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**A new species of *Apatania* KOLENATI and the faunistic list for Köprüçay River and the surrounding area from southern Turkey (Trichoptera, Apataniidae)**

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**Abstract.** The adult and larva of a new species, *Apatania baspinar* sp. n. (Apataniidae), are described and illustrated. It was collected from the source of the Köprüçay River in southern Anatolia and occupies a small area there. It is a Pleistocene relict, like the closely related species *Apatania volsorum* MORETTI, CIANFICCONI & PAPAGNO, 1988, found only in Italy. A distribution map of the *Apatania ulmeri* subgroup is given. The Trichoptera fauna of the Köprüçay River and the surrounding area is listed.

**Key Words.** Trichoptera, *Apatania*, new species, Pleistocene relict, faunistic, *ulmeri* subgroup, distribution, southern Turkey.

The genus *Apatania* KOLENATI, 1848 is represented in Turkey by two species, *A. subtilis* MARTYNOV, 1909, in northeastern Anatolia and *A. oympica* MALICKY, 1982, in northwestern Turkey. Both are related to each other and belong to the *subtilis* species subgroup. A new species, *Apatania baspinar* sp. n., discovered in the Taurus Mountains and described in this study, belongs to the *ulmeri* subgroup (SCHMID, 1954, IVANOV & LEVANIDOVA, 1993), characterized by the long outer branches of segment X. The known four species of the *ulmeri* subgroup are close to each other and show extreme disjunctive distribution; these are *A. ulmeri* SCHMID, 1950 (Sajan Mountains near Baikal Lake) and *A. maritima* IVANOV & LEVANIDOVA, 1993 in Russian Far East Asia; *A. volsorum* MORETTI, CIANFICCONI & PAPAGNO, 1988, found in Italy and *A. baspinar* sp. n. in southern Turkey (Figure 18). Among these species the closest relative of the new species, *A. volsorum*, lives nearly 2000 km further west in only one locality in the Lazio region in Italy; in Asia, the other close relative, *A. ulmeri*, lives in the Sajan Mountains, almost 5000 km further east. *Apatania baspinar* sp. n. lives in cold source water (9.5 °C); it is a Pleistocene relict like its closest relative, *A. volsorum*, and occupies a very small area. The distribution pattern of the new species resembles that of *Apatania* species found in Turkey, Greece, and Asia, namely, *A. borcka* SİPAHİLER, 1996 is found only in one locality in the Karçal Mountains near the state border of Georgia (SİPAHİLER, 1996), while three species as close relatives are found in central Greece, three species in central Asia, and one species in the Far East (MALICKY, 2005). These species are also Pleistocene relicts occupying small areas with long distances between their relatives and they live in cold waters.

The Trichoptera fauna of the Köprüçay River and the surrounding area is listed based on the adult material collected since 1982. There are 38 species belonging to 24 genera and 11 families; 20 of them are endemic to Turkey (52%), of which 7 species are found only in the Köprüçay River.

***Apatania baspinar* sp. n. (Figures 2-10)**

Antennae black, maxillary palps blackish; head dorsal and thorax black, hairs whitish, pleural parts reddish-brown; the tergites and sternites of abdomen blackish-gray; wings black, radius on the forewing thick, black; pterostigma blackish,

with pale small dots, the anterior half of the wing with numerous pale spots; a big white spot is on the media near the fork, the second big white spot is on the anal veins. The length of the anterior wing of males is 7-7.5 mm, of females 8-8.5 mm.

**Male genitalia (Figures 1-6).** Segment IX dorsally and ventrally narrow, the sides are roundly dilated towards anterior; the dorsal part is very thin in the median portion. The preanal appendages are strongly sclerotized, nearly blackish, narrow, and as long as half the length of the side prolongations of segment X. In dorsal view, the median part of segment X is slightly shorter than the preanal appendages, nearly narrow triangular, the apex is rounded; in lateral view, the basal part is broad, narrowing on the apical portion; in dorsal view, the bases of the side prolongations of segment X broad almost quadrangular, the prolongations are long, rather broad, becoming broader, subdistally curving inside and downward; the curved distal portions strongly sclerotized, blackish, each possessing three short and strong projections at the apex. In lateral view, the basal segment of the inferior appendages broad at the base, the distal half is almost quadrangular, bearing long, stout black setae on the outer sides and small setae on the ventral surface of the distal part; the apical segment is as broad as the basal segment, pointed at the tip. The dorsal sclerotized long projections of the phallic apparatus are knife shaped, laterally broad but very thin, the apex is pointed; in ventral view, the aedeagus membranous on the apical margin, possessing on each side three setae; the parameres are membranous apically with numerous setae.

**Female genitalia (Figures 7-10).** In dorsal view, segment IX broad, apical edge rounded, segment X almost quadrangular; in lateral view, the edge between segment IX and X fused, the apical edge of segment X deeply excised, ventral part long and nearly triangular, a small excision forms a small rounded dilatation in the middle, the second excision is located ventrally, the margin between them is straight. In ventral view, the side lobes of the vulvar scale are broad, pointed at the tips, the median scale membranous, long, apically nearly rounded; bursa copulatrix is broad, with narrow dorsal part.

**Remarks.** *Apatania baspinar* sp. n. is closely related to *A. volsorum*; the following differences are seen in the male genitalia: in *A. volsorum* the preanal appendages are shorter, not reaching the apex of the median part of segment X, segment X dorsally broad, nearly quadrangular, the lateral prolongations narrower, each possessing two projections at the apex; the aedeagus of the phallic apparatus bears two setae on each side of the tips (MALICKY, 2004), whereas in *A. baspinar* sp. n. the preanal appendages are longer, reaching laterally half the length of the lateral prolongations of segment X, which is in dorsal view nearly triangular; the lateral prolongations of segment X rather thick, each bearing three pointed projections at the apex; the aedeagus of the phallic apparatus bears three setae on each side of the tips. The differences in female genitalia are especially seen in the shape of the apical edge of segment X, which has in the related species two projections medially and a short ventral part and narrower bursa copulatrix.

**Material:** Holotype male and paratypes (1 male, 24 females): Turkey, Isparta, Eğirdir, Aksu, Başpınar, source of Köprüçay, (light), 1367 m, 37°49'N, 31°06'E, 6.10.2016, same place and date, daylight, 2 males, 4 females (paratypes); 1348 m, 8.6.2014, 1 female pupa; 30.7.2001, 3 larvae. All in the collection of the author.

**Description of the last-instar larva (Figures 11-17).** The length of the last-instar larvae is 5.5-6 mm; head width 0.74-0.75 mm (n=2).

**Head.** Head capsule is reddish-brown, hypognathous, laterally with three long setae near the eye, of which the median seta is the longest and the thickest; the area around the eyes pale brown (Fig. 11); antennae are found between the eyes and the anterior edge of head, with a shorter seta located anteriorly. Labrum possesses three short setae on each side of the middle. Mandibles are black, spatulate, distally without teeth (Fig. 12).

**Thorax.** Pronotum reddish-brown, anterior portion pale brown, the posterior edge with strongly sclerotized stripe; dorsally there are four longer setae on each pronotal half; anterior edge with short setae; the defensive gland, which occurs in Apataniidae larvae, is found beneath the pronotum and an additional part of this gland is located between the pronotum and head capsule (Fig. 13), which is white, has a broad, rounded basal part and a distal part, which is membranous, nearly transparent, and composed of two lobes; this is an eversible organ, its secretion composed of 30 fatty acids, which cause paralyzing effects on predators (WAGNER et al., 1990). Mesonotum is paler reddish brown, darker spots located on each posterior corner; the paler anterior part covered with microspinules; metanotum pale, thinner than mesonotum, ten setae each near anterior margin, four setae near posterior margin, and 11 setae on the lateral sclerites; prothoracic horn is not seen. Legs (Figs. 14) are reddish brown, anterior end of tibia of each leg blackish.

**Abdomen.** First abdominal segment with one dorsal and two lateral protuberances covered with microspinules; first abdominal dorsum with 10 setae, lateral protuberances each with 16 setae and ventrally with 18 setae. Tergite of segment IX reddish brown, with two long and strong setae near the middle of the anterior edge, two long setae on the sides of the posterior edge; between them shorter setae are found (Fig. 15). The claw of anal leg (Fig. 16) with two long and strong setae dorsally and two shorter and thinner setae on the sides. Gills are single and found on segments 2-6 (Fig. 1); the shorter gills are located on the anterior parts of segments 2 and 3. Fringes are found on segments 2-7.

Segment	ventral	dorsal
2	1 (short) 1 (long) 1	1 2 (short, long) 1 2 (long) 1
3	1 (short) 1 (long) 1	1 1 (short, long) 1 (long) 1
4	1 (long) 1	1 1 (long) 1
5	1 (long) 1	1 1 (long) 1
6	1 (long) 1	

Fig. 1: Numbers of the gills and their arrangements

**Case.** Made of small sand grains; larger grains are found especially on the anterior part of the sides; 6-7 mm long, slightly curved, broader on the anterior part and narrower posteriorly, with one rounded opening at the end of the case (Fig. 17).

**Remarks.** The larva of *A. baspinar* sp. n. resembles the larva of *A. volsorum*; the main differences are seen in the number of gills and setae and the case, which is made of smaller sand grains in *A. baspinar* sp. n. (CORALLINI & MORETTI, 1988).

## List of Trichoptera for the Köprüçay River and the surrounding area

### Rhyacophilidae

#### *Rhyacophila isparta* SİPAHILER, 1996

Endemic to Turkey.

Isparta, Sütçüler, Yazılı Kanyon, (light), 30.5.1993, 2 males (types); Eğirdir, Aksu, Zindan deresi, 1150 m, 1.8.2002, 1 male pupa, larva.

### Glossosomatidae

#### *Agapetus caucasicus* MARTYNOV, 1913

Manavgat, Beşkonak, Köprüçay, 24.3.1992, 14 males; same place, 146 m, 37°10'N, 31°10'E, 8.10.2016, 2 males.

#### *Agapetus selgensis* SİPAHILER, 2005

Endemic to Turkey; known only from Köprüçay.

Antalya, Manavgat, Beşkonak, Köprüçay, 37°19'N, 31°17'E, 21.5.2003, 10 males, 16 females (types).

#### *Synagapetus anaticus* ÇAKIN, 1983

Endemic to Turkey.

Eğirdir, Aksu, Kasımlar direction, Tota Mountain, 3.8.2002, 3 males, 4 females.

#### *Glossosoma develi* MALICKY, 1972

Endemic to Turkey.

Isparta, Sütçüler, Yazılı kanyon, (light), 350 m, 37°27'N, 30°55'E, 30.5.1993, 3 males, 1 female; Eğirdir, Aksu, Zindan Deresi, source, 1350 m, 37°49'N, 31°06'E, 17.6.2002, 7 males, 11 females; same place, 8.6.2014, 1 male; same place, 1367 m, (light), 37°49'N, 31°06'E, 6.10.2016, 3 males, larvae; Antalya, Manavgat, Beşkonak, Köprüçay, 146 m, 37°10'N, 31°10'E, 8.10.2016, 3 males, 1 females.

### Hydroptilidae

#### *Agraylea sexmaculata* CURTIS, 1834

Antalya, Manavgat, Beşkonak, Köprüçay, 21.5.2003, 1 female.

#### *Hydroptila angustata* MOSELY, 1939

Eğirdir, Aksu, Taurus Mountains, above the source of Zindan Deresi, a spring, 1396 m, 37°51'N, 31°04'E, 6.19.2016, 3 males.

#### *Hydroptila kalonichtis* MALICKY, 1972

Isparta, Sütçüler, Gökbüvet, 350 m, 23.4.1991, 33 males.

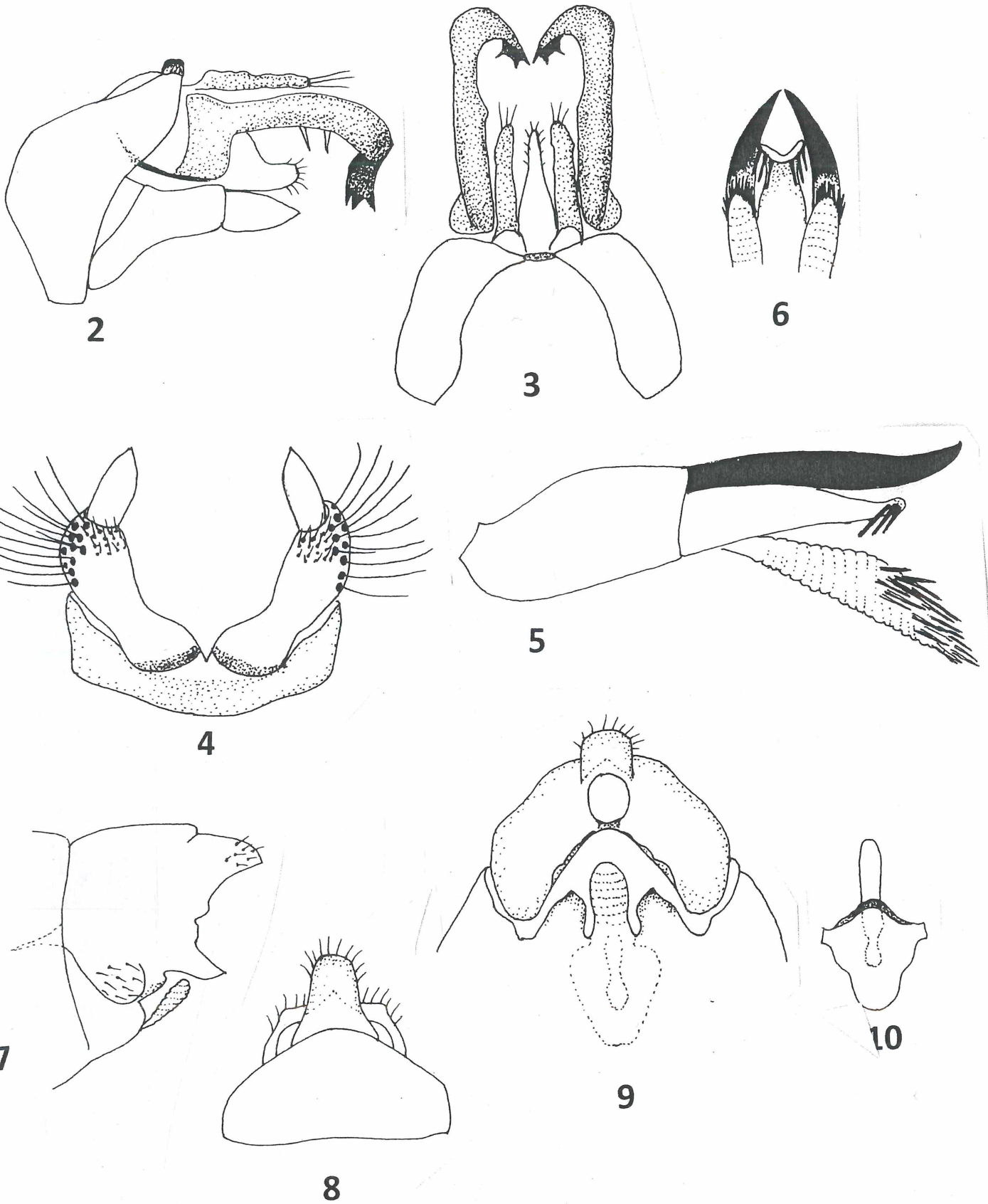
#### *Hydroptila manavgatensis* MALICKY & ÇAKIN, 1983

Endemic to Turkey.

Antalya, Manavgat, Beskonak, Köprüçay, 27.7.1982, 1 male (holotype).

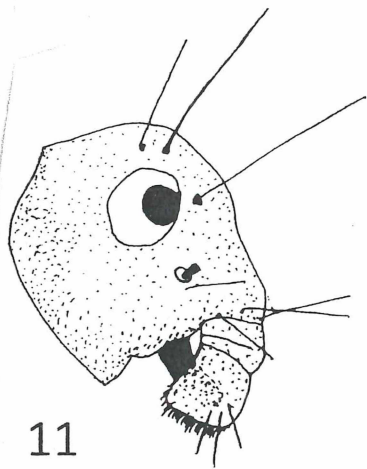
#### *Hydroptila occulta* (EATON, 1873)

Isparta, Sütçüler, Yazılı Kanyon, Aksu Irmağı, (light), 30.5.1993, 7 males, 7 females; 29.5.1993, 1 male. Antalya, Manavgat, Beşkonak, Köprüçay, 21.5.2003, 1 male. 11 females.



Figures 2-6. *Apatania baspinar* sp. n., male genitalia: 2, lateral; 3, dorsal; 4, ventral; 5, phallic apparatus, ventral; 6, phallic apparatus, lateral.

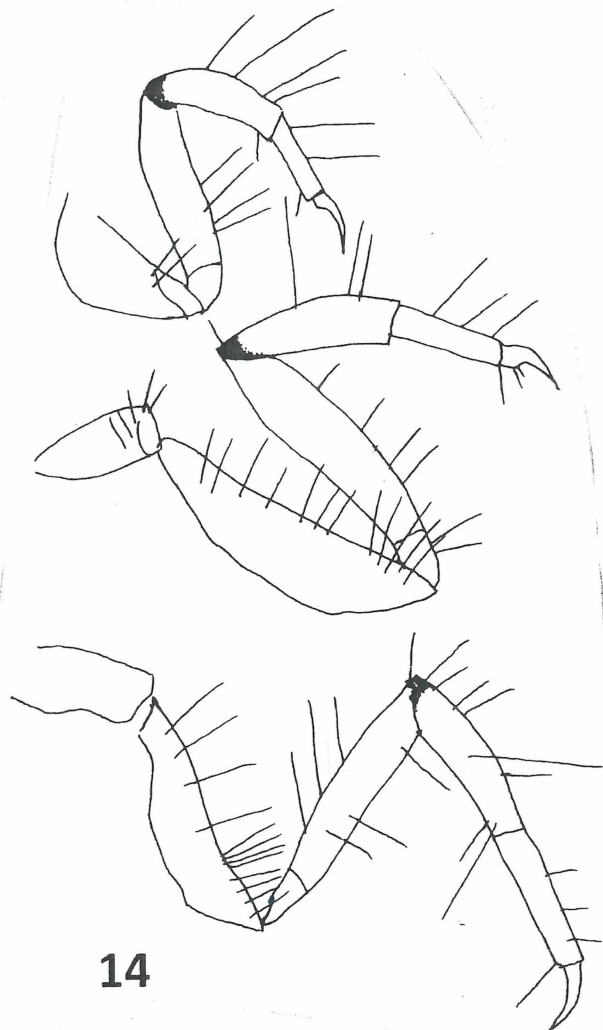
Figures 7-10. *Apatania baspinar* sp. n., female genitalia: 7, lateral; 8, dorsal; 9, ventral; 10, bursa copulatrix, ventral.



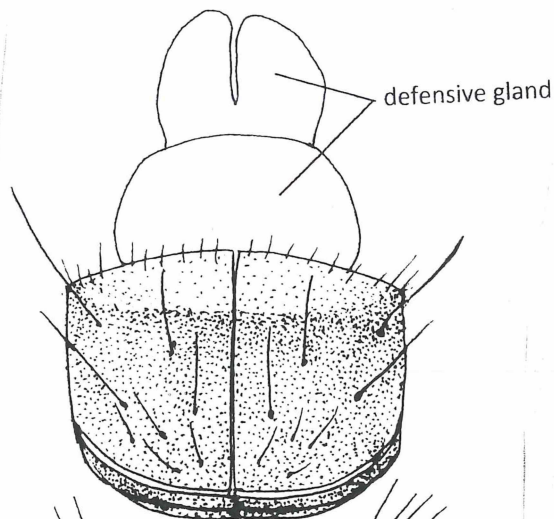
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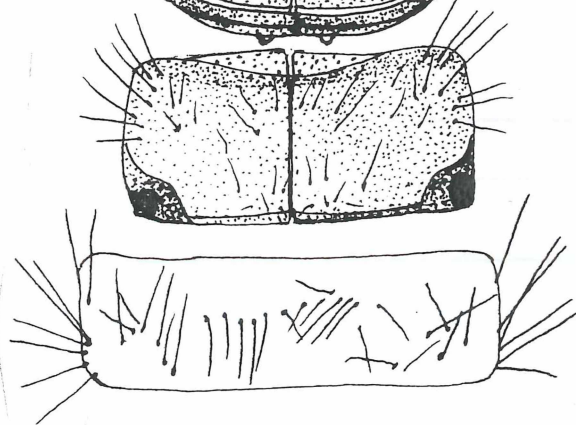
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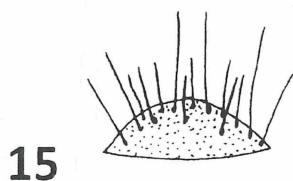
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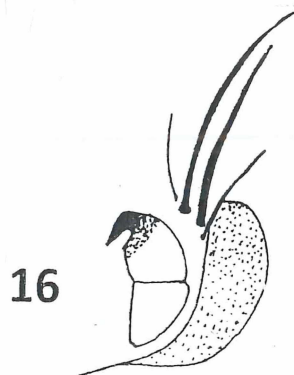
defensive gland



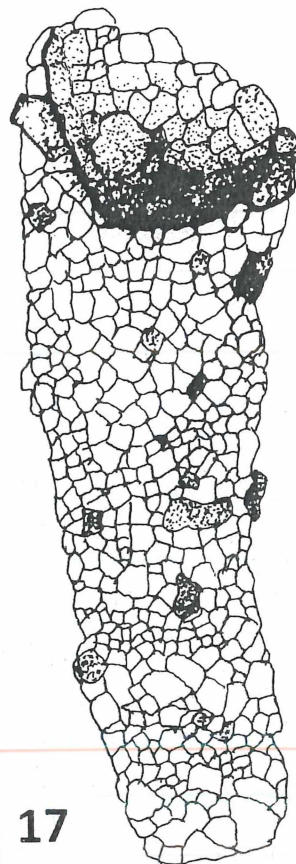
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17

Figures 11-17. *Apatania baspinar* sp.n., full-grown larva. 11 head lateral, 12 right mandible lateral, 13 thorax with defensive gland, 14 legs lateral, 15 tergite of segment 9 dorsal, 16 right anal leg and claw lateral, 17 larval case ventral view. Scale bar 1 mm.

***Hydroptila tineoides* DALMAN, 1819**

Isparta, Eğirdir, Aksu, above Zindan Deresi, source, 1396 m, 37°51'N, 10°12'E, 30.7.2001, 1 male.

***Hydroptila simulans* MOSELY, 1920**

Manavgat, Beşkonak, Köprüçay, 27.7.1982, 4 males, 1 female.

***Ithyrichia* sp.**

Antalya, Manavgat, Beşkonak, Köprüçay, 21.5.2003, 8 females.

***Oxyethira falcata* MORTON, 1893**

Eğirdir, Aksu, Taurus Mountains, 1396 m, above the source of Zindan Deresi, from a spring, 37°51'N, 31°04'E, 6.19.2016, 14 males, 1 female.

**Polycentropodidae ULMER, 1903*****Polycentropus ierapetra isparta* Sipahiler, 1996**

Endemic to Turkey.

Isparta, Sütçüler, Yazılı Kanyon, (light), 30.5.1993, 2 males, 1 female (types); Antalya, Manavgat, Beşkonak, Köprüçay, 37°11'N, 31°11'E, 20.5.2003, 1 female.

**Psychomyiidae*****Psychomyia pusilla* (FABRICIUS, 1781)**

Antalya, Manavgat, Beşkonak, Köprüçay, 300 m, 31°10'N, 37°09'E, 26.3.1993, 1 male, 1 female; same place, 21.5.2003, 3 male, 1 female; same place, 146 m, 37°10'N, 31°10'E, 8.10.2016, 27 males, 8 females.

***Tinodes kadiellus* BOTOSANEANU & GASITH, 1971**

Isparta, Sütçüler, Yazılı Kanyon, 37°27'N, 30°55'E, 30.5.1993, 1 male.

***Tinodes kemerensis* SIPAHILER, 1989**

Endemic to Turkey.

Isparta, Sütçüler, Yazılı Kanyon, Aksu çayı, (light), 37°27'N, 30°55'E, 30.5.1993, 10 males, 18 females; Eğirdir, Aksu, Başpınar, source of Köprüçay, (light), 1367 m, 37°49'N, 31°06'E, 6.10.2016, 2 males.

***Tinodes oyae* SIPAHILER, 1994**

Endemic to Turkey. Known only from Köprüçay.

Antalya, Manavgat, Beşkonak, Köprülü Kanyon, Köprüçay, 300 m, 31°10' N, 37° 09' E, 26.3.1993 (types); same place, 21.5.2003, 12 males, 2 females; same place, 146 m, 37°10'N, 31°10'E, 8.10.2016, 2 males.

***Tinodes pluvialis* MALICKY, 1987**

Endemic to Turkey.

Isparta, Sütçüler, Yazılı Kanyon, Aksu Çayı, 37°27'N, 30°55'E, 29.5.1993, 2 males.

**Hydropsychidae*****Hydropsyche akseki* SIPAHILER, 2005**

Endemic to Turkey.

Antalya, Manavgat, Beşkonak, Köprüçay, Köprülü Kanyon, 146 m, 37°10'N, 31°10'E, 8.10.2016, 1 male.

***Hydropsyche alanya* SIPAHILER, 1987**

Endemic to Turkey.

Antalya, Manavgat, Beşkonak, Köprüçay, Köprülü Kanyon, (light), 37°11'N, 31°11'E, (light), 20.5.2003, 65 males, 3 females.

***Hydropsyche cetibeli* MALICKY & SIPAHILER, 1993**

Endemic to Turkey.

Antalya, Manavgat, Beşkonak, Köprülü Kanyon Milli Parkı, 20.5.2003 (light), 37°19'N, 31°17'E, 6 males, 3 females.

***Hydropsyche kebab* MALICKY, 1974**

Endemic to Turkey.

Isparta, Sütçüler, Yazılı Kanyon, Aksu Çayı, 37°27'N, 30°55'E, 29.5.1993, 2 males, 5 females; Eğirdir, Aksu, 1150 m, 16.6.2002, 1 male; Aksu, 1200 m, 2.8.2002, 1 male; Aksu, Zindan Deresi, (light), 12.6.2007, 1 male.

***Hydropsyche kepez* SIPAHILER, 2005**

Endemic to Turkey.

Antalya, Manavgat, Beşkonak, Köprüçay, 37°19'N, 31°17'E, 26.3.1993, 2 males, 1 female; same place, 20.5.2003, 6 males.

***Hydropsyche kocaki* ÇAKIN, 1982**

Endemic to Turkey.

Antalya, Manavgat, Beşkonak, Köprüçay, Köprülü Kanyon, (light), 37°11'N, 31°11'E, (light), 20.5.2003, 1 male, 1 female.

**Goeridae*****Lithax musaca* MALICKY 1972**

Isparta, Eğirdir, Aksu, Başpınar, source of Köprüçay, 1350 m, 37°49'N, 31°06'E, 17.6.2002, 1 male.

**Lepidostomatidae*****Lepidostoma holzschuhi* (MALICKY, 1977)**

Endemic to Turkey.

Isparta, Sütçüler, Yazılı Kanyon, 37°27'N, 30°55'E, 30.5.1993, 3 males, 11 females; same place, 29.5.1993, 1 female.

**Apataniidae*****Apatania baspinar* sp. n.**

Endemic to Turkey.

Isparta, Eğirdir, Aksu, Başpınar, source of Köprüçay, (light), 1367 m, 37°49'N, 31°06'E, 6.10.2016, 2 males, 24 females (types); same place, daylight, 6.10.2016, 2 males, 4 females (paratypes); 1348 m, 8.6.2014, 1 female pupa; 30.7.2001, 3 larvae.

**Limnephilidae****Drusinae*****Ecclisopteryx aksu* SIPAHILER, 2015**

Endemic to Turkey.

Isparta, Eğirdir, Aksu, Zindan Deresi, 1350 m, 37°49'N, 31°06'E, 17.6.2002; 5 males, 3 females.

**Limnephilinae****Stenophylacini*****Halesus digitatus* (SCHRANK, 1781)**

Isparta, Eğirdir, Aksu, Pazarköy, 1190 m, 37°44'N, 31°01'E, 6.10.2016, 1 female.

***Mesophylax impunctatus aduncus* (NAVÁS, 1923)**

Isparta, Eğirdir, Sütçüler, Gökbüvet, 350 m, 23.4.1991, 1 male.

***Micropterna nycterobia* MCLACHLAN, 1875**

Isparta, Eğirdir, Aksu, Zindan Deresi, (light), 1250 m, 37°48'N, 31°05'E 1200 m, 6.10.2016, 2 males.

***Potamophylax latipennis* (CURTIS, 1834)**

Isparta, Eğirdir, Aksu, 1200 m, 37°49'N, 31°06'E, 1.8.2002, 2 females (pupae), larva; same place, (light), 12.6.2007, 1 male.



## Leptoceridae

*Adicella hypseloknossois* MALICKY, 1977

Antalya, Manavgat, Beşkonak, Köprüçay, 37°19'N, 31°17'E, 27.7.1982, 1 male; 20.5.2003, 7 males; 8.10.2016, 1 male; same place, 163 m, 37°11'N, 31°10'E, 8.10.2016, 1 male; 146 m, 37°10'N, 31°10'E, 8.10.2016, 2 males; Sütçüler, Gökbüvet, 350 m, 23.4.1991, 2 males; Gökbüvet, Akbelenli, 2.8.2002, 1 male; Eğirdir, 40 km south, 37°33'N, 30°51'E, 30.9.2010, 2 males.

*Leptocerus aksu* SİPAHİLER, 2005

Endemic to Turkey.

Isparta, Eğirdir, direction Sütçüler, Pazarköy, 1150 m, 37°44'N, 31°00'E, 2.8.2002, 1 male, 7 females (types); Eğirdir, Aksu, Taurus Mountains, 1396 m, above the source of Zindan Deresi, from a spring, 37°51'N, 31°04'E, 30.7.2001, 1 males, 2 females; same place, 1.8.2002, 1 male (paratypes).

*Leptocerus interruptus* (FABRICIUS, 1775)

Isparta, Eğirdir, Aksu, Taurus Mountains, 1300 m, above the source of Köprüçay River, 30.7.2001, 7 males 6 females; same place, 1.8.2002, 36 males, 37 females; Eğirdir, direction Sütçüler, Pazarköy, 1150 m, 2.8.2002, 89 males, 31 females.

*Setodes dehensurae* ÇAKIN & MALICKY, 1983

Endemic to Turkey.

Antalya, Manavgat, Beşkonak, Köprüçay, 37°19'N, 31°17'E, 27.7.1982, 7 males, 5 females (types).

*Ylodes conspersus* (RAMBUR, 1842)

Isparta, Eğirdir, Aksu, 1300 m, Zindan Deresi, from a spring, 37°52'N, 30°07'E, 30.7.2001, 1 males, 1 female; same place, 1.8.2002, 14 males, 6 females.

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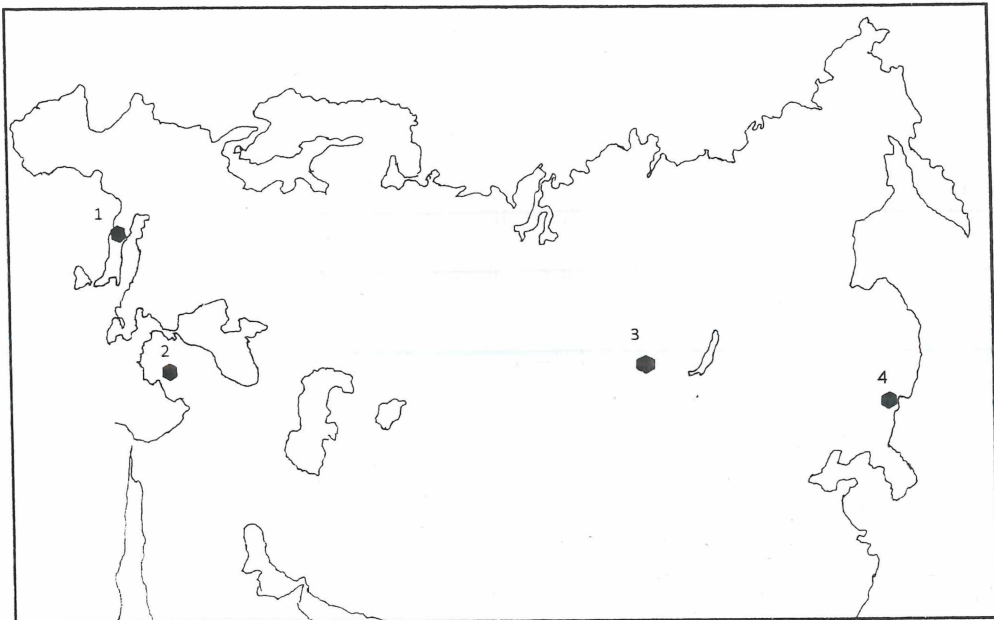


Figure 18. Distribution of *Apatania baspinar* sp.n. and relatives: 1. *A. volsorum* (Italy, Lazio), 2. *A. baspinar* (Turkey, Eğirdir), 3. *A. ulmeri* (Sajan Mts.), 4. *A. maritima* (South Primorye, Kedrovaya)

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