

Four new species of the genus *Kelgena* Mey from Turkey (Trichoptera: Limnephilidae, Chaetopterygini)

Cuatro nuevas especies del género *Kelgena* Mey de Turquía (Trichoptera: Limnephilidae, Chaetopterygini)

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Abstract

The following new species of the genus *Kelgena* Mey, in the tribe Chaetopterygini, are described and illustrated from northeastern Turkey: *Kelgena zigana* sp. n., *Kelgena camibogazi* sp. n., *Kelgena limni* sp. n. and *Kelgena kavron* sp. n. All the new species are found at high altitudes in the northeastern Anatolian mountains and related to each other in having a convex median part of the spinulose zone of tergite VIII.

Key words: Trichoptera, new species, *Kelgena*, Chaetopterygini, Turkey.

Resumen

Se describen e ilustran las siguientes nuevas especies del género *Kelgena* Mey, perteneciente a la tribu Chaetopterygini, procedentes del Noroeste de Turquía: *Kelgena zigana* sp. n., *Kelgena camibogazi* sp. n., *Kelgena limni* sp. n. and *Kelgena kavron* sp. n. Todas las especies descritas han sido encontradas a elevadas altitudes en las montañas del nordeste de Anatolia y están interrelacionadas por poseer por poseer una parte convexa mediana en la zona espinulífera del VIII terguito.

Palabras clave: Trichoptera, nuevas especies, *Kelgena*, Chaetopterygini, Turkey.

INTRODUCTION

The tribe Chaetopterygini is represented in Turkey by 19 species belonging to five genera. All the genera and the species are found in northern Turkey. The genus *Kelgena* is represented in the Caucasus by two species: *K. kelensis* Martynov, 1926, and *K. minima* Mey, 1979 (MEY, 1979). The other three known species, namely *K. macahelensis* Sipahiler, 1999, *K. sisensis* Sipahiler, 2009 and *K. nehiraie* Sipahiler, 2009, were found in

northeastern Turkey (SİPAHİLER: 1999, 2009). In the present study, four more new species found in northeastern Turkey are described. They are related to each other and to *K. kelensis* and *K. macahelensis*. All these species have a convex median part of the spinulose zone of tergite VIII. The number of species in Turkey has reached seven, suggesting that the center of origin of the genus *Kelgena* is found in northeastern Anatolia.

MATERIALS AND METHODS

Specimens were collected during the day time using a hand entomological net. The material was preserved in 75% ethyl alcohol and deposited in the author collection in Hacettepe University (Beytepe, Ankara, Turkey). The figures were drawn using a Zeiss Stemi SV 6 microscope.

DESCRIPTIONS

***Kelgena zigana* sp. n.** (Fig. 1)

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F614B0B5-480F-4983-9039-F478DCBA1984

Material. Holotype male and paratypes (1 male, 2 females): Turkey, Gümüşhane, Trabzon direction, Zigana Mountains, Zigana Pass, 1820 m, 40° 39' N, 39° 24' E, 13.10.2007, leg. and coll. Sipahiler.

Antennae, maxillary palps, legs, thorax, abdomen, and wings pale brown-yellowish; brachypterous, wings as long as the abdomen or slightly shorter than it. Spur formula of males 0.3.3, of females 1.3.3. The length of the anterior wing of males is 7-9 mm, of females 8-10 mm.

Male genitalia (Fig. 1: a-d). The spinulose zone of tergite VIII is very large, covering half of tergite VIII; in dorsal view the convex median portion is narrow and quadrangular, the apical edge is slightly excised medially, the sides are rounded; this median part possesses scarcely thickened spines, the sides of the spinulose zone are densely covered with spines. Segment IX is laterally large and dilated anteriorly; dorsally and ventrally narrow; the preanal appendage in lateral view is broad, roundly dilating on the ventral edge; laterally, the intermediate appendage is rather long directing posterior, the base is broad, medially narrower,

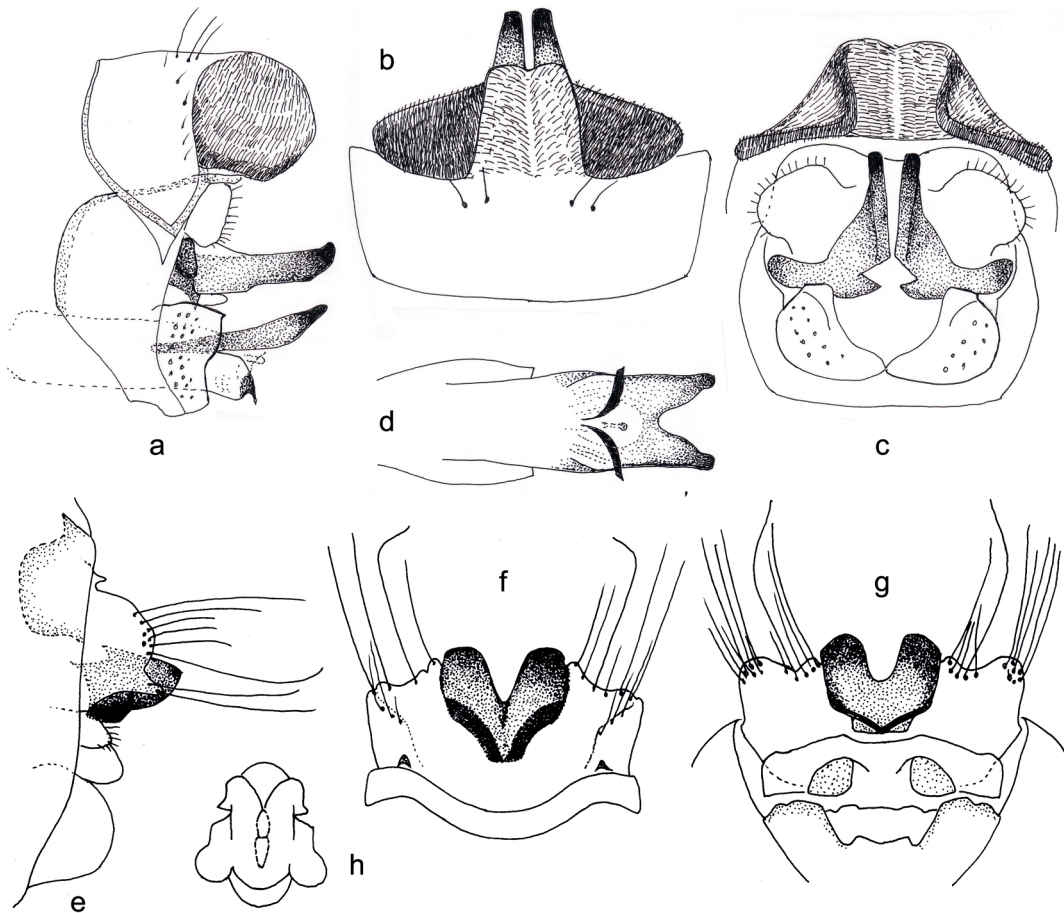


Figure 1. *Kelgena zigana* sp. n. a-d: male genitalia. a, lateral; b, dorsal; c, caudal; d, phallic apparatus, ventral. e-h: female genitalia. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

Figura 1. *Kelgena zigana* sp. n. a-d: genitalia masculina. a, lateral; b, dorsal; c, caudal; d, aparato fállico, ventral. e-h: genitalia femenina. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

the apex is pointed on the dorsal corner and the posterior edge is rounded. The inferior appendages are short and broad; in lateral view, the posterior margin is straight on the ventral half, the dorsal half is somewhat broad and rounded, with a small pointed projection on the dorsal corner; in caudal view, the apical edges are almost straight. The sclerotized dorsal plate of the phallic apparatus is laterally dilated on the subdistal portion of the ventral edge, narrowed on the rounded tip and at the base; in ventral view the apex of the dorsal plate is almost V-shaped excised, the sides of the excision are sinuate; the apical edges of the ventro-lateral lobes are sclerotized, the rest of the lobes are membranous, between them the aedeagus is found and seen well in the copulated specimens.

Female genitalia (Fig. 1: e-h). The dorsal cavity of segment IX is deep and rounded anteriorly; the lateral projections near the anterior edge are oval. Segment IX dorsally as a large plate, dilated

towards the posterior margin; in lateral view the dorsal part is dilated towards the ventral, with a narrow, finger-shaped projection possessing long setae protruding on the ventral corner of the apical edge; in dorsal view the median portion is concave; the strongly sclerotized median part fused with segment X, covering the anal opening; in dorsal view, the apical edge deeply V-shaped excised in the middle, the sides of the excision are large and broad, with straight apical margin; the ventral part is short and not seen in dorsal view; in caudal view the ventral part forms a thin V-shaped band. The median part of the vulvar scale is broad; medially slightly excised and the sides are nearly triangular.

Remarks. See the affinities of *Kelgena camibogazi* sp. n.

***Kelgena camibogazi* sp. n.** (Fig. 2)

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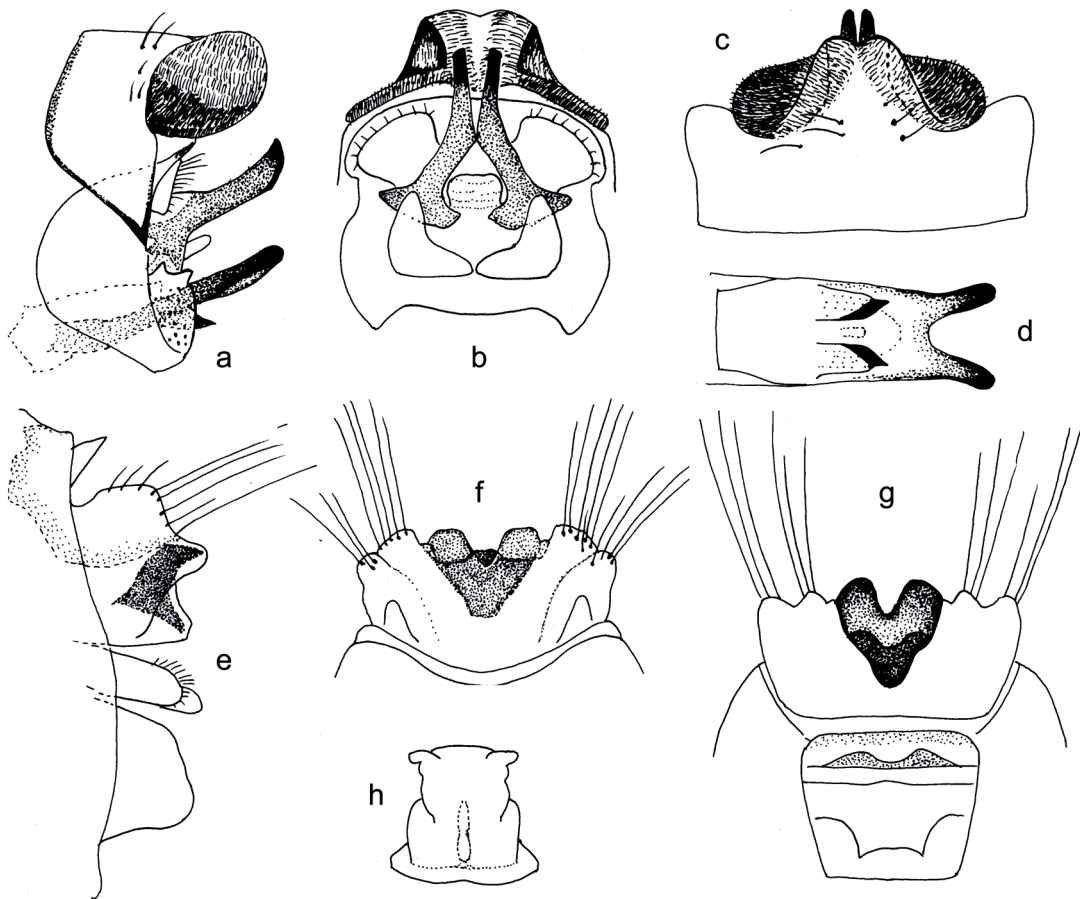


Figure 2. *Kelgena camibogazi* sp. n. a-d: male genitalia. a, lateral; b, dorsal; c, caudal; d, phallic apparatus, ventral. e-h: female genitalia. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

Figura 2. *Kelgena camibogazi* sp. n. a-d: genitalia masculina. a, lateral; b, dorsal; c, caudal; d, aparato fálico, ventral. e-h: genitalia femenina. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

Material. Holotype male: Turkey, Gümüşhane, Camiboğazı Yaylası, 2070 m, 40° 38' N, 39° 41' E, 14.10.2007; paratypes: same place, 2077 m, 3.10.2008, 17 males, 9 females, leg. and coll. Sipahiler.

Antennae, maxillary palps, legs thorax, and abdomen wings pale brown-yellowish; brachypterous, wings of males as long as the abdomen or slightly shorter than it, of females shorter than of males. Spur formula of males 0.3.3, of females 1.3.3. The length of the anterior wing of males is 5.5-7.5 mm, of females 8.5-9 mm.

Male genitalia (Fig. 2: a-d). In dorsal view, the median part of the spinulose zone of tergite VIII broad, nearly trapezoidal, the apical edge excised medially, the sides are rounded; the median part possesses sparse spines on the sides, the median portion is without spines, the side flat portions bear dense spines. In lateral view segment IX roundly dilated anteriorly on the side portion; the preanal appendage short, the apical margin is straight; the intermediate appendage broad at the base, the dorsal and the ventral edges are almost parallel directed towards dorsal, the posterior edge is larger than the median portion, nearly rounded, with a pointed projection on the dorsal corner; in caudal view, the subgenital plate is large, membranous, nearly quadrangular with rounded corners; in lateral view, the posterior edge of the inferior appendage slightly rounded, with a small projection on the dorsal corner; in caudal view, gradually narrowed towards the rounded tips. The sclerotized dorsal plate of the phallic apparatus laterally is broad at the base, dilated on the second half of the ventral edge, the tip is rounded and broad; in ventral view the apex of the dorsal plate is almost U-shaped excised, the sides of the excision are directed somewhat on the sides; the ventro-lateral lobes are rather narrow; the apical edges are sclerotized, the rest of the lobes are membranous.

Female genitalia (Fig. 2: e-h). The dorsal cavity of segment IX deep rounded, narrower towards anterior, the lateral projections near anterior edge are oval; in dorsal view, segment IX is a concave large plate, the sides are high; in lateral view the dorsal edge nearly straight, the posterior edge protrudes as a broad lobe in the middle, the ventral portion is slightly shorter than it. In dorsal view, the median part is fused with segment X, which

is strongly sclerotized, the apical edge almost V-shaped excised in the middle, the sides of the excision protrude as nearly quadrangular lobes; the median excision of the ventral part is short, large U-shaped and seen in only in ventral view, dorsally its apical edge appears nearly straight; the median part of the vulvar scale is broad slightly rounded.

Remarks. *Kelgena camibogazi* sp. n. and *K. zigana* sp. n. are closely related to each other in having a larger spinulose zone of tergite VIII, of which the median concave parts are nearly quadrangular and the apical edges are excised in the middle, forming rounded lobes on the sides; the following differences are seen in the male genitalia: in *K. zigana* sp. n. the median concave part of the spinulose zone is quadrangular, the flat side parts are large and oval, whereas in *K. camibogazi* sp. n. the median part is larger, trapezoidal, and the flat sides are almost rounded; the preanal appendage of *K. camibogazi* sp. n. laterally is short and narrow, the intermediate appendage is directed posterior, narrower, with a straight ventral edge, while in *K. zigana* sp. n. the preanal appendage is broad, the ventral edge rounded laterally, the intermediate appendage is directed posterior, broader at the basal part; the posterior edge of the inferior appendage of *K. camibogazi* sp. n. is slightly rounded, in caudal view the apex is also rounded, in *K. zigana* sp. n. the posterior edge is laterally rounded on the dorsal half, the ventral half is straight and caudally the apex is straight. The differences in the female genitalia are as follows: in *K. camibogazi* sp. n. the dorsal edge of segment IX is laterally straight, with a broad finger-shaped lobe located medially and also a ventral portion, slightly shorter than it, whereas in *K. zigana* sp. n. the dorsal edge is almost rounded, ended with a narrow finger-shaped lobe, the ventral portion is lacking; in *K. camibogazi* sp. n. the ventral part of the sclerotized median part is visible in dorsal view, in caudal view it is large, reaching nearly half of the length of the dorsal part, whereas in *K. zigana* sp. n. the ventral part is very thin and is not seen in dorsal view, ventrally it is seen as a V-shaped thin band.

***Kelgena limni* sp. n.** (Fig. 3)

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Material. Holotype male and paratypes (5 males, 2 females): Turkey, Gümüşhane, a mountain spring near Limni Lake, 2010 m, 40° 37' N, 39° 24' E, leg. and coll. Sipahiler.

Antennae, maxillary palps, legs, thorax, abdomen, and wings pale brown, forewings with erect hairs on the veins and the membrane; both males and females are brachypterous, wings are slightly longer than abdomen. Spur formula of males 0.3.3, of females 1.3.3. The length of the anterior wing of males is 7-8 mm, of females 8.5-9.5 mm.

Male genitalia (Fig. 3: a-d). The spinulose zone of tergite VIII is large, covering half of tergite VIII in lateral view; in dorsal view the convex median

portion is broad, the apical edge is rounded, the side flat areas are short; this median part possesses scarcely thickened spines, the sides of the spinulose zone are densely covered with spines; in lateral view the posterior edge is smooth. Segment IX is laterally roundly dilated. In lateral view the preanal appendage with slightly rounded apical margin; the intermediate appendage is directed towards dorsal, rather long, the subdistal portion strongly sclerotized, black, the apex is straight, broad, with small pointed projection on the dorsal corner; the ventral edge is dilated on the subdistal part. The inferior appendage laterally is rather narrow, the apical edge is nearly straight, protruding as a long projection on the dorsal corner; in caudal view the apical part narrow, nearly triangular, the thin apex somewhat curved inside. The sclerotized dorsal

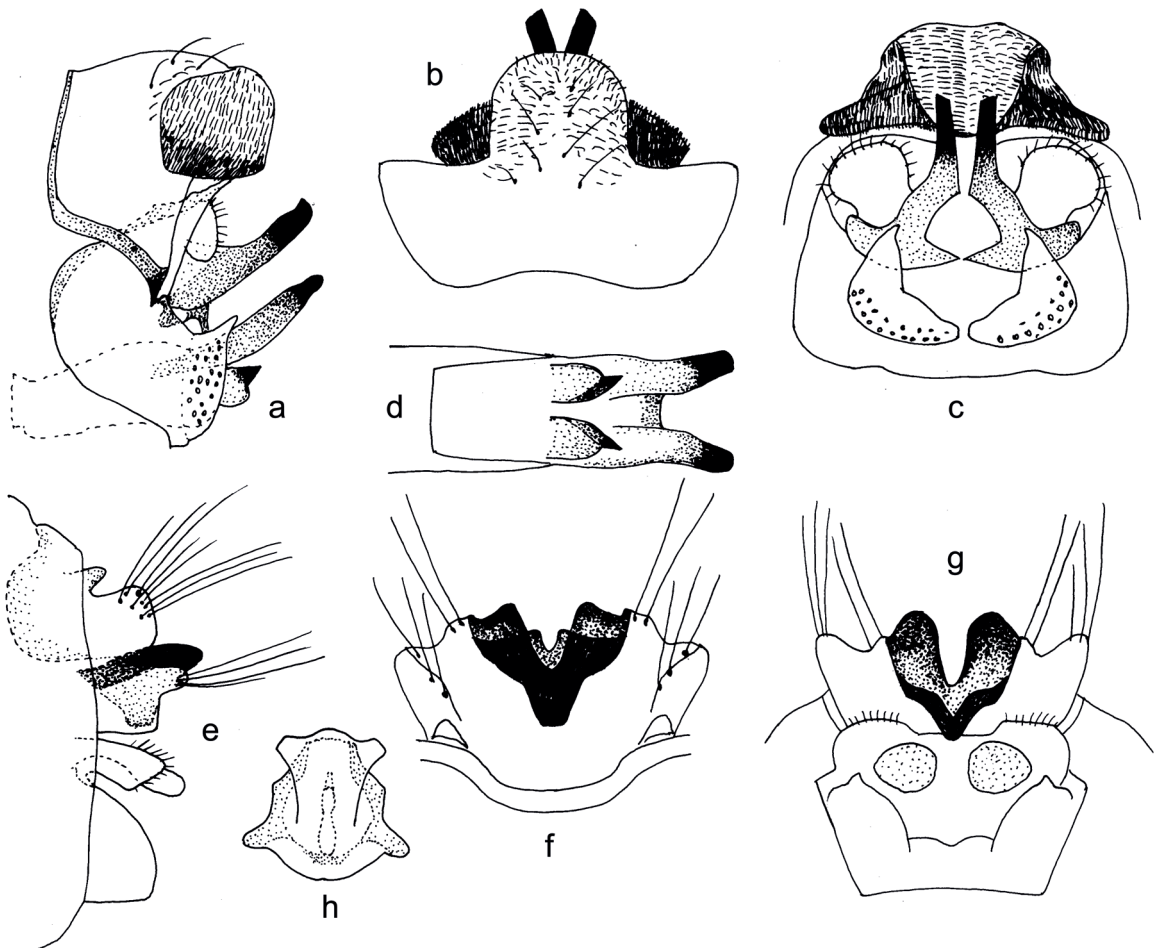


Figure 3. *Kelgena limni* sp. n. a-d. male genitalia. a, lateral; b, dorsal; c, caudal; d, phallic apparatus, ventral. e-h: female genitalia. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

Figura 3. *Kelgena limni* sp. n. a-d: genitalia masculina. a, lateral; b, dorsal; c, caudal; d, aparato fállico, ventral. e-h: genitalia femenina. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

plate of the phallic apparatus laterally dilated on the ventral edge, narrowed before the rounded tip; in ventral view the apex of the dorsal plate is almost U-shaped excised, the sides of the excision are directed on the sides; the apical edges of the ventrolateral lobes are sclerotized, the rest of the lobes are membranous.

Female genitalia (Fig. 3: e-h). The dorsal cavity of segment IX deep and rounded anteriorly; the lateral projections near the anterior edge are oval; segment IX is as a concave large plate, dilated towards the posterior margin; in lateral view the dorsal and ventral parts are almost quadrangular, with a finger-shaped projection protruding in the middle of the apical edge possessing long setae; the median part is fused with segment X, which is strongly sclerotized, nearly black, covering the anal opening; in dorsal view, the apical edge deeply almost V-shaped excised in the middle, the sides of

the excision protrude as nearly triangular lobes; the ventral part and its median excision are shorter but are seen in dorsal view; in caudal view the ventral part forms a narrow V-shape medially. The median part of the vulvar scale is broad; medially slightly excised and the sides are rounded.

Remarks. See the affinities of *Kelgena kavron* n. sp.

***Kelgena kavron* sp. n.** (Fig. 4)

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Material. Holotype male and paratypes (10 males, 3 females): Turkey, Rize, Çamlıhemşin, Ayder, Kaçkar Mountains, Yukarı Kavron, 1500 m, 40° 54' N, 41° 03' E, 9.10.2006; 13 paratypes (6 males, 7 females): same place, 2600 m, 10.10.2006. All leg. and coll. Sipahiler.

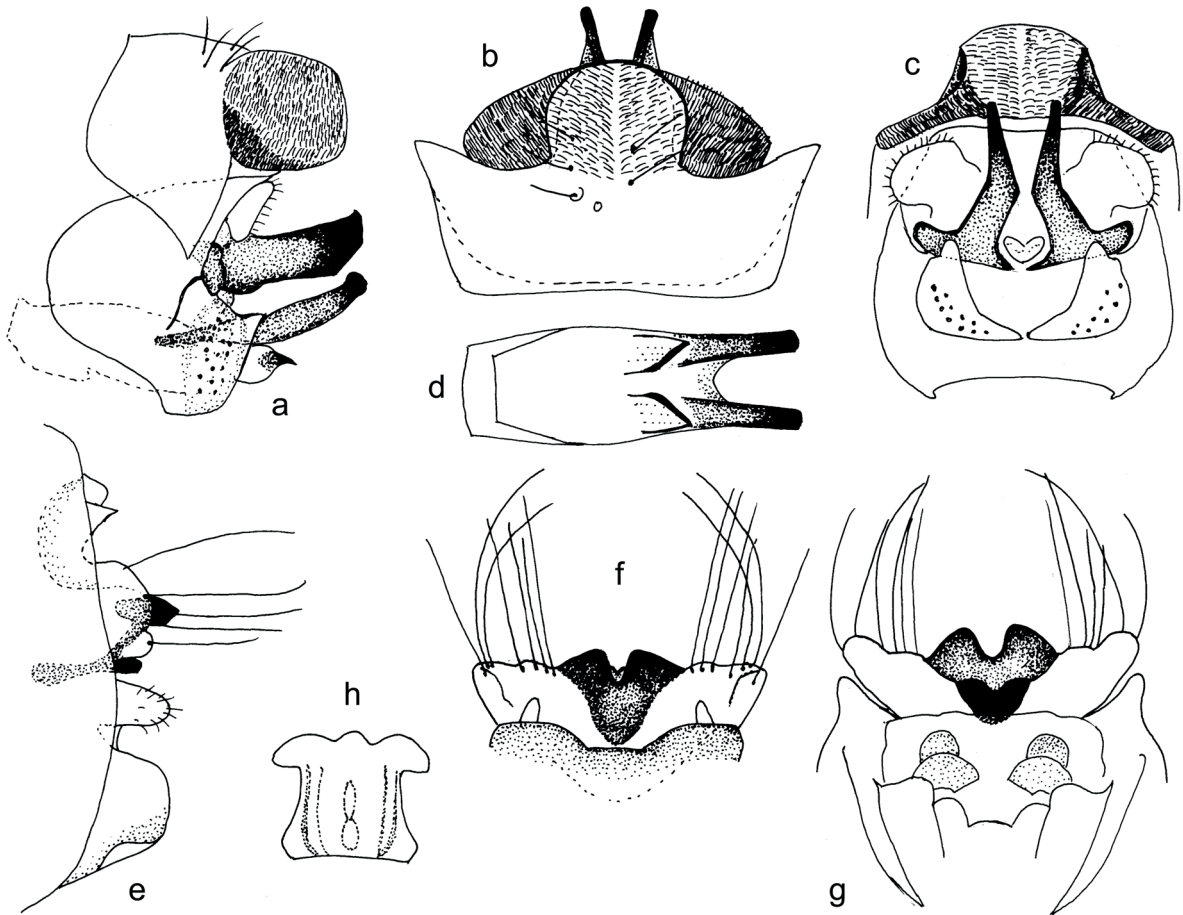


Figure 4. *Kelgena kavron* sp. n. a-d: male genitalia. a, lateral; b, dorsal; c, caudal; d, phallic apparatus, ventral. e-h: female genitalia. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

Figura 4. *Kelgena kavron* sp. n. a-d: genitalia masculina. a, lateral; b, dorsal; c, caudal; d, aparato fàlico, ventral. e-h: genitalia femenina. e, lateral; f, dorsal; g, caudal; h, bursa copulatrix, ventral.

Antennae, maxillary palps, legs, and wings brown; the tergites and sternites of the abdomen brown, the pleural parts dark brown; brachypterous, wings of males as long as the abdomen or slightly shorter than it, in a few males the wings are slightly longer than the abdomen. Spur formula of males 0.3.3, of females 1.3.3. The length of the anterior wing of males is 7.5-8.5 mm, of females 7.5-11 mm.

Male genitalia (Fig. 4: a-d). In dorsal view, the median part of the spinulose zone of tergite VIII large, broad, and rounded, covered with sparse spines, the sides are large and nearly rounded, reaching the apical edge of the median portion; the side flat portions bear dense spines. Segment IX in lateral view broad, roundly expands on the anterior margin, ventrally and dorsally narrow; the preanal appendage is rather narrow, the posterior margin is smooth, roundly dilated towards ventral; the inferior appendage broad, broader at the base, slightly narrower on the median part, becoming broader again towards the subdistal portion, the ventral edge protrudes as a large triangle on the subdistal portion, the posterior edge straight with a small pointed projection on the dorsal corner; in caudal view, the dorsal portions of the intermediate appendages are straight and narrow. The subgenital plate is membranous, large, and nearly heart-shaped. The posterior edge of the inferior appendage is laterally almost smooth; caudally the apical parts narrower and rounded at the tips. In lateral view the sclerotized dorsal plate of the phallic apparatus is thin at the base, becoming broader on the second half, subdistally narrower, the apex is broad and rounded; in ventral view the apex of the dorsal plate is almost U-shaped and deeply excised, the sides of the excision are nearly straight; the ventro-lateral lobes are rather narrow; the sclerotized apical edges are thin, the rest of the lobes are membranous.

Female genitalia (Fig. 4: e-h). The dorsal cavity of segment IX broad and rounded on the anterior part; the anterior edge is strongly sclerotized; the lateral projections near the anterior edge are thin, almost oval; in dorsal view, segment IX is a concave, rather narrow plate, the sides are also narrower; in lateral view the dorsal edge is short, the posterior edge is roundly dilated, with a small excision near

the ventral edge; in dorsal view, the median part, which is fused with segment X, is strongly sclerotized, the apical edge almost U-shaped excised in the middle, the sides of the excision protrude as nearly triangular lobes; the median excision of the ventral part is small and short, broadly U-shaped and seen in ventral and dorsal view; the median part of the vulvar scale is broad, slightly rounded.

Remarks. *Kelgena limni* sp. n. and *K. kavron* sp. n. are closely related to each other in having a rounded concave portion of the spinulose zone of tergite VIII and an intermediate appendage with a straight apical edge. The following differences are seen in the male genitalia: in *K. limni* sp. n. the flat side parts of the spinulose zone are short, reaching half of the length of the median concave part in dorsal view; laterally, the apical margin of the preanal appendage is slightly rounded, the intermediate appendage rather narrow, directed towards dorsal, whereas in *K. kavron* sp. n. the flat side parts of the spinulose zone are long and broad, reaching the top of the median part, the apical margin of the preanal appendage is straight in lateral view, the intermediate appendage broad, directing posterior. In *K. limni* sp. n. the apex of the preanal appendage is very narrow, laterally prolonged towards dorsal, but in *K. kavron* sp. n. in caudal view the apex is broadly oval; in *K. limni* sp. n. in ventral view the sclerotized dorsal plate of the apical portion of the phallic apparatus somewhat directed on the sides and rather broad, while in *K. kavron* sp. n. they are almost parallel to each other and thinner. The differences in the female genitalia are as follows: in *K. limni* sp. n. segment IX is large and long, the dorsal edge of laterally straight, with a rounded excision in the middle and a finger-shaped lobe located beneath the excision and the ventral portion with a straight edge, whereas in *K. kavron* sp. n. segment IX is narrow, laterally the dorsal edge short, with a small excision before the broad and short finger-shaped lobe. In *K. limni* sp. n. the median excision of the sclerotized median part is deep in dorsal view, in caudal view the ventral part is narrow and V-shaped, whereas in *K. kavron* sp. n. the median excision is short, the ventral part is broad, with a small rounded excision in the middle.

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