kansuense*; **58**, *L. leucozonium*; **59**, *L. mutilum*; **60**, *L. niveocinctum*; **61**, *L. occidens*; **62**, *L. rostratum*; **63**, *L. scitulum*; **64**, *L. subopacum*; **65**, *L. upinense*; **66**, *L. zonulum*. Scale bar 0.25 mm.

T1 on dorsal surface more densely and regularly punctate (0.5-2.0). Membranous retrorse lobe of gonocoxite narrowly rounded at apex (Fig. 11). – Metapostnotum relatively coarsely and sparsely strigate, shiny. Gonostylus as in Fig. 24. Body length 7.5-8.0 mm **L. (*Lasioglossum*) zeyanense** Pesenko

– Head rounded triangular in front view, about as high as wide; clypeus stronger projecting below eyes. T1 on dorsal surface very sparsely and irregularly punctate (1-5 or more). Membranous retrorse lobe of gonocoxite pointed or truncate at apex (Figs 5, 6) 49

49(48). Metapostnotum mat, very finely and densely striate (same as that of female). Membranous retrorse lobe of gonocoxite angulate lancet-shaped (Fig. 6). Gonostylus rectangular, with not deep triangular excision and long bristles on distal margin (Fig. 19). Body length 8-9 mm **L. (*Lasioglossum*) ochreohirtum** (Blüthgen)

– Metapostnotum shiny, much more coarsely and sparsely strigate. Membranous retrorse lobe of gonocoxite elongate lancet-shaped (Fig. 5). Gonostylus elongate elliptical and curved mesad, on dorsal surface densely pubescent (Fig. 18). Body length 8-9 mm **L. (*Lasioglossum*) lisa** Ebmer

50(38). Metapostnotum as long as scutellum, triangular, laterally not bordered by carina, projecting backward (over posterior vertical surface of propodeum) as a sharp transverse plate. Lateral surfaces of propodeum strongly converging backward, very coarsely striate.

Membranous retrorse lobe of gonocoxite short and wide, rounded triangular (Fig. 12). Body length 9-10 mm. – Head thick. Gonostylus narrow, in distal third curved at nearly right angle (Fig. 25) **L. (*Ebmeria*) costulatum** (Kriechbaumer)

– Metapostnotum shorter, semi-lunar or trapezoidal, not projecting backward as a transverse plate. Shape of head varying. Lateral surfaces of propodeum much less converging backward. Membranous retrorse lobe of gonocoxite of other shape 51

51(50). Carina running along lateral margins of posterior vertical surface of propodeum in its upper end jointed at right angle with carina running along posterior margin of metapostnotum, far from middle of propodeum. Head very short, transversely elliptical in front view, 0.8-0.85 times as high as wide. T1 polished, very sparsely and irregularly punctate (2-8 or more). S6 with inconspicuous pubescence, without median brush of short dense erect hairs. Membranous retrorse lobe of gonocoxite large, trapezoidal, broadened distad (Fig. 13). Gonostylus short, flat, nearly square (Fig. 26). Body length 8.5-9.0 mm **L. (*Lophalictus*) proximatum** (Smith)

– Carina running along lateral margins of posterior vertical surface of propodeum at its upper end curved mesad and not jointed with carina running along posterior margin of metapostnotum, or jointed in middle of propodeum. Head higher, as high as wide, higher than wide, or somewhat (not more than 1.1 times)

- wider than high. Sculpture of T1 varying. S6 with median brush (sharply defined area covered with very dense short hairs). Gonocoxite without membranous lobe. Shape of gonostylus varying 52
- 52(51). Head longitudinally-elliptical in front view, significantly narrower than mesosoma, 1.2-1.3 times as high as wide. Clypeus almost entirely situated below eyes. Metapostnotum as long as scutellum or slightly longer than the latter, heart-shaped, finely granulate, with indistinct fine and dense striae, dull. Brush of S6 unbroken, situated far from posterior margin of sternum, transversely-elliptical (Fig. 42) or nearly round, without hairless area at centre. – Lateral surface in upper parts with similar sculpture, but border between them and metapostnotum distinct, marked by slight carina. Gonostylus as in Fig. 62. Body length 7.5-8.0 mm
- **L. (*Leuchalictus*) rostratum** (Morawitz)
- Head approximately as wide as mesosoma, wider than high, as high as wide, or somewhat higher than wide, but not more than 1.1 times. Clypeus less projecting below eyes. Metapostnotum 0.5-0.85 times as long as scutellum, semi-lunar, triangular, or trapezoidal, coarsely or very coarsely strigate, shiny (except for *L. upinense* having metapostnotum similar to that of *L. rostratum* in shape and microsculpture, sometimes also in relative length). Brush of S6 of other form (except for *L. agelastum*) 53
- 53(52). Propodeum (except for bare metapostnotum) and T1-T4 in anterior parts covered with dense yellowish pubescence of thick hairs like silk-fibres. Mesoscutum with anterior margin deflected upward medially. Metapostnotum half as long as scutellum. – Pronotum with large triangular lateral lamina, that half as long (wide) as eye width. Mesoscutum and metasomal terga densely punctate, mat. Brush of S6 unbroken or consisting of 3 parts, adjoining to posterior margin of sternum, U- or II-shaped, with rectangular hairless area inside figure (Figs 47, 48). Gonostylus as in Fig. 64. Body length 9.0-9.5 mm
- **L. (*Leuchalictus*) subopacum** (Smith)
- Silk-fibre pubescence absent; propodeum and T1 in anterior parts usually with sparse short erect hairs, sometimes with tomentum; anterior bands of T2-T4 formed by dense tomentum. Mesoscutum flat on anterior margin or depressed along admedian line. Metapostnotum usually 0.6-0.8 times as long as scutellum 54
- 54(53). Brush of S6 unbroken, adjoining to posterior margin of sternum, having right-angled form, with angle directed forward (Figs 35, 49). – Head somewhat higher than wide or as high as wide 55
- Brush of S6 of other form 57
- 55(54). Mesoscutum very densely and regularly punctate (nearly without interspaces), mat. Legs entirely dark. T2-T4 distinctly blue metallic, densely regularly punctate (interspaces less than puncture diameters), shagreened, mat. Gonostylus elongate elliptical (Fig. 65). Body length 8-9 mm. – Head rounded triangular in front view owing to projecting clypeus. Metapostnotum and upper parts of lateral surfaces of propodeum with relatively fine strigulae
- **L. (*Leuchalictus*) upinense** (Morawitz)
- Mesoscutum more sparsely punctate, at least in middle of disc shiny. Hind tibia at proximal end and middle and hind basitarsi white-yellow. T2-T4 black, without metallic lustre, more sparsely punctate 56
- 56(55). Mesoscutum coarsely punctate (40-50 μ m), entirely polished on interspaces, except for narrow stripe along its anterior margin. Head rounded in front view. Metapostnotum and lateral surfaces of propodeum with nearly straight striae. Gonostylus long and narrow (Fig. 55). Body length 7.0-8.5 mm
- **L. (*Leuchalictus*) discum** (Smith)
- Mesoscutum more finely punctate (25-35 μ m), shagreened on greater surface. Head rounded triangular in front view. Metapostnotum and lateral surfaces of propodeum with more curved striae or alveolate rugulose. Gonostylus relatively broad, elongate elliptical (Fig. 58). Body length 8-9 mm
- **L. (*Leuchalictus*) leucozonium** (Schrank)
- 57(54). Body deep-black. Lateral carina of pronotum covered with dense snow-white tomentum. Mesoscutum and T1 coarsely punctate, polished or very finely shagreened on interspaces, shiny. – Metapostnotum about 0.6 times as long as scutellum. Metapostnotum and upper parts of lateral surfaces of propodeum coarsely strigate, shiny. Gonostylus elongate elliptical (Figs 54, 60) 58
- Body with brownish or greyish tint. Lateral carina of pronotum without tomentum or with yellowish tomentum. Mesoscutum and T1 more finely punctate; sometimes mesoscutum or/and T1, at least partly, shagreened on interspaces, dull. – Legs entirely black 59
- 58(57). Larger, body length 7.5-8.5 mm. Brush of S6 unbroken, adjoining to posterior margin of sternum, U- or II-shaped with triangular hairless area inside figure (Figs 33, 34; sometimes lateral branch only partly joined with anterior part of brush). Lateral lamina of pronotum large, triangular, more than half as long as eye width. Mesoscutum emarginate in middle of anterior margin. Legs entirely black
- **L. (*Leuchalictus*) denticolle** (Morawitz)
- Smaller, body length 6-7 mm. Brush of S6 unbroken, situated far from posterior margin of sternum, having trapezoidal form with narrower side directed backward, emarginate medially (Fig. 41). Pronotum with less developed lateral carina. Mesoscutum straight along middle part of anterior margin. Hind tibia at proximal end and middle and hind basitarsi white-yellow
- **L. (*Leuchalictus*) niveocinctum** (Blüthgen)
- 59(57). Brush of S6 unbroken, situated far from posterior margin of sternum, round, without hairless area inside figure (Fig. 27; in some individuals, brush having thin lateral “legs” directed backward, Fig. 28). – Clypeus entirely black. Mesoscutum straight on anterior margin medially, densely punctate (in middle of disc, 0.2-0.8, in some places up to 1.5), in middle shiny. Metapostnotum 0.6-0.7 times as long as scutellum. Lateral surfaces of propodeum in upper parts with coarse strigation similar to that of metapostnotum. T1 on anterior and convex surfaces very sparsely punctate (10-20 μ m / 1-5 or more), entirely polished on interspaces or very finely striate (often in Japanese populations), shiny. Gonostylus broad, strongly widened distad (Fig. 51). Body length 8.5-9.5 mm
- **L. (*Leuchalictus*) agelastum** Fan & Ebmer
- Brush of S6 of other shape 60
- 60(59). Brush of S6 unbroken, adjoining to posterior margin of sternum, U- or II-shaped, with triangular or rectangular hairless area inside figure (Figs 31, 32, 36, 43; in some individuals of *L. circularum* and *L. occidens*, posterior lateral branches nearly disjointed from anterior median part of brush, Figs 32, 44). Gonostylus elongate elliptical (Figs 53, 56, 61). – Mesoscutum depressed along admedian line in its anterior part, emarginate in middle of anterior margin, regularly and very densely punctate, densely sha-

- greened, mat (except for some individuals of *L. occidens* having mesoscutum more sparsely punctate and shiny in middle). Metapostnotum 0.8 times as long as scutellum. Metasoma elongate. T1 entirely shagreened, dull or silk-mat. 8.5-10.5 mm 61
- Brush of S6 consisting of 3 parts: rounded, longitudinally elliptical, or very narrow (in *L. scitulum*) anterior median part and 2 posterior lateral parts, those frequently merged (in some species and as well in some individuals of other species); this resulting brush of 2 parts, anterior part and posterior part, which is scyphiform or longitudinal rectangular, emarginate on anterior margin. Gonostylus broad, widened distad (Figs 52, 57, 59, 63, 66) 63
 - 61(60). T1 on convex surface very sparsely punctate (1-5 or more), entirely finely strigate on interspaces, silk-mat. Head rounded in front view, relatively thick; genal area somewhat wider than eye in lateral view to head. Clypeus with dully yellow, hardly noticeable median spot in lower half. Antenna short, reaching only posterior margin of mesoscutum. Pronotum with lower lateral carina. Lateral surface of propodeum in upper parts more finely strigate than metapostnotum. - Mesoscutum regularly, finely, shallowly, and very densely punctate (25-30 µm / 0.2-0.3), densely shagreened, mat. Body length 8.5-9.5 mm **L. (*Leuchalictus*) circularum** Fan & Ebmer
 - T1 on convex surface at least twice more densely punctate. Head rounded triangular in front view owing to projecting clypeus; genal area 0.6-0.8 times as wide as eye in lateral view to head. Clypeus with distinct wide transverse yellow band along lower margin (except for some small individuals of *L. occidens* having clypeus entirely black). Antenna longer, reaching posterior margin of scutellum or metanotum. Lateral lamina of pronotum large, triangular, however, not so developed as that of females of these species (see Couplets 27 and 35) and as those of both sexes of *L. denticolle* (see Couplets 35 and 58). Lateral surfaces of propodeum in upper parts coarsely rugulose, similar to metapostnotum 62
 - 62(61). T1 regularly and very densely punctate (0.2-0.4). Vertex and dorsal surface of mesosoma covered with brownish yellow pubescence. Mesoscutum more finely punctate (20-25 µm). Body length 9.5-10.5 mm **(*Leuchalictus*) formosae** (Strand)
 - T1 more irregularly and more sparsely punctate (0.5-2.0, in some places up to 3.0). Head and mesosoma covered with whitish pubescence. Mesoscutum nearly twice more coarsely punctate (35-45 µm). Body length 8.5-10.0 mm **L. (*Leuchalictus*) occidens** (Smith)
 - 63(60). T1 on anterior and dorsal surfaces finely and very sparsely punctate (2-8 or more), entirely polished on interspaces. Head transversely elliptical, wider than mesosoma, thick; in dorsal view to head, length of vertex greater than distance between inner margins of posterior ocelli; in lateral view to head, genal area 1.2-1.5 times as wide as eye. Mandible long, sabre-shaped. Metapostnotum short, half as long as scutellum. T7 with broad rounded triangular lateral process. - Clypeus with transverse yellow band along lower margin. Antenna short, reaching middle of scutellum or its posterior margin. Brush of S6 consisting of 3 parts: elongate elliptical or tear-shaped anterior median part and 2 posterior lateral parts, those closely spaced, narrowly rectangular, with obliquely cut anterior margin (Fig. 50). Body length 7-8 mm **L. (*Leuchalictus*) zonulum** (Smith)
 - T1 on anterior and dorsal surfaces much more densely punctate (except for some individuals of *L. scitulum*). Head as wide as mesosoma or narrower; in dorsal view to head, length of vertex less than distance between inner margins of posterior ocelli; in lateral view to head, genal area narrower than eye. Mandible usual, short and slightly curved (except for *L. kansuense*, but then head higher than wide). Metapostnotum longer, 0.6-0.8 times as long as scutellum. T7 without lateral tooth 64
 - 64(63). Smaller, body length 6.5-7.0 mm. - Clypeus with wide transverse yellow band along lower margin 65
 - Larger, body length 8.5-11.0 mm 66
 - 65(64). Brush of S6 consisting of 3 very narrow parts (Fig. 45), frequently posterior lateral parts merged (Fig. 46). T1 usually polished on interspaces **L. (*Leuchalictus*) scitulum** (Smith)
 - Brush of S6 consisting of 3 broad parts, of equal size and form, usually nearly round (Fig. 30), but sometimes posterior lateral parts longitudinal elliptic (Fig. 29). T1 usually shagreened on interspaces **L. (*Leuchalictus*) alinense** (Cockerell)
 - 66(64). Clypeus entirely black. Pubescence of clypeus, vertex and dorsal surface of mesosoma with significant admixture of brown hairs. Body length 9.5-11.0 mm . . . **L. (*Leuchalictus*) harmandi** (Vachal)
 - Clypeus usually with wide transverse yellow band along lower margin. Pubescence of clypeus, vertex and dorsal surface of mesosoma whitish, yellowish, or light brownish-yellow, without dark hairs 67
 - 67(66). Head wider than high, not thick; in dorsal view to head, length of vertex less than distance between inner margins of posterior ocelli; in lateral view to head, genal area narrower than eye. Mandible usual, short and slightly curved. Mesoscutum regularly and very densely punctate (0.2-0.4), densely shagreened on interspaces, mat. T1 entirely shagreened, mat or silk-mat. Posterior lateral parts of brush on S6 with parallel-sided outer margins (Fig. 39), when merged those forming rectangular figure with excision in middle of anterior margin (Fig. 40). Body length 8.5-9.5 mm **L. (*Leuchalictus*) mutilum** (Vachal)
 - Head higher than wide, thick; in dorsal view to head, length of vertex greater than distance between inner margins of posterior ocelli; in lateral view to head, genal area 1.2-1.5 times as wide as eye. Mandible long, sabre-shaped. Mesoscutum more irregularly and more sparsely punctate (in middle of disc, 0.2-0.8), at least on posterior part, shiny. T1 entirely polished on interspaces, shiny. Posterior lateral parts of brush on S6 with outer margins converging backward (Fig. 37), when merged those forming triangular figure with excision in middle of anterior margin (Fig. 38). Body length 8.5-9.5 mm **L. (*Leuchalictus*) kansuense** (Blüthgen)

Annotated list of Eastern Palaearctic species

Lasioglossum* (*Ebmeria*) *costulatum
(Kriechbaumer, 1873)

Andrena campestris Eversmann, 1852: 8 (key), 20, ♀. Lectotype: ♀, Russia: "Spassk" [Orenburg Prov.: Spasskoe]; designated by Pesenko (1986: 137); ZISP. Nomen oblitum (Opinion of ICZN, no. 1511; see also Pesenko, 1987: 17). Synonymy by Pesenko (1986: 137).
Halictus costulatus Kriechbaumer, 1873: 59, ♀♂. Lectotype: ♀, Germany: Rosenheim; designated by Ebmer (1976b: 4); ZSM; examined.

Halictus alpestris Morawitz, 1877: 88. ♀, Lectotype: ♀, Azerbaijan: “Chan-Eilar” [Khanlar, 7 km N Gyanja]; designated by Pesenko (1986: 137); ZISP. Synonymy by Alfken (1904: 1); see also Blüthgen (1922: 46).

Taxonomy. Alfken, 1904: 1; Blüthgen, 1920: 87 (key), 101 (key); 1921a: 272; 1922: 46; 1924a: 407 (key), 500 (key); 1931a: 330 (key), 331 (key); Ebmer, 1970: 19 (key), 26 (key), 36, Fig. 37; 1976b: 4; Pesenko, 1986: 137 (key); 1987: 17; Pesenko et al., 2000: 190 (key), 201, Fig. 295.

Published records. **Russia:** Krasnoyarsk, Irkutsk (Pesenko, 1986: 137).

Material examined (1 ♂, 2 ♀; ZISP). **Russia:** Krasnoyarsk Terr.: Krasnoyarsk; Irkutsk Prov.: Irkutsk.

Distribution. Temperate zones of Eurasia, as far in the east as Irkutsk; northwestern Africa (Morocco, Algeria); Europe: nearly throughout, as far as Denmark and northern Poland in the north; Syria, Asia Minor, Iran, western and southern Kazakhstan, Middle Asia, Altai, south of Krasnoyarsk Terr. and Irkutsk Prov.

Lasioglossum (Lasioglossum) chloropus (Morawitz, 1894)

Halictus chloropus Morawitz, 1894: 75. ♂. Lectotype: ♂, Tajikistan: “Sching” [30 km SSE Pendzhikent]; designated by Pesenko (1986: 130); ZISP.

Lasioglossum (Lasioglossum) aksuense Ebmer, 1972a: 231, 237 (key), ♀. Holotype: ♀, China: “Aksu-Tamdik (Nordrand des Tarimbeckens)” [Xinjiang]; MNB; examined. Synonymy by Ebmer (1982: 208).

Lasioglossum (Lasioglossum) chloropum: Ebmer, 1982: 208. Erroneous spelling of *L. chloropus* Morawitz.

Taxonomy. Ebmer, 1982: 208, Figs 10, 11; Pesenko, 1986: 130 (key).

Published records. **Mongolia:** Uvs: Harhiraa, 30 km S Ulaangom (Ebmer, 1982: 208), Naranbulak-Somon; Hovd: Chonoharaih, Jarantai on Bulgan-gol; Tuv: Bogduul, 50 km E Ulanbaatar; Umnugovi: 40 km W Dalanzadgad (Ebmer, 2005: 369).

Material examined (1 ♀; ZISP). **Russia:** Irkutsk Prov.: Olkhon Island (Lake Baikal), Usuk, 30.VII.1902, leg. V. Sovinskii; ZISP.

Distribution. Southeastern Kazakhstan, Tajikistan, Kyrgyzstan, Russia (**first record**: Irkutsk Prov.), northwestern China (Xinjiang), and Mongolia (Hovd, Uvs, and Ömnögovı).

Lasioglossum (Lasioglossum) ebmerianum Sakagami & Tadauchi, 1995

Lasioglossum (Lasioglossum) ebmerianum Sakagami & Tadauchi, 1995: 184, Figs 35-37, 40, 41, 48-50, ♀♂. Holotype: ♀, Japan: Gonohe (Aomori Pref., Honshu); HUS.

Taxonomy. Ebmer, 1998: 404, Figs 48-50; 2002: 831.

Published records. **Japan:** Honshu: Aomori, Iwate, Ibaraki, Gifu, Fukui, Kyoto, Tottori, and Shimane Pref. (Sakagami & Tadauchi, 1995: 187), Ishikawa Pref. (Negoro, 1997: 9); Kyushu: Fukuoka Pref. (Sakagami & Tadauchi, 1995: 187).

Distribution. Japan (Honshu and Kyushu).

Lasioglossum (Lasioglossum) eos Ebmer, 1978

Lasioglossum (Lasioglossum) eos Ebmer, 1978a: 192, Figs 3, 5, 6, ♀♂. Holotype: ♀, China: Harbin (Heilongjiang); EBM.

Lasioglossum (Lasioglossum) kasparyani Pesenko, 1986: 132, Fig. 20, ♀, **syn. n.** Holotype: ♀, Russia: Turan (Tuva Republic); ZISP.

Lasioglossum (Lasioglossum) kerzhneri Pesenko, 1986: 132, Fig. 21, ♀. Holotype: ♀, Mongolia: Salkhit Mt. (Dornod); ZISP. Synonymy by Ebmer (1996: 273).

Taxonomy. Pesenko, 1986: 132 (key); Ebmer, 1996: 273.

Published records. **Russia:** Tuva, Buryatia (Pesenko, 1986: 132; *L. kasparyani*); Primorsk Terr. (Pesenko, 1986: 132; Proshchalykin, 2004: 6). **Mongolia:** Dornod: Salkhit Mt. (Pesenko, 1986: 132; *L. kerzhneri*); Umnugovi: 40 km W Dalanzadgad (Ebmer, 2005: 369; *L. kasparyani*). **China:** Heilongjiang: Harbin (Ebmer, 1978a: 194).

Material examined [13 ♂, 77 ♀; IZB (including 2 ♂ labelled “*L. (Lasioglossum)*, sp. 8. aff. *belliatum*”); ZISP]. **Russia:** Tuva: Turan (holotype of *L. kasparyani*); Irkutsk Prov.: Irkutsk, Kultuk on E shore of Lake Baikal; Buryatia: 20 km W Lake Gusinoe (paratype of *L. kasparyani*), Kyakhta; Amur Prov.: Klimoutsy, Simonovo; Primorsk Terr.: Anisimovka, Lazo Nature Reserve (6 localities), Russkii Island. **Mongolia:** Dornod: 32 km SE Salkhit Mt. (holotype of *L. kerzhneri*), Darhin-tsgagan-obo (60 km ENE Bayan-Burd). **China:** Jilin, Hebei, Liaoning, Heilongjiang, Shandong.

Distribution. Southeastern Siberia and southern Far East of Russia [Tuva, Buryatia, Irkutsk Prov. (**first record**), Amur Prov. (**first record**), Primorsk Terr.], Mongolia (Umnugovi, Dornod), northern China (Heilongjiang; **first records**: Xinjiang, Jilin, Hebei, Liaoning, and Shandong).

Lasioglossum (Lasioglossum) exiliceps (Vachal, 1903)

Halictus exiliceps Vachal, 1903: 129, ♀. Lectotype: ♀, Japan: Tokyo (Honshu); designated by Ebmer (1996: 271); MNP; examined.

Taxonomy. Pesenko, 1986: 130 (key); Sakagami & Tadauchi, 1995: 187, 188 (♂); Ebmer, 1996: 271.

Published records. **Russia:** Khabarovsk Terr. (Pesenko, 1986: 130; Proshchalykin, 2004: 6): 20 km N Bikin (Ebmer, 1996: 272); Primorsk Terr. (Pesenko, 1986: 130; Proshchalykin, 2004: 6): Anisimovka, 28 km SE Chuguevka, Przhewalski Mt. (Ebmer, 1996: 272). **North Korea:** Kangwon Prov.: Kumsang-san Mt. (Ebmer, 1996: 272). **Japan:** Hokkaido (Hirashima, 1989: 681, localities in Japanese); Honshu (Ikudome & Namamura, 1996: 175, localities in Japanese): Tokyo (Vachal, 1903: 129), Aomori Pref. (Yamada et al., 1990: 37), Fukui Pref. (Hane-da, 1990: 5), Hiroshima Pref. (Ikudome & Namamura, 1994: 7), Ishikawa Pref. (Negoro, 1997: 9); Kyushu: Setaura (Iwata, 1997: 640).

Material examined (47 ♀; IBSV, ZISP). **Russia:** Khabarovsk Terr.: Khekhtsy; Primorsk Terr.: Anisimovka, “Kedrovaya Pad” Nature Reserve, Lazo Nature Reserve (6 localities), Molchanovka, 20 km SE Spassk, Vladivostok. **Japan:** Hokkaido: 40 km S Sapporo; Honshu: Rifucho (Miyagi Pref.), Zao Mt. (Miyagi Pref.), Tochigi Pref.

Taxonomic note. The male of the species was described by Sakagami & Tadauchi (1995: 188, 189). The authors compared it with the males of *L. ebmerianum* and three other close species inhabiting Japan but gave the lone character: head height / width ratio 0.98 ± 0.1 ($0.96-1.00$) in *L. exiliceps*, whereas heads somewhat higher in *L. leviventre* or shorter in other species (see Table on p. 189). One more character distinguishes the males of *L. exiliceps* and of *L. leviventre* combined from three other species. This comparison may be formally considered the description of the male of *L. exiliceps*, but gives no basis for distinguishing this male from males of all the other Eastern Palaearctic species of the genus.

Distribution. Southern Far East of Russia (Khabarovsk and Primorsk Terr.), North Korea, Japan (Hokkaido, Honshu, Kyushu, and Okinawa).

Lasioglossum (Lasioglossum) fallax (Morawitz, 1874)

Distribution. A steppe and desert species, occurring from southeastern European Russia in the west, as far as Mongolia in the east; including 3 subspecies: (1) western nominotypical one, inhabiting southeastern European Russia (Rostov and Volgograd Prov., Bashkiria, and Daghستان), Asia Minor, Georgia, Iran, and Turkmenistan; (2) eastern *L. fallax melanarium* (Morawitz, 1876), see below; (3) *L. fallax rhadiourgon* Ebmer, 1980, known from Pakistan.

Lasioglossum (Lasioglossum) fallax melanarium (Morawitz, 1876)

Halictus melanarius Morawitz, 1876: 241, ♂. Holotype: ♂, Uzbekistan: Shakhimardan [Uzbek enclave in the territory of Kyrgyzstan; Alai Ridge]; ZMMU; examined. The lectotype designations by Ebmer (1980: 495) and by Warncke (1982: 91) are unnecessary.

Lasioglossum (Lasioglossum) melan Ebmer, 1980: 493, Figs 12, 13, ♀. Holotype: ♀, Tajikistan: Dushanbe; EBM; examined. Synonymy by Ebmer (1998: 382).

Taxonomy. Blüthgen, 1932: 30 (= *Halictus fallax*); Ebmer, 1980: 495 (*L. melanarium*), 1984: 317 (♂, *L. melan*), Figs 6, 7; 1998: 382 (subspecific status), Figs 11, 12; Warncke, 1982: 91 (*H. melanarius*); Pesenko, 1986: 128 (key, *L. melan*).

Published records. **Mongolia:** Hovd: Jarantaj on Bulgan-gol (Ebmer, 1982: 210, *L. fallax*).

Material examined (1 ♂; ZISP). **Mongolia:** Hovd: 40 km N Uench-somon, 31.VII.1968, leg. M. Kozlov.

Distribution. Central, southern and southeastern Kazakhstan, Uzbekistan, Tajikistan, Kyrgyzstan, Afghanistan, and western Mongolia (Hovd). The record of *Halictus fallax* from “Jultschin (Chinese Turkestan)” by Strand (1909: 6) belongs to *L. jultschinicum*.

Lasioglossum (Lasioglossum) hummeli (Blüthgen, 1934)

Halictus hummeli Blüthgen, 1934b: 8, Fig. 3, ♀. Holotype: ♀, China: “S. Kansu” [Wen-hsien-ho, 140 km SSE Minsjan; 32°57'N, 104°39'E; Gansu]; NRS.

Taxonomy. Pesenko, 1986: 127 (key); Ebmer, 1998: 403; 2002: 836.

Distribution. Central China (Gansu).

Lasioglossum (Lasioglossum) jultschinicum Ebmer, 1972

Halictus nigricornis Morawitz, 1887: 223, ♀♂ [junior homonym of *H. nigricornis* Say, 1837 (= *Agapostemon virescens*); junior homonym of *Hylaeus nigricornis* Schenck, 1853 (= *Evyllaes laticeps*)]. Lectotype: ♀, China: “Keria Gebirge” (Xinjiang); designated by Ebmer (1978a: 192); ZISP; examined. Synonymy by Ebmer (1978a: 192).

Lasioglossum (Lasioglossum) jultschinicum Ebmer, 1972a: 230, 237 (key), ♀. Holotype: ♀, China: “Chinese Turkestan: Jultschin bei Polu” (Xinjiang); MNB; examined.

Halictus nigricornutus Warncke, 1973b: 292; nom. n. pro *Halictus nigricornis* Morawitz, 1887.

Taxonomy. Ebmer, 1978a: 192, Figs 6a, 6b (♂); Pesenko, 1986: 132 (key).

Published records. **China:** “northern China” (Pesenko, 1986: 132).

Material examined (6 ♀; IZB, ZISP). **China:** Qinghai; Ningxia: Josto, Suburgan-gol (Alashan Mts.).

Distribution. Eastern Kyrgyzstan, northwestern and northern China (Xinjiang; **first records:** Qinghai and Ningxia).

Lasioglossum (Lasioglossum) leviventre (Pérez, 1905)

Halictus leviventris Pérez, 1905: 36, ♀. Lectotype: ♀, Japan: Yokohama (Honshu); designated by Ebmer (1978a: 193); MNP; examined.

Lasioglossum laeviventre: Sakagami & Fukuda, 1972: 4; 1973: 246; Fukuda et al., 1973: 163; Usui et al., 1976: 228; Ebmer, 1978a: 193; Ikudome, 1978: 522; 1981: 161; Pesenko, 1986: 132; Hirashima, 1989: 681; Yamada et al., 1990: 37; Takagashi & Sakagami, 1993: 274; Sakagami & Tadauchi, 1995: 188, 189. Unjustified emendation of *H. leviventris*.

Taxonomy. Cockerell, 1919: 121; Ebmer, 1978a: 193, 194 (♂), Figs 7, 8; 1996: 273; Pesenko, 1986: 132 (key); Sakagami & Tadauchi, 1995: 188, 189.

Published records. **Russia:** Primorsk Terr.: 40 km SW Ussuriisk (Ebmer, 1996: 273); Kuril Islands: Kunashir (Pesenko, 1986: 132), Urup, and Iturup (Ebmer, 1996: 273). **Japan** (Hirashima, 1989: 681, localities in Japanese): Hokkaido (Sakagami & Fukuda, 1972: 4, localities in Japanese): Hama-Koshimizu (Fukuda et al., 1973: 163), Sapporo (Sakagami & Fukuda, 1973: 246), Obihiro (Usui et al., 1976: 228), Uryu (Ebmer, 1996: 273); Honshu: Tokyo (Cockerell, 1919: 121), Yokohama (Pérez, 1905: 36), Fukui Pref. (Haneda, 1990: 5), Aomori Pref. (Yamada et al., 1990: 37), Gifu Pref. (Ebmer, 1996:

273), Ishikawa Pref. (Negoro, 1997: 9); Izu Islands: Hachijo-jima (Takahashi, 1991: 173; Takahashi & Sakagami, 1993: 274); Shikoku: Kōchi Plain (Ikudome, 1978: 522; 1981: 161).

Material examined (1 ♀; ZISP). **Russia:** Kuril Islands: Kunashir, Goryacheye Ozero [Hot Lake], on flowers of *Stellaria*, 28.VII.1981, leg. Yu. Pesenko.

Taxonomic note. The male of the species was described by Ebmer (1978a: 194). On three lines, the author compared it with the male of *L. eos*: head wider; flagellum shorter, with more convex segments; mesoscutum more coarsely and densely punctate; gonostylus of other form (Fig. 8; border between gonocoxite and gonostylus not shown in the figure). Later, Sakagami & Tadauchi (1995: 188, 189) compared the male of *L. leviventre* with the males of *L. ebmerianum* and three other close species inhabiting Japan and gave two characters as follows: (1) head height / width ratio 1.01 ± 0.1 (1.00-1.04) in *L. leviventre*, whereas heads somewhat or significantly shorter in other species (see Table on p. 189); (2) metapostnotum ("propodeal dorsum", in the authors' terms) more regularly and densely striate and shinier in *L. leviventre* than that of other species. The comparisons above may be formally considered the description of the male of *L. leviventre*, but give no basis for distinguishing this male from males of all the other Eastern Palaearctic species of the genus.

Distribution. Southern Far East of Russia (Primorsk Terr. and southern Kuril Islands: Kunashir, Urup, and Iturup), and Japan (Hokkaido, Honshu, Izu, Shikoku, and Okinawa).

***Lasioglossum (Lasioglossum) lisa* Ebmer, 1998**

Lasioglossum (Lasioglossum) lisa Ebmer, 1998: 404, Figs 45-47, ♀. Holotype: ♀, China: Ganguyi (35 km NE Yanan; Shaanxi); OLML.

Taxonomy. Ebmer, 2002: 831 (♂), Figs 10-15.

Published records. **China:** Shaanxi: 35 km NE Yanan and Seide; Shanxi: 50 km W Linfen (Ebmer, 1998: 404).

Material examined (17 ♀ labelled as "*L. sizium* sp. n." and 7 ♀ labelled as "*L. sizium* var."; IZB, ZISP). **China:** Shaanxi: Dingbian, Ningshaan; Hebei.

Distribution. China: Shaanxi, Shanxi; **first records:** Sichuan: Emei; Hebei (see above); and Zhejiang: Tienmushan, Mokanshan).

***Lasioglossum (Lasioglossum) ochreohirtum* (Blüthgen, 1934)**

Halictus ochreohirtus Blüthgen, 1934b: 7, ♀. Holotype: ♀, China: "S. Kansu" [Kuan-chang, Gansu]; NRS.

Taxonomy. Pesenko, 1986: 130 (key); Ebmer, 1998: 403, Figs 6, 7; 2002: 834, 836.

Published records. **China:** Gansu: "Berg [Mt.] Litscha-pu" (Morawitz, 1890: 364; "*Halictus sexnotatus* var."), "S. Kansu" [Kuan-chang] (Blüthgen, 1934b: 7).

Material examined [19 ♀; IZB (including 8 ♀ provided with labels "*L. (Lasioglossum)* sp. 4, aff. *exiliceps*"; ZISP]. **China:** Qinghai: Qilian; Beijing.

Variability. A variable species. In some females from southern China, legs black, mesoscutum more densely and finely punctate, T1 more distinctly punctate, T2 on disc more densely punctate.

Distribution. China (Gansu; **first records:** Xizang, Sichuan, Yunnan, Qinghai, Beijing, and Zhejiang).

Male (new). **Diagnosis.** It is similar to *L. zeyanense* Pesenko and *L. lisa* Ebmer in the coloration of the pubescence of the body and in the general structure of the genitalia. Differences between these species are given in the key above.

Structure. Body length 8.5 mm. Head rounded triangular in front view, about as wide as high. Clypeus projecting below eye by two thirds of its height. Antenna relatively short, reaching posterior margin of metanotum; 3rd flagellomere about 1.5 times as long as wide in lateral view. Metapostnotum semi-lunar, as long as scutellum, slightly concave, narrowly roundly passing onto posterior vertical surface of propodeum, not carinate along posterior margin and without transverse median plate directed backward. Posterior vertical surface of propodeum ecarinate on upper halves of its lateral margins. Membranous retrorse lobe of gonocoxite nearly 4.5 times as long as wide, angulate lancet-shaped, pointed at apex, weakly pubescent (Fig. 6). Gonostylus nearly rectangular, emarginate distally, with very long bristle on lower corner, about 1.5 times as long as wide (Fig. 19).

Sculpture. Clypeus shiny on lower half, punctate with large, longitudinally elliptical punctures ($40 \text{ } \mu\text{m} / 60 \text{ } \mu\text{m} / 0.5-1.0$); on upper half mat, twice more finely and densely punctate. Supraclypeal area mat, more finely punctate ($30 \text{ } \mu\text{m} / 0.5-2.0$), densely shagreened on interspaces. Mesoscutum on anterior half mat, densely granulate; on posterior half, shiny, distinctly punctate ($25-35 \text{ } \mu\text{m} / 0.2-0.8$). Scutellum mat, more densely punctate. Sides of mesosoma mat, granulate and roughened. Metapostnotum dull, densely and very finely strigate; wrinkles strongly smoothed on posterior third. T1 polished throughout, impunctate on anterior and convex surfaces, very finely and sparsely punctate on dorsal surface and posterior area ($10-15 \text{ } \mu\text{m} / 1-6$). T2 polished, on anterior half of disc twice more densely punctate than T1.

Coloration. Body brownish black. Lower half of clypeus yellow. Antenna black on upper side, dark brown on lower side. Tarsi dully orange.

Pubescence. Vertex, mesoscutum, and scutellum pubescent with light ochre-brown hairs, posterior surface of head and side of mesosoma with paler, nearly white hairs. Anterior hair bands of

terga represented by narrow lateral spots of sparse tomentum on T2-T4. Sterna with inconspicuous pubescence.

Material. China: Sichuan: Sunpan, 9.IX.1983, leg. Zhang Xue-zhong, 1 ♂; ZISP.

Lasioglossum (Lasioglossum) pseudofallax (Blüthgen, 1923)

Halictus pseudofallax Blüthgen, 1923: 268, Fig. 28, ♀. Holotype: ♀, Kyrgyzstan: “Togus Tjurae” [Toguz Torau]; SMH.

Taxonomy. Blüthgen, 1925: 87; Ebmer, 1972a: 236 (key); 1975a: 84 (♂), Figs 34, 35a, 35b; 1978a: 193; 1982: 210; 2005: 370; Pesenko, 1986: 127 (key).

Published records. **Mongolia:** “Nordmongolei” (Blüthgen, 1925: 87); Hovd: Bulgan-gol; Uvs: 30 km S Ulaangom (Ebmer, 1982: 210; 2005: 370).

Distribution. Kyrgyzstan and western Mongolia (Hovd and Uvs).

Lasioglossum (Lasioglossum) sutshanicum Pesenko, 1986

Lasioglossum (Lasioglossum) sutshanicum Pesenko, 1986: 135, Fig. 23, ♀. Holotype: ♀, Russia: Tigrovaya (Primorsk Terr., Suchan District); ZISP.

Lasioglossum (Lasioglossum) sutshanicum Ebmer, 1996: 272. Incorrect spelling of *L. sutshanicum*.

Published records. **Russia:** Primorsk Terr. (Pesenko, 1986: 135; see “Material examined”; Proshchalykin, 2004: 6), Zhuravlevka (Ebmer, 1996: 272). **North Korea:** Hyangsan Prov.: Myhyang Mt. (Ebmer, 1996: 272).

Material examined (8 ♀, holotype and paratypes; ZISP). **Russia:** Primorsk Terr.: Tigrovoe, Anisimovka, Evseevka, Brounichi, Lazo.

Distribution. Southern Far East of Russia (Primorsk Terr.), North Korea, and Taiwan.

Lasioglossum (Lasioglossum) tungusicum Ebmer, 1978

Lasioglossum (Lasioglossum) tungusicum Ebmer, 1978b: 34, Figs 21-23, ♂. Holotype: ♂, Iran: Chalus (Elburs Mts.); EBM; examined.

Halictus (Lasioglossum) tinnunculus Warncke, 1982: 96 (key), 101, ♀, **syn. n.** Holotype: ♀, Iran: northern pass between Chalus and Karaj (Mazandaran Prov.); OLML; examined.

Lasioglossum (Lasioglossum) sexmaculatum (non *Hylaeus sexmaculatus* Schenck, 1853): Pesenko, 1986: 130 (part.); Pesenko & Davydova, 2004: 698. Misidentification (**corrected here**).

Taxonomy. Ebmer, 1982: 209 (♀), Fig. 12; Pesenko, 1986: 129 (key; *L. tungusicum*), 131 (key; *L. tinnunculus*).

Published records. **Russia:** Yakutia (Pesenko, 1986: 130; Pesenko & Davydova, 2004: 698; “*L. sexmaculatum*”, see “Material examined”). **Mongolia** (Pesenko, 1986: 130; “*L. sexmaculatum*”).

Material examined [20 ♂, 24 ♀; IZB (including 6 ♀ determined as *L. sexmaculatum* and 3 ♀ labelled as “*L. (Lasioglossum) sp. 8. aff. belliatum* ♀”); ZISP]. **Rus-**

sia: Yakutia: Yakutsk, mouth of Buotama River, 60 km NE Amga, Petropavlovskoe on Aldan River; Irkutsk Prov.: Irkutsk; Amur Prov.: Klimoutsy. **Mongolia:** Hovd: 25 km NNW Bulgan; Туув: Ulanbaatar, Shara-hada near Ulanbaatar; Hentiy: Dumd-bayan, 8 km S Norovlin; Dornod: 32 km SE Salhit Mt. **China:** Qinghai.

Distribution. European Russia (**first record:** Leningrad, Kirov, Kursk and Rostov Prov., Udmurtia), Western Siberia (**first record:** Orenburg Prov.: Spasskoe; Chelyabinsk Prov.: Galievo, Troitskii Nature Reserve; Tyumen Prov.: Yaluturovsk; Altai: Semiyarskaya, Chu Steppe), Eastern Siberia (Yakutia; Irkutsk, and Amur Prov.), Asia Minor, Iran, Armenia (**first record:** Murkhuz), southern Azerbaijan (Nakhichevan), Kazakhstan, Mongolia (Hovd, Туув, Hentiy, and Dornod), China (**first records:** Xinjiang, Xizang, Qinghai, and Sichuan).

Lasioglossum (Lasioglossum) verae Pesenko, 1986

Lasioglossum (Lasioglossum) verae Pesenko, 1986: 132 (key), 148, Figs 7-12, ♀♂. Holotype: ♀, Kazakhstan: “Karaganda Prov.: Zhana Ark”; ZISP.

Published records. **Mongolia:** Uvs: Црүг-нур; Hovd: 15 km N Bulgan (2 ♂, 1 ♀, paratypes; Pesenko, 1986: 150).

Additional material examined (3 ♂; ZISP). **Mongolia:** Hovd: Chonoharaih-gol; Govialtay: 40 km W Erdene.

Distribution. Central and eastern Kazakhstan, western Mongolia (Uvs, Hovd; **first record:** Govialtay).

Lasioglossum (Lasioglossum) xanthopus (Kirby, 1802)

Apis emarginata Christ, 1791: 183, Fig., ♀. Syntype(s): [Germany]; lost. Nomen oblitum (see Warncke, 1973a: 24; 1973b: 285; Ebmer, 1974b: 121). Synonymy by Illiger (1806: 56).

Melitta xanthopus Kirby, 1802: 78, ♀♂. Lectotype: ♀, England: Burham; designated by Ebmer (1988: 579); BML.

Hylaeus derasus Imhoff, 1832: 1199, ♀♂. Syntypes: [Switzerland: Basel]; lost. Synonymy by Frey-Gessner (1901: 315).

Lasioglossum tricingulum Curtis, 1833: 448, ♂. Holotype: ♂, England: Wight Island; lost (see Warncke, 1973b: 285).

Hylaeus fulvicrus Eversmann, 1852: 33 (key), 35 (key), 39, ♀♂. Lectotype: ♀, Russia: “Spassk” [Orengurg Prov.: Spasskoe]; designated by Pesenko (1986: 126); ZISP. Synonymy by Blüthgen (1931b: 209).

Halictus soreli Dours, 1872: 302, Fig. 2 on Pl. XXVIII, ♀. Lectotype: ♀, “Al.” [Algeria]; **designated here**; IZK. Synonymy by Alfken (1914: 189).

Halictus sorelii Dalla Torre, 1896: 85. Incorrect spelling of *H. soreli*.

Lasioglossum (Lasioglossum) xanthopus: Ebmer, 1970: 43; 1976c: 234; 1978b: 30; Bytinski-Salz & Ebmer, 1974b: 181. Incorrect spelling of *L. xanthopus*.

Taxonomy (selected references). Blüthgen, 1920: 88 (key), 113 (key); 1921b: 124; 1922: 47, 51; 1924a: 353,

415 (key), 493 (key); 1931b: 209; Ebmer, 1970: 22 (key), 28 (key), 43; 1974b: 121; 1988: 579; Warncke, 1973a: 24; 1973b: 285; 1982: 96 (key); 1984: Fig. 8; Pesenko, 1986: 126 (key); Pesenko et al., 2000: 185 (key), 192, Figs 275, 283, 284.

Published records. Mongolia: Hovd: Bulgan-gol (Ebmer, 1982: 208).

Distribution. Western Palaearctic Region, as far in the east as Lake Zaisan (Eastern Kazakhstan) and western Mongolia. Northwestern Africa (Morocco, Algeria, and Libya), Europe nearly throughout, Israel, Asia Minor, Transcaucasus, Iran, Pakistan, Kazakhstan, Uzbekistan, Tajikistan, Kyrgyzstan, western Mongolia (Hovd), and northwestern China (**first record:** Xinjiang).

Lasioglossum (Lasioglossum) zeyanense

Pesenko, 1986

Lasioglossum (Lasioglossum) zeyanense Pesenko, 1986: 130, Fig. 18, ♀. Holotype: ♀, Russia: Birshert (Amur Prov.); ZISP.

Lasioglossum (Lasioglossum) acervolum Fan & Ebmer, 1992: 348 (in Chinese), 349 (in English), Fig. 7, ♀. Holotype: ♀, China: Badalin (Beijing Municipality); IZB; examined. Synonymy by Ebmer (1996: 274).

Taxonomy. Ebmer, 1996: 274; 1998: 403; 2002: 835, Figs 26-29.

Published records. Russia: Buryatia: Lake Dzherguchevskoe near Kyakhta; Yakutia: Solyanka; Amur Prov.: Bishert on Zeya River; Khabarovsk Terr.: Sofiisk (6 ♀, holotype and paratypes; Pesenko, 1986: 130). **China:** Gansu: "Qinzhou" [Qinsahui], "Zin-lan-sjan", "Dsin-nan" in Eastern Nan Shan Mt. Range (3 ♀, paratypes; Pesenko, 1986: 130); Qinghai: "Sining-Huangyuan" [Huangzhong] (Ebmer, 1996: 274; 2002: 835); Beijing: Badalin (Fan & Ebmer, 1992: 349; *L. acervolum*).

Additional material examined [1 ♂, 25 ♀, IZB (including 2 ♀ provided with labels "*L. (Lasioglossum) sp. 7, aff. zeyanense*"; ZISP]. **Russia:** Buryatia: Kyakhta; Chita Prov.: "Yablonovyi Mt. Range; Amur Prov.: area between Klimoutsy, Simonovo; Khabarovsk Terr.: Komsomolsk-on-Amur. **China:** Shaanxi: Ningshaan; Beijing; Hebei: Xiaowutai.

Distribution. Southeastern Palaearctic region. Russia (Buryatia, Amur Prov., southern Yakutia, Khabarovsk Terr; **first record:** Chita Prov.), China (Gansu, Qinghai, Beijing; **first records:** Xizang, Yunnan, Shaanxi, and Hebei).

Male (new). **Diagnosis.** It is similar to *L. ochreohirtum* (Blüthgen) and *L. lisa* Ebmer in the coloration of the pubescence of the body and in the general structure of the genitalia. Differences between these species are given in the key above.

Structure. Body length 7.5-8.0 mm. Head transversely elliptical in front view, 1.05 times as wide as high. Clypeus projecting below eye by a half of its height. Antenna relatively short, reaching posterior margin of scutellum; 3rd flagellomere about 1.5 times as long as wide in lateral view. Metapostnotum semi-lunar, 0.9 times as long as

scutellum, slightly concave, hanging over posterior vertical surface of propodeum as a short and narrow transverse plate in middle of its posterior margin. Posterior vertical surface of propodeum ecarinate in upper halves of its lateral margins. Membranous retrorse lobe of gonocoxite 3 times as long as wide, lancet-shaped, narrowly rounded at apex, weakly pubescent (Fig. 11). Gonostylus rounded triangular, about 1.5 times as long as wide (Fig. 24).

Sculpture. Clypeus shiny on lower two thirds, dull on upper third or fourth, punctate with moderately large, longitudinally elliptical punctures (30-45 µm / 0.3-0.6 in middle; more finely in upper part, more coarsely in lower part). Supraclypeal area mat, more finely punctate (20-25 µm / 0.3-0.8), densely shagreened on interspaces. Mesoscutum and scutellum on their discs regularly densely punctate (25-30 µm / 0.2-0.4), dull or moderately shiny on narrow interspaces. Sides of mesosoma mat, granulate and roughened. Metapostnotum shiny, with relatively coarse and sparse, more or less longitudinal wrinkles. T1 polished throughout, impunctate on anterior and convex surfaces and on middle of posterior area, moderately finely and densely punctate on dorsal surface (15-20 µm / 0.5-2), more finely and sparsely punctate on sides of posterior area (10-15 µm / 1-4). Sculpture of T2 similar to that of T1, but posterior area of T2 very finely strigate.

Coloration. Body brownish black. Lower half of clypeus yellow. Antenna black on upper side, dark brown on lower side. Tarsi ochre-yellow in 2 ♂, but reddish brown in third one.

Pubescence. Face, vertex, mesoscutum, and scutellum pubescent with ochre-brown hairs, posterior surface of head and side of mesosoma with paler, off-white hairs. Anterior hair bands of terga represented by inconspicuous narrow lateral spots of very sparse tomentum on T2 and T3. S2 and S3 pubescent with long and dense erect hairs; other sterna with inconspicuous pubescence.

Material. China: Shaanxi, Ningshaan, 2300 m, 6.VIII.1979, leg. Han Yin-han, 1 ♂; Yunnan, Lijiang, 2750-3000 m, 24.VIII.1984, 2 ♂; IZB, ZISP.

Lasioglossum (Leuchalictus) agelastum

Fan & Ebmer, 1992

Lasioglossum (Lasioglossum) agelastum Fan & Ebmer, 1992: 346 (in Chinese), 349 (in English), Figs 1-5, ♀♂. Holotype: ♀, China: Tienmushan (Zhejiang Prov.); IZB; labelled as "*Lasioglossum pseudokansuense*"; examined.

Lasioglossum koreanum (non Ebmer, 1978): Pesenko, 1986: 141. Misidentification (**corrected here**).

Lasioglossum (Lasioglossum) nipponicola Sakagami & Tadauchi, 1995: 177, Figs 2, 5, 9-11, 18, 25, 27, 29,

32-34, ♀♂, **syn. n.** Holotype: ♀, Japan: Asahiyama (Hokkaido); HUS.

Taxonomy. Pesenko, 1986: 141 (key, ♀, *L. koreanum*); Ebmer, 1996: 276 (*L. nipponicola*); 2002: 836, Figs 30-33, 36; Lee et al., 1999: 32, Photos A-E on Pl. I (*L. nipponicola*).

Published records. **Russia:** Primorsk Terr. (Pesenko, 1986: 141; “*L. koreanum*”): Sputnik near Vladivostok (Ebmer, 1996: 276; *L. nipponicola*); Kuril Islands: Kunashir (Pesenko, 1986: 141; “*L. koreanum*”): Alekhino (Proshchalykin, 2003: 7; 2004: 6). **South Korea:** Suwon (Lee et al., 1999: 32, *L. nipponicola*). **China:** Shaanxi: Xunyangba (Ebmer, 2002: 836). **Japan:** Hokkaido: Teshio, Kamikawa, Kushiro, Tokaxhi, Hidaka, Ishikari, Sorachi, Shiribeshi, Iburi, and Oshima Distr. (Sakagami & Tadauchi, 1995: 180; *L. nipponicola*); Honshu: Aomori, Miyagi, Ibaraki, Tochigi, Tokyo, Gifu, Fukui, Hiroshima, Kyoto Pref. (Sakagami & Tadauchi, 1995: 180; Iku-dome & Nakamura, 1996: 175; 1997: 25; Nakamura & Haneda, 1999: 28; Haneda, 2002: 50; *L. nipponicola*), Ishikawa Pref. (Negoro, 1997: 9; *L. nipponicola*).

Material examined [26 ♂, 32 ♀, including the holotype and paratypes; IBSV, IZB (including 3 ♀ provided with labels “*L. shoihii* sp. n.”), ZISP, ZMMU]. **Russia:** Primorsk Terr.: “Kedrovaya Pad” Nature Reserve, Nezhino, Sedanka (near Vladivostok), Vladivostok; Kuril Islands: Kunashir: Alekhino, Mendeleyevo, Tret'yakovo. **China:** Heilongjiang. **Japan:** Hokkaido: Sapporo; Honshu: Kitaibaraki (Ibarasaki Pref.).

Distribution. A Southeastern Palaearctic and Northern Oriental species. Southern Far East of Russia (Primorsk Terr., Kunashir), South Korea, China (Shaanxi, Sichuan, Zhejiang; **first records:** Heilongjiang, Jiangxi, Jiangsu, and Hunan), and Japan (Hokkaido and Honshu).

Lasioglossum (Leuchalictus) alinense (Cockerell, 1924)

Halictus (Curtisapis) alinensis Cockerell, 1924: 583, ♀. Holotype: ♀, “Siberia: Amagu Village” [Russia: Primorsk Terr.]; USMW.

Halictus lutzenkoi Cockerell, 1925: 5, 7 (key), ♂. Holotype: ♂, Russia: “Okeanskaya, Siberia” [Primorsk Terr.: environs of Vladivostok]; USMW. Presumable synonymy by Ebmer (1996: 278).

Halictus gorkiensis Blüthgen, 1931a: 327, ♀. Holotype: ♀, Byelarus: Gorki (Mogilev Prov.); MNB; examined. Synonymy by Pesenko (1986: 139). Comment on the synonymy see below in Section “Taxonomic note” for *L. scitulum*.

Taxonomy. Cockerell, 1925: 4 (key), 7 (key); Ebmer, 1978a: 196; 1978c: 310; 1996: 277 (♂), Figs 3 (*L. lutzenkoi*); Pesenko, 1986: 139 (key); Pesenko et al., 2000: 191 (key), 208.

Published records. **Russia:** Irkutsk Prov. (Pesenko, 1986: 139): “Smolenschina” [Smolenskoe, 10 km SW Irkutsk] (Cockerell, 1937: 3); Amur Prov. (Proshchalykin, 2004: 6); Khabarovsk Terr. (Pesenko, 1986: 139; Proshchalykin, 2004: 6): 20 km N Bikin (Ebmer, 1996: 278; *L. lutzenkoi*); Primorsk Terr. (Pesenko, 1986: 139; Proshchalykin, 2004: 6): “Kongaus” [now Anisimovka], Amagu, Kudia River, Olga, Okeanskaya near Vladivostok (Cockerell, 1924: 583; 1925: 5), Suchan (Gussakovskij, 1932: 64), Ternei (Ebmer, 1978a: 196; *L. lutzenkoi*), Partizansk, Anisimovka, Litovka Mt. near Anisimovka,

Shkotovo, 14 km SW Slavyanka, 40 km SW Ussuriisk (Ebmer, 1996: 278; *L. lutzenkoi*). **China:** Heilongjiang: Harbin (Ebmer, 1996: 278, *L. lutzenkoi*).

Material examined (64 ♂, 146 ♀; CMP, IZB, IBSV, ZISP, ZMMU). **Russia:** Irkutsk Prov.: Alari, Bolshaya Rechka Vil., Irkutsk, 35 km N Irkutsk, Markovo, Melnikovo; Amur Prov.: Arkhara, Klimoutsy, Simonovo; Jewish Autonomus Republic: Birobijan; Khabarovsk Terr.: Elabuga, Efimov Island, Garmakhta, Khabarovsk, Khekhtsyur, Khopersk, Komsomolsk-on-Amur, Pivan, Vyazemskii; Primorsk Terr.: “Amagu Vill.” (paratypes of *Halictus alinensis* Cockerell), Barabash-Levada, Bolshoi Uli-iss, Chernigovka, Diomid Bay, Evseyevka, “Kedrovaya Pad” Nature Reserve, Kievka, 40 km E Kraskino, Novokachalinsk, Pos'yet, 30 km NE Preobrazhenie Bay, Putilovka, Slavyanka, Spassk, Suchan, Troitsa Bay, Ussuriisk, Lake Khanka, Golubiny Utes near Khasan, Shkotovo, Vladivostok, Yakovlevka. **China:** Heilongjiang, Neimenggu, Liaoning, Jilin.

Distribution. A nearly transpalaearctic species having a vast disjunction in European part of Russia and Western Siberia. Lithuania, Byelarus, Russia (Altai, Irkutsk and Amur Prov., Khabarovsk and Primorsk Terr.), and China (Heilongjiang; **first records:** Sichuan, Yunnan, Neimenggu, Liaoning, Jilin, Fujian, and Zhejiang). The bees determined by Ebmer as *L. gorkiense* belong to *L. scitulum*; see below.

Lasioglossum (Leuchalictus) circularum Fan & Ebmer, 1992

Lasioglossum (Lasioglossum) circularum Fan & Ebmer, 1992: 346 (in Chinese), 349 (in English), Fig. 6, ♀. Holotype: ♀, China: Gulin (Jiangsu); labelled as “*Lasioglossum pseudokoreanum*”; IZB; examined.

Taxonomy. Ebmer, 2002: 838, Figs 38, 39, 41, 42.

Published records. **China:** Jiangsu: Gulin (Fan & Ebmer, 1992: 346); Shaanxi: Xunyangba (Ebmer, 2002: 838).

Material examined (23 ♀, including the holotype and 3 paratypes; IZB, ZISP). **China:** Beijing.

Distribution. A Southeastern Palaearctic and Northern Oriental species. China (Sichuan, Shaanxi, Fujian, Jiangsu, Zhejiang, and Hunan; **first records:** Beijing, Anhui, Jiangxi, and Guizhou).

Male (new). **Diagnosis.** The sculpture of the head, mesoscutum, scutellum, metapostnotum and T1 is as that of the female. It is similar to the males of *L. formosae* (Strand) and *L. occidens* (Smith) in the structure and sculpture of mesoscutum, metapostnotum and T1, and in the shape of the gonostylus and hair brush of S6. Differences between these species are given in the key above.

Structure. Body length 8.5-9.5 mm. Head rounded in front view, 1.0-1.05 times as high as wide, relatively thick; in lateral view to head, width of genal area somewhat greater than maximum width of eye. Antenna short, reaching only posterior margin of mesoscutum; 3rd flagellomere 1.5 times as long as wide in lateral view. Lateral carina of pronotum ill-developed. Meso-

scutum depressed along admedian line in its anterior part, concave on anterior margin medially. Metapostnotum 0.75 times as long as scutellum. Metasoma elongate. Posterior vertical surface of propodeum with strong carina along entire lateral margins. Gonocoxite without membranous retrose lobe. Gonostylus elongate elliptical (Fig. 53).

Sculpture. Clypeus more or less shiny, densely punctate (20-35 μm / 0.2-0.7). Supraclypeal area mat, densely granulate-punctate. Mesoscutum regularly, finely, obscurely, very densely punctate (25-30 μm / 0.2-0.3), densely shagreened on interspaces, mat. Mesepisterna alveolate-rugulose, moderately shiny. Lateral surfaces in upper parts with finer wrinkles than those on metapostnotum. T1 on convex surface very sparsely punctate (1-5 or more), throughout finely shagreened on interspaces, silk-mat.

Coloration. Body black, with brownish tint. Clypeus with dully yellow, hardly noticeable median spot in lower half. Legs entirely black. Wing membrane slightly brownish infuscate.

Pubescence. Lateral carina of pronotum covered with yellowish tomentum. Pubescence of vertex, mesoscutum and scutellum ochre-brown or brownish yellow. Lower part of face, genal areas, and lateral surfaces of propodeum covered with dirty-yellowish sparse tomentum. Mes- and metepisterna with whitish erect hairs. Brush of S6 unbroken, II-shaped, with rectangular or triangular bare area inside (Figs 31, 32), sided with posterior margin of sternum.

Material. China: Hunan, Dayong, 400 m, 21.VIII.1988, leg. Yang Long-long, 1 σ ; same locality and collector, 700-900 m, 8.VIII.1988, 1 σ ; IZB, ZISP.

Lasioglossum (Leuchalictus) denticolle (Morawitz, 1891)

Halictus denticollis Morawitz, 1891: 145, φ . Lectotype: φ , Russia: Minusinsk (Krasnoyarsk Terr.); designated by Pesenko (1986: 139); ZISP.

Halictus glycybromifer Strand, 1915: 67, φ . Holotype: φ , China: "Tsingtau" [now Shandong: Qingdao]; DEI; examined. Synonymy by Blüthgen (1931a: 327; 1931b: 211).

Halictus laevifrons Blüthgen, 1923: 324, φ . Lectotype: φ , Russia: "Siberia" (sine loco); **designated here**; IZK. Synonymy by Blüthgen (1934c: 300).

Halictus morbillosus r. orientis Cockerell, 1924: 583, φ . Syntypes: Russia: "Siberia" [Primorsk Terr.]: 4 φ , "Kongaus" [now Anisimovka], 1 φ , Okeanskaya [near Vladivostok]; AMNY, USMW and ZISP, examined. Synonymy by Blüthgen (1931a: 326; 1931b: 211).

Taxonomy. Blüthgen, 1931a: 324; 1931b: 211; Ebmer, 1978a: 198 (σ); Pesenko, 1986: 139 (key); Ebmer & Maeta, 1999: Fig. 13.

Published records. **Russia:** Krasnoyarsk Terr.: Minusinsk (Morawitz, 1891: 145); Buryatia (Pesenko, 1986: 139); Amur Prov. (Proshchalykin, 2004: 6); Khabarovsk

Terr. (Pesenko, 1986: 139; Proshchalykin, 2004: 6); Primorsk Terr. (Pesenko, 1986: 139; Proshchalykin, 2004: 6); "Kongaus" [now Anisimovka], Okeanskaya near Vladivostok (Cockerell, 1924: 583; *Halictus morbillosus r. orientis*), Sedanka near Vladivostok, Putyatin Island (Gussakovskij, 1932: 63), 14 km SW Slavyanka, Sputnik near Vladivostok (Ebmer, 1996: 275); "southern Kurils" (Proshchalykin, 2004: 6). **China:** Shanxi: 10 km E Longmen, 50 km W Linfen (Ebmer, 1998: 408); Heilongjiang: Harbin, Chen (Ebmer, 1978a: 198); Shandong: "Tsingtau" [now Qingdao] (Strand, 1915: 67; *H. glycybromifer*). **North Korea:** Pyongyang Prov.: Pyongyang, 25 km W Pyongyang, 45 km E Pyongyang (Ebmer, 1978c: 310).

Material examined (169 σ , 360 φ ; CMP, IBSV, IZB, ZISP, ZMMU). **Russia:** Krasnoyarsk Terr.: Minusinsk (lectotype and two paralectotypes of *Halictus denticollis* Morawitz); Buryatia: Peschanka near Kyakhta; Amur Prov.: Blagoveshchensk, Klimoutsy Simonovo; Khabarovsk Terr.: Bychikha, Khabarovsk; Primorsk Terr.: Andreyevka, Anisimovka (including the syntype of *Halictus morbillosus r. orientis* Cockerell), Barabash-Levada, Chernigovka, Dmitriyevka, Golubiny Utes near Khasan, Gornotayezhnoe, Innokent'yevka, 20 km W Kamen-Rybolov, "Kedrovaya Pad" Nature Reserve, 40 km E Kraskino, Lazo Nature Reserve (12 localities), Molchanovka, Murav'yevka, Novokachalinsk, Novoselishche on shore of Lake Khanka, Okeanskaya near Vladivostok (including the syntype of *Halictus morbillosus r. orientis* Cockerell), Pos'yet, Putsylovka, Russkii Island, Slavyanka, 25 km SW Slavyanka, Spassk, 35 km NE Spassk, 60 km E Spassk, Suchan, Tigrovyy, Troitsa Bay, Shkotovo, Vinogradovka, Vladivostok, Yakovlevka. **China:** Shanxi, Neimenggu, Liaoning, Heilongjiang, Hebei, Beijing, Jilin, Shandong (including the holotype of *Halictus glycybromifer* Strand).

Distribution. A Southeastern Palaearctic and Northern Oriental species. Southeastern Siberia and southern Far East of Russia (southern Krasnoyarsk Terr., Buryatia, Khabarovsk and Primorsk Terr.; **first record:** Amur Prov.), North Korea, and China (Xinjiang, Shanxi, Heilongjiang, and Shandong; **first records:** Xizang, Yunnan, Neimenggu, Hebei, Liaoning, Beijing, Fujian, Jiangxi, and Hunan).

Lasioglossum (Leuchalictus) discum (Smith, 1853)

Halictus discus Smith, 1853: 70, φ . Lectotype: φ , Greece: Rhea (Attika); designated by Ebmer (1976a: 141); BML.

Halictus morbillosus Kriechbaumer, 1873: 61, $\varphi\sigma$. Lectotype: φ , Italy: "Haslach bei Bozen" [now Bolzano]; designated by Ebmer (1976b: 5); ZSM; examined. Synonymy by Ebmer (1976a: 141).

Halictus major (non Nylander, 1852): Morawitz, 1876: 218 (key), 219 (key), 237. Misidentification (see Morawitz, 1893: 76; Blüthgen, 1922: 48; 1935: 362, 1937: 106).

Halictus fertoni Vachal, 1895: 149, σ . Holotype: σ , France: Provence; in Mus. Seville.

Halictus morbillosus r. glasunovi Cockerell, 1924: 582, σ . Holotype: σ , Tajikistan: "Varsaminor"; ZISP; examined. Synonymy (with *H. morbillosus* var. *fertoni*) by Blüthgen (1931b: 211).

Halictus platycestrus [non Dours, 1872 (= *L. albocinctum*); auct. Misidentification (see Blüthgen, 1931a: 324; 1931b: 211).

Lasioglossum (Lasioglossum) pseudomorbillosum Ebmer, 1970: 20 (key), 25 (key), 30, Fig. 44, ♂♀. Holotype: ♂, Sicily: Palermo; EBM; examined. Synonymy (with *L. discum fertoni*) by Pagliano (1988: 98).

Taxonomy (selected references). Strand, 1909: 11; Blüthgen, 1920: 86 (key), 112 (key); 1921a: 271; 1922: 48 (*H. morbillosus*), 61 (*H. fertoni*); 1924a: 357 (*H. platyceustus*), 411 (key, *H. morbillosus*, *H. platyceustus*), 495 (key, *H. fertoni*), 496 (key, *H. morbillosus*, *H. platyceustus*); 1926b: 404 (*H. fertoni*); 1931a: 324; 1931b: 211 (*H. morbillosus*, *H. fertoni*); 1935: 361; 1961: 282; Cockerell, 1924: 582; Ebmer, 1970: 20 (key), 25 (key), 29, Fig. 43; 1974b: 125, Fig. 145, 125, Fig. 146 (*L. pseudomorbillosum*); 1976a: 141; 1976b: 5; 1976d: 399; 1988: 590; Warncke, 1973b: 284; 1982: 112; Pesenko, 1986: 140 (key); Pagliano, 1988: 98.

Published records. **Russia:** Tuva: 15 km W Kyzyl (Ebmer, 2005: 350).

Taxonomic note. In northwestern Africa and southwestern Europe (Spain, Sicily, Corsica, and southwestern France), individuals with somewhat more densely punctate T1 (on dorsal surface, 0.5-1.5, on posterior area, 0.2-0.6; vs. 1-3 and 0.2-1.0, respectively, in most of individuals from eastern Europe and western Asia) prevail. These individuals, inhabiting the southwestern part of the distributional range of the species, were considered by Ebmer (1988: 590) as belonging to a separate subspecies, *L. discum fertoni* (Vachal, 1895) (= *L. pseudomorbillosum* Ebmer, 1970). However, individuals with more densely punctate T1 occur also in Transcaucasus and Middle Asia. Moreover, the lone individual known from China (Xinjiang: upper reaches of Black Irtysh River, Kandagatai River, 8-22.IX.1876, leg. Potanin, 1 ♀; ZISP) undoubtedly belongs to "*L. discum fertoni*". On this reason, I do not consider such a difference in the punctation density of T1 as a diagnostic character at the subspecies level.

Distribution. A Western Palaearctic species, occurring in steppes and deserts as far in the east as Tuva and northwestern China. Northwestern Africa (Morocco, Algeria, and Tunisia), southern Europe as far in the north as Piemont, eastern Austria, Hungary, southern Urals, Israel, Asia Minor, Transcaucasus, Iran, Afghanistan, southern Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan, south of Western Siberia, Tuva, northwestern China (Xinjiang).

Lasioglossum (Leuchalictus) formosae (Strand, 1910)

Halictus formosae Strand, 1910: 189, ♂. Holotype: ♂, "Formosa [Taiwan]: Kanshirei"; MNB; examined.

Halictus recognitus Cockerell, 1911: 664 (key), 665, ♀. Syntype: 1 ♀, "Formosa [Taiwan]: Taihanroku"; MNB; examined. Synonymy by Blüthgen (1922: 63).

Taxonomy. Strand, 1914: 152 (♀); Blüthgen, 1922: 63; Ebmer, 1978c: 309, Figs 2, 4; Pesenko, 1986: 143 (key); Ebmer & Maeta, 1999: 238, Figs 14-21.

Published records. **North Korea:** Pyongyang Prov.: 14 km W Pyongyang, 60 NE Pyongyang (Ebmer, 1978c: 309).

Distribution. A Northern Oriental species. North Korea, continental China (**first record:** Sichuan, Jiangsu, Zhejiang, Fujian, Guangdong, and Guizhou), Taiwan, Nepal, Vietnam (**first record:** Cuc-phuong, Hanoi; MIZW).

Lasioglossum (Leuchalictus) harmandi (Vachal, 1903)

Halictus harmandi Vachal, 1903: 130, ♀. Holotype: ♀, Japan: "Env. de Tokyo et Alpes de Nikko"; MNP; examined.

Lasioglossum (Leuchalictus) nipponense (non *Halictus nipponensis* Hirashima, 1953): Pesenko, 1986: 141; Proshchalykin, 2003: 7. Misidentification (**corrected here**).

Taxonomy. Ebmer, 1978b: 44; Pesenko, 1986: 141 (key); Sakagami & Tadauchi, 1995: 182, 183 (♂), Figs 4, 7, 14, 15, 23.

Published records. **Russia:** Kuril Islands: Kunashir (Pesenko, 1986: 141, "*L. nipponense*"; Proshchalykin, 2003: 7, "*L. nipponense*"). **Japan** (Hirashima, 1989: 681; localities in Japanese); Hokkaido (Sakagami & Fukuda, 1972: 4; localities in Japanese); Honshu (Ikudome & Nakamura, 1996: 175; localities in Japanese): Tokyo (Vachal, 1903: 130), Aomori Pref. (Yamada et al., 1990: 37), Fukui Pref. (Haneda, 1990: 3), Ishikawa Pref. (Negoro, 1997: 9).

Material examined (14 ♀; IBSV, MNP, ZISP). **Russia:** Kuril Islands: Kunashir: Alekhino, Dubovoe, Golovnin Volcano, Lake Lagunnoe, Mendeleyevo, Sernovodsk, Yuzhnokurilsk. **Japan:** Honshu: Tokyo (holotype), Zao Mt.

Distribution. Russia (southern Kurils: Kunashir), Japan (Hokkaido, Honshu, and Okinawa).

Lasioglossum (Leuchalictus) kansuense (Blüthgen, 1934)

Halictus zonulus kansuensis Blüthgen, 1934b: 7, ♀♂. Syntypes: 1 ♀, 1 ♂, China: "S. Kansu" [Gansu: Kung-tse-tagga and Gahoba near Minsjan]; NRS.

Lasioglossum (Lasioglossum) esoense Hirashima & Sakagami in Sakagami et al., 1966: 673, ♀♂. Holotype: ♀, Japan: Sapporo (Hokkaido); KUF. Synonymy by Ebmer (1978a: 197).

Taxonomy. Ebmer, 1978a: 197; 1978b: 44; 1982: 211; 1998: 410; 2002: 837, Figs 34, 35, 37; Pesenko, 1986: 141 (key); Sakagami & Tadauchi, 1995: 182, Figs 3, 6, 12, 13, 22; Ebmer & Maeta, 1999: Fig. 10.

Published records. **Russia:** Irkutsk Prov. (erroneous record); Buryatia (Pesenko, 1986: 141); Amur Prov. (Proshchalykin, 2004: 6); Khabarovsk Terr.; Primorsk Terr. (Pesenko, 1986: 141; Proshchalykin, 2004: 6); Kuril Islands: Kunashir (Pesenko, 1986: 141; Ebmer, 1996: 276; Proshchalykin, 2004: 6). **China:** Gansu (Morawitz, 1880: 367, "N.W. Mongolei", *Halictus major*): Kung-tse-tagga and Gahoba near Minsjan (Blüthgen, 1934b: 7); Heilongjiang: Harbin (Ebmer, 1978a: 197). **North Korea:** Ryang-gang Prov.: Sam-zi-yan; Gang-von; Kum-gang-san (Ebmer, 1978a: 310). **Japan** (Hirashima, 1989: 681; localities in Japanese): Hokkaido (Sakagami & Fukuda, 1972: 4; 1973: 246, localities in Japanese, *L. esoense*): Sapporo, Tokachi, Kitami (Sakagami et al., 1966: 673, *L. esoense*),

Obihiro (Usui et al., 1976: 228, *L. esoense*); Honshu: Aomori Pref. (Yamada et al., 1990: 37), Fukui Pref. (Haneda, 1990: 3), Ishikawa Pref. (Negoro, 1997: 9), Gifu, Miyagi, Yokohama (Ebmer, 1996: 276; 1998: 276).

Material examined [65 ♂, 212 ♀; IBSV, IZB (including 11 ♂ misidentified by me as *L. zonulum* f. *dexter*), ZISP, ZMMU]. **Russia**: Buryatia: Kyakhta, Peschanka near Kyakhta; Amur. Prov.: Klimoutsy, Simonovo; Jewish Autonomous Prov.: 40 km NW Amurzet; Khabarovsk Terr.: Elabuga, Komsomolsk-on-Amur; Primorsk Terr.: Anisimovka, Barabash-Levada, Bolshoi Uliss, Chernigovka, Cape Falshivy near Khasan, Golubiny Utes near Khasan, Gornotayezhnoe, 20 km W Kamen-Rybolov on shore of Lake Khanka, “Kedrovaya Pad” Nature Reserve, Lazo Nature Reserve (4 localities), Monakino, Novokachalinsk, Partizansk, Pogranichnaya Station, Slavyanka, Spassk, Troitsa Bay, Cape Turii Rog, Vladivostok; Kuril Islands: Kunashir: Dubovoe. **Korean Peninsula**: Chanten. **China**: Gansu, Qinghai, Beijing, Hebei, Jilin, Shanxi, Shaanxi, Shandong. **Japan**: Hokkaido: Sapporo (paratypes of *L. esoense* Hirashima & Sakagami); Honshu: Rifucho (Miyagi Pref.), Kitaibaraki (Ibarasaki Pref.).

Distribution. A Southeastern Palaearctic and Northern Oriental species. South of Eastern Siberia and Far East of Russia (Buryatia, Amur Prov., Jewish Autonomous Prov., Khabarovsk and Primorsk Terr., Kunashir), Korean Peninsula, China (Xizang, Gansu, Sichuan, Jiangsu, and Heilongjiang; **first records**: Yunnan, Qinghai, Shanxi, Shaanxi, Beijing, Hebei, Jilin, Shandong, Hubei, and Guizhou), and Japan (Hokkaido, Honshu, and Okinawa).

Lasioglossum (Leuchaliectus) leucozonium (Schrank, 1781)

Apis leucozonium Schrank, 1781: 406, ♀. Syntype(s): Austria: Vienna; lost (see Warncke, 1973a: 24; Ebmer, 1974b: 117).

Apis leucostoma Schrank, 1781: 406, ♂. Syntype(s): Austria: Vienna; lost (see Warncke, 1973a: 24). Synonymy by Warncke (1973a: 24).

Halictus similis Smith, 1853: 69, ♀ (junior homonym of *Apis similis* Fabricius, 1793). Syntype: 1 ♀, no locality; BML. Synonymy by Cockerell (1909: 325).

Halictus bifasciatus Schenck, 1875: 322, ♂. Lectotype: ♂, Germany: Weilburg; designated by Ebmer (1975b: 246); FSF. Synonymy by Alfken (1904: 1; see also Blüthgen, 1922: 47).

Halictus leucozonius var. *nigrotibialis* Dalla Torre, 1877: 178, ♂. Syntype(s): Austria: northern Tirol; lost (see Warncke, 1973b: 284; Ebmer, 1988: 588). Synonymy by Warncke (1973b: 284).

Halictus deiphobus Bingham, 1908: 361, ♀. Syntype(s): India: Simla Hills (Matiana); ZMUC. Synonymy by Blüthgen (1926b: 418).

Halictus tadschicus Blüthgen, 1929: 51, ♀ ♂, **syn. n.** Syntypes: 6 ♀, 11 ♂. Pakistan: Quetta, BML; 2 ♀, “Turkestan” [no locality], MNB, examined.

Halictus satschauenis Blüthgen, 1934a: 145, ♀ ♂, **syn. n.** Lectotype: ♀, China: “Oase Sachzhou” (now Dunhuang, Gansu); designated by Pesenko (1986: 142); ZISP.

Halictus bifasciatus Schenck, 1875: 29. Unjustified emendation of *H. bifasciatus* Schenck, 1875.

Halictus (Leuchaliectus) leucozonius clusius Warncke, 1975: 98 (material), 116 (diagnosis), ♀ ♂. Holotype: ♀, Turkey: Hatay (= Antakya); OLML.

Lasioglossum (Lasioglossum) leucozonium cedri Ebmer, 1976: 235, ♀ ♂. Holotype: ♀, Morocco: Azrou; EBM.

Lasioglossum (Lasioglossum) zonulum elysium Ebmer, 1979: 131, ♀. Holotype: ♀, Spain: Puerto de I. Ragua (Sierra Nevada); EBM. Synonymy by Warncke (1982: 112).

Lasioglossum (Lasioglossum) satschauense mandschuricum Ebmer, 1978a: 199, ♀ ♂, **syn. n.** Holotype: ♀, China: “Mandschurei: Charbin” [Heilongjiang: Harbin]; EMB.

Lasioglossum (Lasioglossum) zonulum xylopedis Ebmer, 1978b: 43, ♀. Holotype: ♀, Iran: Nowshar; EBM. Synonymy by Warncke (1982: 112).

Taxonomy (selected references). Morawitz, 1876: 217 (key), 219 (key), 237; Blüthgen, 1920: 88 (key), 111 (key); 1921a: 271; 1922: 47; 1924a: 358, 414 (key), 499 (key); 1926a: 497; 1926b: 390, 418; 1926c: 348; 1929: 51 (*H. tadschicus*), 52; 1934c: 304; 1934d: 60; 1935: 362 (*H. tadschicus*); 1937: 106 (*H. tadschicus*); 1961: 282 (*H. tadschicus*); Sandhouse, 1933: 78; Ebmer, 1970: 21 (key), 25 (key), 29, Fig. 50; 1972b: 608; 1974a: 193 (*L. tadschicum*); 1974b: 117; 1976c: 235; 1978a: 199 (*L. satschauense mandschuricum*), 200; 1978b: 42; 1979: 131 (*L. zonulum elysium*), 132 (*L. zonulum xylopedis*); 1980: 474; 1981: 116; 1982: 210 (*L. satschauense mandschuricum*); 1988: 588, 589; 1996: 274 (*L. satschauense mandschuricum*); 1998: 388, 407 (*L. satschauense mandschuricum*); 2005: 371; Warncke, 1973a: 24; 1973b: 284; 1975: 116; 1982: 111, 112; Pesenko, 1986: 141 (key); *L. satschauense*), 143 (key); Pesenko et al., 2000: 191 (key), 206, Figs 278, 300, 301.

Published records. **Russia**: Tuva: environs of Turan (Ebmer, 1998: 408); Krasnoyarsk Terr. (Pesenko, 1986: 142, *L. satschauense*, 143, *L. leucozonium*); Irkutsk Prov. (Pesenko, 1986: 143), Buryatia (Pesenko, 1986: 142, *L. satschauense*); Amur Prov. (Pesenko, 1986: 142, *L. satschauense*); Khabarovsk Terr. (Pesenko, 1986: 142, *L. satschauense*; Proshchalykin, 2004: 6, *L. satschauense*); Primorsk Terr. (Pesenko, 1986: 142, *L. satschauense*; Proshchalykin, 2004: 6, *L. satschauense*); Partizansk (Ebmer, 1996: 274, *L. satschauense mandschuricum*). **Mongolia** (Pesenko, 1986: 141, *L. satschauense*, 143, *L. tadschicum*): Туув: 50 km E Ulanbaatar, 90 km N Ulanbaatar (Ebmer, 2005: 371, *L. leucozonium mandschuricum*). **China**: Xinjiang (Morawitz, 1880: 367, *Halictus leucozonius*); Gansu: Dunhuang (Blüthgen, 1934a: 145, *H. satschauenis*); Shaanxi: Lǎeyang (Ebmer, 1998: 408); Jilin: Heishan (Ebmer, 1996: 275, *L. satschauense mandschuricum*); Heilongjiang: Harbin, 34 km N Harbin (Ebmer, 1978a: 199, *L. satschauense mandschuricum*).

Material examined [185 ♂, 199 ♀; IBSV, IZB (including 17 ♂ and 15 ♀ misidentified by me as *L. aegyptiellum*, 3 ♂ and 9 ♀ provided with labels “*L. zolum* sp. n.”), ZISP, ZMMU]. **Russia**: Krasnoyarsk Terr.: Krasnoyarsk, Minusinsk; Irkutsk Prov.: Bratsk, Irkutsk, Melnikovo; Buryatia: Khoronkhai Station, Kyakhta; Amur Prov.: Blagoveshchensk, Lake Ogoron, Klimoutsy, Shimanovsk, Simonovo; Khabarovsk Terr.: Garmakhta, Khabarovsk, Pivan; Primorsk Terr.: Anisimovka, Barabash-Levada, Baranovsk, Gaivoron on shore of Lake Khanka, Gornotayezhnoe, Innokentevka, Lake Khasan, Kamenushka, Kamen-Rybolov on shore of Lake Khanka, Kievka (Lazo Nature Reserve), Lazo, Novokachalinsk, Novoselskoe on shore of Lake Khanka, P’yanovo, Slavyanka, Spassk, 30 km NW Spassk, 35 km NE Spassk, Ussuriisk, Vladivostok. **Mongolia**: Bayan-Hongor: Tsagan-gol; Hentiy: 30 km SE Norovlin, 25 km NE Bayan-Adraga; Dornod: 7 km S Erentsav, 32 km E Salhit Mt., 18 km NE Dashbalbar. **China**: Gansu, Neimenggu, Liaoning, Heilongjiang, Hebei, Beijing, and Jilin.

Taxonomic note. In the southern and eastern parts of its vast distributional range, the species demonstrates a strong variability in the coloration of the pubescence and in the density of the punctuation on T1. This circumstance was a basis for description of a number of taxa at the specific and subspecific levels.

(1) In the majority of individuals from the southeast of European Russia (Astrakhan Prov.), Asia Minor, Armenia, Azerbaijan, Iran, Afghanistan, Pakistan, western and southern Kazakhstan, Uzbekistan, Tajikistan, northwestern China (Xinjiang), and northwestern Mongolia, the head and mesosoma are covered with white pubescence (in typical *L. leucozonium*, vertex and mesosoma on upper surface at least partly with brown or yellowish brown pubescence), also hind legs of females covered with white pubescence, only the hind tibia on the posterior margin sometimes with admixture of brown hairs (in typical *L. leucozonium*, it is with greyish yellow pubescence, along the posterior margin with brown hairs), the anterior hair band of T4 is wide, nearly reaching its posterior area (in typical *L. leucozonium*, it is relatively narrow, far not reaching the posterior area of the tergum). These individuals were considered a separate species, *L. tadschicum* (Blüthgen, 1929) (see Ebmer, 1974a: 193; 1978a: 200; 1978b: 43; 1980: 474), or a subspecies of *L. leucozonium* (see Warncke, 1982: 112). The last consideration of *L. tadschicum* (as a subspecies of *L. leucozonium*) inhabiting the Asian deserts and semi-deserts cannot be accepted because of a wide overlap of the distributional ranges of both the nominal taxa. The opinion on *L. tadschicum* as a separate species is also wrong because the presence of intermediate individuals in the Caucasus and western Kazakhstan. In Middle Asia, the typical form occurs usually in mountains, but in plane deserts, usually the form “*L. tadschicum*”. It should be noted that nearly all individuals collected in Eastern Siberia have the white pubescence.

(2) Blüthgen (1934) described a new species, *Halictus satschauenensis*, from “Oase Satschau” (Sachzhou; now Dunhuang, in the north of Gansu Prov., China), which strongly differs from the typical form of *L. leucozonium* in the sculpture of T1 and the propodeum: T1 entirely very finely and densely strigate, silk-mat or slightly shiny, sparsely punctate (on dorsal surface in front of posterior area, usually 1-5, sometimes 0.5-3.0) or nearly impunctate (in typical *L. leucozonium*, it is shagreened on interspaces, but without strigation, sometimes shiny in the middle of the dorsal surface, more densely punctate, ≤ 1.5 , sometimes up to 3); the metapostnotum and upper parts of the lateral surfaces of the propodeum are much more finely and densely rugulose than those of

typical *L. leucozonium*. I agree with the opinion by Ebmer (1998: 408) who considered the population from Sachzhou as only an extreme form of *L. leucozonium*. Both the forms, *L. leucozonium* and *L. satschauenense*, and as well numerous intermediate individuals occur in the territory situated eastward this locality. In particular, the form with denser punctuation of T1 was described as a separate subspecies, *L. satschauenense mandschuricum* Ebmer, 1978 (type locality: Harbin). An additional argument for the synonymy is as follows. Individuals with very sparsely punctate T1, which is finely strigate or polished on interspaces, sometimes occur also in the Transcaucasus (e.g., 1 ♂ and 2 ♀ from Nakhichevan, 1 ♀ from Baku, 4 ♀ from Gyanja, and 1 ♀ from Gyumri; Azerbaijan) and southern Kazakhstan (1 ♀ from environs of Chelkar).

In eastern China, females with darker pubescence of T5 around the bare longitudinal stripe (orange or light brown in typical *L. leucozonium*) frequently occur. In all the forms above, the structure of the genitalia and pubescence of S6 of males are identical.

Distribution. A Holarctic species, in Palaearctic Region from Atlantic to Pacific Oceans. Northwestern Africa; Europe nearly throughout; Asia: Near East, Asia Minor, Transcaucasus, Kazakhstan, Middle Asia, southern Siberia, southern Far East of Russia, Mongolia (Tuv; **first records**: Bayan-Hongor, Hentiy, and Dornod), China (Xinjiang, Gansu, Yunnan, Shaanxi, Jilin, and Heilongjiang; **first records**: Xizang, Sichuan, Neimenggu, Liaoning, Hebei, Beijing, and Hubei), Pakistan, northern India.

Lasioglossum (Leuchalictus) mutilum (Vachal, 1903)

Halictus mutilus Vachal, 1903: 129, ♂. Holotype: ♂, Japan: “Env. de Tokyo et Alpes de Nikko” (Honshu); MNP; examined.

Halictus orientalis Pérez, 1905: 37, ♀ (junior homonym of *H. orientalis* Lepelletier, 1841 and *H. cylindricus* var. *orientalis* Magretti, 1890). Syntype(s): Japan: Tsushima; MNP. Synonymy by Blüthgen (1926c: 349).

Halictus tsushimensis Cockerell, 1919: 122; nom. n. pro *Halictus orientalis* Pérez, 1905.

Taxonomy. Blüthgen, 1926c: 349; Pesenko, 1986: 143 (key); Takahashi & Sakagami, 1993: 271; Sakagami & Tadauchi, 1995: 183, Fig. 24.

Published records. **Japan** (Hirashima, 1989: 681; localities in Japanese): Hokkaido: Sapporo (Sakagami & Fukuda, 1973: 246), Obihiro (Usui et al., 1976: 228); Honshu (Ikudome & Nakamura, 1996: 175; localities in Japanese): Tokyo (Vachal, 1903: 129), Hiroshima Pref. (Ikudome & Nakamura, 1994: 7; 1997: 25; Nakamura & Haneda, 1999: 28), Aomori Pref. (Yamada et al., 1990: 37), Ishikawa Pref. (Negoro, 1997: 9), Fukui Pref. (Haneda, 1990: 4), Gōfukokawa (Ikudome & Nakamura, 1995: 52); Izu Islands: Hachijo-jima (Takahashi, 1991: 172;

Takahashi & Sakagami, 1993: 274), Aogashima (Takahashi, 1992: 28; Takahashi & Sakagami, 1993: 274); Shikoku: Kōfuchi Plain (Ikudome, 1978: 516, 520, 522; 1981: 160), Tosayama-Mura (Ikudome, 1983: 139); Kyushu: Fukuoka Pref. (Kusumoto, 1986: 219), Kagoshima City (Ikudome, 1992: 133), Setaura (Iwata, 1997: 640); Tsushima (Pérez, 1905: 37, *Halictus orientalis*).

Material examined (2 ♂, 5 ♀; ZISP, ZMUH). **Japan:** Hokkaido: Hakodate; Honshu: Tokyo (holotype of *Halictus mutilus* Vachal), Tsuchitzi (Miyagi Pref.), Rificho (Miyagi Pref.), Aobayama Mt. (Miyagi Pref.); Kyushu: Amagi Mt. (Fukuoka Pref.).

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu, Izu, Tsushima, and Okinawa).

Lasioglossum* (*Leuchalictus*) *niveocinctum (Blüthgen, 1923)

Halictus niveocinctus Blüthgen, 1923: 325. ♀♂. Syntypes: 1 ♀, Kazakhstan: “Baigakum bei Djulek” [near Kzyl-Orda], MNB; 1 ♂, Turkmenistan: “Saraks” [Serax], MNB; 1 ♀, Russia: Astrakhan, IZK; all examined.

Taxonomy. Blüthgen, 1925: 92; 1929: 52; Ebmer, 1982: 210; Pesenko, 1986: 140 (key).

Published records. **Mongolia:** Bayan-Hongor: oasis Echin-gol (Ebmer, 1982: 210), Tsagan-Bogd-ula (Ebmer, 2005: 371). **China:** (“northern China”; Pesenko, 1986: 140).

Material examined (20 ♂, 13 ♀; IZB, ZISP). **China:** Gansu: Dunhuang; Neimenggu: 65 km W Inchuang.

Distribution. A species inhabiting deserts and semi-deserts of Palaearctic Region. Southeastern European Russia (Volograd and Astrakhan Prov., Daghestan), Kazakhstan (except for the north), Turkmenistan, Uzbekistan, Tajikistan, southern Mongolia (Bayan-Hongor), northern China (Xinjiang, Gansu, and Neimenggu).

Lasioglossum* (*Leuchalictus*) *occidens (Smith, 1873)

Halictus occidens Smith, 1873: 200, ♀. Holotype: ♀, Japan: Hiogo (Honshu); BML.

Halictus quadraticollis Vachal, 1903: 129, ♀. Holotype: ♀, Japan: “Env. de Tokyo et Alpes de Nikko” (Honshu); MNP; examined. Synonymy by Blüthgen (1926: 348).

Lasioglossum (*Lasioglossum*) *koreanum* Ebmer, 1978c: 309, Figs 1, 3. ♂♀, **syn. n.** Holotype: ♂, North Korea: Pyongyang; HNB.

Taxonomy. Cockerell, 1919: 122; Blüthgen, 1926a: 501; 1926c: 348; Ebmer, 1980: 501; 1996: 275; 2002: 838, Figs 40, 43, 44 (*L. koreanum*); Pesenko, 1986: 139 (key); Sakagami & Tadauchi, 1995: 183, Figs 17, 26, 28, 30, 31 (♂); Ebmer & Maeta, 1999: Fig. 11 (*L. koreanum*), Figs 12, 22 (*L. occidens*).

Published records. **Russia:** Sakhalin: “Tonmaitcha” [Lake Tunaycha] (Matsumura, 1911: 107); Kuril Islands: Kunashir (Ebmer, 1996: 276; *L. koreanum*). **China:** “northern China” (Pesenko, 1986: 139). **Korean Peninsula** (Doi, 1938: 41): Pyongyang, Gang-von, and Pyongsung Prov. (a lot of localities) (Ebmer, 1978c: 310; *L. koreanum*). **Japan** (Hirashima, 1989: 681; localities in Japanese): Hokkaido (Sakagami & Fukuda, 1972: 4;

localities in Japanese): Hama-Koshimizu (Fukuda et al., 1973: 163; Ebmer, 1996: 275), Уругу (Ebmer, 1996: 275), Sapporo (Sakagami & Fukuda, 1973: 246; Ebmer, 1996: 275); Honshu (Ikudome & Nakamura, 1996: 176; localities in Japanese): Hiroshima Pref. (Ikudome & Nakamura, 1994: 7; 1997: 25), Ishikawa Pref. (Negoro, 1997: 10), Fukui Pref. (Haneda, 1990: 3), Aomori Pref. (Yamada et al., 1990: 37; Ebmer, 1996: 275), Hiogo (Smith, 1873: 200), Tokyo (Vachal, 1903: 129, *Halictus quadraticollis*), Gōnokawa (Ikudome & Nakamura, 1995: 52), Gifu, Wakayama, Yokohama, Osaka (Ebmer, 1996: 275); Shikoku: Kōfuchi Plain (Ikudome, 1978: 516, 522; 1981: 160), Tosayama-Mura (Ikudome, 1979: 419; 1983: 140); Sado (Baba, 1935: 84); Izu Islands: Hachijo-jima (Takahashi, 1991: 172; Takahashi & Sakagami, 1993: 274), Ohshima, Shikine-jima (Takahashi & Sakagami, 1993: 274); Kyushu: Kagoshima City (Ikudome, 1992: 133), Setaura (Iwata, 1997: 640), Fukuoka Pref. (Kusumoto, 1986: 219).

Material examined (39 ♂, 137 ♀; IZB, ZISP). **North Korea:** Pyongyang (paratypes of *L. koreanum* Ebmer). **China:** Gansu, Beijing, Tianjin, Hebei, Shandong. **Japan:** Hokkaido: Hakodate, Sapporo, 40 km S Sapporo; Honshu: Tokyo (holotype of *Halictus quadraticollis* Vachal).

Comment on the synonymy. The diagnosis and description of *Lasioglossum koreanum* made by Ebmer (1978c: 309) were inadequate as this new species was compared with the morphologically remote Chinese *L. formosae* (Strand, 1910), but not with the very close *L. occidens* (Smith, 1873) at that time known only from Japan. As a result, in “A key to females of the Palaearctic *Lasioglossum*” (Pesenko, 1986: 141), I misunderstood *L. koreanum* and ascribed this name to a new species, which was later described as *L. agelastum* Fan & Ebmer, 1992. In 1988, I examined the paratypes of *L. koreanum* (male and female from Pyongyang, North Korea) kindly sent to me by Mr. Andreas W. Ebmer (Linz, Austria) for study. These paratypes appear to be very similar to specimens of *L. occidens* from Hakodate (Hokkaido, Japan) determined by the late Prof. Shoichi F. Sakagami (Sapporo University). Subtle differences between them are given in Table 1.

Examination of extensive material (28 ♂ and 113 ♀; deposited at IZB) of the complex “*L. occidens*-*L. koreanum*” from 14 provinces of China made by me in 1993 has shown that all the above differences widely overlap, not permitting to consider the continental population even a separate subspecies, in contrast to suggestion by Ebmer (Ebmer & Maeta, 1999: 232; Ebmer, 2002: 838). Hence, *Lasioglossum koreanum* Ebmer, 1978 is a junior synonym of *Halictus occidens* Smith, 1873.

Distribution. A Southeastern Palaearctic and Northern Oriental species. Russia (Sakhalin and Kunashir), North Korea, China (Xizang, Sichuan, Shaanxi, Beijing, Hunan, Jiangsu, Fujian, Guangdong, Jiangxi, and Zhejiang; **first records:** Gansu, Hebei, Tianjin, Shandong, Hubei, and Guizhou), Japan, Taiwan. The records of the species (under the name *L. koreanum*) from Primorsk

Table 1. Differences between paratypes of *L. koreanum* and specimens of *L. occidentis* from Japan

Character	Paratypes of <i>L. koreanum</i> from Pyongyang (North Korea)	<i>L. occidentis</i> from Hakodate (Hokkaido, Japan)
Female		
Head in front view	Rounded, somewhat higher than wide	Rounded triangular, somewhat wider than high
Clypeus: punctuation	28-42 μm / 0.2-0.5, only on lower fifth coarser; interspaces polished	28-56 μm / 0.5-2.0; interspaces obscurely shagreened
Supraclypeal area in middle: sculpture	Impunctate, shiny	Finely and densely punctate, submat
Lateral wing-shaped prominence of pronotum	As long as half width of eye	Somewhat longer than half width of eye
Mesoscutum: punctuation	Interspaces consisting of 0.5-1.0 puncture diameters	Interspaces consisting of 1-2 puncture diameters
Mesoscutum: coloration	Black, with slight gray blue lustre	Black, without lustre
Metapostnotum	With very weak lateral carina	Without carina
T1 on dorsal surface: punctuation	21-28 μm / 0.3-1.0; interspaces polished	28-42 μm / 0.5-3.0; interspaces finely strigate
T1 on posterior area: punctuation	10-14 μm / 0.3-1.0; interspaces polished	14-21 μm / 1-3; interspaces obscurely shagreened
Male		
Yellow transverse band along lower margin of clypeus	Wide, about half of clypeus height	Narrow, 0.2-0.25 of clypeus height or absent
Flagellum on lower side	Brown	Black
Mesoscutum: punctuation	21-28 μm / 0.2-0.4; interspaces shagreened throughout	28-42 μm / 0.3-0.6; interspaces shagreened, except middle of disc
T1 on dorsal surface: punctuation	14-21 μm / 0.4-0.8; interspaces obscurely shagreened; punctuation distinct	21-28 μm / 0.5-3.0; interspaces shagreened; punctuation obscure
T1 on posterior area: punctuation	Uniform, dense	Lacking in middle

Terr. and Kunashir by Pesenko (1986: 141) belong to *L. agelastum* (corrected here).

Lasioglossum (Leuchalictus) rachifer
(Strand, 1915)

Halictus rachifer Strand, 1915: 66, ♀. Holotype: ♀, China: "Tsingtau" [now Shandong: Qingdao]; DEI; examined.

Published records. **China:** Shandong: Qingdao (Strand, 1915: 66).

Material examined (3 ♀; DEI, IZB, ZISP). **China:** Shandong (including the holotype).

Distribution. Eastern China (Shandong).

Lasioglossum (Leuchalictus) rostratum
(Eversmann, 1852)

Hylaeus rostratus Eversmann, 1852: 35 (key), 38, ♀. Lectotype: ♀, Russia: "Spassk" [Orenburg Prov.: Spasskoe]; designated by Pesenko (1986: 138); ZISP.

Halictus chlapovskii Vachal, 1902: 226, ♀♂. Lectotype: ♀, Russia: "Siberie occid."; **designated here**; IZK. Synonymy by Blüthgen (1926b: 404).

Halictus chlapovskii Blüthgen, 1926b: 404. Incorrect spelling of *H. chlapovskii*.

Taxonomy. Smith, 1854: 423; Blüthgen, 1923: 309, Fig. 23 (*Halictus chlapovskii*); 1926b: 404; Ebmer, 1982: 211; Pesenko, 1986: 138 (key).

Published records. **Russia:** Chita Prov.: Chita (Blüthgen, 1923: 309). **Mongolia:** Тив: 80 km N Ulanbaatar; Увс: Harhiraа (Ebmer, 2005: 371); Dornod: Choibalsan (Ebmer, 1982: 211). **China:** Gansu: "Berg Chuan-Chua-Schan" (Morawitz, 1890: 363), "S. Gansu (Hummel leg.)" [Ngai-men-hou-tou near Tan-chang] (Blüthgen, 1934b: 4); Shaanxi: Suide (Ebmer, 1998: 410); Shanxi: Monen, 50 km W Linfen (Ebmer, 1998: 410).

Material examined (55 ♂, 96 ♀; IZB, ZISP, ZMMU, ZMUH). **Russia:** Tuva: Tes River; Krasnoyarsk Terr.: Krasnoyarsk, Minusinsk; Irkutsk Prov.: Irkutsk, Listvenichny, Melnikovo, Usol'ye; Chita Prov.: Chita; Amur Prov.: Klimoutsy; Khabarovsk Terr.: Udinsk; Primorsk Terr.: Novokachalinsk. **Mongolia:** Bayan-Hongor: Bog-

do; Цвур-Хангай: southern slope of Ulugin-obo; Selenge: Ero-gol near Dulanhan, 20 km NNE Darhan, 15 km E Bayan-gol; Тув: 29 km W Lun Somon; Hentiy: 10 km NNW Binder; Сьһбаатар: 50 km SSW Барун-урт, 69 km NNE Барун-урт, 80 km NNE Барун-урт, 10 km NE Хавирга, 10 km W Бухын-хашатын-худук, 32 km SE Салхит Mt. **China**: Gansu, Neimenggu, Shaanxi, Qinghai, Beijing, Hebei, Liaoning.

Distribution. A Siberian and Southeastern Palaearctic species. Southern Urals (Orenburg and Chelyabinsk Prov.), western (Yanvartsevo) and northern (Astana) Kazakhstan, south of Western Siberia (Tomsk, Tyumen, and Omsk Prov.), Altai, south of Eastern Siberia and Russian Far East (Krasnoyarsk Terr., Irkutsk and Chita Prov.; **first records**: Tuva, Amur Prov., Khabarovsk and Primorsk Terr.), northern half of China (Xinjiang, Gansu, Neimenggu, Shaanxi, and Shanxi; **first records**: Qinghai, Beijing, Hebei, and Liaoning), Mongolia (Тув, Увс, Дорнод; **first records**: Bayan-Hongor, Цвур-Хангай, Selenge, and Сьһбаатар).

Lasioglossum (Leuchaliectus) scitulum (Smith, 1873)

Halictus scitulus Smith, 1873: 200, ♀. Holotype: ♀, Japan: Hakodate (Hokkaido); BML.

Halictus japonicola Strand, 1910: 184, ♀. Holotype: ♀, Japan: [Tokyo] (Honshu); MNB; examined. Synonymy by Blüthgen (1926b: 396).

Halictus basicirus Cockerell, 1919: 122, ♀. Holotype: ♀, Japan (sine loco); USMW. Synonymy by Ebmer (1978a: 196).

Lasioglossum gorkiense (non *Halictus gorkiensis* Blüthgen, 1931): Ebmer, 1996: 277; 1998: 410; Sakagami & Tadauchi, 1995: 183. Misidentification (**corrected here**).

Taxonomy. Blüthgen, 1926b: 396; Ebmer, 1978a: 196; 1996: 277 (*L. scitulum*, ♂, and "*L. gorkiense*"), Figs 1, 10, 11 (*L. scitulum*), 2, 12 ("*L. gorkiense*"); 1998: 410 ("*L. gorkiense*"); Pesenko, 1986: 138 (key); Sakagami & Tadauchi, 1995: 183, Figs 19 ("*L. gorkiense*"), 21 (*L. scitulum*).

Published records. **Russia**: Khabarovsk Terr. (Pesenko, 1986: 138; Proshchalykin, 2004: 6); Primorsk Terr. (Pesenko, 1986: 138; Proshchalykin, 2004: 6); Shkotovo (Ebmer, 1996: 278), 25 km S Lesozavodsk, Zhuravlevka, Sputnik [near Vladivostok] (Ebmer, 1996: 278; "*L. gorkiense*"); Sakhalin (Pesenko, 1986: 138; Proshchalykin, 2004: 6): Aniva (Ebmer, 1978a: 197, "*L. gorkiense*"), Kholmok (Ebmer, 1978a: 197, "*L. gorkiense*"); Proshchalykin et al., 2004: 161), Okhotskoe (Ebmer, 1996: 278; "*L. gorkiense*"), Chistovodnoe, Guberovo, 20 km N Nevelskii, Novikovo, Ozerskii, Shebunino, Starodubskoe, Yuzhnosakhalinsk, 20 km W Aniva (Proshchalykin et al., 2004: 161); Kuril Islands: Kunashir (Pesenko, 1986: 138; Ebmer, 1996: 278; "*L. gorkiense*"); Proshchalykin, 2004: 6): Mendeleyevo (Proshchalykin, 2003: 8). **China**: Gansu: Wudu (Ebmer, 1998: 410, "*L. gorkiense*"); Shanxi: Xiexiang (Ebmer, 1998: 410, "*L. gorkiense*"); Heilongjiang: Harbin (Ebmer, 1978a: 196, *L. scitulum* and "*L. gorkiense*"), Hulan 34 km N Harbin (Ebmer, 1978a: 196, "*L. gorkiense*"). **North Korea**: Ryang-gang Prov.: 10 km NEE Bochonbo; Pyongyan Prov.: Pyongyan; 20

km NE Kaesong (Ebmer, 1978c: 310; "*L. gorkiense*"). **Japan** (Hirashima, 1989: 681, "*L. gorkiense*" and *L. scitulum*, localities in Japanese): Hokkaido (Sakagami & Fukuda, 1972: 4, localities in Japanese): Hakodate (Smith, 1873: 200), Hama-Koshimizu (Fukuda et al., 1973: 163), Sapporo (Sakagami & Fukuda, 1973: 246; Ebmer, 1978a: 196, *L. scitulum*; 197, "*L. gorkiense*"), Kushiro (Ebmer, 1978a: 196, *L. scitulum*; 197, "*L. gorkiense*"), Obihiro (Usui et al., 1976: 228); Honshu (Ikudome & Nakamura, 1996: 176, localities in Japanese): Tokyo (Strand, 1910: 184, *Halictus japonicola*; Ebmer, 1996: 277, "*L. gorkiense*" and *L. scitulum*), Kibi-Wakayama, Yokohama (Ebmer, 1978a: 196), Hiroshima Pref. (Ikudome & Nakamura, 1994: 7; 1997: 25; Nakamura & Haneda, 1999: 29), Aomori Pref. (Yamada et al., 1990: 37), Ishikawa Pref. (Negoro, 1997: 10); Shikoku: Kōchi Plain (Ikudome, 1978: 516, 520, 522; 1981: 160), Tosayama-Mura (Ikudome, 1979: 419; 1983: 140); Kyushu: Kagoshima City (Ikudome, 1992: 133), Setaura (Iwata, 1997: 640).

Material examined (101 ♂, 272 ♀; IBSV, IZB, ZISP).

Russia: Amur Prov.: Simonovo; Khabarovsk Terr.: Khabarovsk; Primorsk Terr.: Diomid Bay, Golubiny Utes near Khasan, Guberovo, Kholmok, Kievka, Novokachalinsk, 12 km NNW Preobrazhenie Bay, Spassk, 35 km NE Spassk, 20 km NW Spassk, Vladivostok; Sakhalin: Aniva, 20 km W Aniva, Konuma, Kuznetsovo, Lesogorka, 20 km N Nevelsk, Novikovo, Novoaleksandrovsk, Ogonki, Ozerskii, Poronai River near Hoe, Sergeyevo, Starodubskoe, Tymovsk, Yuzhnosakhalinsk; Kuril Islands: Kunashir: Dubovoe, Mendeleyevo, Yuzhnokurilsk. **China**: Neimenggu, Shaanxi, Beijing, Hebei, Liaoning, Jilin, Shandong. **Japan**: Hokkaido: Kaributo; Honshu: Tokyo (holotype of *Halictus japonicola* Strand), Tsuchitzi (Miyagi Pref.), Rifucho (Miyagi Pref.).

Variability. A very variable species in body size and sculpture of interspaces between punctures on T1 (polished to finely shagreened or strigate). Some females occupy an intermediate position between the typical *L. scitulum* and *L. kansuense*, and also between the typical *L. scitulum* and *L. formosae*.

Taxonomic note. Ebmer (1996: 277) distinguishes 3 species of the "*L. scitulum* complex": (1) *L. scitulum* (Smith, 1873) = *Halictus japonicola* Strand, 1910 = *Halictus basicirus* Cockerell, 1919; (2) *L. gorkiense* sensu Ebmer, non *Halictus gorkiensis* (Blüthgen, 1931); (3) *L. lutzenkoi* (Cockerell, 1925) = ?*L. alinense* (Cockerell, 1924). I have found the differences between *L. scitulum* and "*L. gorkiense*" listed by Ebmer (1996: 277) too subtle and widely overlapping in the extensive material from the Russian Far East and China examined by me. Therefore, in contrast to Ebmer's opinion, I distinguish only two species: (1) *L. scitulum* (Smith, 1873) = *L. gorkiense* sensu Ebmer, 1996; (2) *L. alinense* (Cockerell, 1924) = *Halictus lutzenkoi* Cockerell, 1925 = *Halictus gorkiensis* Blüthgen, 1931. The main difference between females of these species is the sculpture of T1, a character erroneously ignored by Ebmer as a very variable one in all species of the complex.

Distribution. A Southeastern Palaearctic and Northern Oriental species. South of Russian Far

East (Khabarovsk and Primorsk Terr., Sakhalin and Kunashir; **first record**: Amur Prov.), China (Gansu, Shanxi, and Heilongjiang; **first records**: Xinjiang, Sichuan, Yunnan, Neimenggu, Shaanxi, Beijing, Hebei, Liaoning, Jilin, Jiangsu, Zhejiang, Fujian, Shandong, Anhui, Jiangxi, Hubei, and Guizhou), North Korea, and Japan. The bees determined by Ebmer as *L. lutzenkoi* belong to *L. alinense*.

Lasioglossum (Leuchalictus) subopacum
(Smith, 1853)

Halictus subopacus Smith, 1853: 63, ♀. Syntype: ♀, “N. China: Foo-cho-foo” [now Fujian: Fuzhou]; BML.
Halictus chiniae Strand, 1910: 182, ♀. Syntypes: 2 ♀, China: “Tsingtau [now Shandong: Qingdao]; MNB; examined. Synonymy by Blüthgen (1926a: 500; 1926b: 396).
Halictus horishensis Cockerell, 1911: 662, ♂. Holotype: ♂, “Formosa [Taiwan]: Horisha”; USMW. Synonymy by Ebmer (1980: 501).
Halictus perangulatus Cockerell, 1911: 663 (key), 666, ♀. Syntypes: 7 ♀, “Formosa” [Taiwan; no locality]; MNB; examined. Synonymy (with *H. chiniae*) by Blüthgen (1922: 63).
Halictus baguionis Crawford, 1918: 170, ♀♂. Holotype: ♀, Philippine Islands: Bagua Luzon; USMW. Synonymy by Blüthgen (1926b: 416).

Taxonomy. Smith, 1873: 200; Vachal, 1903: 129; Pjerez, 1905: 36; Cockerell, 1919: 123; Blüthgen, 1922: 63 (*Halictus chiniae*); 1926a: 500, 501; 1926b: 396, 416; Ebmer, 1980: 500, 501; Pesenko, 1986: 137 (key); Sakagami & Tadauchi, 1995: 183, Fig. 16; Ebmer & Maeta, 1999: 230, Figs 7-9.

Published records. **China**: “northern China” (Pesenko, 1986: 137); Shandong: “Tsingtau” [now Qingdao] (Strand, 1910: 182, *Halictus chiniae*).

Material examined (124 ♂, 536 ♀; IZB, NMW, ZISP). **China**: Beijing Municipality: Beijing, 40 km N Beijing; Hebei: Tianjin; Shandong: Qingdao (including syntypes of *Halictus chiniae* Strand), Yan-tan.

Distribution. A Southeastern Palaearctic and Oriental species (Ebmer, 1996: 410). China (Xizang, Shandong, Fujian, Jiangsu; **first records**: southern Gansu, Sichuan, Hebei, Beijing, Tianjin, Zhejiang, Jiangxi, Guangdong, Guangxi, Guizhou, and Hunan), Taiwan, southern Japan, Vietnam (**first record**: Hanoi, Tenh-he; MIZW, ZISP), and Philippine Islands. The record of the species from India by Bingham (1897: 428) belongs to *L. spodiozonium* (see Blüthgen, 1926a: 493; 1926b: 416).

Lasioglossum (Leuchalictus) upinense
(Morawitz, 1890)

Halictus upinensis Morawitz, 1890: 363, ♀. Lectotype: ♀, China: Upin (Gansu); designated by Pesenko (1986: 142); ZISP.
Halictus carbonarius Blüthgen, 1923: 323, ♂ (junior homonym of *H. carbonarius* Smith, 1953). Lectotype: ♂, Russia: “Ostsiberien” (sine loco); **designated here**; IZK. Synonymy by Ebmer (1978a: 194).

Halictus (Curtisapis) tacitus Cockerell, 1924: 584, ♀. Holotype: ♀, Russia: “Kongaus, Siberia” [now Primorsk Terr.: Anisimovka]; USMW. Synonymy by Blüthgen (1926b: 409).

Halictus carbonatus Blüthgen, 1925: 92; nom. n. pro *Halictus carbonarius* Blüthgen, 1923.

Halictus wittenbourgi Cockerell, 1925: 5, 7 (key), ♂. Holotype: ♂, Russia: “Kongaus, Siberia” [now Primorsk Terr.: Anisimovka]; USMW. Synonymy by Ebmer (1978a: 196).

Taxonomy. Blüthgen, 1926b: 409; Ebmer, 1978a: 194, 196; 1998: 410; Pesenko, 1986: 142 (key).

Published records. **Russia**: Amur Prov. (Pesenko, 1986: 142; Proshchalykin, 2004: 6); Khabarovsk Terr. (Pesenko, 1986: 142; Proshchalykin, 2004: 6); Bikin, 20 km N Bikin (Ebmer, 1996: 276); Primorsk Terr. (Pesenko, 1986: 142; Proshchalykin, 2004: 6): “Kongaus” [now Anisimovka], Okeanskaya [near Vladivostok] (Cockerell, 1924: 584, *Halictus tacitus*), “Kongaus” (Cockerell, 1925: 6, *H. wittenbourgi*), Ternei (Ebmer, 1978a: 196), Anisimovka, Litovka Mt. near Anisimovka, Przhewalskii Mt., 40 km E Ussuriisk, Lake Khasan, Samarka, Shkotovo, Sputnik near Vladivostok, 30 km W Vladivostok (Ebmer, 1996: 276). **China**: Gansu: Upin (Morawitz, 1890: 364), “S. Gansu (Hummel leg.)” (Blüthgen, 1934b: 4); Heilongjiang: Harbin, Erzendianzy, Gaoлинzsa (Ebmer, 1978a: 196). **North Korea**: North Pyongan Prov.: Myohyang Mt. (Ebmer, 1996: 276).

Material examined (261 ♂, 547 ♀; IBSV, IZB, ZISP, ZMMU). **Russia**: Amur Prov.: Klimoutsy, Kundur, Malmyzh, Novospasskii, Simonovo, Ukrainka; Khabarovsk Terr.: Chernigovka, Defriz, Elabuga, Frolovka, Garmakhta, Gionskaya Canal, Khabarovsk, Komsomolsk-on-Amur; Primorsk Terr.: Andreyevka, Anisimovka, Barabash-Levada, “Kedrovaya Pad” Nature Reserve, Lazo Nature Reserve (15 localities), Lyalichi, Molchanovka, Monakino, Nezhino, Novokachalinsk, Partizansk, Pos’yet, Sedanka near Vladivostok, Shamara Bay, Shkotovo, 25 km SW Slavyanka, Sokolovskaya Bay, Spassk, 30 km NW Spassk, 20 km SE Spassk, Tigrovy, Vladivostok, 30 km SE Ussuriisk, 50 km SW Ussuriisk, Yakovlevka. **China**: Gansu (including the lectotype and paralectotype of *Halictus upinensis* Morawitz), Hebei, Liaoning, Shaanxi, Jilin, Heilongjiang.

Distribution. A Southeastern Palaearctic species. Southern Far East of Russia (Amur Prov., Khabarovsk and Primorsk Terr.), North Korea, and China (Gansu, Xizang, Sichuan, and Heilongjiang; **first records**: Shaanxi, Hebei, Liaoning, Jilin, and Jiangsu).

Lasioglossum (Leuchalictus) zonulum
(Smith, 1848)

Halictus zonulus Smith, 1848: 2171, ♀♂. Lectotype: England: Woolwich; designated by Ebmer (1988: 592, 593; sex not indicated); ZMUO.

Hylaenus trifasciatus Schenck, 1853: 168, ♀♂. Syntypes: Germany: Wiesbaden; lost (see Blüthgen, 1919: 196). Synonymy by Schenck (1861: 283).

Halictus rhenanus Verhoeff, 1890: 325, ♂. Syntype(s): Germany: Bonn; lost (see Warncke, 1973b: 285). Synonymy by Warncke (1973b: 285).

Halictus receptivus Vachal, 1902: 227, ♀. Holotype: ♀, Lithuania: Vilnius; IZK; examined. Synonymy by Blüthgen (1922: 61).

Halictus craterus Lovell, 1908: 35, ♀♂. Lectotype: ♀, USA: Maine; designated by Covell (1972: 12); USMW. Synonymy by Sandhouse (1933: 78).
Halictus zonulus sinister Blüthgen, 1934a: 152, ♀♂. Syn-types: Azerbaijan: Lenkoran and "Hellenendorf" [now Khanlar, 7 km N Gyanja]; MNB; examined.
Halictus zonulus dexter Blüthgen, 1934a: 153, ♀. Holotype: ♀, Kazakhstan: "Aulie-Ata" [now Zhambul]; MNB; examined.
Lasioglossum (Lasioglossum) sinistrum: Ebmer, 1978b: 43. Incorrect spelling of *L. sinister*.
Lasioglossum (Lasioglossum) zonulum euronotum Ebmer, 1998: 389, ♀. Holotype: ♀, China: Luo Shui (Yunnan); EBM.

Taxonomy (selected references). Blüthgen, 1919: 196; 1920: 87 (key), 110 (key); 1922: 61; 1923: 311; 1924a: 414 (key), 498 (key); 1934a: 153; 1934c: 303; Sandhouse, 1933: 78; Ebmer, 1970: 21 (key), 24 (key), 35, Figs 40a, 40b; 1978b: 43; 1979: 132; 1988: 592, 593; Warncke, 1973b: 284; 1982: 111; Pesenko, 1986: 142 (key); Sakagami & Tadauchi, 1995: Fig. 20; Pesenko et al., 2000: 191 (key), 205, Figs 274, 277, 282, 298, 299.

Published records. **Russia:** Irkutsk (Strand, 1909: 20). **China:** Gansu: "Utai", "Berg Ischu-Schan" (Morawitz, 1890: 363).

Material examined (11 ♂, 14 ♀; IZB, ZISP). **Russia:** Krasnoyarsk Terr.: Krasnoyarsk; Irkutsk Prov.: Bratsk, Irkutsk, Melnikovo, Monakino, Usol'ye; Buryatia: Durena on left bank of Chikoi River, Ust-Kiran. **China:** Gansu.

Taxonomic note. In southern and southeastern parts of its vast distributional range, the species demonstrates certain variability in the coloration of the body pubescence and in the density of the punctuation of T1. This circumstance was a basis for description of a number of subspecies. (1) Some of the females of *L. zonulum*, occurring in southern Kazakhstan, Uzbekistan, and Kyrgyzstan and having the bright rusty-brown pubescence of the vertex and the dorsal surface of mesosoma, denser punctuation of T1 and wider anterior hair bands on T2-T4, were considered by Blüthgen (1934a: 153) to be a separate subspecies, *Halictus zonulus dexter*; later this taxon was raised by Ebmer (1988: 593) up to specific level. (2) Most of the individuals of *L. zonulum*, occurring in Azerbaijan (and also in Iran; see Ebmer, 1978b: 44; Warncke, 1982: 111) and having a pale pubescence of the vertex and the dorsal surface of the mesosoma, were considered by Blüthgen (1934a: 152) a separate subspecies, *H. zonulus sinister*. (3) Ebmer (1998: 389) described a new subspecies, *L. zonulum euronotum*, on the basis of several females from southern China (Yunnan and Sichuan) differing from the typical form in a somewhat sparser punctuation of T1. My examination of an extensive material from different parts of the distributional range of the species has shown that the variability of both the abovementioned characters does not demonstrate a distinct geographical trend and is rather intrapopulational one.

Distribution. A Holarctic species, common in

cold and temperate zones; in Palaearctic Region nearly throughout, as far in the east as the south of Krasnoyarsk Terr. (**first record**), Irkutsk Prov., Buryatia (**first record**), and western China (Gansu, Yunnan, Sichuan; **first record**: Xinjiang).

Lasioglossum (Lophalictus) proximum (Smith, 1879)

Halictus proximus Smith, 1879: 31, ♀. Holotype: ♀, Japan: Hakodate (Hokkaido); BML.

Halictus discrepans Pérez, 1905: 36, ♀. Lectotype: ♀, Japan: Yokohama (Honshu); designated by Ebmer (1996: 272); MNP; examined. Synonymy by Ebmer (1996: 272).

Halictus moltrechti Cockerell, 1925: 2, 4 (key), ♀. Holotype: ♀, Russia: "Okeanskaja, Siberia" [Primorsk Terr., near Vladivostok]; USMW. Synonymy by Ebmer (1996: 272).

Halictus kraloffi Cockerell, 1925: 3, 4 (key), ♀. Holotype: ♀, Russia: "Kongaus, Siberia" [now Primorsk Terr.: Anisimovka]; USMW. Synonymy by Ebmer (1996: 272).

Halictus emelianoffi Cockerell, 1925: 7, ♂. Holotype: ♂, Russia: "Okeanskaja, Siberia" [Primorsk Terr., near Vladivostok]; USMW. Synonymy by Ebmer (1996: 272).

Lasioglossum (Lophalictus) acuticrista Pesenko, 1986: 126 (key), 144, Figs 1-6, ♀♂. Holotype: ♀, Russia: Lazovskii Nature Reserve (Primorsk Terr.); ZISP. Synonymy by Sakagami & Tadauchi (1995: 187) with reference to Ebmer's personal communication; see also Ebmer (1996: 273).

Taxonomy. Cockerell, 1909: 315; Blüthgen, 1925: 103; Pesenko, 1986: 126 (key), 144, Figs 1-6 (*L. acuticrista*); Sakagami & Maeta, 1990: Figs 4, 7, 12, 15, 17, 21; Sakagami & Tadauchi, 1995: Figs 38, 42, 43, 47; Ebmer, 1996: 272.

Published records. **Russia:** Khabarovsk Terr.: 20 km N Bikin (Ebmer, 1996: 273); Primorsk Terr.: Anisimovka, "Kedrovaya Pad" Nature Reserve, Lazo Nature Reserve (a number of localities), Sedanka near Vladivostok, Okeanskaya near Vladivostok, 24 km SE Slavyanka, Ussuri Nature Reserve (8 ♂, 31 ♀, holotype and paratypes of *L. acuticrista*; Pesenko, 1986: 148; Proshchalykin, 2004: 6, *L. acuticrista*), Okeanskaya [near Vladivostok] (Cockerell, 1925: 3, *Halictus moltrechti*; 1925: 7, *H. emelianoffi*), "Kongaus" [now Anisimovka] (Cockerell, 1925: 3, *H. kraloffi*), Litovka Mt. near Anisimovka, Slavyanka, Khasan, 30 km W Vladivostok, 40 km E Ussuriisk (Ebmer, 1996: 273); Kuril Islands: Kunashir: "Kotankesi" [now Alekhino] (1 ♀, paratype of *L. acuticrista*; Pesenko, 1986: 148; Proshchalykin, 2003: 7, *L. acuticrista*; 2004: 6). **China:** Shaanxi: 35 km NE Yanan (Ebmer, 1998: 403). **North Korea:** Kangwon Prov.: Kum-gangsan Mt. near Kuryong (Ebmer, 1996: 273). **Japan** (Hirashima, 1989: 681, localities in Japanese): Hokkaido (Sakagami & Fukuda, 1972: 4, localities in Japanese, *L. discrepans*): Hakodate (Smith, 1879: 31), Sapporo (Sakagami & Fukuda, 1973: 246, *L. discrepans*), Obihiro (Usui et al., 1976: 228; Ebmer, 1996: 273), Hamakoshimizu (Fukuda et al., 1973: 163, *L. discrepans*; Ebmer, 1996: 273), Uryu (Ebmer, 1996: 273); Honshu (Ikudome & Nakamura, 1996: 176, localities in Japanese): Yokohama (Pérez, 1905: 36; Ebmer, 1996: 273), Hiroshima Pref. (Ikudome & Nakamura, 1994: 7; 1997: 25), Fukui Pref. (Haneda, 1990: 4), Aomori Pref. (Yamada et

Table 2. Occurrence of *Lasioglossum* species in the Eastern Palaearctic Region

Species	Eastern Siberia	Russian Far East	Mongolia	Northern China	Eastern China	Korean Peninsula	Japan
<i>L. agelastum</i>	-	+	-	+	+	+	+
<i>L. alinense</i>	+	+	-	-	+	-	-
<i>L. chloropus</i>	+	-	+	-	-	-	-
<i>L. circularum</i>	-	-	-	+	+	-	-
<i>L. costulatum</i>	+	-	-	-	-	-	-
<i>L. denticolle</i>	+	+	-	+	+	+	-
<i>L. discum</i>	+	-	-	-	-	-	-
<i>L. ebmerianum</i>	-	-	-	-	-	-	+
<i>L. eos</i>	+	+	+	-	+	-	-
<i>L. exiliceps</i>	-	+	-	-	-	+	+
<i>L. fallax</i>	-	-	+	-	-	-	-
<i>L. formosae</i>	-	-	-	-	-	+	-
<i>L. harmandi</i>	-	+	-	-	-	-	+
<i>L. hummeli</i>	-	-	-	+	-	-	-
<i>L. jultschanicum</i>	-	-	-	+	-	-	-
<i>L. kansuense</i>	+	+	-	+	+	+	+
<i>L. leucozonium</i>	+	+	+	+	+	-	-
<i>L. leviventre</i>	-	+	-	-	-	-	+
<i>L. lisa</i>	-	-	-	+	+	-	-
<i>L. mutilum</i>	-	-	-	-	-	-	+
<i>L. niveocinctum</i>	-	-	+	+	-	-	-
<i>L. occidens</i>	-	+	-	+	+	+	+
<i>L. ochreohirtum</i>	-	-	-	+	+	-	-
<i>L. primavera</i>	-	-	-	-	-	-	+
<i>L. proximatum</i>	-	+	-	-	+	+	+
<i>L. pseudofallax</i>	-	-	+	-	-	-	-
<i>L. rachifer</i>	-	-	-	-	+	-	-
<i>L. rostratum</i>	+	+	+	+	+	-	-
<i>L. scitulum</i>	-	+	-	+	+	+	+
<i>L. subopacum</i>	-	-	-	+	+	-	-
<i>L. sutshanicum</i>	-	+	-	-	-	+	-
<i>L. tessaranotatum</i>	-	-	-	+	-	-	-
<i>L. tungusicum</i>	+	+	+	+	-	-	-
<i>L. upinense</i>	-	+	-	+	+	+	-
<i>L. verae</i>	-	-	+	-	-	-	-
<i>L. xanthopus</i>	-	-	+	-	-	-	-
<i>L. zeyanense</i>	+	+	-	+	+	-	-
<i>L. zonulum</i>	+	-	-	-	-	-	-
Total	12	17	10	18	17	10	11

al., 1990: 37; Ebmer, 1996: 273); Ishikawa Pref. (Negoro, 1997: 10), Gfōnokawa (Ikudome & Nakamura, 1995: 52, *L. discrepans*), Gifu (Ebmer, 1996: 273); Shikoku: Kfōchi Plain (Ikudome, 1978: 520, 522; 1981: 161, *L. discrepans*; Ebmer, 1996: 273), Tosayama-Mura (Ikudome, 1979: 419; 1983: 141, *L. discrepans*); Kyushu: Setaura (Iwata, 1997: 640, *L. discrepans*).

Additional material examined (14 ♂, 26 ♀; IZB, ZISP). **Russia:** Amur Prov.: Klimoutsy; Primorsk Terr.: Putsilovka, 25 km SW Slavyanka, Spassk, 20 km NW Spassk,

20 km SSE Spassk, 20 km SE Ussuriisk. **China:** Liaoning, Beijing, and Hebei.

Distribution. A Southeastern Palaearctic and Northern Oriental species. Southern Far East of Russia (Khabarovsk and Primorsk Terr., Kunashir Island; **first record:** Amur Prov.), North Korea, southern and eastern China (Shanxi, Xizang; **first records:** Sichuan, Liaoning, Beijing, Hebei, Fujian, Hubei, Zhejiang, and Jiangsu), and

Japan (Hokkaido, Honshu, Shikoku, Kyushu, and Okinawa).

Lasioglossum* (*Warnckenia*) *tessarannotatum
Ebmer, 1998

Lasioglossum (*Lasioglossum*) *tessarannotatum* Ebmer, 1998: 405, Figs 51-53. ♀. Holotype: ♀, China: Ganguyi (Shaanxi); OLML.

The species is known only from the type series.

Lasioglossum* (subgenus ?) *primavera
Sakagami & Maeta, 1990

Lasioglossum (*Lasioglossum*) *primavera* Sakagami & Maeta, 1990: 52, Figs 1, 2, 5, 8, 10, 13, 16, 18, 19, 39, 44-46, ♀♂. Holotype: ♂, Japan: Mori Koshoku (Nagano Pref., Honshu); KUF.

Taxonomy. Sakagami & Tadauchi, 1995: 189, Figs 44-46.

Published records. **Japan:** Honshu: Nagano, Aomori, Ishikawa, Fukui, Kanagawa, Shimane Pref. (Sakagami & Maeta, 1990: 57), Ishikawa Pref. (Negoro, 1997: 10), and Hiroshima Pref. (Nakamura & Haneda, 1999: 28).

Distribution. Japan (Honshu).

Discussion: distributional patterns

The Eastern Palaearctic fauna of the genus *Lasioglossum* is the richest among all other genera of Halictinae, except for *Evylaeus*. It consists of 38 species, i.e. more than a third of the Palaearctic fauna of the genus. The genus *Lasioglossum* is represented in the Eastern Palaearctic Region by diverse zoogeographical (chorological) elements, i.e. species having very different geographical ranges:

Holarctic polyzonal (2 species), *L. leucozonium* and *L. zonulum* (only penetrating to the west of the Eastern Palaearctic Region);

Western Palaearctic, only penetrating to the west of the Eastern Palaearctic Region (10), *L. costulatum*, *L. chloropus*, *L. discum*, *L. fallax*, *L. jultschanicum*, *L. niveocinctum*, *L. pseudofallax*, *L. tungusicum*, *L. verae*, and *L. xanthopus*;

Oriental or Northern Oriental, only penetrating to the south of the Eastern Palaearctic Region (5), *L. circularum*, *L. formosae*, *L. occidens*, *L. ochreohirtum*, and *L. subopacum*;

Endemic or subendemic to the Southeastern Palaearctic Region (17), *L. agelastum*, *L. alinense* (recorded also from Lithuania and Byelarus), *L. eos*, *L. denticolle*, *L. exiliceps*, *L. hummeli*, *L. kansuense*, *L. leviventre*, *L. lisa*, *L. proximatatum*, *L. rachifer*, *L. rostratum* (also occurring in Western Siberia and Urals), *L. scitulium*, *L. sutshanicum*, *L. tessarannotatum*, *L. upinense*, and *L. zeyanense*;

Endemic to Japanese Islands or also to southern Kurils (4), *L. ebmerianum*, *L. harmandi*, *L. mutilum*, and *L. primavera*.

Thus, the majority of species (28 species, 73.7% of the fauna) are endemic or subendemic to the Southeastern Palaearctic and Northern Oriental Regions.

The occurrence of *Lasioglossum* species in different countries and parts of the Eastern Palaearctic Region, according to available data, is given in Table 2 above. The fauna of northern China includes the most number of species (18), the faunas of Mongolia and Korean Peninsula are the poorest (10 species in each).

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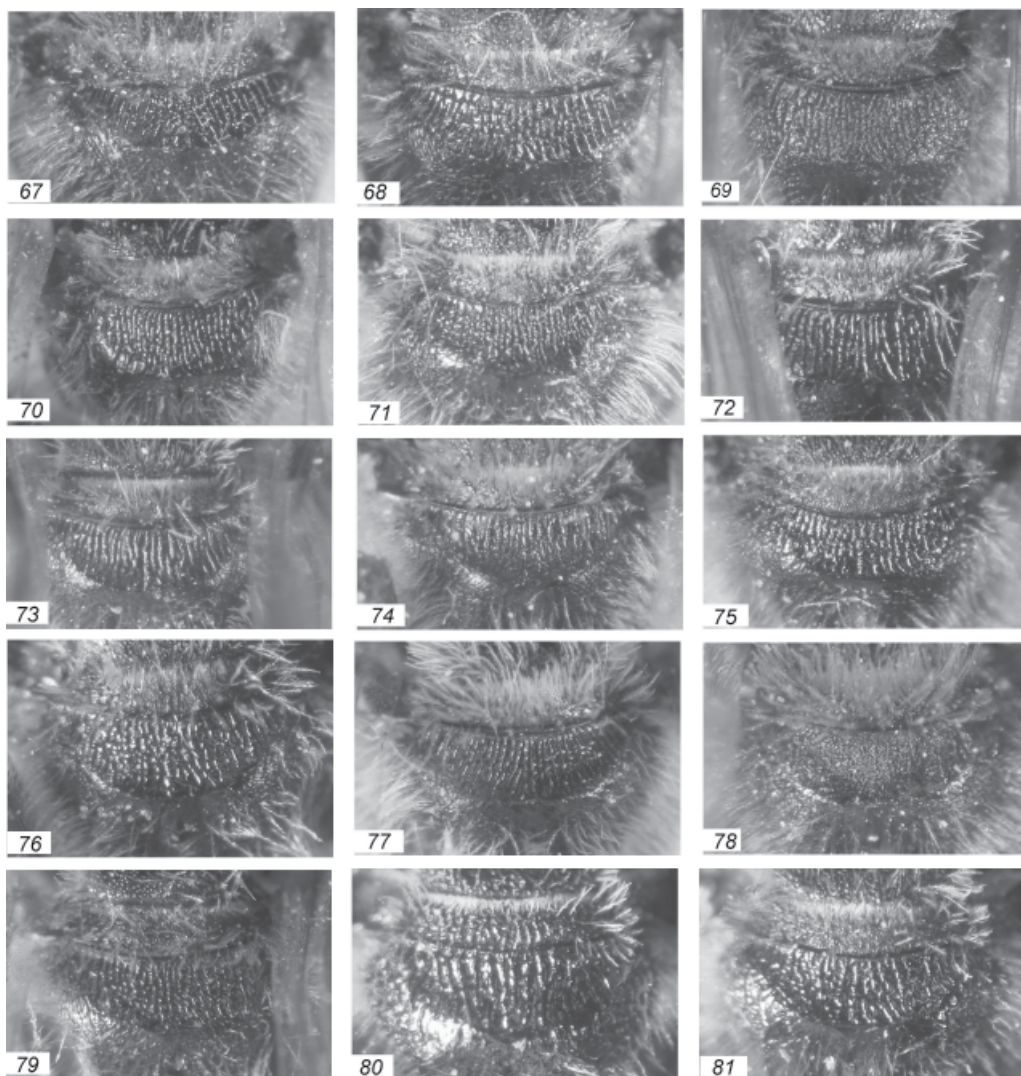
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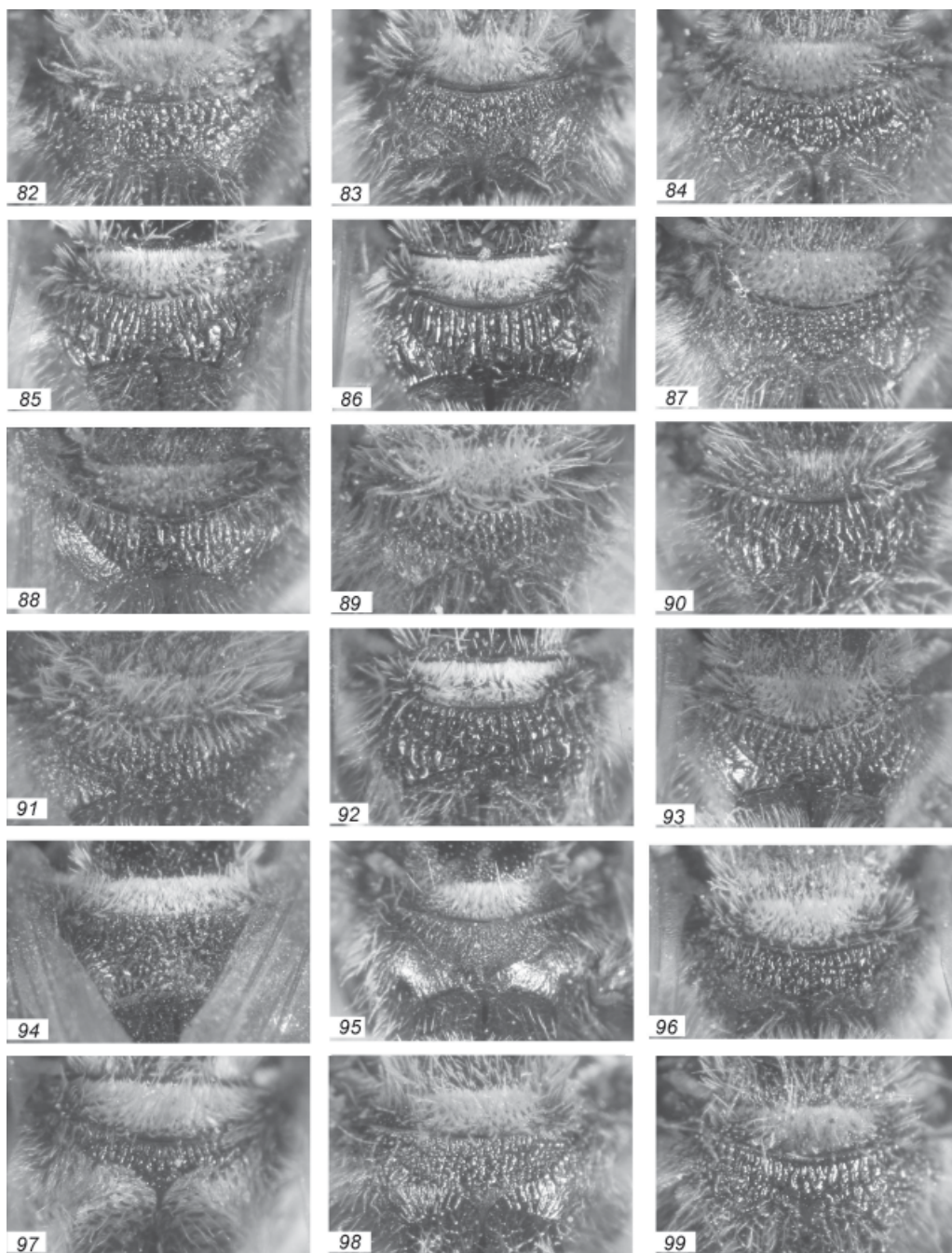
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Figs 67-81. Metapostnotum of *Lasioglossum* females: subgenera *Lasioglossum*, *Ebmeria*, and *Lophalictus*. **67**, *L. chloropus*; **68**, *L. eos*; **69**, *L. exiliceps*; **70**, *L. fallax melanarium*; **71**, *L. jultschanicum*; **72**, *L. leviventre*; **73**, *L. lisa*; **74**, *L. ochreohirtum*; **75**, *L. sutshanicum* (paratype); **76**, *L. tungusicum*; **77**, *L. verae* (paratype); **78**, *L. xanthopus*; **79**, *L. zeyanense* (paratype); **80**, *L. costulatum*; **81**, *L. proximatum*.



Figs 82-99. Metapostnotum of *Lasioglossum* females: subgenus *Leuchalictus*. **82,** *L. agelastum*; **83,** *L. alinense*; **84,** *L. circularum*; **85,** *L. denticolle*; **86,** *L. discum*; **87,** *L. formosae*; **88,** *L. harmandi*; **89,** *L. kansuense*; **90,** *L. leucozonium*; **91,** *L. mutilum*; **92,** *L. niveocinctum*; **93,** *L. occidens*; **94,** *L. rachifer*; **95,** *L. rostratum*; **96,** *L. scitulum*; **97,** *L. subopacum*; **98,** *L. upinense*; **99,** *L. zonulum*.