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# Studies on the males of the genus *Diplectrona* WESTWOOD, 1840 in Turkey (Trichoptera, Hydropsychidae)

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**Abstract.** In this study, *Diplectrona* specimens collected in Turkey were studied and three new species are described and illustrated: *Diplectrona arhavi* sp. n., *Diplectrona polovit* sp. n. and *Diplectrona macahel* sp. n. All these species are found in northeastern Turkey. The distribution and a brief description of *Diplectrona atra* MCLACHLAN, 1878 are also given.

**Key words.** Trichoptera, *Diplectrona*, systematics, distribution, new species, synonym, Turkey.

Specimens of the genus *Diplectrona* collected over 35 years in Turkey were studied and three new species from northeastern Turkey are described. *Diplectrona yazata* SCHMID, 1959 was the first species described from Turkey, and it was synonymized with *Diplectrona atra* MCLACHLAN, 1878 by BOTOSANEANU (1960). Later *Diplectrona atra* was discovered in central Anatolia and *Diplectrona vairyra* was recorded in northeastern Turkey (SIPAHILER, 2005), which was considered in that study as a new species.

## *Diplectrona arhavi* sp. n. (Figures 1-5)

**Material.** Holotype male: Turkey, Artvin, Arhavi, 4 km E, Çamlıköy, 200 m, 41°20'N, 41°18'E, 14.7.1999, leg. and coll. Sipahiler.

Antennae, maxillary palps, and wings brown, legs pale brown yellowish. The length of the anterior wing of the male is 6 mm. The lateral filament of segment V is short, somewhat longer than half of the length of the segment.

**Male genitalia** (Figures 1-5). Segment IX broad on lateral and dorsal parts; in dorsal view, dorsomedian part is triangular. Segment X is deeply excised in the middle, each side has two long lobes; the outer lobe is longer and wider, the apex is roundly oval; the inner lobe is narrower and slightly shorter than the outer lobe. The hairy area is large and oval. The coxopodite of the inferior appendages is rather short; the harpago is longer and thin. The coxopodite is at least twice the length of the harpago. The phallic apparatus is laterally curved at the base, the distal part is roundly dilated towards the ventral part; in ventral view each side of the distal part has two long and sclerotized lobes directed towards the posterior that are pointed at the tips, the dorsolateral lobes are broader and longer than the ventrolateral lobes, the median part of the ventral edge possesses quadrangular lobes, which are shorter than the lateral lobes.

**Remarks.** *Diplectrona arhavi* sp. n. differs from the other species described in this study by the shape of the phallic apparatus, which is curved at the base, and the distal part of the phallic apparatus, of which the sclerotized parts are directed towards the posterior. It is related to *D. polovit* sp. n., but the following differences are seen: in *D. arhavi* sp. n. the apical sclerotized parts of the phallic apparatus are shorter

and directed towards the posterior, the inner spines are also shorter and not seen in ventral view, while in *D. polovit* sp. n. the apical sclerotized parts are close to each other at the tips, the inner sclerotized spines are longer and seen in ventral view; in dorsal view, the outer lobes of segment X are rounded at the apex in *D. arhavi* sp. n. while in *D. polovit* sp. n. the outer lobe of segment X is dorsally straight at the tips and in lateral view the apex is curved towards the dorsum. In addition, the inner lobes of segment X are slightly shorter than the outer lobes.

## *Diplectrona polovit* sp. n. (Figures 6-10)

**Material.** Holotype male: Turkey, Rize, Çamlıhemşin, Polovit, 1250 m, 40°59'N, 41°56'E, 15.8.2005, 1 male; paratypes: İkizdere, Cimil direction, 900 m, 40°45'N, 40°45'E, 22.7.1984, 1 male; Çamlıhemşin, Aşağı Vice Village, 780 m, 41°01'N, 41°00'E, 16.7.1984, 19 males, 1 female; Tozkapan, 820 m, 40°52'N, 40°55'E, 15.7.1984, 17 males, 2 females; Ayder, Kaler, 1900 m, 41°55'N, 41°09'E, 17.7.1984, 14 males, 3 females; same place, 1400-1600 m, 1.8.1989, 1 male; Çamlıhemşin, Çat direction, Tozkapan, 850 m, (light), 40°52'N, 40°55'E, 17.8.1992, 2 males; Cimil, İkizdere direction, 1000-1500 m, 40°45'N, 40°45'E, 21.8.1992, 1 male.

Antennae, maxillary palps, and wings are dark brown, legs pale brown; the length of the anterior wing of the male is 5-5.5 mm. The lateral filament of segment V is shorter than half the length of segment.

**Male genitalia** (Figures 6-10). Segment IX broad on the dorsal part and on the sides; in dorsal view, triangular. Dorsally, segment X deeply excised in the middle, the side lobes are nearly equal in length, the outer lobe is almost straight on the apical margin; in lateral view, the apex is curved towards the dorsum. In ventral view, the harpago of the inferior appendages is long, narrow, curving somewhat inside, the coxopodite is shorter, the harpago is long, the coxopodite is at least 1.75 times longer than the length of the harpago. The phallic apparatus is curved at the base, broad, narrowing medially and broad on the apical part; in ventral view the side sclerotized parts are broad, triangular, pointed at the tips; the inner spines are thin, rather long, curving inside.

**Remarks.** *Diplectrona polovit* sp. n. differs from the other species by the shape of the male genitalia, especially the long harpago and somewhat shorter coxopodite of the inferior appendages; the side lobes of segment X are nearly equal in length. It is related to *D. arhavi* sp. n. as discussed above and it also resembles *Diplectrona atra* MCLACHLAN, 1878, but the following differences are seen in the male genitalia: in *D. atra* the harpago is short and the coxopodite is long, while in the new species the harpago is long and the coxopodite is short; in *D. atra* the outer lobe of segment X is long and the inner lobe is shorter, while in *D. polovit* sp. n. both lobes are nearly equal in length. Differences in the shape of the phallic apparatus are also evident; in *D. atra* laterally the phallic apparatus is curved nearly in the middle, the apical lateral lobes are curved, and the sclerotized spines are thin, while in the new species laterally curved at the base, the apical lateral lobes are directed towards the posterior, the inner spines are curved inside.

*Diplectrona macahel* sp. n.  
(Figures 11-15)

**Material.** Holotype male and paratype female: Turkey, Artvin, Gorgit Yaylası direction, 1000-1400 m, 41°24'N, 41°56'E, 13.7.1997; other paratypes: Borçka, Camili, Uğurköy, Maral direction, 1100 m, 41°29'N, 41°58'E, 7.8.1995, 1 male; Uğurköy, 1000 m, 41°28'N, 41°58'E, 14.7.1997, 6 males (Paratypes); Lodiwake Yaylası, Efeler direction, 850-1300 m, 41°25'N, 41°59'E, 15 males, 1 female; same place, 13.7.1997, 900 m, 2 males (Paratypes); Camili, 450 m, 41°28'N, 41°53'E, 15.7.1997, 3 males, 1 female.

Antennae, maxillary palps, and legs pale brown, wings brown, the length of the anterior wing of males 5-5.5 mm, of females 5.5 mm. The lateral filament of segment V is short, reaching half the length of segment V.

**Male genitalia** (Figures 11-15). Segment IX dorsally and ventrally narrow; in dorsal view, the median part is triangular; segment X deeply excised in the middle and the side lobes also excised medially, each outer lobe is longer than the inner lobe; both straight and rounded at the apex. The hairy areas are large and oval. The coxopodite of the inferior appendages is rather short and thin, the harpago is somewhat curved inside; the coxopodite is three times longer than the harpago. In lateral view, the phallic apparatus is curved at the base, the subdistal part is also curved towards the ventral; the distal lobes are long, strongly sclerotized; in ventral view, the sides and the ventral parts of the distal portion are also strongly sclerotized, long and rather narrow, almost equal in breadth, narrowing towards the apex and the median part, inside with two sclerotized thick spines, which are curved on the outer edges and pointed at the tips.

**Remarks.** *Diplectrona macahel* sp. n. differs from the other species of the genus by the shape of the apical part of the phallic apparatus, which is rather long and strongly sclerotized, possessing two curved spines inside.

*Diplectrona atra* MCLACHLAN, 1878  
(Figures 16-20)

**Material examined.** Manisa, Salihli, Birgi direction, 22 km South, 1000 m, 38°22'N, 28°05'E, 29.5.1988, 33 males, 12 females; Salihli, Ödemiş direction, 38°22'N, 28°05'E, 22.5.1992, 3 males; 25 km South, 500 m, source, 38°26'N, 28°07'E, 22.5.1992, 1 male; 25 km, 22.5.1992, 4 males; Ankara, Elmadağ, Eymir direction, 39°48'N, 33°00'E, 4.6.1988, 5 males, 3 females; Çamlıdere, 40°01'N, 32°22'E, 5.6.2004, 2 males; Düzce, Kardüz Yaylası direction, 695 m, 40°40'N, 31°02'E, 5.7.2012, 1 female; same place, 710 m, 40°43'N, 31°03'E, 23.9.2012, 1 male; 3.7.2013, 1 male; 6.7.2013, 1 male pupa; 15.8.2013, 1 female; Gölyaka, Hendek direction, Kadifekale, source, 415 m, 40°43'N, 30°51'E, 15.8.2013, 5 males; Benlevit Village, Altındere (source of Dinsiz Çayı), 182 m, 40°40'N, 30°41'E, 15.8.2013, 1 male; 450 m, 40°43'N, 30°50'E, 15.8.2013, 1 male; Sakarya, Sapanca, İkramiye Village, Akçay, 510 m, 40°36'N, 30°15'E, 4.9.2012, 1 male pupa; Taraklı, Mahdumlar Village, Gürleyik Stream, 500 m, 40°26'N, 30°33'E, 19.5.2006, 15 males, 3 females; Şeker Pınarı, 168 m, 40°59'N, 30°46'E, 4.7.2013, 1 male; Sinop, Hanönü-Ayancık direction, Çangal Mountain, 733 m, 41°39'N, 34°39'E, 9.8.2009, 1 male, 2 females; Çangal Mountain, 1140 m, 41°42'N, 34°38'E, 9.8.2009, 1 male; Dikmen, Durağan direction, 1015 m, 41°31'N, 35°08'E, 10.8.2009, 1 male, 1

female; same place, 917 m, 41°31'N, 35°09'E, 10.8.2009, 3 males, 2 females; Hanönü-Ayancık direction, Çangal Mountain, 1140 m, 41°42'N, 34°38'E, 9.8.2009, 1 male; same place, 1190 m, 41°43'N, 34°40'E, 9.8.2009, 1 male; same place, Akgöl, spring, 1180 m, 41°41'N, 34°34'E, 9.8.2009, 4 males; Bürnük, (light), 1146 m, 41°39'N, 34°51'E, 8.8.2009, 1 male, 1 female; Küre Mountains, 1031 m, Durağan-Dikmen direction, Uzunöz, (Ice cave direction), 41°31'N, 35°05'E, 10.8.2009, 2 males; Zonguldak, Çaycuma, Çayır Village, Çayır Cave, 41°27'N, 31°59'E, 130 m, 23.6.2011, 2 males; Devrek, Ereğli direction, 41°14'N, 31°50'E, 195 m, source, 23.6.2011, 1 male; Alaplı, Bacaklı, 797 m, 41°02'N, 31°06'E, 16.8.2013, 1 male; Karabük, Safranbolu, Bulak, Mencilis, 41°16'N, 32°27'E, 690 m, 13.7.2011, 3 males; same place, 13.6.1993, 9 males; Kapullu, Yenice direction, Başköy, 41°16'N, 32°34'E, 940 m, 14.7.2011, 1 male; Yenice, Yenice Forest, Şeker Kanyonu direction, 41°06'N, 32°22'E, 540 m, 21.8.2011, 2 females; Kapullu, Baklabostan district, Büyükdüz direction, 950 m, 41°16'N, 32°32'E, 23.8.2011, 1 female; Yenice direction, Subatan Suyu, 226 m, 41°09'N, 32°27'E, 22.8.2011, 2 males, 1 female; Konya, Akşehir, Sultan Mountains, 1450 m, 7.5.1994, 3 males; Saray Village, Yalvaç direction, Sultan Mountains, 1500 m, 11.6.1994, 3 males, 1 female; Ermenek, Nadire Değirmeni, 36°33'N, 32°41'E, 700 m, 28.6.2000, 6 males, 1 female; Bolu, Abant, 6.6.1983, 1400 m, 40°35'N, 31°17'E, 1 male; same place, 26.6.1999, 2 males, 2 females; Mudurnu, Karamurat Lake, source, 650 m, 40°33'N, 30°57'E, 25.6.1994, 6 males, 1 female; Göynük, Sünnet Lake, spring, 750 m, 40°26'N, 30°57'E, 21.5.2006, 6 males, 3 females; Ankara, Kızılcahamam, Soğuksu, 1220 m, 40°27'N, 32°38'E, 26.6.1981, 1 male; Kalecik, Baykuş Boğazı, 1140 m, 40°08'N, 33°20'E, 22.6.1980, 15 males, 6 females; 6.8.1980, 14 males, 9 females; 15.5.1981, 35 males, 9 females; 27.5.1982, 5 males; Çubuk, Karagöl, 1170 m, 40°16'N, 32°59'E, 9.7.1980, 2 males; 20 km von Kalecik, 3.7.1981, 710 m, 40°05'N, 3.7.1981, 4 males; Antalya, Kemer, Ulupınar, 39°11'N, 39°32'E, 16.5.1982, 1 male; Antalya, 30 km West, Geyikbayırı, 300 m, 36°52'N, 30°27'E, 21.5.1999, 3 males; Erzurum, Tortum, 1750 m, 40°20'N, 41°29'E, 16.6.1981, 7 males, 6 females; İzmir, Bergama, Kozak direction, 10 km East, 350 m, 39°14'N, 27°09'E, 31.5.1992, 6 males, 1 female; Manisa, Turgutlu, Bayındır direction, Kamberler Village, 5 km South, 600 m, 38°17'N, 27°35'E, 21.5.1992, 9 males, 4 females; Balıkesir, Edremit, Güre, Zeytinli direction, Ayı Stream, 400 m, 39°40'N, 26°49'E, 7.8.1994, 8 males, 3 females; Bursa, İznik, 60 km West, Orhangazi, Narlıca, 100 m, 40°23'N, 29°28'E, 20.5.2000, 19 males, 1 females; same place, 5.7.2000, 10 males, 5 females; Kastamonu, Ilgaz Mountains, Çatören, 1200 m, 41°05'N, 33°49'E, 5.6.2002, 1 male; Bartın, Gökırmak, 80 m, 41°35'N, 32°24'E, 12.7.2003, 1 male.

Antennae, maxillary palps, legs pale brown, wings dark brown; the length of the anterior wing of males 5.5-6 mm, of females 6-6.5 mm. The lateral filament of segment V is slightly shorter than the length of segment V.

**Male genitalia** (Figures 16-20). In dorsal view, segment IX is broadly triangular or somewhat quadrangular; the outer lobes of segment X are longer than the inner lobes. The harpago of the inferior appendages is short, the coxopodite is clearly longer, the coxopodite is 4 times longer than the harpago. In lateral view, the phallic apparatus is gradually curved in the middle, the apical part with two outer lobes, curving inside; in ventral view, inside of the apical portion with two thick sclerotized spines.

**Remarks.** *Diplectrona atra* MCLACHLAN, 1878 is distributed in rather a large area in western and northwestern Turkey, and also found in eastern and southern Turkey. *Diplectrona atra* differs from the other species described in this study by the short harpago and long coxopodite of the inferior appendages; the inner lobes of segment X are shorter than the outer lobes and the apical lobes of the phallic apparatus are smaller. It is a variable species; variations are seen especially in the shape of segment IX, which could be triangular or quadrangular, the apical portion of the phallic apparatus could be narrow or ventrally dilated.

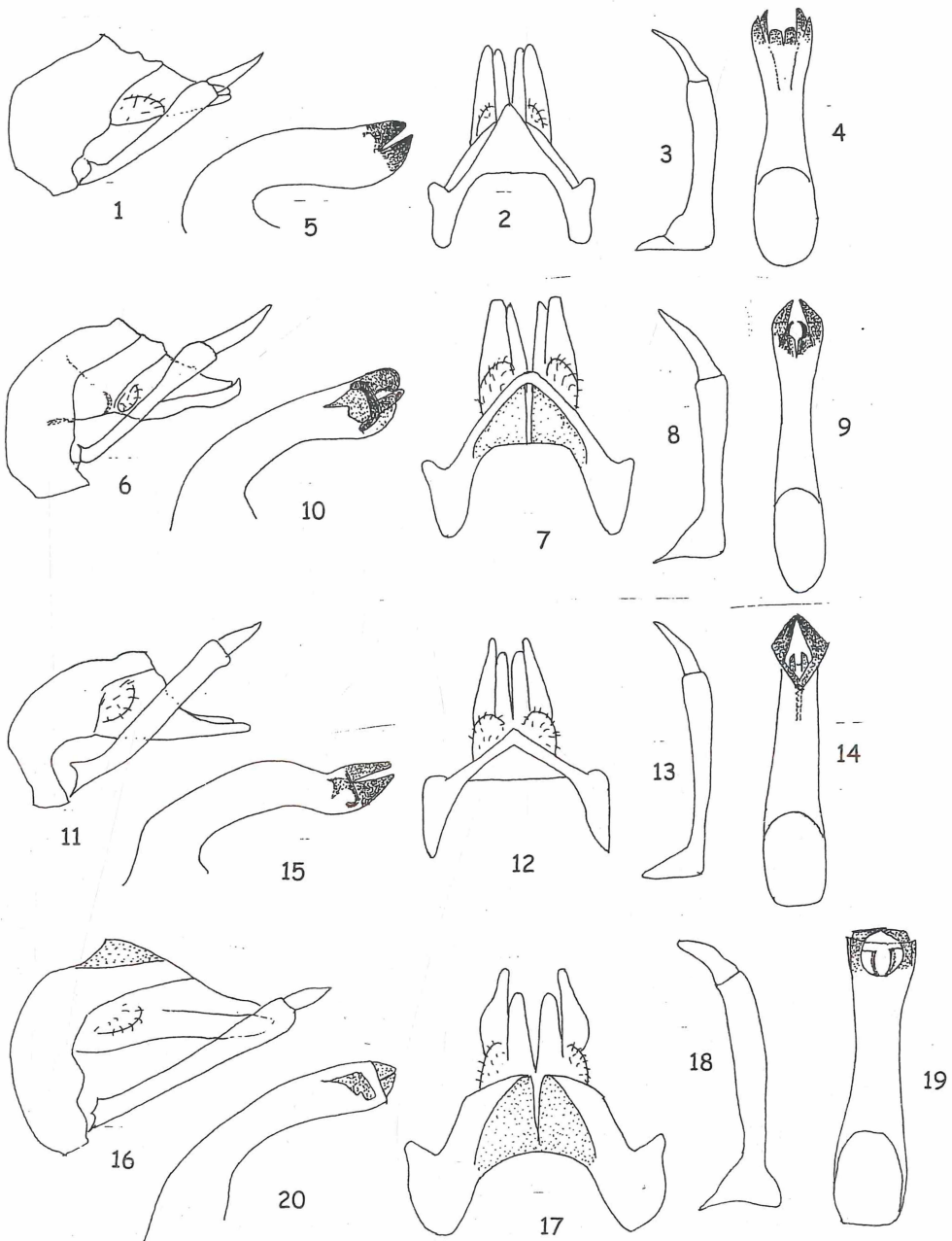
Schmid described a new species from Merzifon (in Amasya Province), *Diplectrona yazata* SCHMID, 1959 (SCHMID, 1959), and wrote that its distinguishing character is the dorsal portion of segment IX, which is short. This feature is variable like the other features of the genitalia; the males collected from the neighbouring area show variations in similar features.

## References

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