

An annotated list of Pediciidae (Insecta, Diptera) from Romania with a revision of the literature data

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Summary: Between 2007 and 2012 a number of 32 different Pediciidae species was collected from Romania. A number of 5 species are new records to the Romanian fauna, as *Dicranota (Paradicranota) consimilis* MENDEL, 1987, *D. (P.) mikiana* LACKSCHEWITZ, 1940, *D. (P.) pavida* (HALIDAY, 1833), *D. (P.) subflammatra* STARÝ, 1998 and *Tricyphona (Tricyphona) alticola* STROBL, 1910. A short comment on general distribution of the species with a critical revision on the published is added. Original drawings on male hypopygium are also presented.

Key words: Pediciidae, new records, *Dicranota*, *Tricyphona*, Romania

Introduction

The small family of crane flies (Pediciidae) comprises slender flies of tipuloid appearance. Adults of Pediciidae have various body sizes, from a few millimeters up to 30 millimeters (STARÝ 2000) with slender legs and wings. A conspicuous common feature of all species belongs to Pediciidae is the presence of the pubescent eyes. This is the reason why they are named hairy-eyed crane flies. This character combining with spurred tibiae and a characteristic wing venation, such as the strongly retracted Sc_2 , and a four-branched Media, can be used to separate them from all the other Tipuloidea family (STARÝ 1992). Most of the species are mountainous connected with the boggy environment of the headwaters springs. The adults can be found in vegetation near brooks or springs. Larvae are hemicephalic and metapneustic, with a strongly fused head capsule and with two lobes on the ventral margin of the spiracular field, excepting members of the *Ula* genera, which larvae has five lobes (UJVÁROSI *et al.* 2010b). Some abdominal segments are provided with creeping welts (*Pedicia*, *Tricyphona*, *Nasiternella*, *Ula*) or pseudopods (*Dicranota*) (REUSCH and OOSTERBROEK 1997, KRIVOSHEINA 2009). Most genera of Pediciidae (*Pedicia*, *Dicranota*, *Tricyphona*) are carnivorous and they are top predators in springs and marsh habitats (UJVÁROSI *et al.* 2010b). Larvae belonging to *Ula* are mycetophagous (STARÝ 2000). *Nasiternella varinervis* (ZETTERSTEDT, 1851) larvae are xylophilous, frequently

found in dead wood of fallen trunks in deciduous and coniferous trees and are not associated with strongly moistened substrates (KRIVOSHEINA 2009). This can be also true for the enigmatic, relic like and range restricted *N. regia* RIEDEL, 1914 belonging to the Romanian fauna.

Pediciidae are the second smallest family of the Tipuloidea following Cylindrotomidae, with 490 recognized taxa worldwide (OOSTERBROEK 2012) from which seventy-seven species in five genera were recorded from the Westpalearctic region.

Although Romania harbors an important diversity of the European Pediciidae fauna, distribution data from different regions are rather sporadic. KOWARZ was the first who listed first in 1873 two Pediciidae species from Băile Herculane. These data were completed by STROBL (1897) and THALHAMMER (1899) and listed together a number of seven species from the current Romanian area. RIEDEL (1914) described *Nasiternella regia* based on a single female collected from Braşov area and added another species to the Romanian fauna. MOCZÁR (1952) indicate the *Pedicia (Crunobia) littoralis* from Parâng Mountains. The first comprehensive list of Pediciidae from Romania was published by ERHAN-DINCA and CEIANIU (1986) recording seven new species from the country's area. Summarized the all known faunistic data for that time, SAVCHENKO *et al.* (1992) published a list of 20 species of Pediciidae from Romanian, and record further nine new species from here based mostly on unpublished data of E. ERHAN-DINCA.

From 2000 an intensive survey of Romanian Pediciidae was initiated by Lujza KERESZTES (formerly

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UJVÁROSI) with important new records in the country's fauna and new species descriptions using an integrative approach of morphology and molecular data in the case of *Pedicia (Crunobia) apusenica* (UJVÁROSI and STARÝ 2003) and *Pedicia (Amalopsis) fusca* (UJVÁROSI *et al.* 2010a, UJVÁROSI and BÁLINT 2012). Altogether a number of 36 species of Pediciidae were recorded up to the present from the Romanian fauna (OOSTERBROEK 2012). The last comprehensive species list of the Romanian Pediciidae was published by UJVÁROSI (2007).

The aim of this paper is to introduce some new records for the Romanian fauna and review the literature data with some corrections of previously misidentified species. A complete list of the Romanian Pediciidae was also produced.

Material and methods

Between 2007 and 2012 a number of 966 individuals of Pediciidae belonging to 32 species were investigated by us from different habitats, mostly in mountainous regions of the Carpathians. Part of the material was stored in 96% alcohol and deposited in the Diptera Collection of the Faculty of Biology and Geology, Cluj-Napoca, Romania. The postabdomen of the male individuals was macerated in KOH 10% and then put on glycerol prior to morphology studies. Specimens were examined with an Olympus SZ50 dissection microscope equipped with Olympus SP500UZ camera.

Results

During our investigation a number of 966 individuals of Pediciidae belonging to 32 different species were collected and identified from different parts of Romania whereof five species are recorded for the first time from here. The male hypopygium are illustrated in each case.

New species to the Romanian fauna

1. *Dicranota (Paradicranota) pavida* (HALIDAY, 1833)

Material: *Transylvania*: Tulgheș, Giurgeu Mountains, Tisașului Valley, 860 m, 46°51'42.46" N 25°40'38.02" E, August 18, 2010, 1 ♂, leg. L. P. Kolcsár; August 9, 2011, 5♂♂, leg. L. P. Kolcsár; Păltiniș, Cindrel Mountains, 1525 m, 45°38'21.32" N 23°57'21.76" E, August 1, 2006, 2 ♂♂, leg. L. Keresztes; Azuga, Bucegi Mountains, Casariei Valley, brook, 1024 m, 45°26'52.19" N 25°34'15.92" E, June 28, 2012, 4 ♂♂, leg. L. Keresztes; Padiș Apuseni, Cetatea Rădesei, 1294 m, 46°37'48.20" N 22°42'29.14" E, July 27, 2009, 1 ♂, leg. L. Keresztes; Pădurea Neagră, Plopiș Mountains, Bistra River, 441 m, 47° 8'57.23" N 22°26'38.57" E, September 8, 2012, 2 ♂♂, leg. E. Török.

Biology: Based on our recent data is a quite common species in the western and northern regions of the country. The adults were frequently founded in wooded bank of the rivers, brooks and springs. Larvae are aquatic (KRAMER 2011). Individuals examined by us were consequently collected along spring brooks and wooded bank of brooks. Field data suggest a flight period for this species from June to September. The male hypopygium is presented in Fig. 1.

Distribution: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Latvia, Lithuania, Netherlands, Norway, Poland, Slovakia, Sweden, Switzerland and Ukraine (OOSTERBROEK 2012).

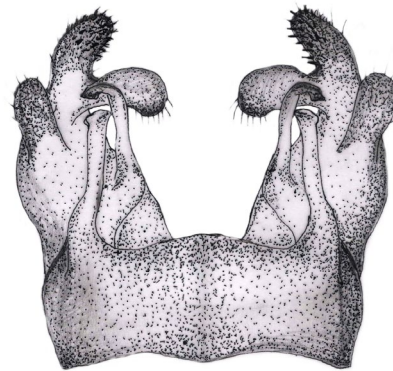


Fig. 1. Male hypopygium, dorsal view of *Dicranota (Paradicranota) pavida*.

2. *Dicranota (Paradicranota) consimilis* MENDEL, 1987

Material: *Transylvania*: Padiș, Apuseni Mountains, Cetatea Rădesei, 1294 m, 46°37'48.20" N 22°42'29.14" E, July 27, 2009, 1 ♂, leg. L. Keresztes.

Biology: It is a very rare species with scarce literature data on distribution and biology. The Romanian individual was collected by us from a small brook in a kartsic area. The male hypopygium is presented in Fig. 2.

Distribution: France (Corsica), Italy (Sardinia) and Slovakia (OOSTERBROEK 2012).

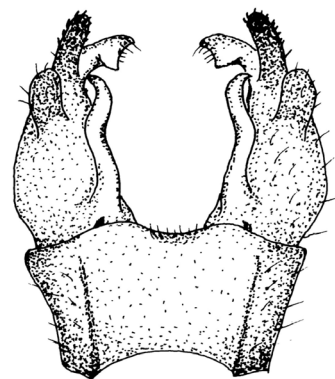


Fig. 2. Male hypopygium, dorsal view of *Dicranota (Paradicranota) consimilis*.

3. *Dicranota (Paradicranota) mikiana* LACKSCHEWITZ, 1940

Material: *Transylvania*: Băile Chirui, Harghita Mountains, marsh, 1002 m, 46°18'44.24" N 25°39'17.45" E, April 23, 2007, 1 ♂, leg. M. Bálint.

Biology: Very little is known about the biology of this species, but our field data suggests an early spring activity of adult specimens. This species was collected by us from a marshy brook feed by a number of carbonated acid springs. The male hypopygium is presented in Fig. 3

Distribution: This is a Central European species recorded from Austria, Czech Republic and Slovakia (OOSTERBROEK 2012).

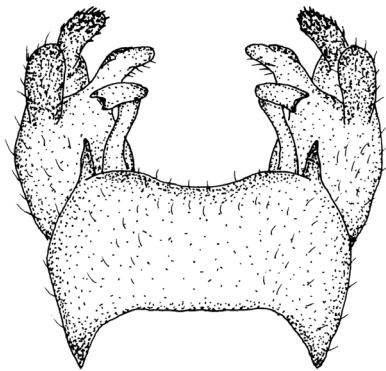


Fig. 3. Male hypopygium, dorsal view of *Dicranota (Paradicranota) mikiana*.

4. *Dicranota (Paradicranota) subflammatra* STARÝ, 1998

Material: *Muntenia*: Dobrești, Bucegi Mountains, Săua Dichiului, 1695 m, 45°22'24.99" N 25°26'20.83" E, June 6, 2007, 1 ♂, leg. M. Bálint; Dobrești, Bucegi Mountains, Cheile Tătarului Mare, Obârșiei Valley, 1473 m, 45°21'47.86" N 25°25'57.96" E, June 6, 2007, 14 ♂♂, leg. M. Bálint; *Transylvania*: Sub Cetate, Gurghiu Mountains, Zetea lake, 657 m, 46°29'27.98" N 25°23'36.38" E, May 1, 2010, 1 ♂, leg. L. Keresztes; Padiș, Apuseni Mountains, Cheile Someșului Cald, 1159 m, 46°38'24.00" N 22°44'9.73" E, July 21, 2000, 2 ♂♂, leg. L. Keresztes; Tulgheș, Giurgeu Mountains, Tisașului Valley, 860 m, 46°51'42.46" N 25°40'38.02" E, July 10, 2010, 1 ♂, leg. L. P. Kolcsár; Fundu Râului, Cindrel Mountains, Sadu River, 761 m, 45°36'16.15" N 24° 0'52.96" E, June 3, 2007, 1 ♂, leg. M. Bálint.

Biology: The biology of this species is unknown. The Romanian individuals were collected around brooks and springs in a period limited from May to July. The male hypopygium is presented in Fig. 4

Distribution: This is a Central European species recorded from Czech Republic and Slovakia (OOSTERBROEK 2012). A revision of the Romanian Pediciidae fauna revealed that data referring to

Dicranota flammatra STARÝ, 1981 from Padiș region are in fact *D. subflammatra* (UJVÁROSI 2005b).

5. *Tricyphona (Tricyphona) alticola* STROBL, 1910

Material: *Transylvania*: Padiș, Apuseni Mountains, Cheile Someșului Cald, 1159 m, 46°38'24.00" N 22°44'9.73" E, July 27, 2009, 2 ♂♂, leg. M. Bálint; Bălan, Retezat Mountains, Gura Apei lake, 1115 m, 45°20'21.90" N 22°44'3.68" E, July 31, 2006, 4 ♂♂, leg. L. Keresztes; Bălan, Hășmaș Mountains, Olt River, 1078 m, 46°43'9.99" N 25°44'10.74" E, August 3, 2012, 1 ♂, leg. L. P. Kolcsár; Gheorgheni, Giurgeu Mountains, Covaci Peter, springs, 1225 m, 46°43'17.78" N 25°42'41.97" E,

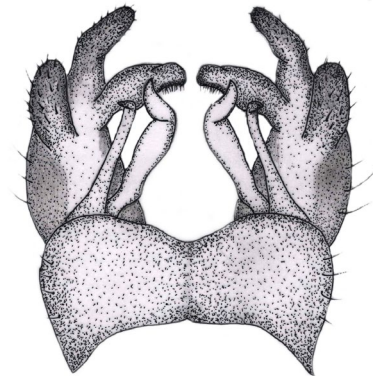


Fig. 4. Male hypopygium, dorsal view of *Dicranota (Paradicranota) subflammatra*.

August 3, 2012, 9 ♂♂, 1 ♀, leg. L. P. Kolcsár; Suseni, Gurghiu Mountains, springs, 1047 m, 46°34'46.29" N 25°34'42.11" E, August 4, 2012, leg. L. P. Kolcsár; *Muntenia*: Căpățânenii Ungureni, Făgăraș Mountains, Caprei Valley, 1899 m, 45°35'23.15" N 24°37'56.54" E, August 2, 2006, 2 ♂♂, leg. L. Keresztes.

Biology: Very little is known about the biology of this species, the larvae is yet unknown. In Romania this species was collected more frequently around sphagnum-pools and springs. Collection data suggests a summer activity of the adult specimens. The male hypopygium is presented in Fig. 5.

Distribution: Albania, Austria, France, Germany, Italy, Slovakia and Switzerland (OOSTERBROEK 2012).

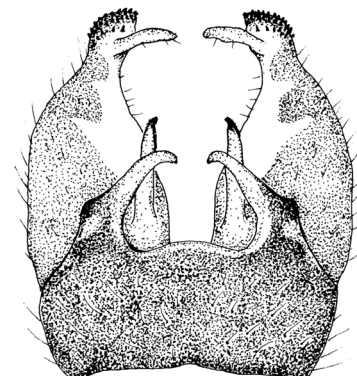


Fig. 5. Male hypopygium, dorsal view of *Tricyphona (Tricyphona) alticola*.

Rare species

UJVÁROSI in 2007 published an updated list of the Pediciidae from Romania, in where she reported *Pedicia (Crunobia) lobifera* SAVCHENKO, 1986 for the first time from here, but without a detailed record on habitat and region. Also *Nasiternella regia*, a very rear species of Pediciidae were found again after roughly 85 years. We present here their detailed record data. Further on, a revision of the Pediciidae material deposited in the Diptera Collection of the Faculty of Biology and Geology, Cluj-Napoca, Romania revealed that *Dicranota (Paradicranota) flammatra* STARÝ, 1981 recorded as new species to the Romanian fauna by UJVÁROSI in 2005b is in fact *D. (P.) subflammatra*. So here we present a revised distribution data of *D. (P.) flammatra* in Romania.

1. *Nasiternella regia* RIEDEL, 1914

Material: *Transylvania*: Bălan, Hășmaș Mountains, Fântână lui Gal brook, 978 m, 46°38'57.38" N 25°50'29.56" E, Augustus 18, 1999, 1♂, leg. L. Keresztes.

Biology: The species was described from Romania by Riedel in 1914, based on a single female individual, which was collected from the Brașov area. The biology of this species is unknown. Likely as the other European *Nasiternella* species, *N. varinervis* show strong affinities to drier places, in contrast with the majority of other Pediciidae, connected with boggy or wet conditions. Only one male was collected by us from the Hășmaș Mountains (Eastern Carpathian), in a pine forest.

Distribution: Albania, Austria and Romania (OOSTERBROEK 2012).

2. *Pedicia (Crunobia) lobifera* SAVCHENKO, 1986

Material: *Transylvania*: Bălan, Hășmaș Mountains, Pietra Singuratică, spring and small brook, 1404 m, 46°40'39.24" N 25°49'38.60" E, July 6, 2006, 1♂, leg. L. Keresztes; July 3, 2010, 3♂♂, leg. L. Keresztes; July 11, 2010, 1♂, leg. L. P. Kolcsár.

Biology: It is a very rare species, endemic to the North-Eastern Carpathians. Larvae are unknown. Up to the present we discovered only a single small population belonging to this species around a karts spring in the Hășmaș Mountains, Eastern Carpathians. Collection data suggest a middle summer activity of the adult specimens.

Distribution: Romania and Ukraine (Carpathians) (OOSTERBROEK 2012).

3. *Dicranota (Paradicranota) flammatra* STARÝ, 1981

Material: *Transylvania*: Borșa, Rodnei Mountains, Prislop pass, springs, 1349 m, 47°36'39.69" N 24°51'5.80" E, May 12, 2006, 4♂♂, 1♀, leg. L.

Keresztes; Fundu Râului, Cindrel Mountains, Sadu River, 761 m, 45°36'16.15" N 24° 0'52.96" E, June 1, 2007, 1♂, leg. M. Bálint; Dălgheu, Ciucaș Mountains, Dălgheu River, 937 m, 45°33'32.90" N 25°54'41.80" E, May 19, 2009, 2♂♂, leg. L. Keresztes; Feleacu, Moară Valley, small brooks, 697 m, 46°41'45.02" N 23°35'28.26" E, April 25, 2010, 2♂♂, leg. L. Keresztes; Borșa, Rodnei Mountains, Știol Lake, 1657 m, 47°34'25.04" N 24°48'48.24" E, June 15, 2010, 1♂, leg. R. Vaida; Cluj-Napoca, Gârbău brook, 416 m, 46°43'16.47" N 23°31'41.82" E, May 18, 2011, 6♂♂, leg. L. P. Kolcsár; April 24, 2012, 24♂♂, 5♀♀, leg. L. P. Kolcsár and E. Török; Băișoara, Gilău Mountains, 1279 m, 46°32'30.31" N 23°18'21.07" E, May 12, 2012, 1♂, leg. L. Keresztes; *Oltenia*: Obaria Lotrului, Parâng Mountains, Lotru River valley, brook, 1368 m, 45°25'19.99" N 23°37'25.76" E, June 2, 2007, 2♂♂, leg. M. Bálint.

Biology: The biology of this species is unknown. The Romanian individuals were collected from different habitats, most frequently along mountainous and hilly springs and brooks. The adults are active from April to middle June.

Distribution: Andorra, Austria, Bulgaria, Czech Republic, France (Ariege, Pyrenees Orientales), Germany, Italy (Trentino-Alto Adige), Poland, Romania, Slovakia, Switzerland (OOSTERBROEK 2012).

The annotated list of Pediciidae of Romania is presented in Table 1, which number 41 species. Five species are recorded for the Romanian fauna for the first time (noted by * in Table 1.). From 1999 (the year when we started collecting Pediciidae from Romania) we collected altogether 33 Pediciidae species (noted by ** in Table 1.)

Discussion

As our results reflects, the last 10 years of intensive samplings of Pediciidae revealed a high but yet uncharted diversity of hairy-eyed crane flies in Romania, summarized in five new records and new faunistic data on a number of other 28 different species. This number (33 species) represents 80.5% of the known Pediciidae species from Romania. During the revision of the collection of the Faculty of Biology and Geology, Cluj-Napoca, Romania we identify two *Dicranota (Paradicranota) subflammatra* which were published in literature as *D. (P.) flammatra* (UJVÁROSI 2005b). *Pedicia (Crunobia) pallens* SAVCHENKO, 1978 (reported by UJVÁROSI and STARÝ 2003), *Dicranota (Paradicranota) candelisequa* STARÝ, 1981 and *Tricyphona (Tricyphona) schummeli* EDWARDS, 1921 (reported by UJVÁROSI 2005a) are results of misidentifications (noted by *** in Table 1). Our revisions revealed that in the case of *P. (C.) pallens* all individuals belong in fact to *P. (C.) zernyi* (LACKSCHEWITZ, 1940). In the case of *D. (P.) candelisequa* the revised material proved to be all *D.*

Table 1. List of Romanian Pediciidae fauna. * - first recorded **- we collected *** - misidentify

Taxon name	Status
<i>Dicranota (Dicranota) bimaculata</i> (SCHUMMEL, 1829)	**
<i>Dicranota (Ludicia) lucidipennis</i> (EDWARDS, 1921)	**
<i>Dicranota (Paradicranota) brevicornis</i> BERGROTH, 1891	**
<i>Dicranota (Paradicranota) brevitarsis</i> BERGROTH, 1891	**
<i>Dicranota (Paradicranota) candelisequa</i> STARÝ, 1981	***
<i>Dicranota (Paradicranota) consimilis</i> MENDEL, 1987	*
<i>Dicranota (Paradicranota) flammatra</i> STARÝ, 1981	***
<i>Dicranota (Paradicranota) fuscipennis</i> LACKSCHEWITZ, 1940	**
<i>Dicranota (Paradicranota) gracilipes</i> WAHLGREN, 1905	**
<i>Dicranota (Paradicranota) landrocki</i> CZIZEK, 1931	**
<i>Dicranota (Paradicranota) martinovskyi</i> STARÝ, 1974	**
<i>Dicranota (Paradicranota) mikiana</i> LACKSCHEWITZ, 1940	*
<i>Dicranota (Paradicranota) minuta</i> LACKSCHEWITZ, 1940	**
<i>Dicranota (Paradicranota) pallens</i> LACKSCHEWITZ, 1940	**
<i>Dicranota (Paradicranota) pavida</i> (HALIDAY, 1833)	*
<i>Dicranota (Paradicranota) schistacea</i> LACKSCHEWITZ, 1940	**
<i>Dicranota (Paradicranota) simulans</i> LACKSCHEWITZ, 1940	**
<i>Dicranota (Paradicranota) subflammatra</i> STARÝ, 1998	*
<i>Dicranota (Paradicranota) subtilis</i> LOEW, 1871	**
<i>Nasiternella regia</i> RIEDEL, 1914	**
<i>Pedicia (Amalopsis) fusca</i> UJVÁROSI and BÁLINT, 2012	**
<i>Pedicia (Amalopsis) occulta</i> (MEIGEN, 1830)	**
<i>Pedicia (Crunobia) apusenica</i> UJVÁROSI and STARÝ, 2003	**
<i>Pedicia (Crunobia) littoralis</i> (MEIGEN, 1804)	**
<i>Pedicia (Crunobia) lobifera</i> SAVCHENKO, 1986	**
<i>Pedicia (Crunobia) nielsenii</i> (SLIPKA, 1955)	**
<i>Pedicia (Crunobia) pallens</i> SAVCHENKO, 1978	***
<i>Pedicia (Crunobia) spinifera</i> STARÝ, 1974	**
<i>Pedicia (Crunobia) staryi</i> SAVCHENKO, 1978	**
<i>Pedicia (Crunobia) straminea</i> (MEIGEN, 1838)	**
<i>Pedicia (Crunobia) zernyi</i> (LACKSCHEWITZ, 1940)	**
<i>Pedicia (Pedicia) rivosarivosa</i> (LINNAEUS, 1758)	**
<i>Tricyphona (Tricyphona) alticola</i> STROBL, 1910	*
<i>Tricyphona (Tricyphona) immaculata</i> (MEIGEN, 1804)	**
<i>Tricyphona (Tricyphona) livida</i> MADARASSY, 1881	**
<i>Tricyphona (Tricyphona) schummeli</i> EDWARDS, 1921	***
<i>Tricyphona (Tricyphona) unicolor</i> (SCHUMMEL, 1829)	**
<i>Ula (Ula) bolitophila</i> LOEW, 1869	**
<i>Ula (Ula) mixta</i> STARÝ, 1983	**
<i>Ula (Ula) mollissima</i> HALIDAY, 1833	**
<i>Ula (Ula) sylvatica</i> (MEIGEN, 1818)	**

(*P.*) *gracilipes* WAHLGREN, 1905. In the case of *T.* (*T.*) *shummeli*, a revision of the individuals belongs to the Diptera Collections from Cluj-Napoca revealed the identity of *T.* (*T.*) *livida* MADARASSY, 1881 in all cases.

Despite their intensive samplings in the last more than 10 years, there are still some species of Pediciidae which have only literature data. There are *Dicranota (Paradicranota) candelisequa* STARÝ, 1981 and *D.* (*P.*) *minuta* LACKSCHEWITZ, 1940 recorded for the first time by ERHAN-DINCA and CEIANU (1986), with

individuals collected from the northern part of the Eastern Carpathians. *D.* (*P.*) *brevitarsis* BERGROTH, 1891 individuals were recorded only by STROBL (1897) identified from the Retezat Mountains at Cârțișoara. SAVCHENKO et al. (1992) listed the *D.* (*P.*) *fuscipennis*, *D.* (*P.*) *schistacea* and *P.* (*C.*) *spinifera* from Romania based on unpublished data of E. ERHAN-DINCA only. Unfortunately they were not followed by any details on their collection sites.

UJVÁROSI and STARÝ (2003) stated that in the case of *P. (C.) spinifera* the Romanian occurrence of this species needs confirmation because of the previously limited numbers of southern Balkan records and they raised the idea that the Romanian records of *P. spinifera* should be in fact *P. apusenica*. This could be also problematic, based on a recent revision on the distribution of the *P. strayi* species group in Romania (KERESZTES, in litt.). *P. spinifera* was collected from the Balkan Area, from the Rila Mountains in 1934 and described later by STARÝ in 1974 based on a single male individual only, deposited in the Entomological collection from Prague, Czech Republic. The species is quite distinct from all the other members of the *strayi* species group, by having a thorn in the tip of the interbase. In the original publication from 1974 the collecting site is not very exactly defined. For this reason we can add here our recent collecting data of this rare Balkan species from the Siroka Laka, Rhodope Mountains, Perelik hut surroundings brook, 1855 m, 41°36'17.53" N 24°35'44.74" E, July 17, 2012, 5 ♂♂, 1 ♀, leg. L. Keresztes, E. Török, L. P. Kolcsár.

D. (P.) candelisequa and *D. (P.) minuta* were reported from the northern part of the Eastern Carpathians, from the Putna River valley (ERHAN-DINCA and CEIANU 1986), and additionally an other individual belongs to *D. (P.) minuta* was recorded from Piatra Craiului Mountains also by Pârveu (2004), ecosystems which were not investigated by us.

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