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CONTRIBUTIONS TO THE HALICTID FAUNA OF THE EASTERN PALAEARCTIC REGION: SUBFAMILY NOMIINAE (HYMENOPTERA: HALICTIDAE)

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A total of nine species of the subfamily were found in the Eastern Palearctic Region: *Lipotriches fruhstorferi* (Pérez), *L. esakii* (Hirashima), *L. yasumatsui* (Hirashima) (with two subspecies), *Nomia chalybeata* Smith, *N. punctulata* Dalla Torre, *Nomiapis diversipes* (Latreille), *N. femoralis* (Pallas), *N. fugax* (Morawitz), and *N. mandschurica* (Hedicke). A key to all of them is given. An annotated list of the species includes data for each of species on its synonymy, general geographical distribution, published records from the Eastern Palearctic Region, and the material examined. The lectotypes of two nominal species are designated: *Andrena brevitarsis* Eversmann, 1852 and *Nomia fugax* Morawitz, 1877. *Lipotriches fruhstorferi*, *Nomiapis diversipes*, *N. femoralis*, and *N. mandschurica* are recorded for the first from Mongolia; *Lipotriches esakii* and *L. yasumatsui*, from Viet Nam.

KEY WORDS: Halictidae, Nomiinae, Eastern Palearctic Region, taxonomy, key, distribution.

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Всего в Восточной Палеарктике выявлено 9 видов подсемейства: *Lipotriches fruhstorferi* (Pérez), *L. esakii* (Hirashima), *L. yasumatsui* (Hirashima) (с 2 подвидами), *Nomia chalybeata* Smith, *N. punctulata* Dalla Torre, *Nomiapis diversipes* (Latreille), *N. femoralis* (Pallas), *N. fugax* (Morawitz) и *N. mandschurica* (Hedicke). Для всех этих видов составлена определительная таблица. Аннотированный список видов

включает данные об их синонимии, общем географическом распространении, опубликованные сведения о встречаемости в Восточной Палеарктике и исследованный материал. Обозначены лектотипы 2 номинальных видов: *Andrena brevitarsis* Eversmann, 1852 и *Nomia fugax* Morawitz, 1877. Впервые для Монголии указывается *Lipotriches fruhstorferi*, *Nomiapis diversipes*, *N. femoralis* и *N. mandschurica*; впервые для Вьетнама – *Lipotriches esakii* и *L. yasumatsui*.

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INTRODUCTION

The subfamily Nomiinae is nearly cosmopolitan group of bees (absent in South America). It comprises about 500 species. For a long time, all species of the subfamily were considered to be belonging to a single genus, *Nomia* Latreille. This genus has been subdivided into several genera as a result of a number of regional revisions: Japan (Hirashima, 1961), Western Palaearctic Region (Warncke, 1976), and Africa (Pauly, 1990, 1991). In accordance with the classification by Michener (2000), the subfamily includes 11 genera. We accept also *Nomiapis* Cockerell as a separate genus after Baker (2002). The Nomiinae is a sister group in relation to Nomioidinae and Halictinae combined (Pesenko, 2000). Nomiines inhabit mostly arid and semi-arid zones. Members of the subfamily are abundant in deserts, subtropics and tropics of the Old World. They are relatively poor represented in the Holarctic Region. In the Palaearctic Region, 65 species are recorded; they belong to 4 genera: *Lipotriches* Gerstaecker, 1858; *Nomia* Latreille, 1804; *Nomiapis* Cockerell, 1919; and *Pseudapis* W. F. Kirby, 1900.

All species of the subfamily make nests; there are no cleptoparasitic forms. All species, well studied in relation their biology, are solitary (sometimes subsocial). They nest in the ground, usually on exposed warm dry areas. Females of many species form communal nests. Lateral furrows, containing cells at the end, are very short. Lower and lateral blend furrows are usually absent. Cells are horizontal or slightly inclined; they usually form comb-like groups. The inner surface of cell walls are polished and covered with hydrophobic secretory lining. Larvae do not make cocoons. The hibernating phase is prepupa.

Only the following nine species of the subfamily Nomiinae can be considered inhabitants of the Eastern Palaearctic Region (as defined in the first paper of the series; see Pesenko, 2005): *Lipotriches fruhstorferi* (Pérez), *L. esakii* (Hirashima), *L. yasumatsui* (Hirashima) (with 2 subspecies), *Nomia chalybeata* Smith, *N. punctulata* Dalla Torre, *Nomiapis diversipes* (Latreille), *N. femoralis* (Pallas), *N. fugax* (Morawitz), and *N. mandschurica* (Hedicke).

The paper presents the results of the taxonomic study of the bees of the subfamily Nomiinae mostly deposited at the Zoological Institute of the Russian Academy of Sciences (St. Petersburg) and Institute Biology and Soil Science of the Russian Academy of Sciences (Vladivostok). The lectotypes of two nominal species are designated: *Andrena brevitarsis* Eversmann, 1852 and *Nomia fugax* Morawitz, 1877. *Lipotriches fruhstorferi*, *Nomiapis diversipes*, *N. femoralis*, and *N. mandschurica* are recorded for the first time from Mongolia; *Lipotriches esakii* and *L. yasumatsui*, from Viet Nam.

The information on the occurrence of the species in the Eastern Palaearctic Region contains in the following publications arranged in the chronological order:

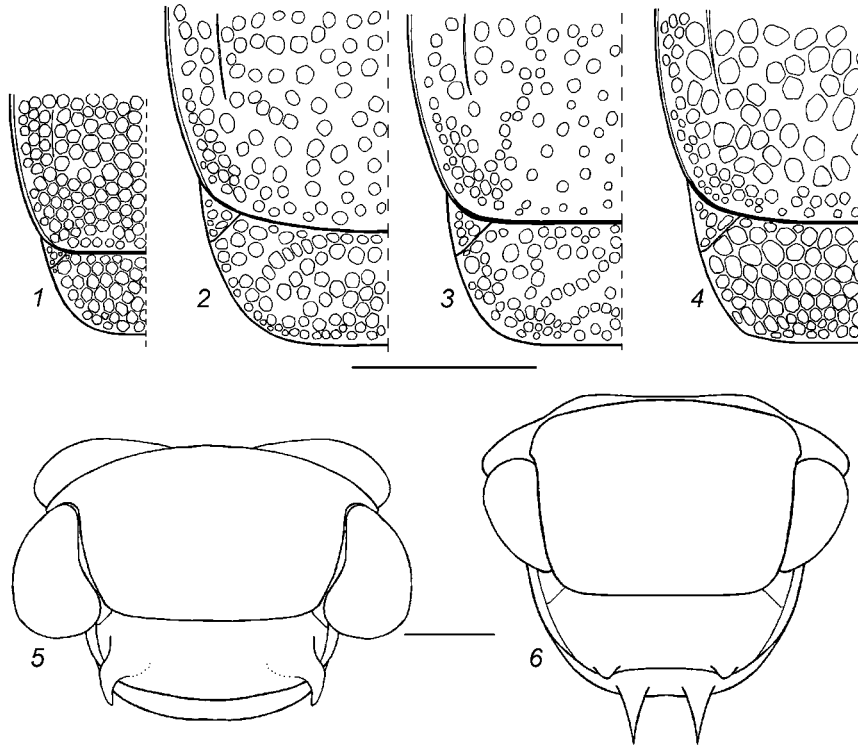
- Sickmann, 1894 (*Nomia chalybeata* from northeastern China);
 Friese, 1897 (*Nomia chalybeata* and *N. punctulata* from northeastern China);
 Perez, 1905 (*Lipotriches fruhstorferi* from Japan);
 Yasumatsu, 1934 (“*Nomia punctata*” = *N. punctulata* from Japan);
 Yasumatsu & Narisada, 1935 (“*Nomia punctata*” = *N. punctulata* from northeastern China);
 Yasumatsu, 1937 (“*Nomia punctata*” = *N. punctulata* from Japan);
 Yasumatsu, 1938 (“*Nomia punctata*” = *N. punctulata* from Japan);
 Okabe, 1939 (*Nomiapis mandschurica* from northeastern China);
 Hedicke, 1940 (*Nomiapis mandschurica* from northeastern China);
 Yasumatsu, 1946 (“*Nomia punctata*” = *N. punctulata* and *N. chalybeata* from northeastern China);
 Hirashima, 1961 (*Lipotriches fruhstorferi*, *L. esakii*, *L. yasumatsui*, *Nomia punctulata*, and *Nomiapis mandschurica* from Japan, China and Korean Peninsula);
 Warncke, 1976 (*Nomiapis femoralis* from eastern Siberia);
 Ebmer, 1978 (*Lipotriches fruhstorferi* and *L. yasumatsui* from northeastern China);
 Ikudome, 1978 (*Nomia punctulata* from Japan);
 Ikudome, 1981 (*Nomia punctulata* from Japan);
 Ikudome, 1992 (*Lipotriches fruhstorferi*, *L. yasumatsui*, *Nomia punctulata*, and *Nomiapis mandschurica* from Japan);
 Ikudome & Nakamura, 1994 (*Nomia punctulata* from Japan);
 Ikudome & Hirashima, 1995 (*Lipotriches yasumatsui* from Japan);
 Ikudome & Nakamura, 1996 (*Nomia punctulata* from Japan);
 Ikudome & Nakamura, 1997 (*Lipotriches yasumatsui* and *Nomia punctulata* from Japan);
 Iwata, 1997 (*Lipotriches fruhstorferi*, *L. yasumatsui*, and *Nomia punctulata* from Japan);
 Proshchalykin, 2004 (*Lipotriches fruhstorferi* and *Nomiapis mandschurica* from the south of Russian Far East).

The following abbreviations are used in the text for indication of museums and institutions as depositaries for types and other material examined.

- BML** – British Museum of Natural History, London, UK;
IBSV – Institute of Biology and Soil Sciences, Russian Academy of Sciences, Vladivostok, Russia;
KUF – Kyushu University, Fukuoka, Japan;
MNB – Museum für Naturkunde an der Humboldt Universität zu Berlin, Germany;
MNP – Muséum National d’Histoire Naturelle, Paris, France;
ZISP – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia;
ZSM – Zoologische Staatssammlung, München, Germany.

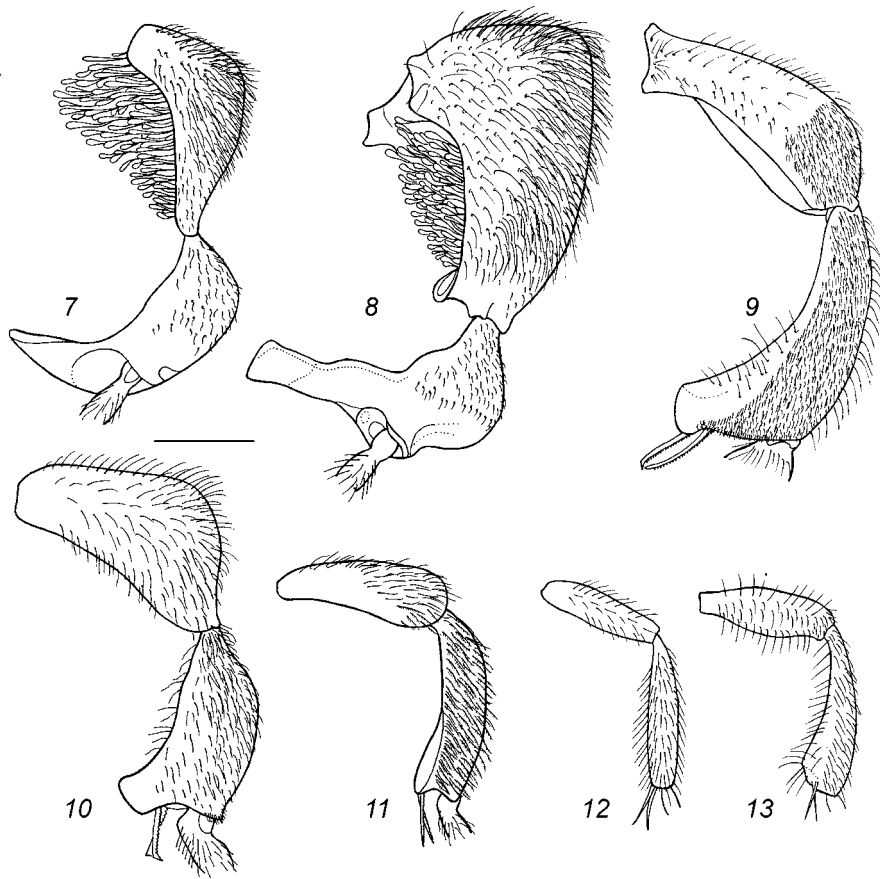
A KEY TO THE EASTERN PALAEARCTIC SPECIES

1. ♂ ♀: tegula strongly enlarged (Fig. 5); pronotum with lateral wing-like lamellae (Fig. 5); preoccipital carina well developed; metasomal terga on posterior areas hyaline, without band of pale appressed hairs. ♂: hind tibia without spur; S8 with small rounded incision in middle of posterior margin; upper gonostylus a wide semi-hyaline membranous plate, pubescent with thin, nearly inconspicuous hairs, clearly distinct from gonocoxite (Fig. 25–28). (Genus *Nomiapis* Cockerell, 1919) 2



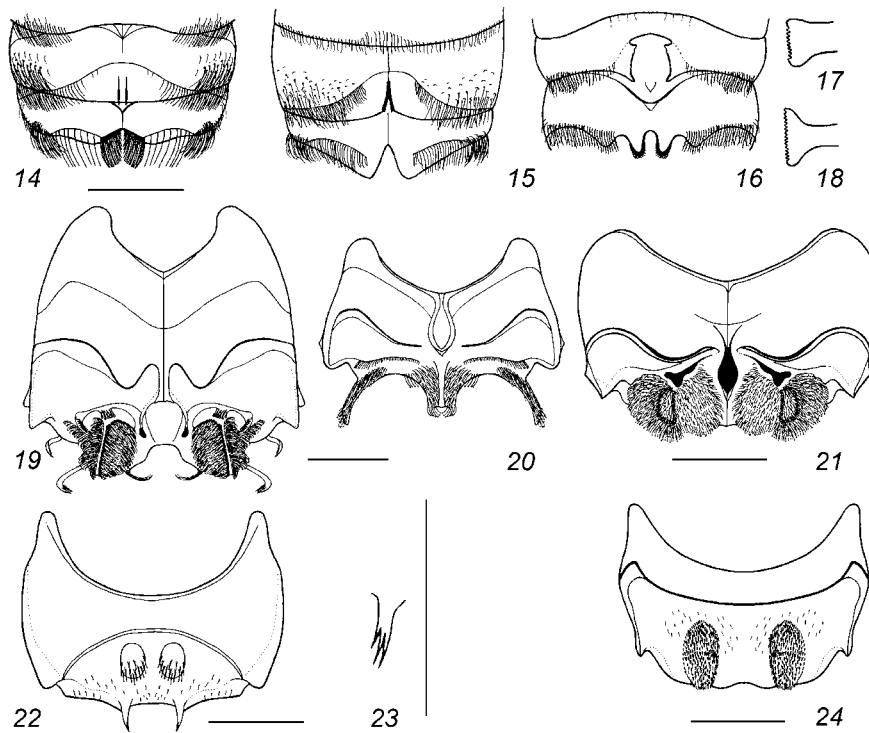
Figs 1–6. 1) *Nomiapis diversipes*; 2) *N. femoralis*; 3, 5) *N. fugax*; 4) *N. mandshurica*; 6) *Nomia punctulata*. 1-4) posterior half of mesoscutum and scutellum (left half); 5, 6) mesosoma (without propodeum), dorsal view; 1-4) ♀; 5, 6) ♂. Scale bars = 1 mm

- ♂ ♀: tegula usual (Fig. 6); pronotum without lateral wing-like lamellae, but sometimes with continuous transverse carina near posterior margin; preoccipital carina absent; metasomal terga on posterior areas brightly enamel-like coloured or, at least, in ♀ with band of pale appressed hairs. ♂: hind tibia with spur; S8 with finger-shaped process in middle of posterior margin; upper gonostylus of other structure, frequently fused to gonocoxite 5
- 2. ♂ ♀: vertex about 1.5 times as long as ocellus diameter. ♂: distal enlargement of hind tibia acute-angled, pointed at apex (Fig. 7); S4 straight along posterior margin, in middle with 2 closely placed, longitudinal thickenings (Fig. 14); gonostyli and distal part of gonocoxite as in Fig. 25. ♀: mesoscutum on posterior half denser punctate (< 0.3). Body length 8–10 mm. – ♀: mesoscutum and scutellum on entire surface coarsely and densely (< 0.3) punctate mostly by hexahedral punctures (Fig. 1) 6. *N. diversipes*



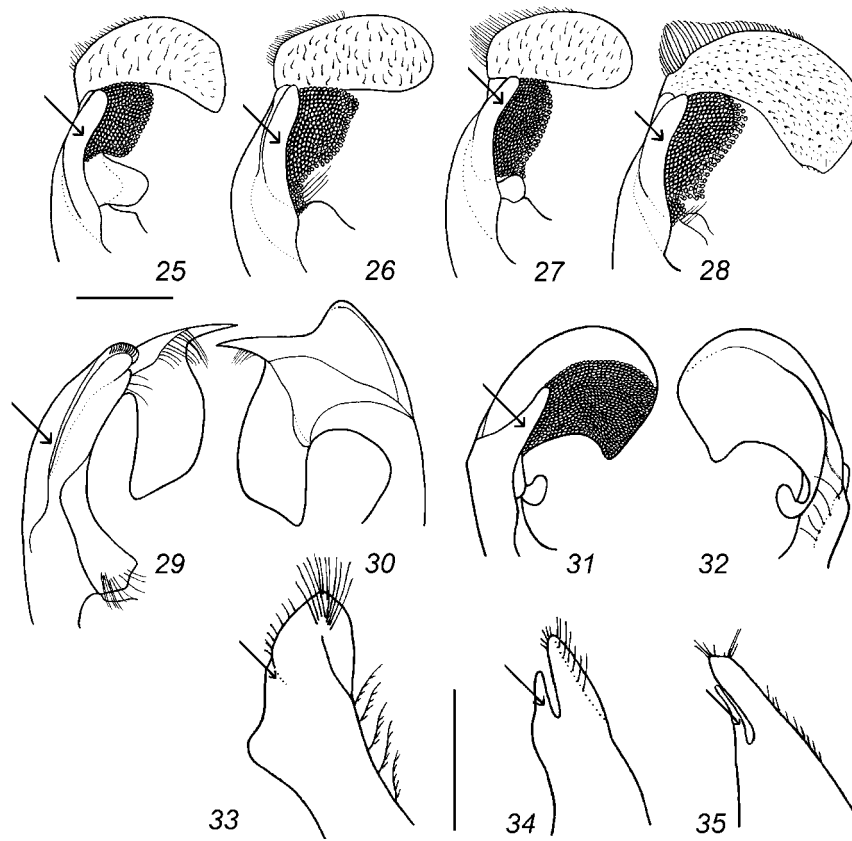
Figs 7-13. 7) *Nomiapis diversipes*; 8) *N. femoralis*; 9) *Nomia chalybeata*; 10) *N. punctulata*; 11) *Lipotriches fruhstorferi*; 12) *L. esakii*; 13) *L. yasumatsui*. 7-13) hind femur and tibia of male, lateral view. Scale bars = 1 mm

- ♂ ♀: vertex twice as long as ocellus diameter. ♂: distal enlargement of hind tibia a plate truncate at right angle (Fig. 8); S4 deeply emarginate in middle of posterior margin. ♀: mesoscutum on posterior half sparser punctate (≥ 1.0 , i.e. interspaces as large as or more than puncture diameters) 3
- 3. ♂ ♀: vertex rounded along posterior margin, without carina. ♂: middle and hind tarsi light brown or brown-yellow; S4 and S5 narrowly triangularly emarginated in middle of posterior margins (Fig. 15); gonostyli and distal part of gonocoxite as in Fig. 27. ♀: clypeus nearly 3 times as wide as high; mesoscutum near anterior margin with short scale-like semi-erect hairs, on posterior half sparsely punctate (to 3-5) by rounded punctures (Fig. 3). Body length 9-11 mm 8. *N. fugax*



Figs 14-24. 14) *Nomiapis diversipes*; 15) *N. fugax*; 16, 17) *N. mandshurica*; 18) *N. femoralis*; 19) *Nomia chalybeata*; 20) *N. punctulata*; 21) *Lipotriches fruhstorferi*; 22, 23) *L. esakii*; 24) *L. yasumatsui*. 14-16) S4, S5 of σ , ventral view; 17, 18) lamellar process of S4 of σ , lateral view; 19-22, 24) S5 of σ , ventral view; 23) dentate process of S5 of σ , lateral view. Scale bars = 1 mm

- σ φ : vertex with sharp carina along posterior margin. σ : middle and hind tarsi brown or rusty-brown; S4 in middle of posterior margin with wide emargination provided on each side with dentate process (Fig. 16); S5 in middle of posterior margin with 2 rounded teeth (Fig. 16). φ : clypeus twice or less as wide as high; mesoscutum near anterior margin only with usual erect hairs, on posterior half more densely punctate (≤ 3) 4
- 4. σ : scutellum without lateral teeth, only with small prominences; lamellar processes of S4 slightly broadened toward apex (Fig. 17); gonostyli and distal part of gonocoxite as in Fig. 28; body length 10–11 mm. φ : mesoscutum (on posterior half < 1.0) and scutellum (< 0.3) densely punctate by large (up to 140 μm on posterior half of mesoscutum), deep, angulated or nearly hexahedral punctures (Fig. 4); mesoscutum near anterior margin densely pubescent; body length 9–11 mm 9. *N. mandshurica*



Figs 25-35, ♂. 25) *Nomiapis diversipes*; 26) *N. femoralis*; 27) *N. fugax*; 28) *N. mandschurica*; 29, 30) *Nomia chalybeata*; 31, 32) *N. punctulata*; 33) *Lipotriches fruhstorferi*; 34) *L. esakii*; 35) *L. yasumatsui*. 25-29, 31) gonostyli and distal part of gonocoxite, ventral view; 30) upper gonostylus, posterodorsal view; 32) upper gonostylus and distal part of gonocoxite, dorsal view; 33-35) gonostyli and distal part of gonocoxite, lateral view. Lower gonostylus marked by arrow. Scale bars = 0.5 mm

- ♂: scutellum with lateral teeth; lamellar processes of S4 strongly broadened toward apex (Fig. 18); gonostyli and distal part of gonocoxite as in Fig. 26; body length 10–11 mm. ♀: mesoscutum (on posterior half 1.5–3.0) and scutellum (to 1.0) more sparsely punctate by not so large (< 100 μm), less deep, angulated or rounded punctures (Fig. 2); mesoscutum near anterior margin sparsely pubescent; body length 9–11 mm 7. *N. femoralis*

5. ♂ ♀: larger, body length 10–12 mm; outer spur of hind tibia curved near apex, provided with a single small tooth at bend, directed along main axis of the spur; metasomal terga on posterior areas brightly enamel-like coloured, impunctate, hairless. ♂: upper gonostylus wide, directed backward. (Genus *Nomia* Latreille, 1804) 6
- ♂ ♀: smaller, body length 7.0–9.5 mm; outer spur of hind tibia usual, not curved near apex; metasomal terga on posterior areas dark, with bands of appressed pale hairs, or (in ♂ of *L. fruhstorferi*) hyaline, and without hair bands. ♂: upper gonostylus relatively narrow, curved mesad. (Genus *Lipotriches* Gerstaecker, 1858)..... 7
6. ♂ ♀: clypeus without lateral carinae; metanotum without processes; metasoma with metallic blue-violet tint more strong on T1–T3. ♂: scutellum without teeth.
- ♂ ♀: body length 11–12 mm; clypeus and supraclypeal area slightly convex; mesoscutum and scutellum covered with pale erect hairs; dorsal part of metapostnotum smooth or slightly granulate, without striae; T2–T4 on posterior areas brightly enamel-like coloured: green, blue-green or sometimes on last terga green-yellow; yellow-green or blue-green in ♀. ♂: inclined part of metapostnotum shiny; hind tibia with off-yellow trapezoidal distal enlargement bearing 2 spurs (Fig. 9); S5 as in Fig. 19; upper gonostylus complicatedly emarginate, without bristles on lower surface (Fig. 29, 30) 4. *N. (Acunomia) chalybeata*
- ♂ ♀: clypeus with distinct longitudinal lateral carinae; metanotum with 2 wide, triangularly tapered, lamellar processes (Fig. 6), those jointed at bases in ♀; metasoma without metallic tint. ♂: scutellum with very small, blunt lateral teeth (Fig. 6). – ♂ ♀: body length 10–11 mm; scutellum densely punctate (mostly < 1.0); T1 and T2 on discs distinctly punctate by deep punctures; T2–T4 on posterior areas brightly enamel-like coloured: pale blue, pale blue-green or sometimes yellow-green in ♂; light green or yellow-green in ♀. ♂: hind tibia with square distal enlargement, provided with 2 spurs (Fig. 10); S5 as in Fig. 20; upper gonostylus wide, leaf-shaped, bearing dense short hook-like bristles on lower surface (Figs. 31, 32) 5. *N. (Hoplonomia) punctulata*
7. ♂ ♀: pronotum without transverse carina near posterior margin; anterior part of mesoscutum cloping toward concave pronotum; hind tibia covered with plumose hairs. ♂: metasoma elliptical; T1 wider than long; lower gonostylus nearly inconspicuous, separated from upper one by slight narrow chink (Fig. 33). – ♂ ♀: body black; body length 7–9 mm; vertex 1.5 times as long as ocellus diameter; mesoscutum and scutellum very finely (about 25 µm), densely (< 0.5) and deeply punctate; interspaces shiny; spurs of hind tibia pectinate. ♂: T1–T5 on posterior areas hyaline, without bands of pale appressed hairs; hind femur slightly broadened in distal end, but not forming process (Fig. 11). S5 as in Fig. 21. ♀: T1 with posterior lateral spots, T2–T5 with posterior bands of appressed white or yellowish scale-like hairs; band of T2 sometimes interrupted medially 1. *L. (Austronomia) fruhstorferi*

- ♂ ♀: pronotum with continuous transverse carina near posterior margin situated at level of mesoscutum; mesoscutum not inclined downward; hind tibia covered with simple hairs. ♂: metasoma slender, narrowed at anterior end; T1 longer than wide; lower gonostylus distinct, separated from upper one by deep notch 8
- 8. ♂ ♀: vertex with sharp carina along posterior margin; T1 and T2 red, reddish-brown or dark brown; body length 8–9 mm. ♂: hind tibiae slender, not dilated distally (Fig. 12); S5 with a pair of large tubercles basally with setae, and with a pair small broadly separated tridentate processes (seen in lateral view) at posterior margin (Figs. 22, 23); lower gonostylus separated from upper one less deep notch (Fig. 34). ♀: metasoma elliptical 2. *L. (Lipotriches) esakii*
- ♂ ♀: vertex rounded along posterior margin; metasomal terga blackish or piceous. ♂: hind tibia dilated distally (Fig. 13); S5 without tubercles and processes, with a pair of large, longitudinal tufts of dense, erect, brownish hairs (Fig. 24); lower gonostylus separated from upper one more deep notch (Fig. 35). ♀: metasoma tapering toward anterior end. (*L. yasumatsui*) 9
- 9. ♂ ♀: tegula deep brown. ♂: flagellum black, obscurely reddened on lower side; scutellum moderately to strongly convex, densely punctate; middle basitarsus sometimes pale in distal part; body length 8 mm. ♀: flagellum narrow ferruginous on lower side, broadly darkened on upper side; body length 8.5–9.5 mm 3a. *L. (Lipotriches) yasumatsui yasumatsui*
- ♂ ♀: tegula ferruginous subhyaline; body length 9.0 mm. ♂: flagellum ferruginous; scutellum more strongly convex, sparsely punctate, shiny on interspaces; middle basitarsus broadly pale or whitish excepting distal end. ♀: flagellum more broadly ferruginous 3b. *L. (Lipotriches) yasumatsui koreana*

AN ANNOTATED LIST OF THE EASTERN PALAEARCTIC SPECIES

1. *Lipotriches (Austronomia) fruhstorferi* (Pérez, 1905)

Nomia fruhstorferi Pérez, 1905: 37. ♀. Lectotype: ♀, Japan: «Tsushima»; designated by Ebmer (1978: 213); MNP.

TAXONOMY. Hirashima, 1961: 282, Fig. 53; 1978: 91, Fig. 1; Ebmer, 1978: 213, Abb. 18–20 (♂).

PUBLISHED RECORDS. Pérez (1905: 37): **Japan**: Tsushima Islands (no locality). Hirashima (1961: 283): **Japan**: Honshu (Karuizawa), Kyushu (Kirishima Mt.), Tsushima (Ariake Mt., Tsutsu). Ebmer (1978: 213): **China**: Heilongjiang (Harbin). Ikudome (1992: 133): **Japan**: Kyushu (Kagoshima). Iwata (1997: 640): **Japan**: Kyushu (Setaura). Proshchalykin (2004: 7): **Russia**: south of Far East (Amur Province, Khabarovsk and Primorskii Territories; no localities).

MATERIAL EXAMINED (122♂, 59♀). **Russia**: Far East: Jewish Autonomous Province (Amurzet, Obluch'ye); Amur Province (Area between Malaya Pera and Bolshoi Ergel Rivers; Arkhara; Klimoutsy; Korsakovo-on-Amur, 100 km W Svobodnyi; Kundur; Leninskii, Svobodnyi); Primorskii Territory (Andreevka; Kamen-Rybolov;

Khasan; Lazo; Novokachalinsk; Pokrovka; Pos'et; Preobrazhenie Bay; Slavyanka; Spassk; Ussuriisk; Vladivostok). **Mongolia**: Dornod (Bayan-gol; Derhin-pagan-obo, 60 km ENE Bayan-burda; Dzavasar-bulak; Numreg-in-gol, SE Salhit Mt.; 75 km WSW Salhit Mt.). **China**: Liaoning (Mukden [Sheniang]).

DISTRIBUTION. A southeastern Palaearctic species. South of Russian Far East, eastern Mongolia (new record), northeastern China, Japan (Honshu, Kyushu, Tsushima).

2. *Lipotriches (Lipotriches) esakii* (Hirashima, 1961)

Rhopalomesa esakii Hirashima, 1961: 257, Figs. 15–25. ♂ ♀. Holotype: ♂, Japan: Kashii (Kyushu); KUF.

TAXONOMY. Wu, 1985: 58 (key).

PUBLISHED RECORDS. Hirashima (1961: 262): **Japan**: Kyushu (Abura-yama; Kashii; Kunimi-yama); **Korean Peninsula** [Kaya Mt.; Risen; Suigen (Suwon)].

MATERIAL EXAMINED (2♂, 1♀). **China**: Liaoning (Mukden [Sheniang]).

DISTRIBUTION. A southeastern Palaearctic and northern Oriental species. China (Liaoning; Xizang, Yunnan), Korean Peninsula, Japan (Kyushu), Viet Nam (first record; Hanoi, 2♂), Taiwan.

3. *Lipotriches (Lipotriches) yasumatsui* (Hirashima, 1961)

DISTRIBUTION. A southeastern Palaearctic and northern Oriental species. It is considered to be consisting of 2 subspecies: Japanese ssp. *yasumatsui* and continental ssp. *koreana* (see below).

3a. *Lipotriches (Lipotriches) yasumatsui yasumatsui* (Hirashima, 1961)

Rhopalomesa yasumatsui yasumatsui Hirashima, 1961: 263, Figs. 26–34. ♂ ♀. Holotype: ♂, Japan: Wajiro (Kyushu), KUF.

TAXONOMY. Wu, 1985: 58 (key).

PUBLISHED RECORDS. Hirashima (1961: 268): **Japan**: Honshu (Koma Mt.; Kurobe; Mitake Mt.); Kyushu (Wajiro, Kashii). Ikudome (1992: 133): **Japan**: Kyushu (Kagoshima). Ikudome & Hirashima (1995: 65): **Japan**: Kyushu (Higashimotokata). Ikudome & Nakamura (1997: 20): **Japan**: Honshu (Hiroshima Prefecture). Iwata (1997: 640): **Japan**: Kyushu (Setaura).

DISTRIBUTION. Japan (Honshu, Kyushu, Okinawa), Viet Nam (first record; Cao Phong, 1♂).

3b. *Lipotriches (Lipotriches) yasumatsui koreana* (Hirashima, 1961)

Rhopalomesa yasumatsui koreana Hirashima, 1961: 269. ♂ ♀. Holotype: ♂, Korean Peninsula: Suigen (Suwon); KUF.

PUBLISHED RECORDS. Hirashima (1961: 269): **Korean Peninsula** [Suigen (Suwon)]. Ebmer (1978: 213): **China**: Heilongjiang (Harbin).
DISTRIBUTION. China; Korean Peninsula.

4. *Nomia (Acunomia) chalybeata* Smith, 1875

Nomia chalybeata Smith, 1875: 59. Fig. 5 on pl. 2, ♀ ♂. Syntypes: "Shanghai, N. China"; BML.

TAXONOMY. Friese, 1897: 50 (key), 52 (key), 71; Cockerell, 1931: 8 (key); Michener, 1965: 154; Pauly, 1990, 261.

PUBLISHED RECORDS. Sickmann (1894: 236): **China**: Tianjin (Tientsin). Friese (1897: 72): **China**: Tianjin (Tientsin). Yasumatsu (1946: 21): **China**: Beijing.

MATERIAL EXAMINED (3 ♂, 2 ♀). **China**: Tianjin (Tientsin).

DISTRIBUTION. A southeastern Palearctic and northern Oriental species. Northeastern and eastern China.

5. *Nomia (Hoplonomia) punctulata* Dalla Torre, 1896

Nomia punctata Westwood, 1875: 213. ♀ ♂; nec *Nomia punctata* Smith, 1859. Syntypes: "China"; BML.

Nomia punctulata Dalla Torre, 1896: 169; replacement name for *Nomia punctata* Westwood, 1875.

TAXONOMY (selected references). Friese, 1897: 50 (key), 52 (key), 72 ("*Nomia punctata*"); Cockerell, 1931: 8 (key); Yasumatsu, 1938: 379, Pl. 169 ("*Nomia punctata*"); Hirashima, 1961: 270 (key), 271, Figs. 35–43.

PUBLISHED RECORDS. Friese (1897: 73): **China** (Beijing). Yasumatsu (1934: 62; "*Nomia punctata*"): **Japan**: Yakushima Island. Yasumatsu & Narisada (1935: 67; "*Nomia punctata*"): **China**: Liaoning ("Dairen"= Dalian). Yasumatsu (1937: 68; "*Nomia punctata*"): **Japan**: Tsushima Islands). Yasumatsu (1938: 379; "*Nomia punctata*"): **Japan**: Tsushima Islands). Yasumatsu (1946: 21): **China**: Beijing. Hirashima (1961: 271): **China**: "S. Manchuria" (no locality); **Korean Peninsula** (no locality); **Japan**: Honshu (no locality), Kyushu (no locality), Shikoku (no locality), Tsushima (no locality), Yakushima (no locality). Ikudome (1978: 316, 323): **Japan**: Shikoku (Kôchi). Ikudome (1981: 162): **Japan**: Shikoku (Kôchi). Ikudome (1992: 133): **Japan**: Kyushu (Kagoshima). Ikudome & Nakamura (1994: 9): **Japan**: Honshu (Takatsugawa Basin). Ikudome & Nakamura (1996: 176): **Japan**: Honshu (Hiroshima and Shimane Prefectures). Ikudome & Nakamura (1997: 20): **Japan**: Honshu (Hiroshima Prefecture). Iwata (1997: 640): **Japan**: Kyushu (Setaura).

MATERIAL EXAMINED (1 ♂, 3 ♀). **South Korea**: Gueongsangnam-do (Jinju). **Japan**: Honshu (Kyoto)

DISTRIBUTION. A southeastern Palearctic and northern Oriental species. Korean Peninsula, northeastern, eastern and southern China, Japan (Honshu, Shikoku, Yakushima, Kyushu, Tsushima, Okinawa), Taiwan.

6. *Nomiapis diversipes* (Latreille, 1806)

Nomia diversipes Latreille, 1806: 14, Fig. 8 on Pl. 14. ♂. Syntype(s) lost.

Andrena humeralis Jurine, 1807: 231, Pl. 14. [♀]. Syntype(s) lost. Synonymy by Gerstäcker (1872: 304).

Nomia hungarica Förster, 1853: 356. ♂. Syntype(s): Hungary; ZSM. Synonymy by Gerstäcker (1872: 304).

TAXONOMY (selected references). Warncke, 1976: 96 (key), 98 (key), 110, Figs. 16, 37; Pauly, 1990: 101; Pesenko et al, 2000: 137 (key), 138, Figs. 182, 184, 186; Baker, 2002: 34, 58 (key).

MATERIAL EXAMINED (4♂, 2♀). **Mongolia:** Bayan-Hongor (Dzurhe River in upper reaches of Tsagan-gol), Hovd (Ulyastain-gol, N Bulgan), Dornod (Halhin-gol).

DISTRIBUTION. A western Palaearctic species reaching as far as eastern Mongolia in the east. Mostly in steppe zone of Palaearctic Region. North Africa; Middle and Southern Europe; Asia: Israel, Transcaucasus, Afghanistan, Iraq, Iran, Kazakhstan, Middle Asia, Pakistan; Siberia (Orenburg Province and Altai), Mongolia (first record).

7. *Nomiapis femoralis* (Pallas, 1773)

Apis femoralis Pallas, 1773: 731. [♂]. Holotype: ♂, «in deserto ad Iaikum» [in a desert on the bank of the Ural River, western Kazakhstan]; MNB.

Lasius difformis Panzer, 1805: Jg. 8, H. 89, Taf. 15. [♂]. Syntype(s): Germany: Mannheim; MNB. Synonymy by Mocsáry (1879: 25).

Andrena brevitarsis Eversmann, 1852: 9 (key), 18. ♀ «in promontoriis Uralensibus australibus». Lectotype: ♀, «Spassk» [Orenburg Province]; designated here; ZISP. Synonymy by Warncke (1976: 111).

TAXONOMY (selected references). Warncke, 1976: 96 (key), 98 (key), 111, Figs. 21, 42a (*Nomia*); Pauly, 1990: 101; Pesenko et al, 2000: 137 (key), 149, Figs. 183, 185, 187; Baker, 2002: 34, 58 (key).

PUBLISHED RECORDS. Warncke (1976: 112): **Russia:** Irkutsk.

MATERIAL EXAMINED (17♂, 9♀). **Russia:** Irkutsk, Buryatia (Kyakhta; Ulan-Ude). **Mongolia:** Hentiy (Bayan-gol, SW Hentiy), Selenge (upper reaches of Hara-gol), Uvs (Tsetserleg-ula).

DISTRIBUTION. A western Palaearctic species reaching as far as Baikal in the east. Middle and Southern Europe (as far in the west as Austria); Asia: Kazakhstan, Middle Asia; Siberia (Orenburg Province, Altai, Irkutsk, Buryatia), northern Mongolia (first record).

8. *Nomiapis fugax* (Morawitz, 1877)

Nomia fugax Morawitz, 1877: 93. ♀♂. Lectotype: ♂, Azerbaijan: Kurgulutschaiskaya; designated here; ZISP.

TAXONOMY. Morawitz, 1894: 70 (*Nomia* «*fallax*» [lapsus calami]); Friese, 1897: 50 (key), 51 (key), 56; Warncke, 1976: 96 (key), 98 (key), 110, Figs. 17, 38; Pauly, 1990: 101; Baker, 2002: 37, 58 (key).

MATERIAL EXAMINED (3 ♂, 20 ♀). **Russia:** Irkutsk. **China:** Gansu (Shule He).

DISTRIBUTION. A western Palaearctic species reaching as far in the east as Baikal. East of North Africa (Egypt); southeast of European Russia (Daghestan); Asia: Azerbaijan, Kazakhstan, Middle Asia, Iran, Pakistan, Irkutsk, northwestern and northern China (Xinjiang, Gansu).

9. *Nomiapis mandschurica* (Hedicke, 1940)

Nomia femoralis sensu Matsumura, 1912: 205, Fig. 16 on Pl. LIX (♂); 1930: 175, Fig. 16 on Pl. XVII (♂); nec *Apis femoralis* Pallas, 1773 (see Hirashima, 1961: 248).

Nomia (Nomiapis) mandschurica Hedicke, 1940: 336, ♂ ♀. Holotype: ♂, China: «Umgebung von Kintschou, Provinz Liaushi» [Liaoning: Jinzhou]; MNB.

TAXONOMY. Hirashima, 1961: 248, Figs. 1, 6–14; Baker, 2002: 38, 57 (key).

PUBLISHED RECORDS. Hirashima (1961: 252-253): **China:** Liaoning (“Kai-gen”); **Korean Peninsula** [Soheki; Suigen (Suwon); Tyunando]; **Japan:** Honshu (no locality), Kyushu (Kashii; Kinugasa Mt.). Okabe (1939: 23): **China:** Heilonjiang (Hataho). Hedicke (1940: 338): **China:** Heilongjiang (no locality). Ikudome (1992: 133): **Japan:** Kyushu (Kagoshima). Proshchalykin (2004: 7): **Russia:** south of Far East (Amur Province and Primorskii Territory; no localities).

MATERIAL EXAMINED (26 ♂, 20 ♀). **Russia:** Buryatia (Kyakhta), Amur Province (Arkharu; Klimoutsy; Svobodnyi); Primorskii Territory [Andreevka; Kamen-Rybolov; Lazo, Novokachalinsk, Spassk; Sudzukhe River (Kievka)]. **Mongolia:** Selenge (Darhin-pagan-obo; Ero-gol near Dulan-han), Dornod (Bayan-gol River; Malagaitendab Pass; Numreg-in-gol, SE Salhit Mt.; Halhin-gol, SE Halh-gol). **China:** Neimenggu (Manzhou), Liaoning (“Sunyao”).

DISTRIBUTION. A southeastern Palaearctic species. Russia: Buryatia, Amur Province, Primorskii Territory; northeastern Mongolia (new record); northeastern China, Korean Peninsula, Japan.

DISCUSSION: DISTRIBUTIONAL PATTERNS

The occurrence of numbered species in countries and main areas of the Eastern Palaearctic Region is shown in Table below. The majority (67 %) of nomiine species in the fauna of the Eastern Palaearctic Region are endemics to this region (*Lipotriches fruhstorferi* and *Nomiapis mandschurica*) or are northern Oriental forms penetrating to the southern part of the Palaearctic region (*Lipotriches esakii*, *L. yasumatsui*, *Nomia chalybeata*, and *N. punctulata*). For this reason, the richest countries in relation to the Nomiinae are eastern China (including the northeast; 6 species) and Japan (5 species). Three the rest species, *Nomiapis diversipes*, *N. femoralis*, and *N. fugax*, are mostly western Palaearctic and reach as far as in the east only Mongolia or/and northern China.

T a b l e

Occurrence of nomiine species in Eastern Palaearctic Region

Species	Eastern Siberia	Russian Far East	Mongolia	Northern China	Eastern China	Korean Peninsula	Japan
<i>Lipotriches fruhstorferi</i>	–	+	+	+	+	–	+
<i>L. esakii</i>	–	–	–	–	+	+	+
<i>L. yasumatsui</i>	–	–	–	–	+	+	+
<i>Nomia chalybeata</i>					+		
<i>N. punctulata</i>	–	–	–	+	+	+	+
<i>Nomiapis diversipes</i>	–	–	+	–	–	–	–
<i>N. femoralis</i>	+	–	+	–	–	–	–
<i>N. fugax</i>	+	–	–	+	–	–	–
<i>N. mandschurica</i>	–	+	+	+	+	+	+
Total	2	2	4	4	6	4	5

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