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Research Article

Two New Species of *Chaetopteryx* Stephens, 1837 from Turkey with a Description of the Unknown Female of *C. bektasensis* Sipahiler, 2008 (Trichoptera, Limnephilidae: Limnephilinae: Chaetopterygini)

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Two new species of Trichoptera from Turkey are described and illustrated: *Chaetopteryx akgolensis* sp.n. and *Chaetopteryx sinopica* sp.n. (Limnepphilidae). Both belong to the tribe Chaetopterygini in the Limnephilinae. *C. akgolensis* sp.n. is close to *C. bektasensis* Sipahiler, 2008, whereas *C. sinopica* sp.n. is closely related to *C. nalanae* Sipahiler, 1996. The previously unknown female of *Chaetopteryx bektasensis* Sipahiler, 2008 is described and figured.

1. Introduction

The genus *Chaetopteryx* Stephens was previously thought to be represented in Turkey by four species. Two of them, *C. bosniaca* Marinkovic, 1955 (found in the Carpathians, the Balkans, and Turkey) and *C. abchazica* (Martynov, 1916) (found in the Caucasus, Iran, and northeastern Turkey), are widely distributed species; the others, *C. bektasensis* Sipahiler, 2008 and *C. nalanae* Sipahiler, 1996 have restricted distributions, being found in northeastern and northwestern Turkey, respectively [1–3]. In the present paper, two new species of this genus are described: *C. akgolensis* sp.n., which is closely related to *C. bektasensis* and *C. abchazica*, and *C. sinopica* sp.n., which is close to *C. nalanae*. Both are found in northwestern Anatolia.

2. Materials and Methods

Specimens were collected in autumn during the day using a hand net. The material was preserved in 75% ethyl alcohol and deposited in my collection in Hacettepe University Department of Biology Education. For the code of depository the abbreviation, CD is used.

3. Taxonomy

3.1. Chaetopteryx akgolensis Sp.n. (Figures 1 and 2)

Material. Holotype male and paratype female: Turkey, Sinop, Hanönü, Ayanıck direction, Çangal Mountain (CD: R-1251), 1130 m, a small spring near Akgöl, 41°41′ N, 34°34′ E, 3.x.2009; same place (CD: R-1262), 26.x.2009, 1 female, leg. and coll. Sipahiler.

Antennae, palps, legs, and wings pale brown; forewing with a white spot on the medial vein, and a larger one on anal vein 1 located near anastomosis and near the margin, respectively. Spur formula of male is 0.3.3, of female 1.3.3. Length of anterior wing of male 14.5 mm, of female 15–15.2 mm.

Male Genitalia (Figure 1). Spinulose zone of tergite VIII large; in dorsal view, the posterior and anterior edges almost straight and the sides rounded. In lateral view, the sides of segment IX are dilated on the anterior margin; the ventral part of segment IX is narrow. The preanal appendages are more or less rounded; in caudal view, the inner side of the apical edge with a large, almost rounded sclerotized

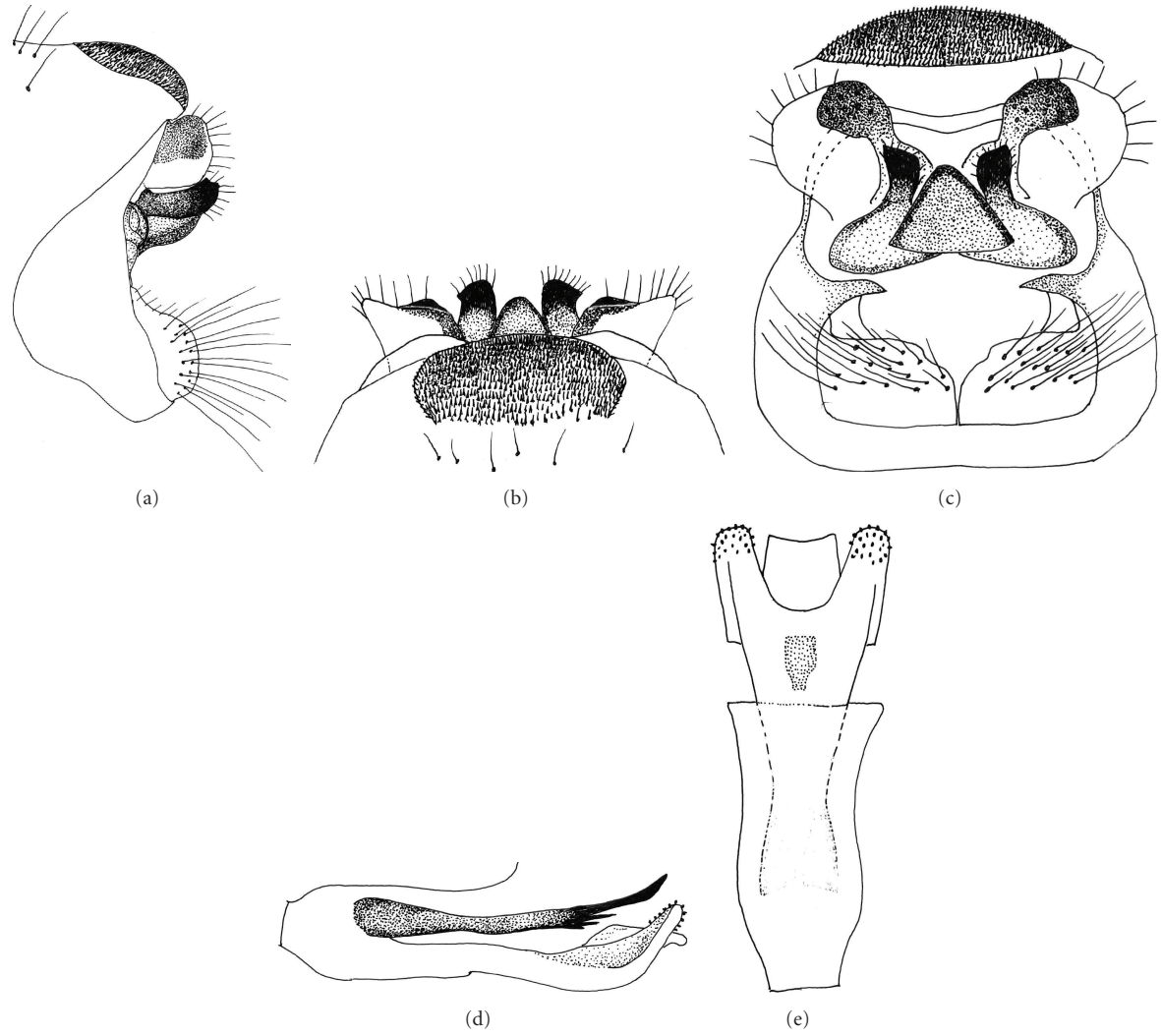

Figure 1: *Chaetopteryx akgolensis* sp.n., male genitalia: (a) lateral; (b) dorsal; (c) caudal; (d) phallic apparatus, lateral; (e) phallic apparatus, ventral.

zone. The intermediate appendages are nearly quadrangular and covered with white-yellowish short hairs; in lateral view, the ventral edge is somewhat dilated subdistally, the apex with two small pointed projections. The supra-anal plate is very large and long, almost triangular, strongly sclerotized; in dorsal view, it is seen as a large lobe between the intermediate appendages. The inferior appendages are short; in lateral view, the posterior edge broadly rounded. In caudal view, the inner edges are sinuate, and the dorsal edges are straight. The phallic apparatus is large on the apical portion; in ventral view, the sides are almost smooth, with the apical edge deeply and roundly excised, forming rounded lobes on each side, which are sclerotized and covered with tubercles; the median part with a weakly sclerotized almost quadrangular plate; parameres long, strongly sclerotized, and each possesses a long and rather broad spine, which is curved subdistally inside, and has three small spines, located subdistally.

Female Genitalia (Figure 2). In dorsal view, the dorsal part of segment IX is broadly and roundly excised, forming finger-shaped lobes on each side; the median part of this excision is broadly dilated; segment X is tube shaped, strongly sclerotized and located between the side lobes of segment IX; its dorsal part is deeply and roundly excised in the middle, and the sides of the excision are straight; the ventral part is longer than the dorsal part, and the apical margin is more or less straight, bearing short spines on the dorsal surface; in lateral view, the tube-like part of segment X is longer than the side lobes of segment IX, and the cavity is large. In caudal view, the median lobe of the vulvar scale is moderately large, apex rounded.

Remarks. Chaetopteryx akgolensis sp.n. is closely related to *C. bektasensis* Sipahiler, 2008 [3], but differs from this species by the following features: in *C. bektasensis*, the spinulose zone of tergite VIII is roundly dilated in the middle of the

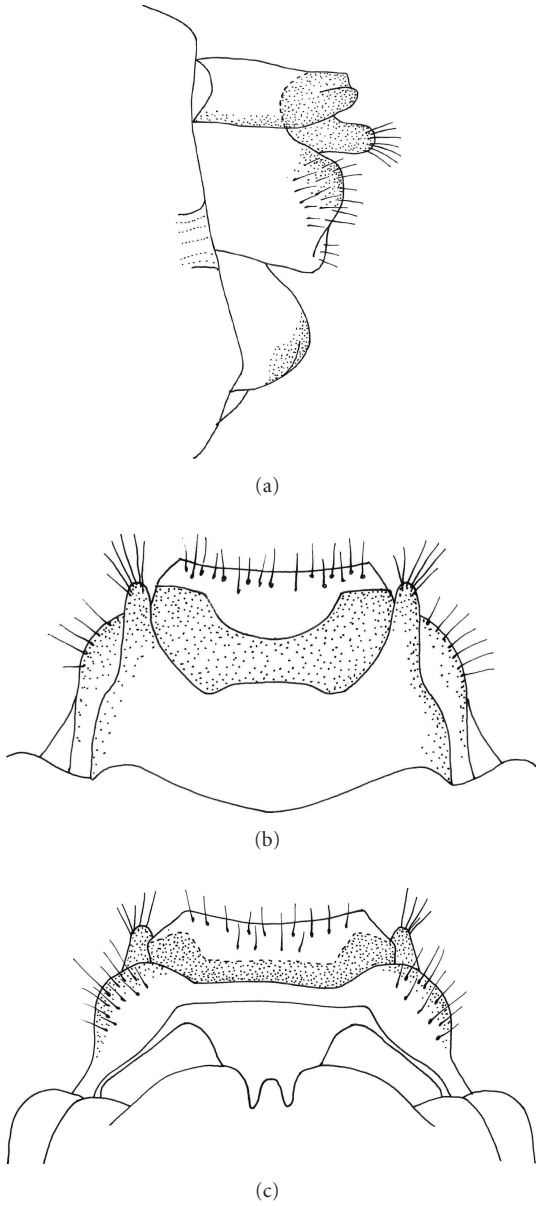

Figure 2: *Chaetopteryx akgolensis* sp.n., female genitalia: (a) lateral; (b) dorsal; (c) ventral.

apical edge; segment IX is broad on the ventral portion; in lateral view, the preanal appendage is elongate and dilated on the ventral edge, with the sclerite small and located on the inner corner, while in *C. akgolensis* sp.n., the apical edge of the spinulose zone of tergite VIII is broadly rounded. Segment IX is narrower ventrally, with the preanal appendage in lateral view shorter and almost rounded; the sclerite on the inner surface continues as a large band towards the base; the supra-anal plate of the related species is short and small but in *C. akgolensis* it is very large and long. Laterally, the inferior appendage of *C. bektasensis* is long, broad at the base, and narrowing towards the apical edge. In the new species, it is short and broad. The phallic apparatus of *C. bektasensis*, in ventral view, with a bilobed median portion, with the basal parts of the paramere not totally sclerotized. Laterally, there is a short finger-shaped lobe, bearing long spines, of which the inner one is longer than the others and the phallic apparatus. In *C. akgolensis* sp.n., the median part of the phallic apparatus is quadrangular, and the parameres are strongly and completely sclerotized, having no basal lobe. The longer sclerotized spine, located on the inner side, is as long as the phallic apparatus. Differences in the female genitalia are also evident. In *C. bektasensis*, the dorsal and ventral edges of the tube-like part of segment X are narrower, and the ventral edge is roundly excised in the middle, forming rounded lobes on each side. The cavity of the tube-like part is small; in the new species, the tube-like part of segment X is broad, the cavity is large, the dorsal edge roundly excised medially, the sides are straight, and the ventral edge is smooth.

Etymology. Named after the place where the type specimens were collected.

3.2. *Chaetopteryx sinopica* Sp.n. (Figures 3 and 4)

Material. Holotype male and paratypes (4 males, 2 females): Turkey, Sinop, Küre Mountains, Boyabat, Bürnük (CD: R-1248), 41°39′ N, 34°51′ E, 1146 m, 2.x.2009; other paratypes: Sinop, Hanönü, Akgöl, Çangal Mountain (CD: R-1250), 3.x.2009, 3 males, 2 females; same places, 41°41′ N, 34°34′E, 1130 m (CD: R-1261), 26.x.2009, 1 male, 1 female; Sinop, Dikmen, Durağan direction, Küre Mountains, 41°31′ N, 35°09′E, 917 m, (CD: R-1265), 25.x.2009, 2 males, 2 females; leg and coll. Sipahiler.

Scapus pale brown, other segments of the antennae dark brown; palps and legs pale brown, wings brown; spur formula of male is 0.3.3, of female 1.3.3. Length of the anterior wing of males 10-11 mm, of females 12-13 mm.

Male Genitalia (Figure 3). In dorsal view, spinulose zone of tergite VIII is large, almost oval, with sides dilated; in lateral view, anterior edge and dorsolateral part of segment IX strongly sclerotized; dorsal cavity rather large, with preanal appendage small; in caudal view, preanal appendages rounded, ventral parts becoming narrower, forming a petiole. In lateral view, intermediate appendage is broad and rather short, dorsal edge slightly dilated, and ventral edge roundly dilated; apical portion becoming narrower and quadrangular. In dorsal view, triangular with apex curved on sides. In lateral view, inferior appendage is long, curving inside; outer portion with long hairs. In caudal view, apical part is short, strongly sclerotized, almost quadrangular. Supra-anal plate is narrow, weakly sclerotized; apical part slightly rounded. In lateral view, the phallic apparatus is curved dorsally. In ventral view, apical part as broad as basal portion; apical edge roundly excised in the middle, with a small membranous part, sides are straight. Apex with sclerotized thick spine on each side, the shaft with long and thin sclerotized bands. Parameres dilated subdistally and each bears six spines, of which the outer one is thicker than the others.

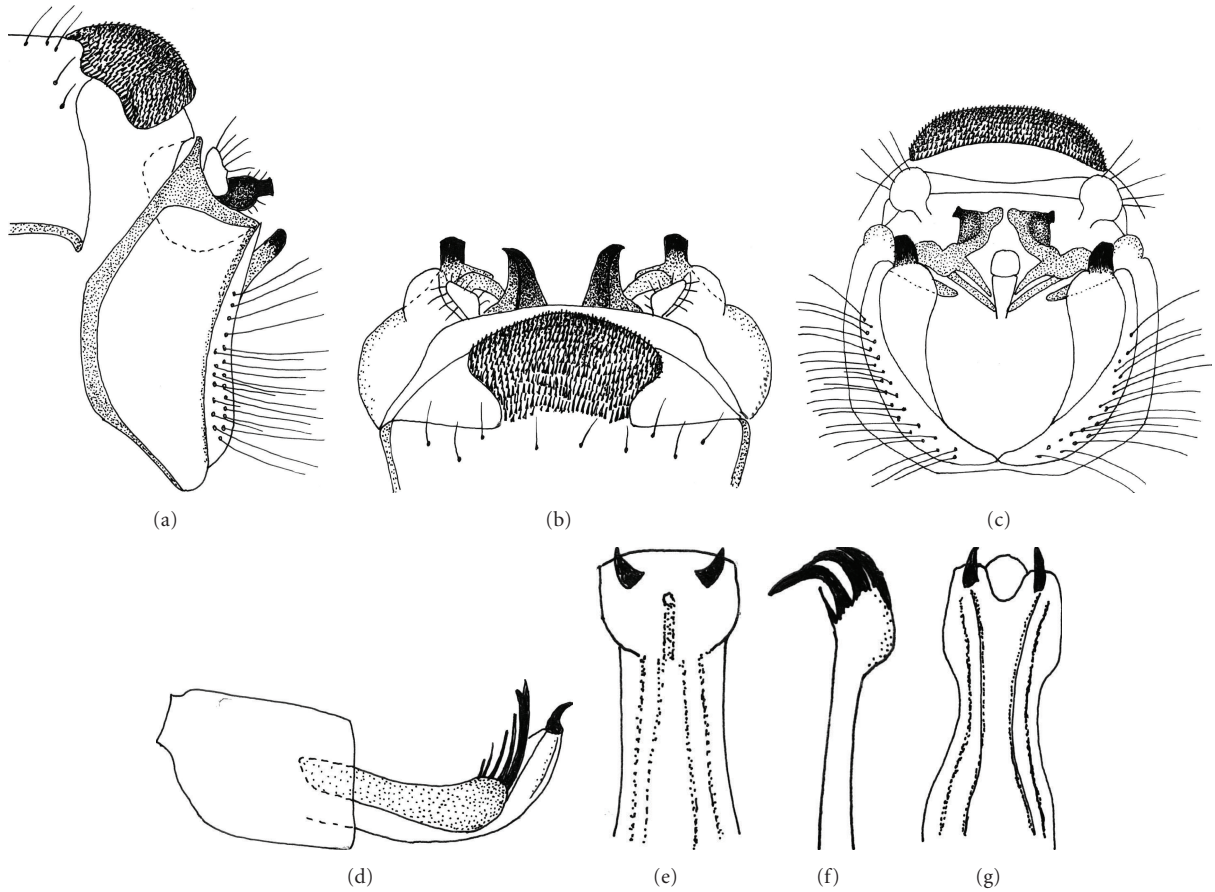

Figure 3: *Chaetopteryx sinopica* sp.n., male genitalia: (a) lateral; (b) dorsal; (c) caudal; (d) phallic apparatus, lateral; (e) phallic apparatus, dorsal, (f) left paramere, dorsal; (g) phallic apparatus, ventral.

Female Genitalia (Figure 4). In dorsal view, dorsal part of segment IX broadly and roundly excised, forming two triangular lobes on each side; covering the cavity of segment X. The ventral part is trapezoidal, with apical margin very short and smooth, bearing two long spines on each corner. In lateral view, ventral margin of tube-like part of segment X is pointed at the tip and as long as side lobes of segment IX. In caudal view, median lobe of the vulvar scale is large, with apex rounded.

Remarks. Chaetopteryx sinopica sp.n is closely related to *C. nalanae* Sipahiler, 1996, described from Bolu province in northwestern Turkey [1]. The following differences exist in the male genitalia: in *C. nalanae*, in dorsal view, the spinulose zone of tergite VIII is nearly trapezoidal, the apical and lateral edges are straight, the preanal appendages are broadly rounded and without petioles on the ventral parts, the intermediate appendages are long and narrow, the phallic apparatus very large on the apical portion, of which the sides are rounded, and the parameres are broad on the distal portion. In the new species, the spinulose zone is almost elliptical; at the preanal appendages, petioles are present ventrally, and the intermediate appendages are short and broad. Quadrangular projections are protruding apically, apical part of the phallic apparatus narrow, and the sides straight and the parameres distally narrow. The differences in the female genitalia are as follows: in *C. nalanae*, in dorsal view, the side lobes of segment IX are rounded, the ventral part of segment X is long, almost quadrangular, and the apical margin slightly excised. In the new species the side lobes of segment IX are triangular, the ventral part of segment X is as long as the side lobes and trapezoidal. The apical edge is very short, bearing two long setae, and, in lateral view, it is pointed at the tip.

Etymology. Named after the place where the type specimens were collected.

3.3. *Chaetopteryx bektasensis* Sipahiler, 2008 (*Figure 5*)

Material. Turkey, Giresun, direction to Bektaş Yaylası (CD: R-1102), 2000 m, 12.x.2007 1 female; Giresun, Kümbet Yaylası, 40°33′ N, 38°23′ E (CD: R-1173), 1600 m, 2.x.2008, 1 male, 1 female; same place, Çıkrıktepe, 1871 m, (CD: R-1164), 2.x.2008, 1 male, 1 female; Giresun, Karagöl Yaylası direction, 1825 m (CD: R-1159), 1.x.2008, 40°33′ N, 38°12′E, 2 females; same place, 1.x.2008 (CD: R-1180), 1 male, 2 females; Trabzon, Macka, Sumela, Camiboğazı Yaylası, 2077 m (CD: R-1179), 3.x.2008, 1 female; Sivas, Koyulhisar, Eğriçimen Yaylası, 4.x.2008 (CD: R-1161), 1600 m, 40°21′ N,

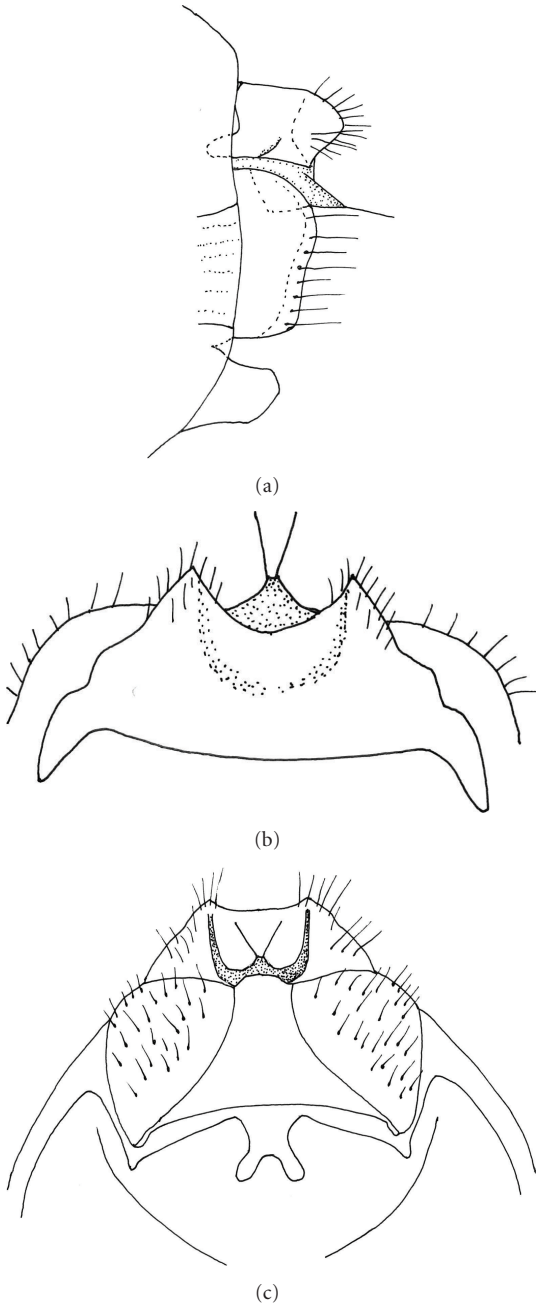

Figure 4: *Chaetopteryx sinopica* sp.n., female genitalia: (a) lateral; (b) dorsal; (c) ventral.

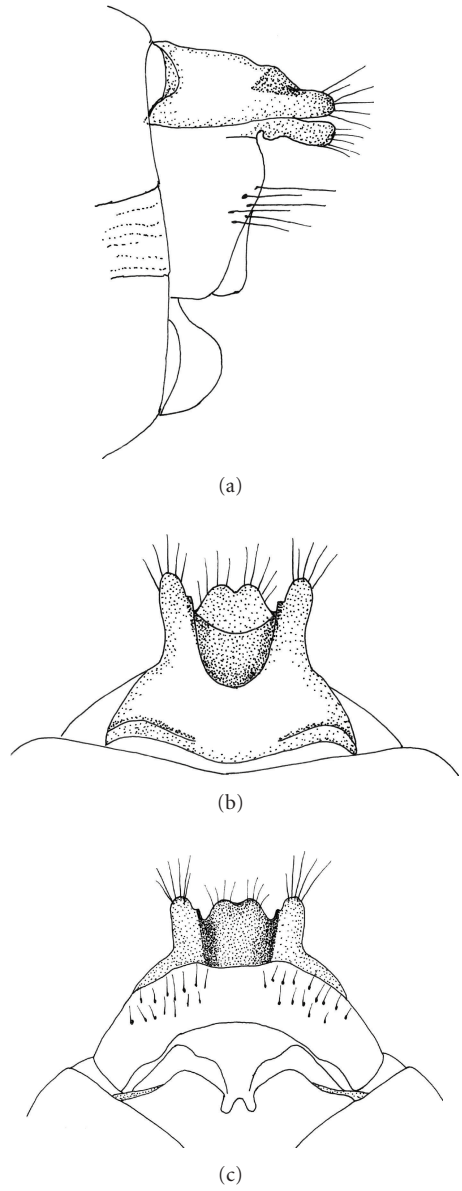

Figure 5: *Chaetopteryx bektasensis* Sipahiler, female genitalia: (a) lateral; (b) dorsal; (c) ventral.

37°47′ E, 1 female; same place (CD: R-1110), 11.x.2007, 1 female; Giresun, Kumbet Yaylası, Köprü, 2.x.2008 (CD: R-1162), 1 male, 3 females; Ordu, Çambaşı Yaylası, Yeşilce-Mesudiye direction, 1960 m (CD: R-1207), 40°35′ N, 37°53′ E, 19.8.2008, 1 female; leg. and coll. Sipahiler.

Antennae, palps and legs pale brown; wings brown, both membrane and the veins with upright hairs; spurs 1.3.3. Length of anterior wing 15-16 mm.

Female Genitalia (Figure 5). Segment IX dorsally broad at base, narrower in middle; apical edge roundly excised, forming narrow lateral lobes, which are rounded at the tips. Ventral plate of segment X as long as side lobes of segment IX; in dorsal and ventral view, somewhat narrower towards apex. Apical margin with a small excision and sides rounded. Median lobe of the vulvar scale small and obtuse at tip.

Remarks. The female genitalia of *C. bektasensis* differs from the female of *C. abchazica* by the following features: in *C. abchazica,* lateral lobes of segment IX shorter than ventral plate of segment X, somewhat divergent and the median lobe of the vulvar scale is lacking [4]. In *C. bektasensis,* lateral lobes of segment IX as long as the ventral plate, and the median lobe of the vulvar scale is small.

Acknowledgment

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