

Six new species of the clearwing moths from the Caucasus, USSR

(Lep., Sesiidae)

by

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Summary: The descriptions of six new species of the clearwing moths (Sesiidae), viz.: *Synanthedon spatenkai* spec. nov., and *Chamaesphecia kistenjovi* spec. nov. from Georgia; *Synanthedon armeniacum* spec. nov., and *Bembecia gegamica* spec. nov. from Armenia; *Chamaesphecia ophimontana* spec. nov. from Nakhichevan; and *Bembecia daghestanica* spec. nov. from Daghestan; and the redescription of *Chamaesphecia guriensis* (EMICH, 1872), are presented.

Synanthedon spatenkai spec. nov. (figs. 1-4; colour plate XXII, fig. 1)

Material

Holotype ♂, USSR, Transcaucasus, Georgia, Meskhetian Mt. Range, appr. 6 km S Abastumani, 41°42'N, 42°50'E, 17.VII.1989, leg. O. GORBUNOV. Paratypes 4 ♂♂, same locality and date, leg. O. GORBUNOV. The holotype is deposited in the collection of the Zoological Institute of the USSR Academy of Sciences, Leningrad. Three paratypes are in the author's collection and one in Dr. K. ŠPATENKA's (Prague, CSFR).

Description, holotype

Body length 11.9, forewing 8.3, antenna 5.6 mm.

Head: frons, vertex, labial palps, antenna and pericephalic hairs black with bright bluish green metallic lustre.

Thorax: dorsally completely black with bluish-green metallic lustre; laterally black with a large orange-red speck.

Forewing: from above costal and anal margins, apical area and discal spot black with bright bluish-green lustre; transparent areas well developed, covered with a few colourless scales; external transparent area about three times as wide as discal spot, divided into five elongate cells; from below costal margin yellow from base to external transparent area, other parts black; cilia black with bronze lustre.

Hindwing: transparent; veins black with violet lustre; discal spot wide, triangular, black with top at base of veins M3-Cu1.

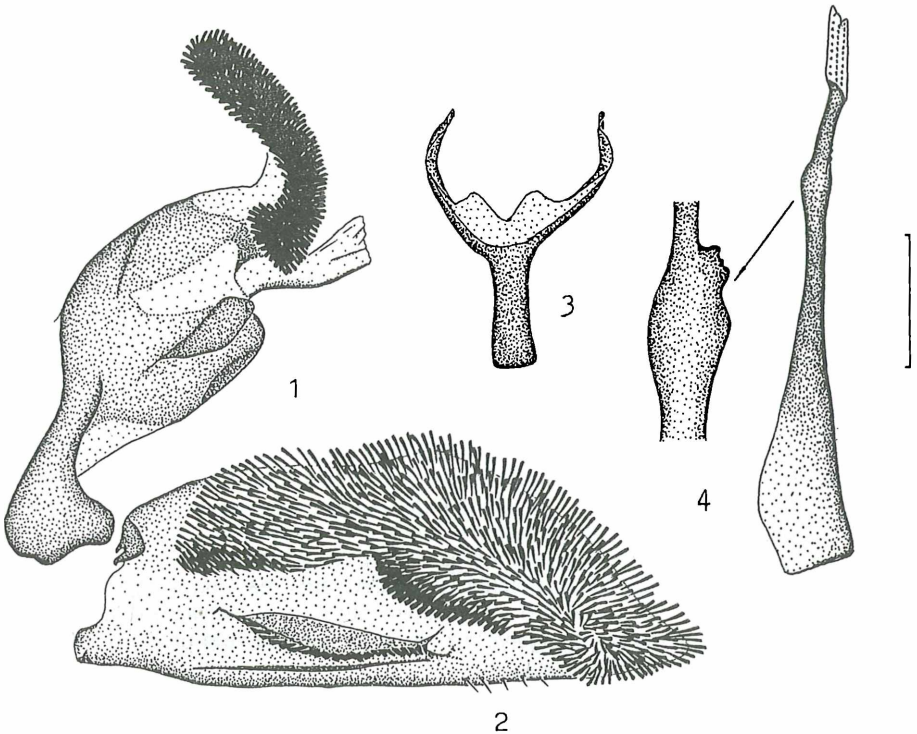
Legs: black with bright bluish violet lustre; tarsi and fore tibiae grey ventrally; spurs black with bronze lustre.

Abdomen: ground colour black with greenish metallic lustre; laterally segment no. 2 and all segment no. 4 completely orange-red; anal tuft black with greenish lustre.

Table 1: Differences between two newly described *Synanthedon* spp. and their relatives

species character	<i>S. spatenkai</i> spec. nov (col.pl. XXII:1)	<i>S. armeniacum</i> spec. nov (col.pl. XXII:2)	<i>S. myopae-</i> <i>formis</i> БКН. (col.pl. XXII:3)	<i>S. soffneri</i> ŠPATENKA (col.pl. XXII:4)	<i>S. andrenae-</i> <i>formis</i> LASPEYRES
frons	black	black with a white strip laterally	black with a white strip laterally	black	black
labial palps	black	black	black dorsally and yellow-orange ventrally	black dorsally and yellow ventrally	black dorsally white-yellow ventrally
thorax laterally	orange-red	orange-red	orange-red	yellow-orange	yellow
abdomen dorsally	segment no. 4 orange-red	segment no. 4 orange-red	segment no. 4 orange-red	segment no. 4 yellow-orange	segments nos. 2 and 4 with a thin yellow distal strip
abdomen ventrally	segment no. 4 orange-red	segment no. 4 completely and no. 5 centrally yellow-orange	segment nos. 4-6 white	segment no. 4 completely and nos. 5-6 with a few yellow-orange scales	segments nos. 4-6 white
anal tuft	black	black	black dorsally and yellow ventrally	black	black with yellow-orange distal half
crista gnathi lateralis	short, trapeziform	unknown	long, oval	short, square	short, triangular
crista sacculi	with setae along base	unknown	with setae on top edge and with a row of setae from caudal top angle to ventral edge of valve close to base	with setae along base	with setae along base

Genitalia: Tegumen-uncus complex (fig. 1) narrow (width-length ratio 3:6.5); scopula androconialis well-developed; crista gnathi lateralis trapeziform, crista gnathi medialis broad and long with a small narrow plate at outer edge; valve (fig. 2) trapeziform, crista sacculi pocket-shaped, long, basally with a row of strong setae with flat top; saccus with flat base, slightly shorter than valve (1.5:1.9), broadest at base, dorso-subapically with a small broadening; vesica with rows of numerous but small cornuti.



Figs. 1-4: Male genitalia of *Synanthedon spatenkai* spec. nov., paratype: 1) tegumenuncus complex, 2) valve, 3) saccus, 4) aedeagus. Line on the right: 0.5 mm.

Female: unknown.

Variability: The paratypes have no differences from the holotype in colour patterns, but in size only: body length 11.5-12.4; forewing 7.5-9.0; antenna 4.8-6.0 mm.

Diagnosis: *S. spatenkai* spec. nov. is very similar in habitus to *S. myopaeformis* (BORKHAUSEN, 1789) and *S. armeniacum* spec. nov., but distinctly differs from them by the colour of the frons and abdomen. Structure of the genitalia puts *S. spatenkai* spec. nov. close to *S. soffneri* ŠPATENKA, 1983 and *S. andrenaeformis* (LASPEYRES, 1801), but all these species are easily distinguishable by colour patterns, especially of the abdomen. More detailed differences between these five species are presented in table 1.

Bionomics: unknown.

Habitat: The type series has been captured with a synthetic pheromone developed by Dr. PRIESNER (Max-Planck-Institute, Seewiesen, Germany) for european populations of

S. polaris (STAUDINGER, 1877) on a small glade within a mixed forest at the southern slope of the Meskhetian Range, S-W Georgia.

Etymology: I am pleased to name this new species after my good friend Dr. KAREL ŠPATENKA, Prague, CSFR, a famous expert on Sesiidae, especially on the genus *Synanthedon*.

Synanthedon armeniacum spec. nov. (fig. 5; colour plate XXII, fig. 2)

Material

Holotype ♂, USSR, Transcaucasus, Armenia, Khosrov Nature Reserve, 39°58'N, 44°53'E, 1400m, 17.VI.1986, ex pupa, leg. O. GORBUNOV. The holotype is deposited in the author's collection.

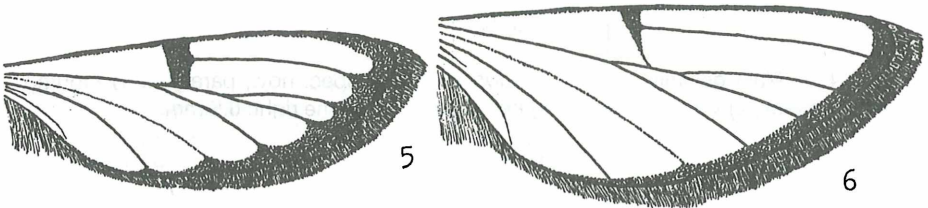
Description, holotype

Body length 11.5; forewing 8.5; antenna 5.7 mm.

Head: frons black with bluish-violet lustre, with a white strip laterally; vertex, labial palps, antenna and pericephalic hairs black with bluish-violet lustre.

Thorax: dorsally completely black with bright greenish lustre; laterally black with a large orange-red speck.

Forewings: from above costal and anal margins, apical area and discal spot black with bright greenish-violet lustre; transparent areas well developed, covered with a few colourless scales; external transparent area slightly wider than discal spot only (3.0:2.5), divided into five elongate cells; posterior transparent area reaching to proximal edge of discal spot; from below costal and anal margins, apical area between veins and a few scales of discal spot distally orange-yellow; discal spot and a strip between veins R1-R3 black; cilia black with bronze-violet lustre.



Figs. 5-6: Hindwing: 5) *Synanthedon armeniacum* spec. nov., 6) *S. myopaeformis* (BORKHAUSEN, 1789).

Hindwing: transparent; veins from above black with violet lustre, from below black with a few orange-yellow scales; apical area wide, as wide as cilia, widening on veins, black dorsally and orange-yellow ventrally; discal spot wide, quadrangular, black, with top at base of veins M3-Cu1.

Legs: black with blue lustre; tarsi and fore tibiae grey-yellow ventrally; spurs grey with violet lustre.

Abdomen: ground colour black with greenish-blue lustre; laterally segment no. 2 and dorsally segment no. 4 orange-red; ventrally segment no. 4 completely and no. 5 centrally yellow-orange; anal tuft black with greenish lustre.

Genitalia: not examined, lost.

Female: unknown.

Variability: unknown.

Diagnosis: The present species is related to *S. myopaeformis*, but it may be distinguished from the latter by its more robust habitus, shorter posterior transparent area, as well as by the shape of both discal spot and apical area of the hind wing (figs. 5, 6). Other differences between the new and related species are presented in table 1.

Bionomics: The host plant of this species is the apple-tree (*Malus communis*). The peculiarities of its vital activity are very similar to those of *S. myopaeformis*. I have discovered a cocoon with a living pupa and several abandoned cocoons on an old damaged apple-tree. The imago emerged on the next day. The life cycle of this species seems to last one year.

Habitat: This species has been found in an old apricot orchard with a few apple-trees at the edges situated in a small valley of Vedi River about 1400m in elevation.

Distribution: Known from the type locality only. Other places of occurrence of this species are unclear, because both above and below the type locality within the Vedi Valley and elsewhere in Transcaucasia only *S. myopaeformis* occurs.

***Bembecia daghestanica* spec. nov.** (figs. 7-10; colour plate XXII, fig. 5)

Material

Holotype ♂, USSR, NE-Caucasus, Daghestan, appr. 2 km NW Upper Gunib, 42°29'N, 46°51'E, 1700m, 25.VI.1989, leg. O. GORBUNOV. Paratypes 2 ♂♂, same locality and date, leg. O. GORBUNOV. The types are deposited in the author's collection.

Description, holotype

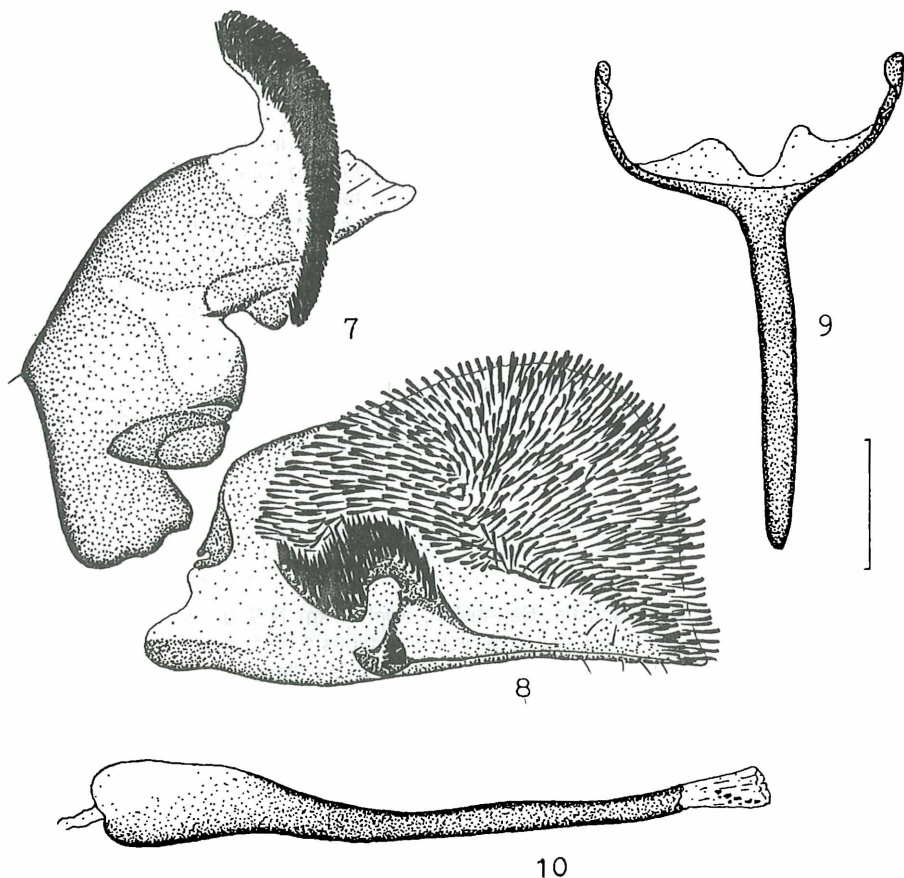
Body length 12.5; forewing 7.5; antenna 5.0 mm.

Head: frons dark brown with a white strip laterally; vertex black with a few long hairy-like white scales; pericephalic hairs yellowish; labial palps yellowish with a black strip outside, segments nos. 1 and 2 covered with very long hairy-like scales ventrally; antenna black with bluish-green lustre.

Thorax: patagia black with bronze lustre; with a few white scales laterally; tegula black with greenish-violet lustre, with a small white speck near base of forewing and a few white scales apically; meso- and metathorax dorsally black, but thickly covered with silver-white hairy-like scales; laterally black with a small white speck near base of forewing.

Forewing: from above costal margin black with a few yellow scales; base of anal margin, cubital stem and veins R4, R5 and M3 black; anal margin yellow; apical area very narrow, about 0.5 times as wide as cilia, with black distal and yellow proximal half; veins M1 and M2 within external transparent area yellow with a few black scales; discal spot black with a large triangular yellow-orange speck distally; transparent areas well-developed, external transparent area extremely broad, about 3.5 times as wide as discal spot, divided into six cells; from below yellow; proximal half of discal spot, veins R1-R3 completely and R4, R5

and M1-M3 within external transparent area black; distal half of discal spot yellow-orange; cilia dark brown with bronze lustre.



Figs. 7-10: Male genitalia of *Bembecia daghestanica* spec. nov, paratype: 7) tegumenuncus complex, 8) valve, 9) saccus, 10) aedeagus. Line on the right: 0.5 mm.

Hindwing: transparent; veins and discal spot from above black, from below yellow (veins M3 and Cu1 black); discal spot triangular, with top at base of veins M3-Cu1.

Legs: fore tarsi and tibiae black dorsally and yellow ventrally; middle and hind tarsi yellowish; middle tibiae black with a yellow patch externally, hind tibiae black with a narrow white strip ventrally and a small yellow patch at base of spurs; femorae black with a few white scales internally; fore coxae black, but covered with yellowish hairy-like scales, with a narrow white strip externally and basally; spurs yellowish.

Abdomen: ground colour black with bluish-green lustre; dorsally segments nos. 4, 6 and 7 with a narrow yellow distal strip, besides, a distal row of scales of segments nos. 2, 4 and 6 white; ventrally segment no. 4 with a narrow white distal strip; anal tuft dorsally black with a few yellow scales in central part, ventrally yellow.

Genitalia: tegumen-uncus complex (fig. 7) broad (Width-length ratio 3.5:6.5); scopula androconialis well-developed; gnathos double: proximal crista large, oval, distal crista very small; valve (fig. 8) wide but short, trapeziform; crista sacculi double: dorsal part large, strongly S-curved, with numerous strong and pointed setae; ventral part small, oval, with short and flat-topped setae, connected with first due to a narrow crista centrally; saccus about twice as long as vinculum (fig. 9); aedeagus (fig. 10) somewhat longer than valve; vesica with a few rows of small cornuti.

Female: unknown.

Variability: Main sizes of the paratypes: body length 9.8-15.0; forewing 7.3-10.6; antenna 4.8-7.0 mm. Apical area of forewing of one paratype extremely narrow because yellow proximal scales are absent. Anal tuft of the paratypes yellow centrally.

Diagnosis: *B. daghestanica* spec. nov. clearly belongs to the species of the *megillaeformis*-group and is very similar to *B. gegamica* spec. nov. These two new species can rather easily be distinguished by both the coloration of the frons and the hairy-like scales of the thorax dorsally, by the size of the apical area of the forewing, and especially by both the size of the proximal crista of the gnathos and the shape of the crista sacculi. From other species of the group, such as *B. megillaeformis* (HÜBNER, 1808-13), *B. puella* LAŠTUVKA, 1989 (colour plate XXII, fig. 8), *B. parthica* (LEDERER, 1870) (figs. 15-18; colour plate XXII, fig. 7), the new species clearly differs by the size of the apical area, coloration of both abdomen and forewing, and by details of the male genitalia. More detailed differences between those related species are presented in table II.

Bionomics: unknown.

Habitat: The type specimens had been captured on a small glade within a birch-grove (*Betula* spec.) a little above Upper Gunib. I failed to collect any more Sesiidae in that locality.

Bembecia gegamica spec. nov. (figs. 11-14; colour plate XXII, fig. 6)

Material

Holotype ♂, USSR, Transcaucasus, Armenia, Khosrov Nature Reserve, 40°00'N, 44°54'E, 1600m, 12.VII.1989, leg. O. GORBUNOV. The holotype is deposited in the author's collection.

Description, holotype

Body length 15.5; forewing 10.2; antenna 7.2 mm.

Head: frons white; vertex black with a few long hairy-like yellow scales; pericephalic hairs yellowish dorsally and white laterally; labial palps white with a black strip outside, segments nos. 1 and 2 covered with long hairy-like scales ventrally; antennae black with greenish lustre dorsally and light brown ventrally.

Thorax: patagia black with bronze lustre dorsally and white laterally; tegula black with bronze lustre, with a small white speck near base of forewing and yellowish apically; meso- and metathorax dorsally black, but thickly covered with very long, hairy-like yellowish scales; laterally black with a large white speck.

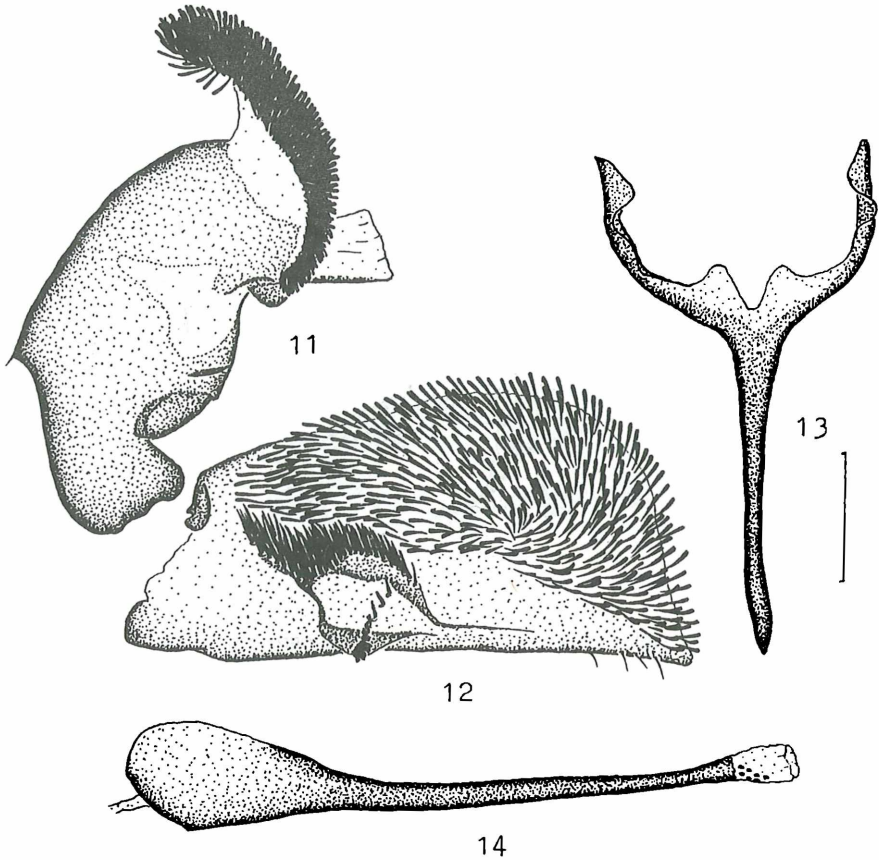
Table 2: Differences between two newly described *Bembecia* spp. and their relatives

species character	<i>B. daghestanica</i> spec. nov. (col.pl. XXII:5)	<i>B. gegamica</i> spec. nov. (col.pl. XXII:6)	<i>B. parthica</i> (LEDERER, 1870) (col.pl. XXII:7)	<i>B. puella</i> LAŠTUVKA, 1989 (col.pl. XXII:8)
frons	dark brown with a white strip laterally	white	white with a few dark brown scales centrally	white with a few dark brown scales centrally
antenna	black	black dorsally and light brown ventrally	ventrally light brown, dorsally black with a small pale yellow speck subapically	black dorsally and light brown ventrally
hairy-like scales of thorax dorsally	silver-white	yellowish	yellow	yellow
thorax: laterally	black with a small white speck	black with a large white speck	black with a small white speck	black mixed with white and yellow scales
apical area / cilia of forewing ratio	1 : 2	1 : 1	1.7 : 1	1 : 1
hind tarsi	yellowish	pale yellow with a few black scales	yellow	orange
proximal crista gnathi	large	small	large	large
dorsal crista sacculi	strongly S-curved	slightly S-curved	strongly S-curved (fig. 16)	strongly S-curved
connection between dorsal and ventral part of crista sacculi	centrally from ventral part	proximally from ventral part	absent	distally from ventral part

Forewing: from above costal margin, cubital stem and veins R4, R5 and M3 brown, anal margin yellow; apical area narrow, as wide as cilia, yellow with a narrow black distal part; veins M1 and M2 yellow with a few brown scales; discal spot narrow, black with a small orange-yellow speck distally; transparent areas well-developed, external transparent area extremely broad, about three times as wide as discal spot, divided into six cells (one cell between veins R4 and R5 very small), covered with colourless scales; from below costal margin pale yellow; proximal half of discal spot, veins R2-R5, Cu1 and Cu2 completely and

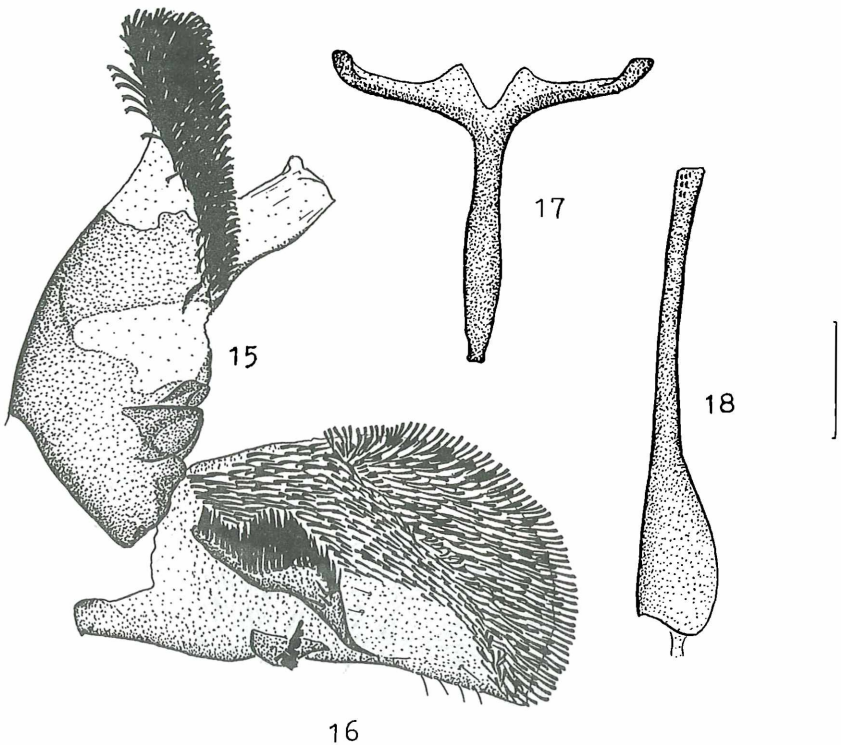
M1-M3 in distal half black; apical area and proximal half of veins M1-M3 yellow; distal half of discal spot yellow-orange; cilia dark brown.

Hindwing: transparent; veins and discal spot from above black, from below yellow (veins M2, M3 and Cu1 black); discal spot small, triangular, with top at base of vein M2.



Figs. 11-14: Male genitalia of *Bembecia gegamica* spec. nov., holotype: 11) tegumen-uncus complex, 12) valve, 13) saccus, 14) aedeagus. Line on the right: 0.5 mm.

Legs: fore tarsi black, middle and hind tarsi pale yellow with a few black scales; fore tibiae black dorsally and yellow ventrally, middle tibiae black with a small pale yellow speck centro-externally and apically, hind tibiae black mixed with pale yellow scales; femorae black with a few white scales; fore coxae white with a few black scales; spurs yellowish.



Figs. 15-18: Male genitalia of *Bembecia parthica* (LEDERER, 1870): 15) tegumen-uncus complex, 16) valve, 17) saccus, 18) aedeagus. Line on the right: 0.5 mm.

Abdomen: ground colour black with bluish-violet lustre; dorsally segments nos. 2, 4, 6 and 7 with a narrow pale yellow distal strip, and segments nos. 3 and 5 with a very narrow pale yellow strip centrally; ventrally segments nos. 2-7 with a pale yellow strip at distal half; anal tuft dorsally black with a pale yellow speck centrally, ventrally yellow.

Genitalia: tegumen-uncus complex (fig. 11) broad (width-length ratio 3.2:6.0); scopula androconialis well-developed; gnathos double: proximal crista small; oval distal crista very small; valve (fig. 12) wide but short, trapeziform; crista sacculi double: dorsal part large, slightly S-curved, with numerous strong and pointed setae; ventral part small, oval, with short and flat-topped setae, connected with first due to a narrow crista proximally; saccus about twice as long as vinculum (fig. 13); aedeagus (fig. 14) somewhat longer than the valve; vesica with a few rows of small cornuti.

Female: unknown.

Variability: unknown.

Diagnosis: *B. gegamica* spec. nov. is similar to *B. daghestanica* spec. nov., but can be distinguished by the coloration of the frons, hairy-like scales of the thorax dorsally, by the apical area of the forewing and by details of the male genitalia. More differences between those and other related species are presented in table II.

Bionomics: unknown.

Habitat: The holotype has been captured in a sparse *Juniperus* grove with a lot of diverse herbaceous plants. In this locality I collected also other Sesiidae: *Microsphenia myrmosaeformis* (Herrich-Schäffer, 1846), *M. hoplisiformis* (Mann, 1864), *Synanthedon amasina* (Staudinger, 1856), *Pyropteron mimianiformis* (Freyer, 1845), *Bembecia romanovi* (Barzel, 1912), *B. zuvadica* Gorbunov, 1987, *B. ichneumoniformis* (Denis & Schiffmüller, 1775), *Chamaesphenia morosa* Le Cerf, 1937, *Ch. elampiformis* (Herrich-Schäffer, 1846) and *Ch. schmidtiformis* (Freyer, 1856).

Chamaesphenia guriensis (Emich, 1872) (figs. 19-22; colour plate XXII, figs. 9-12)

EMICH, 1872:63 (*Sesia*); EMICH, 1873:41, tab. IIb, fig. 1 (*Sesia*); BARTEL, 1899:285 (*Sesia*); STAUDINGER & REBEL, 1901:404 (*Sesia*); BARTEL, 1912:407, Tab. 52c (*Chamaesphenia*); DALLA TORRE & STRAND, 1925:94 (*Chamaesphenia*); HEPPNER & DUCKWORTH, 1981:36 (*Chamaesphenia*); GORBUNOV, 1986:8 (*Chamaesphenia*); LAŠTUVKA, 1988: Abb. 27 (*Chamaesphenia*).

Locus typicus: "Provinz Gurien, bei dem Dorfe Surebia..." - W-Georgia, Surebi.

Material

1 ♂, 1 ♀: "Grusia", "coll. ERSHOVA"; 1 ♀, USSR, Transcaucasus, N-Georgia, Mtiuletski Mt. Range, Krestovyi Pass, 42°28'N, 44°28'E, 2000m, 21.VI.1989, e.p., leg. O. GORBUNOV; 2 ♂♂, USSR, Transcaucasus, N-Georgia, Mleta, 42°26'N, 44°28'E, 2000m, 4.VI.1990, e.p., leg. O. GORBUNOV. First two specimens in the collection of the Zoological Institute of the USSR Academy of Sciences, Leningrad, other specimens in the author's collection.

Redescription

Body length 10.2; forewing 10.0; antenna 6.5 mm.

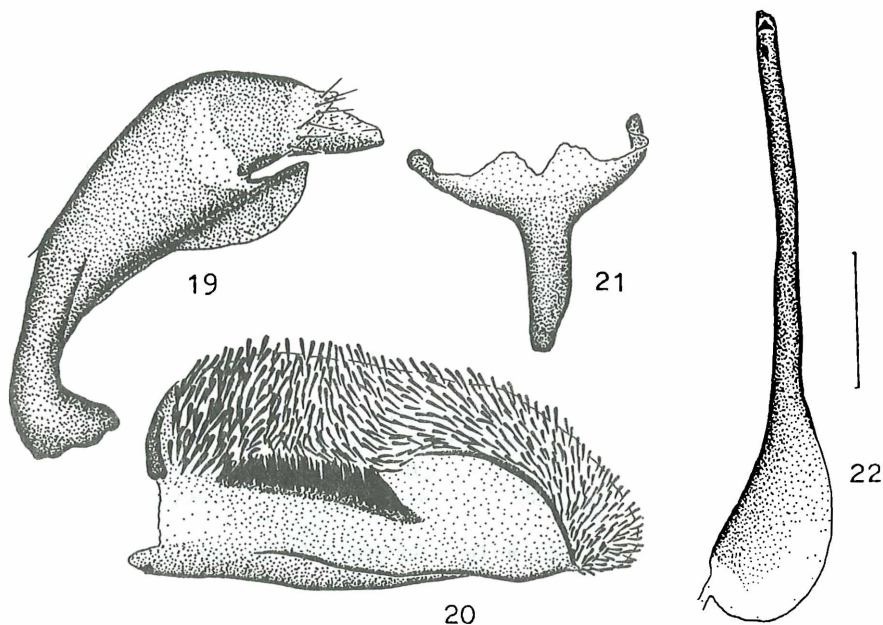
Head: frons completely brown-black; vertex black with a few orange scales; pericephalic hairs yellow-orange; labial palps whitish-yellow dorsally and black ventrally; antenna black with a whitish-yellow strip laterally.

Thorax: patagia black with violet lustre; tegula black with a narrow strip internally; metathorax black with two tufts of yellow hairy-like scales; other parts of thorax black.

Forewing: from above dark brown with a few whitish-yellow scales at costal and anal margins, as well as between veins R2-R4+5, and between veins of apical area distally; discal spot about 1.75 times narrower than apical area; from below brown-black with some more whitish-yellow scales; cilia brown with a pale brown edge.

Hindwing: transparent; veins from above dark brown, from below dark brown with a few whitish-yellow scales; discal spot triangular with top at base of veins M3-Cu1.

Legs: tarsi and fore tibiae dark brown dorsally and whitish-yellow ventrally; middle tibiae dark brown with a few yellow scales, hind tibiae dark brown with a broad whitish-yellow ring near base of medial spurs; femorae and fore coxae dark brown; spurs whitish-yellow.



Figs. 19-22: Male genitalia of *Chamaesphecia guriensis* (EMICH, 1872): 19) tegumen-uncus complex, 20) valve, 21) saccus, 22) aedeagus. Line on the right: 0.5 mm.

Abdomen: ground colour dorsally black with greenish-violet lustre; segments nos. 4, 6 and 7 with a very narrow whitish strip distally, segment no. 4 completely covered with whitish scales, segments nos. 6 and 7 with a few whitish scales centrally; ventrally dark brown with a few yellowish scales here and there; anal tuft black with a few yellow scales laterally.

Genitalia: tegumen-uncus complex (fig. 19) narrow (width-length ratio 2.5:7.0) with a few setae apically; scopula androconialis undeveloped; crista gnathi lateralis oval, small, crista gnathi medialis absent; valve (fig. 20) trapeziform; crista sacculi long, straight, with strong and pointed setae; saccus as long as vinculum (fig. 21); aedeagus (fig. 22) bulbous basally, somewhat longer than valve; vesica with two cornuti.

Female

Body length 10.0; forewing 9.2; antenna 5.4 mm.

Frons brown-black with an obscure whitish-yellow strip laterally; mesothorax with a very narrow yellow strip medially; discal spot of forewing as broad as external transparent area; fore coxae brown-black, covered with thick whitish-yellow scales; abdomen dorsally with a very narrow distal whitish strip on segment no. 4, segments nos. 4 and 6 with a few whitish-yellow scales; laterally segments nos. 2, 4-6 whitish-yellow; anal tuft black with a few whitish-yellow scales dorsally. Other colour pattern as in male.

Genitalia: unknown.

Variability: The fresh specimens are brighter in coloration; mesothorax of males dorsally with a narrow yellow central strip, and dorsally segments nos. 2 and 7 of abdomen without whitish distal strip; anal tuft of one female yellow-orange, and forewing from above, except for the discal spot, thickly covered with yellow scales (colour plate XXII, figs. 11, 12).

Diagnosis: There is certain similarity in the habitus between *Ch. guriensis* and *Ch. kistenjovi* spec. nov., as well as with the other related species of *Chamaesphecia* s.str. Differences between these species are presented in table 3 in more detail.

Bionomics: The host plant of *Ch. guriensis* is *Euphorbia oblongifolia* C. KOCH. The larva lives inside the root, where it hibernates twice. After the second hibernation, the larva moves up into the stem about 5-10 cm above ground level. Pupation takes place in a gallery in the stem without construction of a cocoon. The flying period of the imago is from the end of June to the mid of July.

Habitat: This corresponds to that of the host plant which is known to be typical in the subalpine belt of both Caucasus Major and Minor. This spurge very often grows amidst *Rhododendron*.

Chamaesphecia kistenjovi spec. nov. (figs. 23-27; colour plate XXII, figs. 13, 14)

Material

Holotype ♂, USSR, Transcaucasus, Georgia, Borzhomi, 41°55'N, 43°18'E, 2.VI.1990, ex pupa, leg. O. GORBUNOV. Paratypes 2 ♂♂, 5 ♀♀, same locality and date, ex pupa, leg. O. GORBUNOV; 1 ♂, USSR, Transcaucasus, Georgia, Lagodekhi Nature Reserve, 41°58'N, 46°20'E, 1600m, 16.VII.1986, leg. S. SINIOV; 1 ♀, USSR, Transcaucasus, Georgia, Borzhomi Nature Reserve, 41°53'N, 43°18'E, 10.VII.1989, leg. O. GORBUNOV. Holotype and one paratype (♀) are deposited in the collection of the Zoological Institute of the USSR Academy of Sciences, Leningrad. Other paratypes are in the collections of Dr. K. ŠPATENKA (Prague, CSFR) and of the author.

Description, holotype

Body length 12.8; forewing 10.8; antenna 7.0 mm.

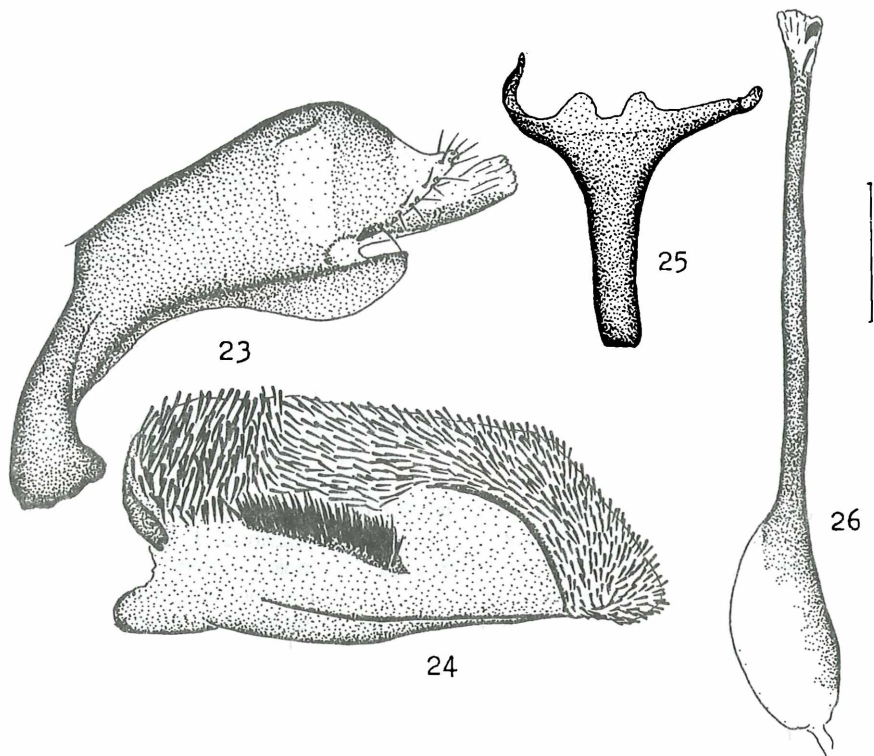
Head: frons black with greenish lustre; vertex black with greenish lustre, with a few orange hairy-like scales behind; pericephalic hairs orange; labial palps black with yellow scales externally and internally on segments nos. 1 and 2; antenna black with bluish lustre, with a narrow yellow strip laterally.

Thorax: patagia black with violet lustre dorsally and yellow laterally; tegula black with bluish lustre, with a narrow yellow strip internally; dorsally meso- and metathorax black with bluish lustre, laterally black with a few yellow scales in front.

Forewing: from above black with bluish-violet lustre, with a few yellow scales at costal and anal margins and at veins within external transparent area; discal spot about twice as narrow as apical area; from below black; costal and anal margins yellowish; apical area between veins distally yellow; cilia dark grey-brown.

Hindwing: transparent; veins black (A1 from below with a few yellow scales); discal spot narrow, trapeziform, with the top at the base of the veins M3-Cu1.

Legs: tarsi and fore tibiae black dorsally and yellow laterally; middle and hind tibiae black with violet lustre, with a few yellow scales centrally; femorae and fore coxae black with violet lustre; spurs yellowish.



Figs. 23-26: Male genitalia of *Chamaesphecia kistenjovi* spec. nov., paratype: 23) tegumen-uncus complex, 24) valve, 25) saccus, 26) aedeagus. Line on the right: 0.5 mm.

Abdomen: ground colour black with bluish-violet lustre; dorsally segment no. 4 completely and thickly covered with yellow scales; segment no. 7 with a few yellow scales distally; ventrally completely black; anal tuft with a narrow yellow strip laterally near base.

Genitalia (figs. 23-26): Very similar to those of *Ch. guriensis* (figs. 19-22).

Female: Somewhat more robust than male. Apical area of forewing from above between veins with a few yellow scales distally; hind tibiae with a small orange speck centrally; dorsally abdominal segments nos. 4 and 6 with a narrow yellow strip distally, segments nos. 5 and 6 with a few yellow scales centrally; laterally segments nos. 4-6 yellow, ventrally with a few yellow scales. Other colour pattern as in male.

Genitalia (fig. 27): abdominal tergite no. 8 narrow; papilla analis oval, well-sclerotized, covered with short setae; apophysis anterior as long as apophysis posterior; antrum well-sclerotized, funnel-shaped; corpus bursae round, membranous, with numerous but very small signa.

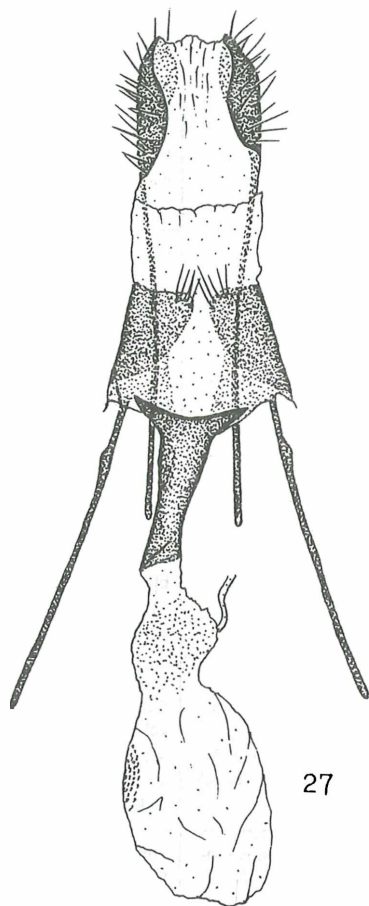


Fig. 27: Female genitalia of *Chamaesphecia kistenjovi* spec. nov., paratype. Line on the right: 0.5 mm.

Variability: All the other paratypes have little size differences from the above description: body length 12.0-13.9; forewing 10.5-11.0; antenna 6.8-7.3 mm, as well as in the number of yellow scales at both the apical area of the forewing and the abdomen.

Diagnosis: The new species is very similar to *Ch. guriensis*, but can be distinguished by the more black background coloration, orange pericephalic hairs and vertex behind, as well as by the coloration of the abdomen. *Ch. kistenjovi* spec. nov. is also clearly distinguishable by both bionomics and habitat. From the other related species, such as *Ch. euceraeformis* (OCHSENHEIMER, 1816) and *Ch. hungarica* (TOMALA, 1901), the present species distinctly differs by both, coloration and bionomics. More detailed differences are presented in table 3.

Bionomics: The host plant of this new species is *Euphorbia glaberrima* C. KOCH. The early-instar larva lives inside the stem near ground level, sometimes lowering to the base of the root. The larva moves up into the stem, to eat the pith, approximately 5-20 cm above the stem's base. There it constructs a cocoon, fastening it to the inner wall of the stem. At the end of the vegetation period in late autumn the stems of the host plants wither, and a dry hollow stem with the larva inside the cocoon breaks off. Pupation occurs in late spring or early summer. The

biological cycle is one per year. It is very difficult to find such a dry stem with the pupa in summer, because it may be carried away from the plant by water. The flying period of the imago is from mid-June to mid-July.

Habitat: Banks of brooks or small rivers, flowing within a dark mixed forest on mountain slopes.

Etymology: I am pleased to name this new species after my good friend Mr. ALEXEI KISTENIOV, Moscow, USSR, a famous ichthyologist.

Table 3: Differences between *Chamaesphecia kistenjovi* spec. nov. and related species

species character	<i>Ch. guriensis</i> (EMICH, 1872) (col.pl. XXII:9-12)	<i>Ch. kistenjovi</i> spec. nov. (col.pl. XXII:13-14)	<i>Ch. euceraeformis</i> (OCHSENHEIMER, 1816)	<i>Ch. hungarica</i> (TOMALA, 1901) (col.pl. XXII:15)
frons	brown black	black	brown black with dark yellow scales centrally	black, sometimes with a few yellow scales centrally
vertex	black with a few orange scales	black with a few orange scales	black with a few orange scales	black
pericephalic hairs	yellow-orange	orange	orange-yellow	yellow-orange
mesothorax dorsally	black, sometimes with a narrow yellow central strip	black	black with a narrow yellow central strip	black with a narrow yellow central strip
metathorax dorsally	black with yellow hairy-like scales	black	black with yellow hairy-like scales	black with yellow hairy-like scales
hind tibiae	dark brown with a broad whitish-yellow ring	black	black mixed with yellow and orange scales externally	black with a yellow ring near base of spurs
coloration of abdomen dorsally	segments nos. 4, 6 and 7 with a very narrow whitish strip distally, segment no. 4 thickly covered with whitish scales	segment no. 4 thickly covered with yellow scales	segment no. 4 with a narrow yellowish strip distally, segments nos. 2-7 with a small yellow speck centrally	segments nos. 4 and 6 with a narrow yellow strip distally, segments nos. 2-7 covered with a few yellow scales
host plant	<i>Euphorbia oblongifolia</i>	<i>Euphorbia glaberrima</i>	<i>Euphorbia polychromus</i> , <i>Eu. austriacus</i>	<i>Euphorbia lucidus</i> <i>Euphorbia palustris</i>

Chamaesphecia ophimontana spec. nov. (colour plate XXII, fig. 16)

Material

Holotype ♂, USSR, Transcaucasus, Nakhichevan, Daralagez Mt. Range, appr. 3 km N Buzgov, 39°32'N, 45°24'E, 1500m, 9.VII.1982, leg. O. GORBUNOV. Deposited in the author's collection.

Description, holotype

Body length 12.5; forewing 9.5; antenna 6.6 mm.

Head: frons brown-grey with a white strip laterally; vertex black with a few orange scales in front; pericephalic hairs yellowish; labial palps yellowish with a narrow black strip on

segment no. 2 externally; antenna black with a yellow strip laterally.

Thorax: patagia black with greenish lustre dorsally and yellow laterally; tegula black with bronze lustre, with a narrow yellow strip internally and a yellowish speck near base of forewing; dorsally mesothorax black and covered with yellowish hairy-like scales; metathorax black with two yellow specks; laterally yellowish.

Forewing: from above dark brown with a few yellowish scales at anal margin and between veins of apical area; posterior transparent area small with top near level of discal spot of hindwing; external transparent area divided into four cells (cell between veins M3-Cu1 very small); discal spot narrow, about 2.5 times narrower than length of external transparent area; from below costal and anal margins, and veins within external transparent area whitish-yellow; apical area brown but thickly mixed with whitish-yellow scales; discal spot dark brown with bronze lustre; cilia dark brown with a narrow whitish-yellow edge.

Hindwing: transparent; veins dark brown (M2 and A1 whitish-yellow from below); discal spot dark brown, triangular with small widening at vein M2, with top at base of veins M3-Cu1.

Legs: fore tarsi and tibiae dorsally black with greenish lustre, ventrally yellow; middle and hind tarsi yellow with a few black scales dorsally; middle tibiae yellow with black base and a small black speck near base of apical spurs internally; femorae yellow internally and dark brown with a few yellow scales externally; fore coxae yellow with an elongate black patch centrally; spurs yellow.

Abdomen: ground colour black with greenish lustre; dorsally distal half of segments nos. 2, 4, 6 and 7 yellow, segments nos. 3 and 5 with a narrow yellow strip centrally; ventrally segment no. 2 yellow, segments nos. 4-7 yellow with a few black scales, segment no. 3 black with a few yellow scales; anal tuft ventrally and central part dorsally yellow, laterally black with a narrow yellow strip and a few yellow scales basally.

Genitalia: not examined.

Female: unknown.

Variability: unknown.

Diagnosis: *Ch. ophimontana* spec. nov. is somewhat similar to *Ch. doryceraeformis* (LEDERER, 1853), but can easily distinguished from it by the more yellow colour of both labial palps and fore coxae, yellow segment no. 2 of the abdomen ventrally, and darker forewing from above. The present species is clearly distinguishable from the other related species, such as *Ch. morosa* LE CERF, 1937, *Ch. aurifera* (CHRISTOPH, 1885) and *Ch. sefid* LE CERF, 1938, by the absence of yellow or greenish-yellow dense scales on the wings, thorax and abdomen.

Bionomics: unknown.

Habitat: The only known specimen was captured with a butterfly net in a biotope typical for the southern Transcaucasus which was named by GROSSHEIM (1948) as "highland xerophytes" This habitat is known to support a lot of perennial plants, in particular various species of labiates (Lamiaceae), legumes (Fabaceae), etc. I have collected plenty of Sesiidae in similar biotopes near Buzgov, e.g. *Microsphecia myrmosaeformis* (HERRICH-SCHÄFFER, 1846), *M. hoplisisformis* (MANN, 1864), *Pyropteron minianiformis* (FREYER, 1845), *Bembecia zuvadica* GORBUNOV, 1987, *Chamaesphacia schwingenschussi* (LE CERF, 1937), *Ch. morosa* LE CERF, 1937, *Ch. aurifera* (CHRISTOPH, 1885) and *Ch. elampiformis* (HERRICH-SCHÄFFER, 1846).

Etymology: The name is derived from the Greek ophis (snake) and the Latin montis (mountain) and refers to the name "Ilandag" (Azerbaijani meaning Snake Mountain) as one of the symbols of Nakhichevan area.

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Colour plate XXII (p. 379):

- Fig. 1: *Synanthedon spatenkai* spec. nov., holotype ♂.
 Fig. 2: *Synanthedon armeniacum* spec. nov., holotype ♂.
 Fig. 3: *Synanthedon myopaeformis* (BORKHAUSEN, 1789), ♂.
 Fig. 4: *Synanthedon soffneri* ŠPATENKA, 1983, paratype ♂
 Fig. 5: *Bembecia daghestanica* spec. nov., holotype ♂.
 Fig. 6: *Bembecia gegamica* spec. nov., holotype ♂.
 Fig. 7: *Bembecia parthica* (LEDERER, 1870), ♂.
 Fig. 8: *Bembecia puella* LAŠTUVKA, 1989, ♂.
 Fig. 9: *Chamaesphecia guriensis* (EMICH, 1872), ♂.
 Fig. 10: *Chamaesphecia guriensis* (EMICH, 1872), ♀.
 Fig. 11: *Chamaesphecia guriensis* (EMICH, 1872), ♂.
 Fig. 12: *Chamaesphecia guriensis* (EMICH, 1872), ♀.
 Fig. 13: *Chamaesphecia kistenjovi* spec. nov., holotype ♂.
 Fig. 14: *Chamaesphecia kistenjovi* spec. nov, paratype ♀.
 Fig. 15: *Chamaesphecia hungarica* (TOMALA, 1901), ♂.
 Fig. 16: *Chamaesphecia ophimontana* spec. nov., holotype ♂.

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13	14	15	16

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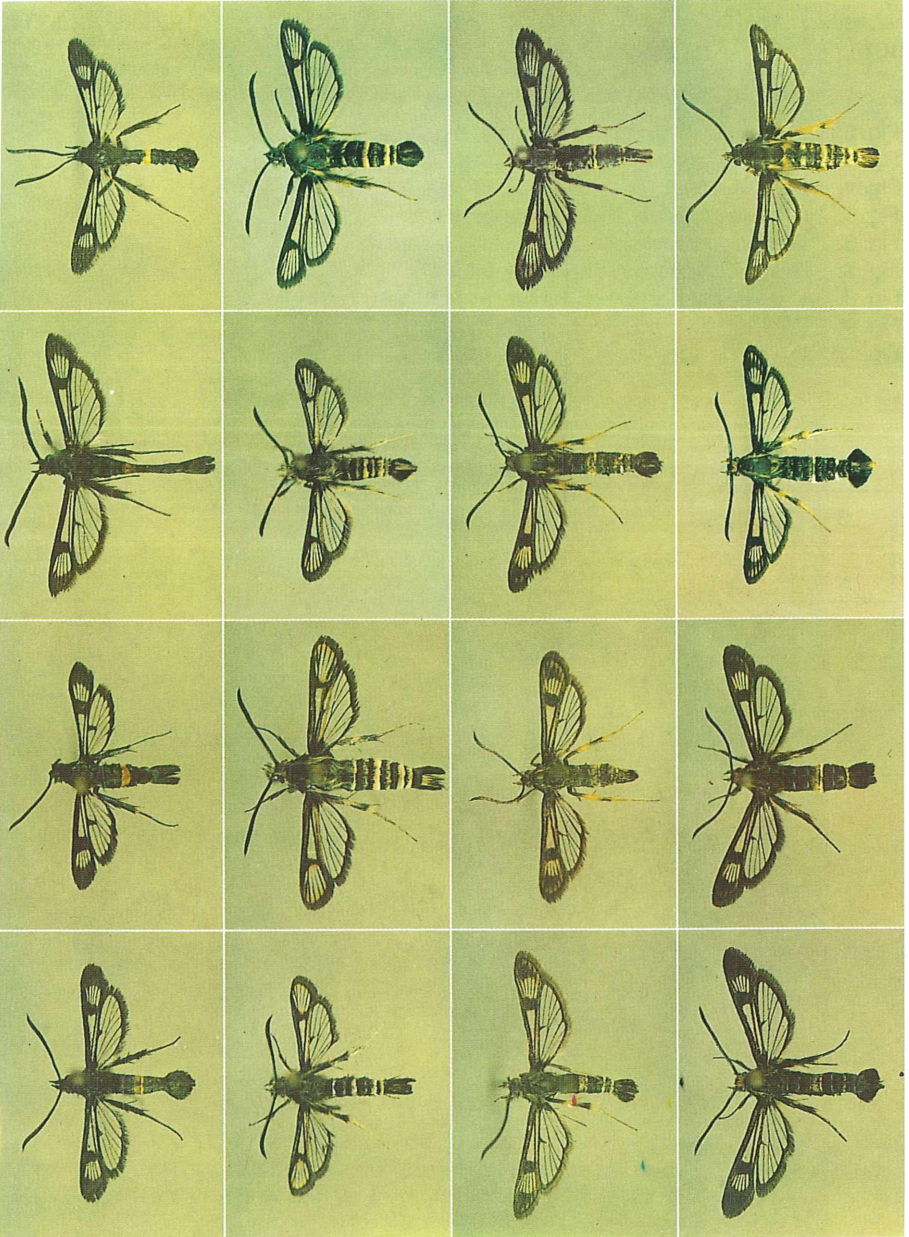
Colour plate XXII

GORBUNOV, O.: Six new species of the clearwing moths from the Caucasus, USSR. *Atalanta* **22**(2/3):125-143.

- Fig. 1: *Synanthedon spatenkai* spec. nov., holotype ♂
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Colour plate XXII



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