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Contributions to the halictid fauna of the Eastern Palaearctic Region: subfamily Rophitinae

(Hymenoptera: Halictidae)

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Abstract

The paper presents the results of the taxonomic study of the bees of the subfamily Rophitinae. A new species, *Trilia kerzhneri*, from Mongolia is described. The lectotypes of *Epimethea nana* MORAWITZ, 1880 and *Rophites cana* EVERSMANN, 1852 are designated. *Rophites gruenwaldti* EBMER is recorded from Russia for the first time; *Rhophitoides canus* (EVERSMANN), from Korean Peninsula. A total of 19 species of the subfamily were found in the Eastern Palaearctic Region. An illustrated key to all of them, except for *Dufourea flavozonata* (WU), is given. An annotated list includes data for each species on its synonymy, general geographical distribution, published records from the Eastern Palaearctic Region, and the material examined.

Резюме

Ю.А. Песенко и Ю.В. Астафурова «К фауне галиктид Восточной Палеарктики: подсемейство Rophitinae (Hymenoptera: Halictidae)». Описан новый вид *Trilia kerzhneri* sp. n. из Монголии. Обозначены лектотипы *Epimethea nana* Morawitz, 1880 и *Rophites cana* Eversmann, 1852. *Rophites gruenwaldti* Ebmer впервые указывается для фауны России, а *Rhophitoides canus*, для Корейского полуострова. Всего в Восточной Палеарктике выявлено 19 видов подсемейства. Для их определения составлен иллюстрированный ключ. В аннотированном списке для каждого вида приведены синонимика, общее географическое распространение, опубликованные находки в Восточной Палеарктике и изученный материал.

Introduction

The present paper is the sixth one of a series treating the Eastern Palaearctic Halictidae (see Pesenko, 2005a on the genus *Halictus*; Pesenko, 2005b on the subfamily Nomioidinae; Astafurova & Pesenko, 2005 on the subfamily Nomiinae; Pesenko, 2006a on the genus *Seladonia*; Pesenko, 2006b on the genus *Lasioglossum*). As defined in the first paper of the series (see 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 and 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 Kuril Islands), Mongolia, northern and northeastern China (northern half of Qinghai, Gansu and Shaanxi, Neimenggu, Ningxia, Shanxi, Hebei, Shandong, Liaoning, Jilin, and Heilongjiang), Korean Peninsula, and Japan excluding the Ryukyu (Nansei) Islands.

Subfamily Rophitinae. The overwhelming majority of rophitine species occur in the Holarctic Region, only a few species also inhabit Afrotropical, Oriental, and Neotropical Regions; no species are recorded from Australia. In difference from the classification by Michener (2000), *Flafodufourea*, *Rhophitoides*, and *Trilia* are considered separate genera in the present paper. Thus, the subfamily includes 16 genera: the Holarctic *Dufourea* Lepeletier, Palaearctic and Afrotropical *Systropha* Illiger, Palaearctic *Flafodufourea* Ebmer, *Morawitzella* Popov, *Morawitzia* Friese, *Rhophitoides* Schenck, *Rophites* Spinola, and *Trilia* Vachal, and also American *Ceblurgus* Urban & Moure, *Conanthalictus* Cockerell, *Goeletapis* Rozen, *Micralictoides* Timberlake, *Penapis* Michener, *Protodufourea* Timberlake, *Sphecodosoma* Crawford, and *Xeralictus* Cockerell. By contrast to other halictid subfamilies, many species of Rophitinae are montane, the majority of species are oligo- or monolectic. All rophitines are nesting species (non-parasitic), constructing their nests in soil; all behaviourally known species are solitary (not even subsocial).

The subfamily concludes somewhat over 200 currently recognised species; of them, 95 species of 8 genera inhabit the Palaearctic Region; 19 species of the following 6 genera are recorded from the Eastern Palaearctic Region: *Dufourea* (13 species), *Flavodufourea* (1), *Morawitzella* (1), *Rhophitoides* (1) *Rophites* (2), and *Trilia* (1).

Genus *Dufourea*. *Dufourea* is a Holarctic genus, also represented by 22 species in the north of the Oriental Region. The genus consists of about 125 species divided into almost equal parts between North America and Eurasia. In the Palaearctic Region, 52 species of *Dufourea* are known.

Almost for a century, the bees included now in the genus *Dufourea* were considered by European and American entomologists as belonging to two genera: *Dufourea*, and *Halictoides*; also some species were described in the genus *Rophites*. The broader treatment of the genus *Dufourea* (with *Halictoides* as a subgenus) established by MICHENER (1951) is agreed by the majority of taxonomists (*e.g*., EBMER, 1987a; MOURE & HURD, 1987; PESENKO, 1998). A subgeneric classification, worked up by WARNCKE (1979; as several subgenera of *Rophites* s. l.) and EBMER (1984, 1987a, 1987b, 1989, 1993, 1999), included 13 subgenera, most of which slightly differ from each other in some proportions of parts of the labiomaxillary complex and details in the structure of the male genitalia. This classification seems to be oversplitted. The number of subgenera reduced to eleven by PESENKO (1998). MICHENER (2000) has taken a much more radical decision: he treats *Dufourea* as a genus not subdivided into subgenera. In the present paper, *Dufourea* is considered a genus consisting of 7 subgenera: *Cephalictoides* COCKERELL (4 species in Palaearctic Region), *Cyprirophites* WARNCKE (8), *Dentirophites* WARNCKE (4), *Dufourea* s. str. (29), *Glossadufourea* EBMER (1), *Halictoides* NYLANDER (8) and *Merrophites* WARNCKE (1).

In the Eastern Palaearctic Region, 13 species occur; they belong to four the subgenera: *Cephalictoides* (5 species) *Cyprirophites* (1), *Dufourea* (2), and *Halictoides* (5).

Genus *Morawitzella*. A Palaearctic genus, including a single species, *M. nana* (MORAWITZ), known from the type series from central China (Saanxi).

Genus *Flavodufourea*, status nov. A Palaearctic genus, including two species: the type species *F. flavicornis* (FRIESE) known from the type series from southeastern Siberia (Buryatia) and *F. ulkenkalkana* (PATINY) recently described from southeastern Kazakhstan. POPOV (1946) considered *F. flavicornis* a member of the genus *Rophites*, but SCHWAMMBERGER (1975), of the genus *Rhophitoides*. *Flavodufourea* was described by EBMER (1984) as a subgenus of the genus *Dufourea*; such a position of the taxon is agreed by PATINY (2003). However, MICHENER (2000) included *Flavodufourea* in the genus *Rophites*. All the three points of view above are supported by certain morphological characters. Taking into consideration an evidently intermediate position of *Flavodufourea* between *Dufourea* and *Rophites* and aiming to avoid the contradiction between different taxonomists, we consider *Flavodufourea* a separate genus here till the reconstruction of the phylogeny of Rophitinae.

Genus *Rophites*. A Palaearctic genus, including 17 species. Its highest species richness is in the Mediterranean and Pontic basins. The genus is a coherent and well-isolated group of the subfamily Rophitinae, owing to a unusual structure of the labial palp and the presence of spines on the frons in females.

Genus *Rhophitoides*. A Palaearctic genus, including four species. A single species, *Rh. canus* (EVERSMANN), occurs in the Eastern Palaearctic Region. MICHENER (2000) considers *Rhophitoides* a subgenus of *Rophites*, although the differences of *Rhophitoides*

from *Rophites* are much more than enough for recognition of *Rhophitoides* as a separate genus.

Genus *Trilia*. A Palaearctic genus, including four species: North African *T. muoti* (VACHAL), Middle Asian *T. deserticola* POPOV and *T. montana* POPOV, and Mongolian *T. kerzhneri* sp. n. described below. VACHAL (1900: 534) was described his *Dufourea muoti* and placed it in a new subgenus, *Trilia*. POPOV (1957: 918) considered *Trilia* a separate genus and described two species more of it (see above). Also he listed a number of characters, mostly in the structure of the male genitalia, distinguishing *Trilia* from *Dufourea*; however, the majority of these characters lost their diagnostic importance for *Trilia* when many new species of *Dufourea* were described. Later POPOV's point of view was supported by EBMER (1987b: 72, 93). MICHENER (2000: 311) considered *Trilia* a synonym of *Dufourea* and gave the presence of three submarginal cells as a single difference of the first from other species of *Dufourea* (MICHENER, 2000: 312). At least one more diagnostic character of *Trilia* can also be added: metasomal terga provided with very wide anterior bands of dense tomentum.

Published records of Rophitinae from the Eastern Palearctic Region

The information (original data) on the occurrence of the rophitine species in the Eastern Palaearctic Region is contained in the following publications arranged by chronology.

NYLANDER (1848): *Dufourea inermis* from Russia (Khabarovsk Terr.).

EVERSMANN (1852): *Dufourea dentiventris* from Russia (Irkutsk; *Rophites bispinosa*).

MORAWITZ (1880): *Morawitzella nana* from China (Shaanxi).

MORAWITZ (1887): *Dufourea calcarata* from China (Niemenggu).

MORAWITZ (1890): *Dufourea clavicra* from China (Gansu).

FRIESE (1913): *Flavodufourea flavicornis* from Russia (Buryatia).

ALFKEN (1936): *Dufourea versicolor* from China: (Gansu).

POPOV (1958): *Dufourea paradoxa sibirica* from Mongolia (Bayan-Hongor; *Halictoides atrocoeruleus*).

POPOV (1959): *Dufourea armata* from China (Qinghai); *D. carinata* from Russia (Amur. Prov.) and China (Neimenggu); *D. mandibularis* from China (Gansu); *D. mongolica* from Mongolia (Bayan-Hongor); *D. spiniventris* from China (Gansu).

EBMER (1978a): *Dufourea carinata* from Russia (Khabarovsk Terr.) and China (Heilongjiang); *Rophites gruenwaldti* from China (Heilongjiang).

EBMER (1978b): *Dufourea dentiventris* from North Korea (Ryang-gang; *D. odontogastra*).

EBMER (1984): *Dufourea carinata* from China (Heilongjiang); *D. paradoxa sibirica* from Mongolia (Bayan-Hongor; *D. paradoxa atrocoerulea*).

EBMER & SCHWAMMBERGER (1986): *Rophites gruenwaldti* from Mongolia (Dundgovi).

WU (1987): *Dufourea carinata* from China (Beijing); *D. inermis* from China (Heilongjiang).

EBMER (1988): *Rhophitoides canus* from Mongolia (Töv).

WU (1990a): *Dufourea flavozonata* from China (Neimenggu).

PESENKO (1998): *Dufourea carinata* from Russia (Buryatia, Amur. Prov., Primorskii Terr.) and China (Neimenggu); *D. dentiventris* from Russia (Yakutia) and China (Qinghai); *D. inermis* from Russia (Irkutsk Prov., Yakutia, Amur Prov., Khabarovsk and Primorskii Terr.) and China (Qinghai); *D. minuta* from China (Qinghai); *D. mongolica* from Mongolia (Bayan-Hongor, Övör-Hangay, Ömnögovi); *D. paradoxa sibirica* from Russia (Yakutia) and Mongolia (Bayan-Ölgiy, Uvs, Dzavhan, Bayan-Hongor, and Töv); *D. spiniventris* from China (Gansu).

PESENKO & DAVYDOVA (2004): *Dufourea inermis* and *D. paradoxa sibirica* from Russia (Yakutia).

PROSHCHALYKIN (2004): *Dufourea carinata* and *D. inermis* from Russia (Amur Prov., Khabarovsk, and Primorskii Terr.).

Material and methods

The most part of the material examined (a total of 261) from the Eastern Palaearctic Region is deposited at ZISP (explanation of abbreviation used see below). A number of bees been provided for study from IBSV and ZMMU.

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 μm and intervals of (typical) interspace widths estimated in the number of average puncture diameters (in parentheses), e.g. 28-35 μm / (2-3). All illustrations are original, except for a few ones having references to their authorships in the explanations of figures. In this key, *Dufourea flavozonata* (WU) described on the basis of a single female from northern China (Neimenggu) is not included as its description by WU (1990a) is too brief and incompletely adequate Formally, this species runs to Couplet 10 (together with *D. mongolica*).

In the annotated list below, species are provided with the sections "Published records" and "Material examined" including only the data from the Eastern Palaearctic Region. The words "Province", "Autonomous Region" and "Municipality" in names of administration districts in China and "Aimak" in names of administration districts in Mongolia 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:

BML.....British Museum of Natural History, London, UK;

DIE.....Deutsches entomologisches Institut, Eberswalde (at present, in Müncheberg), Germany;

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

FSF.....Forschungsinstitut Senckenberg, Frankfurt an Main, Germany;

HMB .....Hungarian Natural History Museum, Budapest;

IBSV .....Institute of Biology and Soil Sciences, Russian Academy of Sciences, Vladivostok;

IZB.....Institute of Zoology, Academia Sinica, Beijing, China;
MIZW .....Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw;
MNB .....Museum für Naturkunde an der Humboldt Universität zu Berlin, Germany;
MNP.....Muséum National d'Histoire Naturelle, Paris, France;
NMW .....Naturhistorisches Museum, Wien, Austria;
NRS .....Naturhistoriska Riksmuseet, Stockholm, Sweden
OLML.....Oberösterreiches Landesmuseum (Biologiezentrum), Linz, Austria;
SCH .....Private collection of Maximilian Schwarz; Ansfelden by Linz, Austria.
ZISP.....Zoological Institute, Russian Academy of Sciences, St. Petersburg;
ZML.....Zoologiska Museet, Lunds Universitet, Lund, Sweden;
ZMUH .....Zoological Museum, Helsinki University, Helsinki, Finland;
ZMUO .....Zoological Museum, Oxford University, Oxford, UK.

A key to the Eastern Palaearctic species

1 ♀♀ 2
- ♂♂ 18

2 (1) Forewing with 3 submarginal cells (Fig. 40). T2-T4 with very wide anterior bands of dense tomentum. – Body length ≤ 5 mm. 3rd submarginal cell much less than 1st one ..... *Trilia kerzhneri* PESENKO & ASTAFUROVA, sp. n.

- Forewing with 2 submarginal cells (Figs 36-39). T2-T4 without or with narrow anterior bands of tomentum (in *Flavodufourea flavicornis*)..... 3

3 (2) (Female unknown. The diagnosis below is tentative). Lower half of face, scutellum, metanotum, and posterior areas of metasomal terga yellow. Marginal cell of forewing along costal margin shorter than pterostigma, half as long as distance between distal end of the cell and wing apex. 1st submarginal cell more than twice as great as 2nd one (Fig. 38) ..... *Morawitzella nana* (MORAWITZ)

- Body entirely black, sometimes with deep blue or green metallic lustre. Marginal cell of forewing along costal margin as long as or longer than pterostigma, as great as distance between distal end of the cell and wing apex. 1st and 2nd submarginal cells of approximately equal size (Figs 36, 37, 39)..... 4

4 (3) 1st medial (discoidal) cell short, only twice as long as wide (Figs 36, 37). Both 1st and 2nd segments or at least 2nd segment of labial palp narrow, as wide as 3rd and 4th segments (Figs 15, 16). Metasomal terga without bands of appressed hairs, only with transverse raw of erect hairs. Dorsal surface of propodeum as long as scutellum or still longer, rounded on posterior margin 5

- 1st medial cell longer, 2.5-3.0 times as long as wide (Fig. 39). Both 1st and 2nd segments of labial palp widened and flattened, sharply differing from 3rd and 4th segments in form (Figs 18, 20, 21). Metasomal terga with posterior bands of appressed hairs (not so dense as those of *Halictus*). Dorsal surface of propodeum shorter than scutellum, forming distinct angle with posterior vertical surface 15

5 (4) Middle tibia with distinct longitudinal depression in outer surface. Head and mesosoma with deep blue or green metallic lustre (except for *D. spiniventris*, in which body entirely black). Vertex sharp along posterior margin, sometimes carinate. – Body length 6.0-9.5 mm 6

- Middle tibia normal, convex in outer surface. Body brownish black to black, without metallic lustre (except for *D. armata* и *D. versicolor*, in which head and mesosoma with deep blue metallic lustre; but their body length 4.5-5.0 mm). Vertex usually rounded along posterior margin 9

6 (5) Body black, without metallic lustre. Face in middle above antennal sockets with strong and sharp triangular (in plane) elevation surrounding with deep furrow. Propodeum (except for finely granulose and mat metapostnotum) shiny; on lateral and posterior vertical surfaces densely punctate, with polished interspaces; along posterior margin of metapostnotum with wide smooth stripe. Metasomal terga sparsely, but distinctly punctate, shiny (T1 on dorsal part, 10-15 μm / 1-3; T2 on disc, 15-20 μm / 1-3). – Head transversely elliptical in front view, 0.8 times as high as wide (Fig. 9). Pubescence of mesoscutum, scutellum, and metanotum white, withadmixture of dark hairs. Body length 9 mm ..... *Dufourea* (*Cephalictoides*) *spiniventris* (POPOV)

- At least head and mesosoma with distinct deep blue or green metallic lustre. Face in middle above antennal sockets only with weak longitudinal carina. Propodeum entire mat. T1 and T2 on discs without distinct punctation 7

7 (6) Smaller, body length 6 mm. Pubescence of body, including legs, entirely black. T1 and T2 smoothed, polished; only T2 with several punctures. – Body entirely with deep blue metallic lustre. Head transversely elliptical in front view, 0.85 times as high as wide (Fig. 2) ..... *Dufourea* (*Cephalictoides*) *clavicra* (MORAWITZ)

- Larger, body length 8.5-9.5 mm. Pubescence of most surface of body white; only genal area on lower half with dark hairs, prepygidial fringe (on T5) and posterior part of metatibial scopa dark (in *D. paradoxa sibirica* also clypeus and vertex with dark pubescence, sometimes withadmixture of white hairs; mesosoma frequently withadmixture of dark hairs). T1 and T2 obscurely punctate (in *D. paradoxa sibirica*) or densely granulate (in *D. calcarata*) 8

8 (7) Head and mesosoma with weak deep blue, bluish green or bronze metallic lustre, sometimes nearly inconspicuous; metasoma black. Head rounded in front view, about as high as wide (Fig. 8). Pubescence of clypeus and vertex dark. Pronotum not projecting or weakly projecting from under mesoscutum in dorsal view to mesosoma. T1 on dorsal part polished, with very sparse, fine punctures; on posterior area finely strigate, entirely shiny. T2 slightly shiny, obscurely and more or less densely punctate, finely shagreened on interspaces ..... *Dufourea* (*Cephalictoides*) *paradoxa sibirica* PESENKO

- Head, mesosoma, and metasomal terga on discs metallic light green. Head transversely rectangular in front view, 0.9 times as high as wide (Fig. 1). Pubescence of clypeus and vertex pale. Pronotum a wide transverse plate in dorsal view to mesosoma. T1 and T2 throughout uniformly finely granulate, silk-mat ..... *Dufourea* (*Cephalictoides*) *calcarata* (MORAWITZ)

9 (5) Head 1.05 times as high as wide. Vertex strongly expending upward, nearly rectangular in front view to head. Frons and mesoscutum with deep blue metallic lustre. Proboscis very long, especially maxillary palp that 2.5 times as long as labial palp. – Mesoscutum sparsely punctate (12-16 µm / 0.8-3.0), shiny on interspaces. T1 nearly impunctate, only with a few, very small punctures (4-10 µm). Body length 4.5 mm. (Male unknown) ..... *Dufourea* (*Cyprirophites*) *versicolor* ALFKEN

- Head wider than high. Vertex slighter expending upward, rounded in front view to head. Body brownish-black to black, without metallic lustre (except for *D. armata*). Proboscis not so long; maxillary palp only 1.2-1.6 times as long as labial palp 10

10 (9) Smaller, body length 5-6 mm. Nervellus distinctly antefurcal (Fig. 37) 11

- Bigger, body length 6.5-8.0 mm. Nervellus interstitial (Fig. 36) 12

11 (10) Body black. Pubescence of head and dorsal surface of mesosoma black. Head nearly transversely rectangular in front view; 0.8-0.85 times as high as wide (Fig. 6). Mesoscutum brightly shiny, with very sparse and fine punctures separated by many puncture diameters. Body length 5.5-6.5 mm ..... *Dufourea* (*Dufourea*) *minuta* LEPELETIER

- Head and mesosoma with distinct greenish deep-blue lustre. Pubescence of head and dorsal surface of mesosoma white, with littleadmixture of black-brown hairs. Head rounded in front view, as high as wide. Mesoscutum more densely punctate (< 1). Body length 5 mm ..... *Dufourea* (*Dufourea*) *armata* POPOV

12 (10) Face between antennal sockets with strict, longitudinally rhomboidal elevation, occupying supraclypeal area and lower part of frons. – Head transversely elliptical in front view; 0.9 times as high as wide (Fig. 3). T1 relatively coarsely and not densely punctate (15-25 µm / 0.5-3). Body length 6.0-7.5 mm ..... *Dufourea* (*Halictoides*) *carinata* (POPOV)

- Face between antennal sockets with not high, hump-shaped elevation having slanting sides 13

13 (12) Pubescence of body, including metatibial scopa, white; prepygidial fringe (on T5) light orange-yellow. Head less strong transversely elliptical in front view; 0.9 times as high as wide (Fig. 7). – T1 on dorsal part densely punctate (≤ 1). Body length 6-7 mm ..... *Dufourea* (*Halictoides*) *mongolica* (POPOV)

- Pubescence of head and dorsal surface of mesosoma, metatibial scopa and prepygidial fringe black brown, usually withadmixture of pale hairs on head and mesosoma. Head more strong transversely elliptical in front view; 0.8-0.85 times as high as wide (Figs 4, 5) 14

14 (13) T1 on dorsal part with microscopic fine, very sparse and irregularly punctation (1-6 or still more). Body length 6.5-8.0 mm ..... *Dufourea* (*Halictoides*) *dentiventris* (NYLANDER)

- T1 on dorsal part much more densely and regularly punctate (~ 1). Body length 6.5-8.0 mm ..... *Dufourea* (*Halictoides*) *inermis* (NYLANDER)

15 (4) (Female unknown. The diagnosis below is tentative). 1st segment of labial palp strongly widened toward distal end (Fig. 18). Metasomal terga with anterior bands of dense appressed hairs ..... *Flavodufourea flavicornis* (FRIESE)

- 1st segment of labial palp nearly parallel-sided (Figs 20, 21). Metasomal terga with posterior hair bands (sparser than those of *Halictus*) 16

16 (15) Frons only with usual hairs, without spines. Labial palp of usual length (shorter than maxillary palp); 1st and 2nd segments only twice as long as 4th one or still shorter; all segments directed along common axis (Fig. 20). – Body length 7.5-8.5 mm. It differs from other species of the genus in the following characters: punctate hump-shaped elevation present between the antennal sockets; metapostnotum more strongly inclined and rounded along posterior margin..... .....*Rhophitoides canus* (EVERSMANN)

- Frons with sharp long spines being transformed hairs (Figs 10, 11). Labial very long (much longer than maxillary palp), due to strongly elongate and flattened 1st and 2nd segments; each of them, at least 5 times as long as 4th one; ultimate segment directed to other side in comparison with main axis formed by 1st-3rd segments (Fig. 21) 17

17 (16) Frons along entire its length with strong longitudinal median depression. Vertex with ill-developed posterolateral angles, uniformly rounded along posterior margin in front view to head (Fig. 10). Mesoscutum finely and densely punctate (12-20 μm / 0.1-0.2), covered with dense tomentose appressed pubescence. Body length 8-9 mm ..... *Rophites gruenwaldti* EBMER

- Frons flat. Vertex with strongly developed posterolateral angles, rounded rectangular in front view to head (Fig. 11). Mesoscutum more coarsely and sparsely punctate, covered mostly with usual, long and slightly plumose hairs. Body length 8.5-10.5 mm.....*Rophites quinquespinosus* SPINOLA

18 (1) Forewing with 3 submarginal cells (Fig. 40). T2-T5 with very wide anterior bands of dense tomentum. – For structure of pregenital sterna and genital capsule see description of the species below..... *Trilia kerzhneri* PESENKO & ASTAFUROVA, sp. n.

- Forewing with 2 submarginal cells (Figs 36-39). T2-T5 without or with narrow anterior bands of tomentum (in *Flavodufourea flavicornis*)..... 19

19 (18) Lower half of face, scutellum, metanotum, and posterior areas of metasomal terga yellow. Marginal cell of forewing along costal margin shorter than pterostigma, half as long as distance between distal end of the cell and wing apex. 1st submarginal cell more than twice as great as 2nd one (Fig. 38). Apodemae of S7 sided to anterior margin of the sternum (Fig. 81). S8 rounded convex on anterior margin (Fig. 96). (Female unknown).....*Morawitzella nana* (MORAWITZ)

- Body entirely black, sometimes with deep blue or green metallic lustre. Marginal cell of forewing along costal margin as long as or longer than pterostigma, as great as distance between distal end of the cell and wing apex. 1st and 2nd submarginal cells of approximately equal size (Figs 36, 37, 39). Apodemae of S7 directed anterolaterally, joined with sternal body only in middle (Figs 67-80, 82-84). S8 straight (Figs 95, 97) or with excision on anterior margin (Figs 86-94, 98, 99) 20

20 (19) 1st medial (discoidal) cell short, only twice as long as wide (Figs 36, 37). Both 1st and 2nd segments or at least 2nd segment of labial palp narrow, as wide as 3rd and 4th segments (Figs 15, 16). Metasomal terga without bands of appressed hairs, only with transverse raw of erect hairs. Dorsal surface of propodeum as long as scutellum or still longer, rounded on posterior margin. S8 with deep excision on anterior margin (Figs 86-94) 21

- 1st medial cell longer, 2.5-3.0 times as long as wide (Fig. 39). Both 1st and 2nd segments of labial palp widened and flattened, sharply differing from 3rd and 4th segments in form (Figs 18, 20, 21). Metasomal terga with bands of appressed hairs (not so dense as those of *Halictus*). Dorsal surface of propodeum shorter than scutellum, forming distinct angle with posterior vertical surface. S8 straight (Figs 95, 97) or with relatively weak excision on anterior margin (Figs 98, 99)..... 32

21 (20) Middle tibia distinctly concave in outer surface, sometimes depression carinate along its margins (Fig. 42). Middle (Fig. 42) and hind femora inflated. Frons and mesoscutum with deep blue or green metallic lustre (except for *D. spiniventris*, in which entire body black), very weak in some *D. paradoxa*. Vertex strongly stretched, nearly sharply carinate along posterior margin. – Volsella very thin and long (Figs 102, 103, 106, 108, 109)..... 22

- Middle tibia usual, convex in outer surface. Middle and hind femora usual. Body brownish black to black, without metallic lustre (except for *D. armata* and *D. versicolor*). Vertex convex, usually rounded on posterior margin..... 26

22 (21) Body black, without metallic lustre. Antenna very long, reaching posterior margin of T1; middle flagellomeres 2.5-3.0 times as long as their diameters; ultimate segment narrow and curved (Fig. 31). Propodeum (except for finely granulose and mat metapostnotum) shiny; on lateral and posterior vertical surfaces densely punctate, with polished interspaces; along posterior margin of metapostnotum with wide smooth stripe. Hind tibia on inner surface pubescent with very long and dense snow-white hairs (Fig. 44). Middle and hind basitarsi strongly widened (Figs 43, 44). Metasomal terga relatively sparsely, but distinctly punctate, shiny (T1 on dorsal part and T2 on disc, 20-30 μm / 0.5-2.5). S6 with long narrow parallel-sided posterior median process (Fig. 60). Penis valva triangular, strongly broadened toward distal end (Fig. 109). – Head transversely elliptical in front view, 0.8 times as high as wide. Face in middle above antennal sockets with strong and sharp triangular (in plane) elevation surrounding with deep furrow. S7 as in Fig. 79. Body length 9.5-10.5 mm .... *Dufourea* (*Cephalictoides*) *spiniventris* (POPOV)

- At least head and mesosoma with distinct deep blue or green metallic lustre. Antenna usually shorter; ultimate segment usual (Figs. 22-30). Propodeum entire mat (except for *D. mandibularis*, in which it is shiny on the lateral and posterior vertical surfaces, densely punctate with polished interspaces; but without a smooth stripe along the posterior margin of the metapostnotum). Hind tibia on inner surface pubescent with much less long and dense hairs. Middle and hind basitarsi weaker widened. T1 without distinct punctation. S6 without posterior median process (Fig. 52) or with process of other shape (Figs 51, 56, 59). Penis valva narrow, pointed at apex (Figs 102, 103, 106, 108)..... 23

23 (22) Smaller, body length 7.0-8.5 mm. Pubescence of head and dorsal surface of mesosoma black. T1 shiny, impunctate, entirely polished 24

- Larger, body length 9.0-10.5 mm. Pubescence of body white. T1 mat, tuberculous roughened (in *D. paradoxa sibirica*) or finely granulose (in *D. calcarata*)..... 25

24 (23) Smaller, body length 7 mm. Head transversely elliptical in front view, 0.8 times as high as wide; vertex weakly extended backward; as long as distance between inner margins of posterior ocelli. Face in middle over antennal sockets only with weak longitudinal carina. Mandible usual, bidentate (with small subapical tooth). Antenna long and thin, reaching posterior end of mesosoma; middle flagellomeres 1.5-1.7 times as long as their diameters (Fig. 23). Propodeum entirely mat; its lateral and posterior vertical surfaces densely granulate. S6 wide-triangular on posterior margin (Fig. 52). S7 with broad triangular posterior lobes (Fig. 69). Genital capsule as in Fig. 103..... *Dufourea* (*Cephalictoides*) *clavicra* (MORAWITZ)

- Larger, body length 8.5 mm. Head less transversely elliptical in front view, 0.9 times as high as wide; vertex strongly extended backward; twice as long as distance between inner margins of posterior ocelli. Face in middle above antennal sockets with strong and sharp triangular (in plane) elevation surrounding with deep furrow. Mandible strongly broadened toward apex, with 3 rounded tooth on distal margin (Fig. 14). Antenna very short, reaching middle of mesoscutum; middle flagellomeres 1.1-1.2 times as long as their diameter (Fig. 27). Lateral and posterior vertical surfaces of propodeum in upper parts distinctly punctate, with shiny interspaces. S6 narrow-triangular (Fig. 56). S7 with narrow, nearly parallel-sided posterior lobes (Fig. 73). S8 as in Fig. 92. Genital capsule as in Fig. 106. (Female unknown)..... *Dufourea* (*Cephalictoides*) *mandibularis* (POPOV)

25 (23) Head and mesosoma with slight deep blue, bluish green or bronze metallic lustre, sometimes nearly inconspicuous; metasoma black. Head rounded in front view, about as high as wide; vertex strongly extended backward; 1.5 times as long as distance between inner margins of posterior ocelli. Pubescence of clypeus and vertex dark. Face in middle over antennal sockets only with weak longitudinal carina. Antenna moderately long, reaching propodeum; middle flagellomeres 1.3-1.5 times as long as their diameter (Fig. 30). Pronotum not projecting or weakly projecting from under mesoscutum in dorsal view to mesosoma. Hind tibia and basitarsus strongly longitudinally concave in outer surface (Fig. 42). T1 on dorsal part and T2 on disc finely shagreened and tuberculous; on posterior areas polished .... *Dufourea* (*Cephalictoides*) *paradoxa sibirica* PESENKO

- Head, mesosoma, and metasomal terga on discs metallic light green. Head transversely elliptical in front view, 0.8 times as high as wide; vertex weakly extended backward; its length (width) less than distance between inner margins of posterior ocelli. Pubescence of clypeus and vertex pale. Face in middle above antennal sockets with strong and sharp triangular (in plane) elevation. Antenna very short, reaching only middle of mesoscutum; middle flagellomeres about as long as their diameter (Fig. 22). Pronotum a wide transverse plate in dorsal view to mesosoma. Hind tibia and basitarsus convex in outer surface. T1 and T2 entirely and uniformly finely granulose, mat .... *Dufourea* (*Cephalictoides*) *calcarata* (MORAWITZ)

26 (21) (Male unknown. The diagnosis below is tentative). Head higher than wide. Vertex strongly extended backward, rectangular in front view to head. Frons with deep blue metallic lustre. Proboscis very long, especially maxillary palp that 2.5 times as long as labial palp. – Mesoscutum sparsely punctate, strongly shiny on interspaces. T1 nearly impunctate, only with few, very small punctures. Posterior lobes of S7 strongly reduced, represented by small elliptical thickened plates. S8 with wing-shaped lobes at sides of basal part of posterior median process..... .....*Dufourea* (*Cyprirophites*) *versicolor* ALFKEN

- Head wider than high. Vertex weakly extended backward, rounded in front view to head. Body brownish-black to black, without metallic lustre. Proboscis not so long, maxillary palp only 1.2-1.6 times as long as labial palp. Body much more densely and coarsely punctate (except for *D. minuta*). Posterior lobes S7 normally (for the genus) developed. S8 without wing-shaped lobes at sides of posterior median process 27

27 (26) Smaller, body length 5-6 mm. Antenna short, reaching only scutellum or metanotum. Nervellus distinctly antefurcal (Fig. 37). S6 flattened. Volsella broad and short, elliptical (Figs 101, 107) 28

- Bigger, body length 6.5-8.0 mm. Antenna longer, reaching propodeum or posterior end of mesosoma. Nervellus interstitial (Fig. 36). S6 with distinct blister-shaped thickenings. Volsella thin and long (Figs 104-106). – Head transversally elliptical in front view; 0.75-0.85 times as high as wide. Each of 6-11th flagellomeres with "rhinarium" (specialised depression covered very dense short erect bristles); middle flagellomeres 1.5-2.0 times as long as their diameters (Figs 24-26, 29) 29

28 (27) Body black, without metallic lustre. Pubescence of head and dorsal surface of mesosoma black Head transversally elliptical in front view; 0.85 times as high as wide. Each of 6-11th flagellomeres with rhinarium near proximal margin of lower side; middle flagellomeres somewhat shorter than long (Fig. 28). Mesoscutum brightly shiny, with very sparse fine punctures separated by many puncture diameters. S6 with rounded convex lateral margins and converging apodemae, rounded on posterior margin (Fig. 57). Apodemae of S7 wide, its posterior lobes rounded triangular (Fig. 74). Posterior median process of S8 widened at base (Fig. 93). Gonostylus weakly bordered from gonocoxite, triangular (Fig. 107). Body length 5.5-6.0 mm ..... *Dufourea* (*Dufourea*) *minuta* LEPELETIER

- Head and mesosoma with distinct deep-blue-green lustre. Pubescence of head and dorsal surface of mesosoma white, with littleadmixture of black brown hairs. Head rounded in front view, as high as wide. Flagellomeres without rhinaria; middle flagellomeres 1.5 times as long as their diameters. Mesoscutum less shiny, much more densely punctate (< 1). S6 with parallel-sided lateral margins and not conveging apodemae, pointed on posterior margin (Fig. 50). Apodemae of S7 narrow, its posterior lobes elongate elliptical, curved (Fig. 67). Posterior median process of S8 nearly parallel-sided (Fig. 86). Gonostylus well bordered from gonocoxite, narrow and long (Fig. 101). Body length 5 mm..... ..... *Dufourea* (*Dufourea*) *armata* POPOV

29 (27) Face between antennal sockets with strict, longitudinally rhomboidal elevation, occupying supraclypeal area and lower part of frons. Gonocoxite without dense long pubescence on dorsal surface. Gonostylus weakly bordered from gonocoxite on ventral side (Fig. 104). – Flagellomeres with small rhinaria, spaced on proximal margins of segments and occupying not more than one third of segment lengths (Fig. 24). T1 relatively coarsely and not densely punctate (15-25 µm / 0.5-3). S6 as in Fig. 53. S7 as in Fig. 70. Posterior median process of S8 narrow (Fig. 88). Body length 7-8 mm..... *Dufourea* (*Halictoides*) *carinata* (POPOV)

- Face between antennal sockets with not high, hump-shaped elevation having slanting sides. Gonocoxite with dense long pubescence on dorsal surface. Gonostylus distinctly bordered from gonocoxite (Figs 105, 106) 30

30 (29) Frons on lower half covered with long dense white hairs. Antenna relatively thin; middle flagellomeres twice as long as their diameters; rhinaria occupying nearly entire lower surfaces of segments (Fig. 29). – T1 on dorsal part relatively densely punctate (≤ 1). S6 as in Fig. 58. S7 as in Fig. 76. Body length 6-7 mm .... *Dufourea* (*Halictoides*) *mongolica* (POPOV)

- Frons with barely visible pubescence. Antenna relatively thick; middle flagellomeres 1.5-1.7 times as long as their diameters; rhinaria occupying 1/3-2/3 segment lengths (Figs 25, 26)..... 31

31 (30) T1 on dorsal part with obscure, fine, and sparse punctation. S5 with large triangular lateral prominence on posterior margin (Fig. 47). S6 on Fig. 54. S7 on Fig. 72. Posterior median process of S8 wide (Fig. 89), strongly curved and broadened toward apex in lateral view (Fig. 90). Body length 6.5-8.0 mm .... *Dufourea* (*Halictoides*) *dentiventris* (NYLANDER)

- T1 on dorsal part with distinct, relatively coarse and dense punctation (25-35 µm / 0.3-1.0). S5 without lateral prominence (Fig. 48). S6 on Fig. 55. Posterior median process of S8 narrow, less curved and not broadened apically (Fig. 91). Genital capsule as in Fig. 105. Body length 6.5-8.0 mm .... *Dufourea* (*Halictoides*) *inermis* (NYLANDER)

32 (20) 1st segment of labial palp strongly widened in distal half (Fig. 18). Ultimate flagellomere narrowed toward apex and curved, hook-shaped (Fig. 34). Metasomal terga with anterior bands of dense appressed hairs. Apodemae of S7 wide at bases, still widened at apices (Fig. 80). Gonobase transversely rectangular in dorsal or ventral view. Gonostylus wide, parallel-sided in proximal half, sharply narrowed in distal half, forming narrow process at apex. Penis valva truncate at apex (Fig. 110). Body length 7 mm. – All parts of labiomaxillary complex short; maxillary palp about as long as labial palp (Fig. 18). S8 straight on anterior margin (Fig. 95). From *F. ulkenkalkana* (PATINY), the second species of the genus *Flavodufourea* EBMER, it differs in the following characters: head thicker; face more densely punctate; mesoscutum sparsely, but distinctly punctate; T1-T3 more densely punctate; apodemae of S6 narrow (Fig. 61); posterior lobes of S7 rounded at apices (Fig. 80); penis valva with triangular projection on inner margin near base (Fig. 110)..... *Flavodufourea flavicornis* (FRIESE)

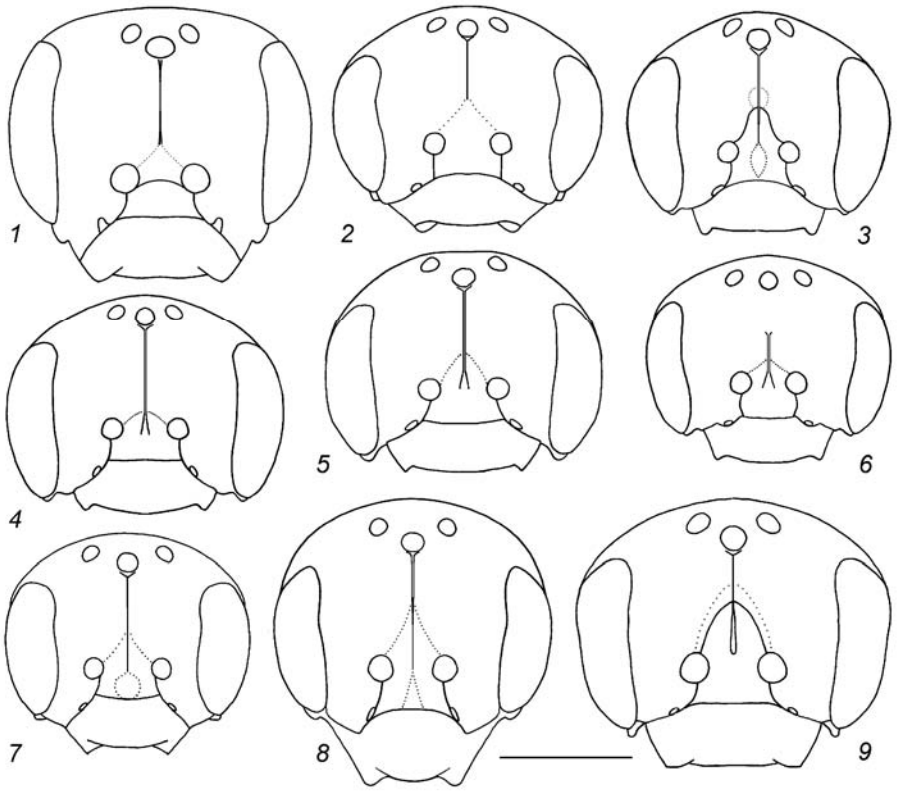
- 1st segment of labial palp nearly parallel-sided (Figs 20, 21). Ultimate flagellomere usual, not curved (Fig. 35). Metasomal terga with posterior hair bands (sparser than those of *Halictus*). Apodemae of S7 narrow (Figs 82-84). Gonobase semi-lunar in dorsal or ventral view Gonostylus of other form. Penis valva pointed or narrowly rounded at apex (Figs 112-114)..... 33

33 (32) Labial palp of usual length (shorter than maxillary palp), all segments directed along common axis; 1st and 2nd segments only twice as long as 4th one or else shorter (Fig. 20). S8 straight on anterior margin (Fig. 97). Body length 7-8 mm. – From other members of the genus *Rhophitoides* SCHENCK, it differs in the following characters: antenna moderately short, with more or less cylindrical (non-modified) segments; flagellum brownish yellow on lower side, pregenital sterna of other form .....*Rhophitoides canus* (EVERSMANN)

- Labial palp very long (much longer than maxillary palp), due to strongly elongate and flattened 1st and 2nd segments; each of them at least 5 times as long as 4th one; last segment directed to other side in comparison with main axis formed by 1st-3rd segments (Fig. 21). S8 with relatively not deep excision on anterior margin (Figs 98, 99) 34

34 (33) Mesoscutum finely and densely punctate (12-20 μm / 0.1-0.2), covered with dense tomentose appressed pubescence. 1st-3rd hind tarsomeres usual, not widened (Fig. 45). Long hairs in posterior part of longitudinal carina of S6 directed fan-likely; posterior margin of S6 bearing hairs only in middle (Fig. 64). Posterior lobes of S7 wide, rounded rectangular (Fig. 83). Gonostylus triangular (Fig. 113). Body length 8-9 mm ..... *Rophites gruenwaldti* EBMER

- Mesoscutum more coarsely and sparsely punctate, covered mostly with usual hairs (long, slightly plumose, erect). 1st-3rd hind tarsomeres widened (Fig. 46). Hairs of longitudinal carina of S6 in parallel; S6 bearing long hairs along nearly all its posterior margin (before teeth) (Fig. 65). Posterior lobes of S7 narrow, lancet-shaped (Fig. 84). Gonostylus elongate elliptical (Fig. 114). Body length 8.5-10.5 mm ..... *Rophites quinquespinosus* SPINOLA



Figs 1-9: Head of *Dufourea* females in front view: (**1**) *D. calcarata*, (**2**) *D. clavicra*, (**3**) *D. carinata*, (**4**) *D. dentiventris*, (**5**) *D. inermis*, (**6**) *D. minuta*, (**7**) *D. mongolica*, (**8**) *D. paradoxa sibirica*, (**9**) *D. spiniventris*. Scale bar means 1 mm.

Dufourea (*Cephalictoides*) *calcarata* (MORAWITZ, 1887)

Halictoides calcaratus MORAWITZ, 1887: 213. ♀♂. Lectotype: ♀, China: "Bassin des gelben Flusses" [Ordos Historical Terr., Niemenggu]; designated by EBMER (1984: 369); ZISP; examined.

T a x o n o m y . FRIESE, 1901: 51 (key), 52 (key), 60; WU, 1982: 397, Fig. 20 (a-k); 1987: 191 (key; in Chinese); EBMER, 1984: 369.

P u b l i s h e d r e c o r d s . China: Niemenggu: Ordos Historical Terr. (MORAWITZ, 1887: 213).

M a t e r i a l e x a m i n e d (1♂, 1♀; ZISP). Lectotype (see above) and paralectotype with the same label.

D i s t r i b u t i o n . Western and northern China: Xinjiang (WU, 1996: 298), Xizang (WU, 1982: 398; 1987: 189), and Niemenggu (MORAWITZ, 1887: 213).

Dufourea (*Cephalictoides*) *clavicra* (MORAWITZ, 1890)

Halictoides clavicrus MORAWITZ, 1890: 360. ♂. Lectotype: ♂, «Mongolia mer[idionalis]: Dshin-Tasy» [China: Gansu]; designated by EBMER (1984: 369); ZISP; examined.

Halictoides montanus MORAWITZ, 1890: 361. ♀. Lectotype: ♀, China: "Tschatshaku" (Sichuan); designated by EBMER (1984: 369). Synonymy by EBMER (1984: 369); ZISP; examined.

T a x o n o m y . FRIESE, 1901: 51 (key), 52 (key), 62, 64; EBMER, 1984: 369; WU, 1987: 193 (key; in Chinese).

P u b l i s h e d r e c o r d s . China: Gansu: "Dshin-Tasy" (MORAWITZ, 1890: 360).

M a t e r i a l e x a m i n e d (1♂; ZISP). Lectotype (see above).

D i s t r i b u t i o n . Western and northern China: Gansu (MORAWITZ, 1890: 360, 361), Xizang (WU, 1982: 395; 1987: 188), and Sichuan (MORAWITZ, 1890: 361, *Halictoides montanus*; WU, 1992: 1383).

Dufourea (*Cephalictoides*) *mandibularis* (POPOV, 1959)

Halictoides (*Cephalictoides*) *mandibularis* POPOV, 1959: 235, Fig. 5. ♂. Holotype: ♂, China: "southern slopes of South Tetung Mt. Range" (Gansu); ZISP; examined.

Rophites (*Cephalictoides*) *tridentatus* WARNCKE, 1979: 155. Unnecessary new name for *Halictoides mandibularis* POPOV, 1959, preoccupied in the genus *Rophites*.

T a x o n o m y . MORAWITZ, 1880: 356 ("*Rhophites atrocoeruleus*"); EBMER, 1984: 370; WU, 1987: 191 (key; in Chinese).

The species is known only from the holotype (see above).

Dufourea (*Cephalictoides*) *paradoxa sibirica* PESENKO, 1998

Dufourea (*Cephalictoides*) *paradoxa sibirica* PESENKO, 1998: 680, Figs 38-39. ♂♀. Holotype: ♀, Russia: Yakutia: Balagannakh (30 km ESE Ust-Nera); ZISP.

Published records. Russia: Yakutia (PESENKO, 1998: 680; PESENKO & DAVYDOVA, 2004: 685; see "Material examined" below). Mongolia: Bayan-Hongor: Bogd-ula (EBMER, 1984: 369; *Dufourea paradoxa atrocoerulea*), western slopes of Ich-Bogd-ula; Töv: Kugelen River E Ulanbaatar (POPOV, 1958: 50; *Halictoides atrocoeruleus*); Bayan-Ölgiy, Uvs, Dzavhan, Bayan-Hongor, and Töv (PESENKO, 1998: 680; see "Material examined" below).

Material examined (4♂♂, 48♀♀, including the holotype and 39 paratypes; ZISP). Russia: Tuva: Lake Maly Khindighol (60 km W Mugur-aksy); Yakutia: Ust-Nera, 30 km ESE Ust-Nera, Indigirka River in 15 km S Tebyulyakh, Artyk on Nera River, mouth of Kara-Yulyakh River. Mongolia: Bayan-Ölgiy: southeastern side of Hoton-nur, Jangyz-agch-gol in 15 km SE Delun; Uvs: Ogotor-hamryn-daba Pass; Dzavhan: Songino; Bayan-Hongor: western slopes of Ich-Bogd-ula; Töv: Kugelen E Ulanbaatar.

Distribution. *D. paradoxa* (MORAWITZ) is nearly transpalaearctic species. In Europe and western Asia, it inhabits only some isolated mountain countries, where forms a number of subspecies: ssp. *paradoxa* in the Alps, ssp. *mesembria* EBMER in the northern Pyrenées, ssp. *nivalis* EBMER in the Sierra-Nevada Mts. (southern Spain), ssp. *zolotasi* (WARNCKE) in the Olimp Mt. (Greece), ssp. *atrocoerulea* (MORAWITZ) in the Pamir-Alai Mt. Country; ssp. *nepalensis* EBMER in the Himalayas. (The species does not occur in the Carpathians and Caucasus.) In difference of the subspecies above, ssp. *sibirica* occupies a vast plain (including foothills) territory placed in the Stricly Continental Sector of the Eastern Palaearctic Region: Altai, Tuva (**first record**), Yakutia, and Mongolia (Bayan-Ölgiy, Uvs, Bayan-Hongor, Dzavhan, and Töv).

Dufourea (*Cephalictoides*) *spiniventris* (POPOV, 1959)

Halictoides (*Cephalictoides*) *spiniventris* POPOV, 1959: 232, Fig. 4. ♂. Lectotype: ♂, China: "Pin-Fan-Chen" (Gansu); designated by PESENKO (1998: 681); ZISP.

Taxonomy. EBMER, 1984: 370; Wu, 1987: 191 (key; in Chinese); PESENKO, 1998: 681, Figs. 40-42 (♀).

Published records. China: Gansu (POPOV, 1959: 234; PESENKO, 1998: 681; see "Material examined" below).

Material examined (2♂♂, 1♀; ZISP). China: Gansu: "Oin-Fan-Chen (lectotype), "Pin-Fan-Chen" (male paralectotype and 1♀).

Distribution. China: Gansu (POPOV, 1959: 234; PESENKO, 1998: 681) and Sichuan (WU, 1987: 188; 1992: 1383).

Dufourea (*Cyprirophites*) *versicolor* ALFKEN, 1936

Dufourea versicolor ALFKEN, 1936: 17. ♀. Holotype: ♀, China: "S. Gansu: Tan-chang"; NRS.

Taxonomy. EBMER, 1993: 39 (key).

The species is known only from the holotype.

Dufourea (*Dufourea*) *armata* POPOV, 1959

Dufourea armata POPOV, 1959: 226, Fig. 1. Holotype: ♂, China: "northern Qaidam (Govi)" (northern Qinghai); ZISP; examined.

T a x o n o m y . EBMER, 1984: 358; WU, 1990b: 471 (in Chinese), 475 (in English), Figs 32-34, 36 (♀).

P u b l i s h e d r e c o r d s . China: Qinghai: northern Qaidam (POPOV, 1959: 227).

M a t e r i a l e x a m i n e d (1♂; ZISP). Holotype (see above).

D i s t r i b u t i o n . China: Qinghai (POPOV, 1959: 227; WU, 1990b: 471) and Xizang (WU, 1990b: 471). Records of the species from Xizang and Sichuan by WU (1982: 393) partly belong to *D. tibetensis* WU (see WU, 1990b: 471).

Dufourea (*Dufourea*) *minuta* LEPELETIER, 1841

Dufourea minuta LEPELETIER, 1841: 228. ♀♂. Lectotype: ♀, sine loco ("southern France or northern Spain"); designated by BAKER (1994: 1199); ZMUO.

Dufourea vulgaris SCHENCK, 1861: 206. ♀♂. Lectotype: ♀, Germany: [Hessen]; designated by EBMER (1975: 240); FSF. Synonymy by BAKER (1994: 1199).

T a x o n o m y (selected references). EBMER, 1975: 240; 1984: 323 (key), 340 (key), 351, 353 (key), Figs 1, 2, 24-29, 106, 133-137, 153; 1988: 681 (*Dufourea vulgaris*); 1999: 185; WARNCKE, 1979: 128 (key), 130 (key), Fig. 20 (*Rophites vulgaris*); BAKER, 1994: 1198; SCHWARZ et al., 1996: 89; PESENKO, 1998: 672, Figs 9, 10; PESENKO et al., 2000: 115 (key), 117, Figs 140, 142; 2002: 25 (key), 26 (key), Figs 41, 43.

P u b l i s h e d r e c o r d s . China: Qinghai (PESENKO, 1998: 674; see "Material examined" below)

M a t e r i a l e x a m i n e d (3♀♀; ZISP). China: Qinghai: "Ulan-bulak in Humboldt Mt. Range (Nan Shan), late VI.1894, leg. ROBOROVSKI and KOZLOV".

D i s t r i b u t i o n . Europe from Spain in the west, as far in the east as Perm Prov. and Bashkiria, to Finland (to 63° N) and Udmurtia in the north. Asia: western Siberia (Ekaterinburg, Chelyabinsk Prov.), northern China (isolated population in Qinghai; PESENKO, 1998: 674).

Dufourea (*Halictoides*) *carinata* (POPOV, 1959)

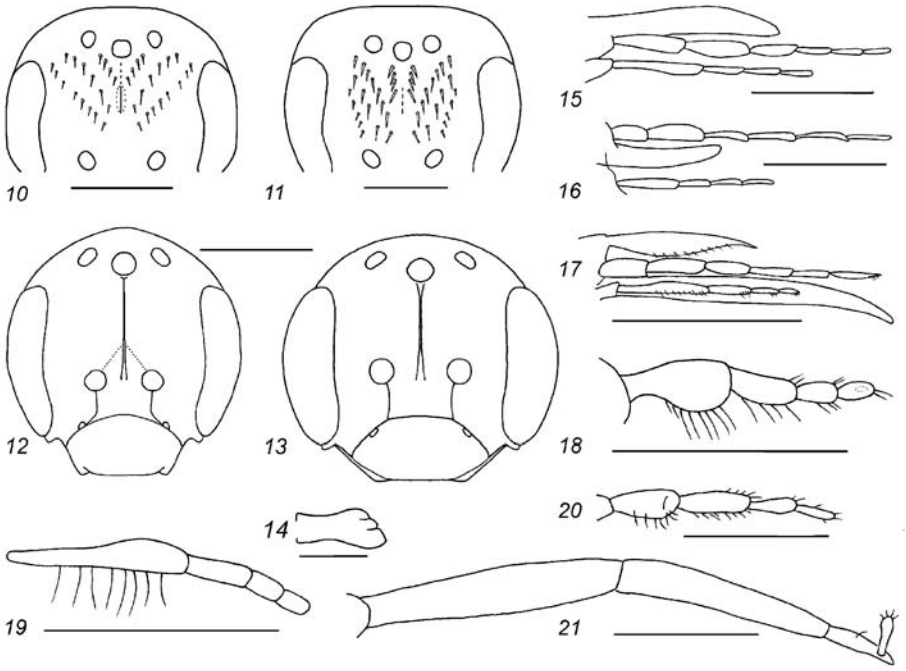
Halictoides (*Halictoides*) *carinatus* POPOV, 1959: 230, Fig. 3. ♀♂. Lectotype: ♂, "Mongolia: Hingan" [Major Hingan Mt. Range; China: Neimenggu]; designated by PESENKO (1998: 681); ZISP; examined.

T a x o n o m y . EBMER, 1984: 367, Fig. 76; WU, 1987: 191 (key; in Chinese); PESENKO, 1998: 681.

P u b l i s h e d r e c o r d s . Russia: Amur Prov. (POPOV, 1959: 232); Buryatia; Amur. Prov.; Primorskii Terr. (PESENKO, 1998: 682; PROSHCHALYKIN, 2004: 5; see "Material examined" below); Khabarovsk Terr. (EBMER, 1978a: 217). China: Neimenggu: Major Hingan Mt. Range (POPOV, 1959: 230); Heilongjiang: Harbin (EBMER, 1978a: 217; 1984: 367); Beijing (WU, 1987: 188).

M a t e r i a l e x a m i n e d (63♂♂, 22♀♀, including the lectotype and two paralectotypes; ZISP). Russia: Buryatia: Armak (middle stream of Jida River); Amur Prov.: 35 km W Svobodny, Simonovo, 10 km E Arkhara; Primorskii Terr.: Khasan, 40 km E Khasan, Novokachalinsk, 15 km E Pos'et. China: Neimenggu: Major Hingan Mt. Range.

D i s t r i b u t i o n . A Southeastern Palaearctic species. South of Eastern Siberia (Buryatia; PESENKO, 1998: 681), Far East of Russia (Amur Prov., POPOV, 1959: 232; Khabarovsk Terr., EBMER, 1978a: 217; Primorskii Terr., PESENKO, 1998: 681), northeastern China (Neimenggu (POPOV, 1959: 232; Heilongjiang; EBMER, 1978a: 217; 1984: 367; Beijing; WU, 1987: 188).



Figs 10-21: Head and its appendages of Rophitinae: (**10**, **11**) frons of female, (**12**) head of female in front view, (**13**) head of male in front view, (**14**) mandible of male, (**15-17**) distal part of labiomaxillary complex in lateral view, (**18-21**) labial palp. (**10**) *Rophites gruenwaldti*, (**11**, **21**) *R. quinquespinosus*, (**12**, **13**, **17**) *Trilia kerzhneri*, (**14**) *Dufourea mandibularis* (from POPOV, 1959), (**15**) *D. minuta* (from PESENKO, 1998), (**16**) *D. spiniventris* (from PESENKO, 1998), (**18**) *Flavodufourea flavicornis*, (**19**) *Morawitzella nana*, (**20**) *Rhophitoides canus.* Scale bar means 1 mm for Figs 10-14; 0.25 mm for Figs 15-21.

Dufourea (*Halictoides*) *dentiventris* (NYLANDER, 1848)

Dufourea dejeanii LEPELETIER, 1841: 228. ♂. Lectotype: ♂, no locality label; designated by BAKER (1994: 1199); FSF. Nomen oblitum. The name suppressed by the ICZN for the purposes of the principle of priority (EBMER, 2001; Opinion 2001).

Halictoides dentiventris NYLANDER, 1848: 195, Fig. 2 on Pl. 3. ♀♂. Lectotype: ♀, Finland: "Tavastia, Kekoni"; designated by EBMER (1976: 1); ZMUH.

Rophites bispinosa EVERSMANN, 1852: 60. ♂, non ♀ (= *R. cana* EVERSMANN). Lectotype: ♂, Russia: Irkutsk; designated by PESENKO (1998: 682); ZISP. Synonymy by MORAWITZ (1866: 28).

Dufourea putoniana DOURS, 1873: 291. ♀♂. Syntypes: France: "Hospenthal (St. Gotthardt), 1♀; "Lautaret" (?Vogesen), 3♂♂; MNB (only 1♂ retained). Synonymy by WARNCKE (1979: 140).

Dufourea (*Halictoides*) *odontogastra* EBMER, 1978b: 317, Figs 11-15. ♂. Holotype: ♂, North Korea: Pektusan Mt.; HMB. Synonymy by EBMER (1984: 364).

Taxonomy (selected references). EBMER, 1976: 1; 1984: 328 (key), 338 (key), 364, Figs 70-75, 190-192, 265; 1988: 683; WARNCKE, 1979: 140; BAKER, 1994: 1199; PESENKO, 1998: 682; PESENKO et al., 2000: 115 (key), 118, Figs 141, 144; 2002: 25 (key), 26 (key), Figs 42, 45.

Published records. Russia: Irkutsk (EVERSMANN, 1852: 60, *Rophites bispinosa*); Yakutia (PESENKO, 1998: 683; see "Material examined" below). North Korea: Ryang-gang Prov.: Pektusan Mt., 25 km NW Sam-zi-yan (EBMER, 1978b: 317, *Dufourea odontogastra*). China: Qinghai (PESENKO, 1998: 683; see "Material examined" below).

Material examined (2♂♂; ZISP). Russia: Irkutsk Prov.: Irkutsk (lectotype of *Rophites bispinosa*). China: Qinghai: "Kurlyk near Baingol (Eastern Qindam), 21.V.1895, leg. ROBOROVSKI and KOZLOV", 1♂.

Distribution. Europe nearly throughout, as far in the north as southern Sweden, Finland (to 64° N), and Udmurtia; in the south mostly in mountains (the Alps, Pyrenees, Caucasus); as far in the east as Perm Prov. of Russia and Bashkiria. Asia: Western Siberia (Orenburg Prov.; PESENKO, 1998: 683); Eastern Siberia (Irkutsk; EVERSMANN, 1852: 60, *Rophites bispinosa*); North Korea (EBMER, 1978b: 317, *Dufourea odontogastra*); northern China (Qinghai; PESENKO, 1998: 683).

Dufourea (*Halictoides*) *flavozonata* (WU, 1990)

Halictoides (*Halictoides*) *flavozonatus* WU, 1990a: 243 (in Chinese), 250 (in English), Fig. 3. ♀. Holotype: ♀, China: Dong Ujimqin (Neimenggu); IZB.

The species is known only from the holotype.

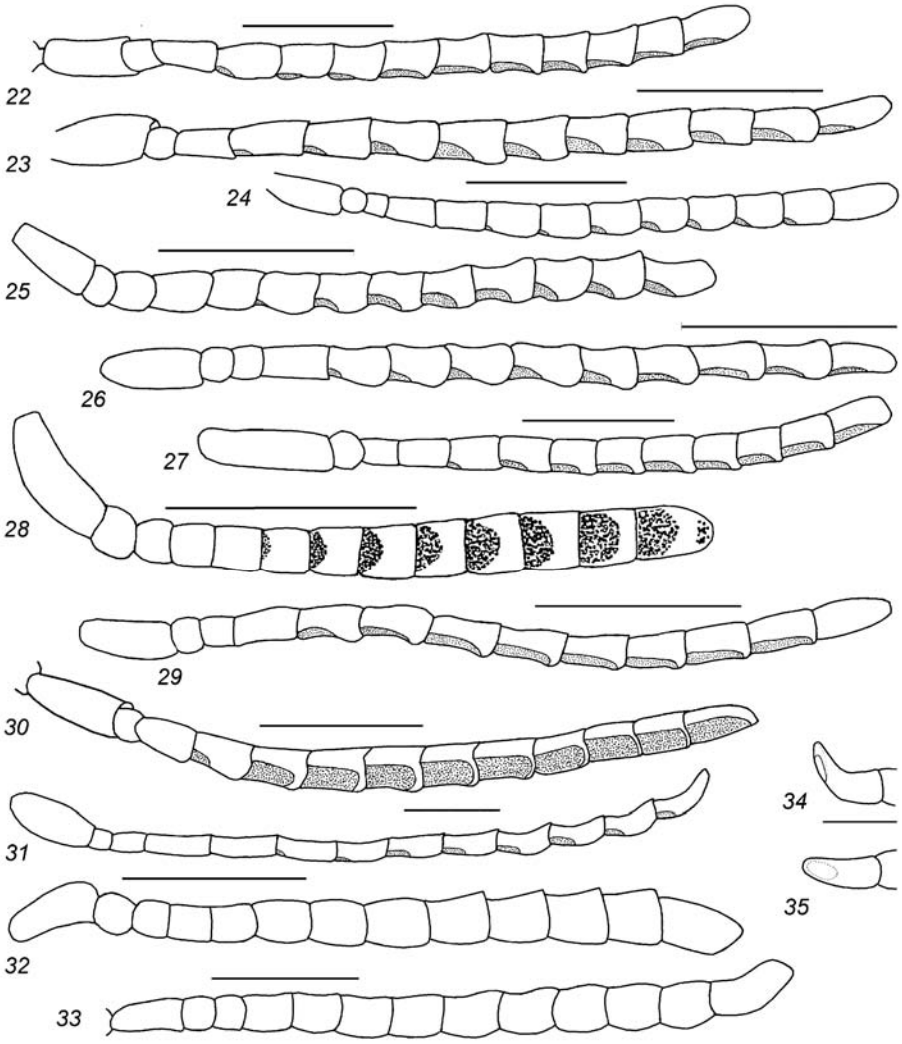
Dufourea (*Halictoides*) *inermis* (NYLANDER, 1848)

Halictoides inermis NYLANDER, 1848: 197. ♂. Lectotype: ♂, "Siberia orientalis" [Khabarovsk territory]; designated by EBMER (1976: 2); ZMUH.

Taxonomy (selected references). EBMER 1976: 2; 1984: 330 (key), 340 (key), 365, Figs 5, 6, 77, 78, 193-196; 1987a: 48, Fig. 8; 1988: 684; WU, 1987: 192 (key; in Chinese); PESENKO et al., 2000: 115 (key), 119, Fig. 145; 2002: 25 (key), 26 (key), Fig. 46.

Published records. Russia: Khabarovsk Terr. (NYLANDER, 1848: 197), Yakutia (PESENKO, 1998: 683; PESENKO & DAVYDOVA, 2004: 685; see "Material examined" below), Irkutsk Prov., Amur Prov., and Primorskii Terr. (PESENKO, 1998: 683; PROSHCHALYKIN, 2004: 5; see "Material examined" below). China: Qinghai (PESENKO, 1998: 683; see "Material examined" below); Heilongjiang (WU, 1987: 188; localities in Chinese).

Material examined (13♂♂, 8♀♀; ZISP). Russia: Irkutsk Prov.: Irkutsk; Yakutia: 10 km N Yakutsk, 60 km N Amga, Khattygy-Terde on Amga River; Amur. Prov.: 10 km E Arkhara, Blagoveshchensk, 35 km W Svobodny, Khabarovsk Terr.: Srednetambovskoe, Nizhnetambovskoe; Primorskii Terr.: Lake Khasan, Benevskoe near Lazo. China: Qinghai: "Kurlyk near Baingol (Eastern Qindam), 21.V.1895, leg. ROBOROVSKI & KOZLOV", 1♂.



Figs 22-35: Antenna (**22-33**) and ultimate flagellomere (**34**, **35**) of male of Rophitinae: (**22**) *Dufourea calcarata*, (**23**) *D. clavicra*, (**24**) *D. carinata*, (**25**) *D. dentiventris*, (**26**) *D. inermis*, (**27**) *D. mandibularis*, (**28**) *D. minuta* (from EBMER, 1984); (**29**) *D. mongolica*, (**30**) *D. paradoxa sibirica*, (**31**) *D. spiniventris*, (**32**) *Morawitzella nana*, (**33**) *Trilia kerzhneri*, (**34**) *Flavodufourea flavicornis*. (**35**) *Rophites quinquespinosus.* Scale bar means 1 mm for Figs 22-31; 0.5 mm for Figs 32-35.

D i s t r i b u t i o n . Europe nearly throughout, as far in the north as the Netherlands and Finland (to 62° N), in the south mostly in mountains (the Pyrenees, Bulgarian Rodopes, Caucasus), as far in the east as Perm Prov. and Bashkiria. Moderate zones of Asia: Western Siberia (Orenburg Prov., Altai; PESENKO, 1998: 683); Eastern Siberia (Irkutsk Prov., Yakutia; PESENKO, 1998: 683; PESENKO & DAVYDOVA, 2004: 685); Russian Far East (Amur Prov., Khabarovsk and Primorskii Terr.; NYLANDER, 1848: 197; PESENKO, 1998: 683); northern China (Qinghai; PESENKO, 1998: 683; EBMER, 1999: 206; Heilongjiang; WU, 1987: 188).

Dufourea (*Halictoides*) *mongolica* (POPOV, 1959)

Halictoides (*Halictoides*) *mongolicus* POPOV, 1959: 228, Fig. 2. ♂. Lectotype: ♂, Mongolia: Ich-Bogd-ula (Bayan-Hongor); designated by PESENKO (1998: 683); ZISP; examined.

T a x o n o m y . EBMER 1984: 367; PESENKO, 1998: 683, Figs 43-45 (♀).

P u b l i s h e d r e c o r d s . Mongolia: Bayan-Hongor: Ich-Bogd-ula (POPOV, 1959: 230); Övör-Hangay, Ömnögovi (PESENKO, 1998: 683; see "Material examined" below).

M a t e r i a l e x a m i n e d (15♂♂, 1♀; ZISP). Mongolia: Bayan-Hongor: Ich-Bogd-ula (lectotype and paralectotypes), 30 km ESE Bayan-govi (southeastern slopes of Tsagan-Bogd-ula), 40 km E Bayan-govi; Övör-Hangay: 20 km S Hovd (Arts-Bogd-ula); Ömnögovi: 35 km NW Bulgan.

D i s t r i b u t i o n . Mongolia (Bayan-Hongor, Övör-Hangay, Ömnögovi).

Flavodufourea flavicornis (FRIESE, 1913)

Dufourea flavicornis FRIESE, 1913: lx. ♂. Lectotype: ♂, "Mongolia: Monda" [Russia: Mondy (Buryatia)]; designated by PATINY (2003: 3); MNB.

T a x o n o m y . POPOV, 1946; SCHWAMMBERGER, 1975: 58, 63 (key), Figs 1a-1e; WARNCKE, 1979: 138; EBMER, 1984: 373, Figs. 15, 123, 255-261; MICHENER, 2000: 314; PATINY, 2003: 3, Figs 1a, 2a, 3a, 4a.

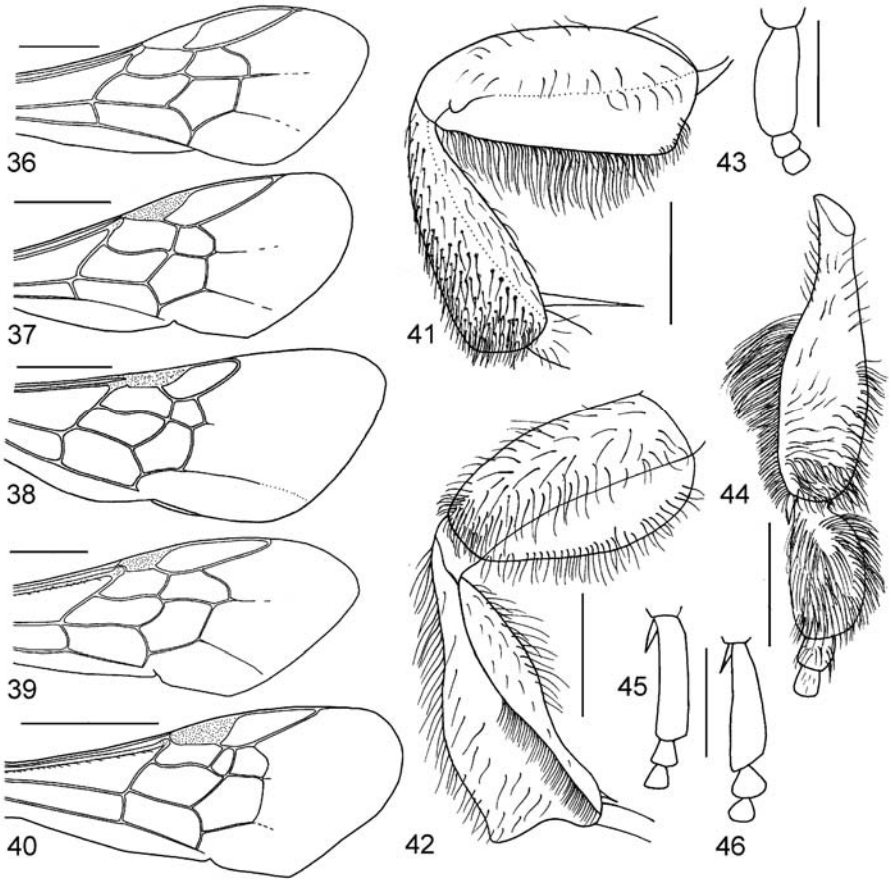
The species is known only from the type series from Buryatia.

Morawitzella nana (MORAWITZ, 1880)

Epimethea nana MORAWITZ, 1880: 357. ♂. Lectotype: ♂, China: "Bassin des gelben Flusses" [Ordos, Shaanxi]; **designated here**; ZISP. References to diagnoses are given in Section "Taxonomy" below.

T a x o n o m y . FRIESE, 1901: 29; POPOV, 1957: 916, Fig. 1; WARNCKE, 1979: 117, Figs 1-6; EBMER, 1984: Fig. 262.

The species is known only from the type series from Shaanxi.



Figs 36-46: Appendages of mesosoma of Rophitinae: (**36-40**) forewing, (**41**, **42**) middle femur and tibia of female (**41**) and male (**42**) in lateral view, (**43**, **45**, **46**) 1st-3rd middle tarsomeres of male, (**44**) hind tibia and basitarsus of male. (**36**) *Dufourea carinata*, (**37**) *D. minuta*, (**38**) *Morawitzella nana*, (**39**, **46**) *Rophites quinquespinosus*, (**40**) *Trilia kerzhneri*, (**41**, **42**) *Dufourea paradoxa sibirica*, (**43**, **44**) *D. spiniventris*, (**45**) *Rophites gruenwaldti*. Scale bar means 1 mm for Figs 36, 37, 39, 41-45; 0.5 mm for Figs 38, 40.

Rhophitoides canus (EVERSMANN, 1852

Rophites cana EVERSMANN, 1852: 60. ♂. Lectotype: ♂, Russia: Spassk [Orenburg Prov.: Spasskoe]; **designated here**; ZISP. References to diagnoses are given in Section "Taxonomy" below.

Rhophites bifoveolatus SICHEL, 1854: lxxiv. ♀♂. Syntypes: environs of Paris; ?MNP. Synonymy by MORAWITZ (1872: 63).

Rhophitoides distinguendus SCHENCK, 1861: 171 (key), 208. ♂. Syntypes: 3♂♂, Germany: "Wiesbaden und Hüchst"; FSF. Synonymy by DALLA TORRE (1896: 175).

T a x o n o m y (selected references). SCHWAMMBERGER, 1975: 58, 63 (key); WARNCKE, 1979: 142-143; EBMER, 1984: Fig. 267; 1988: 685; PESENKO et al., 2000: 121, Fig. 117; 2002: 27, Fig. 18.

P u b l i s h e d r e c o r d s . Mongolia: Töv: Ulanbaatar, Bornuur, Batsumber, Zuun Hara (EBMER, 1988: 686).

M a t e r i a l e x a m i n e d (38♂♂, 6♀♀; ZISP). Russia: Krasnoyarsk Terr.: Ishim near Kansk, Krasnoyarsk; Buryatia: Ulan-Ude. Korean Peninsula: Diuyr ad Chongjin, 24.VIII.1959, leg. B. Pisarski, 2♂♂; MIZW. Mongolia: Hovd: Elsen-devseg, Bodonchin-gol in 12 km SW Lower Altay, Uench; Töv: Ulanbaatar; Selenge: 25 km E Garhan; Dornod: 33 km SE Halhgol-somon.

D i s t r i b u t i o n . A steppe Eurasian species. Europe: from Belgium and eastern France in the west, as far in the north as central Poland, Lithuania, and Udmurtia, to Bashkiria in the east. Asia as far in the east as Transbaikalia, Mongolia (Hovd, Töv, Selenge, Dornod), Korean Peninsula (**first record**), and northwestern China (Xinjiang; WU, 1985: 140).

Rophites gruenwaldti EBMER, 1978

Rophites gruenwaldti EBMER, 1978a: 217, Figs 29-31, 33-35. ♂♀. Holotype: ♂, China: Harbin (Heilongjiang); EBM.

T a x o n o m y . EBMER & SCHWAMMBERGER, 1986: 278 (key), 280 (key), 291, Figs 56-61, 125.

P u b l i s h e d r e c o r d s . Mongolia: Dundgovi: Delgerhangay-ula (EBMER & SCHWAMMBERGER, 1986: 291). China: Heilongjiang: Harbin (EBMER, 1978a: 218).

M a t e r i a l e x a m i n e d (2♂♂, 2♀♀; ZISP). Russia: Amur Prov.: Blagoveshchensk, 35 km N Svobodny; Primorskii Terr.: Vladivostok. Mongolia: Sühbaatar: Dzotol-han-ula.

D i s t r i b u t i o n . Far East of Russia (**first record**: Amur Prov., Primorskii Terr.), Mongolia (Dundgovi, EBMER & SCHWAMMBERGER, 1986: 291; **first record**: Sühbaatar), northeastern China (Heilongjiang; EBMER, 1978a: 218).

Rophites quinquespinosus SPINOLA, 1808

Rophites quinquespinosus SPINOLA, 1808: 72. ♂. Lectotype: ♂, Italy: "Liguria: in montibus Orerii"; designated by SCHWAMMBERGER (1971: 579); in Mus. Turin.

Rhophites pilichi MÓCZÁR, 1967: 114. ♀♂. Syntypes: Hungary, HMB. Synonymy by WARNCKE. (1980: 42).

Rhophites moeschleri SCHWAMMBERGER, 1971: 579, Figs 1a, 1b. ♂♀. Holotype: ♂, Sweden: Lindholmen; ZML. Synonymy by WARNCKE (1980: 41).

Rophites bluethgeni BENEDEK, 1973: 272, Figs 1b, 1d, 1g. ♂♀. Hungary: Simontornya; Holotype: ♂, HMB. Synonymy (*Rophites quinquespinosus bluethgeni*) by WARNCKE (1980: 42).

T a x o n o m y . FRIESE, 1901: 68 (key), 69 (key), 71; WARNCKE. 1980: 39-42, Figs 1, 3, 5, 7, 9, 11; EBMER & SCHWAMMBERGER, 1986: 278 (key), 280 (key), 281, Figs 1-18, 41-44, 48, 119, 120, 122, 123; EBMER, 1984: Fig. 266; 1988: 686; PESENKO et al., 2000: 125 (key), Fig. 159; 2002: 28 (key), 29 (key), Fig. 48.

V a r i a t i o n . A rather variable species. This variation was a reason for description of some redundant taxa for the last 30 years (see the synonymy above); one of which even was considered by WARNCKE (1980: 42) as a separate subspecies, spp. *pilichi* Móczár (= *R. bluethgeni* Benedek). The species is close to *R. algirus trispinosus* PÉREZ; differences between them were given by WARNCKE (1980: 39) and by EBMER & SCHWAMMBERGER (1986: 278, 280).

M a t e r i a l e x a m i n e d (9♂♂, 6♀♀; ZISP). Russia: Krasnoyarsk Terr.: Krasnoyarsk; Irkutsk Prov., Irkutsk Prov.: Irkutsk, Nizhneudinsk, Padun on Upper Tunguska River, Telma.

D i s t r i b u t i o n . Europe almost throughout, from France in the west, as far in the east as the Urals, to southern Sweden in the north. Asia: Asia Minor, Kyrghyzstan, Western Siberia (Tomsk Prov.), Eastern Siberia (**first record**: south of Krasnoyarsk Terr., Irkutsk Prov.), northwestern China (Xinjiang; WU, 1985: 139).

Trilia kerzhneri PESENKO & ASTAFUROVA, sp.nov.

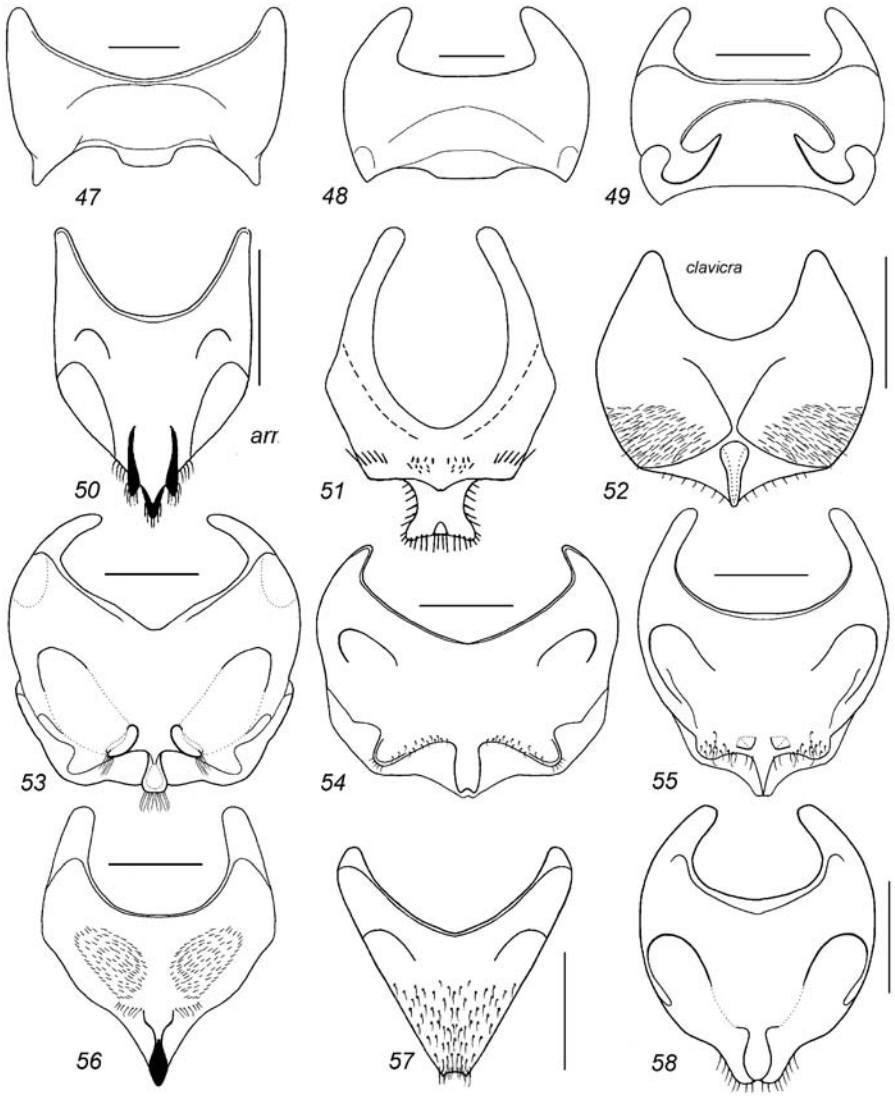
H o l o t y p e . ♂, Mongolia: Ömnogövi, Bordzon Govi, 80 km SSE Nomgon, 5-8.VIII.1967, leg. I.M. KERZHNER.

P a r a t y p e s . Mongolia: Bayan-Hongor, 15 km S Ehingol Oasis, 14.VIII.1969, leg. I.M. KERZHNER, 2♂♂, 2♀♀; Bayan-Hongor, 70 km E Talyn-bilgeh-bulak, on flowers of *Salsola arbuscula*, 19.VIII.1969, leg. I.M. KERZHNER, 2♂♂, 1♀. All labels are written in Russian. The holotype and most of the paratypes are deposited at ZISP; one male paratype is deposited at SCH.

D i s t r i b u t i o n : Western and southern Mongolia.

D i a g n o s i s . The new species differs from all other congeners in the following characters: mesopleuron very sparsely punctate, metapleuron and lateral surface of propodeum distinctly punctate and polished on interspaces, yellow pattern of legs more expansive (nearly throughout yellow in the male, all tarsi and hind tibia yellow in the female), male S6 strongly narrowed backward, S7 with several strong thorns on ventral surface, gonostylus with obtuse-angled process on inner margin. It is similar to *T. muoti* (VACHAL) in the long gonostylus, but differs from *T. muoti* in a number of characters, including much more sparsely punctate mesoscutum, distinctly punctate and shiny T1 of both sexes (densely roughened and mat in *T. muoti*), longer male flagellum, volsella pubescent with long dense hairs in ventral surface. In four the last characters, *T. kerzhneri* is similar to *T. deserticola*, but differs from the latter in the following characters: head much shorter of both sexes, clypeus entire dark (yellowish on most surface in *T. deserticola*), female face flatter (deeply depressed at sides of supraclypeal area of *T. deserticola*), male flagellum on upper side with eyelash-like raw of short curved hairs, posterior lobe of male S7 provided with long thin process on posterior margin, gonostylus much longer.

M a l e . Structure. Body length 3.7-5.0 mm. Head rounded in front view, as high as wide or somewhat wider than high (Fig. 13), with strongly convex vertex; between antennal sockets moderately convex. Mandible with subapical tooth. Maxillary palp twice as long as postpalpal part of galea; its second segment longest, other segments approximately of equal length (Fig. 17). Labial palp somewhat longer than postpalpal part of galea; its first segment almost as long as all three subsequent ones combined (Fig. 17). Antenna relatively long; middle flagellomeres 1.3-1.5 times as long as their diameters in lateral view (Fig. 33). Dorsal surface of propodeum flat, about as long as scutellum. Marginal cell of forewing very large, pointed at apex, 1.5 times as long (along costal margin) as each pterostigma and free distal part of costal margin of wing.



Figs 47-58: S5 (**47-49**) and S6 (**50-58**) of males of *Dufourea* in ventral view: (**47**, **54**) *D. dentiventris* (**48**, **55**) *D. inermis*, (**49**, **58**) *D. mongolica*, (**50**) *D. armata*, (**51**) *D. calcarata* (from WU, 1982), (**52**) *D. clavicra* (**53**) *D. carinata*, (**56**) *D. mandibularis*, (**57**) *D. minuta*. Scale bar means 0.5 mm for Figs 50, 52-58.

Forewing with three submarginal cells; 1st one larger than 3rd; 2nd one smallest, trapezoidal. Nervellus antefurcal (Fig. 40). Posterior areas of metasomal terga narrow, separated from their discs by distinct step along entire anterior margins. Discs of T2-T4 moderately convex, roundly depressed in anterior parts. S6 strongly narrowed backward,

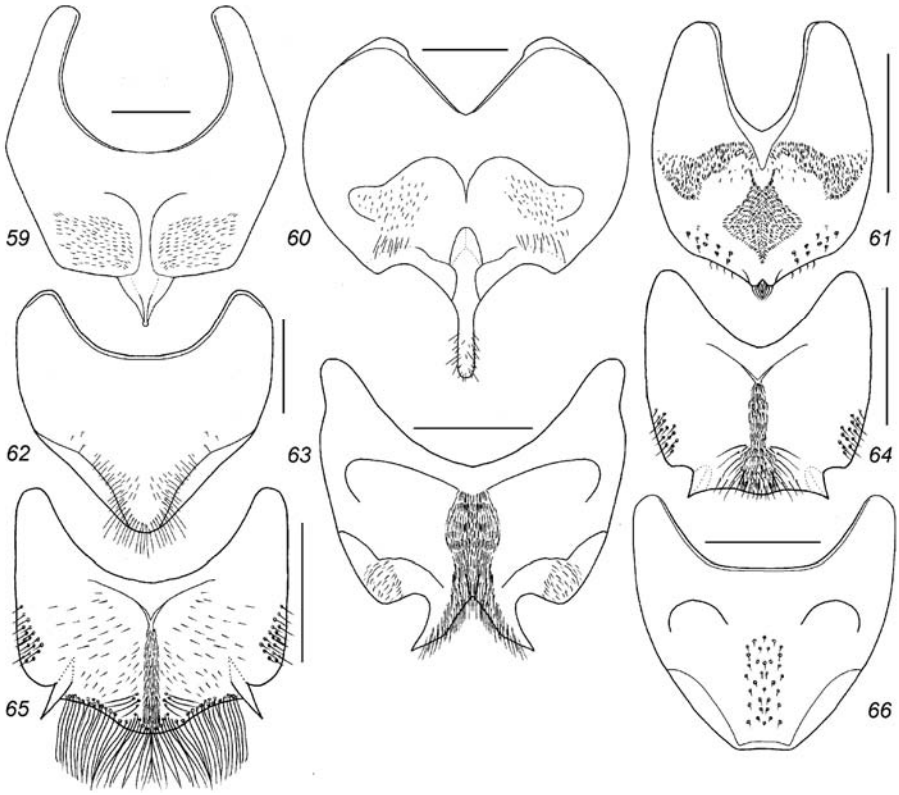
but not forming posterior median process (Fig. 66). Apodemae of S7 narrow, posterior lobe of the sternum nearly square, provided with several strong thorns on ventral surface and with long thin process on posterior margin (Fig. 85). S8 with deep excision on anterior margin, its depth nearly half length of main body of the sternum; posterior median process of S8 bulb-shaped (Fig. 100). Gonobase rectangular in dorsal or ventral view, 0.3 times as long as wide; genital foramen transversely elliptical. Volsella moderately long, pubescent with long dense hairs on ventral surface. Gonostylus distinctly bordered from gonocoxite, 4 times as long as wide, with obtuse-angled process in middle of inner margin (Fig. 115, 116).

Sculpture. Body shiny of most surface. Lower half of face (in norm, its surface closed by dense pubescence) very finely and densely punctate (4-6 μm / 0.3-0.5), shiny on interspaces, except for wide transverse impunctate polished stripe around dorsal abscissa of epistomal suture. Lower half of frons and upper half of paraocular area more coarsely and sparsely punctate (10-15 μm / 0.5-2.0), polished on interspaces. Upper half of frons and vertex with very sparse punctures, polished. Genal area (in norm, its surface closed by dense pubescence) sparsely obscurely punctate, shiny. Mesoscutum nearly impunctate, only with several coarse punctures (20-25 μm), polished. Sculpture of mesopleuron similar to that of lower half of frons. Sculpture of lateral and posterior vertical surfaces of propodeum similar to that of lower half of face. Metapostnotum finely densely granulate, mat, except for wide polished stripe along its posterior margin. T1 on dorsal surface and T2-T4 on discs distinctly punctate (15-20 μm / 0.3-1.5), polished on interspaces, shiny; their posterior areas impunctate.

Coloration. Head, including entire clypeus, and mesosoma black. Mandible dark yellow, with reddish apex. Scape dark on most surface; flagellum yellow on lower side, ochre-yellow on upper side. Humeral pronotal tubercle, anterior third of hyaline tegula, basal sclerites and costal vein of forewings yellowish white. Coloration of legs varying: from nearly throughout yellow to brown coxae, trochanters, femora, and tibiae of all legs. Membrane of wings hyaline; veins light yellow. Metasoma brown to dark brown; posterior areas of terga horny-yellowish translucent.

Vestiture. Tomentose pubescence absent on head and mesosoma. Face up to middle of frons and genal area covered with very dense, long plumose appressed snow-white hairs. Flagellum on upper side with eyelash-like raw of short curved hairs. Mesosoma covered with moderately dense and long erect plumose white hairs, except for bare metapostnotum. Metasomal terga with wide anterior bands of dense white tomentum.

F e m a l e . Structure. Body length 3.7-5.0 mm. Head rounded in front view, as high as wide or somewhat higher than wide (Fig. 12); between antennal sockets moderately convex. Face slightly depressed at sides of supraclypeal area. Structure of mouth parts as that of male. Antenna very short; middle flagellomeres half as long as their diameters. Dorsal surface of propodeum flat, about as long as scutellum. Venation of forewing as that of male. Posterior areas of metasomal terga, narrow, separated from their discs by distinct step along entire anterior margins. Discs of T2-T4 weakly convex.



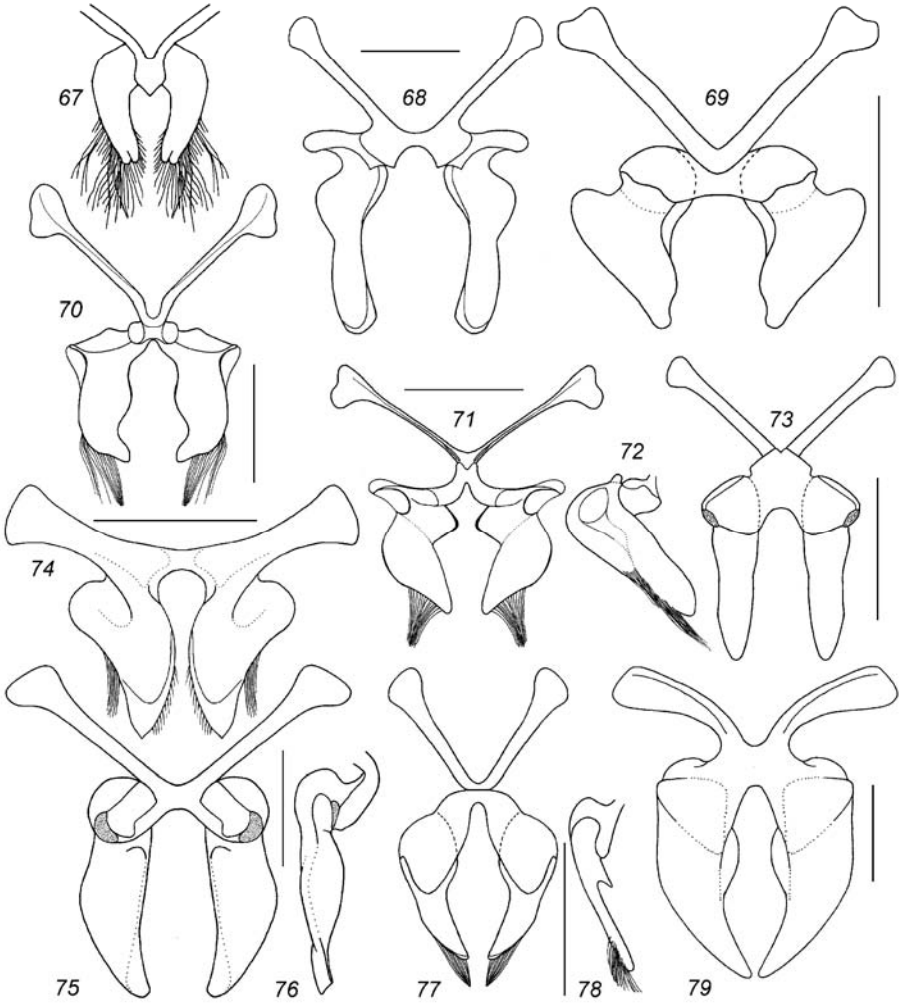
Figs 59-66: S6 of males of Rophitinae in ventral view: (**59**) *Dufourea paradoxa sibirica*, (**60**) *D. spiniventris*, (**61**) *Flavodufourea flavicornis*, (**62**) *Morawitzella nana*, (**63**) *Rhophitoides canus*, (**64**) *Rophites gruenwaldti*, (**65**) *R. quinquespinosus*, (**66**) *Trilia kerzhneri*. Scale bar means 1 mm for Figs 61, 64, 65, 0.5 mm for Figs 59, 60, 63; 0.25 mm for Figs 62, 66.

Sculpture. It similar to that of male, except for surfaces as follows. Clypeus polished throughout, with a few shallow pits in lower half. Supraclypeal area sparsely and relatively coarsely punctate (10-15 μm / 0.5-2.0). Metapostnotum polished on larger surface and its granulation (on anterior third or half) finer and obscure than that of male.

Coloration. It similar to that of male, except for brownish black lower half of head. On legs only tarsi and and most of tibiae yellow to dark yellow.

Vestiture. It similar to that of male, except for much weaker pubescence of face. Scopa of hind legs and prepygidial fringe white.

Derivatio nominis. The new species is named for Prof. Izyaslav M. Kerzhner (ZISP), a collector of the type series, well known entomologist and recognized authority in the field of Zoological Nomenclature.



Figs 67-79: S7 of males of *Dufourea* in ventral view (**67-71**, **73-75**, **77**, **79**) and in lateral view (**72**, **76**, **78**; without apodemae): (**67**) *D. armata* (from POPOV, 1959), (**68**) *D. calcarata*, (**69**) *D. clavicra*, (**70**) *D. carinata*, (**71**, **72**) *D. dentiventris* (**73**) *D. mandibularis*, (**74**) *D. minuta*, (**75**, **76**) *D. mongolica*, (**77**, **78**) *D. paradoxa sibirica*, (**79**) *D. spiniventris*. Scale bar means 0.5 mm for Figs 68-79.

Discussion: distributional patterns

The Eastern Palaearctic fauna of the subfamily Rophitinae consists of 19 species, *i.e.* about a fifth part of the Palaearctic fauna of the subfamily. It is twice more rich than the fauna of Nomiinae of the Eastern Palaearctic Region (9 species of 3 three genera; see ASTAFUROVA & PESENKO, 2005) and Nomioidinae (9 species of 2 genera; see PESENKO,

2005b), but 8.5 times less than the fauna of Halictinae (164 species of 6 genera). The subfamily Rophitinae is represented in the Eastern Palaearctic Region by several zoogeographical (chorological) elements, i.e. species having different geographical ranges:

Transpalaearctic or nearly so (6 species): *Dufourea dentiventris*, *D. inermis*, *D. paradoxa*, *D. minuta*, *Rhophitoides canus*, and *Rophites quinquespinosus*;

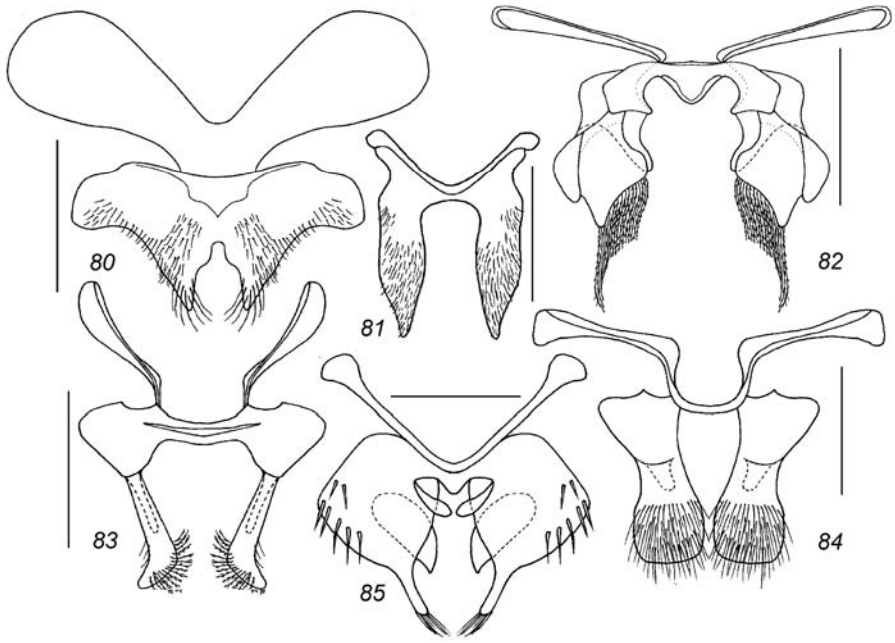
Endemic to the Southeastern Palaearctic Region (2): *Dufourea carinata* and *Rophites gruenwaldti*;

Endemic to Mongolia and/or Buryatia (3): *Dufourea mongolica*, *Flavodufourea flavicornis*, and *Trilia kerzhneri*;

Endemic to northern (or northern and western) China, mostly montane species (8): *Dufourea armata*, *D. calcarata*, *D. clavicra*, *D. flavozonata*, *D. mandibularis*, *D. spiniventris*, *D. versicolor*, and *Morawitzella nana*.

Thus, the majority of species (13 species, 68.5% of the fauna) are endemic to the Southeastern Palaearctic or its parts.

The occurrence of rophitine species in different countries and parts of the Eastern Palaearctic Region, corresponding to available data, is given in the Table below. The fauna of northern China includes the most number of species (11), then the faunas of Eastern Siberia (7) and Mongolia (5) follow. From the Korean Peninsula, a single species, *D. dentiventris*, is recorded. No rophitine species inhabit Japan.



Figs 80-85: S7 of males of Rophitinae in ventral view: (**80**) *Flavodufourea flavicornis*, (**81**) *Morawitzella nana*, (**82**) *Rhophitoides canus*, (**83**) *Rophites gruenwaldti*, (**84**) *R. quinquespinosus*, (**85**) *Trilia kerzhneri*. Scale bar means 0.5 mm for Figs 80, 82-84; 0.25 mm for Figs 81, 85.

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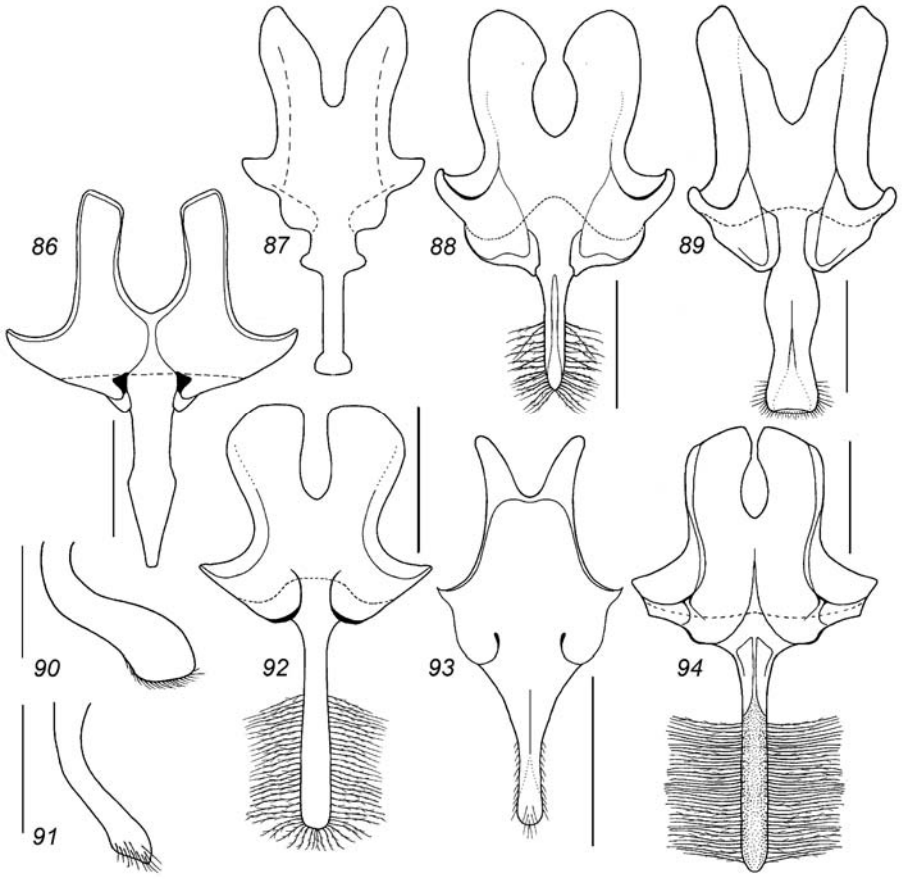
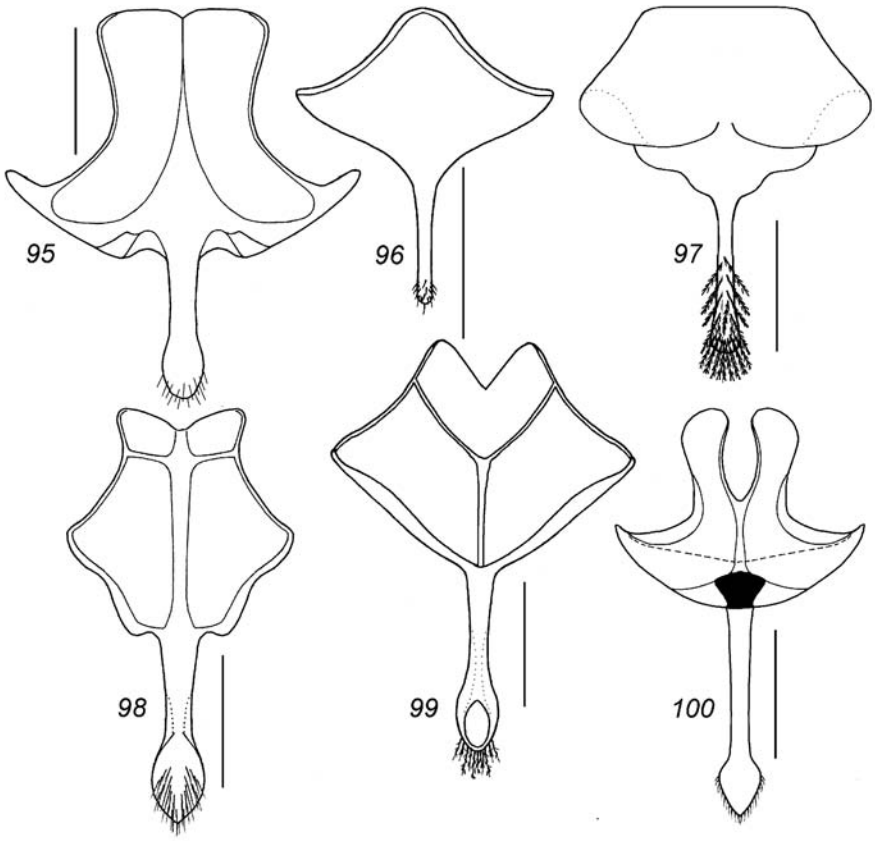
Occurence of rophitine species in the Eastern Palaearctic Region

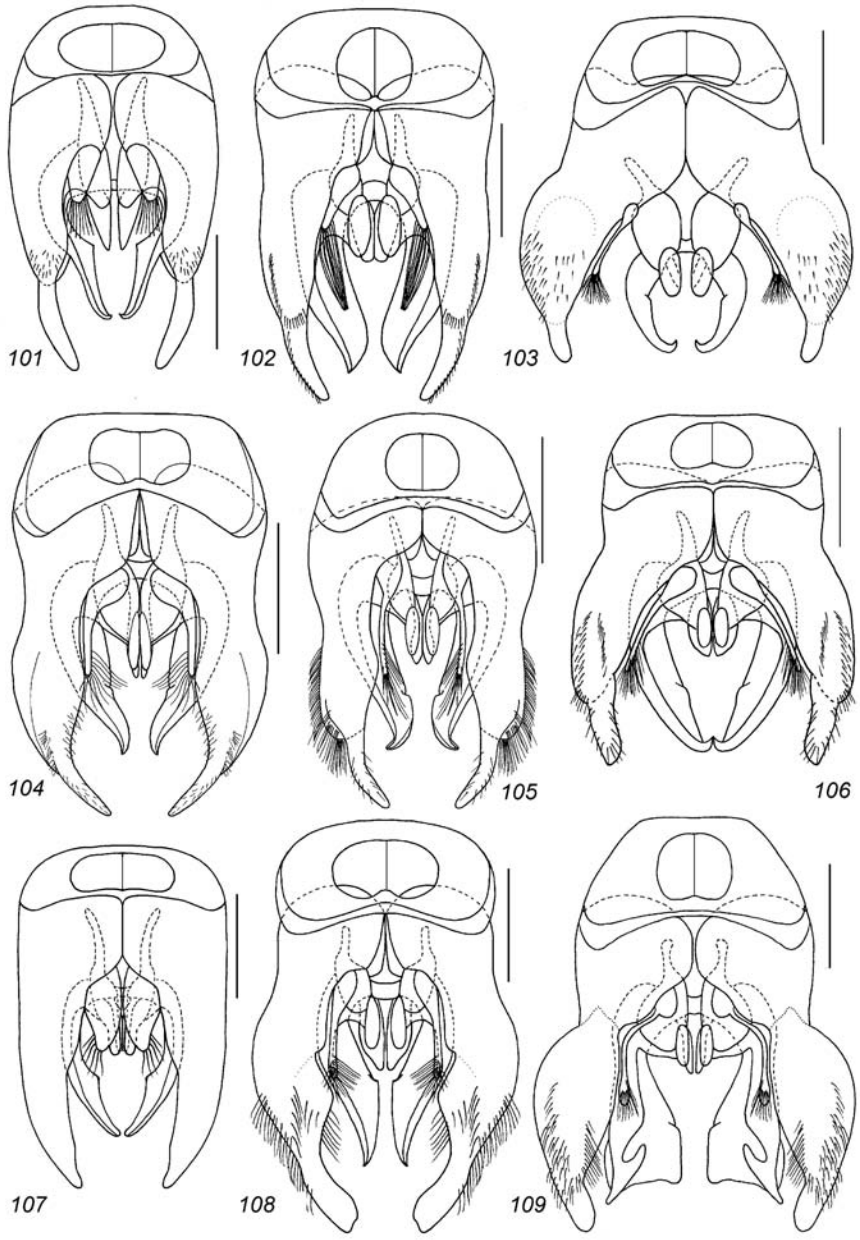
Species	Eastern Siberia	Russian Far East	Mongolia	Northern China	Eastern China	Korean Peninsula	Japan
Dufourea armata	-	-	-	+	-	-	-
D. calcarata	-	-	-	+	-	-	-
D. carinata	+	+	-	-	+	-	-
D. clavicra	-	-	-	+	-	-	-
D. dentiventris	+	-	-	+	-	+	-
D. flavozonata	-	-	-	+	-	-	-
D. inermis	+	+	-	+	+	-	-
D. mandibularis	-	-	-	+	-	-	-
D. minuta	-	-	-	+	-	-	-
D. mongolica	-	-	+	-	-	-	-
D. paradoxa	+	-	+	-	-	-	-
D. spiniventris	-	-	-	+	-	-	-
D. versicolor	-	-	-	+	-	-	-
Flavodufourea flavicornis	+	-	-	-	-	-	-
Morawitzella nana	-	-	-	+	-	-	-
Rhophitoides canus	+	-	+	-	-	-	-
Rophites gruenwaldti	-	+	+		+	-	-
R. quinquespinosus	+	-	-	-	-	-	-
Trilia kerzhneri	-	-	+	-	-	-	-
Total	7	3	5	11	3	1	-



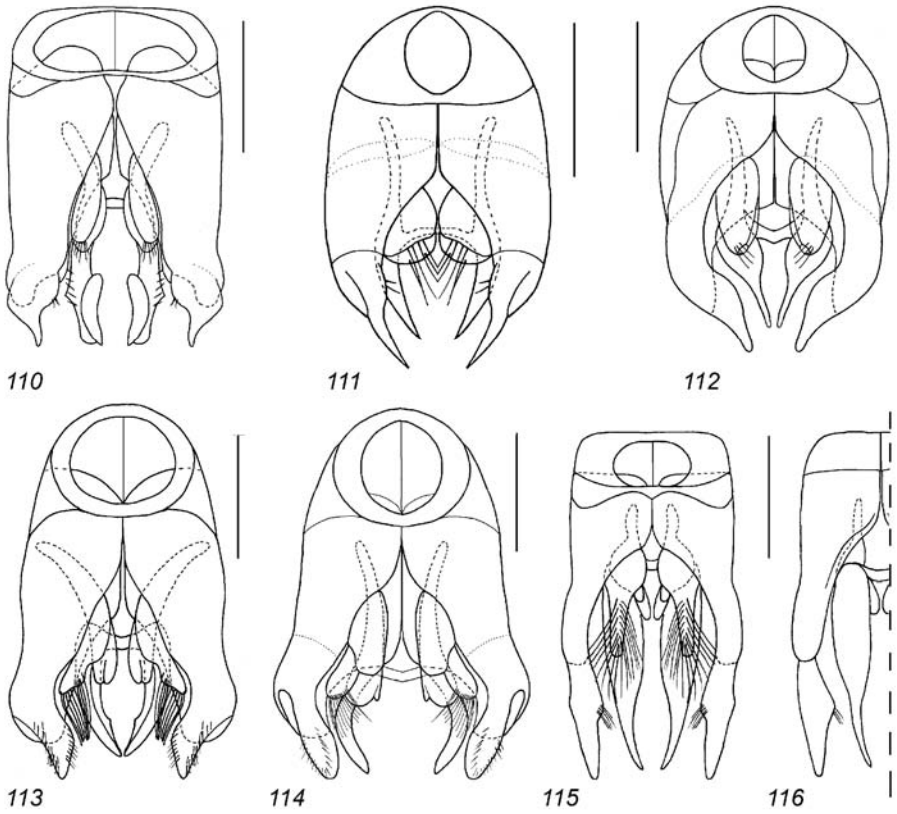
Figs 86-94:, S8 of males of *Dufourea* in ventral view (**86-89**, **92-94**) and in lateral view (**90**, **91**; posterior median process): (**86**) *D. armata*, (**87**) *D. calcarata* (from WU, 1982), (**88**) *D. carinata*, (**89**, **90**) *D. dentiventris*, (**91**) *D. inermis*, (**92**) *D. mandibularis*, (**93**) *D. minuta*, (**94**) *D. paradoxa sibirica.* Scale bar means 0.5 mm for Figs 88-94; 0.25 mm for Fig. 86.



Figs 95-100: S8 of males of Rophitinae in ventral view: (**95**) *Flavodufourea flavicornis*, (**96**) *Morawitzella nana*, (**97**) *Rhophitoides canus*, (**98**) *Rophites gruenwaldti*, (**99**) *R. quinquespinosus*, (**100**) *Trilia kerzhneri*. Scale bar means 0.5 mm for Figs 95, 97-99; 0.25 mm for Figs 96, 100.



Figs 101-109: Genital capsule of males of *Dufourea* in ventral view: (**101**) *D. armata*, (**102**) *D. calcarata*, (**103**) *D. clavicra*, (**104**) *D. carinata*, (**105**) *D. inermis*, (**106**) *D. mandibularis*, (**107**) *D. minuta*, (**108**) *D. paradoxa sibirica*, (**109**) *D. spiniventris*. Scale bar means 0.5 mm for Figs 102-106, 108, 109; 0.25 mm for Figs. 101, 107.



Figs 110-116: Genital capsule of males of Rophitinae in ventral view (**110-115**) and dorsal view (**116**): (**110**) *Flavodufourea flavicornis*, (**111**) *Morawitzella nana*, (**112**) *Rhophitoides canus*, (**113**) *Rophites gruenwaldti*, (**114**) *R. quinquespinosus*, (**115**, **116**) *Trilia kerzhneri*. Scale bar means 0.5 mm for Figs 110, 112-114; 0.25 mm for Figs 111, 115, 116.

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