

Fig. 30. *Sylvictor major* sp. nov., holotype PIN, no. 1700/4010: (a) general appearance; (b) forewing. Scale bar 10 mm.

mesonotum is transverse, the metanotum is noticeably larger and elongated. The forelegs are the shortest, the hind legs are strongly elongated, the tibiae are slightly curved and each has a longitudinal ridge. The anterior margin of the forewing is concave basally, then is almost straight, the apex is rounded. The costal field is as wide as the subcostal one and crossed with simple and straight anterior branches of SC, which extends nearly to the wing apex being curved at crossvein insertions. R is straight, the interradial field is narrow, RS starts in the basal third of the wing and has eight outruns. MA is three-branched, MP is two-branched. CuA has six outruns, CuA<sub>1</sub> is almost straight and forming an anterior comb of dichotomized branches. CuP is slightly bent basally, A<sub>1</sub> is simple and straight, A<sub>2</sub> has six closely approximate branches. Crossveins are simple or forming double or triple rows of cells. The anterior margin of the hindwing is straight, the apex is rounded. SC is running beyond the wing midlength, R is bent basally, RS is pectinate and having six branches. MA is three-branched. The abdomen is shortened and slightly narrowing toward its tip.

Measurements, mm: Body length, 29; forewing length, 34; hindwing length, 29.

Comparison. The new species most resembles *O. magna* Sharov, 1961, from which it differs in the rounded wing apex, narrow interradial field, greater number of branches of the media, and almost straight CuA<sub>1</sub>.

Material. Holotype.

#### Genus *Sylvictor* Aristov, gen. nov.

Etymology. From the Sylva River and Latin *victor* (winner).

Type species. *S. major* sp. nov.

Diagnosis. Large insects. Head not large, parantotal ring trapezoidal and widens posteriorly. Mesonotum slightly narrowing backward and is as long as it is wide. Metanotum similar, hind legs elongated, tibiae slightly curved, each with longitudinal ridge. Anterior margin of forewing convex, apex acuminate. Costal field as wide as subcostal one. Venation polymerized. RS starting in basal quarter of wing, branches irregu-

larly, and creating a large number of branches, MA and MP together have as many outruns as CuA does. CuA sinuous before bifurcation. CuA<sub>1</sub> ramifies early and has an almost unbent posterior comb of branches.

**Species composition.** Type species.

**Comparison.** This new genus most resembles the genus *Ornaticosta* in its size, wing shape and venation, but differs in that RS branches irregularly, CuA<sub>1</sub> dichotomizes early, and the posterior comb of the branches is given.

*Sylvictor major* Aristov, sp. nov.

Plate 6, fig. 1

**Etymology.** From Latin *major* (large).

**Holotype.** PIN, no. 1700/4010, part and counterpart of well-preserved complete insect; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 29). The head is as long as it is wide, the eyes are large and round, the antennae are thin. SC is curved parallel to the anterior margin of the wing and terminating in the distal third of the wing, R has anterior branches near its tip, RS has eight outruns. MA and MP have three branches each, CuA has six branches, CuP is straight. In the hindwing, R is almost straight and CuA is apparently simple.

**Measurements**, mm: Forewing length, 59; hindwing length, 53.

**Remark.** It differs from *O. novokshonovi* sp. nov. in a shorter mesonotum.

**Material.** Holotype.

**Genus *Parasylyvaella* Aristov, gen. nov.**

**Etymology.** From Latin *para* (equal) and the generic name *Sylvaella*.

**Type species.** *P. umbra* sp. nov.

**Diagnosis.** Medium-sized insects. Head longer than it is wide. Pronotum quadrangular, paranotal ring narrow, being wider at sides, and also quadrangular. Anterior and posterior margins of forewing convex, apex slightly rounded. Costal field several times wider than subcostal one and crossed with anterior branches of SC that are linked to each other with crossveins. Interradial field with double row of cells. RS two-branched, MA simple, MP and CuA<sub>1</sub> with two outruns each. Crossveins simple or forming double rows of cells.

**Species composition.** Type species and *P. minor* sp. nov.

**Comparison.** It differs from the closest genus, *Sylvaella*, in the convex anterior margin of the forewing, wide costal field, presence of a double row of cells in the interradian field, and two-branched CuA<sub>1</sub>.

*Parasylyvaella umbra* Aristov, sp. nov.

**Etymology.** From Latin *umbra* (shadow).

**Holotype.** PIN, no. 4987/37, positive impression of well-preserved complete insect; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 31a). The eyes are not large and oval-shaped, the maxillary palps are long and three-segmented, antennomeres are elongated. In the forewing, SC terminates at the end of the distal third of the wing and has simple or dichotomizing anterior branches, R has straight and closely approximate anterior branches, RS starts in the basal third of the wing. The hindwings slightly protrude beyond the forewings, R is bent basally, RS is two-branched.

**Measurements**, mm: Forewing length, 24; hindwing length, 21.

**Material.** Besides the holotype, paratype PIN, no. 1700/812 from the same locality.

*Parasylyvaella minor* Aristov, sp. nov.

**Etymology.** From Latin *minor* (lesser).

**Holotype.** PIN, no. 4987/38, positive impression of satisfactorily preserved forewing, pronotum and head; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 31b). The posterior margin of the pronotum is convex. In the forewing, SC is nearly reaching the wing apex, RS starts near the wing midlength, CuP and A<sub>1</sub> are straight.

**Measurements**, mm: Forewing length, 14.

**Comparison.** It differs from the type species in being smaller, having a longer SC, and later origin of RS.

**Material.** Holotype.

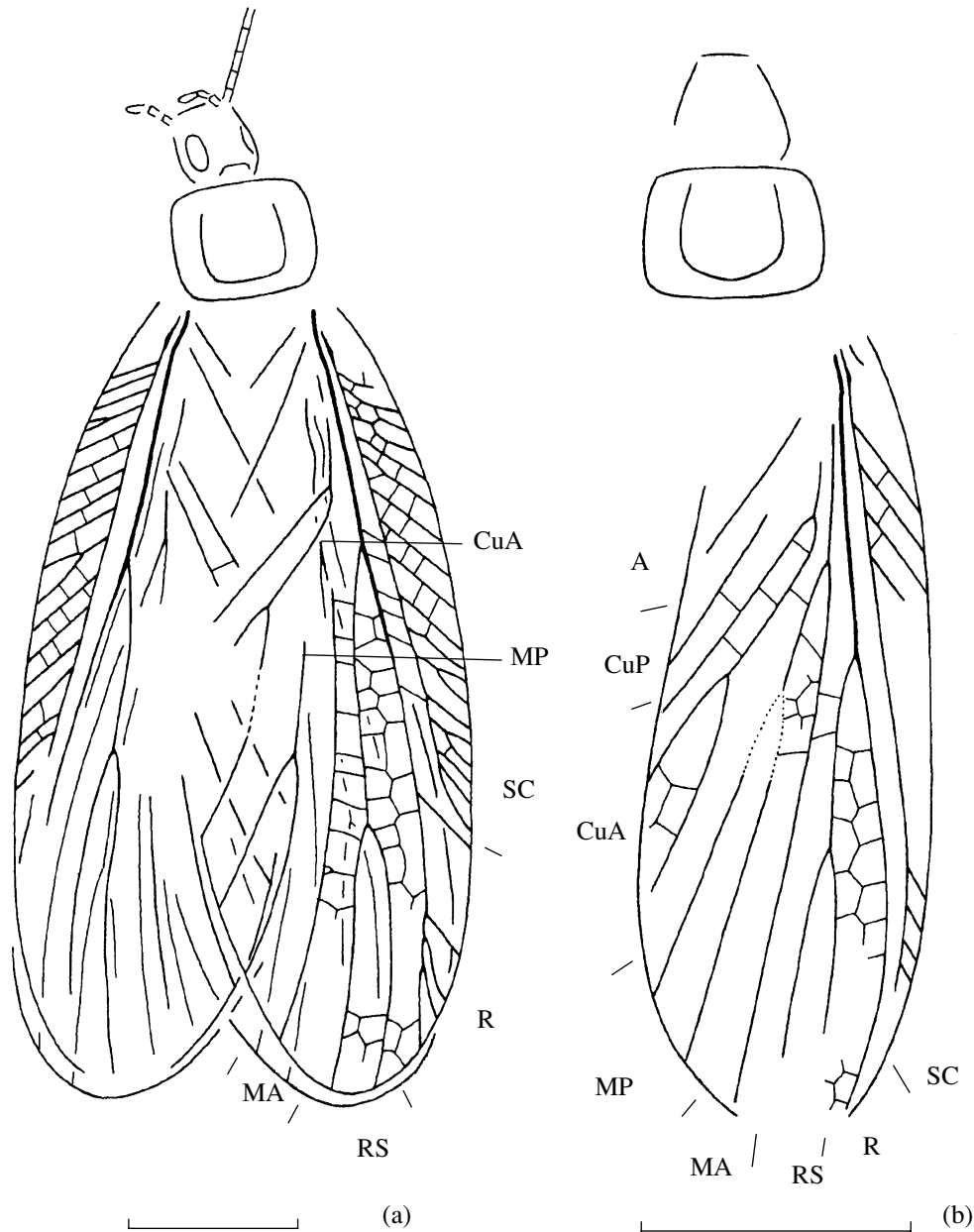
**Genus *Liomopterella* Sharov, 1961**

*Liomopterella kungurica* Aristov, sp. nov.

**Etymology.** From the Kungurian Stage.

**Holotype.** PIN, no. 1700/3770, part and counterpart of satisfactorily preserved forewing; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 32). Medium-sized insects. The mesonotum is as long as it is wide, the legs are not elongated, the femora are somewhat wider than the tibiae, the latter are slightly longer than the tarsi, which is five-segmented, the first tarsomere is the longest, the fourth tarsomere is the shortest. Both the anterior and posterior margins of the wing are convex, the apex is slightly acuminate. The costal field is broad and crossed with simple or dichotomizing anterior branches of SC, which terminates at the end of the distal third of the wing. The anterior branches of R are simple, straight or slightly curved. RS starts in the basal third of the wing, has three to four branches, is backwardly pectinated, the interradian field is abruptly constricted near the wing apex. MA has two to four branches, MP is two-branched or simple, CuA<sub>1</sub> has three outruns. CuA<sub>2</sub> is not parallel to the posterior margin of the wing. CuP and A<sub>1</sub> are straight. A<sub>2</sub> has four to five branches that



**Fig. 31.** Representatives of the genus *Parasylyvaella* gen. nov.: (a) *Parasylyvaella umbra* sp. nov., holotype PIN, no. 4987/37, general appearance; (b) *Parasylyvaella minor* sp. nov., holotype PIN, no. 4987/38, general appearance. Scale bar 5 mm.

may be linked to each other. Crossveins are simple or forming double rows of cells.

**Measurements, mm:** Forewing length, 26–34.

**Comparison.** It differs from the closest species, *L. bella* Sharov, 1961, in the interradiial field abruptly narrowing near the wing apex,  $CuA_2$  being not parallel to the posterior margin of the wing, and the straight  $CuP$ .

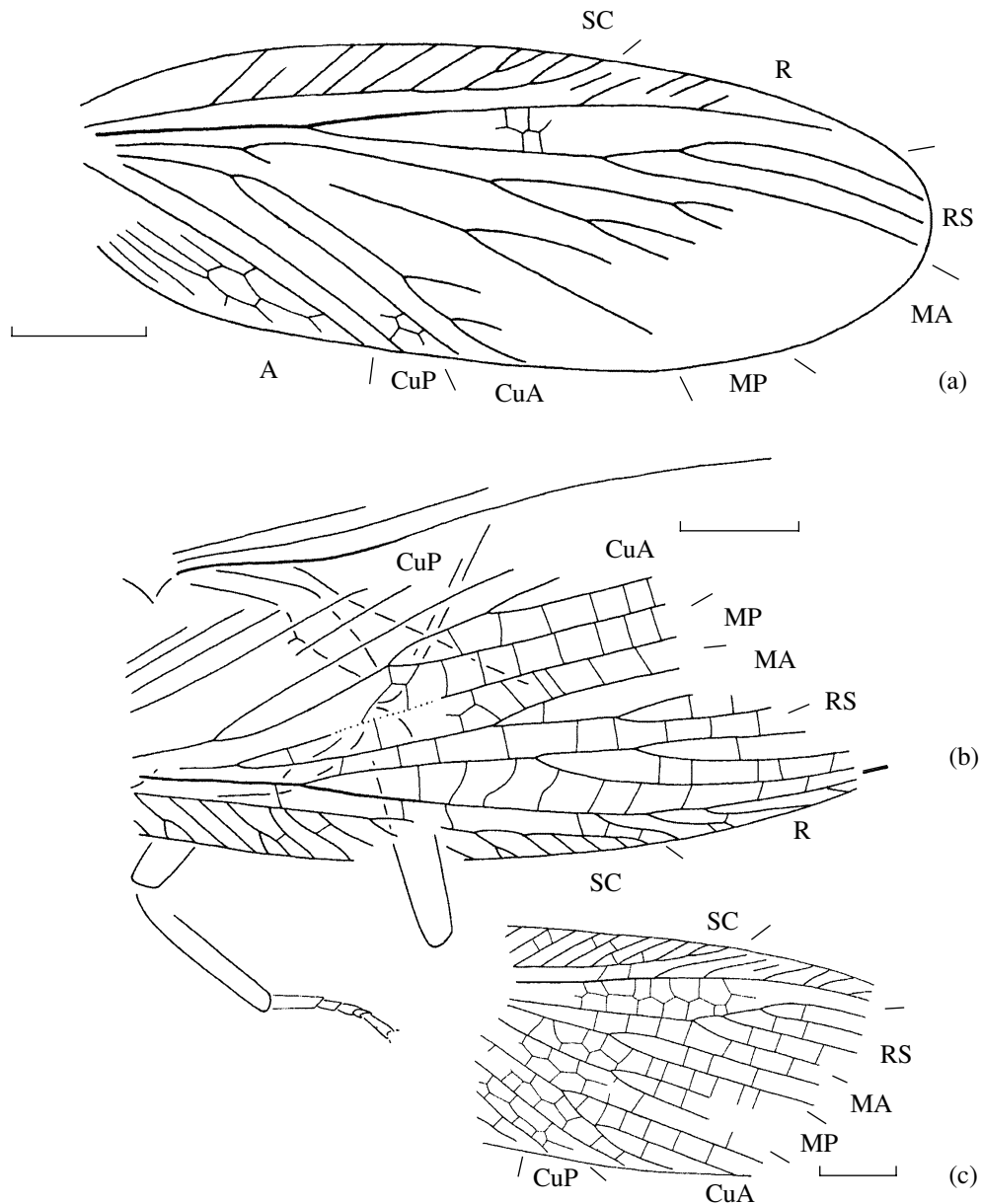
**Material.** In addition to the holotype, paratypes PIN, nos. 1700/594, 815, and 3961 from the same locality.

#### **Genus *Kungurolioma* Aristov, gen. nov.**

**Etymology.** From the Kungurian Stage and the generic name *Lioma*.

**Type species.** *K. cancellata* sp. nov.

**Diagnosis.** Medium-sized insects. Head large, with large eyes, antennae slender. Pronotum large, trapezoidal, and narrowing posteriorly, paranotalia narrow. Metanotum transverse, scutum broad, triangular, and with large lobes. Metanotum as long as it is wide, hind legs long. Anterior margin of forewing weakly convex, costal field 1.5 times as wide as subcostal one and crossed with anterior branches of  $SC$  that form double



**Fig. 32.** *Liomopterella kungurica* sp. nov., (a) holotype PIN, no. 1700/3770, forewing; (b) paratype PIN, no. 1700/3961, forewing and body fragment; (c) paratype PIN, no. 1700/815, forewing. Scale bar 5 mm in Figs. 32a and 32b, and 3 mm in Fig. 32c.

row of cells. RS pectinate, CuA ramifies late and is gently curved, CuA<sub>1</sub> apparently simple or branching near posterior margin of wing. Abdomen short and slightly tapering apically.

**Species composition.** Type species.

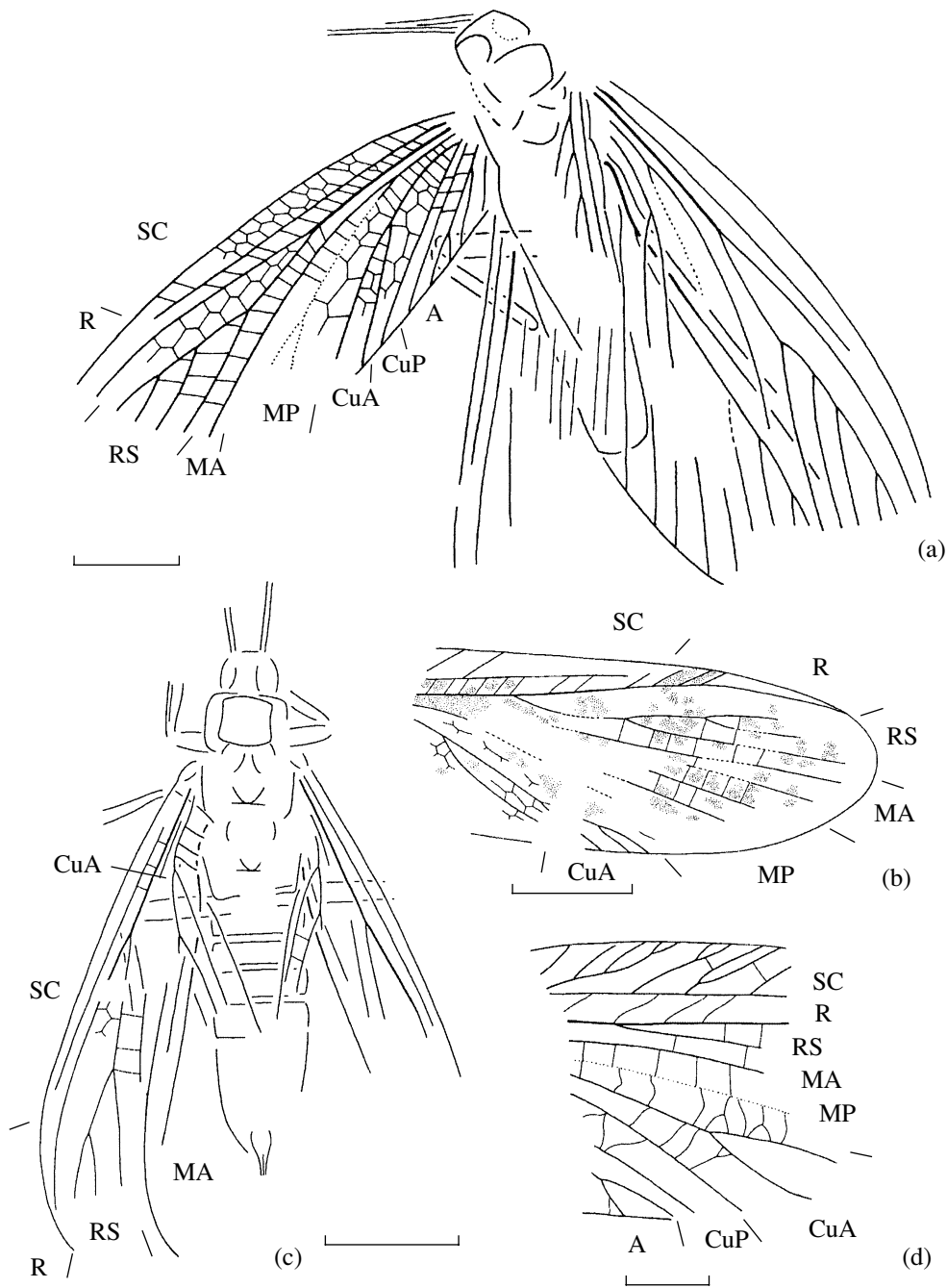
**Comparison.** This genus is closest to *Parapermula* Sharov, 1961, from which it differs in the weakly convex anterior margin of the forewing and in the costal field being narrower and having a double row of cells, which is formed by anterior branches of SC.

*Kungurolioma cancellata* Aristov, sp. nov.

**Etymology.** From Latin *cancellata* (cross-barred).

**Holotype.** PIN, no. 4987/39, part and counterpart of well-preserved complete insect; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 33a). In the forewing, SC reaches the distal third of the wing, RS starts in the basal half of the wing and has five branches, MA is simple, MP is heavily desclerotized and having in two or more branches. CuP and A<sub>1</sub> are simple and straight, A<sub>2</sub> is pectinate and having four branches. Crossveins are simple or forming double rows of cells. The anterior margin of the hindwing is straight, the costal field is as wide as the subcostal one. R is bent basally, RS is pectinate, the media is three-branched, CuA is two-branched.



**Fig. 33.** Representatives of the family Liomopteridae: (a) *Kungurolioma cancellata* sp. nov., holotype PIN, no. 4987/39, general appearance; (b) *Cerasopterus impurum* sp. nov., holotype PIN, no. 4987/44, forewing; (c) *Cerasopterus megakhosaroides* sp. nov., holotype PIN, no. 4987/41, general appearance; (d) *Uralioma maxima* sp. nov., holotype PIN, no. 4987/45, forewing. Scale bar 5 mm.

Measurements, mm: Body length, 20–23; forewing length, 23; hindwing length, 20.

Material. Besides the holotype, paratype PIN, no. 4987/40 from the same locality.

**Genus *Cerasopterus* Kukalová, 1964**

*Cerasopterus megakhosaroides* Aristov, sp. nov.

**Etymology.** From the generic name *Megakhosara*.

**Holotype.** PIN, no. 4987/41, positive impression of well-preserved complete insect; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 33c). Medium-sized insects. The head is large, with large eyes. The pronotum is quadrangular, its lateral margins are concave, the paranotaula are narrow. The mesonotum is as long as it is wide, the scutum is triangular, its lobes are large. The metanotum is similar, although the scutum is smaller. The

fore- and middle legs are subequally long, the hind legs are longer, the tibiae are slightly curved. The anterior margin of the forewing is straight, the apex is rounded. The costal field is little widened basally and, then, is as wide as the subcostal field. SC is reaching the distal quarter of the wing, RS starts at the wing midlength and has three branches, CuA is sinuous prior to its branching, CuA<sub>1</sub> dichotomizes for the first time near its midlength, the intercubital field contains rigid crossveins. Crossveins are simple or forming double rows of cells. The anterior margin of the hindwing is straight, the apex is round, R is strongly curved basally. The abdomen is broad and not reaching the apices of folded wings, the ovipositor is slender and short.

**Measurements**, mm: Body length, 18–20; forewing length, 20–21; hindwing length, 17–18.

**Comparison**. The new species differs from the closest species, *C. oborianum* Kukalová, 1964, in the costal field being widened basally, longer SC, and early branching CuA<sub>1</sub>.

**Material**. In addition to the holotype, paratypes PIN, nos. 1700/874, 3472, 3757, 3758, 4031, 4960 and 4987/42, 43 from the same locality.

*Cerasopterum impurum* Aristov, sp. nov.

**Etyymology**. From Latin *impurum* (filthy).

**Holotype**. PIN, no. 4987/44, part and counterpart of satisfactorily preserved forewing; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 33b). Medium-sized insects. Both the anterior and posterior margins of the wing are straight, the apex is slightly acuminate. The costal field in the basal half is twice as wide as the subcostal one and crossed with simple and straight anterior branches of SC that terminates in the distal third of the wing. The anterior branches of R are simple and straight, RS starts near the wing midlength and has three branches, MA has two outruns, MP has three outruns. The CuA fork is not symmetrical, CuA<sub>1</sub> is straight and ramifies late, creating three branches, CuA<sub>2</sub> is curved. Crossveins are simple or forming double rows of cells. The color pattern is developed in the form of irregular spots.

**Measurements**, mm: Forewing length, about 22.

**Comparison**. It differs from all congeners in the costal field being widened.

**Material**. Holotype.

**Genus *Uralioma* Storozhenko et Aristov, 1999**

*Uralioma maxima* Aristov, sp. nov.

**Etyymology**. From Latin *maxima* (largest).

**Holotype**. PIN, no. 4987/45, part and counterpart of forewing fragment; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 33d). Large insects. The costal field is twice as wide as the subcostal one, the anterior branches of SC have two to four outruns. The RS

base is situated beyond the CuP tip, MP is heavily desclerotized, the CuA branches are straight, CuA<sub>1</sub> is two-branched, A<sub>1</sub> has an apical fork. Crossveins are either simple or Y-shaped.

**Measurements**, mm: Forewing length, about 55; forewing width, 18.

**Comparison**. It differs from the type species *U. variabilis* Storozhenko et Aristov, 1999 in being larger, having anterior branches of SC with four outruns, and the two-branched A<sub>1</sub>.

**Remark**. This new species is assigned to the genus *Uralioma* provisionally due to its incomplete preservation; new material will probably allow the establishment of a separate genus for *U. maxima* sp. nov.

**Material**. Holotype.

**Genus *Depressopterum* Kukalová, 1964**

*Depressopterum bardum* Aristov, sp. nov.

Plate 5, fig. 6

**Etyymology**. From the locality of Barda.

**Holotype**. SGM, KP-769-5, positive impression of satisfactorily preserved forewing; Barda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 34). Medium-sized insects. The wing widens toward its apex, the anterior margin of the wing is straight, the posterior margin is convex. The costal field is as wide as the subcostal one, SC reaches the distal third of the wing. R has simple anterior branches, RS starts in the basal quarter of the wing and has six branches, MA and MP are two-branched. CuA<sub>1</sub> is irregularly ramified, with five branches, one of which does not reach the wing margin, CuP is straight.

**Measurements**, mm: Forewing length, about 15.

**Comparison**. This species is the closest to *D. fragile* Kukalová, 1964, from which it differs in the straight anterior margin of the wing and in the costal field being narrower.

**Material**. Holotype.

Grylloblattida incertae sedis

**Genus *Gurianovella* G. Zalessky, 1939**

*Gurianovella silphidoides* G. Zalessky, 1939

**Holotype**. SGM, no. VI 196/15, nymph part and counterpart; Tshekarda locality; Kungurian, Koshelevka Formation.

**Redescription** (Fig. 2a). Nymph with a broad body. The head is large and triangular, the eyes are large, the frons is divided by the epicranial suture, the antennae are short, antennomeres are as long as they are wide. The anterior margin of the pronotum has a deep incision, the paranotalia are elongated, with attenuated posterior corners; the meso- and metanotum are small and quadrate and have similar paranotalia. The forelegs are medium to long, the femora are strongly thickened, the tibiae are slightly bent, widen apically, and for-

wardly directed. The middle legs are as long as the forelegs, the coxae are small, the femora are thickened, the tibiae are forwardly directed. The hind legs are longer, the coxae are larger, the femora are not thickened, the tibiae are longer than the femora and directed backward, the tarsus is short, with two or three tarsomeres. The tibiae are unarmed. First three abdominal segments are not large and rectangular, their width is decreasing toward the tip of the abdomen. The fifth segment is quadrangular, all segments have wide paranotalia with attenuated backward posterior corners.

**Measurements**, mm: Body length, 14.

**Material**. Holotype.

#### Genus *Tshekardites* Aristov, gen. nov.

**Etymology**. From the locality of Tshekarda.

This is a formal genus established for grylloblattid nymphs with a body that is not elongated, large head, more or less quadrangular pronotum, and stocky legs.

**Species composition**. *Tsh. bardensis* sp. nov., *Tsh. comitalis* sp. nov., *Tsh. lientericus* sp. nov., *Tsh. calcomessor* sp. nov., *Tsh. curculiuculus* sp. nov., *Tsh. gracilis* sp. nov.

#### *Tshekardites bardensis* Aristov, sp. nov.

Plate 7, Fig. 5

**Etymology**. From the locality of Barda.

**Holotype**. PIN, no. 4902/11, positive impression of satisfactorily preserved nymph; Barda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 35a). The head is large, with small eyes, the antennae are long and slender, with elongated antennomeres. The pronotum is slightly wider than it is long and slightly widens backward, its anterior margin is slightly concave, the lateral margins are convex. The paranotal ring is not narrow and widens anteriorly. The meso- and metanotum are equal, transverse, trapezoidal, and narrowing posteriorly. The wing sheaths are not large, with straight anterior margins and acuminate apices. The forewing sheaths reach the anterior third of the mesonotum, the hindwing sheaths reach the first abdominal tergite. The fore- and middle legs are short and stocky, the femora and tibiae are equally long, the tarsi are short. The hind tibiae are long and rather slender, the tarsi are rather long but shorter than the tibiae and are five-segmented, the first tarsomere is the largest, the fourth tarsomere is the smallest. The tibiae bear no spines. The abdominal paranotalia are narrow, with posterior corners being attenuated backwardly; the cerci are broad, their segments are as long as they are wide.

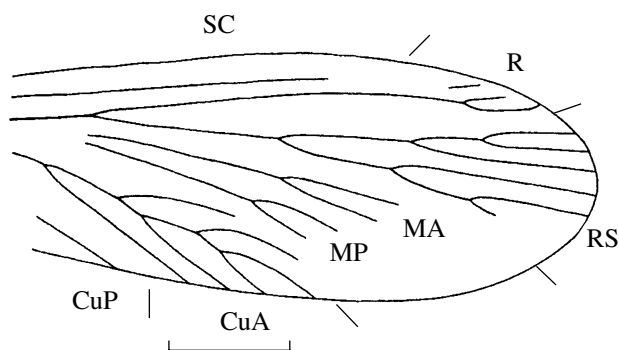
**Measurements**, mm: Body length, 25.

**Material**. Holotype.

#### *Tshekardites comitalis* Aristov, sp. nov.

Plate 7, fig. 3

**Etymology**. From Latin *comitalis* (epileptic).



**Fig. 34.** *Depressopterus bardum* sp. nov., holotype SGM, KP-769-5, forewing. Scale bar 3 mm.

**Holotype**. SGM, KP-769-6, part and counterpart of well-preserved complete nymph without tip of abdomen; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 35b). The head is large, the eyes are not large, the maxillary palp segments are large, the antennae are long and narrowing apically, basal antennomeres are as long as they are wide, distal segments are elongated. The pronotum is somewhat wider than that it is long, the paranotal ring is narrow and uniformly wide on all sides. The mesonotum is slightly transverse and subdivided by a longitudinal suture. The anterior margin of the forewing sheath is convex, the apex is rounded, the posterior margin is weakly convex; the forewing sheaths reach the second abdominal segment. The metanotum is transverse, the hindwing sheaths have a convex anterior margin, rounded apex, and sinuous posterior margin and reach the fourth abdominal segment. The hind legs are longer than the middle ones. The legs are stocky and short, the tibiae are wide and having apical spines. The tarsi are narrowing apically, three-segmented, the second tarsomere is the shortest, the third tarsomere bears claws. The abdomen is short, the tergites are narrow and their posterior corners are not drawn out.

**Measurements**, mm: Body length, about 20.

**Comparison**. It is most similar to *Tsh. bardensis* sp. nov., from which it differs in the nonwidening forward paranotalia, spines on the tibiae, and tergites without drawn-out posterior corners.

**Material**. Holotype.

#### *Tshekardites lientericus* Aristov, sp. nov.

**Etymology**. From Latin *lientericus* (troubled with looseness).

**Holotype**. PIN, no. 4987/46, positive impression of satisfactorily preserved complete nymph; Tshekarda locality; Kungurian, Koshelevka Formation.

**Description** (Fig. 35c). The head is large and is as long as it is wide, the eyes are small and round, the antennae are rather wide, with elongated segments. The