

NEW LEAFHOPPER SPECIES OF THE SUPERFAMILY FULGOROIDEA (AUCHENORRHYNCHA) FROM THE CAUCASUS

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The entomological expedition mounted by the Institute of Zoology, Ukrainian Academy of Sciences in the Caucasus between 1962 and 1973 provided extensive opportunities for the collection of leafhoppers in this region. Investigations were carried out along selected routes in the various natural and geographical zones of the Caucasus from the steppes of the Ciscaucasian plain to the high mountains of the Greater and Lesser Caucasus, including the Talysh, the uplands south of the Caucasus and the subtropics of the Black Sea coast. The Caucasus owes the wealth and the endemism of its insect fauna to the extreme diversity of natural conditions and to its geographical setting. The author has described more than 60 new leafhopper species belonging to various genera of the families Cixiidae, Delphacidae, Issidae and Cicadellidae on the basis of materials from the Caucasian expedition.

The present article contains descriptions of 6 new species of the superfamily Fulgoroidea, a large part of which were found on examination of the northern and southern spurs of the Greater Caucasian Range (1972 and 1973). The holotypes and paratypes of the new species are in the collection of the Institute of Zoology, Ukrainian Academy of Sciences (Kiev); some paratypes have been sent to the Zoological Institute, USSR Academy of Sciences (Leningrad).

Family CIXIIDAE

Cixius admirabilis Logvinenko, sp. n. (Figs. 1-3).

Small, dark brown leafhoppers with translucent whitish fore wings and large brown spots on light veins.

Male. Head relatively narrow, with prominent light brown carinae. Vertex concave, piceous, projecting forward in an obtuse angle, its length in the middle equal to its width at the anterior margin, posterior angles drawn out behind, yellowish, darkened apically. Lateral carinae of vertex raised high above the eyes. Frons with prominently drawn out lateral carinae, the intervals between them, slightly concave and piceous. Pronotum light brown, very short, its posterior margin rectangularly notched in the middle, the sides slightly darkened. Scutellum piceous, finely shagreened, carinae dark brown or black. Tegulae yellowish brown. Markings of fore wings often absent or consisting of small, scattered fumose brown spots on the basal and apical parts of the wing, and sometimes with a narrow band on the level of the middle. Crossveins usually fumose, dots absent along outer margin in apical cells. Hind wings semitransparent, whitish, with brown veins.

Anal tube without apical appendages, with a simple, broadly rounded lower margin. Plate of stylus broad, strongly transverse. Aedeagus bearing one very long, unusually shaped mobile tooth at the base of the distal segment; this tooth submedially broadened and flattened, giving way abruptly to a finely pointed distal end practically reaching the base of the shaft. Ridges of theca low, angularly widened: dorsal ridge in apical half, ventral ridge in front of the base. Distal segment of aedeagus slender, weakly sclerotized, without an apical tooth.

Body length 4.8-5.1 mm.

Female distinguished from male by more developed markings on fore wings.

Body length 5.3-5.8 mm.

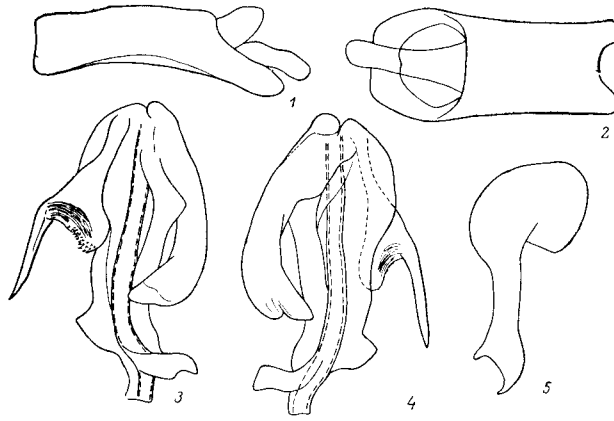
Material: 23 males, 14 females (holotype - male), Azerbaydzhan, Shemakha district, Pirkuli, mixed woodland, on common yew and maple, 20 May 1972; 6 males, 13 females, same region, Vartashen district, Fil'fili, deciduous woodland, on fern and shoots, 3 July 1973; 3 males, 6 females, Dagestan, Rutul, 1800 m, on pine, oak and beech, 29 May 1972; 5 males, 4 females, Chechen-Ingush region, Vedenov, 5 June 1972; 3 males, 5 females, same region, Verkhniy Alkun, on willow, 10 June 1972.

Pentastira superans Logvinenko, sp. n. (Figs. 6-9).

Body very large. Integument shiny, black, carinae of anterior part of body light brown, fore wings dark brown, with black veins.

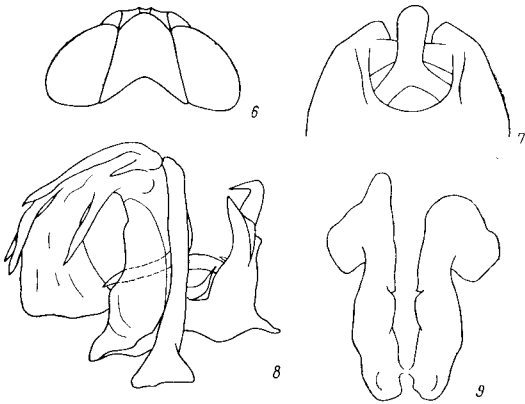
Male. Vertex strongly concave, drawn out forward, its length in the middle equal to its width on a level with the middle of the eyes, the anterior margin projecting in an apically notched angle, the posterior margin cut off rectangularly, outer carinae very prominent. Frons finely transversely striated, moderately concave between the carinae, widest on the level of the antennae. Pronotum very short, pronotal disk yellowish, sides behind the eyes brownly darkened. Carinae of scutellum prominent, brown. Fore wings transparent and shiny, dark brown in the cells. Black veins finely dotted, with whitish hairs, crossveins broadly fumose apically. In pale specimens only the apical part of the fore wings is deeply darkened, otherwise the cells are simitransparent, the veins black-brown, the apex of the clavus and the costal margin darker. Abdomen and legs of the structure usual for the genus.

The species is very similar in genital structure to *P. major* (Kbm.) and *P. megista* Em. The posterior margin of the anal tube has a notch laterally bounded by teeth onto which the carinae of the anal tube extend. Styli not identical, left stylus projecting more strongly



Figs. 1-5. *Cixius admirabilis*, sp. n., male.

1) Side view of anal tube, 2) dorsal aspect, 3) aedeagus from the right, 4) from the left, 5) stylus.



Figs. 6-9. *Pentastira superans*, sp. n. male.

6) head from above, 7) apex of anal tube, 8) aedeagus from left, 9) styli.

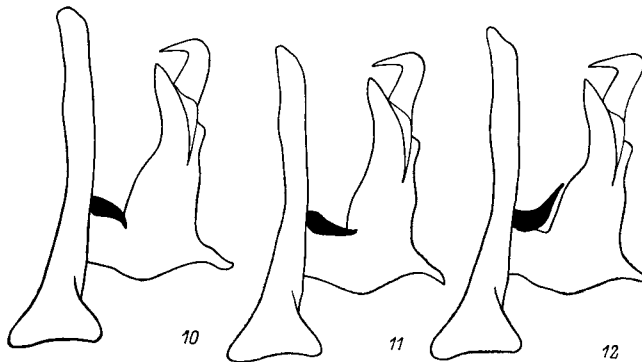
caudad as a process, right stylus broadly rounded. The left stylus similar in shape to that of *P. megista* Em., but lacking a tubercle on the posterior outer margin. The aedeagus has the same structural plan as in *P. major* (Kbm.) and *P. megista* Em., differing from them in the position of the small tooth at the base of the basal process of the theca, the distal end of which is directed toward the distal end of the shaft.

Body length 9-10 mm.

Female like male. Body length 10-12 mm.

Material: 9 males, 3 females (holotype - male), Azerbaidzhan, Mukhtadir, Caspian coast, on oak, 29 June 1973.

The differences between the three similar species of the genus *Pentastira* are set out in the following table.



Figs. 10-12. Position of tooth at base of basal process of theca (diagrammatic).

10) *Pentastira major* (Kbm.), 11) *P. megista* Em., 12) *P. superans*, sp. n.

Differences Between Species of the Genus *Pentastira*

Species	Posterior outer margin of stylus	Direction of distal end of tooth at base of basal process of theca relative to shaft of aedeagus	Size and coloration of fore wings
<i>P. major</i> (Kbm)	Practically straight	Sideways (Fig. 10)	8-10 mm, transparent, sometimes mottled
<i>P. megista</i> Em.	Clearly concave	Sideways (Fig. 11)	8-10 mm, light, transparent, sometimes mottled
<i>P. superans</i> , sp. n.	Wavy	Toward distal end (Fig. 12)	9-12 mm, transparent, cells dark brown

Family DELPHACIDAE

*Muellerianella relict*a Logvinenko, sp. n. (Figs. 13-18).

Externally well distinguishable from the two known species of the genus, *M. brevipennis* (Boh.) and *M. fairmairei* Perr. Very similar in genital structure to *M. brevipennis* (Boh.)

Small, slender leafhoppers with abbreviated fore wings. Integument light brown, shiny, with a pattern of black-brown spots on the anterior part of the body.

Male. Vertex practically square with prominently protruding carinae. Color brownish yellow, vertexal pits not darkened, median cell black. Frons narrow, its length 3.5 times its basal width, tapering slightly toward the apex. Carinae prominent, spaces between them concave; 1-2 pairs of rounded black-brown spots on a level with the middle of the eyes. Clypeus darkened (brown) each side of the median carina, a large dark brown spot on cheeks below antenna. Antennae of the usual structure, 1st segment usually brown apically. Pronotum of same length as vertex, posterior margin of pronotum concave in the middle, carinae prominent, especially in the posterior part of the pronotum. Pronotal disk lighter than sides; the pair of dark brown spots on posterior half of pronotal disk separated by a light median carina. Scutellum very slightly longer than pronotum, its disk flat and yellow. Median carina prominent only in anterior half of scutellum; a dark brown spot apically on lateral carinae. Fore wings shorter than abdomen (reaching tergite VI), oval, diverging along the suture, their tips broadly rounded. Unicolorous brownish, outer margin darker. Veins prominent, slightly darker than the ground color, with barely perceptible dots. Tegulae black-brown. Legs of the usual structure, light. Abdomen narrowing uniformly toward apex, light brown, with a thin yellow stripe along middle of tergites; sternites finely bordered by a darker color along the posterior margin.

Genital capsule yellowish, styli and band running transversely across phragma piceous. Pygofer, anal tube, styli and aedeagus as in *M. brevipennis* (Boh.) (Figs. 19-21), but lateral margins of gonopore smooth, without denticles.

Body length 1.9-2.2 mm.

Female very similar to male, coloration and markings of anterior half of body as in male. Fore

wings reaching abdominal tergite VII. First pair of ovipositor plates with a rounded projection on basal part, ovipositor brown.

Body length 2.0-2.3 mm.

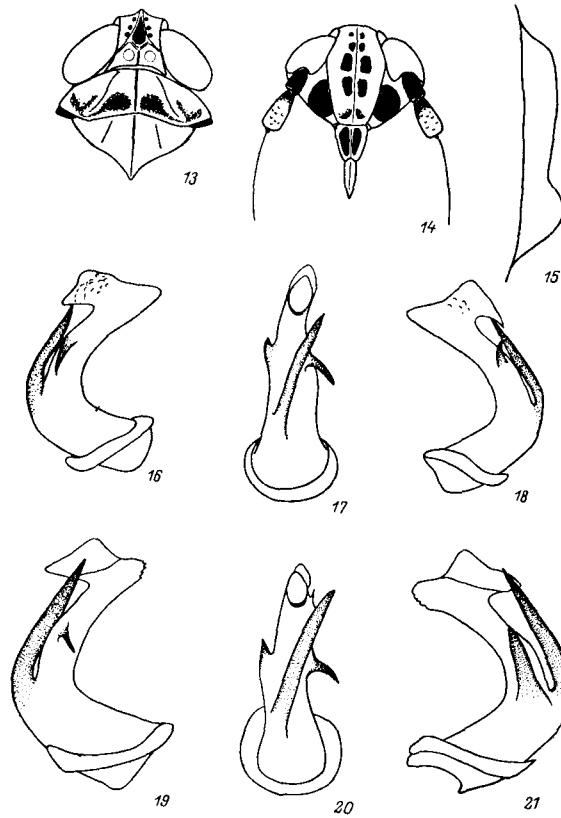
Nymph (instars IV, V) slender, elongated-rhomboid. Color predominantly light yellow, dorsum black, with a yellow longitudinal stripe extending across the vertex, the pronotal disk, the scutellum and the middle of the abdominal tergites. A broad piceous band on face between eyes. Carinae on head, pronotum and scutellum prominent. Hind tibiae and tarsi brownish.

Material: 7 males, 1 female, Azerbaydzhan, Astara district, Zengulyash, forest, on *Luzula* sp., 29 May 1967; 9 males, 8 females, 8 nymphs (including the holotype male), same region, Lenkoran district, Bilyasar, forest, on *Luzula* sp., 7 July 1970; 1 male, 2 females, same region, Kizhaba, grasses beneath the forest canopy, 7 July 1970.

Dicranotropis sagata Logvinenko, sp. n. (Figs. 22-29).

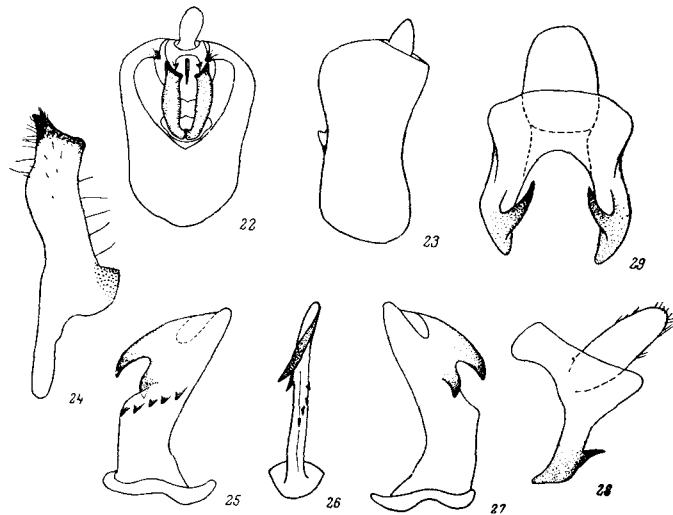
In habitus very similar and morphologically similar to *D. zenata* Logv., another Caucasian member of the genus.

Male. Vertex practically square, its anterior margin broadly rounded. Four parallel longitudinal carinae extending onto frons yellowish, the spaces between them dark brown. Dominant color of vertex yellowish brown, pits slightly darkened. Length of frons approximately three times its width, lateral margins of frons parallel, median carina bifurcating at eye level. Cheeks and clypeus brown, with yellowish, darkly bordered carinae. Antennae of the usual structure, first segment considerably longer than second. Pronotum slightly shorter than vertex, light brown, its posterior margin and longitudinal carinae lighter, dirty yellow. Scutellum slightly longer than vertex, dark brown, with distinct brown carinae, the middle one of which is quite often bordered in black. Thoracic segments mainly dark brown. Fore wings practically transparent, shiny, greatly abbreviated, the broadly rounded posterior margin reaching abdominal tergite V. Fore wings light, whitish in basal and apical thirds, with a dark brown, poorly delineated band on a level with the apex of the clavus. Veins distinct, with barely perceptible dots on them. Hind wings not developed. Legs of the usual structure, femora black, tibiae gradually lightening toward the tarsus. Abdomen black-brown, with lighter tergites VII and VIII.



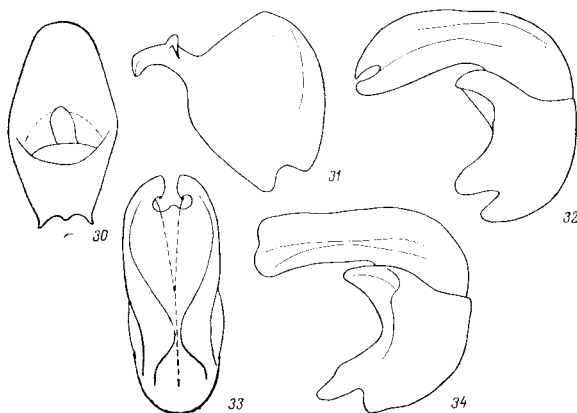
Figs. 13-21.

13-18) *Muellerianella relicta*, sp. n.: 13 - anterior part of body from above, 14 - head from below, 15 - first pair of ovipositor plates, 16 - aedeagus from right, 17 - dorsal aspect of aedeagus, 18 - aedeagus from left; 19-21) *M. brevipennis* (Boh.): 19 - aedeagus from right, 20 - dorsal aspect of aedeagus, 21 - aedeagus from left.



Figs. 22-29. *Dicranotropis sagata*, sp. n., male.

22) Rear view of genital segment, 23) side view, 24) stylus, 25) aedeagus from right, 26) dorsal aspect of aedeagus, 27) aedeagus from left, 28) side of anal tube, 29) anal tube from below.



Figs. 30-34.

30-33) *Mycterodus morulus*, sp. n., male: 30 - anal tube, 31 - stylus, 32 - side view of aedeagus, 33 - dorsal aspect of aedeagus; 34) *M. goricus* Dlab., side view of aedeagus.

Pygofer as in *D. zenata* Logv.; lateral processes of posterior margin only slightly drawn out behind, dorsal wall appearing as a short crosspiece. Anal tube as in *D. zenata* Logv., with strongly developed recurrent teeth. Styli practically parallel, flattened, uniformly broad, with obliquely truncate apex that is concave in the middle. Base of stylus thickened, projection large, bearing small tubercles. Aedeagus strongly flattened laterally, with two large dorsal teeth on the lower margin of the gonopore and a regular row of 5 smaller teeth on the right side of the shaft. Gonopore apical, shifted to the left side.

Body length 2.5-2.7 mm.

Female slightly paler than male: band on fore wings less contrasting, brownish-gray spots on the abdominal tergites. First pair of ovipositor plates whitish.

Body length 2.6-2.8 mm.

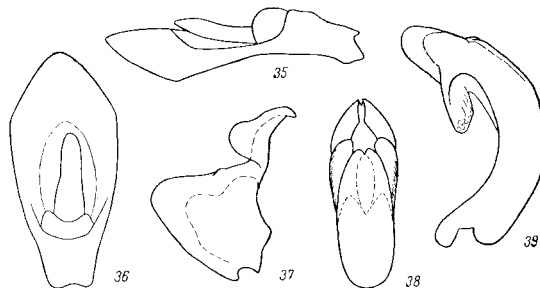
Material: 6 males, 20 females (holotype male), Georgia, 12 km east of Sagaredzho, dry grass clearing in forest, 13 July 1973.

Family ISSIDAE

Mycterodus morulus Logvinenko, sp. n. (Figs. 30-33).

Extremely similar to *M. goricus* Dlab., particularly in habitus. Integument brown, with dense black-brown small specks.

Male. Vertex pentagonal, clearly transverse, its lateral margins parallel or diverging weakly forward, median carina inconspicuous, light. Frons parallel-sided, practically flat, black-brown, densely variegated with light brown. Longitudinal carinae prominent, lateral carinae falling slightly short of the frontoclypeal suture. Frontal spots inconspicuous, rounded, frequently absent. Clypeus moderately convex, without a median carina. Pronotum of same length as vertex, pronotal disk concave,



Figs. 35-39. *Scorlupella medea*, sp. n., male.

35) side view of anal tube, 36) dorsal aspect, 37) stylus, 38) dorsal aspect of tip of aedeagus, 39) aedeagus in side view.

median carina inconspicuous, appearing as a thin light stripe. Scutellum exceeding the pronotum by one quarter of its length, its lateral carinae distinct, the median carina appearing as a ridge. Fore wings narrowly rounded apically. Veins prominent, light, longitudinal veins and outer margin of wing finely bordered with black, cells with fine dense black-brown specks. Hind wings not developed. Abdominal tergites and venter densely variegated with black. Carinae on legs light brown, spaces between them darker, hind tibiae with two teeth on outer margin.

The species has much in common with *M. goricus* Dlab. in the structure of the genitalia. Anal tube rhomboid, with broadly rounded angles. Stylus very slightly elongate, its inner upper margin angular, its outer margin smooth. Distal end of stylus (from rear) broadly rounded. Aedeagus apically slightly narrowed, dorsal lobe more pointed. Lower margin of gonopore convex in the middle, distal ends of dorsal lobes bounding it on the sides slightly recurved inward.

Body length 4.6-4.8 mm.

Female same as male, frontal spots most often absent. Abdominal sternites brown.

Body length 4.7-5.0 mm.

Material: 5 males, 9 females (holotype male), Dagestan, Rutul, on spiraea and *Astragalus* sp., 29 May 1972; 1 male, 1 nymph, same region. Levashi district, Khadzhal'makhi, 2 June 1972; 7 males, 1 nymph, same region, Avarskogo Koysu gorge, 14 km west of Sovetskoye, on spiraea, 3 June 1972.

By comparison with *M. goricus* Dlab. the new species is slightly larger and blackish. The distinguishing features of the genitalia of *M. morulus* are the anal tube, which is broader in the middle, the clearly expressed inner angle of the plate of the stylus, its smoothed outer angle and broader apex. The aedeagus narrows apically, the dorsal lobes are more pointed than the ventral lobes, in contrast to *M. goricus* Dlab., in which the dorsal lobe is broad and does not narrow apically (Fig. 34).

Scorlupella medea Logvinenko, sp. n. (Figs. 35-39).

In habitus very similar and morphologically close to *S. (Hysteropterum) discolor* (Germ.), which is found in the Crimea. Dorsum pale, straw yellow, face, legs and venter brownish, abdominal tergites black.

Male. Width of vertex approximately four times its median length, posterior margin raised in a carina, lateral margins slightly diverging forward. Frons practically square, weakly convex, longitudinal carina most prominent in the middle, transverse carina indistinct, interrupted in the middle. Prono-

tum of same length as vertex at the eyes, with a distinct longitudinal carina. Scutellum more than twice as long as pronotum, with three distinct, more lightly colored longitudinal carinae. Fore wings straw yellow, with lighter, carinately raised veins; along the posterior margin of the wing at some distance from it there is a bordering vein with cross veins. Claws without crossveins.

Anal tube elongate, narrowly rounded apically, its lateral margins widening submedially and projecting in an obtuse angle. Stylus approximately triangular, its posterior margin practically even, apex with a rounded lamellar swelling. Aedeagus cylindrical, arcuate, with a pair of subapical processes directed toward the base.

Body length 3.8-4.0 mm.

Female externally very similar to male, genital segment piceous, anal tube yellow, apically broadly rounded.

Body length 4.1-4.6 mm.

Material: 14 males, 18 females (holotype male), Krasnodar Territory, Gelendzhik district, Solntsedar, dry wooded slopes, 21 May 1963; 2 males, 7 females, Pyatigorsk, foot and slopes of Mount Mashuk, 3 July 1970.

The new species is distinguished from *S. discolor* (Germ.) by a number of characters, chief of which are: 1) the less blackened venter; 2) narrowly rounded apex of anal tube, the lateral margin of which projects in an obtuse angle; 3) posterior margin of stylus practically even, without a notch; 4) aedeagus less steeply curved, without a subapical notch to be seen in profile.