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**NOTES ON PALEARCTIC HEMEROBIIDAE
(NEUROPTERA). I. INTRODUCTION AND GENUS
WESMAELIUS KRUGER, 1922. PART 2(1). SUBGENUS
KIMMINSIA KILLINGTON 1937**

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A review of 16 species of the subgenus *Kimminsia* Killington, 1937 with special attention to wing venation and detailed distribution is given. New synonymy is proposed: *Wesmaelius conspurcatus* (MacLachlan, 1875), stat. n. = *Boriomyia anseli* H. Aspöck et U. Aspöck, 1966, syn. n. and *Kimminsia pekinensis* Yang, 1980, syn. n.; *W. navasi* (Andreu, 1911) = *K. neimenica* Yang, 1980, syn. n.; *W. ravus* (Withycombe, 1923) = *K. ogatai* Nakahara, 1956, syn. n. The following species were recorded for first time: *W. altissimus* Ohm from Korea and Kirgizia, *W. sinicus* Tjed. from Russia, *W. sufuensis* Tjed. from Kazakhstan and Tadzhikistan, *W. mortonii* McL. from Ukraine, *W. ravus* With. from Japan, *W. subnebulosus* Steph. from Azebaidzhan, *W. conspurcatus* McL. from Kirgizia.

KEY WORDS: Hemerobiidae, *Wesmaelius*, Palearctic Region, taxonomy.

В.Н.Макаркин. Заметки по палеарктическим гемеробидам (Neuroptera, Hemerobiidae). I. Введение и род *Wesmaelius* Kruger, 1922. Часть 2 (1, 2). Подрод *Kimminsia* Killington, 1937 // Дальневосточный энтомолог. 1996. N 31-32. С. 1-34.

Дается обзор 16 видов подрода *Kimminsia* Killington, 1937 с подробным обсуждением жилкования крыльев и распространения видов. Уста-

новлена новая синонимия: *Wesmaelius conspurcatus* (MacLachlan, 1875), stat. n. = *Boriomyia amseli* H. Aspöck et U. Aspöck, 1966, syn. n. = *Kimminsia pekinensis* Yang, 1980, syn. n.; *W. navasi* (Andreu, 1911) = *K. neimenica* Yang, 1980, syn. n.; *W. ravus* (Withycombe, 1923) = *K. ogatai* Nakahara, 1956, syn. n. Вплевые указываются для России - *W. sinicus* Tjed., для Кореи и Японии - *W. altissimus* Ohm, для Казахстана и Таджикистана - *W. sufusensis* Tjed., для Украины - *W. mortoni* McL., для Японии - *W. ravus* With., для Азербайджана - *W. subnebulosus* Steph. и для Киргизии - *W. conspurcatus* McL.

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INTRODUCTION

This paper is the second one from a series in which the Palearctic species of Hemerobiidae will be observed. Abbreviations are given according my first paper (Makarkin, 1995). Additional abbreviations: ZIS - Zoological Institute, St-Petersburg; AUB - Agricultural University, Beijing; BMNH - British Museum (Natural History), London. The references is given in the end of paper.

Subgenus *Kimminsia* Killington, 1937

Kimminsia Killington, 1937: 254. Type species: *Hemerobius betulinus* Strom, 1788 sensu Killington, 1937 [= *Hemerobius nervosus* Fabricius, 1793], by original designation.

Boriomyia Banks, 1905: 36, nom. preocc., non Banks, 1904. Type species: *Hemerobius disjunctus* Banks, 1897 [= *Hemerobius nervosus* Fabricius, 1893], by original designation.

SPECIES COMPOSITION. The subgenus *Kimminsia* Killington, 1937 includes 59 species (Monserat, 1990). Most of them are distributed in the Palearctic region (39) and in the Nearctic region (13) (Klimaszewski & Kevan, 1987). From the Afrotropical region 7 species are known, of these 5 from Africa, 1 from Madagascar (Tjeder, 1961) and 1 from Yemen (Yang, 1980). In the Neotropical region only 1 species distributed in Guatemala. One species is described from the Philippines [*W. davidicus* (Navas, 1910)] but its generic position needs to be confirmed. Finally one Palearctic species *W. subnebulosus* was introduced to New Zealand (Wise, 1973).

CLASSIFICATION. No comprehensive classification of the subgenus is available. A number of the Palearctic species of the *Kimminsia* are believed to compose the *navasi*-group (*W. navasi*, *W. balticus*, *W. conspurcatus*, *W. lindbergi* and *W. sinicus*) (Ohm, 1967). Nearctic and part of Palearctic species were divided by Klimaszewski & Kevan (1987) into 5 groups: *nervosus*-group (5 species), *subnebulosus*-group (3 species), *coloradensis*-group (1 species), *furcatus*-group (1 species) and *schwartzi*-group (7 species). I propose classification of all Holarctic species based upon genitalia structures both males and females.

lateralis-group

Male: ectoproct possess modified setae (Fig. 4-5), ventral process directed downwards, so that ectoproct has the "*Hemerobius*-like" appearance; gonarcus with very long and narrow paramediuncus; mediuncus short with dorsal thorn-like process; parabaculum very long and narrow. Female: subgenitale thimble-like; lateral lobes fused anteriorly [*W. lateralis* (Navas, 1912)].

ravus-group

In hind wing the basal intraradial crossvein absent. Male: ectoproct with short and acute ventral process; gonarcus with elongate and stout paramediuncus; mediuncus short and acute; parabaculum strongly curved. Female: subgenitale very small, narrow and elongated; lateral lobes fused anteriorly, separated from the subgenitale [*W. ravus* (Withycombe, 1923)].

nervosus-group

Male: ectoproct with relatively short ventral process; gonarcus with elongate and stout paramediuncus; mediuncus short; parabaculum as in Fig. 63; Female: subgenitale with short lateral lobes and an additional central plate placed ventrally.

nervosus-subgroup

Male: typical for genus. Female: subgenitale very broad, with paired minute additional plates [*W. nervosus* (Fabricius, 1793), *W. tjederi* (Kimmins, 1963), *W. helveticus* (H. Aspöck et U. Aspöck, 1964), *W. involutus* (Carpenter, 1940), *W. fassnidgei* (Killington, 1933), *W. griseus* (Zeleny, 1971)].

sinicus-subgroup

Male: gonarcus inside with paired process. Female: as in *nervosus*-subgroup (Fig. 79) [*W. sinicus* (Tjeder, 1937), *W. cunctatus* (Ohm, 1967), *W. persimilis* (Ohm, 1967), ? *W. reisseri* Aspöck et Aspöck, 1982].

navasi-subgroup

Male: as in *nervosus*-subgroup. Female: subgenitale with relatively long lateral lobes, and without paired additional plates [*W. navasi* (Andreu, 1911), *W. balticus* (Tjeder, 1931), *W. conspurcatus* (MacLachlan, 1875), *W. mongolicus* (Steinmann, 1965)].

schwartzi-group

Male: ectoproct with short ventral process; gonarcus with long mediuncus and slender curved paramediuncus; parabaculum as in *nervosus*-group. Female: subgenitale narrowly elongate apically, broad basally with lateral lobes attached to the plate in its basal half (except for *W. malladai*) [*W. mortonii* (MacLachlan, 1899), *W. fumatus* (Carpenter, 1940), *W. pretiosus* (Banks, 1908), *W. schwartzi* (Banks, 1903), *W. constrictus* (Parfin, 1956), *W. yukotensis* Klimaszewski et Kevan, 1987, *W. longipennis* (Banks, 1920), ? *W. malladai* (Navas, 1925)].

brunneus-group

Male: ectoproct with very short ventral process; gonarcus with short mediuncus and paramediuncus situated very near from mediuncus; parabaculum as in *nervosus*-group. Female: subgenitale narrowly elongate, with short lateral lobes [*W. trivenilatus* (Yang, 1980), *W. brunneus* (Banks, 1920)].

subnebulosus-group

Male: ectoproct with rather short to extremely long ventral process; gonarcus with long and stout mediuncus, and with minute paramediuncus; parabaculum varied. Female: subgenitale varied.

subnebulosus-subgroup

Male: ectoproct with rather long curved ventral process; gonarcus as in the group in whole; parabaculum with long, slender, curved terminal lobes. Female: subgenitale slender, with lateral lobes very large and fused [*W. subnebulosus* (Stephes, 1936), *W. vartianae* (H. Aspöck et U. Aspöck, 1966), *W. posticatus*, *W. transsylvanicus* (Kis, 1968)].

furcatus-subgroup

Male: ectoproct with very long curved ventral process; gonarcus as in the group in whole; parabaculum peculiar (Fig. 134). Female: subgenitale slender with long lateral lobes [*W. furcatus* (Banks, 1935), *W. altissimus* (Ohm, 1967)].

sufuensis-subgroup

Male: ectoproct with relatively short ventral process; gonarcus with very small traceable paramediuncus; parabaculum as in Fig. 101. Female: subgenitale elongate with small lateral lobes [*W. sufuensis* (Tjeder, 1968)].

coloradensis-group

Male: ectoproct with long curved ventral process; gonarcus with very slender mediuncus, and a process at base of paramediuncus directed inwards; parabaculum very large. Female: subgenitale very slender, lateral lobes fused entirely [*W. coloradensis* (Banks, 1897)].

Wesmaelius incertae sedis

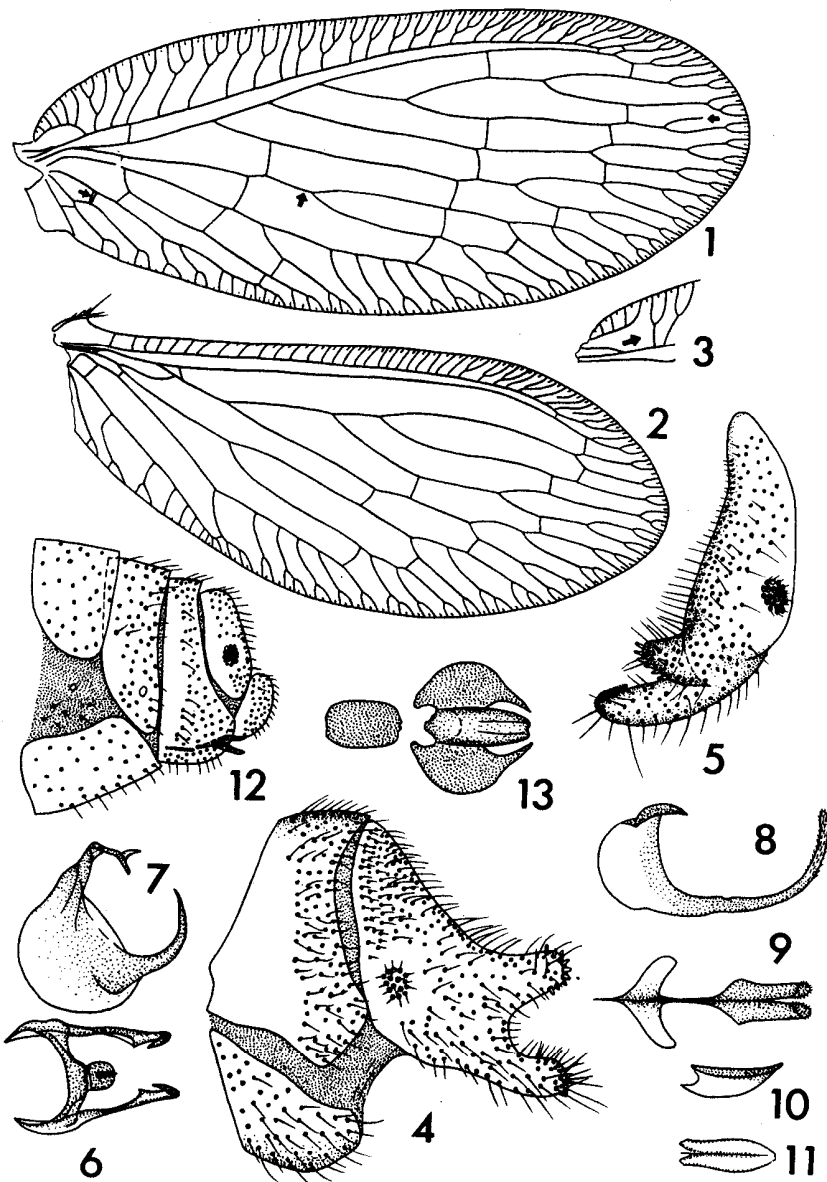
W. baikalensis Navas, 1929, *W. pinicolus* (Ohm, 1967), *W. kaszabi* (Steinmann, 1965), *W. geyri* (Esben-Petersen, 1920), *W. fulvus* (Navas, 1919), *W. lindbergi* (Esben-Petersen, 1931), *W. hani* (Yang, 1985), *W. tuofenganus* (Yang, 1985), *W. ulingensis* (Yang, 1980), *W. exoticus* Makarkin, 1986 and *W. zhiltzovae* Makarkin, 1986.

***Wesmaelius (Kimminsia) lateralis* (Navas, 1912)**

Figs 1-13

Boriomyia lateralis Navas, 1912: 419, fig. 4. Holotype: ♂, Russia: "Amur, promont Pronge, 21.VI 1910 (Derbek)". [ZIS].

COLORATION. Face and genae entirely or mostly black. Vertex pale brownish yellow with a longitudinal median dark stripe. Palpi brown. Scapus yellowish brown, dark brown outside; pedicell yellowish; flagellar segments basally pale, apically brown. Notum brownish yellow, laterally broadly margined with dark brown to black. Pronotum with a longitudinal median dark stripe; lateral lobes apically brownish. Legs pale with distinct tibial spots. Forewing membrane almost colourless with dark brown spots around the crossveins of Gr_2 , between M and CuA , along CuA , and between branches of Cu and A_1 . Sagittate spots relatively large, pale. Longitudinal veins with alternate pale and dark brown lengths. Crossveins dark brown except for two crossveins in Gr_3 (m_1-m_2 and rs_1-m_1). Hind wing membrane colourless. Veins brown; R , Rs and CuA mostly dark brown.



Figs 1-13. *Wesmaelius lateralis*: 1) forewing, 2) hind wing, 3) the base of costal area, 4) apex of abdomen, lateral view, 5) ectoproct, caudal view, 6) gonarcus, dorsal view, 7) same, lateral view, 8) parabaculum, lateral view, 9) same, dorsal view, 10) hyandrium internum, lateral view, 11) same, dorsal view, 12) apex of abdomen, lateral view, 13) subgenitale. 4-11) male; 12-13) female.

VENATION. Forewing (N=8). *Rs* with 3 branches, the distal one with 2 (N=4) or 3 (N=4) secondary branches. *Gr*₂ with 5 (N=5) or 6 (N=3) crossveins, of these 1 double. *Gr*₃ with 7 (N=1), 8 (N=6), or 9 (N=1) crossveins, of these 1 double and 1 (*m-cua*) incomplete. Between the branches of *Cu* 1 (N=1), 2 (N=5), or 3 (N=2) crossveins. Marginal crossvein *cup-a*₁ present (N=7) or absent (N=1). Crossvein *a*₁-*a*₂ double (N=1, Fig. 1). Anomalies: *rv* incomplete (N=1, Fig. 3); one branch of *Rs* with an incomplete apex (N=2, Fig. 1); *M* forking far distally to *Gr*₂ (N=1, Fig. 1). Hind wing (N=7). *Rs* with 4 branches. *b* ending always proximally to *r*; intraradial cell of moderate size. *Gr*₂ with 2 crossveins. *Gr*₃ with 6 (N=2), 7 (N=4), or 8 (N=1) crossveins. Between the branches of *Cu* 0 (N=7) or 1 (N=1) crossvein. Marginal crossvein *cua-a*₁ always present.

MALE. Apex of abdomen as in Fig. 4, ectoproct as in Fig. 5, gonarcus as in Figs 6-7, parabaculum as in Figs 8-9, hypandrium internum as in Figs 10-11.

FEMALE. Apex of abdomen as in Fig. 12, subgenitale as in Fig. 13.

FOREWING LENGTH. Male: 11.7 mm, N=1; female: 10.0-12.7 mm, N=3.

DISTRIBUTION. Russia (Altai Mts, Buryatia, Magadanskaya obl., Khabarovskii krai, Sakhalin), Mongolia, Japan (Honsu).

MATERIAL EXAMINED. See: Makarkin (1986; 1987).

Wesmaelius (Kimminsia) exoticus Makarkin, 1986

Figs 14-17

Wesmaelius exoticus Makarkin, 1986: 609, fig. 29. Holotype: ♀, Kazakhstan: "district of Alma-Ata, 12 km southeast of Talgar, 2.VI 1979 (Kasparyan)", examined. [ZIS].

COLORATION. Frons dark brown. Genae and clypeus brown. Vertex brownish yellow with a distinct median longitudinal dark stripe. Palpi brownish. Antennae brownish yellow. Thorax brownish. Notum brownish yellow, laterally marginated with dark brown. Pronotum with a distinct longitudinal median dark stripe. Legs brownish; the fore and middle tibiae with rather inconspicuous spots. Forewing membrane very pale with numerous dark brown spots (Fig. 14). Small sagittate spots almost entirely absent. Longitudinal veins pale whitish with rather rare but long dark lengths. Hind wing membrane pale. Longitudinal veins pale, in apical part of the wing somewhat darker.

VENATION. Forewing (N=2) as in Fig. 14. Hind wing not studied.

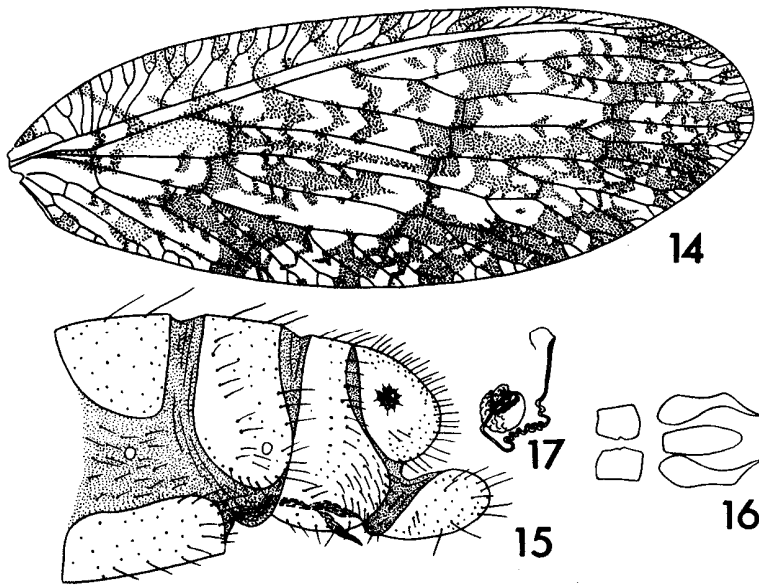
MALE. Unknown.

FEMALE. Apex of abdomen as in Fig. 15, spermatheca as in Fig. 17, subgenitale of very peculiar shape (Fig. 16).

FOREWING LENGTH. Female: 8.8 mm, N = 1.

DISTRIBUTION. South-East Kazakhstan.

REMARKS. The structure of the female subgenitale is somewhat similar to that of *W. lateralis* particularly in subdividing of it into basal and apical parts. Subdivision of the basal part of the plate in this species into right and left halves is possible secondary or a matter of intraspecific variation.



Figs 14-17. *Wesmaelius exoticus*, female: 14) forewing, 15) apex of abdomen, lateral view, 16) subgenitale, ventral view, 17) spermatheca.

Wesmaelius (Kimminsia) mongolicus (Steinmann, 1965)

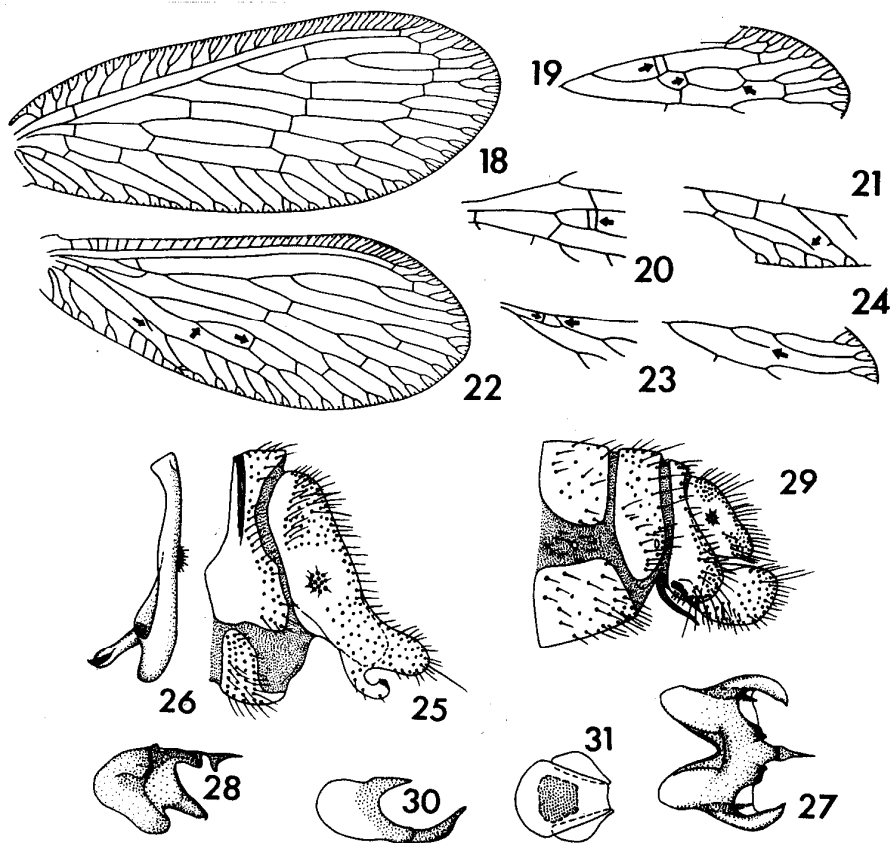
Figs 18-31

Boriomyia mongolica Steinmann, 1965: 187, figs 14-16. Holotype: ♂, Mongolia: "5 km S von Somon Bogd, am Tujngol, 1200m, 24.VI 1964 (Nr. 119), leg. Dr. Z. Kazab". In Hungarian Natural History Museum, Budapest.

Boriomyia arenata H. Aspöck et U. Aspöck, 1966: 78, fig. 4. Holotype: ♂, Turkey: "Asia Minor, Türkei, Kurdistan, leg. Noak". In the collection of P. Ohm, Kiel, Germany. Synonymized by Aspöck et al., 1980: 207.

COLORATION. Body and appendages pale brownish yellow. Face brownish to dark brown. Vertex with 1 median and 2 lateral brown spots. Palpi brownish. Scapus partly brown outside; flagelum brownish towards the apex. Pronotum brownish laterally, with median brownish stripe anteriorly. Scutum of mesonotum dark brown laterally, with inconspicuous brownish patches medially. Metanotum mostly dark brown. Spots on the fore and middle tibiae rather distinct. Maculation of body and its appendages often pale and inconspicuous. Wing membrane unicolorous, pale yellowish, without maculation. Veins yellowish brown; branches of *Rs*, *M*, *CuA* and *A*₁ mostly much more darker.

VENATION. Forewing (N=22) (Fig. 18). *Rs* with 3 branches, the distal one with 2 (N=4) or 3 (N=18) secondary branches. *Gr*₁: *m-cua* placed distally to *M*-forking (N=18) or just at this point; *cua-cup* simple (N=20), furcate (N=1) or double (N=1). *Gr*₂ with 4 (N=1), 5 (N=18), or 6 (N=3) crossveins, of these 9 double and 3 triple (including 9 *r-rs*). *Gr*₃ with 6 (N=2), 7 (N=5), or



Figs 18-31. *Wesmaelius mongolicus*: 18-21) forewings, 22-24) hind wings, 25) apex of abdomen, lateral view, 26) ectoproct, caudal view, 27) gonarcus, dorsal view, 28) same, lateral view, 29) apex of abdomen, lateral view, 30) parabaculum, lateral view, 31) subgeni-tale, ventral view. 25-28, 30) male; 29, 31) female.

8 (N=15) crossveins, of these 3 double, 1 triple, and 1 furcate. Between *Cu*-branches 0 (N=21) or 1 (N=1) crossveins. Additional crossveins: intra-M-forking (N=1, Fig. 20). Anomalies: *Rs*₃ with abnormal branching (N=1, Fig. 19); *CuP* incomplete (N=1, Fig. 21). Hind wing (N=18) (Fig. 22). *Rs* with 3 (N=1, 4 (N=15) or 5 (N=2) branches. *r* far proximal to origin of *Rs*₁ (N=11) or absent (N=7). *b* ending within intraradial cell (N=1), distal to that (N=7) or just opposite *r* (N=3). *Gr*₂ with 2 crossveins. *Gr*₃ with 4 (N=6), 5 (N=10) or 6 (N=2) crossveins.

MALE. Apex of abdomen as in Fig. 25, ectoproct as in Fig. 26, gonarcus as in Figs 27-28, parabaculum as in Fig. 30.

FEMALE. Apex of abdomen as in Fig. 29, subgenitale as in Fig. 31.

FOREWING LENGTH. Male: 7.2-7.4 mm (7.3 mm), N=4; female: 6.3-7.0 mm (6.6 mm), N=5.

DISTRIBUTION. Romania, Ukraine (Khar'kovskaya obl.), Turkey, Iran, Kazakhstan (*Aktyubinskaya obl., *Karagandinskaya obl., *Tselinogradskaya obl., Uralskaya obl.), Mongolia.

MATERIAL EXAMINED. KAZAKHSTAN: Aktyubinskaya obl.: Chelkar Lake, 10-12.VI 1892, 1♀.- Karagandinskaya obl.: 40 km S Zhana-Arka, 14.VI 1960 (I. Kerzhner), 1♀.- Tselinogradskaya obl.: Ishim River, "Spasskaya volost', Akmolinskiy uezd", 26.V 1901, 1♀.- "Kara-Chokat, Experimental Station, 22.VI 1930 (L. Bianki)", 1♂. - MONGOLIA: East Gobi aymak, 300 km SE Urga [=Ulan-Bator], 14.VII 1928 (A. Ivanov)", 3♂, 4♀.

Wesmaelius (Kimminsia) zhiltzovae Makarkin, 1986

Figs 32-36

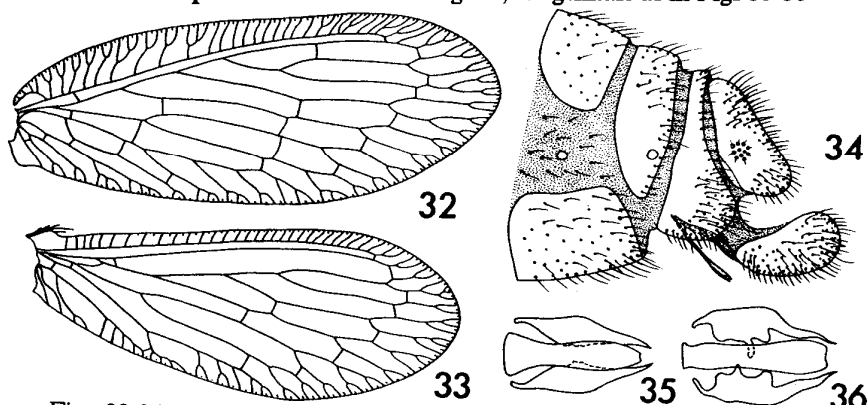
Wesmaelius zhiltzovae Makarkin, 1986: 610, fig. 23. Holotype ♀, Kazakhstan: "Aksu-Dzhabagly Nature Reserve, canyon of the B. Boldabrek River, 19.VI 1966 (Zhiltzova)", examined. [ZIS].

COLORATION. Head pale brownish yellow, with bifurcate indistinct brownish spot between antennae. Palpi and antennae brownish yellow. Thorax brownish yellow, notum laterally brownish. Pronotum with a longitudinal brown stripe. Legs brownish yellow, tibial spots almost not developed. Forewing membrane without dark spots. Sagittate spots inconspicuous, yellowish. Longitudinal veins pale with brownish interruptions. Hind wing with pale veins, darker in apical part of the wing.

VENATION. Forewing and hind wing as in Figs 32-33. No anomalies.

MALE. Unknown

FEMALE. Apex of abdomen as in Fig. 34, subgenitale as in Figs 35-36



Figs 32-36. *Wesmaelius zhiltzovae*, female: 32) forewing, 33) hind wing, 34) apex of abdomen, 35, 36) subgenitale, ventral view.

FOREWING LENGTH. Female: 6.3-7.0 mm, N=2.

DISTRIBUTION. South-East Kazakhstan.

MATERIAL EXAMINED. KAZAKHSTAN: canyon of Chachike River, the *Juniperus pseudosabina* zone (on sparse short grass), 20.VII 1930 (L.Bianki), 1 ♀.

Wesmaelius (Kimminsia) conspurcatus (MacLachlan, 1875), comb. n.

Figs 37-50

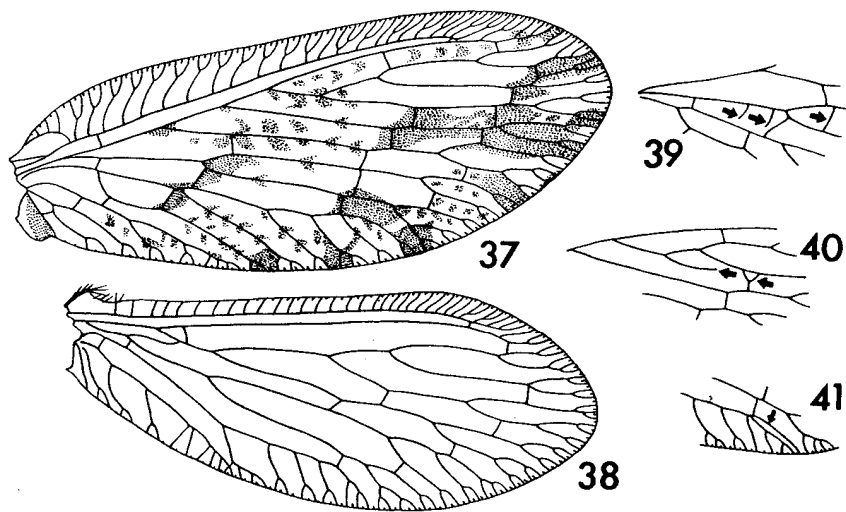
Hemerobius conspurcatus MacLachlan, 1875: 15; pl. 1, fig. 15. Holotype: ♀, Kyrgyzstan: "23.VII 1871 in the Alay Plateau in Kokand, at an elevation of 8100 ft." [Depository unknown, apparently lost].

Boriomyia amseli H. Aspöck et U. Aspöck, 1966: 77, fig. 3, syn. n. Holotype: ♂, Afghanistan: "Afghanistan centr., ostl. v. Band-I-Amir, 3600 m, 29.VII 1963, leg. E. u. A. Vartian und F. Kasy". In collection of H. Aspöck and U. Aspöck, Wien.

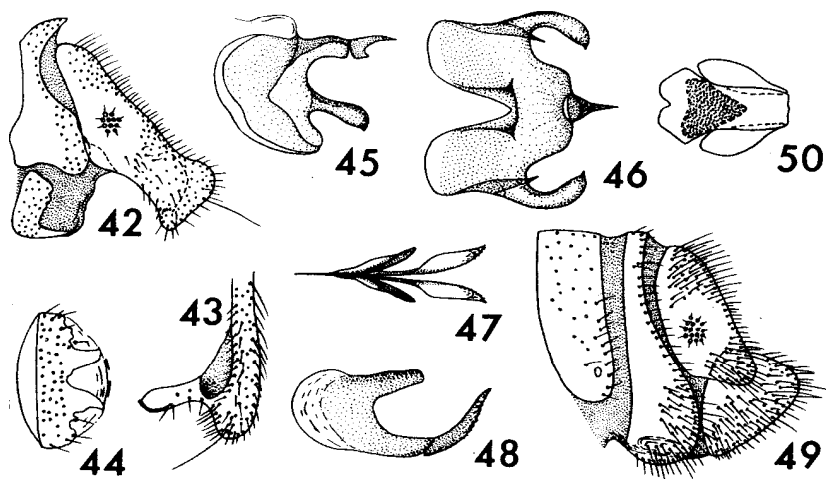
Kimminsia pekinensis Yang, 1980: 59, figs 1, 2d-e, 6, syn. n. Holotype: ♂, China: "Beijing, 1.X 1959". [AUB].

COLORATION. Head yellowish. In males, face entirely brown to dark brown. In females, the anterior and inner margins of the antennal pits margined with dark brown forming two curved stripes connected with two spots just beyond of antennae. Vertex with numerous minute brown dots, sometimes with brown median stripe posteriorly. Palpi brownish with brown apical joint. Antennae yellowish brown to brown. Notum yellowish. Pronotum narrowly margined with brown laterally, often with a longitudinal median brown stripe and a short posterior transverse stripe forming a cross. Meso- and metanotum brownish to brown laterally, often with numerous brown dots medially. Legs pale brownish yellow. Spots on the fore and middle tibia not developed. Apical tarsal joint dark. Forewing membrane colourless, in females with contrastive brownish maculation forming very characteristic pattern (Fig. 37). Veins almost entirely dark where maculation, otherwise very pale yellowish with scarce short dark interruptions. Maculation in the male more reduced. Hind wing membrane colourless. Veins pale except some brownish lengths in apical part of the wing.

VENATION. Forewing (N=40) (Fig. 37). Rs with 3 branches; Rs_3 with 2 (N=11), 3 (N=25) or 4 (N=2) secondary branches. Gr_2 with 3 (N=1), 4 (N=6), 5 (N=30) or 6 (N=3) crossveins, of these 1 furcate and 1 $r-rs$ double; $r-rs$ absent (N=2). Gr_3 with 6 (N=9), 7 (N=19) or 8 (N=12) crossveins. Crossveins between Cu -branches absent (N=38) or present only 1 $cua-cup$ crossvein (N=2). Apical crossvein $cu-a_1$ absent (N=35) or present (N=5). Additional crossveins: $r-rs_1$ (N=2); $r-rs_3$ (N=2); between Sc and its branch (N=1); intra- Rs -forking (N=2); between M and CuA (N=1, Fig. 39). Anomalies: Rs_3 with incomplete branch (N=1, Fig. 40); CuA with double apical part (N=1, Fig. 41). Hind wing (N=18) (Fig. 38). Rs with 4 (N=4) or 4 (N=14) branches. Intraradial cell of variable size. r relatively long, rarely absent (N=1). b ending proximally to r . Gr_2 with 2 crossveins. Gr_3 with 5 (N=11) or 6 (N=7) crossveins. No anomalies.



Figs 37-41. *Wesmaelius conspurcatus*: 37) forewing, 38) hind wing, 39-41) details of the forewing venation.



Figs 42-50. *Wesmaelius conspurcatus*: 42) apex of abdomen, lateral view, 43) apex of ectoproct, caudal view, 44) stenite 9, ventral view, 45) gonarcus, lateral view, 46) same, dorsal view, 47) parabaculum, dorsal view, 48) same, lateral view, 49) apex of abdomen, lateral view, 50) subgenitale, ventral view. 42-48) male, 49-50) female.

MALE. Apex of abdomen as in Fig. 42, ectoproct as in Fig. 43, IX sternite as in Fig. 44, gonarcus as in Figs 45-46, parabaculum as in Figs 47-48.

FEMALE. Apex of abdomen as in Fig. 49, subgenitale as in Fig. 50.

FOREWING LENGTH. Male: 6.3-7.9 mm (7.2 mm), N=15; female: 6.3-8.4 mm (7.4 mm), N=15.

DISTRIBUTION. Afghanistan, Nepal, *Kyrgyzstan, Kazakhstan (Taldy-Kurganskaya obl., Dzhezkazganckaya obl.), Russia (Mts Altai, Buryatia, *Irkutskaya obl.), Mongolia, China (Beijing, Gansu, Shaanxi, Xinjian Uygur, *Ningxia Hui).

MATERIAL EXAMINED. Kazakhstan (6 ex.), Kyrgyzstan (3 ex.), Russia (2 ex.), China (4 ex.), Mongolia (22 ex.).

REMARKS. Although the holotype of *Hemerobius conspurcatus* Mac Lachlan not found, it is undoubtedly conspecific with *W. amseli* (H. Aspöck et U. Aspöck), which should be treated as junior synonym.

Wesmaelius (Kimminsia) navasi (Andreu, 1911)

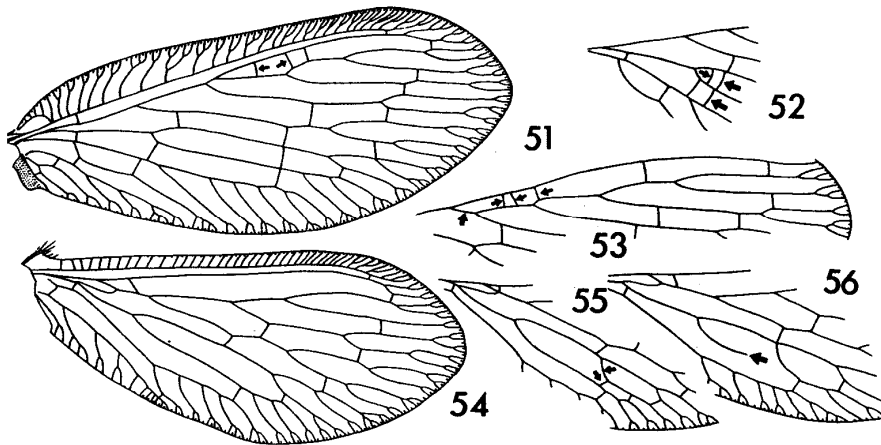
Figs 51-67

Boriomyia navasi Andreu, 1911: 58. Spain: Orihuela (Alicante).

Boriomyia persica Morton, 1921: 22, figs 5-6. Holotype: ♂, Iran: "Enzelim, 1. V 1919 (Buxton)". Synonymized by Ohm, 1967: 234.

Kimminsia neimenica Yang, 1980: 60, figs 2f, 7, syn. n. Holotype: ♂, China: "Inner Mongolia, 7.VIII 1974". [AUB].

COLORATION. Variable. Face yellow entirely or with brown spot between antennae or with dark frons. Vertex yellow entirely or brownish anteriorly. Palpi pale yellowish with usually brown apical joint. Antennae pale, sometimes brownish towards the apex. Notum yellow margined laterally with yellowish brown to brown, sometimes with numerous minute



Figs 51-56. *Wesmaelius navasi*: 51-53) forewings, 54-56) hind wings.

brown spots. Pronotum often with a short indistinct brownish median stripe anteriorly. Legs pale, yellowish, in the most strongly marked specimens femora dark outside and the fore and middle tibia with brown spots. Forewing membrane pale yellowish. Sagittate spots very pale. The only conspicuous spot occurring around the crossvein *m-cua* in *Gr*₃; *CuA* narrowly margined with brownish near crossvein *cua-cup*. Longitudinal veins pale yellowish with short brownish interruptions. Crossveins partly pale, partly dark. Hind wing membrane concolorous yellowish. Veins pale, partly brownish. Crossveins of *Gr*₃ usually dark.

VENATION. Forewing (N=84) (Fig. 51). *Rs* with 1 (N=1), 2 (N=2), 3 (N=79) or 4 (N=2) branches; the distal one with 2 (N=24), 3 (N=51) or 4 (N=7) branches. *Gr*₁: *m-cua* simple (N=81), double (N=1, Fig. 52) or furcate (N=2); *cua-cup* simple (N=80), double (N=2) or furcate (N=2). *Gr*₂ with 4 (N=6), 5 (N=67) or 7 (N=2) crossveins, of these 22 double (including 21 *r-rs*), one *r-rs* triple (Fig. 51) and one *r-rs* furcate; *r-rs* absent (N=1); intra-*M*-forking crossvein absent (N=2). *Gr*₃ with 6 (N=3), 7 (N=55), 8 (N=24) or 9 (N=2) crossveins, of these 2 double and 1 fourfold. Between branches of *Cu* 0 (N=72), 1 (N=11) or 2 (N=1) crossveins. Marginal crossvein *cup-a*₁ absent (N=76) or present (N=8). Additional crossveins: between *Sc*-branches 1 crossvein (N=3); *r-rs*₁, of these 1 double (N=2); *r-rs*₃ (N=3); intra-*M*-forking crossveins: 1 (N=1), 2 (N=1) or 3 (N=1); triple *r-rs* (N=1, Fig. 53). Anomalies: Two *Rs*₃-branches fused with each other (N=1). Hind wing (N=25) (Fig. 54). *Rs* with 3 (N=8) or 4 (N=17) branches. *b* ending within intraradial cell, rarely distally to that. *Gr*₂ with 2 (N=23) or 4 (N=2), of these 1 double. *Gr*₃ with 5 (N=3), 6 (N=18), 7 (N=3) or 8 (N=1), of these 3 double. No crossveins between *Cu*-branches. Marginal crossvein *cup-a*₁ always present. Additional crossveins: *r-rs*₁ (N=1); *r-rs*₃ (N=3); two intra-*M*-forking crossveins (N=1, Fig. 52). Anomalies: *M* interrupted (N=1, Fig. 56); *M* with additional branch (N=2 of one specimen, Fig. 55).

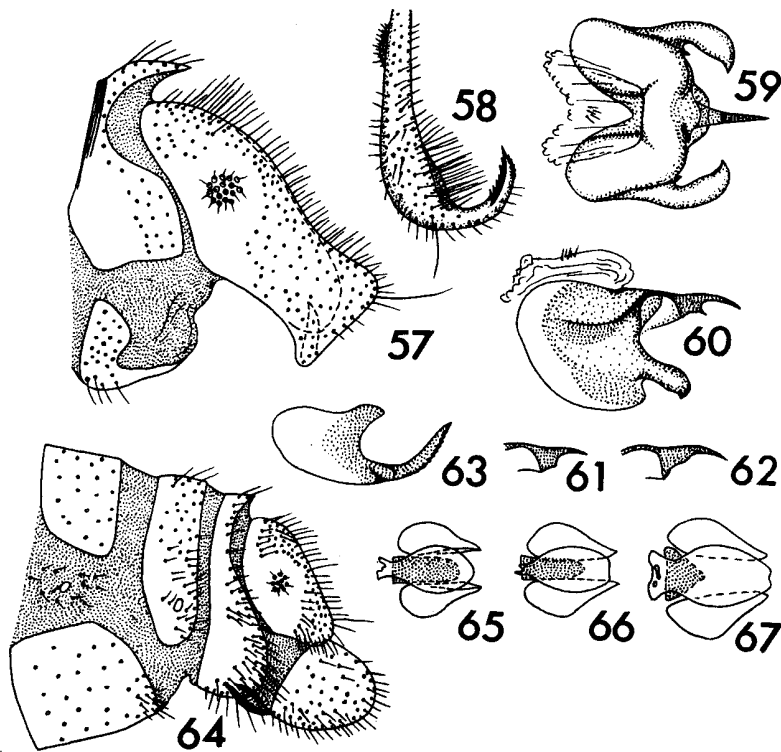
MALE. Apex of abdomen as in Fig. 57, ectoproct as in Fig. 58, gonarcus as in Figs 59-60, mediuncus as in Figs 61-62, parameres as in Fig. 63.

FEMALE. Apex of abdomen as in Fig. 64, subgenitale as in Figs 65-67.

FOREWING LENGTH. 6.1-7.8 mm.

DISTRIBUTION. Morocco, Tunis, Portugal (Madeira), Spain including Canary Is., Malta, Greece (Creta I.), Ukraine (Crimea), Turkey, Lebanon, Israel, Irak, Iran, Afghanistan, Pakistan, Armenia, Azerbaijan, Turkmenistan (*Ashgabadskaya obl., Krasnovodskaya obl., *Maryiskaya obl.), Uzbekistan (*Bukharskaya obl., *Samarkandskaya obl., *Syrdar'inskaya obl., *Khorezmskaya obl.), Tadjikistan (*Kurgan-Tyubinskaya obl.), *Kyrgyzstan: (Mts Talasskii Alatau), Kazakhstan (*Alma-Atinskaya obl., *Akt'yubinskaya obl., Dzhambul'skaya obl., Dzhezhganskaya obl., *Mangyshlaksкая obl., Chimkentskaya obl.), Mongolia, China (Inner Mongolia, *Gansu, *Xinjiang Uygur, *Qinghai).

MATERIAL EXAMINED. Ukraine (12 ex.), Armenia (4 ex.), Kazakhstan (4 ex.), Kyrgyzstan (1 ex.), Uzbekistan (5 ex.), Tadjikistan (1 ex.), Turkmenistan (5 ex.), Mongolia (3 ex.), China (4 ex.).



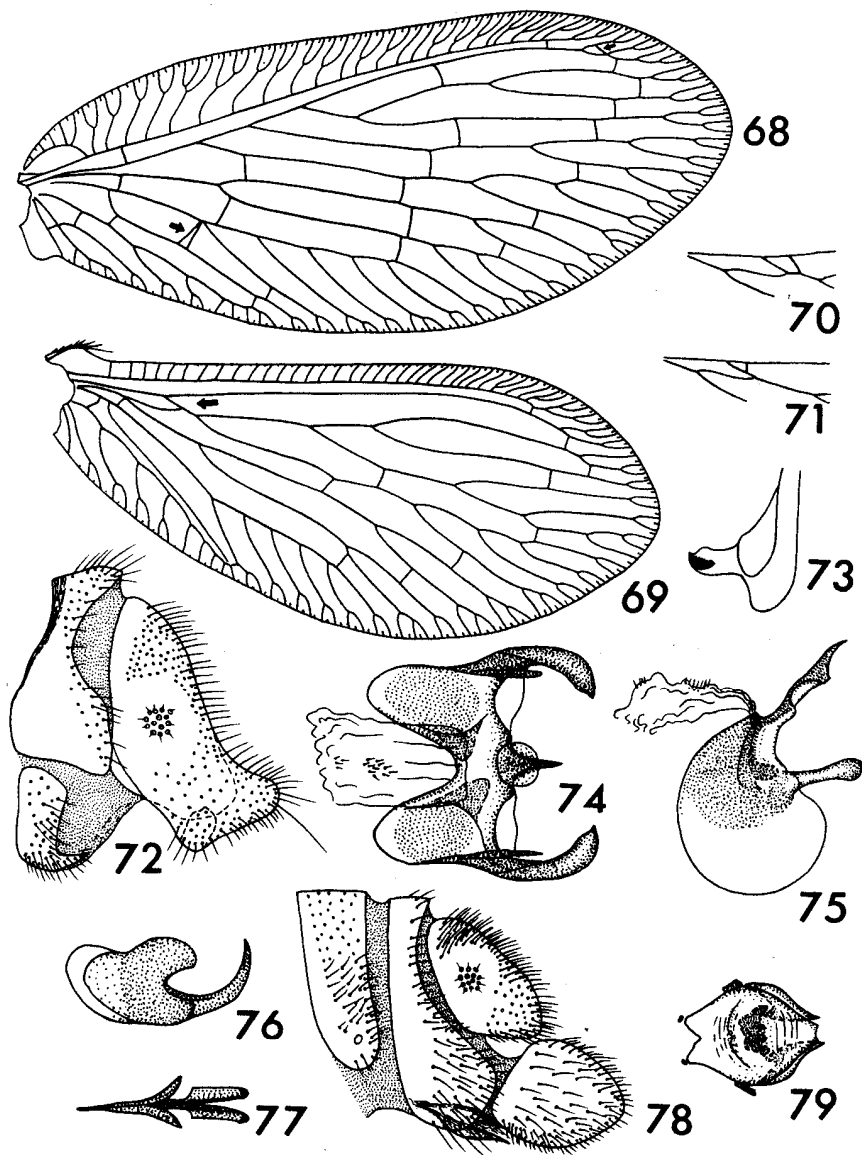
Figs 57-67. *Wesmaelius navasi*: 57) apex of abdomen, lateral view, 58) apex of ectoproct, caudal view, 59) gonarcus, dorsal view, 60) same, lateral view, 61-62) mediuncus, lateral view, 63) parabaculum, lateral view, 64) apex of abdomen, lateral view, 65-67) subgenitale, ventral view. 57-63) male, 64-67) female.

REMARKS. Species is characterized by variability of colour, shape of subgenitale in female (Figs 65-67) and by mediuncus in male. Mediuncus may be as with well-development ventral tooth (Fig. 60) or with reduced one (Figs 61-62). No any connection are observed between intensity of maculations and presence (or absence) of ventral tooth in mediuncus. This tooth reduced almost entirely as in pale yellow specimen so in intensively coloured one (both from Turkmenistan). *W. neimenicus* Yang not differs from *W. navasi* by maculation of the wings and genitalia of male and female.

***Wesmaelius (Kimminsia) sinicus* (Tjeder, 1937)**

Figs 68-79

Boriomyia sinica Tjeder, 1937: 10; pl. 8. Holotype: ♂, China: "S. Kansu, Lu-pa-sze, on River Tao-ho, about 2.700 m, 14.VII 1930, leg. Dr.Hummel". [? Naturhistorika riksmuseet, Stockholm].



Figs 68-79. *Wesmaelius sinicus*: 68) forewing, 69-71) hind wings, 72) apex of abdomen, lateral view, 73) apex of ectoproct, caudal view, 74) gonarcus, dorsal view, 75) same, lateral view, 76) parabaculum, lateral view, 77) same, dorsal view, 78) apex of abdomen, lateral view, 79) subgenitale, ventral view. 72-77) male, 78-79) female.

COLORATION. Face brown to dark brown; clypeus ventrally and labrum paler. Vertex pale brownish, sometimes anteriorly darker and laterally with brown spot; a median brown stripe (if present) rather broad. Palpi pale brownish. Antennae dark. Notum pale yellowish medially. Pronotum broadly margined with dark brown laterally. A median dark stripe not always present; when present, two anterior widely spaced dark spots and a posterior transverse stripe are represented as well. Meso- and metanotum mostly dark brown, medially yellowish. Legs pale; the fore and middle tibia with conspicuous spots. Forewing membrane pale with broad but poorly visible regular sagittate spots. No contrastic dark spots. Longitudinal veins with regular anternating pale and brown lengths. Hind wing membrane not shaded. Veins mostly dark; some lengths of *R* yellowish. Crossveins dark.

VENATION. Forewing (N=55) (Fig. 68). *Rs* with 3 (N=46) or 4 (N=9) branches, the distal one with 2 (N=8), 3 (N=32), 4 (N=9) or 5 (N=6) secondary branches. *Gr*₁: *cua-cup* double (N=1, Fig. 68). *Gr*₂ with 5 (N=49) or 6 (N=6) crossveins, of these 1 (*r-rs*) double; crossvein *rs₁-m* always proximal to the others. *Gr*₃ with 7 (N=2), 8 (N=40) or 9 (N=13) crossveins, of these 1 furcate, 4 double. Distal crossveins *cua₁-cup* and *cup-a₁* always present; crossvein *cua₁-cup₂* present (N=19), of these 2 double, or absent (N=36). Additional crossveins: between *Sc*-branches 1 crossvein (N=3). Hind wing (N=30) (Fig. 69). *Rs* with 3 (N=1) or 4 branches. Intra-radial cell of very variable sizes (Figs 70-71) or reduced (N=2, Fig. 69). *Gr*₂ with 2 (N=22) or 3 (N=8) crossveins. *Gr*₃ with 6 (N=2), 7 (27 wings) or 8 (N=1) crossveins. Additional crossveins: *r-rs* proximal to *r* (2 wings of one specimen).

MALE. Apex of abdomen as in Fig. 72, ectoproct as in Fig. 73, gonarcus as in Figs 74-75, parabaculum as in Figs 76-77.

FEMALE. Apex of abdomen as in Fig. 78, subgenitale as in Fig. 79.

FOREWING LENGTH. Male: 7.4-8.5 mm (8.0 mm), N=12; female: 7.6-9.2 mm (8.5 mm), N=12.

DISTRIBUTION. *Russia (Dagestan, S. Krasnoyarskii krai, Khakassia, Buryatia, Irkutskaya obl.). Mongolia, China (Gansu, Sichuan).

MATERIAL EXAMINED. RUSSIA: Dagestan: Kurus, district of Samur River, 25.VIII 1924 (Ryabov), 1♂, 1♀. - Krasnoyarskii krai: Enissei River, about 25 km up to Krasnoyarsk, Skit, 21.V 1901 (Yakobson), 1♀; Uzhur, 6.VIII 1899 (Rosukovskiy), 1♂. - Khakassia: Shira Lake, 24.VII 1897 (Vagner), 1♀; ibidem, 9.VII 1901 (Yakobson), 3♀. - Irkutskaya obl.: Irkutsk (Yakovlev), 1 ex.; Listvennichnoe, 15.VII 1930 (Shpet), 1♂; NW coast of Baikal Lake, the Kotelnikovskiy Lighthouse, 19.VIII 1930 (Rezvoy), 1♀. - Buryatia: SW Khamar-Daban Mts, Dzhida River, tributary of Selenga River, 15.VII 1903 (Khomze), 1♂; vicinity of Troitskosavsk, Botay, 19.VIII 1930 (Kazakova), 1♂. - MONGOLIA: Urga [Ulan-Bator], 28.VI-5.VII, 8.VII 1928 (A. Ivanov), 11♂, 8♀; ibidem, 13.VIII 1925 (Kozlov), 1♂; Kobdo, 20.VII 1926 (Kulik), 1♀.

(To be continued)