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New earthworm records from the former Yugoslav countries (Oligochaeta, Lumbricidae)

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Abstract. A rich earthworm material from different countries of the former Yugoslavia has been elaborated. Altogether 39 species and subspecies are reported including six new records. *Aporrectodea cemernicensis* proved to be new to the fauna of Serbia, *Eisenia spelaea* to Bosnia-Herzegovina, *Aporrectodea sineporis* is new to Croatia and *Denrobaena hrabei* to Macedonia. *Dendrobaena cognettii* represents a new record to the fauna of Croatia and Macedonia. *Dendrodrilus rubidus subrubicundus* is new to the fauna of Montenegro.

Keywords. Earthworms, faunistics, new records, former Yugoslavia

INTRODUCTION

The earthworm fauna of the former Yugoslavian countries is more or less well explored. The beginning of the researches goes back to the turn of the last century (Rosa 1897, Szüts 1919, Černosvitov 1930, 1935, 1938). These early researches were later followed by local scientists as well (Karaman 1972, Šapkarev 1972, 1977, 1979).

The most complete summary of the earthworms of the Balkan Peninsula including Yugoslavia was presented by Mršić (1991), recording altogether 135 species and subspecies from this region; by countries 57 from Serbia, 68 from Slovenia, 59 from Croatia, 47 from Macedonia, 45 from Bosnia-Herzegovina and 36 from Montenegro.

After this comprehensive work, only a few papers dealt with the earthworm fauna of the former Yugoslav states (Šapkarev 1993, Stojanović & Karaman 2006, 2007, Stojanović *et al.* 2008). The recent data are mainly from Serbia (Karaman & Stojanović 1996, 2002, Stojanović & Karaman 2003a, 2005a, 2005b, Milutinović *et al.* 2010), Macedonia (Šapkarev 1991, 2001) and Montenegro (Stojanović & Karaman 2003b).

In the last decade, researchers of the Hungarian Natural History Museum organized several collecting trips to the Balkan Peninsula (Fehér et al. 2004, Murányi *et al.* 2011). The rich earthworm material collected from the former Yugoslav countries has recently been elaborated and the results are presented herein.

MATERIAL AND METHODS

Earthworms were collected by the diluted formaldehyde method (Raw 1959), complemented with digging and searching under stones and the bark of fallen logs. The specimens were killed and fixed in 96% ethanol then transferred into 75% ethanol and deposited in the earthworm collection of the Hungarian Natural History Museum (HNHM). For later molecular studies, tail parts of specimens of taxonomic importance were placed into 96% ethanol.

RESULTS

Allolobophora mehadiensis voivodinensis (Šapkarev, 1989)

Allolobophora (Serbiona) mehadienis voivodinensis Šapkarev, 1989: 40.
Serbiona mehadiensis voivodinensis: Mršić 1991: 189.

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Material examined. HNHM/16029, 3 ex., Serbia, Đerdap Mts., Donji Milanovac, 335 m, oak forest, N44°28,551' E22°04,406', 28.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16038, 3 ex., Serbia, Đerdap Mts., Rudna Glava, 151 m, meadow with a nut tree, N44°18,662' E22°07,016', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16051, 2 ex., Serbia, Đerdap Mts., Golubinje, 194 m, orchard around a house, N44°30,996' E22°12,913', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16053, 1 ex., Serbia, Đerdap Mts., Golubinje, 191 m, dry oak forest, N44°33,922' E22°14,893', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Allolobophora robusta robusta Rosa, 1895

Allolobophora robusta Rosa, 1895: 2., Zicsi 1982: 437.
Serbiona robusta robusta: Mršić 1991: 193., Stojanović & Karaman 2007: 23.
Allolobophora robusta robusta: Csuzdi *et al.* 2011: 12.

Material examined. HNHM/16020, 6 ex., Serbia, Đerdap Mts., Miroč, 502 m, beech forest fragment on a pasture, N44°30,154' E22°15,018', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16026, 4 ex., Serbia, Đerdap Mts., Lepenski Vir, small valley at the Eastern end of Tunnel 10, 127 m, mixed forest, N44°33,959' E22°01,202', 28.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16028, 10 ex., Serbia, Đerdap Mts., Donji Milanovac, 335 m, oak forest, N44°28,551' E22°04,406', 28.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16031, 4 ex., Serbia, Đerdap Mts., between Miroč and Brza Palanka, 407 m, beech forest, N44°28,616' E22° 21,074', 27.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16036, 2 ex., Serbia, Đerdap Mts., Golubinje, 194 m, orchard around a house, N44°30,996' E22°12,913', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16054, 2 ex., Serbia, Đerdap Mts., Miroč, 502 m, beech forest fragment on a pasture, N44°30,154' E22° 15,018', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Remarks. The new specimens from the Đerdap Mts. are smaller than those of Băile Herculane, Romania (Csuzdi *et al.* 2011) but morphologically fit well in the description of the nominal subspecies.

Allolobophora sturanyi sturanyi Rosa, 1895

(Figure 1)

Allolobophora sturanyi Rosa, 1895: 5., Zicsi 1982: 439.
Karpatodinariona sturanyi: Mršić 1991: 250., Stojanović *et al.* 2008: 59.
Allolobophora sturanyi sturanyi: Csuzdi & Pop 2008a: 26.

Material examined. HNHM/16046, 1 ex., Serbia, Đerdap Mts., Golubinje, 191 m, dry oak forest, N44°33,922' E22°14,893', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16052, 1 ex., Serbia, Đerdap Mts., Golubinje, 191 m, dry oak forest, N44°33,922' E22°14,893', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Allolobophoridella eiseni (Levinsen, 1884)

Lumbricus eiseni Levinsen, 1884: 241.
Allolobophoridella eiseni: Mršić 1991: 254., Csuzdi *et al.* 2011: 12.
Eisenia eiseni: Karaman & Stojanović 2002: 224.

Material examined. HNHM/15899, 1 ex., Macedonia, Prov. Veles, Babuna valley, between Omorani and Martolci, 04.04.2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi; HNHM/15903, 2 ex., Macedonia, Prov. Gostivar, along the Mavrovi Anovi–Galičnik road, 2,6 km after the junction to Mavrovo, beech forest, 1500 m, 09.04.2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi; HNHM/15877, 2 ex., Montenegro, 3 km SE of Grnčar along the Gushinje–Shkodër road, beech forest, 962 m, 04. 10.2005., leg. D. Murányi; HNHM/15885, 1 ex., Montenegro, E of Velika, Murino 18 km toward Čakor-pass, mixed pine forest, subalpine grassland, 1554 m, 05.10.2005., leg. D. Murányi; HNHM/15682, 1 ex., Serbia, Fruska Gora, Petrovarazdin, mesic forest, 2 km E from the pass, 19. 04.2004., leg. J. Kontschán; HNHM/15957, 1 ex., Serbia, 9 km E of Surdulica, dam of Vrla stream, 20 km from Vladičin Han, non limestone rocks, 890 m, 08.04.2006., leg. Z. Erőss, Z. Fehér, A.

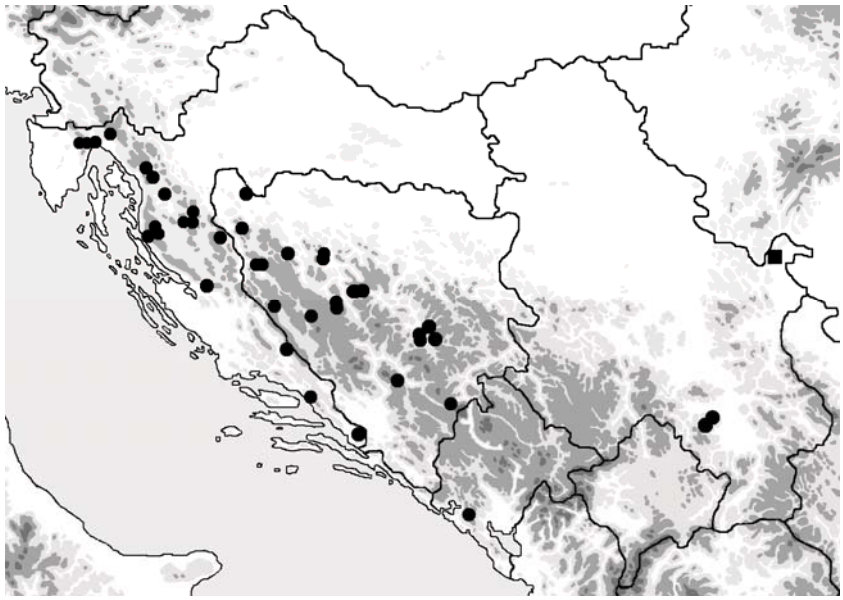

Figure 1. Distribution of *A. sturanyi sturanyi* Rosa, 1895. Black dots = literature data, black square = new record.

Hunyadi, D. Murányi; HNHM/16024, 1 ex., Serbia, Đerdap Mts., Golubinje, foot of Mt. Mali Štrbac, 120 m, old beech forest, N44°38,201' E22°18,418', 27.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16039, 1 ex., Serbia, Đerdap Mts., Majdanpek, 326 m, alder forest along a stream, N44°22,823' E21°59,162', 26.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Remarks. This species is quite common in the Balkan found almost exclusively under bark of fallen logs.

Aporrectodea cemernicensis Mršić, 1991

(Figure 2)

Aporrectodea (Aporrectodea) cemernicensis Mršić, 1991: 284.

Material examined. HNHM/15927, 6 ex., Serbia, Đerdap Mts., Golubinje, stream valley with young forest N of the village, 88 m, N44°30,993' E22°12,692', 13.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi.

Remarks. This species was described from Bosnia-Herzegovina and this is its first record from Serbia.

Aporrectodea georgii (Michaelsen, 1890)

Allolobophora georgii Michaelsen, 1890: 3.
Aporrectodea (Aporrectodea) georgii: Mršić 1991: 315.
Aporrectodea georgii: Milutinović *et al.* 2010: 629.

Material examined. HNHM/15940, 2 ex., Macedonia, Valandovsko Basin, Rabrovo, grassland along the Anska River S of the village, 104 m, N41°18,248' E22°35,185', 18.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi.

Aporrectodea handlirschi (Rosa, 1897)

Allolobophora handlirschi Rosa, 1897: 3.
Aporrectodea (Aporrectodea) handlirschi: Mršić 1991: 292.
Aporrectodea handlirschi: Csuzdi & Zicsi 2003: 84.
Aporrecodea handlirschi handlirschi: Stojanović *et al.* 2008: 59.

Material examined. HNHM/15935, 4 ex., Macedonia, Demir Kapija, Vardar River, gallery forest and dry grassland E of the city, 115 m, N41°24,348' E22°15,938', 17.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15938, 4 ex., Macedonia, Belasica Mts., Kolešino, rude-

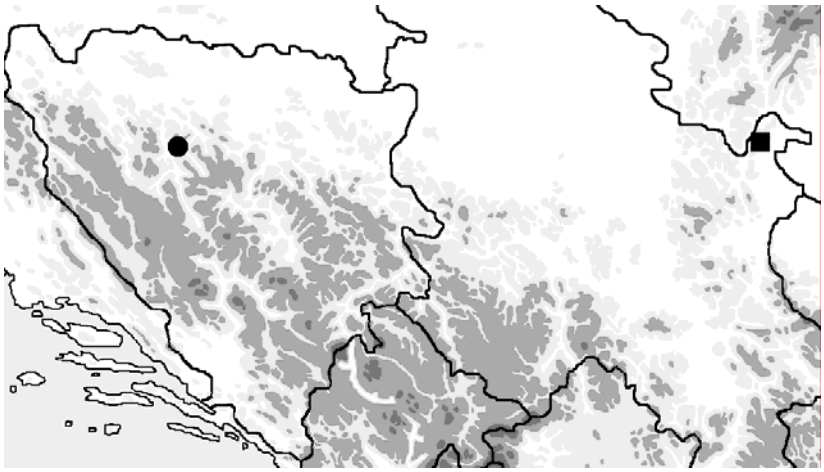

Figure 2. Distribution of *Ap. cemernicensis* Mršić, 1991. Black dot = type locality, black square = new record.

ral vegetation above the village, 300 m, N41° 22,780' E22°48,580', 18.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15654, 1 ex., Serbia, Đerdap Mts., Dobra, limestone rocks and secondary forest, 105 m, N44°34,913' E22° 01,190', 12.10.2006 leg. L. Dányi, J. Kontschán, D. Murányi.

Aporrectodea rosea (Savigny, 1826)

Enterion roseum Savigny, 1826: 182.
Aporrectodea (Aporrectodea) rosea rosea: Mršić 1991: 296.
Aporrectodea rosea: Šapkarev 2001: 111., Stojanović & Karaman 2003b: 55., 2005a: 128.

Material examined. HNHM/15645, 1 ex., Serbia, Gamzigrad, Crni Timok River and its gallery, 183 m, N43°55,510' E22°07,770', 14.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi.

Remarks. *Aporrectodea rosea* is a common peregrine species distributed all over the Balkans but its collection was not forced.

Aporrectodea sineporis (Omodeo, 1952)

(Figure 3)

Eiseniella balcanica sine-poris Omodeo, 1952: 31.
Aporrectodea (Aporrectodea) sineporis: Mršić 1991: 287.
Aporrectodea sineporis: Csuzdi & Zicsi 2003: 99., Stojanović & Karaman 2005b: 133., Milutinović *et al*. 2010: 629.

Material examined. HNHM/15598, 1 ex., Croatia, Ivanscica, ~250 m below the mountain ridge, sparse northern side, 01.04.2006. leg. Á. Garai, J. Kontschán, D. Murányi; HNHM/15599, 2 ex., Croatia, Ivanscica, Lobor, beech-oak mixed forest, 01.04.2006. leg. Á. Garai, J. Kontschán, D. Murányi; HNHM/15695, 1 ex., Croatia, Papuk, 20.04.2004., leg. J. Kontschán; HNHM/15699, 1 ex., Croatia, Papuk, Drenovac, stream bank, near the bridge, 21.04.2004., leg. J. Kontschán; HN HM/15712, 1 ex., Croatia, Papuk, Jankovac pass, beech forest, 24.10.2004., leg. D. Murányi; HN HM/15633, 1 ex., Serbia, Đerdap Mts., Mosna, stream valley with oak forest at the edge of the village, 99 m, N44°25,777' E22°10,633', 12.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15648, 1 ex., Serbia, Đerdap Mts., Mosna, stream valley with oak forest at the edge of the village, 99 m, N44°25,777 E22°10,633', 12.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/16042, 2 ex., Serbia, Đerdap Mts., Majdanpek, 326 m, alder forest along a stream, N44° 22,823' E21°59,162', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16050, 3 ex., Serbia, Đerdap Mts., Golubinje, 135 m, beech for est, N44°30,913' E22°12 831', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

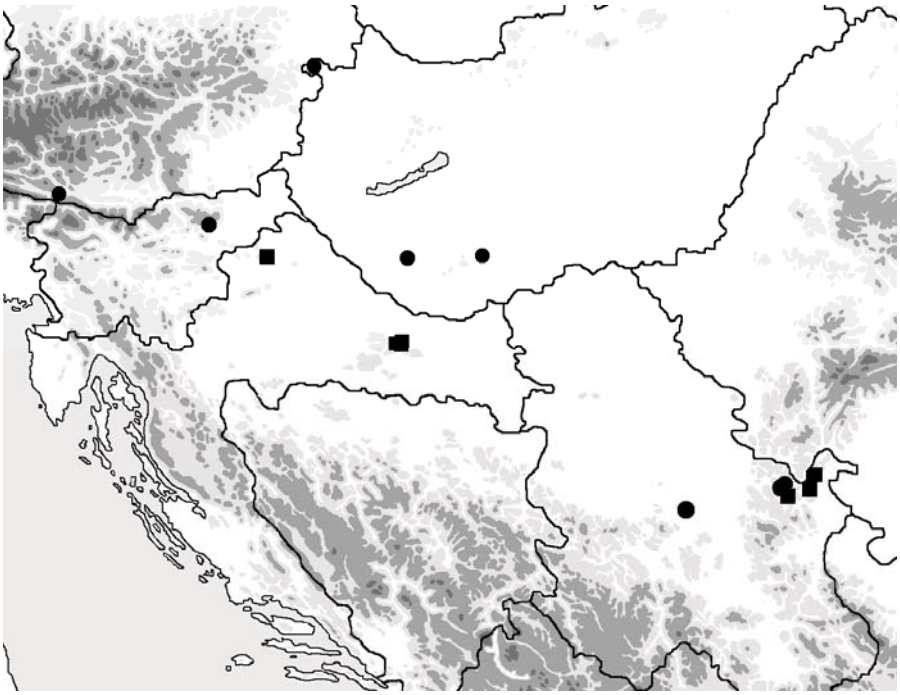

Figure 3. Distribution of *Ap. sineporis* (Omodeo, 1952). Black dots = literature data, black squares = new records.

Remarks. Csuzdi & Zicsi (2003) described *Ap. sineporis* as a typical Southern-Alpine species. Later findings in Serbia (Stojanović & Karaman 2005b) and the present records in Croatia corroborates the view of Stojanović & Karaman (2005b) that this species has a wider distribution in the Balkan, and fits better in the Illyric type of distribution.

Aporrectodea smaragdina (Rosa, 1892)

Allolobophora smaragdina Rosa, 1892: 5.
Aporrectodea (Aporrectodea) smaragdina: Mršić 1991: 308.
Aporrectodea smaragdina: Stojanović & Karaman 2003b: 55.
Aporrectodea smaragdinoides Šapkarev, 1989: 42. **syn. nov.**
Aporrectodea (Aporrectodea) smaragdinoides: Mršić 1991: 312.

Material examined. HNHM/15854, 1 ex., Bosnia-Herzegovina, Zelengora, Suha, spring above the settlement, 1112 m, N43°15,892' E18° 35,595', 10.05.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15861, 2 ex., Bosnia-Herzegovina, Zelengora, Tjentište, sidebrook of the Sutjeska River above the settlement, 765 m, N43°17,372' E18°37,067', 09.05.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15884, 1 ex., Montenegro, Lim valley, River Lim 4 km S of Brodarevo, river, limestone rocks, roadside bush, 530 m, 03.10.2005., leg. D. Murányi; HN HM/15980 1 ex., Slovenia, Moste, near the lake, 630 m, beech forest with pine trees, N46°24,418' E14°08,767', 13.04.2006., leg. L. Dányi, J. Kontschán.

Remarks. Šapkarev (1989) described *Ap. smaragdinoides* because it has not expressed the intensive emerald-green colour, characteristic for *Ap. smaragdina,* and possessed slightly longer clitellum (24–33 vs. 25, 26–33). Already Mršić (1991: 313) raised the question of validity the species *Ap. smaragdinoides* but formally did not synonymise the two names. In our material all colour forms (from turquoise green to much paler greenish-grey) occur and all clitellar positions can be observed therefore, *Ap. smaragdinoides* Šapkarev, 1989 is only a synonym name of *Ap. smaragdina* (Rosa, 1892).

Dendrobaena alpina alpina (Rosa, 1884)

Allolobophora alpina Rosa, 1884: 28.
Dendrobaena alpina alpina: Mršić 1991: 627., Csuzdi *et al.* 2005: 127.
Dendrobaena alpina: Šapkarev 2001: 112., Stojanović & Karaman 2005a: 129.

Material examined. HNHM/15953, 2 ex., Macedonia, Ogražden Mts., beech forest with a brook at the Prevedena Pass, 1167 m, N41° 33,960' E22°50,643', 18.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/16030, 1 ex., Serbia, Đerdap Mts., Donji Milanovac, 335 m, oak forest, N44°28,551' E22°04,406', 28.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16033, 6 ex., Serbia, Đerdap Mts., between Miroč and Brza Palanka, 407 m, beech forest, N44°28,616' E22°21,074', 27.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/ 16041, 1 ex., Serbia, Đerdap Mts., Majdanpek, 326 m, alder forest along a stream, N44°22,823' E21°59,162', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Remarks. *D. alpina* is a polytypic species distributed from France across Central and Southern Europe to Turkey. In the Balkan, apart from *D. alpina alpina* occurs also the subspecies *D. a. popi* mainly in mountainous habitats. The other subspecies *D. a. mavrovensis* Šapkarev, 1971 described from Macedonia according to the online database of Csuzdi (2012) is a synonym of *D. clujensis*.

Dendrobaena alpina popi Šapkarev, 1971

Dendrobaena alpina popi Šapkarev, 1971: 160., Mršić 1991: 634., Csuzdi *et al.* 2011: 13.

Material examined. HNHM/15902, 1 ex., Macedonia, Prov. Gostivar, along the Mavrovi Anovi – Galičnik road, 2,6 km after the junction to Mavrovo, beech forest, 1500 m, 09.04.2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi.

Dendrobaena attemsi (Michaelsen, 1902)

Helodrilus (Dendrobaena) attemsi Michaelsen, 1902: 74.
Dendrobaena attemsi: Mršić 1991: 604., Šapkarev 2001: 112., Stojanović & Karaman 2005a: 129., Csuzdi *et al.* 2011: 14.

Material examined. HNHM/15853, 1 ex., Bosnia-Herzegovina, Zelengora, Suha, forest spring above the settlement, 1112 m, N43°15,892' E18° 35,595', 10.05.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15905, 1 ex., Macedonia, Prov. Ohrid, Galičica Mts.,19 km W of Carina, along the Carina – Trpejča road, spring, 1370 m, 06.04.2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi; HNHM/15906, 1 ex., Macedonia, Prov. Ohrid, Galičica Mts., 16.6 km W of Carina, along the Carina – Trpejča road, rocky beech forest, 1450 m, 06.04.2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi; HNHM/15907, 1 ex., Macedonia, Prov. Gostivar, 2 km SE of Gorno Jelovce, Planinarski dom Šarski Vodi, beech forest,1275 m, 09.04.2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi; HNHM/ 15936, 4 ex., Macedonia, Ogražden Mts., beech forest with a brook at the Prevedena Pass, 1167 m, N41°33,960' E22°50,643', 18.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15951, 1 ex., Macedonia, Galičica Mts., Leskoec, oak forest above the Prespa Lake, 1217 m, N40° 58,577' E20°53,122', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15952, 1 ex., Macedonia, Peštani, karstic forest above the Ohrid Lake, S of the village, 829 m, N40°58,598' E20° 47,645', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/16022, 1 ex., Serbia, Đerdap Mts., between Majdanpek and Donji Milanovac, 621 m, beech forest, N44°26,659' E21°58,858', 28.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Remarks. *D. attemsi* is a widely distributed Balkanic-Alpine species (Csuzdi *et al.* 2011). In the Romanian literature it was frequently lumped under the name of *D. alpina* (Pop *et al.* 2007).

Dendrobaena auriculifera Zicsi, 1969

Dendrobaena auriculifera Zicsi, 1969: 381., Mršić 1991: 574.

Material examined. HNHM/15981, 1 ex., Slovenia, Moste, near the lake, 630 m, beech forest

with pine trees, N46°24,418' E14°08,767', 13.04. 2006., leg. L. Dányi, J. Kontschán.

Dendrobaena byblica byblica (Rosa, 1893)

Allolobophora byblica Rosa, 1893a: 4.
Dendrobaena byblica (part.): Mršić 1991: 566., Csuzdi *et al.* 2011: 14.
Dendrobaena byblica: Šapkarev 2001: 113., Stojanović & Karaman 2005a: 129.

Material examined. HNHM/15649, 1 ex., Serbia, Đerdap Mts., Mosna, stream valley with oak forest at the edge of the village, 99 m, N44° 25,777' E22°10,633', 12.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi.

Remarks. *D. byblica* is a widely distributed polytypic species complex which urgently needs revision (Csuzdi & Pavlíček 1999). Zicsi (1991) resurrected the species *D. ganglbaueri* (Rosa, 1894) which clearly differs from *D. byblica* in the position of the clitellum (24–29 vs. 25–30). In the present work *D. ganglbaueri* is also recognized as a valid species.

Dendrobaena cognettii (Michaelsen, 1903)

Helodrilus cognettii Michaelsen, 1903: 130.
Dendrobaena cognettii: Zicsi 1982: 426., Csuzdi & Zicsi 2003: 114.
Dendrobaena pygmaea: Mršić 1991: 643., Blakemore 2004: 2.

Material examined. HNHM/15620, 1 ex., Croatia, Krk Island, Glavotok, oak forest, 30.04. 2006., leg. L. Dányi; HNHM/15950 1 ex., Macedonia, Šar Planina, Tetovo, Popova Šapka, beech forest, 1153 m, N42°00,940' E20°55,597', 15.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi.

Remarks. This species has not been recorded from the former Yugoslavia (Mršić 1991) therefore it is new to the fauna of Croatia and Macedonia as well.

Dendrobaena ganglbaueri (Rosa, 1894)

Allolobophora (Dendrobaena) ganglbaueri Rosa, 1894: 1.
Dendrobaena byblica (part.): Mršić 1991: 566.
Dendrobaena ganglbaueri: Zicsi 1991: 176., Csuzdi & Zicsi 2003: 116.

Material examined. HNHM/15595, 1 ex., Croatia, Ivanscica, near the mountain foot, mixed beech forest, 01.04.2006. leg. Á. Garai, J. Kontschán, D. Murányi; HNHM/15628, 1 ex., Croatia, Papuk, Drenovac, stream bank, 21.04.2004., leg. J. Kontschán; HNHM/15629, 1 ex., Croatia, Papuk, Novo Zvecevo, after the village, stream bank, 22.04.2004., leg. J. Kontschán; HNHM/ 15687, 2 ex., Croatia, Papuk, Novo Zvecevo, after the village, stream bank, 22.04.2004., leg. J. Kontschán; HNHM/15693, 4 ex., HNHM/15692, 6 ex., Croatia, Papuk, 20.04.2004., leg. J. Kontschán; HNHM/15893, 1 ex., Serbia, 14 km S of Valjevo, 500 m, 19.10.2002., leg. J. Kontschán.

Dendrobaena hortensis (Michaelsen, 1890)

Allolobophora subrubicunda var. *hortensis* Michaelsen, 1890: 15.
Dendrobaena hortensis: Mršić 1991: 622., Stojanović & Karaman 2005a: 129.

Material examined. HNHM/15647, 3 ex., Macedonia, Ohrid Lake and lakeshore N of Peštani, 695 m, N41°02,857' E20°48,093', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/ 15904, 1 ex., Macedonia, Prov. Resen, Krani, the upper end of the village, stream bank, spring, 990 m, 05.04.2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi; HNHM/15933, 4 ex., Macedonia, Sveti Naum, springs and spring lake above the Ohrid Lake, 704 m, N40°54,595' E20°44,868', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15945, 1 ex., Macedonia, Sveti Naum, springs and spring lake above the Ohrid Lake, 704 m, N40°54,595' E20°44,868', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15954, 1 ex., Macedonia, Pelister Mts, Nižepole, brooks in alpine grasslands and beech forests around the ski course, 1375 m, N40°58,812' E21°15,165', 17.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15948, 1 ex., Serbia, Đerdap Mts., quarry N of Golubinje, 100 m, N44°34,143' E22° 14,735', 13.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi.

Dendrobaena hrabei (Černosvitov, 1934)

(Figure 4)

Eisenia veneta var. *hrabei* Černosvitov, 1934: 72.
Dendrobaena hrabei: Mršić 1991: 631.

Material examined. HNHM/15935, 5 ex., Macedonia, Ogražden Mts., beech forest with a brook at the Prevedena Pass, 1167 m, N41°33,960' E22° 50,643', 18.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi

Remarks. This species was described from Bulgaria and this is the first record from Macedonia.

Dendrobaena octaedra (Savigny, 1826)

Enterion octaedrum Savigny, 1826: 183.
Dendrobaena octaedra: Mršić 1991: 607., Stojanović & Karaman 2003: 55., 2005a: 130.

Material examined. HNHM/15694, 1 ex., Croatia, Papuk, 20.04.2004., leg. J. Kontschán; HN HM/15934, 2 ex., Macedonia, Jakupica Mts., Bogomila, Babuna River and its softwood gallery below the village, 460 m, N41°35,610' E21° 30,260', 19.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15941, 1 ex., Macedonia, Šar Planina, Tetovo, Popova Šapka, brook in alpine grassland, 1792 m, N42°00,910' E20° 52,612', 15.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15651, 2 ex., Serbia, Đerdap Mts., Majdanpek, dry beech forest, 141 m, N44° 24,983' E21°56,277', 13.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15897, 1 ex., Serbia, 14km S of Valjevo, 500m, 19.10.2002., leg. J. Kontschán; HNHM/15876, 1 ex., Serbia, Ibar River valley, 1 km SW of Spiljani, river and the littoral alders, limestone rocks, karstic forest, 829 m, 12.10.2005., leg. D. Murányi.

Dendrobaena papukiana Mršić, 1988

Dendrobaena papukiana Mršić, 1988: 16., Mršić 1991: 579.

Material examined. HNHM/15698, 2 ex., Croatia, Papuk, Novo Zvecevo, after the village, stream bank, 22.04.2004., leg. J. Kontschán; HN HM/15711, 8 ex., Croatia, Papuk, Jankovac pass, beech forest, 24.10.2004., leg. D. Murányi.

Rermark. This species has not been reported so far since the original description.

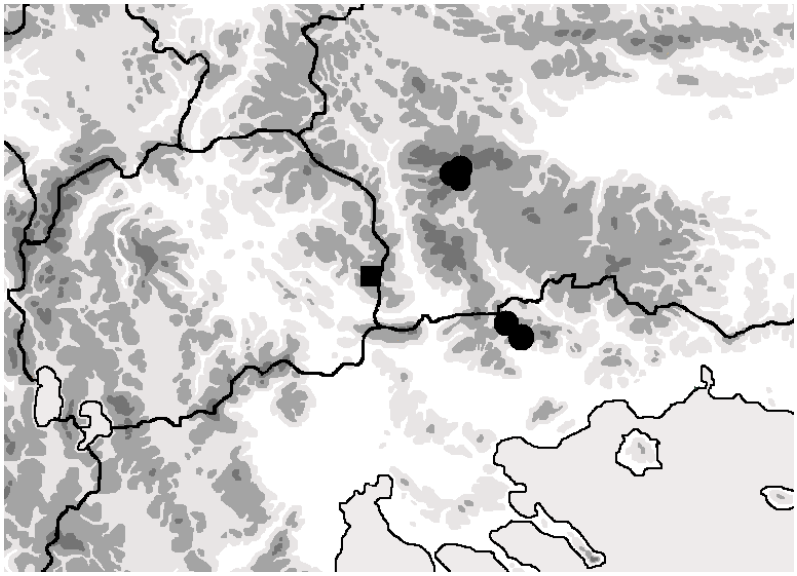

Figure 4. Distribution of *D. hrabei* (Černosvitov, 1934). Black dots = literature data, black square = new record.

Dendrobaena veneta veneta (Rosa, 1886)

Allolobophora veneta Rosa, 1886: 674.
Dendrobaena veneta veneta: Mršić 1991: 613.

Material examined. HNHM/15646, 4 ex., Macedonia, Ohrid Lake and lakeshore N of Peštani, 695 m, N41°02,857' E20°48,093', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15932, 2 ex., Macedonia, Sveti Naum, springs and spring lake above the Ohrid Lake, 704 m, N40° 54,595' E20°44,868', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15947, 4 ex., Macedonia, Sum, spring lake, grassland and pine forest above the Ohrid Lake, 707 m, N41°10,972' E20°37,928', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15949, 3 ex., Serbia, Đerdap Mts., quarry N of Golubinje, 100 m, N44° 34,143' E22°14,735', 13.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi

Dendrodrilus rubidus rubidus (Savigny, 1826)

Enterion rubidum Savigny, 1826: 182.
Dendrodrilus rubidus rubidus: Mršić 1991: 263., Šapkarev 2001: 111., Stojanović & Karaman 2005a: 130., Blakemore 2008: 584.
Dendrodrilus rubidus tenuis: Šapkarev 2001: 111., Stojanović & Karaman 2003b: 56., 2005a: 130., Blakemore 2008: 584.

Material examined. HNHM/15643, 1 ex., Serbia, Gamzigrad, Crni Timok River and its gallery, 183 m, N43°55,510' E22°07,770', 14.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15688, 1 ex., Serbia, Fruska Gora, Grgurevci, mesic forest, 2 km E from the pass, 19.04.2004., leg. J. Kontschán.

Dendrodrilus rubidus subrubicundus (Eisen, 1873)

Allolobophora subrubicunda Eisen, 1873: 51.
Dendrodrilus rubidus subrubicundus: Mršić 1991: 267., Šapkarev 2001: 111., Blakemore 2008: 585.
Dendrodrilus rubidus subrubicunda: Karaman & Stojanović 2002: 224.

Material examined. HNHM/15942, 1 ex., Macedonia, Šar Planina, Tetovo, Popova Šapka, brook in alpine grassland, 1792 m, N42°00,910' E20°52,612', 15.10.2006., leg. L. Dányi, J. Konschán, D. Murányi; HNHM/15946, 1 ex., Macedonia, Sveti Naum, springs and spring lake above the Ohrid Lake, 704 m, N40°54,595' E20° 44,868', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/16007, 2 ex., Macedonia, Polog region, Reka Mts., Vrben, stream in the village 1285 m, N41°43,359' E20°44,149', 16.05. 2010., leg. Z. Fehér, D. Murányi, Zs. Ujvári; HNHM/15886, 1 ex., Montenegro, Lim valley, River Lim 4 km S of Brodarevo, limestone rocks, roadside bush, 530 m, 03.10.2005., leg. D. Murányi; HNHM/15683, 1 ex., Serbia, Fruska Gora, Petrovarazdin, mesic forest, 2 km E from the pass, 19.04.2004., leg. J. Kontschán; HNHM/15928, 1 ex., Serbia, Đerdap Mts., Golubinje, stream valley with young forest N of the village, 88 m, N44° 30,993' E22°12,692', 13.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/16034, 2 ex., Serbia, Đerdap Mts., Golubinje, foot of Mt. Veliki Štrbac, 93 m, beech forest, N44°35,690' E22° 16,073', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16035, 1 ex., Serbia, Đerdap Mts., Dobra, 502 m, beech forest, N44°34,987' E21°58,736', 28.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16040, 3 ex., Serbia, Đerdap Mts., Majdanpek, 326 m, alder forest along a stream, N44°22,823' E21°59,162', 26.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16045, 2 ex., Serbia, Đerdap Mts., Mala Orlova, 91 m, beech-alder forest with stream, N44°38,730' E21°48,769', 25.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16055, 2 ex., Serbia, Đerdap Mts., Majdanpek, 326 m, alder forest along a stream, N44°22,823' E21° 59,162', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Remarks. Acording to Mršić (1991) and Stojanović & Karaman (2003), this peregrine subspecies has not been reported so far from Montenegro.

Eisenia fetida (Savigny, 1826)

Enterion fetidum Savigny, 1826: 182.
Eisenia fetida: Mršić 1991: 497., Blakemore 2008: 587.
Eisenia foetida: Šapkarev 2001: 111.

Material examined. HNHM/16006, 6 ex., Macedonia, Polog region, Reka Mts., Vrben, stream in the village, 1285 m, N41°43,359' E20°44,149', 16.05.2010., leg. Z. Fehér, D. Murányi, Zs. Ujvári.

Eisenia lucens (Waga, 1857)

Lumbricus lucens Waga, 1857: 161.
Eisenia lucens: Mršić 1991: 500., Šapkarev 2001: 111., Csuzdi & Zicsi 2003: 146., Stojanović & Karaman 2005a: 130.

Material examined. HNHM/15926, 5 ex., Macedonia, Osogovski Planina, Sasa, valley of a sidebrook of the Kamenica Stream above the village, 1007 m, N42°06,507' E22°31,555', 19. 10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15544, 2 ex., Serbia, Đerdap Mts., Golubinje, foot of Mt. Mali Štrbac, 120 m, old beech forest, N44°38,201' E22°18,418', 27.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/15653, 4 ex., Serbia, Đerdap Mts., Donji Milanovac, Grgeči spring and its outlet in a beech forest, ~500 m, N44°28' E22°02', 13.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/ 15691, 6 ex., Serbia, Fruska Gora, Petrovarazdin, ruderal habitat, 3 km under the pass, 19.04.2004. leg. J. Kontschán; HNHM/15918, 2 ex., Serbia, 6 km E of Surdulica, 17 km from Vladičin Han, forest, 750 m, 08.04.2006., leg. Z. Erőss, Z. Fehér, A. Hunyadi, D. Murányi; HNHM/15939, 1 ex., Serbia, Krajište Mts., Surdulica, Vrla River above the city, 712 m, N42°41,288' E22°15,125', 20.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15956, 3 ex., Serbia, 9 km E of Surdulica, dam of Vrla stream, 20 km from Vladičin Han, non limestone rocks, 890 m, 08.04. 2006., leg. Z. Erőss, Z. Fehér, A. Hunyadi, D. Murányi; HNHM/16027, 2 ex., Serbia, Đerdap Mts., Lepenski Vir, small valley at the Eastern end of Tunnel 10 , 127 m, mixed forest, N44° 33,959' E22°01,202', 28.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16047, 12 ex., Serbia, Đerdap Mts., Golubinje, foot of Mt. Veliki Štrbac, 93 m, beech forest, N44°35,690' E22° 16,073', 26.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16048, 1 ex., Serbia, Đerdap Mts., Golubinje, foot of Mt. Mali Štrbac, 105 m, rocky roadside under an oak forest, N44°36,561' E22°16,465', 27.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Eisenia spelaea (Rosa, 1901)

Allolobophora spelaea Rosa, 1901: 36.
Eisenia spelaea: Mršić 1991: 503., Csuzdi & Zicsi 2003: 149.

Material examined. HNHM/15852, 3 ex., Bosnia-Herzegovina, Zelengora, Suha, forest spring above the settlement, 1112 m, N43°15,892' E18° 35,595', 10.05.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15594, 3 ex. Croatia, Ivanscica, near the mountain foot, mixed beech forest, 01.04.2006. leg. Á. Garai, J. Kontschán, D. Murányi; HNHM/15597, 1 ex., Croatia, Ivanscica, above Prigorec, stream bank, 01.04.2006., leg. Á. Garai, J. Kontschán, D. Murányi; HNHM/15627, 1 ex., Croatia, Papuk, Drenovac, stream bank, 21.04.2004., leg. J. Kontschán; HNHM/15686, 1 ex., Croatia, Papuk, Novo Zvecevo, after the village, stream bank, 22.04.2004., leg. J. Kontschán; HNHM/15978, 10 ex., Slovenia, Golnik, 460 m, mixed beech forest, N46°19,700' E14° 20,585', 14.04.2006., leg. L. Dányi, J. Kontschán.

Remarks. This species is new to the fauna of Bosnia-Herzegovina.

Fitzingeria platyura platyura (Fitzinger, 1833)

Enterion platyurum Fitzinger, 1833: 553.
Fitzingeria platyura platyura: Mršić 1991: 542., Stojanović & Karaman 2005a: 130.

Material examined. HNHM/15955, 1 ex., Serbia, 9 km E of Surdulica, dam of Vrla stream, 20 km from Vladičin Han, non limestone rocks, 890 m, 08.04.2006., leg. Z. Erőss, Z. Fehér, A. Hunyadi, D. Murányi.

Fitzingeria platyura depressa (Rosa, 1893)

Allolobophora platyura depressa Rosa, 1893b: 439.
Fitzingeria platyura depressa: Mršić 1991: 543.
Fitzingeria viminiana Mršić 1986: 111. (Csuzdi & Zicsi 2003).

Material examined. HNHM/15697, 1 ex., Croatia, Papuk, Novo Zvecevo, after the village, stream bank, 22.04.2004., leg. J. Kontschán; HN HM/15650, 1 ex., Serbia, Đerdap Mts., Mosna, stream valley with oak forest at the edge of the village, 99 m, N44°25,777' E22°10,633', 12.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15929, 1 ex., Serbia, Đerdap Mts., Golubinje, stream valley with young forest N of the village, 88 m, N44°30,993' E22°12,692', 13.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/16021, 1 ex., Serbia, Đerdap Mts., between Majdanpek and Donji Milanovac, 621 m, beech forest, N44°26,659' E21°58,858', 28.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16025, 4 ex., Serbia„ Đerdap Mts., Dobra, 314 m, beech forest, N44°35,755' E21° 51,483', 28.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16044, 1 ex., Serbia, Đerdap Mts., Mala Orlova, 91 m, beech-alder forest with stream, N44°38,730' E21°48,769', 25.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/ 16049, 2 ex., Serbia, Đerdap Mts., Golubinje, 135 m, beech forest, N44°30,913' E22°12,831', 26.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Lumbricus castaneus (Savigny, 1826)

Enterion castaneum Savigny, 1826: 180.
Lumbricus castaneus: Mršić 1991: 466., Karaman & Stojanović 2002: 224., Blakemore 2008: 623.

Material examined. HNHM/15596, 1 ex., Croatia, Ivanscica, above Prigorec, stream bank, 01.04.2006., leg. Á. Garai, J. Kontschán, D. Murányi; HNHM/15630, 1 ex., Croatia, Papuk, Villic Selo, stream bank, 21.04.2004., leg. J. Kontschán; HNHM/15684, 1 ex., Croatia, Papuk, Drenovac, stream bank near the bridge, 21.04. 2004., leg. J. Kontschán; HNHM/15692, 6 ex., Croatia, Papuk, 20.04.2004., leg. J. Kontschán; HNHM/15700, 3 ex., Croatia, Papuk, Drenovac, stream bank, near the bridge, 21.04.2004., leg. J. Kontschán.

Lumbricus polyphemus (Fitzinger, 1833)

Enterion polyphemum Fitzinger, 1833: 552.
Lumbricus polyphemus: Mršić 1991: 473., Karaman & Stojanović 2002: 224., Stojanović & Karaman 2005a: 128.

Material examined. HNHM/15652, 1 ex., Serbia, Đerdap Mts., Majdanpek, mixed beech forest, 604 m, N44°25,752' E21°57,292', 13.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15689, 1 ex., Serbia, Fruska Gora, Petrovarazdin, ruderal habitat, 3 km under the pass, 19. 04.2004. leg. J. Kontschán; HNHM/15690, 1 ex., Serbia, Fruska Gora, Petrovarazdin, ruderal habitat, 3 km under the pass, 19.04.2004. leg. J. Kontschán; HNHM/15898, 1 ex., Serbia, Prov. Paracin, along the Paracin – Zaječar road, 1 km W of the junction to Grza, riverside, 280 m, 11.04. 2004., leg. Z. Erőss, Z. Fehér, A. Hunyadi; HNHM/16032, 4 ex., Serbia, Đerdap Mts., between Miroč and Brza Palanka, 407 m, beech forest, N44°28,616' E22°21,074' 27.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Lumbricus rubellus Hoffmeister, 1843

Lumbricus rubellus Hoffmeister, 1843: 187., Mršić 1991: 474., Šapkarev 2001: 112., Stojanović & Karaman 2003b: 56., 2005a: 130.

Material examined. HNHM/15622, 1 ex., Croatia, Krk Island, Glavotok, oak forest, 30.04. 2006., leg. L. Dányi.

Remark. This is a common peregrine species distributed all over the Balkans but its collection was not forced.

Octodriloides kamnensis (Baldasseroni, 1919)

Octolasium complanatus f. *kamnensis* Baldasseroni, 1919: 3.
Octodriloides kamnensis: Zicsi 1986: 107., Mršić 1991: 458.

Material examined. HNHM/15979, 6 ex., Slovenia, Golnik, 460 m, mixed beech forest, N46°19,700' E14°20,585', 14.04.2006., leg. L. Dányi, J. Kontschán.

Remarks. Mršić (1991) regarded *Oi. karawankensis* (Zicsi, 1969) as a synonym of *Oi. kamnensis*. The present material constantly shows the characteristics of *Oi. kamnensis* (tb. 30–39) and differs from *Oi. karawankensis* (tb. 30–40). Re-

cent taxonomic analysis (Pop *et al.* 2008) also suggests the independence of the two species.

Octodriloides kovacevici (Zicsi, 1970)

Octolasium (Octodrilus) kovacevici Zicsi, 1970: 169.
Octodriloides kovacevici: Zicsi 1986: 107., Mršić 1991: 452.

Material examined. HNHM/15685, 1 ex., Croatia, Papuk, Kokocak, alder forest, 20.04.2004., leg. J. Kontschán; HNHM/15696, 5 ex., Croatia, Psunj, Strmac, mesic forest, 21.04.2004., leg. J. Kontschán.

Octodrilus complanatus (Dugès, 1828)

Lumbricus complanatus Dugès, 1828: 289.
Octodrilus complanatus: Mršić 1991: 398., Karaman & Stojanović 2002: 224., Stojanović & Karaman 2003b: 56., 2005a: 130.

Material examined. HNHM/15623, 1 ex., Croatia, Krk Island, Rudine, near the Biserujka cave, under stone, 29.04.2006., leg. L. Dányi; HNHM/15624, 1 ex., Croatia, Krk Island, Krk, pine and holm oak forest, 29.04.2006., leg. L. Dányi; HN HM/15625, 1 ex., Croatia, Krk Island, Krk, pine and holm oak forest, 29.04.2006., leg. L. Dányi.

Octodrilus lissaensis (Michaelsen, 1891)

Allolobophora lissanesis Michaelsen, 1891: 18.
Octodrilus lissaensis: Mršić 1991: 381.
Non *Octodrilus lissaensis*: Zicsi 1991: 179.

Material examined. HNHM/15621, 2 ex., Croatia, Krk Island, Glavotok, oak forest, 30.04. 2006., leg. L. Dányi.

Remarks. The present specimens fit the originnal description form Vis Island (Lissa), Croatia. The above sited Hungarian material (Zicsi 1991) together with the other Carpathian specimens (Zicsi & Pop 1984, Csuzdi & Pop 2006, 2008b) belongs to *Octodrilus compromissus* Zicsi & Pop, 1984. The main difference between the two species is the position of the tubercles. It is on 29–36 in case of *Oc. lissaensis* and 29–37 in *Oc. compromissus.*

Octodrilus transpadanus (Rosa, 1884)

Allolobophora transpadana Rosa, 1884: 45.
Octodrilus transpadanus: Mršić 1991: 371.

Material examined. HNHM/15931, 1 ex., Macedonia, Sveti Naum, springs and spring lake above the Ohrid Lake, 704 m, N40°54,595' E20° 44,868', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15943, 5 ex., Macedonia, Prespa Lake and lakeshore S of Oteševo, 852 m, N40°57,930' E20°54,352', 16.10.2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/15944, 1 ex., Macedonia, Sveti Naum, springs above the Ohrid Lake, 704 m, N40°54,595' E20°44,868', 16.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi.

Octolasion lacteum (Örley, 1881)

Lumbricus terrestris var. *lacteus* Örley, 1881: 584.
Octolasium lacteum: Zicsi 1982: 431., Šapkarev 2001: 111., Stojanović & Karaman 2003b: 56., 2005a: 130.
Octolasion tyrtaeum: Mršić 1991: 347.

Material examined. HNHM/15644, 1 ex., Serbia, Gamzigrad, Crni Timok River and its gallery, 183 m, N43°55,510' E22°07,770', 14.10. 2006., leg. L. Dányi, J. Kontschán, D. Murányi; HNHM/16023, 1 ex., Serbia, Đerdap Mts., between Majdanpek and Donji Milanovac, 621 m, beech forest, N44°26,659' E21°58,858', 28.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári; HNHM/16043, 2 ex., Serbia, Đerdap Mts., Mala Orlova, 91 m, beech-alder forest with stream, N44°38,730' E21°48,769', 25.10.2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

Proctodrilus opisthoductus Zicsi, 1985

Proctodrilus opisthoductus Zicsi, 1985: 285., Mršić 1991: 130.

Material examined. HNHM/16037 2 ex., Serbia, Đerdap Mts., Rudna Glava, 151 m, meadow with a nut tree, N44°18,662' E22°07,016', 26.10. 2010, leg. L. Dányi, J. Kontschán, Zs. Ujvári.

DISCUSSION

During the recent expeditions altogether 39 earthworm species and subspecies were collected from the former Yugoslavian countries, including six new records. *Ap. cemernicensis* proved to be new to the fauna of Serbia, *E. spelaea* to Bosnia-Herzegovina, *Ap. sineporis* to Croatia as well as *D. hrabei* is new to Macedonia. *D. cognettii* has not been previously reported from the former Yugoslavian countries therefore it represents a new record for the fauna of Croatia and Macedonia. Surprisingly, the peregrine *Dd. rubidus subrubicundus* has also not been reported so far from Montenegro.

Considering the recent data, the number of the known earthworm species and subspecies from the former Yugoslavia is now 147; by countries 70 from Serbia, 69 from Slovenia, 63 from Croatia, 53 from Macedonia, 47 from Bosnia-Herzegovina and 43 from Montenegro.

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New earthworm records from Bulgaria (Oligochaeta, Lumbricidae)

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Abstract. Elaboration of a small earthworm material collected in different parts of Bulgaria resulted in recording altogether 15 species. Surprisingly, the peregrine *Dendrobaena veneta veneta* proved to be new to the fauna of Bulgaria and with this, the present list of Bulgarian earthworms consists of 42 confirmed species and subspecies.

Keywords. Earthworms, faunistics, new records, Bulgaria.

INTRODUCTION

The earthworm fauna of Bulgaria is far from well known, although the beginning of the researches goes back to the end of the 19th century. Rosa (1897) was the first who published data on the Bulgarian earthworms. His work was followed by Černosvitov (1934, 1937), Plisko (1963) Mihailova (1964, 1965, 1966) and Zicsi & Csuzdi (1986). Recently, Valchovski (2012) summarized the knowledge about the Bulgarian earthworm fauna and reported the presence of 50 species and subspecies including several unconfirmed records as well.

In the last decade, researchers of the Hungarian Natural History Museum organized several collecting trips to the Balkan Peninsula. The earthworm material collected from Bulgaria has been elaborated and the results are hereby presented.

MATERIAL AND METHODS

Earthworms were collected by the diluted formaldehyde method (Raw 1959), complemented with digging and searching under stones and the bark of fallen logs. The specimens were killed and fixed in 96% ethanol, then transferred into 75% ethanol and deposited in the earthworm collection of the Hungarian Natural History Museum (HNHM). For later molecular studies, tail parts of specimens of taxonomic importance were placed into 96% ethanol.

The sampling localities in Bulgaria are shown in Figure 1 and in the text the site numbers are indicated in brackets.

RESULTS

Aporrectodea jassyensis (Michaelsen, 1891)

Allolobophora jassyensis Michaelsen, 1891: 15., Plisko 1963: 430., Mihailova 1966: 188.
Aporrectodea (Aporrectodea) jassyensis: Mršić 1991: 316.
Aporrectodea jassyensis jassyensis: Valchovski 2012: 89.

Material examined. HNHM/16074 1 ex., (No. 16) Haskovo province, Gorata Mts., Borislavci, brook in a beech forest W of the village, 225m, N41°39.542' E25°53.406', 29.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/16085 1 ex., (No. 16) Haskovo province, Gorata Mts., Borislavci, brook in a beech forest W of the village, 225m, N41°39.542' E25°53.406', 29.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/16088 3 ex., (No. 15) Kărdžhali province, Šarta Mts., Pelin, mixed pine forest NE of the village, 645m, N41°31.070' E25°47.010', 29.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Cernosvitovia rebeli (Rosa, 1897)

Allolobophora rebelii Rosa, 1897: 3., Csuzdi & Pop 2007: 20.
Octolasium rebeli: Černosvitov 1934: 77., 1937: 89., Mihailova 1966: 194.
Cernosvitovia (Cernosvitovia) rebeli: Mršić 1991: 148.
Cernosvitovia rebeli: Valchovski 2012: 91.

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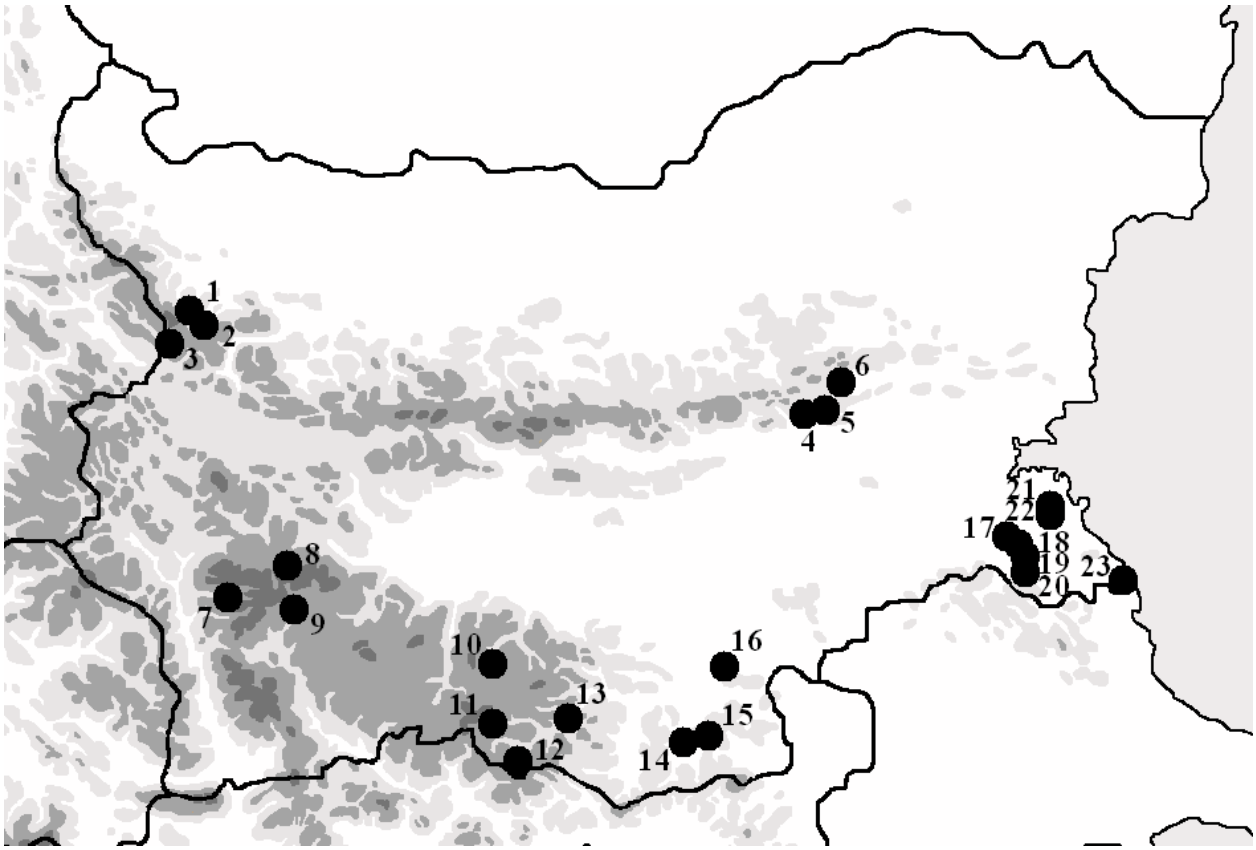

Figure 1. Collecting sites in Bulgaria (for explanations see the text)

Material examined. HNHM/15789 1 ex., (No. 22) Burgas province, Strandcha Mts., sidebrook of Ropotamo Stream in an oak forest, 2km N of Jasna poljana, 80m, N42°17.819' E27°37.246', 08.04.2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi; HNHM/16072 1 ex., (No. 16) Haskovo province, Gorata Mts., Borislavci, brook in a beech forest W of the village, 225m, N41°39.542' E25°53.406', 29.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/16073 1 ex., (No. 16) Haskovo province, Gorata Mts., Borislavci, brook in a beech forest W of the village, 225m, N41°39.542' E25° 53.406', 29.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/16084 1 ex., (No. 16) Haskovo province, Gorata Mts., Borislavci, brook in a beech forest W of the village, 225m, N41° 39.542' E25°53.406', 29.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Dendrobaena alpina alpina (Rosa, 1884)

Allolobophora alpina Rosa, 1884: 28.
Eisenia alpina f. *typica*: Černosvitov 1937: 80., Mihailova 1966: 185.
Dendrobaena alpina: Plisko 1963: 437., Zicsi & Csuzdi 1986: 118., Valchovski 2012: 91.
Dendrobaena alpina alpina: Mršić 1991: 627., Csuzdi *et al.* 2006: 127.

Material examined. HNHM/16077 1 ex., (No. 10) Smoljan province, Radjuva Planina, Pavelsko, beech forest and alpine grassland SE of the village, 1545m, N41°49.826' E24°44.657', 31.05. 2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Dendrobaena attemsi (Michaelsen, 1902)

Helodrilus (Dendrobaena) attemsi Michaelsen, 1902: 74.

Dendrobaena attemsi: Černosvitov 1937: 83., Plisko 1963: 436., Mihailova 1966: 190., Zicsi & Csuzdi 1986: 118., Mršić 1991: 604., Valchovski 2012: 91.

Material examined. HNHM/16071 3 ex., (No. 13) Kărdžhali province, Zălti Djal Mts., Sedlarci, spring and limestone gorge NW of the village, 585m, N41°33.073' E25°01.783', 30.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/16089 1 ex., (No. 11) Smoljan province, Perelik Mts., Smoljan, forest stream and spruce forest above (N of) the city, 1370m, N41°36.524' E24°41.498', 31.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Dendrobaena byblica byblica (Rosa, 1893)

Allolobophora byblica Rosa 1893: 4–5.
Dendrobaena ganglbaueri var. *byblica*: Černosvitov 1934: 74., 1937: 84.
Dendrobaena byblica: Plisko 1963: 437., Mršić 1991: 566., Valchovski 2012: 92.

Material examined. HNHM/15579 1 ex., (No. 9) Blagoevgrad province, Rila Mts., Mesta basin, sidebrook of the Stream Ropalica below the Grăničar mountain hut, 2100m, 07.09.2005., leg. M. Földvári, J. Kontschán, D. Murányi, T. Szüts; HNHM/15790 1 ex., (No. 22) Burgas province, Strandcha Mts, sidebrook of Ropotamo Stream in an oak forest, 2km N of Jasna poljana, 80m, N42°17.819' E27°37.246', 08.04.2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi; HNHM/15808 2 ex., (No. 17) Burgas province, Strandcha (Bosna) Mts, Karamlâk stream, gallery and rocks above Mladežko, 210m, N42° 09.080' E27°21.918', 07.04.2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi.

Dendrobaena hortensis (Michaelsen, 1890)

Allolobophora subrubicunda var. *hortensis* Michaelsen, 1890: 15.
Eisenia veneta var. *hibernica*: Mihailova 1966: 187.
Dendrobaena hortensis: Mršić 1991: 622., Valchovski 2012: 92.

Material examined. HNHM/15803 2 ex., (No. 21) Burgas province, Strandcha Mts, Ropotamo Stream and its shore vegetation, 3km N of Jasna poljana, 30m, N42°18.644' E27°37.428', 08.04. 2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi; HNHM/15804 2 ex., (No. 19) Burgas province, Strandcha Mts, Veleka River S of Zvedec, 200m, N42°05.009' E27°25.662', 07.04. 2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi; HNHM/15817 1 ex., (No. 18) Burgas province, Strandcha (Bosna) Mts, Karamlâk stream and its gallery 3km W of Mladežko, 180m, N42°08.817' E27°24.950', 07. 04.2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi.

Dendrobaena octaedra (Savigny, 1826)

Enterion octaedrum Savigny, 1826: 183.
Dendrobaena octaedra: Černosvitov 1937: 83., Plisko 1963: 435., Zicsi & Csuzdi 1986: 118., Mršić 1991: 607., Valchovski 2012: 93.

Material examined. HNHM/16070 4 ex., (No. 13) Kărdžhali province, Zălti Djal Mts., Sedlarci, spring and limestone gorge NW of the village, 585m, N41°33.073' E25°01.783', 30.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/16078 2 ex., (No. 10) Smoljan province, Radjuva Planina, Pavelsko, beech forest and alpine grassland SE of the village, 1545m, N41°49.826' E24°44.657', 31.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/ 16083 1 ex., (No. 12) Smoljan province, Ardinski Djal Mts., Koritata, stream and mixed forest SW of the village, 995m, N41°24.089' E24°46.786', 30.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi; HNHM/16091 3 ex., (No. 11) Smoljan province, Perelik Mts., Smoljan, forest stream and spruce forest above (N of) the city, 1370m, N41° 36.524' E24°41.498', 31.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Dendrobaena veneta veneta (Rosa, 1886)

Allolobophora veneta Rosa, 1886: 674.
Dendrobaena veneta veneta: Mršić 1991: 613.

Material examined. HNHM/15580 1 ex., (No. 6) Sliven province, Stara Planina, Vârbishka Mts., above Medven, 420m, N42°50.543' E26°33.950', 04-05.09.2005., leg. M. Földvári, J. Kontschán, D. Murányi, T. Szüts.

Remark. This peregrine species is new to the fauna of Bulgaria.

Eisenia lucens (Waga, 1857)

Lumbricus lucens Waga, 1857: 161.
Eisenia submontana: Černosvitov 1934: 71., 1937: 79., Mihailova 1966: 184.
Allolobophora latens: Mihailova 1964: 164.
Eisenia lucens: Plisko 1963: 428., Mršić 1991: 500., Valchovski 2012: 94.

Material examined. HNHM/15569 1 ex., (No. 3) Montana province, Stara Planina, 892m, N43°12.319' E23°03.095', 28.06.2006., leg. Z. Barina, D. Pifkó, L. Lőkös; HNHM/15570 1 ex., (No. 2) Montana province, Stara Planina, 1002m, N43°08.381' E23°13.095', 28.06.2006., leg. Z. Barina, D. Pifkó, L. Lőkös; HNHM/15593 2 ex., (No. 1) Montana province, Berkovica, 15km along the road to the Petrohanski prohod, 1000m, 25.07.2009., leg. Z. Erőss, Z. Fehér; HNHM/15792 1 ex., (No. 5) Sliven province, Stara Planina (Slivenska Planina), beech forest N of Sinite Kamâni, 830m, N42°44.766' E26°25.243', 08.04.2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi; HNHM/15801 3 ex., (No. 20) Burgas province, Strandcha Mts, stream, gallery, rocks in secondary forest 5km of Malko Târnovo, 280m, N42°01.761' E27°28.418', 07.04.2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi; HNHM/16090 3 ex., (No. 11) Smoljan province, Perelik Mts., Smoljan, forest stream and spruce forest above (N of) the city, 1370m, N41°36.524' E24°41.498', 31.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Eisenia storkani (Černosvitov, 1934) stat. nov.

Eisenia rosea var. *storkani* Černosvitov 1934: 74., 1937: 80.
Eisenia (Dendrobaena) grandis storkani: Zicsi & Csuzdi 1986: 119.
Eisenia grandis storkani: Mršić 1991: 510., Valchovski 2012: 94.

Material examined. HNHM/15334 1 ex., (No. 4) Sliven province, Stara Planina, Slivenska Mts., Sinite Kamâni Natural Park, Karandila, karstic spring, 05.09.2005., leg. M. Földvári, J. Kontschán, D. Murányi, T. Szüts; HNHM/15582 1 ex., (No. 8) Sofia province, Rila Mts., Marica basin, Stream Prava Marica at Zavračica mountan hut, 2189m, N42°10.073' E23°38.483', 08.09.2005., leg. M. Földvári, J. Kontschán, D. Murányi, T. Szüts

Remarks. This species was described by Černosvitov (1934) as *Eisenia rosea* var. *storkani* from Belasica Mts., South-Western Bulgaria. Because of its fasciculated longitudinal musculature and the position of its clitellum (26–32) later, Zicsi & Csuzdi (1986) placed it into the *Eisenia grandis* species group, which unites large bodied species that live mainly in the Caucasus region and possess striped pigmentation. Considering the clitellum and musculature, this species may also belong to the *E. grandis* species group, but its small size and the lack of pigmentation shows that *E. storkani* should be regarded as a separate species. Probably *E. storkani* has closer relations with *E. ebneri* (Michaelsen, 1914), *E. kattoulasi* Zicsi & Michalis, 1981 and *E. oreophila* Szederjesi & Csuzdi 2012, all from Greece.

Eiseniella tetraedra (Savigny, 1826)

Enterion tetraedrum Savigny, 1826: 184.
Eiseniella tetraedra f. *typica*: Černosvitov 1934: 71., 1937: 78., Mihailova 1966: 183.
Eiseniella tetraedra mut. *hercynia*: Černosvitov 1937: 79., Mihailova 1966: 184.
Eiseniella tetraedra pupa: Valchovski 2012: 95.
Eiseniella tetraedra tetraedra: Zicsi & Csuzdi 1986: 120., Mršić 1991: 514., Valchovski 2012: 95.
Eiseniella tetraedra: Plisko 1963: 433., Csuzdi & Zicsi 2003: 153. (for complete synonymy)

Material examined. HNHM/15805 1 ex., (No. 19) Burgas province, Strandcha Mts., Veleka River S of Zvedec, 200m, N42°05.009' E27°25.662', 07.04.2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi.

Lumbricus terrestris Linneaus, 1758

Lumbricus terrestris (part.) Linneaus, 1758: 647.
Lumbricus terrestris: Černosvitov 1937: 90., Plisko 1963: 438., Zicsi & Csuzdi 1986: 120., Mršić 1991: 481., Valchovski 2012: 96.

Material examined. HNHM/15561 1 ex., (No. 7) Sofia province, Rila Mts., Rilski Manastir, 11.08.2005., leg. D. Murányi; HNHM/16081 1 ex., (No. 12) Smoljan province, Ardinski Djal Mts., Koritata, stream and mixed forest SW of the village, 995m, N41°24.089' E24°46.786', 30.05. 2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Octodrilus complanatus (Dugès, 1828)

Lumbricus complanatus Dugès, 1828: 289.
Octolasium complanatum: Černosvitov 1937: 90., Mihailova 1966: 193.
Octodrilus complanatus: Mršić 1991: 398., Valchovski 2012: 96.

Material examined. HNHM/16087 1 ex., (No. 14) Kărdžhali province, Boljarsko, Vransko, Krumovica River and a pasture E of the village, 200m, N41°29.505' E25°37.269', 29.05.2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

Octodrilus transpadanus (Rosa, 1884)

Allolobophora transpadana Rosa, 1884: 45., 1897: 4.
Octolasium rectum: Černosvitov 1934: 76., 1937: 90.
Octodrilus transpadanus: Mršić 1991: 371., Valchovski 2012: 97.

Material examined. HNHM/15809 1 ex., (No. 23) Burgas province, Rezovo, spring and puddles in secondary forest at the mouth of Rezovska River, 6m, N41°59.007' E28°01.648', 08.04. 2007., leg. L. Dányi, Z. Erőss, Z. Fehér, J. Kontschán, D. Murányi.

Octolasion lacteum (Örley, 1881)

Lumbricus terrestris var. *lacteus* Örley, 1881: 584.
Octolasium lacteum: Černosvitov 1934: 76., 1937: 89., Plisko 1963:432., Mihailova 1966: 193., Zicsi & Csuzdi 1986: 120.,
Octolasion tyrtaeum: Mršić 1991: 347.
Octolasion lacteum: Valchovski 2012: 98.

Material examined. HNHM/16082 1 ex., (No. 12) Smoljan province, Ardinski Djal Mts., Koritata, stream and mixed forest SW of the village, 995m, N41°24.089' E24°46.786', 30.05. 2012., leg. J. Kontschán, D. Murányi, T. Szederjesi.

DISCUSSION

According to the present and literature data, the number of recorded earthworm species and subspecies known from Bulgaria is 51. This seems to be relatively few, but we have to consider that Bulgaria is an under-researched area and there have been no focused earthworm collections except a few regions.

Besides, there are some uncertainties in the data published. Mihailova (1968) reported the presence of three Dacian endemisms from Bulgaria; *Octodrilus frivaldszkyi* (Örley, 1885), *Oc. exacystis* (Rosa, 1896) and *Oc. gradinescui* (Pop, 1938). However, *Oc. frivaldszkyi* lives solely in the Transylvanian Island Mts. (Apuseni) (Pop *et al.* 2010) so its presence in Bulgaria is inconceivable. *Oc. gradinescui* (Pop, 1938) occurs only inside the Carpathian Basin and doesn't cross the Carpathians (Csuzdi *et al.* 2011). Although *Oc. exacystis* (Rosa, 1896) is present on the outer side of the Carpathians (Pop 1949) as a typical montane species its occurrence in Bulgaria requires further corroboration.

Aporrectodea carpathica (Cognetti, 1927) a Carpathian endemism was also listed by Mihailova (1964) but this species is missing even from the Southern Carpathians (Csuzdi & Pop 2006).

Again Mihailova (1964) indicated the presence of *Perelia phoebea* (Cognetti, 1913) in Bulgaria. This species was described from Rhodos Isl., Greece and its occurrence in Bulgaria is not plausible.

Another uncertain data is *Allolobophora mehadiensis mehadiensis* (Rosa, 1895), which is also of Dacian origin, but it possesses a wider range, so its occurrence in Bulgaria is feasible, but needs confirmation.

The presence of *Bimastos parvus* (Eisen, 1874) a peregrine species of North American origin is also need to be corroborated. The previously published Hungarian and Romanian records all proved to be misidentifications of *Allolobophoridella eiseni* (Levinsen, 1884) (Csuzdi & Zicsi 2003).

The list of Valchovski (2012) contains also some highly disputed subspecies like *Dd. rubidus tenuis* and *Eis. tetraedra pupa* which are commonly regarded only as parthenogenetic forms (Csuzdi & Zicsi 2003). Consequently the present list of Bulgarian earthworms consists of 42 confirmed species and subspecies.

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Uropodina mites of the Balkan Peninsula (Acari: Mesostigmata)

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Abstract. 64 Uropodina mite species are listed from the countries of the Balkan Peninsula. Several new occurrences of the species found are given; all occurrences are depicted on maps. 24 species are listed from Albania, 22 from Greece, 21 from Croatia, 19 from Bulgaria, 17 from Montenegro, 14 from Macedonia, 13 from Serbia, 12 from Bosnia-Herzegovina and 3 from the European part of Turkey. Description and new illustrations of the female of *Polyaspinus feheri* Kontschán, 2003 are given. Ecological characteristics and zoogeography of the species listed are discussed and furthermore, a new key to the Balkanic Uropodina species is provided.

Keywords. Acari, Uropodina, faunistics, taxonomy, Balkan Peninsula, key to the species.

INTRODUCTION

Uropodina is one of the most characteristic groups of the Mesostigmata mites. They can be characterized as follows: relative short legs, reduced setae on legs, usually fused sternal and ventral shields, hypostomal setae situated in a row and the position of stigmata between coxae II and III.

Currently there are more than 2200 species known from all around the world, but uropodids reach their maximum diversity in the tropics. In spite of this fact, the most intensively studied countries [Slovakia (Mašán 2001), Romania, Germany (Wiśniewski 1993), Poland (Błoszyk 1999) and Hungary (Kontschán 2008)] are found in Europe. Seemingly, the most species rich country is Slovakia with more than 140 species listed (Mašán 2001). However, larger parts of Europe are scarcely investigated and the Uropodina fauna of the Balkan Peninsula is especially poorly studied.

Currently, the Balkan Peninsula consists of nine countries (in alphabetic order): Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Montenegro, Serbia (with Kosovo) and European part of Turkey. Although the Southern part of Romania lies on the Balkan Peninsula, some 90% of this country is found outside the Balkan, therefore its fauna is not dealt with in the present work.

The main goals of the present paper are summarizing all of the so far known data on the Uropodina mites of the Balkan Peninsula and give a general insight into the composition and distribution of the Uropodina fauna.

HISTORY OF THE UROPODINA RESEARCH IN THE BALKAN

The first mention of the Uropodina mites in the Balkan can be found in Willmann's (1941) monograph, in which he presented the cave dwelling mites of the Balkan of which five belonged to the suborder Uropodina. More than 50 years later, only a few more records and species were reported in the large summarizing work by Wisniewski & Hirschmann (1993) mentioning 13 species (two from Bulgaria, four from Greece, four from Croatia, one from Bosnia-Herzegovina and two from the ex-Yugoslavia). Parallel with these studies, Athias-Binche & Błoszyk (1985) studied the *Crinitodiscus* species with several zoogeographic notes to the occurrences in the Balkan Peninsula and later Stochowiak *et al.* (2008) presented some new occurrences of *Cilliba sellnicki* Hirschmann & Zirngiebl-Nicol, 1964 from Croatia.

The present author is working continuously on exploration the Uropodina fauna of the Balkan Peninsula since 2003, and firstly reported 19 species from Albania (Kontschán 2003a).

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Kontschán (2003b, 2010) studying the Uropodina fauna of Greece, described four new species and listed 14 species first time from this country. Uropodina materials from the former Yugoslavian countries (Croatia, Serbia-Montenegro and Macedonia) were studied in several cases as well (Kontschán 2005, 2007b, 2011), which resulted in reporting new occurrences of several species, description of six new species and resurrection of the genus *Capitodiscus* on the basis of a new species collected in Croatia. From Bulgaria, Kontschán (2004, 2007a) listed 14 species for the first time and furthermore described two species new to science.

MATERIAL AND METHODS

Soil, leaf litter, moss, lichen, ant, termites and bird nests were collected in different part of the Balkan Peninsula. The materials were put into plastic bags and during the expedition were placed in fridge boxes. After arriving home, the materials collected were extracted using the Berlese-method in the Hungarian Natural History Museum.

The clean mite samples were separated under stereo microscope. The Uropodina specimens were cleared by lactic acid, placed on deep and half covered slides, and identified under scientific microscope. The mites identified are stored in 70% ethanol and deposited in the Soil Zoology Collection of the Hungarian Natural History Museum.

All measurements are given in micrometres (μm). Collectors' acronyms are as follows: CSZ: Szilvia Czigány, DL: László Dányi, EZ: Zoltán Péter Erőss, FZ: Zoltán Fehér, HA: András Hunyadi, KJ: Jenő Kontschán, KT: Tibor Kovács, MD: Dávid Murányi, SZT: Tímea Szederjesi, UZS: Zsolt Ujvári.

TAXONOMY

UROPODINA

Superfamily Polyaspidoidea Evans, 1972

Trachytidae Trägårdh, 1938

Trachytes aegrota (C. L. Koch, 1841)

(Figures 1a, b and 10)

Celaeno aegrota C.L. Koch, 1841: 32.
Trachytes aegrota: Michael 1894: 313.

New records. Albania. Dibër district, Lurë area, Fushë Lurë, mixed pine-beech forest beneath the lakes, leaf litter1410m, N41°47.758' E20° 12.599', 20.V.2010., FZ, MD, UZS. *Bosnia-Herzegovina.* Ozren Mts, pine forest beneath the Mt. Ozren, 1361m, N43°58.581' E18°31.061'moss from soil, 05.X.2007., DL, KJ, MD. *Bulgaria.* Berkovitsa Province, Stara Planina, Berkovitsa, litter from beech forest E of Kom settlement, 1590m, N43°10.722'E23°04.922', 14.VIII.2009., MD. *Macedonia.* Šar Planina, Gorno Jelovce, stream in a beech forest S of the village, 1169m, N41°46'31.0" E20°48'14.1", from litter, 15.X. 2006. DL, KJ, MD., Jakupica Mts, Kapinovo, Babuna River and its gallery forest below the village, 575m, N41°36'54.3" E21°27'02.8", from litter, 19.X. 2006. DL, KJ, MD. *Montenegro.* Visitor Mts., Murino SW 6 km, gorge of the sidestream of Dosova stream at a sink-hole, 1425 m (mixed spruce forest, streamside vegetation) N42° 38.022' E19°51.005', 12.X.2009. DL, FZ,KJ, MD., Savino Polje E 1 km, Đalovica klisura, bank of Bistrica Reka, 609m. N43°04.244' E19°51. 15.X.2008. DL, FZ, KJ, MD. *Serbia.* Zlatibor district, Maljen Mts, Brajkovići, stream and its gallery N of the village, litter from mixed gallery forest, 445m, N44°02.244' E19°54.827', 17.III.2011. KT, MD., Đerdap Mts, Majdanpek, dry beech forest, N44°24'59.0" E21°56'16.6", from litter, 13.X. 2006. DL, KJ, MD., Đerdap Mts, Dobra, Reka Pesača, N44°34, 670, E21°59, 250, 386m, beech forest with stream, 28.X.2010. DL, KJ, UZS.

Previous records from the Balkan Peninsula. Albania. Mountain pass Shtylëss, Ibë (Kontschán 2003a). *Bulgaria*. Rila (Kontschán 2007a), *Greece*. Visina (Kontschán 2010). *Macedonia*. Popova Šapka (Kontschán 2005). *Montenegro*. Velika (Kontschán 2007b).

Distribution. Holarctis.

Remark. These are the first records from Bosnia-Herzegovina and Serbia.

Trachytes arcuatus Hirschmann & Zirngiebl-Nicol, 1969

(Figures 1c and 10)

Previous records from the Balkan Peninsula. Albania. Ndrsen (Kontschán 2003a). *Croatia*. Novo Zvečevo (Kontschán 2005).

Distribution. Central and Southern Europe.

Trachytes baloghi Hirschmann & Zirngiebl-Nicol, 1969

(Figure 10)

New records. Bulgaria. Smoljan province, Perelik Mts, Progled, Čepelarska River and its forest sidebrook NW the village 1260m, N41° 41.207' E24°41.961', 31.V.2012. KJ, MD, SZT., Kărdžhali province, Šarta Mts, Pelin, mixed pine forest NE of the village, 645m, N41°31.070' E25°47.010', 29.V.2012. KJ, MD, SZT., Smoljan province, Zălti Djal Mts, Ribnica, Ribnica Stream W of the village, 780m, N41°27.929' E24° 52.417', 30.V.2012., KJ, MD, SZT. *Greece.* West Greece, Aetolia-Acarnania peripheral unit, Panetoliko Mts, Agios Vlasios, open brook, pine forest and forest puddle S of the village, 825m, N38° 48.360' E21°30.676', 07.V. 2011. KJ, MD, SZT, UZS., Arkadia county, Parnon Mts, Mesorrahi, chestnut and oak mixed forest, S of the village, 900m, N37°22.222' E22°32.121', 02.IV.2009. DL, KJ, MD. *Macedonia.* Dojransko Basin, Nikolik, brook in macchia, 15.III.2008. CSZ, MD. *Serbia.* Đerdap Mts, between Miroč and Brza Palanka, N44°28.616, E22°21.074, 407m, beech forest, 27.X.2010. DL, KJ, UZS.

Previous records from the Balkan Peninsula. Albania. Quafësthamë (Kontschán 2003a), *Bulgaria*. Rupite (Kontschán 2004), Rila and Black Sea coastal hills (Kontschán 2007a).

Distribution. Central- and South Europe.

Remark. These are the first records from Greece, Macedonia and Serbia.

Trachytes irenae Pecina, 1970

(Figure 10)

New records. Bosnia-Herzegovina. Ozren Mts, Vilić, Rača Stream and its gallery beneath the village, 978m, N43°59.577' E18°31.099', leaf litter, 05.X.2007. DL, KJ, MD. *Bosnia-Herzegovina.* Grmeč Mts, Lanište Pass, secondary forest edge W of the pass, 524m, N44°32.750' E16° 41.166', from soil, 02.X.2007. DL, KJ, MD.

Distribution. Central Europe.

Remark. This is the first record from Bosnia-Herzegovina.

Trachytes pi Berlese, 1910

(Figure 10)

Previous records from the Balkan Peninsula. South-Herzegovina (Willmann 1941).

Distribution. Central Europe.

Trachytes parnonensis Kontschán, 2010

(Figure 10)

Previous records from the Balkan Peninsula. Greece. Parnon Mts (Kontschán 2010).

Distribution. Greece.

Trachytes lamda Berlese, 1904

(Figure 10)

New records. Bulgaria. Berkovitsa Province, Stara Planina, Berkovitsa, litter from beech forest E of Kom settlement, 1590m, N43°10.722' E23°04.922', 14.VIII.2009. MD. *Greece.* Evrytania peripheral unit, Anatoliki Fragista, small river, stream and plane tree forest N of the village, 550m, N38°57.577' E21°36.750'07.V.2011. KJ, MD, SZT, UZS. *Montenegro.* Osječenica 3 km S along the Morinj–Vilusi road, 940 m, beech forest, N42°40.658' E18°38.515', 09.X.2008. DL, FZ, KJ, MD.

Distribution. Europe.

Remark. These are the first records from Bulgaria, Greece, and Montenegro.

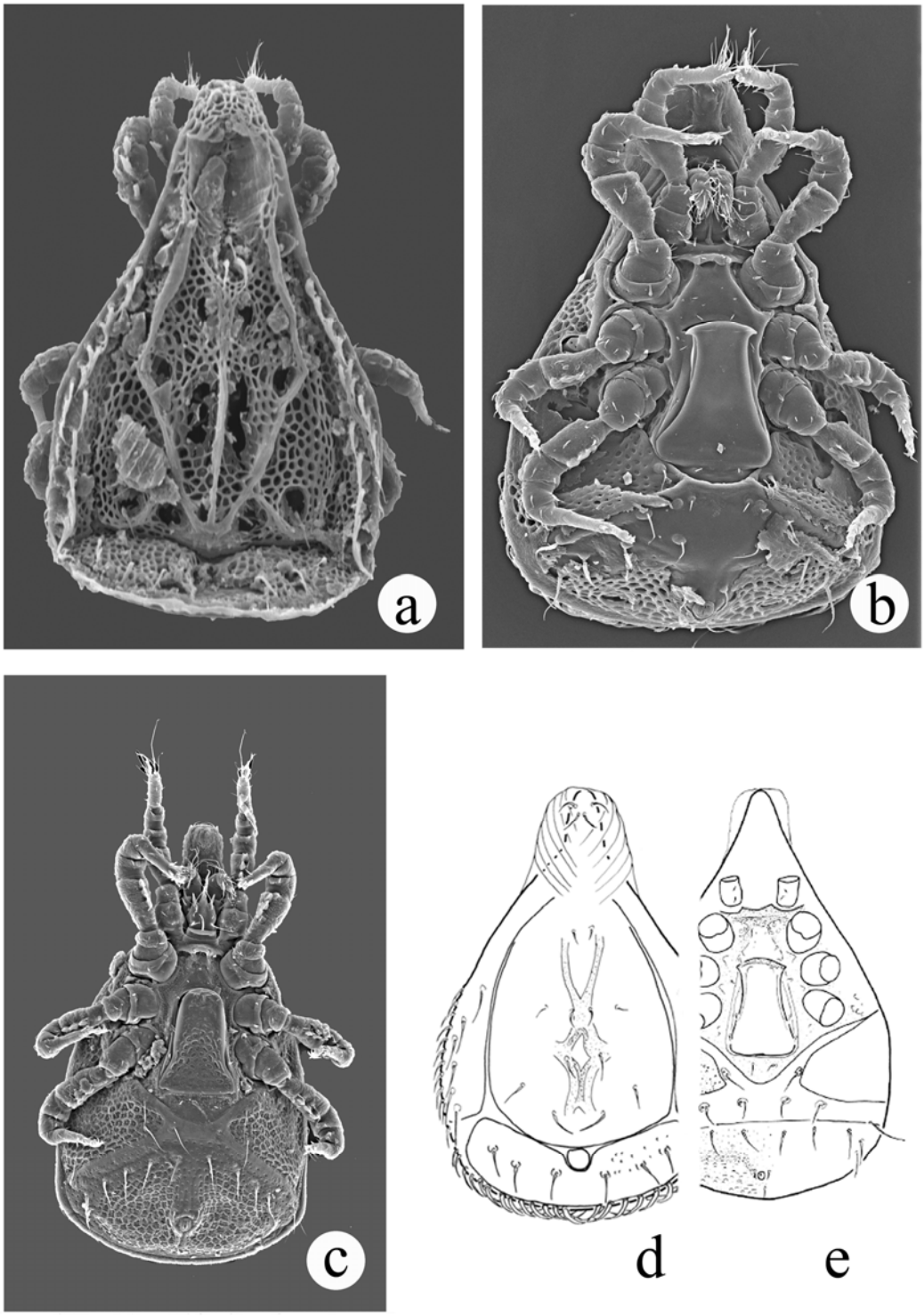


Figure 1. *Trachytes* species from the Balkan Peninsula; a = Dorsal view, b = ventral view of *T. aegrota* (scanning micrographs), c = ventral view of *T. arcuatus* (scanning micrograph), d = Dorsal view, e = ventral view of *T. szonjaae* (after Kontschán 2007b and modified).

***Trachytes carpathicus* Kontschán, 2007**

(Figure 10)

New record. Croatia. Papuk Mts, Slatinski Drenovac, Jankovac Str. and its gallery above the village, 243m, N45°31.966' E17°42.116', from moss, 01.X.2007. DL, KJ, MD.

Distribution. Romania, Croatia.

Remark. This is the first record from Croatia.

***Trachytes macedoniensis* Kontschán, 2005**

(Figure 10)

Previous records from the Balkan Peninsula. Macedonia. Gorno Jelovce (Kontschán 2005).

Distribution. Macedonia.

***Trachytes mystacinus* Berlese, 1910**

(Figure 10)

Previous records from the Balkan Peninsula. Croatia. Medvednica, Mala Kapella, Paklenica National Park (Kontschán 2007b).

Distribution. Slovenia, Slovakia, Austria, Switzerland, Italy, and Croatia.

Remark. This species seems to be an Alpine species.

***Trachytes papukiensis* Kontschán, 2005**

(Figure 10)

Previous records from the Balkan Peninsula. Croatia. Papuk Mountains (Kontschán 2005).

Distribution. Croatia.

***Trachytes szonjaae* Kontschán, 2007**

(Figures 1d, e and 10)

New record. Bosnia-Herzegovina. Konjic, sidestream of the Neretva River at their confluence, 290m, N43°38.322' E17°58.433', form leaf litter, 07.X.2007. DL, KJ, MD.

Previous records from the Balkan Peninsula. Croatia.Vetermicka (Kontschán 2007b).

Distribution. Croatia and Bosnia-Herzegovina.

Remark. This is the first record from Bosnia-Herzegovina.

***Polyaspinus feheri* Kontschán, 2003**

(Figures 2 and 10)

New record. Albania. Vlorë county, Çikë Mts, pine forest N of the Llogara Pass, moss, 11.III. 2008., CSZ, MD. *Greece.* Epirus, Preveza peripheral unit, Thesprotiko Mts, Vrisoula, stream and its plane tree gallery, and roadside puddle S of the village, 220m, N39°14.904' E20°41.735', 05.V.2011. KJ, MD, SZT, UZS.

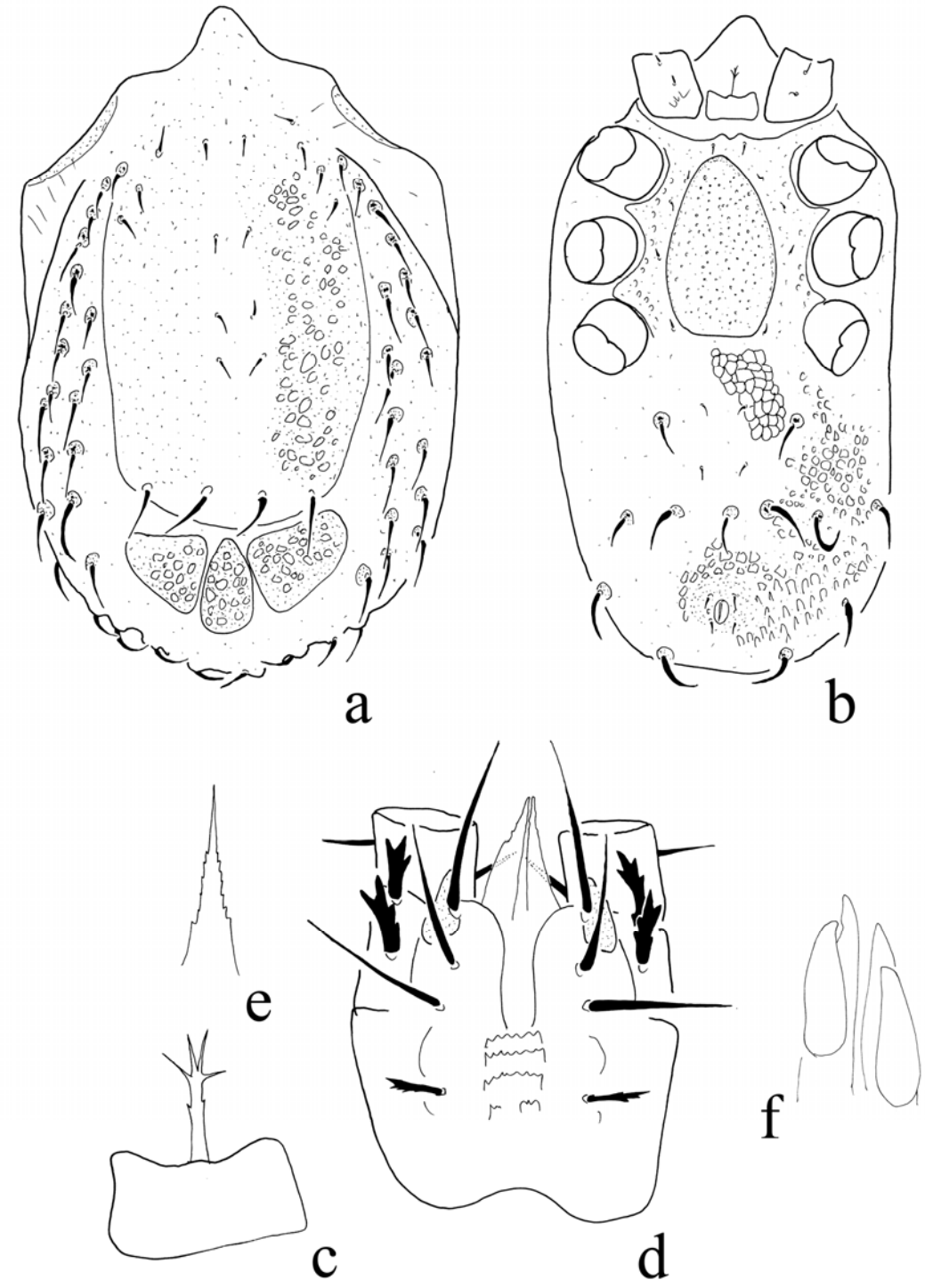
Previous records from the Balkan Peninsula. Albania. Quafësthamë (Kontschán 2003a).

Distribution. Albania and Greece.

Remarks. Kontschán (2003a) described this species exclusively on male specimens. The intensive collection works conducted recently in the Balkan peninsula resulted in finding several females of this species as well. Herewith is the description of the females.

Measurements. Length of idiosoma 590–620 µm, width 240–250 µm. Shape oblong, posterior margin rounded.

Dorsal idiosoma (Figure 2a). Dorsal and marginal shield fused anteriorly. Marginal shield reduced, caudally divided into several rounded platelets bearing needle-like setae. Dorsal shield covered by irregular pits and bearing smooth and needle-like setae, two pairs of long setae situated near posterior margin of dorsal shield. Pygidial shield present and divided into three parts, shape of medial part triangular. Surface of pygidial segments covered by irregular pits and not bear-



Figures 2. *Polyaspinus feheri* Kontschán, 2003. a = dorsal view, b = ventral view, c = tritosternum, d = ventral view of gnathosoma, e = epistome, f = ventral view of chelicera.

ing setae. Setae on membranous cuticle similar in shape and length to setae of dorsal shield.

Ventral idiosoma (Figure 2b). Most surface of sternal shield smooth, near coxae II–IV covered by some oval pits. Sternal setae short, smooth and needle-like, St1 localized near anterior margin of sterna shield, St2 at level of central area of coxae II, St3 at level of posterior margin of coxae II, St4 at level of central area of coxae III, St5 situated near basal edges of genital shield. Ventral shield with two pairs of short and needle-like setae on central area, other ventral setae long, robust and situated on small platelets. Adanal setae short and needle-like. Surface of ventral shield covered by reticulate sculptural pattern near basal line of genital shield and irregular pits can be found on caudal area of ventral idiosoma. Genital shield scutiform, covered by small oval pits and without process on its apical margin. Base of tritosternum wide, tritosternal laciniae divided into four smooth branches (Figure 2c).

Gnathosoma (Figure 2d). Corniculi horn-like, internal malae longer than corniculi and smooth. Hypostomal setae as follows: h1–h3 smooth and long, h4 short and marginally serrate. Palp trochanter with two robust and serrate setae. Epistome marginally serrate (Figure 2e), fixed digit of chelicerae longer than movable digit, without internal sclerotized nodes (Figure 2f).

Legs. All legs with wide and large lamellae.

Notes. Kontschán (2003a) mentioned that this species easy to recognized on the basis of the shape of medial segments of pygidial shield in males, this is true for the females as well, and furthermore the female differs from the other *Polyaspinus* species in the surface of genital shield, which is covered by small oval pits in *P. feheri*, but smooth in the other *Polyaspinus* species.

Polyaspididae Berlese, 1913

Polyaspis patavinus Berlese, 1881

(Figure 10)

Previous records from the Balkan Peninsula. Bulgaria. Rupite (Kontschán 2004). *Serbia*. Fruska Gora (Kontschán 2005).

Distribution. Europe.

Superfamily Uropodoidea Evans, 1957
Trematuridae Berlese, 1917

Trematurella graeca (Kontschán, 2003) comb. nov.

(Figure 10)

Trichouropoda graeca Kontschán, 2003b: 187–189.

New record. Greece. Central Greece: Evryta nia peripheral unit, Klisto, forest brook, spruce forest, wet meadow and roadside puddle N of the village, 1145m, N39°07.326’ E21°49.064’. 08.V. 2011., KJ, MD, SZT, UZS.

Previous records from the Balkan Peninsula. Greece. Thessaloniki (Kontschán 2003b), Tetrazi Mountains (Kontschán 2010).

Distribution. Greece.

Remarks. When Kontschán (2003) described this species, he followed Wiśniewski & Hirschmann’s (1993) system and therefore placed this species into the large and heterogeneous genus *Trichouropoda*. However, the species of the genus *Trematurella* with long and pilose dorsal and ventral setae and large deep irregular sculptural pattern well differ from the other *Trichouropoda* sensu lato species (Błoszyk 1999). *T. graeca* shares all these characteristics therefore I transfer it to the genus *Trematurella.*

Trematurella elegans (Kramer, 1882)

(Figures 3d and 10)

Uropoda elegans Kramer, 1882: 406–407.
Trematurella elegans: Błoszyk 1984: 70.

Previous records from the Balkan Peninsula. Greece: Thessaloniki (Kontschán 2003b).

Distribution. Europe.

Trematurella plana (Sellnick, 1931)

(Figure 10)

Urospina plana Sellnick, 1931: 730–736.
Trematurella plana: Hirschmann 1979: 64.

Previous records from the Balkan Peninsula. Bulgaria. Kozhuh hill (Kontschán 2004).

Distribution. Europe.

***Oodinychus ovalis* (C. L. Koch, 1839)**

(Figures 3a and 11)

Notaspis ovalis C. L. Koch, 1839: 21.
Oodinychus ovalis: Berlese 1920: 158.

New records. Albania. Mat district, Dejë Mts, limestone rocks in the upper valley of the Varoshit stream 1360m, N41°39.905' E20°12.497' moss from tree, 18.X.2010. FZ, MD, UZS. *Croatia.* Konavli Mts, Ljuta (near Gruda), Ljuta Potok, at the Konavoski dvori watermill, 60m gallery forest, N42°32.076' E18°22.610', 07.X. 2008. DL, FZ, KJ, MD. *Macedonia.* Sum, spring lake, grassland and pine forest above the Ohrid Lake, 16.10.2006 707m, N41° 10'58.3" E20° 37'55.7", from soil, 16X.2006. DL, KJ, MD. *Montenegro.* Sinjajevina Mts, Gornji Lipovo (*ca*. 12 km W of the Podgorica–Bijelo Polje road), spring section of Plašnica Stream, 1132m, rocky grassland, N42°52.924' E19°23.987', 11.X.2008, DL, FZ, KJ, MD., Osječenica 3 km S along the Morinj–Vilusi road, 940m, beech forest, N42° 40.658' E18°38.515', 09.X.2008. DL, FZ, KJ, MD., Sinjajevina Mts, Gornji Lipovo NW 4 km, 1351m, beech forest, N42°53.829' E19°23.140', 11.X.2008., DL, FZ, KJ, MD., Vojnik Mts, Mokro, *ca.* 5 km S of Šavnik on the Jasenovo Polje–Žabljak road, 1062m, beech forest, N42°56.858' E19°05.463', 09.X.2008. DL, FZ, KJ, MD. *Serbia.* Đerdap Mts, Klokočevac, stream valley with oak forest, 156m, N44°18'45.2" E22°08'57.1", leaf litter, 12.X.2006. DL, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë and Torovicë (Kontschán 2003a). *Bulgaria*. Arkutino (Kontschán 2004). *Greece*. Purgon (Kontschán 2003b). *Macedonia*. Mavrovi Anovi (Kontschán 2005). *Montenegro*. Grncar (Kontschán 2007b). *Serbia*. Fruska Gora (Kontschán 2005).

Distribution. Palearctis.

***Oodinychus karawaiewi* (Berlese, 1904)**

(Figures 3b and 11)

Urodinychus karawaiewi Berlese, 1904: 270–271.
Oodinychus karawaiewi: Schweitzer 1961: 188.
Trichouropoda querceti Hirschmann, 1972: 12–13. (Błoszyk 1999: 142.)

New records. Albania. Has district, Pashtrik Mts, rocks and alpine grassland beneath the peak region, soil beneath cliffs 1730m, N42°12.417' E20°31.709', 22.V.2010., FZ, MD, UZS. *Macedonia.* Jakupica Mts, Kapinovo, Babuna River and its gallery forest below the village, 19.10.2006 575m, N41°36'54.3" E21°27'02.8", litter, 19.X.2006., DL, KJ, MD.

Previous records from the Balkan Peninsula. Croatia. Papuk Mountains (Kontschán 2005).

Distribution. Europe.

Remark. These are the first records from Albania and Macedonia.

***Trematura patavina* (Canestrini, 1885)**

Trichouropoda patavina Canestrini, 1885: 190.
Trematura patavina: Berlese 1917: 12.

Previous records from the Balkan Peninsula. Bulgaria. No exact locality is given (Kontschán 2004).

Distribution. Palearctis.

***Pseuduropoda pecinai* (Hirschmann, 1972)**

(Figure 11)

Trichouropoda pecinai Hirschmann, 1972: 15.
Pseuduropoda pecinai: Hirschmann 1979: 64.

Previous records from the Balkan Peninsula. Croatia. Papuk Mountains (Kontschán 2005).

Distribution. Central Europe.

***Leiodinychus orbicularis* (C.L. Koch, 1839)**

(Figures 3c and 11)

Notaspis orbicularis C.L. Koch, 1839: 24.
Leiodynchus orbicularis: Berlese 1917: 12.

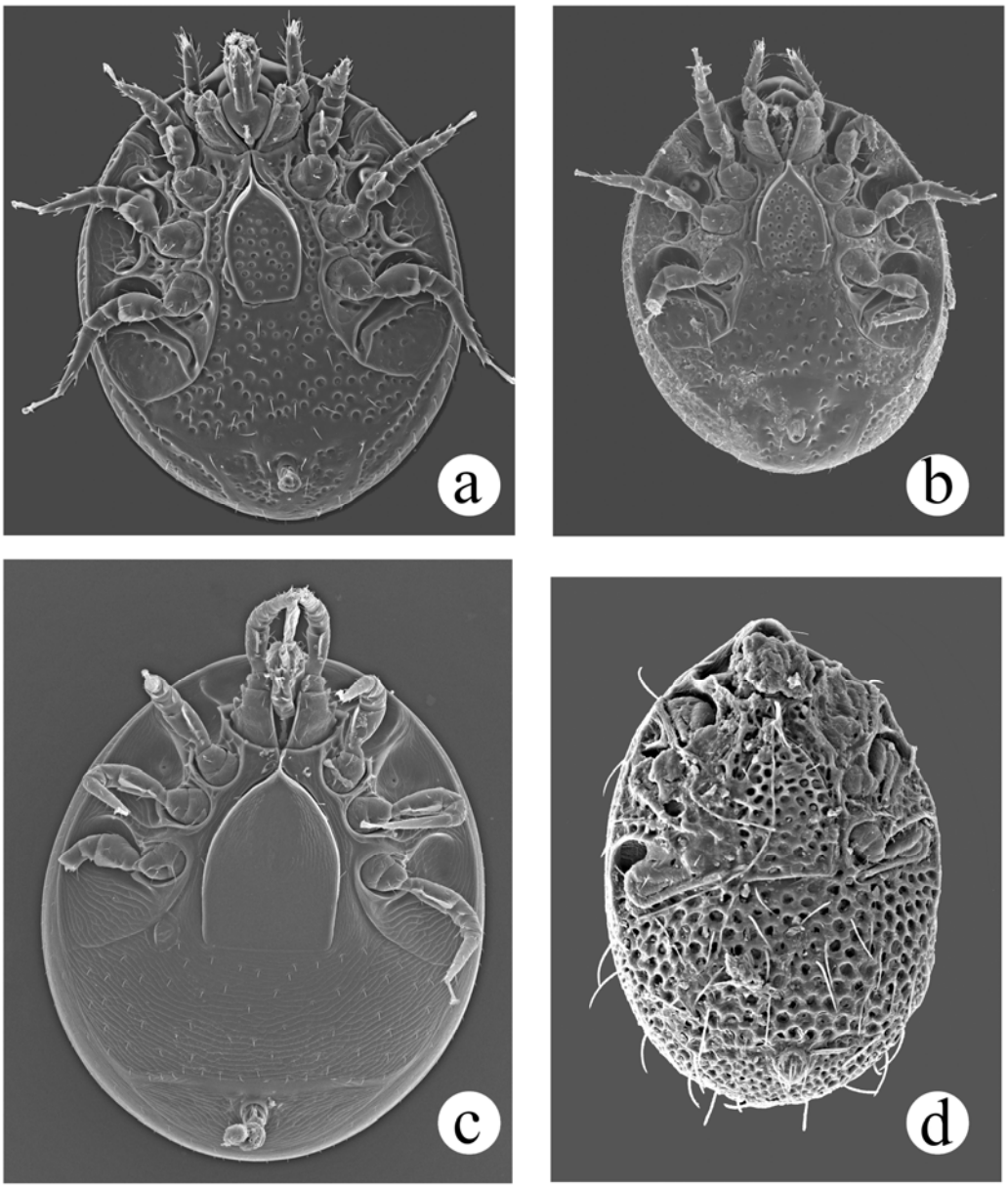


Figure 3. Ventral view of Trematurid species from the Balkan Peninsula. a = *O. ovalis*, b = *O. karawaiewi*, c = *L. orbicularis*, d = *T. elegans*.

New records. *Montenegro.* Savino Polje 1km E of Đalovica klisura, bank of Bistrica Reka, 609m, gallery, N43°04.244' E19°51.687', 15.X. 2008., DL, FZ, KJ, MD., Krivošije Mts, Mokrine 2km NW on the Herceg Novi–Trebinje road, near the Trebinje junction, 560m, open macchia N42° 30.855' E18°29.242', 07.X.2008., DL, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Croatia. Papuk Mountains (Kontschán 2005).

Distribution. Europe.

Remark. This is the first record from Montenegro.

Nenteriidae Hirschmann, 1979

Nenteria stylifera (Berlese, 1904)

(Figure 11)

Urodinychus stylifer Berlese, 1904: 21–22.
Nenteria stylifera: Hirschmann & Zirngiebl-Nicol 1964: 21.

New record. Macedonia. Sum, spring lake, grassland and pine forest above the Ohrid Lake, 707m, N41°10'58.3" E20°37'55.7", from soil, 16.X.2006., DL, KJ, MD.

Distribution. Europe.

Remark. This is the first record from Macedonia.

Dinychidae Berlese, 1916

Dinychus arcuatus (Trägardh, 1943)

(Figure 11)

Phyllodinychus arcuatus Trägardh, 1943: 8–10.
Dinychus arcuatus: Sellnick, 1945: 44.

New records. Croatia. Papuk Mts, Slatinski Drenovac, Jankovac Str. and its gallery above the village, 243m, N45°31.966' E17°42.116', from moss, 01.X.2007. DL, KJ, MD. *Montenegro.* Sinjajevina Mts, 16 km E of Boan, on the pass of Šavnik–Kolašin road, 1587m, peatbog, wet grassland, secondary mixed forest, N42°54.541', E19°16.271', 10.X.2008., DL, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë (Kontschán 2003a), *Macedonia*. Galičica Mountains (Kontschán 2005).

Distribution. Europe.

Remark. These are the first records from Croatia and Montenegro.

Dinychus eroessi Kontschán, 2003

(Figure 11)

Previous records from the Balkan Peninsula. Albania. Mountain pass Shtylëss, Torovicë (Kontschán 2003a).

Distribution. Albania.

Dinychus perforatus Kramer, 1882

(Figure 11)

New records. Bulgaria. Berkovitsa Province, Stara Planina, Berkovitsa, litter from beech forest E of Kom 1590m, N43° 10.722'E23°04.922', 14.VIII.2009. MD. *Greece.* Drama county, Orvilos Mts, stream in alder gallery, and limestone rocks above Katafito, 823m, N41°20.725' E23°40.463', leaf litter, 31.III.2007., DL, EZ, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Bulgaria. Rila Mountains (Kontschán 2007a). *Croatia*. Ivansica Mountains (Kontschán 2007b).

Distribution. Europe.

Remark. This is the first record from Greece.

Dinychus rilaensis Kontschán, 2007

(Figure 11)

Previous records from the Balkan Peninsula. Bulgaria. Rila Mountains (Kontschán 2007a).

Distribution. Bulgaria.

Dinychus woelkei Hirschmann & Zirngiebl-Nicol, 1969

(Figure 11)

New record. Montenegro. Sinjajevina Mts, Gornji Lipovo (*ca.* 12 km W of the Podgorica–Bijelo Polje road), spring section of Plašnica Stream, 1132m, rocky grassland, N42°52.924' E19°23.987', 11.X.2008., DL, FZ, KJ, MD.

Distribution. Central and Southern Europe.

Remark. This is the first record from Montenegro and from Balkan Peninsula.

Dinychus bincheaecarinatus Hirschmann, Wagrowska-Adamczyk &Zirngiebl-Nicol, 1984

(Figure 11)

New record. Bulgaria. Smoljan prov., Radjuva Planina, Pavelsko, beech forest and alpine grassland SE of the village, 1545m, N41°49.826' E24°

44.657', 31.V.2012., KJ, MD, SZT. *Montenegro.* Žijovo Mts, Katun Rikavac, beech forest 2 km W of Rikavačko Jezero, 1467m, secondary beech forest, N42°34.497' E19°35.870', 13.X.2008., DL, FZ, KJ, MD.

Previous records from the Balkan Peninsula. South-Bosnia (Willmann 1941).

Distribution. Central and Southern Europe.

Remark. This is the first record from Montenegro.

Urodiaspididae Trägårdh, 1944

Urodiaspis pannonica Willmann, 1951

(Figures 4c and 11)

Discourella shcherbakae Hirschmann, 1972: 13–14. (Mašán 2001: 184).

New records. Albania. Mat district, Dejë Mts, limestone rocks in the upper valley of the Varoshit stream 1360m, N41°39.905' E20°12.497', 18.V.2010. FZ, MD, UZS., Has district, Pashtrik Mts, rocks and alpine grassland beneath the peak region, soil beneath cliffs 1730m, N42°12.417' E20°31.709', 22.V.2010. FZ, MD, UZS., Shkodër district, Prokletije Mts, Okol, old beech forest near the village moss and leaf litter 840m, N42° 24.077' E19°45.948', 23.V.2010. FZ, MD, UZS., Has district, Pashtrik Mts, rocks and alpine grassland beneath the peak region, soil beneath cliffs 1730m, N42°12.417' E20°31.709', 22.V.2010. FZ, MD, UZS. *Bosnia-Herzegovina.* Ozren Mts, pine forest beneath the Mt. Ozren, 1361m, N43° 58.581' E18°31.061', moss from soil, 05.X.2007. DL, KJ, MD. *Greece.* Rodopi county, Sapka Mts, torrent in an oak forest 14km E of Nea Sanda, 651m, N41°07.672' E25°53.223', termite nest and decaying tree, 04.IV.2007. DL, EZ, FZ, KJ, MD. *Macedonia.* Jakupica Mts, Kapinovo, Babuna River and its gallery forest below the village, 575m, N41°36'54.3" E21°27'02.8", leaf litter, 19.X. 2006. DL, KJ, MD., Ogražden Mts, beech forest with a brook at the Prevedena Pass, 1167m, N41°33'57.6" E22°50'38.6", from leaf litter, 18.X.2006., DL, KJ, MD., Belasica Mts, Kolešino, waterfall of the Kolešino Stream in platan-beech forest above the village, *ca.* 500m, N41°23' E22°48',from litter, 18.X.2006. DL, KJ,MD., Šar Planina, Gorno Jelovce, stream in a beech forest S of the village, 1169m, N41°46'31.0" E20°48' 14.1", from litter, 15.X.2006. DL, KJ, MD. *Montenegro.* Sinjajevina Mts, Gornji Lipovo (*ca.* 12 km W of the Podgorica–Bijelo Polje road), spring section of Plašnica Stream, 1132m, rocky grassland, N42°52.924' E19°23.987', 11.X.2008. DL, FZ, KJ, MD., Lovćen Mts, 2 km from the Lovćen peak towards Njeguši, 1377m, beech forest, N42°23.994' E18°49.882', 08.X.2008. DL, FZ, KJ, MD. *Serbia.* Đerdap Mts, Majdanpek, mixed beech forest, 604m, N44°25'45.1" E21° 57'17.5", from leaf litter, 13.X.2006., DL, KJ, MD. *Turkey.* Istrancha Mts, stream and its alder gallery along the Demirköy–Dupnisa mağarasi road, 445m, N41°50.123' E27°39.666', leaf litter, 07.IV.2007. DL, EZ, FZ, KJ, MD., Kuru Mts, degraded oak forest at the pass of the Keşan–Gelibolu road, 300m, N40°42.446' E26°47.030', mixed moss, leaf litter and decaying tree, 05.IV. 2007., DL, EZ, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Mountain pass Shtylëss (Kontschán 2003a). *Greece*. Ossa Mountains and Vrondous Mountains (Kontschán 2010). *Macedonia*. Galičica Mountains, Gorno Jelovce (Kontschán 2005). *Montenegro*. Velika (Kontschán 2007b).

Distribution. Europe.

Remarks. These are the first records from Bosnia-Herzegovina and Serbia.

Urodiaspis tecta (Kramer, 1876)

(Figures 4a,b and 11)

Notaspis tectus Kramer, 1876: 79.
Urodiaspis tecta: Berlese 1916: 25.

New record. Albania. Has district, Pashtrik Mts, Salghinë, rocky maple-hazel forest N of the village, soil and leaf litter beneath trees 1405m, N42°12.046' E20°31.998', 22.V.2010. FZ, MD, UZS., Has district, Pashtrik Mts, rocks and alpine grassland beneath the peak region, soil beneath

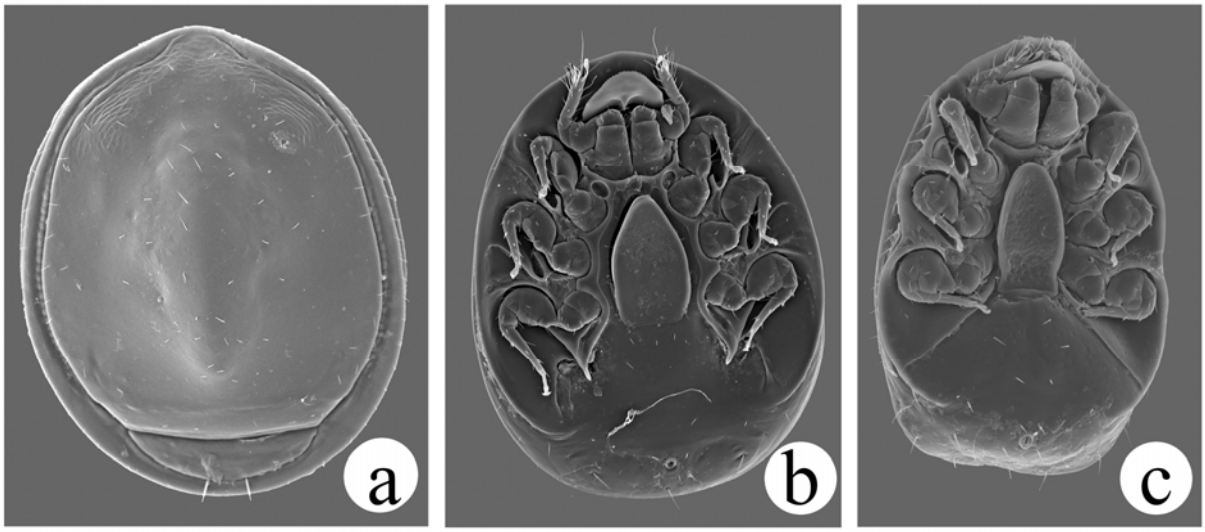


Figure 4. Scanning micrographs of Urodiaspis species from the Balkan; a = dorsal view, b = ventral view of *U. tecta,* c = ventral view of *U. pannonica*.

cliffs 1730m, N42°12.417' E20°31.709', 22.V. 2010. FZ, MD, UZS. *Bosnia-Herzegovina.* Bjelašnica Mts, Igman, old mixed pine forest W of the village, 1352m, N43°43.607' E18°16.467', moss and leaf litter, 06.X.2007. DL, KJ, MD. *Serbia.* Đerdap Mts, Majdanpek, mixed beech forest, 604m, N44°25'45.1" E21°57'17.5", leaf litter, 13.X.2006., DL, KJ, MD.

Previous records from the Balkan Peninsula. Bulgaria. Vithosa (Kontschán 2004) and Black sea coastal hills (Kontschán 2007a). *Serbia*. Bjeluhe (Kontschán 2007b).

Distribution. Europe.

Remark. These are the first records from Albania and Bosnia-Herzegovina.

Urodinychidae Berlese, 1917

Uroobovella fracta (Berlese, 1916)

(Figure 11)

Phaulodinychus fractus Berlese, 1916: 137.
Uroobovella fracta: Hirschmann & Zirngiebl-Nicol 1962: 58, 70.

New records. Albania. Dibër district, Lurë area, Fushë Lurë, inflowing brooks in mixed pine-beech forest at Vogël Lake, leaf litter 1700m, N41°47.552' E20°11.675', leaf litter, 20.V.2010. FZ, MD, UZS. *Montenegro.* Osječenica 3 km S along the Morinj–Vilusi road, 940m, beech forest, N42°40.658' E18°38.515', 09.X.2008., DL, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë (Kontschán 2003a). *Greece*. Sapka Mountains (Kontschán 2010).

Distribution. Central and Southern Europe.

Remarks. This is the first record from Montenegro.

Uroobovella difolveolata Hirschmann & Zirngiebl-Nicol, 1962

Previous records from the Balkan Peninsula. Bulgaria. Not exact localityis given (Kontschán 2004).

Distribution. Central and Southern Europe.

Uroobovella marginata (C. L. Koch, 1839)

Notaspis marginatus C. L. Koch, 1839: 22.
Uroobovella marginata: Hirschmann & Zirngiebl-Nicol 1965: 62.

Previous records from the Balkan Peninsula. Bulgaria. No exact locality is given (Kontschán 2004).

Distribution. Europe.

Uroobovella graeca Kontschán, 2010

(Figures 5a,b and 11)

Previous records from the Balkan Peninsula. Greece. Falakro, Orvilos and Dit-Rodopi Mountains (Kontschán 2010).

Distribution. Greece.

Uroobovella pulchella (Berlese, 1904)

(Figures 5f,g and 11)

Trachyuropoda (Janetiella) pulchella Berlese, 1904: 21.
Uroobovella pulchella: Hirschmann & Zirngiebl-Nicol 1962: 59, 73.

New records. Serbia. Đerdap Mts, Klokočevac, stream valley with oak forest, 156m, N44° 18'45.2" E22°08'57.1", leaf litter, 12.X.2006. DL, KJ, MD.

Distribution. Europe.

Remarks. This is the first record from Serbia and the whole Balkan Peninsula.

Uroobovella hungarica Hirschmann & Zirngiebl-Nicol, 1962

(Figures 5c and 12)

New records. Bosnia-Herzegovina. Bjelašnica Mts, Igman, old mixed pine forest W of the village, 1352m, N43°43.607' E18°16.467', moss and leaf litter, 06.X.2007. DL, KJ, MD., Grmeč Mts, Lanište Pass, secondary forest edge W of the pass, 524m, N44°32.750' E16°41.166', soil, 02.X. 2007., DL, KJ, MD.

Distribution. Central Europe.

Remarks. This is the first record from Bosnia-Herzegovina and from Balkan Peninsula.

Uroobovella reticulata (Willmann, 1941)

(Figure 12)

Pseuduropoda reticulata Willmann, 1941: 42–43.
Uroobovella reticulata: Hirschmann & Zirngiebl-Nicol 1972: 21.

Previous records from the Balkan Peninsula. South-Herzegovina (Willmann 1941).

Distribution. Bosnia-Herzegovina.

Uroobovella obovata (Canestrini & Berlese, 1884)

(Figure 12)

Uropoda obovata Canestrini & Berlese, 1844: 176.
Uroobovella obovata: Berlese 1903: 249.

New records. Turkey.: Istrancha Mts, brook in a beech forest along the Pinarhisar–Demirköy road, 778m, N41°45.289' E27°40.830', leaf litter and soil from a beech forest, 06.IV.2007. DL, EZ, FZ, KJ, MD.

Distribution. Europe.

Remark. These are the first records from the European part of Turkey and the Balkan Peninsula.

Dendrouropoda danyii (Kontschán, 2007) comb. nov.

(Figures 5d, e and 12)

Uroobovella danyii Kontschán, 2007b: 185–188.

Previous records from the Balkan Peninsula. Croatia. Nin (Kontschán 2007b).

Distribution. Croatia.

Remarks. The genus *Dendrouropoda* Willmann, 1959 possesses several unique characters, like the long and undulate peritremes and the tree-

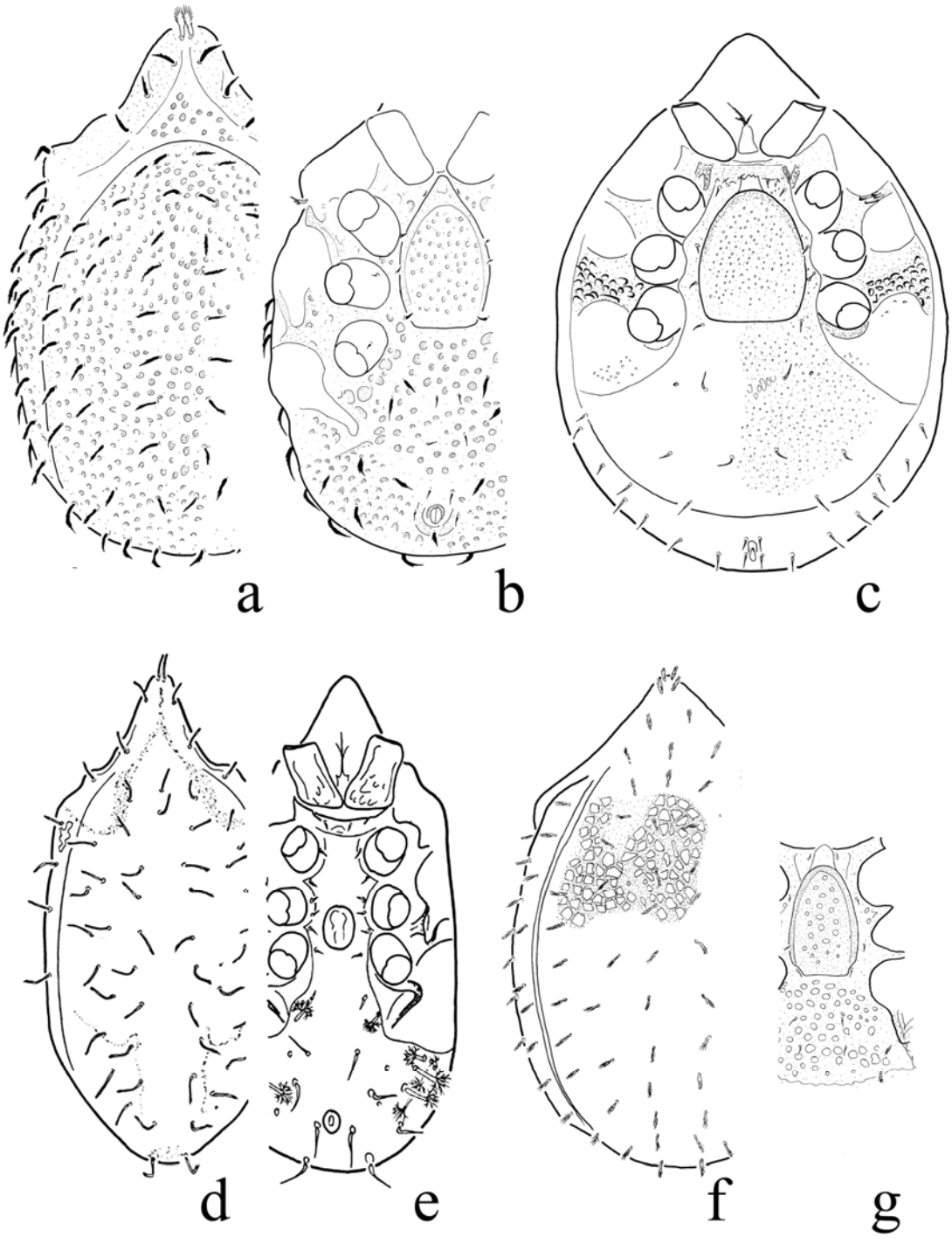


Figure 5. Urodinychid species from the Balkan Peninsula; a = Dorsal view, b = ventral view of *U. parnonensis*, c = ventral view of *Uroob. hungarica*, d = dorsal view, e = ventral view of *D. danyii*, f = dorsal view, g = intercoxal area of *U. pulcherrima* (after Kontschán 2010, 2007b and modified).

like dorsal and ventral setae. These characters can be observed in *U. danyii* as well; therefore here I place it into the genus *Dendrouropoda*.

Trachyuropodidae Berlese, 1917

Urojanetia muranyii (Kontschán, 2003) comb. nov.

(Figure 12)

Trachyuropoda muranyii Kontschán, 2003a: 12–13.

Previous records from the Balkan Peninsula. Albania. Lunik (Kontschán 2003a).

Distribution. Albania.

Remarks. Kontschán (2007c) resurrected the genus *Urojanetia* Berlese, 1917 and gave a new diagnosis for it. On the basis of this diagnosis, *T. muranyii* clearly belongs into this genus.

Urojanetia graeca (Sellnick, 1931) comb. nov.

Trachyuropoda graeca Sellnick, 1931: 736–743.

Previous records from the Balkan Peninsula. Greece.

Distribution. Greece.

Remarks. According to the revised diagnosis of *Urojanetia* Berlese, 1917 (Kontschán 2007c) this species shares all of the important characters with it. Therefore I place *T. graeca* into the genus *Urojanetia*.

Urojanetia excavata (Wasmann, 1899)

(Figures 6d and 12)

Glyphopsis coccinea Wasman var. *excavata* Wasmann, 1899: 168–169.
Urajanetia excavata: Balogh 1938: 108.

New record. Albania. Tepelenë county, Griba Mts, Progonat, Gurrit Stream E of the village, shore moss, 13.III.2008., CSZ, MD.

Distribution. Europe.

Remarks. This is the first records from Albania and Balkan Peninsula.

Urojanetia cristiceps (Canestrini, 1884)

(Figure 12)

Uropoda cristiceps Canestrini, 1884: 720.
Trachyuropoda cristiceps: Berlese 1903: 354–355.

New record. Albania. Dibër district, Lurë area, Humbla, stream in pine forest SE of the settlement, soil and litter beneath pine trees 1215m, N41°48.127' E20°09.272', 05.V.2010. FZ, MD, UZS.

Distribution. Europe.

Remarks. This is the first records from Albania and also the Balkan Peninsula.

Urotrachys formicaria (Lubbock, 1881)

(Figures 6e and 12)

Uropoda formicaria Lubbock, 1881: 386.
Urotracyhs formicarius Berlese 1903: 382–384.

New record. Albania. Dibër district, Lurë area, Humbla, stream in pine forest SE of the settlement, soil and litter beneath pine trees 1215m, N41°48.127' E20°09.272', 05.V.2010., FZ, MD, UZS.

Distribution. Europe.

Remarks. This is the first records from Albania and Balkan Peninsula as well.

Oplitidae Johnston, 1968

Oplitis conspicua (Berlese, 1903)

(Figure 12)

Uroplitella conspicua Berlese, 1903: 250.
Oplitis conspicua: Hirschmann & Zirngiebl-Nicol 1964: 22.

New record. Greece. Central Greece, Evrytania peripheral unit, Timfristos Mts, Ano Kalesmeno, forest brook and spruce forest E of the village, 980m, N38°54.931' E21°43.825', 07.V.2011. KJ, MD, SZT, UZS.

Distribution. Europe.

Remarks. This is the first records from Greece and Balkan Peninsula.

Cillibidae Trägårdh, 1944

Cilliba vellas Kontschán, 2010

(Figures 7d, e and 12)

Previous records from the Balkan Peninsula. Greece. Kalpaki (Kontschán 2010).

Distribution. Greece.

Cilliba sellnicki Hirschmann & Zirngiebl-Nicol, 1964

(Figures 7c and 12)

New records. Bulgaria. Smoljan province, Kajnadinski Djal Mts, Rudozem, beech forest NW of the city 975m, N41°30.707' E24°48.871', 30.V.2012. KJ, MD, SZT. *Macedonia.* Šar Planina, Tetovo, Popova Šapka, brook in alpine grassland, 1792m, N42°00'54.6" E20°52'36.7", from moss, 05.X.2006. DL, KJ, MD., Maleševski Planina, Berovo, stream in a beech forest above the Berovo Lake, 975m, N41°40'18.4" E22°55' 15.4", leaf litter, 18.X. 2006. DL, KJ, MD. *Montenegro.* Savino Polje 1 km E of Đalovica klisura, bank of Bistrica Reka, 609m, gallery, N43°04.244' E19°51.687', 15.X.2008. DL, FZ, KJ, MD., Lovćen Mts, 2 km from the Lovćen peak towards Njeguši, 1377m, beech forest, N42°23.994' E18°49.882', 08.X.2008. DL, FZ, KJ, MD., Sinjajevina Mts, Gornji Lipovo (*ca.* 12 km W of the Podgorica–Bijelo Polje road), spring section of Plašnica Stream, 1132m, rocky grassland, N42°52.924' E19°23.987', 11.X.2008. DL, FZ, KJ, MD. *Serbia.* Zlatibor district, Maljen Mts, Brajkovići, stream and its gallery N of the village, litter from mixed gallery forest, 445m, N44°02.244' E19°54.827', 17.III.2011. KT, MD.

Previous records from the Balkan Peninsula. Croatia: Postojne, Plitriéka Jezera (Stochowiak et al. 2008).

Distribution. Europe and Middle-East.

Remarks. These are the first records from Macedonia, Montenegro and Serbia.

Cilliba erlangensis Hirschmann & Zirngiebl-Nicol, 1969

(Figures 7b and 12)

Uropoda (Cilliba) erlangensis Hirschmann & Zirngiebl-Nicol, 1969: 26.
Cilliba erlangensis: Błoszyk 1984: 70.

New records. Bosnia-Herzegovina. Konjic, sidestream of the Neretva River at their confluence, 290m, N43°38.322' E17°58.433', leaf litter,07.X.2007. DL, KJ, MD., Igman Mts, Vrelo Bosne, Bosna Springs, 511m, N43°49.221' E18°16.063', moss from rock, 06.X.2007. DL, KJ, MD. *Croatia.* Konavli Mts., Ljuta (near Gruda), Ljuta Potok, at the Konavoski dvori watermill, 60m, gallery forest, N42°32.076' E18° 22.610', 07.X.2008. DL, FZ, KJ, MD. *Montenegro.* Vojnik Mts, Mokro, *ca.* 5 km S of Šavnik on the Jasenovo Polje–Žabljak road, 1062m, beech forest, N42°56.858' E19°05, 09.X.2008. DL, FZ, KJ, MD. *Serbia.* Đerdap Mts, Majdanpek, mixed beech forest, 604m, N44°25'45.1" E21°57'17.5", leaf litter, 13.X.2006. DL, KJ, MD., Đerdap Mts, Majdanpek, dry beech forest, 141m, N44°24'59.0" E21°56'16.6", from litter, 13.X.2006. DL, KJ, MD. *Turkey.* Istrancha Mts, Alabalik stream and its gallery along the Pinarhisar–Demirköy road, 538m, N41°44.667' E27°39.279', leaf litter, 06.IV.2007. DL, EZ, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Librazhd (Kontschán 2003a). *Croatia*. Mala Kapella, Paklenica National Park (Kontschán 2007b). *Serbia*. Novoselo (Kontschán 2007b) Fruska-Gora (Kontschán 2005).

Distribution. Europe.

Remarks. These are the first records from Bosnia-Herzegovina and Montenegro.

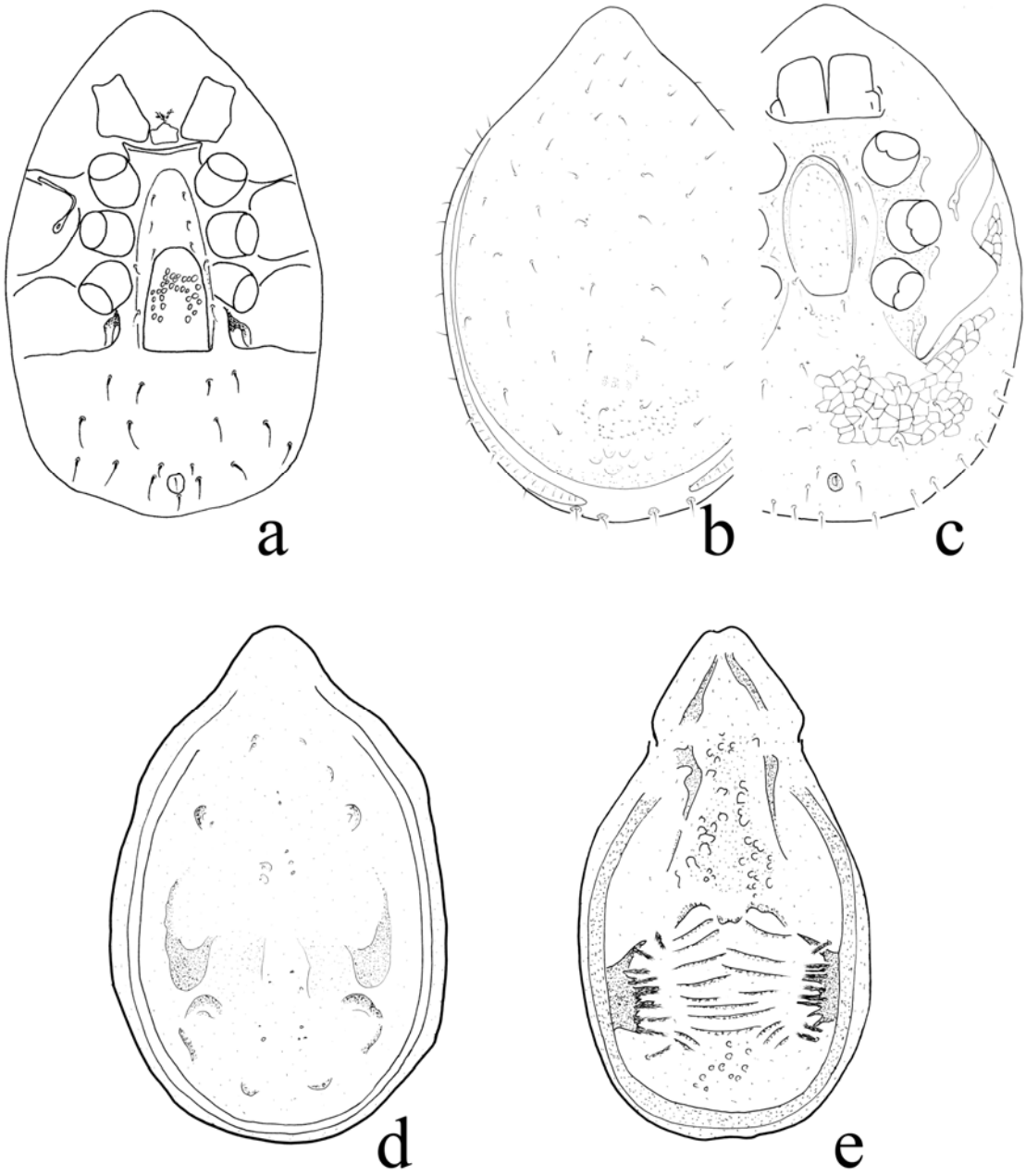


Figure 6. Uropodina species from the Balkan Peninsula; a = ventral view of *Urop. hungarica*, b = dorsal view, c = ventral view of *U. minima*, d = dorsal view of *U. excavata*, e = dorsal view of *U. formicaria*.

Cilliba cassidea (Hermann, 1804)

(Figures 7a and 12)

Notaspis cassideus Hermann, 1804: 93.
Cilliba cassidea: Michael, 1894: 307.

New records. Bosnia-Herzegovina. Konjic, sidestream of the Neretva River at their confluence, 290m, N43°38.322' E17°58.433', leaf litter, 07.X.2007. DL, KJ, MD. *Macedonia.* Šar Planina, Tetovo, Popova Šapka, spring in a meadow and

degraded beech forest, 1426m, N42°00’57.7” E20°54’38.6”, from litter, 15.X.2006. DL, KJ, MD., Šar Planina, Gorno Jelovce, stream in a beech forest S of the village, 1169m, N41°46’ 31.0” E20°48’14.1”, from litter, 15.X.2006. DL, FZ, KJ, MD. *Montenegro.* Visitor Mts, 6 km SW of Murino, gorge of the sidestream of Dosova stream at a sink-hole, 1425m, mixed spruce forest, streamside vegetation, N42°38.022' E19°51.005', 12.X.2008. DL, FZ, KJ, MD., Lovćen Mts, 2 km from the Lovćen peak towards Njeguši, 1377m, beech forest, N42°23.994' E18°49.882', 08.X. 2008. DL, FZ, KJ, MD., Sinjajevina Mts, Gornji Lipovo (*ca.* 12 km W of the Podgorica–Bijelo Polje road), spring section of Plašnica Stream, 1132m, rocky grassland, N42°52.924' E19° 23.987', 11.X.2008. DL, FZ, KJ, MD. *Serbia.* Đerdap Mts, Majdanpek, mixed beech forest, 604m, N44°25’45.1” E21°57’17.5”, leaf litter, 13.X.2006., DL, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë (Kontschán 2003a). *Croatia*. Psunj Mts (Kontschán 2005), Medvednica and Ivansica Mts, Mala Kapella (Kontschán 2007b). *Greece*. Olimpos Mts (Kontschán 2003b). *Montenegro*. Velika (Konstchán 2007b). *Serbia*. Bjeluhe (Kontschán 2007b), Fruska-Gora (Kontschán 2005). South-Herzegovina (Willmann 1941).

Distribution. Europe.

Uropodidae Kramer, 1881

Uropoda hungarica Kontschán, 2004

(Figures 6a and 12)

New records. Serbia. Đerdap Mts, Majdanpek, mixed beech forest, 604m, N44°25’45.1” E21° 57’17.5”, leaf litter, 13.X.2006., Đerdap Mts, Majdanpek, mixed beech forest, 604m, N44° 25’45.1” E21°57’17.5”, leaf litter, 13.X.2006. DL, KJ, MD.

Previous records from the Balkan Peninsula. Croatia. Papuk Mts (Kontschán 2005), Medvednica (Kontschán 2007b).

Distribution. Hungary and Croatia.

Remarks. This is the first record from Serbia.

Uropoda kargi Hirschmann & Zirnbiegel-Nicol, 1969

(Figure 12)

Previous records from the Balkan Peninsula. Albania. Ndrsen (Kontschán 2003a).

Distribution. Europe.

Uropoda mazsalakiae Kontschán, 2005

(Figure 12)

Previous records from the Balkan Peninsula. Croatia. Bibinje (Kontschán 2005), Nin, Sibenik, Grebastica (Kontschán 2007b). *Greece*. Trinisa (Kontschán 2010).

Distribution. Croatia and Greece.

Uropoda mitis (Leonardi, 1899)

(Figure 13)

Dinychus mitis Leonardi, 1899: 924–926.
Uropoda (Phaulodinychus) mitis: Hirschmann & Zirngiebl-Nicol 1969: 127.

New records. Greece. Epirus, Preveza peripheral unit, Mitikas, bush and rocky seashore of the Ionian Sea at the village, N39°00.106’ E20° 42.084’, 05.V.2011. KJ, MD, SZT, UZS., Rodopi county, Sapka Mts, torrent in an oak forest 14km E of Nea Sanda, 651m, N41°07.672’ E25° 53.223’, termite nest and decaying tree, 04.IV. 2007. DL, EZ, FZ, KJ, MD.

Distribution. Italy and Greece.

Remarks. This is the first record from Greece.

Uropoda minima Kramer, 1882

(Figures 6b, c and 13)

Cilliba minima: Kontschán 2007a: 40.

New records. Albania. Vlorë county, Çikë Mts, pine forest N of the Llogara Pass, moss, 11.III.2008., CSZ, MD. *Greece.* Epirus, Preveza

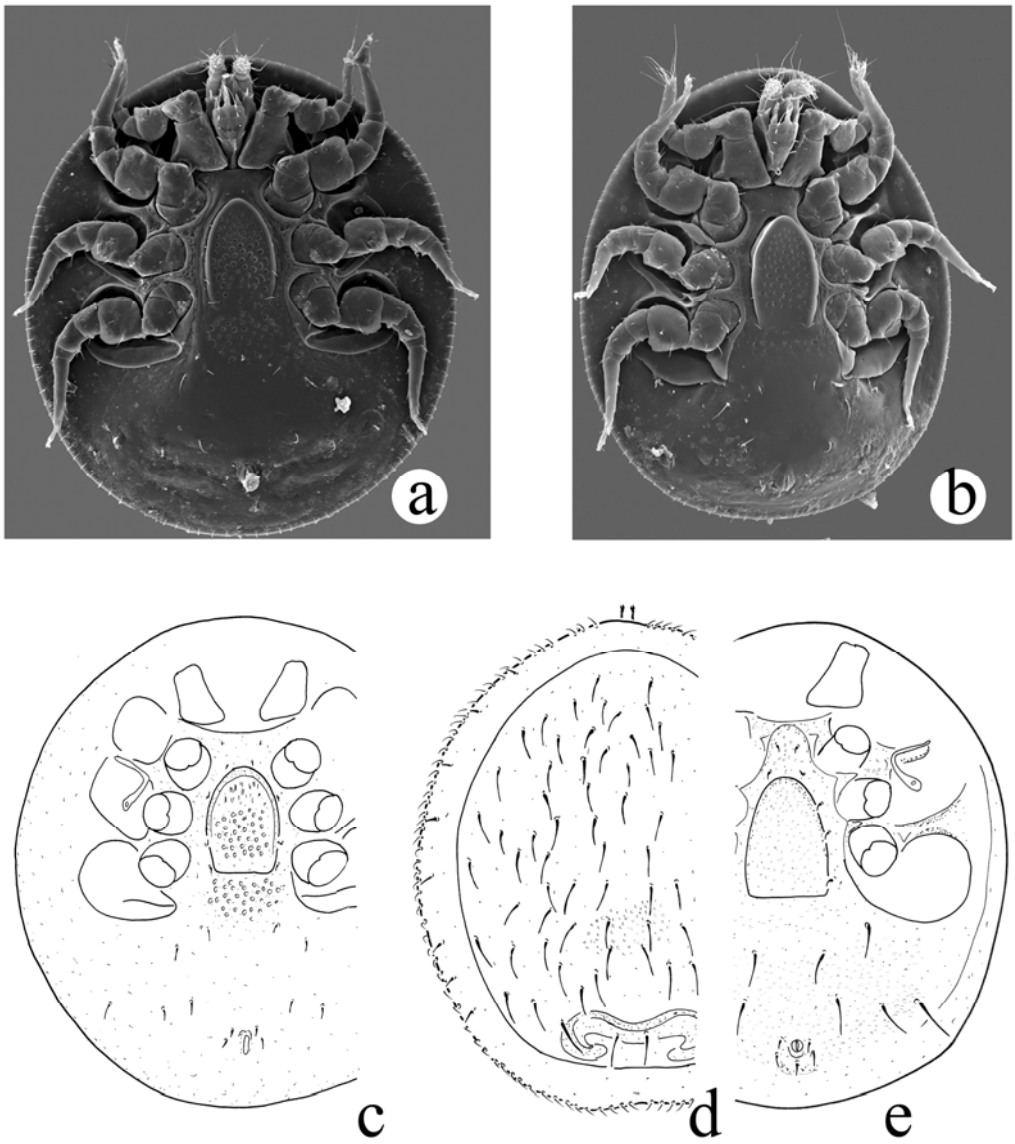


Figure 7. Cillibid species from the Balkan Peninsula; a = ventral view of *C. cassidea*, b = ventral view of *C. erlangensis* c = ventral view of *C. sellnicki*, d = dorsal view, e = ventral view of *C. vellas* (after Kontschán 2010 and modified).

peripheral unit, Mitikas, bush and rocky seashore of the Ionian Sea at the village, N39°00.106' E20°42.084', 05.V.2011. KJ, MD, SZT, UZS., Central Greece: Evrytania peripheral unit, Timfristos Mts, Ano Kalesmeno, forest brook and spruce forest E of the village, 980m, N38°54.931' E21°43.825', 07.V.2011. KJ, MD, SZT, UZS., Kozani county, Morfi, open oak forest with a temporary brook W of the village, sifted litter and soil, 14.III.2008. CSZ, MD., Thessaly, Trikala peripheral unit, Kerketio Mts, Pertouli, open stream and wet meadow E of the village, 1175m, N39°32.588' E21°30.662', 09.V.2011. KJ, MD, SZT, UZS., Thrace, Evros peripheral unit, Anatoliki Rodopi, Roussa, open brook and dry forest N of the village 360m, N41°18.636' E26°01.055',

28.V.2012. KJ, MD, SZT. *Macedonia.* Sum, spring lake, grassland and pine forest above the Ohrid Lake, 707m, N41°10'58.3" E20°37'55.7", from soil, 16.X.2006. DL, KJ, MD., Šar Planina, Tetovo, Popova Šapka, brook in alpine grassland, 1792m, N42°00'54.6" E20°52'36.7", bird nest 15.X.2006. DL, KJ, MD., Šar Planina, Gorno Jelovce, stream in a beech forest S of the village, 1169m, N41°46'31.0" E20°48'14.1", from litter, 15.X.2006. DL, KJ, MD., Zajas municipality, Zajaska planina, beech forest at Straza Pass litter 1220m. N41°40.306'E20°51.258', 18.VII.2010. MD., Zajas municipality, Zajaska planina, beech forest at Straza Pass litter 1220m. N41°40.306' E20°51.258', 18.VII.2010. MD. *Montenegro.* Vojnik Mts, Mokro, *ca.* 5 km S of Šavnik on the Jasenovo Polje–Žabljak road, 1062m, beech forest, N42°56.858' E19°05.463', 09.X.2008., DL, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë and Torovicë (Kontschán 2003a). *Bulgaria*. Rupite, Rhodope (Kontschán 2004), Rila (Kontschán 2007a). *Croatia*. Papuk Mts (Kontschán 2005). *Greece*. Planitero, Ossa Mts, Taigetos Mts, Vrondous Mts (Kontschán 2010).

Distribution. Europe.

Remarks. These are the first records from Macedonia and Montenegro.

Uropoda silvatica Hutu, 1976

(Figure 13)

New records. Albania. Vlorë county, Çikë Mts, pine forest N of the Llogara Pass, moss, 11.III.2008., CSZ, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë (Kontschán 2003a). *Bulgaria*. Rupite (Kontschán 2004).

Distribution. Romania, Albania, Bulgaria.

Neodiscopoma splendida (Kramer, 1882)

(Figures 8b and 13)

Uropoda splendida Kramer, 1882: 414–416.
Neodiscopoma splendida Vitzthum 1943: 785.

New records. Albania. Has district, Pashtrik Mts, Salghinë, rocky maple-hazel forest N of the village, soil and leaf litter from beneath trees 1405m, N42°12.046' E20°31.998', 22.V.2010. FZ, MD, UZS. Dibër district, Lurë area, Mërkuth, limestone rocks under mixed forest, S of the village, soil and leaf litter from rock split 1015m, N41°48.808' E20°08.384', 20.V.2010. FZ, MD, UZS. Mat district, Dejë Mts, limestone rocks in the upper valley of the Varoshit stream 1360m, N41°39.905' E20°12.497', 18.V.2010. FZ, MD, UZS. Periferi Shkodër, W of Shllak (18 km from the Mes bridge) 1020m, limestone rocks, 16.IV.2006. EZ, FZ, HA, MD. Krujë county, Krujë, pine forest beneath the city, litter and moss, 06.III.2008. CSZ, MD. Vlorë county, Çikë Mts, pine forest N of the Llogara Pass, moss, 11.III.2008. CSZ, MD. Periferi Dibër, *ca*. 3 km W of Cidhnë along the footpath to Gurrë-Lurë, gorge of Pr. i Setës 730 m, 12.IV.2006. EZ, FZ, HA, MD. Mat district, Dejë Mts, Varoshit stream at the Shkanderbeu Cliff, N of Murrë Pass, opened mixed forest (beech, oak, hornbeam, sallow, juniper), leaf litter, 970m, N41°38.791' E20°11.408', 18.V.2010. FZ, MD, UZS. Dibër district, Korab Mts, Radomirë, alpine meadow, spring and stream E of the village, moss from rocks 1440m, N41°49.043' E20°30.013', 17.V. 2010., FZ, MD, UZS. Shkodër district, Prokletije Mts, Kir, rocky torrent S of the village, dry mixed forest, moss and litter from cliffs 320m, N42° 12.854' E19°42.349', 23.V.2010. EU, FZ, KJ, MD. *Bosnia-Herzegovina.* Konjic, sidestream of the Neretva River at their confluence, 290m, N43° 38.322' E17°58.433', from leaf litter, 07.X.2007. DL, KJ, MD. Ozren Mts, Vilić, Rača Stream and its gallery beneath the village, 978m, N43° 59.577' E18°31.099', from leaf litter, 05.X.2007. DL, KJ, MD. Bjelašnica Mts, Igman, old mixed pine forest W of the village, 1352m, N43°43.607' E18°16.467', from leaf litter and moss, 06.X.2007. DL, KJ, MD. Grmeč Mts, Lanište Pass, secondary forest edge W of the pass, 524m, N44°32.750' E16°41.166', from soil,02.X.2007. DL, KJ, MD. *Bulgaria*. Smoljan province, Kajnadinski Djal Mts, Rudozem, beech forest NW of the city 975m, N41°30.707' E24°48.871', 30.V. 2012. KJ, MD, SZT. *Croatia.* Konavli Mts., Ljuta

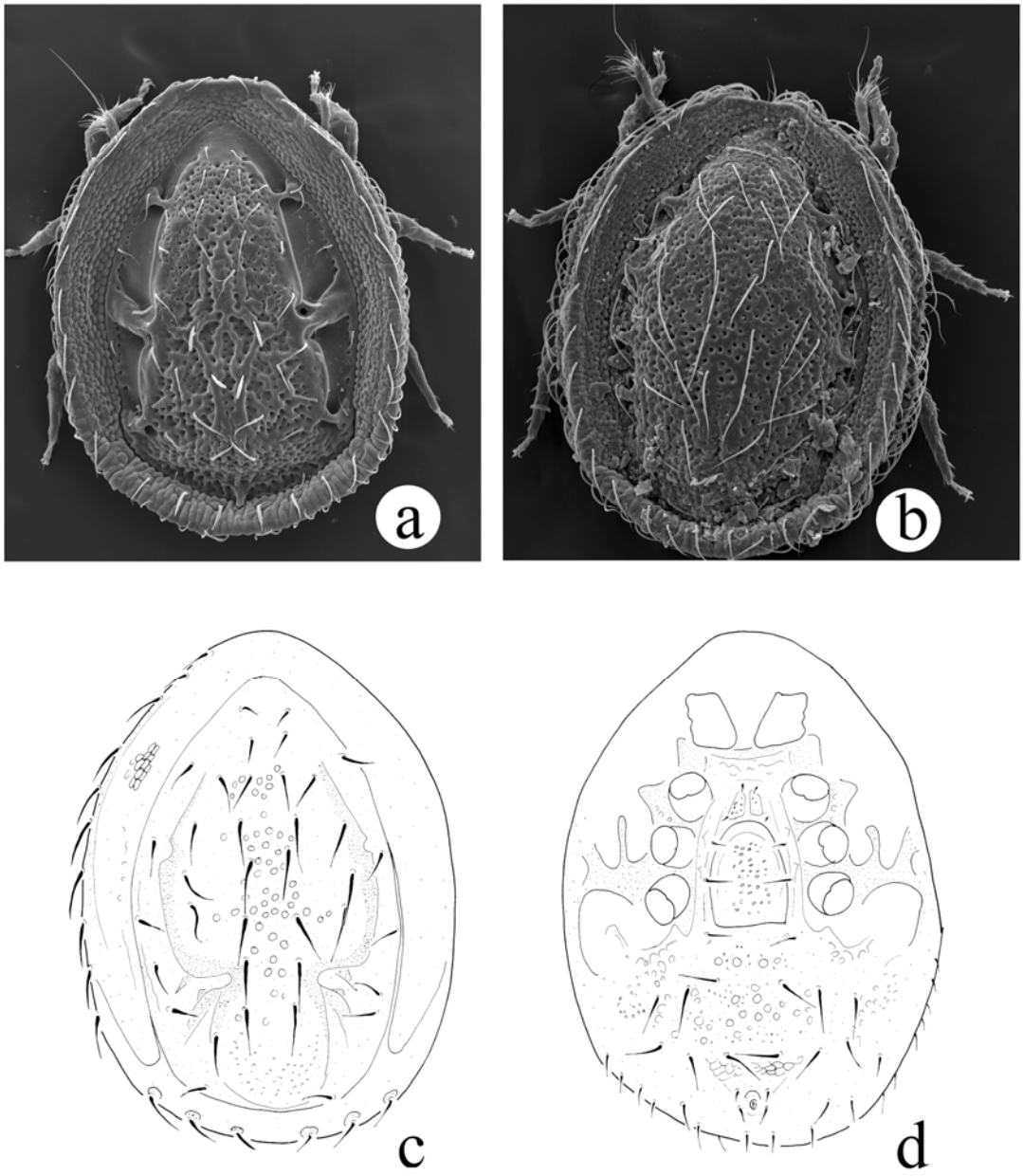


Figure 8. *Neodiscopoma* species in the Balkan Peninsula; a = dorsal view of *N. pulcherrima*, b = ventral view of *N. splendida*, c = dorsal view of *N. abantica*, d = ventral view of *N. abantica*.

(near Gruda), Ljuta Potok, at the Konavoski dvori watermill, 60m, gallery forest, N42°32.076' E18° 22.610', 07.X.2008. DL, FZ, KJ, MD. *Greece.* Central Greece, Phthiotis peripheral unit, Paleokastro, oak forest S of the village, 685m, N38° 58.653' E21°54.221', 08.V.2011. KJ, MD, SZT, UZS., West Greece: Aetolia-Acarnania peripheral unit, Panetoliko Mts, Agios Vlasios, open brook, pine forest and forest puddle S of the village, 825m, N38°48.360' E21°30.676', 07.V. 2011. KJ, MD, SZT, UZS., Aetolia-Acarnania peripheral unit, Panetoliko Mts, Agios Vlasios, open brook, pine forest and forest puddle S of the village, 825m, N38°48.360' E21°30.676', 07.V. 2011. KJ,

MD, SZT, UZS. *Macedonia.* Dojransko Basin, Nikolik, brook in macchia, 15.III.2008. CSZ, MD. Belasica Mts, Kolešino, waterfall of the Kolešino Stream in platan-beech forest above the village, *ca*. 500m, N41°23' E22°48', from moss, 18.X.2006. DL, KJ, MD. Ogražden Mts, beech forest with a brook at the Prevedena Pass, 1167m, N41°33'57.6" E22°50'38.6", leaf litter, 18.X. 2006. DL, KJ, MD. Šar Planina, Tetovo, Popova Šapka, brook in alpine grassland, 1792m, N42°00'54.6" E20°52'36.7", bird nest from soil, 15.X.2006., DL, KJ, MD. Belasica Mts, Kolešino, waterfall of the Kolešino Stream in platan-beech forest above the village, *ca*. 500m, N41°23' E22°48', from litter, 18.X.2006. DL, KJ, MD. Sveti Naum, springs and spring lake above the Ohrid Lake, 704m, N40°54'35.7" E20°44'52.1", from litter, 16.X.2006. DL, KJ, MD. Maleševski Planina, Berovo, stream in a beech forest above the Berovo Lake, 18.10.2006 975m, N41° 40'18.4" E22°55'15.4", leaf litter, 18.X.2006. DL, KJ, MD. *Montenegro.*Krivošije Mts, Crkvice SE, near Zvečava spring, 720m, pasture and secondary forest, N42°32.990' E18°39.295′, 07.X. 2008., DL, FZ, KJ, MD. Visitor Mts., 6 km SW of Murino, gorge of the sidestream of Dosova stream at a sink-hole, 1425m, mixed spruce forest, streamside vegetation, N42°38.022' E19°51.005', 12.X.2008., DL, FZ, KJ, MD. Savino Polje 1 km E of Đalovica klisura, bank of Bistrica Reka, 609m, gallery, N43°04.244' E19°51.687', 15.X. 2008., DL, FZ, KJ, MD. Krivošije Mts, Mokrine 2 km, NW on the Herceg Novi–Trebinje road, near the Trebinje junction, 560m, open macchia wood, N42°30.855' E18°29.242', 07.X.2008. DL, FZ, KJ, MD. Prokletije Mts, Vušanje 2 km, S of Oko and Grlja stream, 1034m, mixed beech forest, N42°30.704' E19°50.088', 12.X.2008. DL, FZ, KJ, MD. Vojnik Mts, Mokro, *ca*. 5 km S of Šavnik on the Jasenovo Polje–Žabljak road, 1062m, beech forest, N42°56.858' E19°05.463', 09.X.2008. DL, FZ, KJ, MD. *Serbia.* Đerdap Mts, Majdanpek, mixed beech forest, 604m, N44°25'45.1" E21°57'17.5", leaf litter, 13.X. 2006., DL, KJ, MD. Đerdap Mts, Klokočevac, stream valley with oak forest, 156m, N44°18' 45.2" E22°08'57.1", from leaf litter, 12.X. 2006. DL, KJ, MD. Đerdap Mts, Majdanpek, dry beech forest, 141m, N44°24'59.0" E21°56'16.6", from litter, 13.X.2006. DL, KJ, MD. Zlatibor district, Maljen Mts, Brajkovići, stream and its gallery N of the village, litter from mixed gallery forest, 445m, N44°02.244' E19°54.827', 17.III. 2011. KT, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë and Quafëmollë (Kontschán 2003a), *Bulgaria*. Rila, Stara Planina (Kontschán 2007a). *Croatia*. Papuk and Psunj Mountains (Kontschán 2005), Mala Kapella (Kontschán 2007b). *Greece*. Polilimnio, Vitina, Kalpaki (Kontschán 2010). *Macedonia*. Ohrid, Popova Sapka (Kontschán 2005). *Montenegro.* Velika (Kontschán 2007b). *Serbia*. Fruska-Gora (Kontschán 2005), Derdap (Kontschán 2007b). South-Herzegovina (Willmann 1941).

Distribution. Europe.

***Neodiscopoma pulcherrima* (Berlese, 1903)**

(Figures 8a and 13)

Discopoma pulcherrima Berlese, 1903: 247.
Neodiscopoma pulcherrima Schweitzer 1961: 182.

New records. Montenegro. Bjelasica Mts, Biogradsko Jezero, 1105m, N42°54.030' E19° 35.736', 11.X.2008., DL, FZ, KJ, MD. *Serbia.* Đerdap Mts, Dobra, Reka Pesača, N44°34, 670, E21°59, 250, 386m, beech forest with stream, leaf litter from alder forest, 28.X.2010. DL, KJ, UZS.

Previous records from the Balkan Peninsula. Croatia. Papuk Mountains (Kontschán 2005), Ivansica Mts, and Mala Kapella (Kontschán 2007b).

Distribution. Europe.

Remarks. This is the first record from Montenegro.

***Neodiscopoma abantica* (Bal & Özkan, 2007) comb. nov.**

(Figures 8c, d and 13)

Uropoda abanticus Bal & Özkan, 2007: 43–47.

New records. Greece: Drama county, Falakro Mts, beech forest beneath the sky centre, 1186m, N41°17.582' E24°00.422', from beech forest, 31.III.2007., leg. DL, EZ, FZ, KJ, MD.

Distribution. Turkey and Greece.

Remarks. Bal & Özkan (2007) placed this species into the very diverse genus *Uropoda sensu lato*. According to my observation the species of the genus *Neodiscopoma* differ from the other *Uropoda* species by the following characters: central area of dorsal shield strongly sclerotized and elevated from the other areas, marginal shield reduced caudally and the caudal setae are situated on small platelets. *U. abanticus* shares all these characters therefore it should be transferred to the genus *Neodiscopoma*.

This is the first record from Greece.

Discourellidae Baker & Wharton, 1952

Discourella modesta (Leonardi, 1899)

(Figure 13)

Calaeno modesta Leonardi, 1899: 924.
Discourella modesta Berlese, 1917:10.

New records. Albania. Mirditë district, Oroshi area, Nanshenë, limestone rocks near the village, rock moss from rocky grassland, 1165m, N41° 52.154' E20°07.118', 21.V.2010. FZ, MD, UZS., Mat district, Dejë Mts, limestone rocks in the upper valley of the Varoshit stream 1360m, N41° 39.905' E20°12.497', 18.V.2010. FZ, MD, UZS., Skrapar county, Bogovë, oak forest at the Osum River and its sidestream N of the village, litter and moss, 10.III.2008. CSZ, MD., Vlorë county, Çikë Mts, pine forest N of the Llogara Pass, moss, 11.III.2008. CSZ, MD. Periferi Dibër, *ca*. 3 km W of Cidhnë along the footpath to Gurrë-Lurë, gorge of Pr. i Setës, 730m, 12.IV.2006. EZ, FZ, HA, MD. *Greece.* Central Greece, Evrytania peripheral unit, Timfristos Mts, Ano Kalesmeno, forest brook and spruce forest E of the village, 980m, N38°54.931' E21°43.825', 07.V.2011. KJ, MD, SZT, UZS., Epirus, Preveza peripheral unit, Thesprotiko Mts, Vrisoula, stream and its plane tree gallery, and roadside puddle S of the village, 220m, N39°14.904' E20°41.735', 05.V.2011. KJ, MD, SZT, UZS. *Macedonia.* Belasica Mts, Kolešino, waterfall of the Kolešino Stream in platan-beech forest above the village, *ca*. 500m, N41°23' E22°48', from litter, 18.X.2006. DL, KJ, MD., Maleševski Planina, Berovo, stream in a beech forest above the Berovo Lake, 975m, N41°40'18.4" E22°55'15.4", leaf litter, 18.X. 2006. DL, KJ, MD. *Montenegro.* Lovćen Mts, 2 km from the Lovćen peak towards Njeguši, 1377m, beech forest, N42°23.994' E18°49.882', 08.X.2008. DL, FZ, KJ, MD., Vojnik Mts, Mokro, *ca*. 5 km S of Šavnik on the Jasenovo Polje–Žabljak road, 1062m, beech forest, N42° 56.858' E19°05.463', 09.X.2008. DL, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Albania. Quafësthamë, Zerqan (Kontschán 2003a). *Bulgaria*. Rhodope (Kontschán 2004), Black sea coastal hills (Kontschán 2007a). *Croatia*. Krk Island (Kontschán 2007b). *Greece*. Thessaloniki (Kontschán 2003b), Vitina (Kontschán 2010). *Macedonia*. Gorno Jelovce (Kontscán 2005).

Distribution. Europe.

Remarks. This is the first record from Montenegro.

Discourella bulgarica Kontschán, 2007

(Figure 13)

New records. Serbia. Krajište Mts, Vučedelce, brooks in beech forest above the village, 1055m, N42°39'46.4" E22°18'17.3", moss from soil, 20.X.2006. DL, KJ, MD.

Previous records from the Balkan Peninsula. Bulgaria. Rila (Kontschán 2007a).

Distribution. Bulgaria and Serbia.

Remarks. This is the first record from Serbia.

Capitodiscus admirandus Kontschán, 2011

(Figures 9c,d and 13)

Previous records from the Balkan Peninsula. Croatia: Konavli Mts (Kontschán 2011).

Distribution. Croatia.

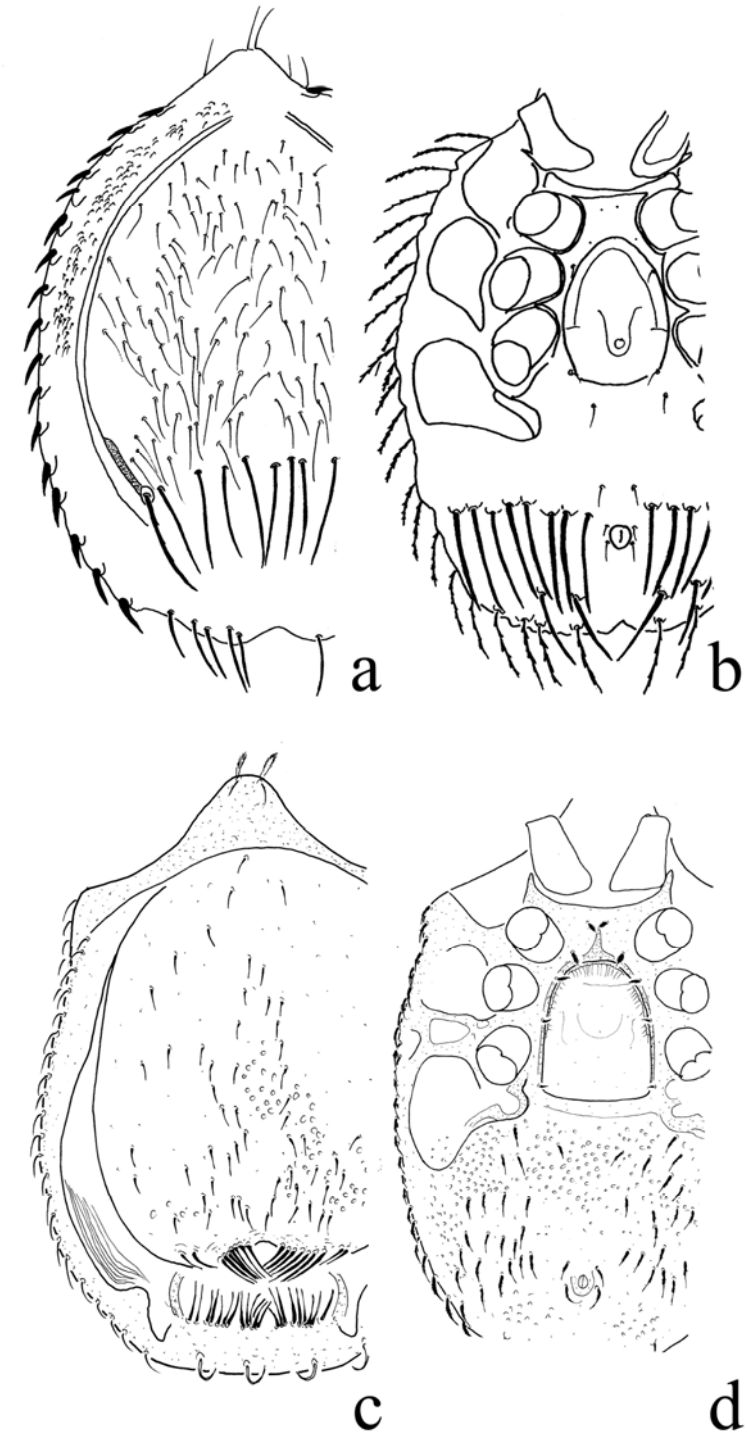


Figure 9. Discourellid species from the Balkan Peninsula; a = dorsal view, b = ventral view of *C. mahunkai*, c = dorsal view, d = ventral view of *C. admirandus* (after Kontschán 2003a, 2010 and modified).

Crinitodiscus beieri Sellnick, 1931

(Figure 13)

New records. Albania. Has district, Pashtrik Mts, Salghinë, rocky maple-hazel forest N of the village, soil and leaf litter beneath trees 1405m, N42°12.046' E20°31.998', 22.V.2010. FZ, MD, UZS., *Albania.:* Mirditë district, Oroshi area, Nanshenë, limestone rocks near the village, rock moss from rocky grassland 1165m, N41°52.154' E20°07.118', 21.V.2010. FZ, MD, UZS., Mirditë district, Oroshi area, Ndërshenë, limestone rocks N of the village, moss beneath cliffs 1135m, N41°51.034' E20°05.842', 21.V.2001. FZ, MD, UZS., Periferi Dibër, *ca*. 3 km W of Cidhnë along the footpath to Gurrë-Lurë, gorge of Pr. i Setës, 730m, 12.IV.2006. EZ, FZ, HA, MD. *Bosnia-Herzegovina.* Drvar, Titovo pećina cave and its surroundings, 476m, N44°22.800' E16°23.230', leaf litter, 03.X.2007. DL, KJ, MD. *Macedonia.* Maleševski Planina, Berovo, stream in a beech forest above the Berovo Lake, 975m, N41° 40'18.4" E22°55'15.4", leaf litter, 18.X.2006., DL, KJ, MD. *Montenegro.* Lovćen Mts, Krstac 6 km SE towards the Lovćen peak from the Kotor–Njeguši road, 1294m, stony macchia, N42°24.022' E18°47.641', 08.X.2008. DL, FZ, KJ, MD.

Previous records from the Balkan Peninsula. Greece. Parnassos Mts, Tetrazi Mts (Kontschán 2010), Greece (Athias-Binche & Błoszyk 1985).

Distribution. Greece.

Remarks. These are the first records from Albania, Bosnia Herzegovina, Macedonia and Montenegro.

Crinitodiscus mahunkai Kontschán, 2003

(Figures 9a, b and 13)

Previous records from the Balkan Peninsula. Albania. Tucep (Kontschán 2003a).

Distribution. Albania.

KEYS TO THE UROPODINA MITES OF THE BALKAN PENINSULA

The keys presented here is adequate only for the Uropodina mites collected in the Balkan Peninsula. It cannot be used for identification of Uropodina mites collected in other regions of the world.

Key to superfamiles

1. Base of tritosternum wide, coxae I narrow and doesn't covere the base of tritosternum (Polyaspidoidea) .. .. A

– Base of tritosternum narrow, coxae I wide and coveres the base of tritosternum (Uropodoidea) ..... B

(A) Key to Polyaspidoidea

1. Pygidial shield small and postmarginal shield present or pygidial shield divided into two or three segments (Trachytidae) 2
– Pygidial shield large and not divided, postmarginal shield absent (Polyaspididae)..... *Polyaspis patavinus*

2. Idiosoma pear-like, chelicerae with long hyaline process (*Trachytes*) 3
– Idiosoma oval, chelicerae without long hyaline process (*Polyaspinus*) ..... *Polyaspinus feheri*

3. Genital shield of female rounded anteriorly, anterolateral angles not pointed 4
– Genital shield of females not rounded anteriorly, anterolateral angles pointed 7

4. Genital shield of female wide ..... *Trachytes lamda*
- Genital shield of female narrow 5

5. Supplementary long setae situated on lateral margins of ventrianal shield ..... *Trachytes mystacinus*
– Supplementary long setae absent on lateral margins of ventrianal shield 6

6. St3 situated near anterior margin of genital shield, anterior area of genital shield smooth .... *Trachytes papukensis*
– St3 situated near anterio-lateral margin of genital shield, anterior area of genital shield ornamented by irregular pits ..... *Trachytes arcuatus*

7. Vertex with broad and ribbed lateral parts 8
– Vertex without broad and ribbed lateral parts 10

8. X-like strongly sclerotized line on dorsal shield present ..... *Trachytes szonjaae*
– X-like strongly sclerotized line on dorsal shield absent 9

9. Ingulinal and peritrematal shield fused, vertex with narrow lateral parts..... *Trachytes baloghi*
– Ingulinal and peritrematal shield separated, vertex with wide lateral parts ..... *Trachytes aegrota*

10. Ventrianal shield fused with inguinal shield 11
– Ventrianal shield not fused with inguinal shield 12

11. Setae X4 and X5 placed on small platelets and situated on membranous cuticle, small pygidial shield oval..... *Trachytes parnonensis*
– Setae X4 and X5 situated on fused shields, small pygidial shield triangular ..... *Trachytes irenae*

12. Genital shield robust, anterior area wide.....
..... *Trachytes macedoniensis*
– Genital shield ax-like, anterior area narrow 13

13. Surface of genital shield covered by web-like structure ..... *Trachytes pi*
– Surface of genital shield covered by small oval pits
..... *Trachytes carpathicus*

(B) Key to Uropodoidea species

1. Internal malae divided into several pilose branches (moustache-like) 2
– Internal malae not divided into several pilose branches 8

2. Idiosoma oval, with strongly sclerotised surface structures, h2 situated laterally to h3 (Trachyuropodidae)..... 4
– Idiosoma rounded, without strongly sclerotised surface structures, h2 situated anteriorly to h3 (Oplitidae)
..... *Oplitis conspicua*

4. Parallel strongly sclerotized transversal lines situated at level of coxae IV on dorsal shield (*Urotrachys*)
..... *Urotrachys formicaria*
– Parallel strongly sclerotized transversal dorsal lines absent (*Urojanetia*) 5

5. Two pairs of U-like strongly sclerotized dorsal ridges present ..... *Urojanetia excavata*
– Two pairs of U-like strongly sclerotized dorsal ridges absent 6

6. Strongly sclerotized dorsal ridges and bulges absent
..... 7
– One pair of dorsal sclerotized bulges present.....
..... *Urojanetia muranyii*

7. Idiosoma oval, central area elevated.....
..... *Urojanetia graeca*
– Idiosoma rounded, central area not evelated.....
..... *Urojanetia cristiceps*

8. Corniculi with lateral teeth (Trematuridae) 9
– Corniculi without lateral teeth 16

9. Genital shield linguliform, with rounded anterior margin.....10
– Genital shield scutiform with process on its anterior margin.....11

10. Ventral shield with numerous additional spilose setae, surface of ventral shield covered by reticulate sculptural pattern (*Trematura*) ..... *Trematura patavina*
– Ventral shield without additional setae, all ventral setae smooth and needle-like, surface of ventral shield with small oval pits (*Pseuduropoda*) .....
.....*Pseuduropoda pecinai*

11. Marginal, dorsal and ventral shields with long setae, surface of idiosoma covered by large irregular or oval pits (*Trematurella*) 12
– Idiosoma without long setae, surface of idiosoma with oval pits or reticulate sculptural pattern.....14

12. Surface of genital shield mostly smooth, only basal area covered by some oval pits 13
– Entire surface of genital shield covered by large iregular pits .....*Trematurella elegans*

13. All sternal setae short.....*Trematurella plana*
– St3 and St4 three times longer than other sternal setae .....*Trematurella graeca*

14. Surface of idiosoma covered by reticulate sculptural pattern (*Leiodinychus ..... Leiodinychus orbicularis*
– Surface of idiosoma covered by pits (*Oodinychus*) 15

15. Surface of idiosoma covered by oval pits .....
..... *Oodinychus ovalis*
– Surface of idiosoma covered by irregular pits .....
..... *Oodinychus karawaiewi*

16. Paralaciniae present (Nenteriidae) .....
..... *Nenteria stylifera*
– Paralaciniae absent.....17

17. Internal sclerotized node associated with levantor tendon present.....18
– Internal sclerotized node associated with levantor tendon absent 34

18. Pedofossae present, internal malae not divided apically 24
– Pedofossae absent, internal malae divided apically (Dinychidae) 19

19. Poststigmatid part of peritreme present..... 20
– Poststigmatid part of peritreme absent.....
.....*Dinychus bincheaecarinatus*

20. Poststigmatid part of peritreme short, reaching only to coxae IV..... 21
– Poststigmatid part of peritreme long 23

21. Ventral shield near basal margin of genital shield coered by oval pits, dorsal shield ornamented by oval pits..... 22
– Ventral shield near basal margin of genital shield with dotted sculptural pattern, dorsal shield without oval pits.....*Dinychus eroessi*

22. Basal line of genital shield situated at level of anterior margin of coxae IV, poststigmatid part of peritreme reaching to posterior margin of coxae IV.....
.....*Dinychus perforatus*
– Basal line of genital shield situated at level of central area of coxae IV, poststigmatid part of peritreme reaching to central area of coxae IV .....*Dinychus arcuatus*

23. Sternal shield without ornamentation.....
.....*Dinychus rilaensis*
– Sternal shield with large, rounded web-like scupltural pattern .....*Dinychus woelkei*

24. Postdorsal shield always present, idiosoma flattend, apical part of fixed digit of chelicerae rounded (Urodiaspidae)..... 25
– Postdorsal shield absent, idiosoma domed on dorsal part, apical part of fixed digit of chelicerae long and finger-like (Urodinychidae) 26

25. Idiosoma oblong, pygidial shield caudally fused to marginal shield.....*Urodiaspis pannonica*
– Idiosoma oval, pygidial shield not fused to marginal shield.....*Urodiaspis tecta*

26. Dorsal and ventral part of body with tree-like setae (*Dendrouropoda*) .....*Dendrouropoda danyii*
– Dorsal and ventral part of body without tree-like setae..... 27

27. Idiosoma strongly sclerotized and strongly ornamented, dorsal and ventral setae pilose or serrate..... 28
–, Idiosoma not strongly sclerotized and not strongly ornamented, dorsal and ventral setae smooth..... 29

28. Genital shield scutiform, idiosoma covered by oval pits..... *Uroobovella graeca*
– Genital shield linguliform, idiosoma covered by iregular pits .....*Uroobovella pulchella*

29. Perireme short, without long prestigmatid parts .....
.....*Uroobovella fracta*
– Peritreme long, with long prestigmatid part..... 30

30. Preanal suture present. ..... *Uroobovella hungarica*
– Preanal suture absent 31

31. Prestigmatid part of peritreme hook-like 32
– Prestigmatid part of peritreme not hook-like .....
.....*Uroobovella difolveolata*

32. Genital shield with anterior process.....33
– Genital shield without anterior process.....
.....*Uroobovella obovata*

33. Anterior process of genital shield long and divided apically, surface of genital shield with reticulate sculptural pattern..... *Uroobovella marginata*
– Anterior process of genital shield short and not divided apically, surface of genital shield with small oval pits ..... *Uroobovella reticulata*

34. Marginal shield not divided into platelets on caudal area, peritreme L-shaped (Cillibidae) 35
– Marginal shield reduced, on caudal area with or without small platelets, peritreme usually not L-shaped 38

35. Caudal area of dorsal shield bearing a large depression..... *Cilliba vellas*
– Large depression absent on dorsal shield.....36

36. Dorsal shield completely separated from marginal shield.....*Cilliba cassidea*
– Dorsal shield fused with marginal shield anteriorly ...37

37. Idiosoma oval, genital shield with uniform pits, V2 setae longer than other ventral setae .....
..... *Cilliba erlangensis*
– Idiosoma circle, genital shield with elongated pits anteriorly and oval pits on basal surface, V2 not longer than other ventral setae ..... *Cilliba sellnicki*

38. Setae h1 serrate or pilose, internal malae marginally strongly pilose (Discourellidae) 47
– Setae h1 smooth, internal malae smooth or finely pilose (Uropodidae) 39

39. Idiosoma strongly sclerotized, central area elevated from other part of dorsal shield, dorsal shield ornamented with ridges (*Neodiscopoma*) 40
– Idiosoma not strongly sclerotized, dorsal shield without ridges (*Uropoda*) 42

40. Lateral branches from elevated central area present 41
– Lateral branches from elevated central area absent ....
.....*Neodiscopoma abantica*

41. Four lateral branches present .....
.....*Neodiscopoma splendida*
– Three lateral branches present .....
..... *Neodiscopoma pulcherrima*

42. Peritreme straight 44
– Perireme not straight 43

43. Peritreme L-shaped ..... *Uropoda hungarica*
– Peritreme with several loops ..... *Uropoda mitis*

44. Separated anal shield present ..... *Uropoda silvatica*
– Anal shield fused with ventral shield 45

45. Marginal shield not reduced ..... *Uropoda kargi*
– Marginal shield reduced 46

46. Marginal shields reaching to caudal area of dorsal body, four setae situated on small platelets on membranous cuticle ..... *Uropoda minima*
– Marginal shields not reaching to caudal area of dorsal body, six setae situated on small platelets on membranous cuticle ..... *Uropoda mazsalakiae*

47. Marginal shield divided into platelets on caudal area (*Discourella*) 48
– Marginal shield not divided into platelets 49

48. Separated pygidial shield present, dorsal setae long ..... *Discourella modesta*
– Separated pygidial shield absent, dorsal setae short ..... *Discourella bulgarica*

49. Ventral setae at level of anal opening long and needle-like, chelicerae without several large teeth (*Crinitodiscus*) 50
– Ventral setae at level of anal opening as long as other ventral setae, chelicerae long and bearing numerous large teeth (*Capitodiscus*) .... *Capitodiscus admirandus*

50. Anterior process of genital shield present ..... *Crinitodiscus beieri*
– Anterior process of genital shield absent ..... *Crinitodiscus mahunkai*

DISSCUSSION

64 species were collected in the countries of the Balkan Peninsula. Most of the species are reported from the smallest country (Albania with 24 recorded species) and interestingly the largest country; Serbia (with 13 species found) proved to be the least species-rich in the Balkan (Table 1). The reason of this phenomenon is the different intensity of the collection work in the Balkan Peninsula. Most of collection trips were led to Albania (Murányi *et al*. 2011), whereto more than 30 expeditions were organized between 2004 and 2012, but only 1–2 trips was conducted in the European part of Turkey or Serbia during the same interval.

Most of the species found possess wide Holarctic, Palearctic or European distribution; these species were very common in the soil samples of this region. The most frequent species were *N. splendida, O. ovalis, U. pannonica, U. minima, C. cassidea* and *D. modesta*, these species are recorded for most of European countries as well and often represent the dominant Uropodina species in the soil samples.

Several species like *O. karawaiewi, T. aegrota, T. baloghi* and *C. sellnicki* appeared also often in the samples collected however, they are less frequent in the Balkan Peninsula than in the other part of Europe.

Several species occur only in the northern part of the Balkan Peninsula, two species of them (*Urop. hungarica* and *Uroob. hungarica*) are distributed from the Southern Carpathian Basin to the northern part of the Balkan Peninsula. *N. pulcherrima* is distributed in the whole Carpathian Basin and its area slightly covers the North Balkan as well.

Interestingly, an Anatolian species has also been recorded from the Balkan Peninsula *N. abantica* found in Greece was reported also for the first time from Europe. This species was described near from the Abant Lake in western Anatolia and taking into account the close tectonic relationship of Anatolia and Greece (Rögl 1999) this distribution is not surprising.

An other distribution worth reporting is shown by *U. mitis*. This species was previously recorded only from Italy, and currently we have two new occurrences from Eastern and Western Greece. *U. mitis* has a very complicated and complex peritreme. Krantz (1974) found this species on submerged sea grass and supposed that the complex peritreme has an important role during the submerged period providing oxygene demand of the animals. The microtricha of the peritreme trap and

retain an air film that allows them to stay underwater. I suppose that *U. mitis* has salt tolerance as well, similarly to *U. mazsalakiae* and *D. danyi*, which occur on the littoral regions of the Balkan Peninsula. The latter two species can be found in a specific habitat; they live among decayed sea grass, where several other mites, worms and talitrids can be observed.

Similar Italian-Balkanc distribution type can be observed in the genus *Capitodiscus* as well. First species of it *C. venustus* occurs in Italy, but the second one *C. admirandus* was collected in the Balkan-Peninsula (Croatia).

Several widely distributed Balkanic endemisms were also recorded. *U. silvatica* was described from southern part of Romania and later was found in Albania and in Bulgaria. *C. beieri* firstly was presented from Greece. Athias-Binche & Błoszyk (1985) assumed the northern border of the distribution of the genus *Crinitodiscus* is the Albanian Alps, but later *C. beieri* was found in Bosnia-Herzegovina and Montenegro as well. *P. feheri* is a typical West-Balkanic species occurring only in Albania and western part of Greece. *D. bulgarica* which have been collected in South Serbia and West Bulgaria semms to be an East Balkanic species. Most of the endemic species in the Balkan Peninsula are known only from the type locality, it can be suppose that these species will later be found in other localities as well.

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Table 1. Number of species found in the different countries of the Balkan Peninsula

Albania	Bosnia-Herzegovina	Bulgaria	Croatia	Greece	Macedonia	Montenegro	Serbia (with Kosovo)	European part of Turkey
24	12	17	21	22	14	17	13	3

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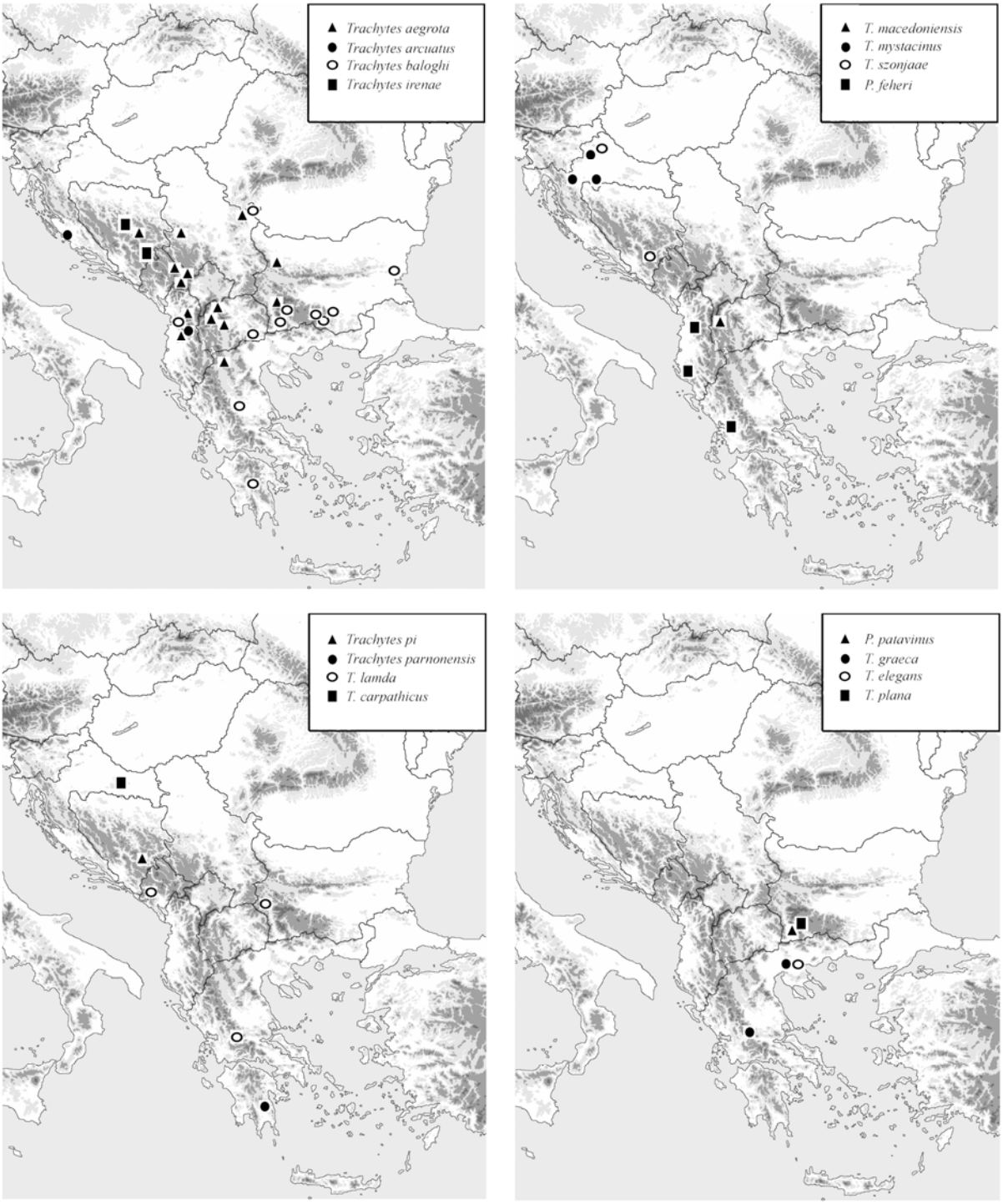


Figure 10. Occurrences of Uropodina species on the Balkan Peninsula I.

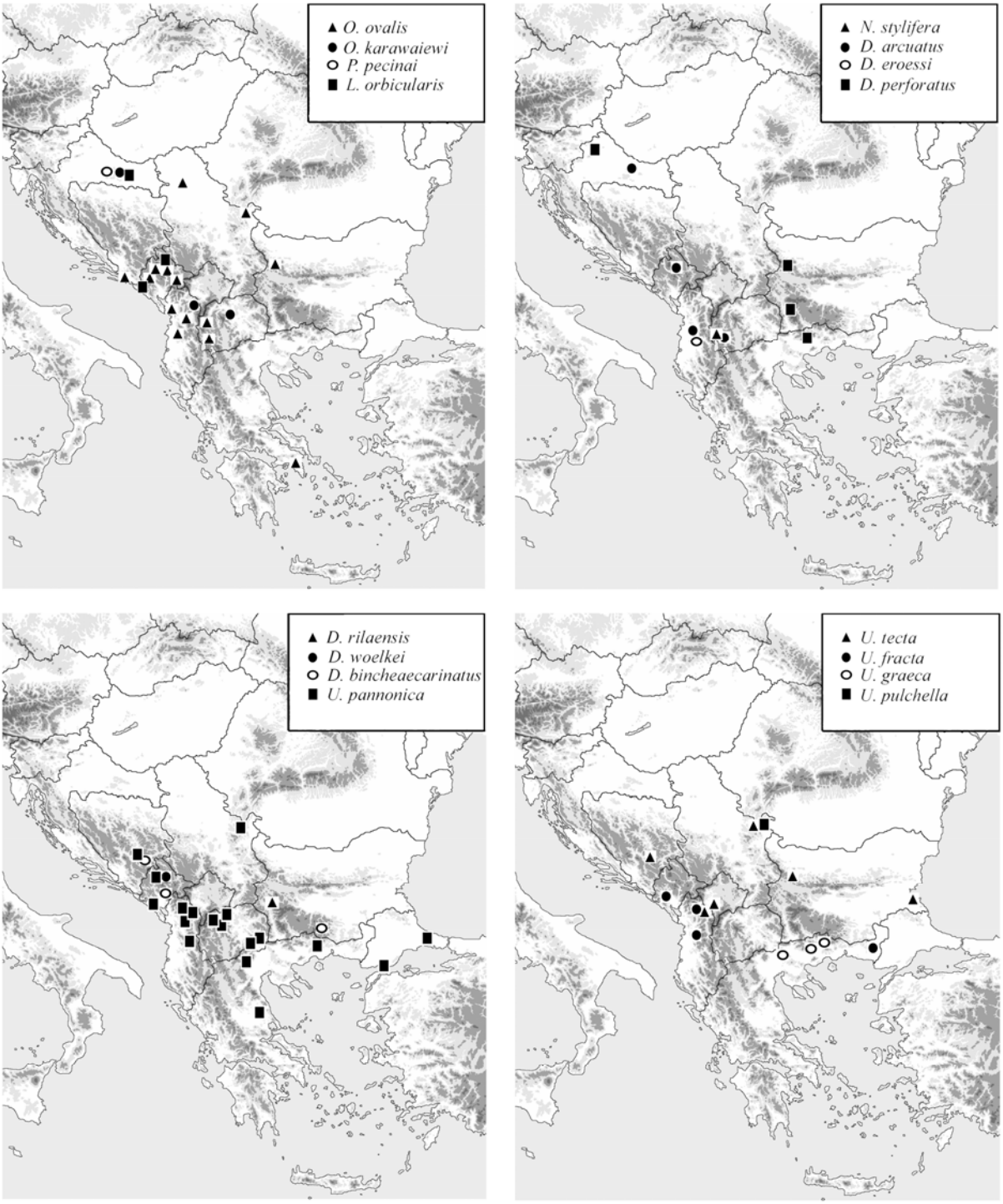


Figure 11. Occurrences of Uropodina species on the Balkan Peninsula II.

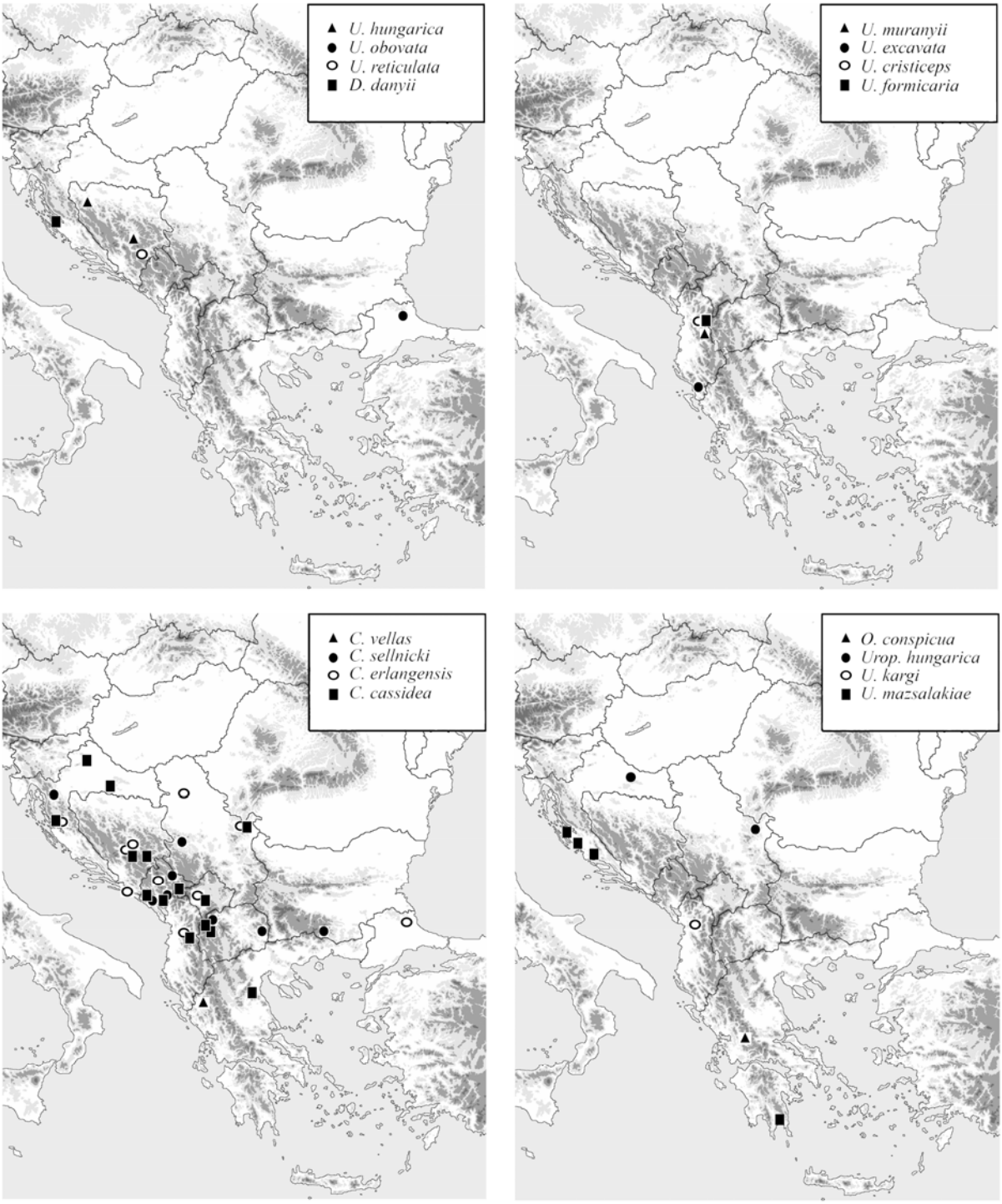
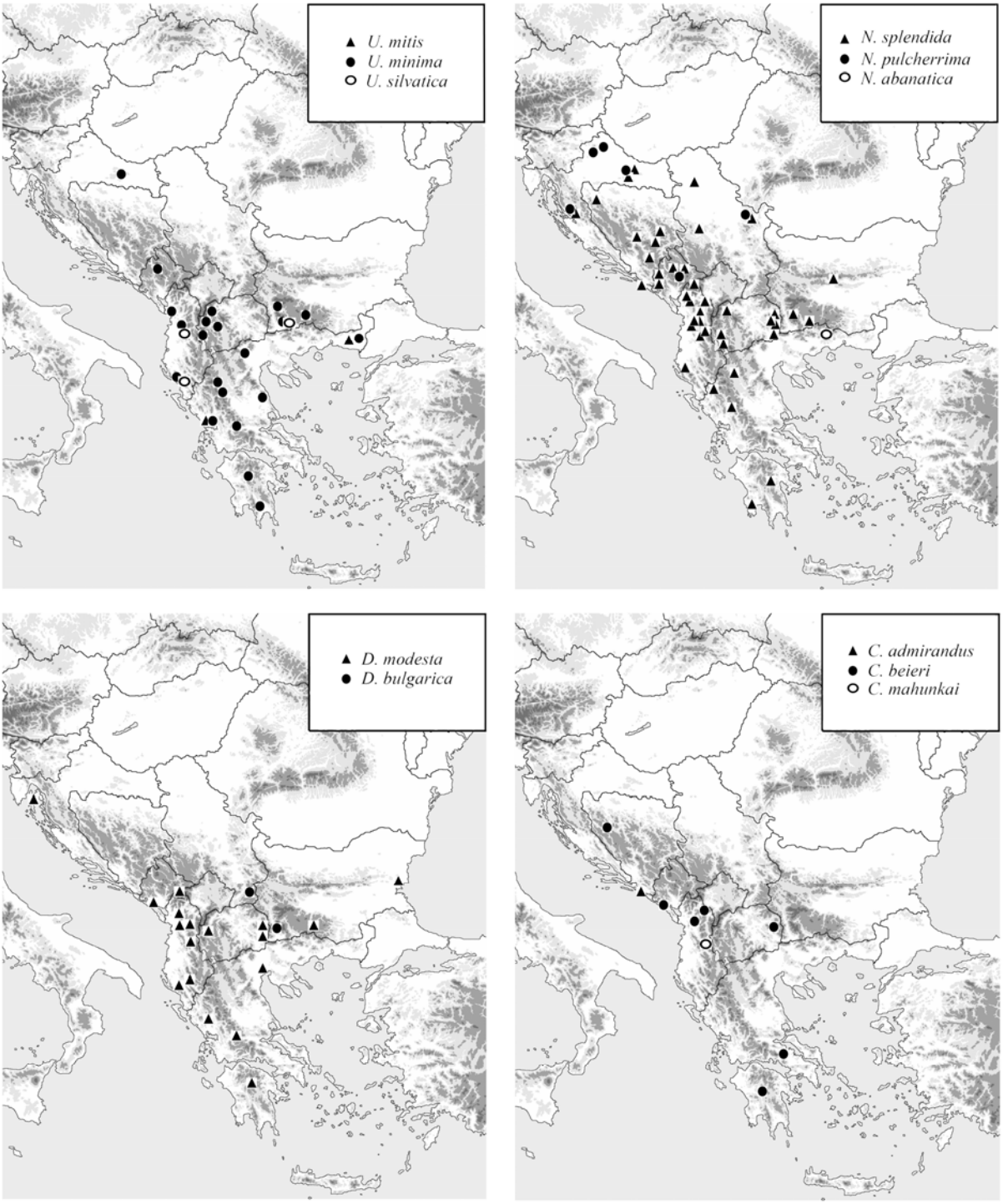


Figure 12. Occurrences of Uropodina species on the Balkan Peninsula III.



Figures 13. Occurrences of Uropodina species on the Balkan Peninsula IV.

Opusc. Zool. Budapest, 2012, 43: 00–00

An undescribed collembolan species swarming on the Peloponnese (Greece)

L. DÁNYI*

Abstract. *Hypogastrura peloponnesica* sp. n. is described from the Menalo Mountains situated on the Peloponnese, Greece, where it has been found swarming among melting snow patches. With a prominent tubercle fronto-lateral of seta sd1 on each side of the head the new species is most similar to *Hypogastrura tooliki* Fjellberg, 1985 from Alaska. The two species can be distinguished by the shape of the maxillae, the relative size of the postantennal organs, the number of ventral tube setae and the size of the basal papillae of the anal spines.

Keywords. Collembola, Hypogastruridae, new species, Greece.

INTRODUCTION

The Balkan Peninsula is the most underrepresented region in Europe considering faunistical research, although an extremely high level of biodiversity has already been demonstrated (Kryštufek & Reed 2004). On one hand, environmental stability and topographic diversity, typical for the Balkans could have contributed to this richness. On the other hand, its location on the Southeastern part of the continent made the region an important refugium for forest communities and associated fauna during the Pleistocene (Kryštufek & Reed 2004).

Investigation of the fauna in this geographical unit was one of the main projects of the Hungarian Natural History Museum (HNHM) in recent years (e.g. Dányi 2010, Fehér *et al*. 2009, Kontschán 2009, 2010, Korsós *et al*. 2008, Mahunka & Mahunka-Papp 2010, Murányi 2007, 2008, Szederjesi & Csuzdi 2012a, 2012b, Ujvári 2011, etc.). The present paper is an outcome of collembolan studies within this framework.

The cosmopolitan genus *Hypogastrura* Bourlet, 1839, the largest genus of the family Hypogastruridae, currently comprises 164 species (Bellinger *et al*. 2012). Many species have been described or revised just recently (e.g. Fanciulli & Dallai 2008, Jiang & Chen 2008, Jiang & Yin 2010, 2012, Skarżyński 2006a, 2006b, 2007, 2009, 2010, Skarżyński & Kaprus 2009, Skarżyński & Smolis 2003). During a collection trip to the Peloponnese thousands of specimens of a *Hypogastrura* species have been found swarming on the Menalo Mts. among melting snow patches (Figs 1–3). They turned out to represent a species new to science.

MATERIALS AND METHODS

The collembolans were collected by a mouth-operated aspirator and preserved in 75% ethanol. For light microscopy, the specimens were depigmented with Hüther's fluid, cleared in a mixture of lactic acid and glycerol (3:1), and examined under a Leica DM 1000 microscope with phase contrast optics. Line drawings were prepared with a drawing tube. Hoyer's medium was used for permanent mounts. For SEM, the specimens were critical point dried, coated with gold-palladium and digitally photographed using a HITACHI S-2600N scanning electron microscope.

All material is deposited in the Soil Zoology Collection of the Hungarian Natural History Museum in Budapest.

The terminology follows Fjellberg (1984, 1999), Babenko *et al*. (1994), and Thibaud *et al*. (2004). Abbreviations: ant. I–IV—antennal segments I–IV, th. I–III—thoracic terga I–III, abd. I–VI—abdominal terga I–VI.

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Figures 1–3. *Hypogastrura peloponnesica* sp. n., 1 = collecting locality, 2–3 = swarming specimens.

***Hypogastrura peloponnesica* sp. nov.**

(Figs 1–29)

Diagnosis. Body length 1.0–1.75 mm. Granulation fine and uniform (Figs 4–5), 10–11 granules between setae p1 on abd. V. Labrum with four apical folds among five papillae. Maxilla of *notha* type. Maxillary outer lobe with 2 sublobal hairs. Labium of *tullbergi* type. Ant. IV with simple apical vesicle, 6 (3 lateral, 3 dorsal) curved, long and moderately thick sensilla and up to 18 short, pointed, erect sensilla in the ventral file. Ant. I with 8 setae. Ocelli 8 + 8. Postantennal organ 1.3–1.5 times larger than neighbouring ocelli, with 4 lobes (anterior pair slightly enlarged), without accessory boss. Head with 3 + 3 ventral setae and a prominent tubercle frontolateral of each seta sd1. Th. I with 3 + 3 setae. Anal spines very small, on very low papillae. One clavate tenent hair on each leg. Ventral tube with 4 + 4 setae. Dens dorsally with 7 setae, with tooth-like granules on the distal part and with a ventroapical hyaline area. Mucro with a broad lateral lamella and a distinct subapical tooth. Tenaculum with 4 + 4 teeth.

Material examined. Holotype female (HNHM coll-795). Greece, 2009/53, Arkadia county, Menalo Mts, limestone rocks under Mt. Mavri Korifi, 1615m, N37°39.565' E22°15.582' leg. Dányi–Kontschán–Murányi, 06.04.2009. *Paratypes.* 3 males and 4 females (HNHM coll-796): same data as the holotype. *Other material.* 72 specimens (HNHM coll-797); 1 male, 1 female (HNHM collpr-418); 2 females (HNHM collpr-419); 2 females (HNHM coll-420); female (HNHM collpr-426 (head) and HNHM collpr-427 (body)); female (HNHM collpr-430 (head) and HNHM collpr-431 (body)); female (HNHM collpr-432 (head) and HNHM collpr-433 (body)): same data as the holotype.

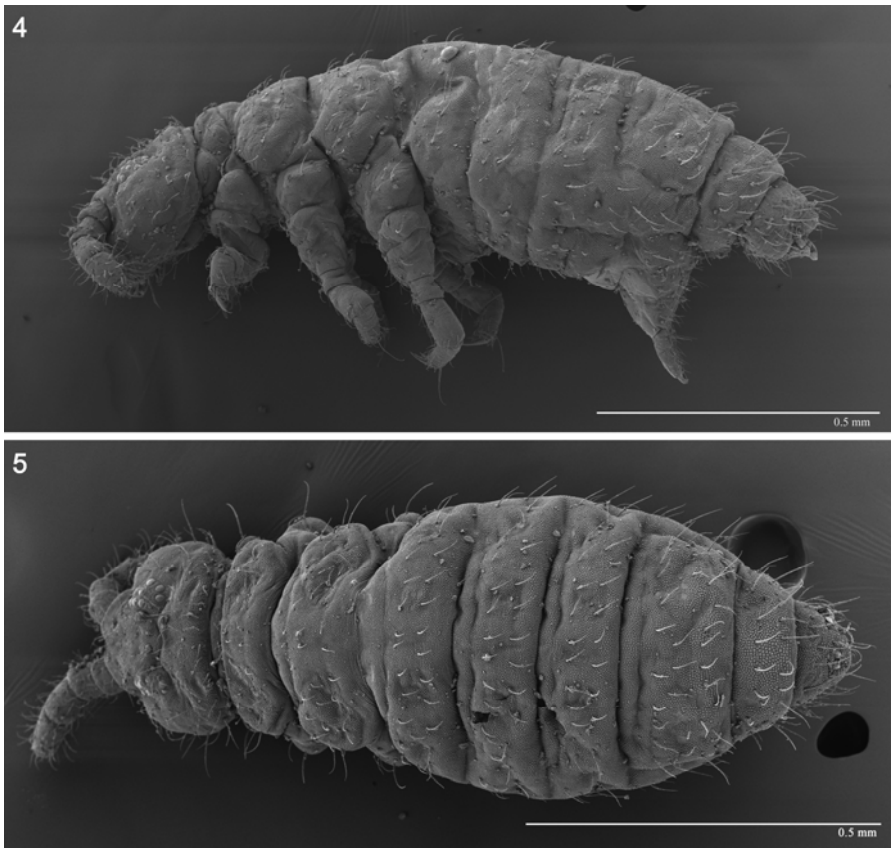
Description. Body length 1.0–1.75 mm. Body colour bluish in living specimens (Figs 2–3), brownish-black in alcohol. Granulation fine and uniform (Figs 4–5), 10–11 granules between setae p1 on abd. V (Figs 5, 22).

Ant. IV with simple apical vesicle, subapical organite (or), microsensillum (ms), 6 (3 lateral, 3 dorsal) curved long and moderately thick sensilla (Fig. 13) and up to 18 short, pointed, erect sensilla in the ventral file. Ant. III organ with two long (lateral) and two short (internal) curved sensilla (Figs 13–14). Microsensillum on ant. III present (Fig. 14). Ant. I with 8 setae (Fig. 15).

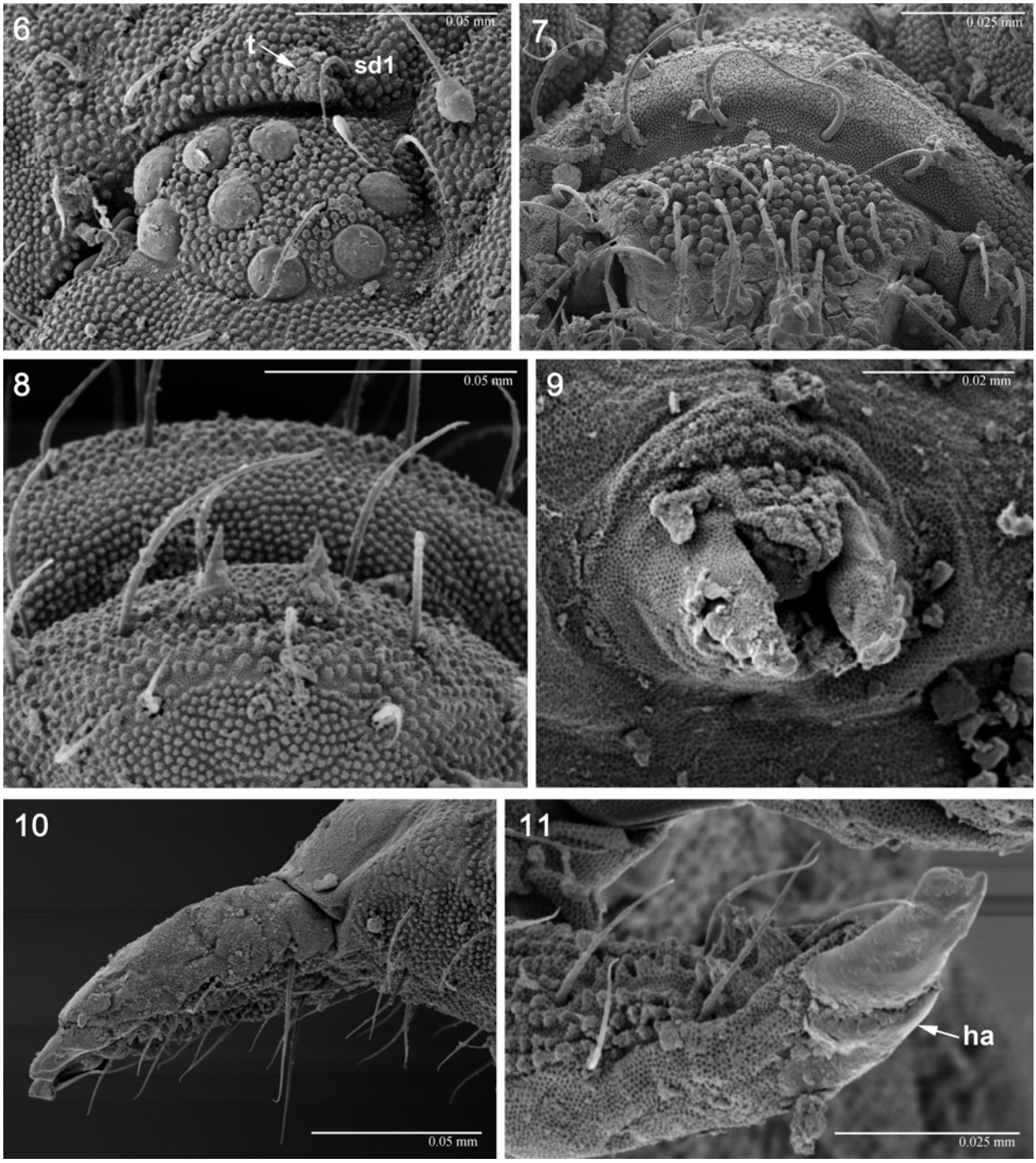
Ocelli 8 + 8. Postantennal organ 1.3–1.5 times larger than neighbouring ocelli, with 4 lobes, anterior pair slightly enlarged (Figs 6, 17). Accessory boss invisible.

Dorsal chaetotaxy of head typical of the genus. Head with 3 + 3 ventral setae and with a prominent tubercle on each side between seta sd1 and next ocellus (Figs 6, 16).

Labrum with 5, 5, 4 setae, 4 prelabrals, and 4 apical folds among 5 distal papillae (Figs 7, 18). Head of maxilla of the *notha* type (Fig. 20) (Fjellberg 1984). Maxillary outer lobe with 2 sublobal hairs (Fig. 19). Labium of the *tullbergi* type (Fjellberg 1999).



Figures 4–5. *Hypogastrura peloponnesica* sp. n., habitus, 4 = lateral view, 5 = dorsal view



Figures 6–11. *Hypogastrura peloponnesica* sp. n., 6 = left side of ocular area and the tubercle (t) above it, 7 = labrum, 8 = anal spines (caudal view), 9 = tenaculum, 10 = furca, 11 = mucro and distal part of dens (ventrolateral view) (ha = ventroapical hyaline area)

Dorsal chaetotaxy of thorax and abdomen as in Figs 4–5, 12, 21–22. Dorsal setae short, thin, acuminate, slightly differentiated, longest setae of larger specimens slightly serrated. Trunk sensilla (s) of similar size or slightly longer than surrounding setae, smooth (Figs 4–5, 12, 21–22). Th. I with 3 + 3 setae. Setae a2 and m3 on abd. IV sometimes missing asymmetrically. Subcoxae I–III with 1, 2, 3 setae respectively.

Anal spines very short, straight, or very slightly curved, inserted on very low basal papillae of about half the height of the spines (Figs 4–5, 8, 23).

Tibiotarsi I–III with 19, 19, 18 setae respecttively, one clavate tenent hair (A1 according to the nomenclature of Lawrence (1977)) on each leg. Tenent hairs longer than claws (Fig. 24), with some variability in length (reaching from 2/3 to the tip of the unguis). Claws with a small inner tooth in the distal half, and a small lateral tooth (Fig. 24). Empodial appendage with a broad basal lamella and an apical filament reaching about 2/3 of inner edge of unguis (Fig. 24).

Ventral tube short, with 4 + 4 setae (Fig. 26). Tenaculum with 4 + 4 teeth (Figs 9, 25).

Furca well developed (Fig. 4). Manubrium with 10 + 10 dorsal setae. Dens with 7 dorsal setae, fine granulation, and a number of subapical conical teeth (4–7 strong, 4–7 somewhat smaller) (Figs 4, 10–11, 27–29). Ventroapical third to half of the dens smooth, without granulation (Figs 10–11) (ventroapical hyaline area according to the terminology of Skarżyński & Smolis (2003)), in some specimens discretely swollen. Mucro wide, 1/3–1/4 as long as dens, with a broad outer lamella and with a distinct subapical tooth (Figs 10–11, 27–29).

Etymology. The name of the new species refers to the geographic region (Peloponnese) where it was collected.

Ecology. Found in a patchy habitat of alpine meadows and *Abies cephalonica* stands (Fig. 1), swarming under limestone rocks at snowmelt (Figs 2–3).

DISCUSSION

The new species is most similar to *H. tooliki* Fjellberg, 1985, which is the only other known *Hypogastrura* with a prominent tubercle on each side of the head. The two species can be distinguished by the morphology of the maxilla (*notha* type in *peloponnesica*, *tullbergi* type in *tooliki* (Fjellberg 1984)), by the height of the anal spine papillae (very low in *peloponnesica*, high in *tooliki*), by the relative size of the postantennal organ (1.3–1.5 times larger (*peloponnesica*) vs. slightly smaller (*tooliki*) than neighbouring ocelli), and by the number of setae on the ventral tube (4 + 4 in *peloponnesica* and typically 5 + 5 in *tooliki*).

H. tooliki belongs to the Nearctic *H. nivicola* (Fitch, 1847) species group (all grouping sensu Skarżyński 2009). Within this and the closely related Palaearctic *H. socialis* (Uzel, 1891) group, the new species shares the *notha* type maxilla only with *H. packardi* (Folsom, 1902) from which it differs in the anal spines (very small in *peloponnesica*, strong in *packardi*) and in the number of sensilla on ant. IV (6 in *peloponnesica*, 8–9 in *packardi*).

With the relatively large postantennal organ, *peloponnesica* differs from all other members of the *nivicola/socialis* groups and resembles species of the *H. monticola* Stach, 1946 group, particularly *H. hatiparae* Babenko, 1994, *H. dasiensis* Selga, 1966 and *H. subpapillata* Babenko, 1994. Differences are apparent in the body granulation (fine in *peloponnesica*, coarse in the other three species), in the dorsal chaetotaxy (m setae on abd. V absent in *peloponnesica*, present in the other three species), in the maxilla (*notha* type in *peloponnesica*, *tullbergi* type in *hatiparae* and *subpapillata*, unknown in *dasiensis*), and in the number of sensilla on ant. IV (6 in *peloponnesica*, 5 in *subpapillata* and *dasiensis*).

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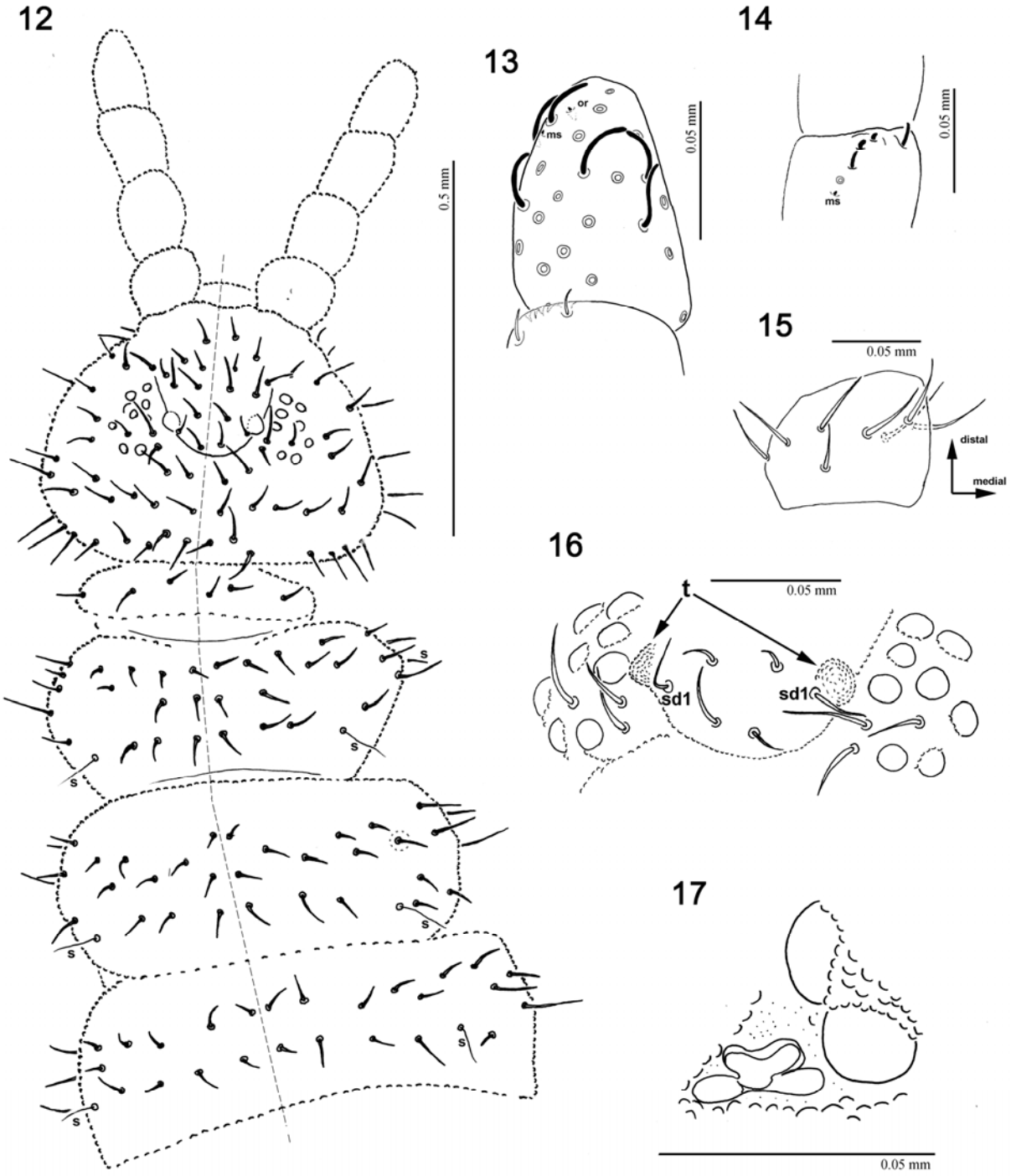
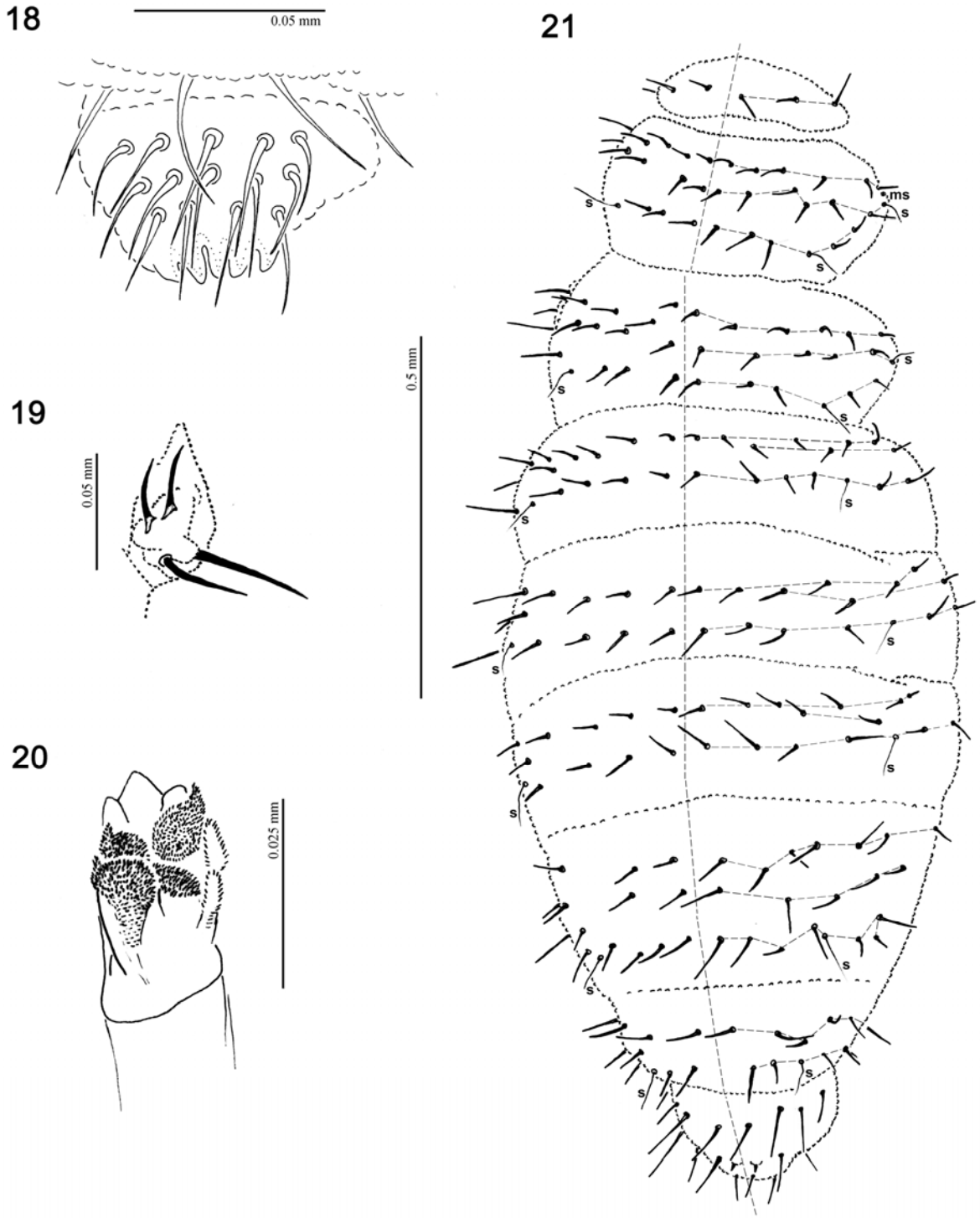
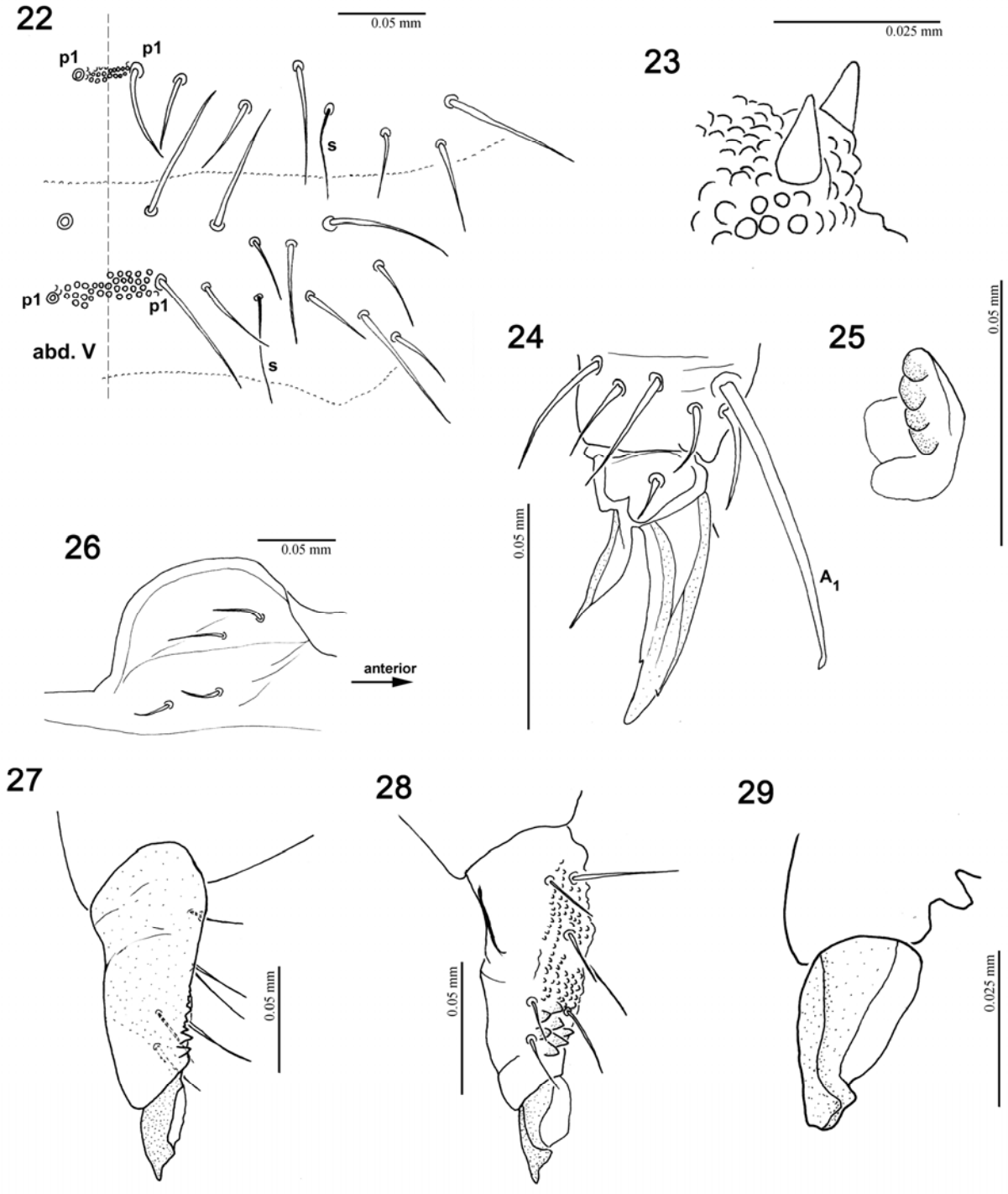


Figures 12–17. *Hypogastrura peloponnesica* sp. n., 12 = chaetotaxy of head, th. I–III and abd. I, 13 = chaetotaxy of ant. IV and distal ant. III (dorsal view) (or = subapical organite, ms = microsensillum), 14 = ant. III organ (ms = microsensillum), 15 = chaetotaxy of ant. I, 16 = ocelar fields and the prominent tubercles (t), 17 = postantennal organ and neighbour ocelli.



Figures 18–21. *Hypogastrura peloponnesica* sp. n., 18 = labrum, 19 = maxillary outer lobe, 20 = head of maxilla, 21 = chaetotaxy of body.



Figures 22–29. *Hypogastrura peloponnesica* sp. n., 22 = dorsal chaetotaxy of abd. V and p row of abd. IV, 23 = anal spines (dorsolateral view), 24 = tibiotarsus III, claw and empodial appendage, 25 = tenaculum, 26 = ventral tube, 27 = furca (lateral view), 28 = furca (caudomedial view), 29 = mucro (caudomedial view).

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Poorly-known phalangiid harvestmen (Opiliones: Phalangioidea) from the Balkans

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Abstract. Complementary description of *Megabunus hadzii* (Kratochvíl, 1935) comb. n. is given on a male specimen found in the South Western coast of Albania. *Dasylobus arcadius* (Roewer, 1956) is redescribed on the basis of the second known specimen found in Evrytania, Greece. *Leiobunum rumelicum* Šilhavý, 1965 is reported for the first time from Eastern Rhodope Mts., Bulgaria and additions to the original description are presented. Notes on the variability of the Greek populations of *Metaplatybunus grandissimus* (C. L. Koch, 1839) and *Zachaeus crista* (Brullé, 1832) are given. *Opilio putnik* Karaman, 1999 and *Opilio dinaricus* Šilhavý, 1938 are reported for the first time from Albania, and further notes are given on the distribution and ecology of *Megabunus pifkoi* Murányi, 2008.

Keywords. Opiliones, Balkans, new combination, redescription, complementary descriptions, variability, new records

INTRODUCTION

Apart from several well explored regions like Bulgarian (Mitov 2007, 2008) or Serbian (Karaman 2008a) mountains and the Aegean Isles (Martens 1966, Gruber 1978), the harvestmen fauna of the Balkan is still poorly known (Mitov 2000, Novak 2004, 2005). There are roughly 150 valid species reported, but at least additional 50 taxa are in need of clarification (Deltsev *et al.* 2005, Gruber 1978, Karaman 2009, Martens 1978, Murányi 2008, Novak 2004, 2005, Novak & Gruber 2000, Novak *et al.* 2006). Although several harvestmen species like *Phalangium opilio* or *Opilio saxatilis* are widespread and common in the Balkan, most of the species are endemic or subendemic, many of them restricted to very small areas or specific habitats. Due to this phenomenon, systematic collecting still easily results in description of new species. Only in the last decade 23 of such endemics were described (Karaman 2005, 2008a, 2008b, 2009, Murányi 2008, Novak & Slana 2003, Schönhofer & Martens 2009) and certainly many more still waiting for discovery.

During the last ten years of researches in the Balkans by the Hungarian Natural History Museum and the Hungarian Academy of Sciences, a notable amount of Opiliones was collected (Murányi *et al.* 2011). Most of the specimens were lent to Plamen Mitov (Sofia University, Bulgaria) for future studies in 2010, while the genus *Megabunus* was studied by Murányi (2008, 2010).

Since the collecting trips of the last two years resulted in founding interesting novelties, those with taxonomical interest are hereby reported with completed descriptions of some rare and other selected harvestman species which have for long been incompletely or even wrongly described.

MATERIAL AND METHODS

The specimens were collected by singling and using beating sheet. They are stored in 70% ethanol and deposited in the Soil Zoological Collections, Department of Zoology, Hungarian Natural History Museum (HNHM).

Drawings were made with a drawing tube on a Nikon SMZ800 microscope. Ovipositors were cleared in 10% KOH and mounted in glycerin gelatin.

Distributional and ecological data of the species studied were depicted after Gruber (1978), Karaman (1999), Martens (1966, 1978), Mitov (2000, 2004, 2007), Murányi (2008, 2010), Novak

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(2004, 2005), Novak *et al.* (2006), Rafalski (1962), Roewer (1956), Staręga (1976) and Šilhavý (1965).

TAXONOMY

Opilio dinaricus Šilhavý, 1938

(Figures 1–4, 20)

Opilio dinaricus Šilhavý, 1938: 14 (original description); Rafalski, 1962: 121 (complementary description); Martens, 1978: 247 (redescription).

Material examined. Albania: Shkodër district, Prokletije Mts., Mollë, limestone walls by the Shallë River at its influx to Koman Lake (loc. 2012/31), N42°11.982' E19°49.121', 180 m, 18. 06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 1♀; Tropojë district, Palc, limestone rocks at a stream on the right bank of Koman Lake (loc. 2012/38), N42°15.496' E19°54.599', 215 m, 18. 06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 1♂; Pukë district, Mertur, gorge of Mertur Stream at the influence to Koman Lake (loc. 2012/40), N42°13.674' E19°54.423', 180 m, 18.06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 1♂ 2♀.

Diagnosis. Medium sized, pale *Opilio* with long legs. Shaft of penis middle long, apically with small lobes; glans elongated and thin, ventrally sinuate. Receptacula seminis with bilobate upper vesicle.

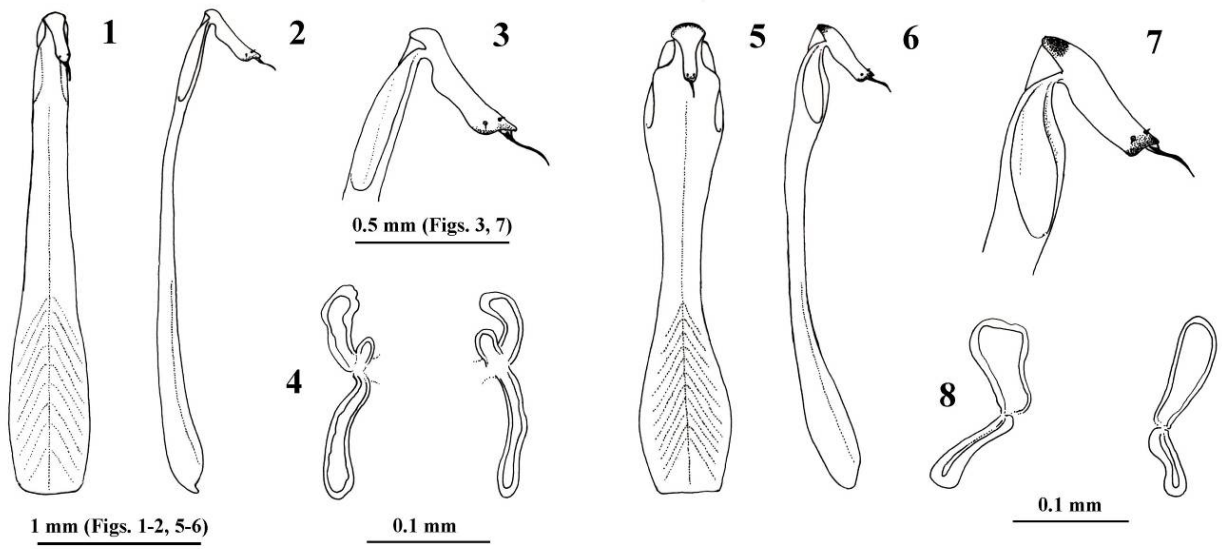
Distribution. The species has a Central European and Balkanic distribution. In the Balkan it is widely distributed in Slovenia, Croatia, Bosnia-Herzegovina and Bulgaria, the present North Albanian localities are the southernmost ones in the Dinaric region (Fig. 20).

Opilio putnik Karaman, 1999

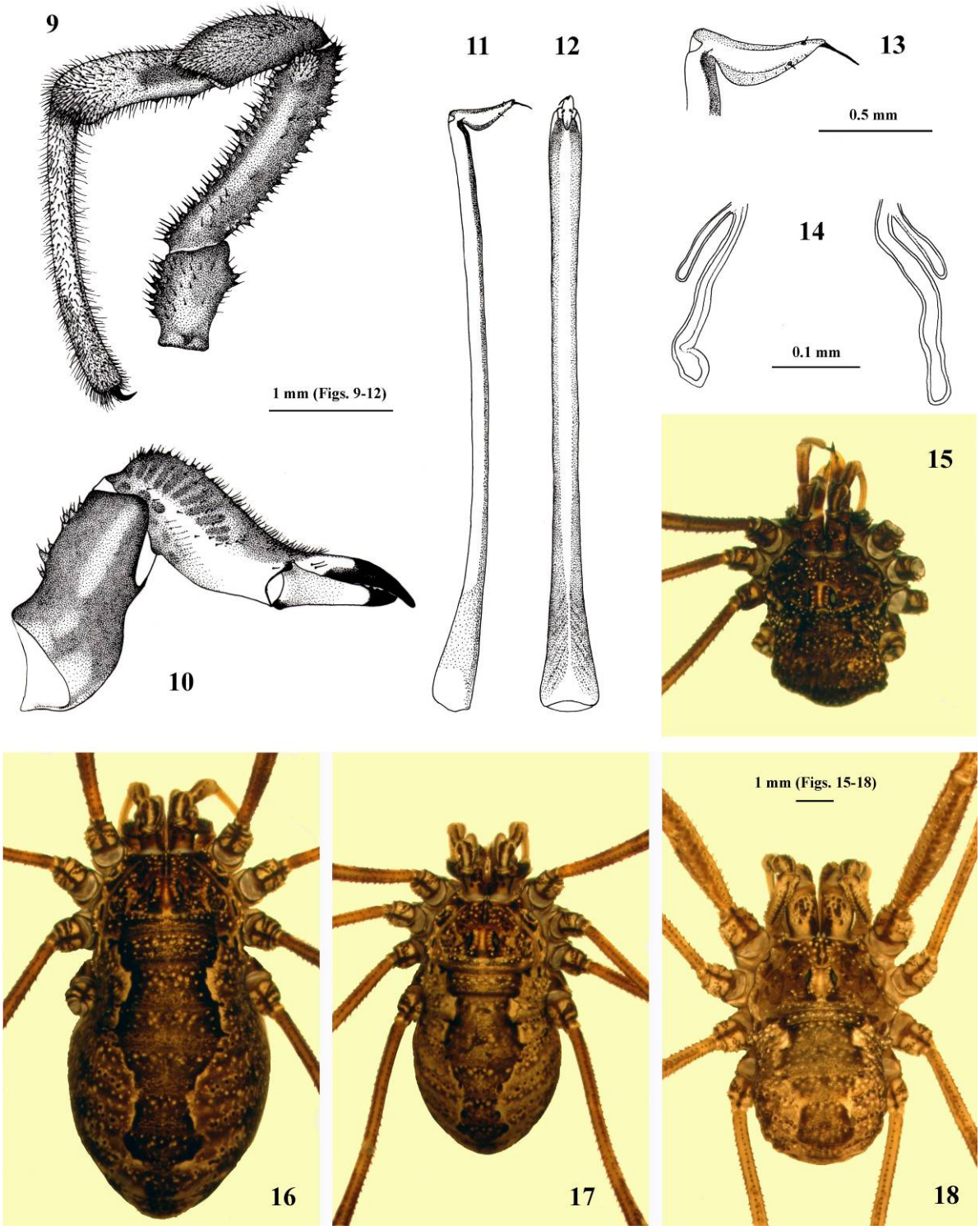
(Figures 5–8, 19, 64, 69)

Opilio putnik Karaman, 1999: 78 (original description).

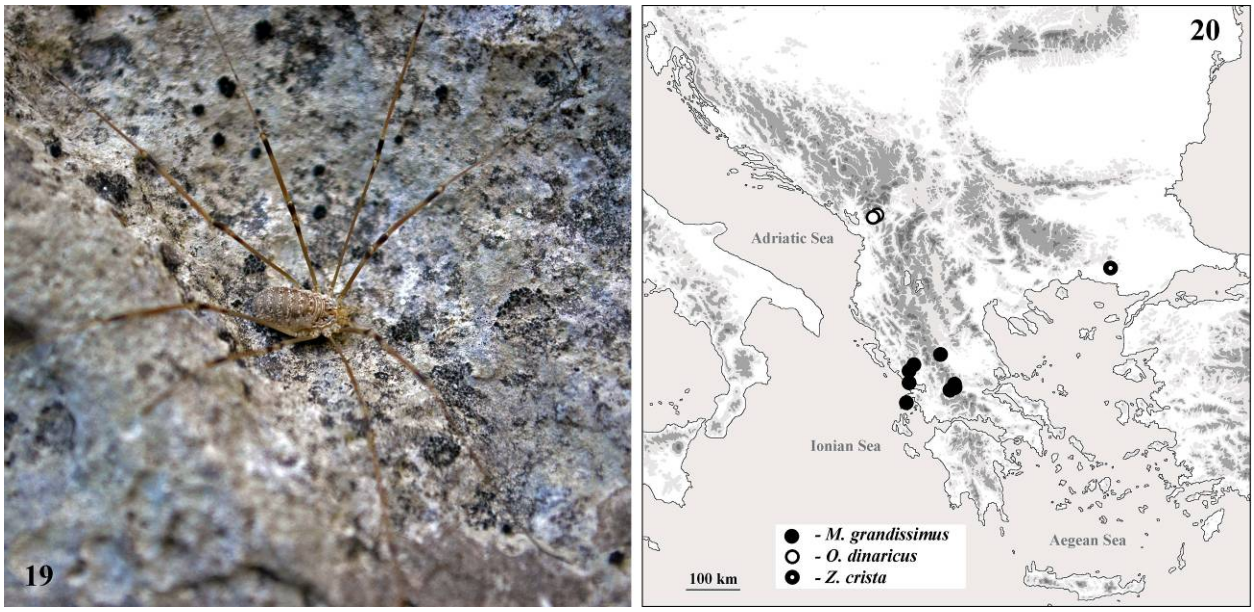
*Material examined. Albania***:** Shkodër district, Prokletije Mts., Mollë, limestone walls by the Shallë River at its influx to Koman Lake (loc. 2012/31), N42°11.982' E19°49.121', 180 m, 18. 06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 1♀; Tropojë district, Palc, limestone gorge of Kapon Brook on the right bank of Koman Lake (loc. 2012/37, Fig. 71), N42°15.912' E19° 55.075', 210 m, 18.06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 4♂ 6♀.



Figures 1–8. *Opilio dinaricus* Šilhavý, 1938 and *O. putnik* Karaman, 1999, Albania. 1−4 = *O. dinaricus*, loc. 2012/40; 5−8 = *O. putnik,* loc. 2012/37; 1, 5 = penis, dorsal view; 2, 6 = penis, lateral view; 3, 7 = glans of penis, lateral view; 4, 8 = receptacula seminis, ventral view.



Figures 9–18. *Metaplatybunus grandissimus* (C. L. Koch, 1839), W Greece. 9–17 = loc. 2011/35; 18 = loc. 2011/33; 9 = pedipalpus, medial view; 10 =chelicera, lateral view; 11 = penis, lateral view; 12 = penis, dorsal view; 13 = glans of penis, lateral view; 14 = receptacula seminis, ventral view; 15, 18 = habitus, male; 16–17 = habitus, female.



Figures 19–20. 19 = Habitus of *Opilio putnik* Karaman, 1999 female, Albania, loc. 2012/37; 20 = Investigated localities of *Opilio dinaricus* Šilhavý, 1938, *Metaplatybunus grandissimus* (C. L. Koch, 1839) and *Zachaeus crista* (Brullé, 1832).

Diagnosis. Large sized *Opilio*, with long legs and distinctive colour pattern. Shaft of penis short and stout, apically swollen with complex lobes; glans elongated and thin. Receptacula seminis with large upper vesicle.

Distribution. The species has been hitherto reported only from the Durmitor Mts. in northern Montenegro, but was found also in the Kosovo part of the Prokletije Mts. (I. Karaman pers. com.). The presented North Albanian localities are from the southern edge of the Prokletije Mts. (Figs. 64, 69).

Metaplatybunus grandissimus (C. L. Koch, 1839)

(Figures 9–18, 20, 71)

Platylophus grandissimus C. L. Koch, 1839: 29 (original description).

Metaplatybunus grandissimus (C. L. Koch, 1839): Martens, 1966: 357 (complementary description and full synonymy: *Opilio laevigatus* L. Koch, 1867, *O. pristes* L. Koch, 1867, *O. instratus* L. Koch, 1867, *O. vorax* L. Koch, 1867).

Material examined. Greece: Epirus, Ioannina peripheral unit, Vouliasta, plane tree gallery forest along upper section of Louros River in the village (loc. 2011/08), N39°25.939’ E20°50.605’, 235 m, 04.05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 1♀; Epirus, Preveza peripheral unit, Thesprotiko Mts., Vrisoula, plane tree gallery forest along a stream S of the village (loc. 2011/11), N39°14.904’ E20°41.735’, 220 m, 05. 05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 2♂; Epirus, Preveza peripheral unit, Nikopoli, shrubby grassland and walls of the ancient ruins S of the village (loc. 2011/14), N39° 00.629’ E20°43.952’, 15 m, 05.05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 1♀; Ionian Islands, Lefkada peripheral unit, Rahi, limestone rocks, plane tree gallery forest and bush W of the village (loc. 2011/19), N38°43.363’ E20°41.404’, 50 m, 06.05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 1♂; Central Greece, Evrytania peripheral unit, Timfristos Mts., Karpenisi, parking of Hotel Lekadin (loc. 2011/33), N38°54.803’ E21°47.024’, 1010 m, 08.05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 1♂; Central Greece, Phthiotis peripheral unit, Agios Georgios, gallery forest along Sperchios River W of the village (loc. 2011/35, Fig. 73), N38°57.009’ E21°56.712’, 365 m, 08.05.2011, leg. J. Kontschán, D. Murányi, T.

Szederjesi, Zs. Ujvári: 2♂ 3♀; Central Greece, Phthiotis peripheral unit, Paleokastro, oak forest S of the village (loc. 2011/36), N38°58.653' E21° 54.221', 685 m, 08.05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 1♀; Thessaly, Karditsa peripheral unit, Mouzaki, garden of Hotel Panorama (loc. 2011/41), N39°26.270' E21°40.363', 165 m, 09.05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 1♂.

Diagnosis. Medium-sized to very large *Metaplatybunus*, with middle long legs. Peltidium with numerous denticles, pedipalpus with short tubercles only. Shaft of penis characteristic for the genus, glans with strongly convex ventrobasal part. Receptacula seminis bivesiculate.

Distribution. The species is known from the Western and Southern Balkan (Montenegro, Albania and Greece), Anatolia and eastwards to Georgia. The studied specimens are from the Western edge of its distribution (Figs. 20, 71).

Remarks. As it was already noted by Martens (1966), this species displays strong variability in body shape, proportions and colour. Figs. 15−18 show the habitual variability of the herein studied populations, but all of them have genital organs, chelicerae and pedipalps like those on Figs. 9−14.

***Megabunus pifkoi* Murányi, 2008**

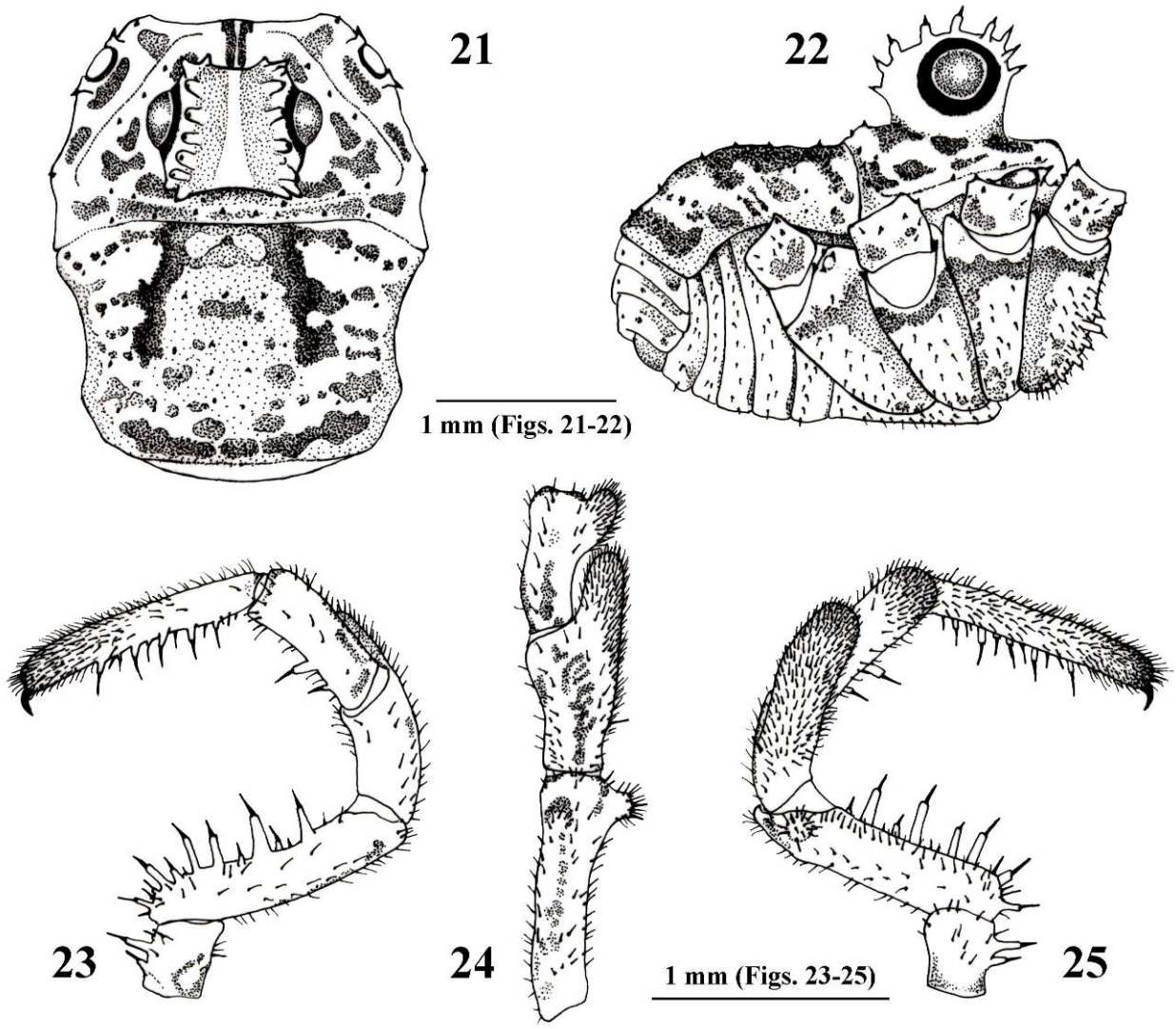
(Figures 63, 70)

Megabunus pifkoi Murányi, 2008: 54 (original description).

Material. Albania: Mat district, Shkanderbeu Mts., Shkopet, limestone rocks on the N foothills of Mt. Mëllezi, at the village (loc. 14653), N41° 41.458' E19°49.375', 275 m, 24.04.2009, leg. Z. Barina, L. Lőkös, D. Pifkó: 1♂ 1♀; Mat district, Dejë Mts., Macukull, rocky forest E (above) of the village (loc. 2010/16), N41°41.825' E20° 08.171', 1280 m, 19.05.2010, leg. Z. Fehér, D. Murányi, Zs. Ujvári: 1♂ 2♀; Mirditë district, Shent Mts., Kurbnesh, limestone rocks along Urakë River NE of the city (loc. 2010/19), N41°47.711' E20°06.703', 800 m, 20.05.2010, leg. Z. Fehér, D. Murányi, Zs. Ujvári: 1♂; Dibër district, Lurë area, Mërkuth, limestone rocks S (above) of the village (loc. 2010/20), N41°48.808' E20°08.384', 1015 m, 20.05.2010, leg. Z. Fehér, D. Murányi, Zs. Ujvári: 3♂ 1♀; Mirditë district, Oroshi area, Ndërshenë, rocks at a karst spring N of the village (loc. 2010/32), N41°50.539' E20° 05.671', 1160 m, 21.05.2010, leg. Z. Fehér, D. Murányi, Zs. Ujvári: 1♂; Mirditë district, Oroshi area, Ndërshenë, limestone rocks N of the village (loc. 2010/33), N41°51.034' E20°05.842', 1135 m, 21.05.2010, leg. Z. Fehér, D. Murányi, Zs. Ujvári: 3♂; Mirditë district, Oroshi area, Nanshenë, limestone rocks N (beneath) of the village (loc. 2010/37), N41°52.240' E20°06.510', 1045 m, 21.05.2010, leg. Z. Fehér, D. Murányi, Zs. Ujvári: 1♀; Gramsh district, Vallamarë Mts., Kukur, limestone rocks at a stream E of the village (loc. 110519_19094), N40°51.991' E20°22.642', 890 m, 19.05.2011, leg. Z. Barina, H. Mező, D. Pifkó: 1♂ 3♀; Tropojë district, Palc, limestone rocks at a stream on the right bank of Koman Lake (loc. 2012/38), N42°15.496' E19°54.599', 215 m, 18. 06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 1♀; Tiranë district, Gropë Mts., limestone rocks in beech forest at Shtyllë Pass (loc. 2012/51, Fig. 72), N41°22.232' E20°05.128', 1515 m, 20.06. 2012, leg. Z. Fehér, T. Kovács, D. Murányi: 3♂ 1♀; Bulqizë district, Çermenikë Mts., Ballenjë, limestone rocks and a cave SW of the settlement (loc. 2012/56), N41°21.621' E20°14.472', 1365 m, 20.06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 3♂.

Diagnosis. Medium sized, dark *Megabunus* with middle long legs. Peltidium with few denticles. Pedipalpal femur with ventral tubercles, which lengths reach the width of the femur, pedipalpal tibia with large tubercles. Penis uniformly pale brown; shaft slightly bent dorsally and slightly narrowing distally, glans pointed. Receptacula seminis rather long, reaching from segment 6 to segment 9 in the ovipositor.

Distribution. The species is known from Central and South Albania. Besides the new localities, data of the specimens collected in 2009 and 2010 are also listed here, because these were only briefly mentioned in Murányi (2010) (Fig. 63, 70).



Figures 21–25. Male *Megabunus hadzii* (Kratochvíl, 1935) comb. n., Albania, loc. 100328_37. 21 = body, dorsal view; 22 = body, lateral view; 23 = pedipalpus, lateral view; 24 = pedipalpus, dorsal view; 25 = pedipalpus, medial view.

Table 1. Length of the leg segments of *Megabunus hadzii* (Kratochvíl, 1935), n. comb., in mm; abbreviations: Fe – femur, Pt – patella, Ti – tibia, Mt – metatarsus, Ta – tarsus

Leg	Fe	Pt	Ti	Mt	Ta	full length
male						
Pp	1.1	0.6	0.6		1.1	3.4
I	3.9	0.9	2.6	5.2	4.1	16.7
II	7.1	1.1	5.3	8.9	7.6	30.0
III	4.2	0.9	3.0	6.3	5.2	19.6
IV	5.9	1.0	3.8	8.6	6.6	25.9

Megabunus hadzii (Kratochvíl, 1935), comb. n.

(Figures 21–33, 63, 68, Table 1)

Platybunus hadzii Kratochvíl, 1935: 291 (original description).
Megabunus sp.: Murányi 2010: 67.

Material examined. Albania: Vlorë district, Vuno, seashore limestone walls at the mouth of Canion Gjipesë, beneath the village (loc. 37, Fig. 70), N40°07.740' E19°40.387', 5 m, 28.03.2010, leg. Z. Barina, D. Pifkó, B. Pintér: 1♂.

Diagnosis. Small-sized, pale *Megabunus* with middle long legs. Peltidium with few denticles; ocularium rather big and with large tubercles. Forecoxa bears tubercles. Pedipalpal femur with ventral tubercles, which length do not reach the width of the femur, pedipalpal tibia with large tubercles. Penis pale brown, except dark brown glans apex; shaft slightly bent dorsally and slightly narrowing distally, shaft basis bulb-shaped; glans pointed and rather elongated.

Redescription. Body shape and proportions are typical of the genus (Figs. 21–22). Length: male 2.7 mm; width: male 2.2 mm.

Colour. Dorsum whitish with dark patches and some silverish hint (Figs. 21–22). Propeltidium with elongated, dark patch divided with thin medial pale line in front of ocularium, lateral patches and those between denticle lines of mesopeltidium distinctly separated; metapeltidium with transverse dark line of patches. Longitudinal dark pattern of opisthosomal scutum laterally dark, central area silverish with irregular dark dots. Besides, discontinuous transverse lines of dark patches appear. Ocularium pale, light brown with medial line between tubercles, tubercles and lateral ocularium areas white. Venter, including genital operculum pale, coxae with subapical dark band (Fig. 22). Ground colour of chelicerae white, both segments bear dark patches; fingers light brown, teeth and apical parts black (Figs. 27–29). Ground colour of pedipalps white; trochanter, femur, patella and tibia bear dark patches, tarsus apically brownish, tarsal claw black (Figs. 23–25). Legs pale with subapical dark bands on femora, patellae and tibiae; terminal articles of tarsi dark brown, claws black (Fig. 26).

Dorsum (Figs. 21–22). Surface imbricate and tuberculate, peltidium with setae on denticles, abdominal setae mostly on areoles. Propeltidium glabrous, with two posteriorly diverging lines of denticles. Supracheliceral laminae smooth. Ozopores with large, single anterior and posterior denticles on each side of ocularium, metapeltidium with transverse row of denticles. Ocularium rather big, with medial groove and rows of nine large, acute tubercles. Setae on abdominal scutum arranged in transverse rows.

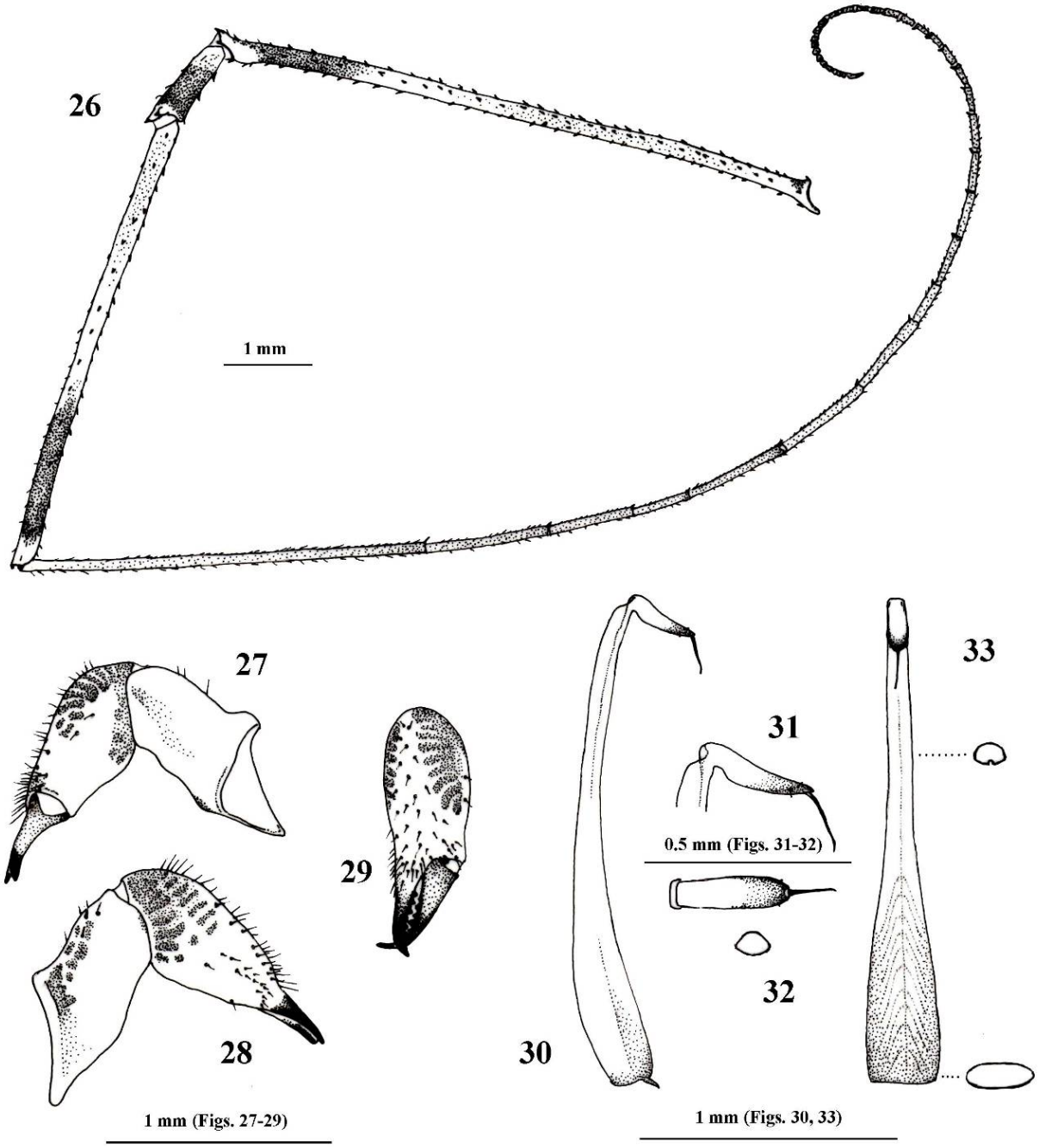
Venter (Fig. 22). Surface imbricate, setae on areoles; genital operculum and coxae densely setose, forecoxa with twice as high as wide spiny tubercles. Genital operculum trapezoid, twice as long as wide at the basis, anterior margin convex.

Chelicerae (Figs. 27–29). Robust, lacking any process; surface mostly glabrous but imbricate on lateral sides of basal segment, setae scarce. Large teeth on fingers alternated by a few smaller ones.

Pedipalps (Figs. 23–25, Table 1). Surface glabrous but partly imbricate, setae diverse, ciliated setae on apophyses. Trochanter with two ventral spines and simple setae. Femur with small, setose medio-distal apophysis; six large and four smaller ventral spine-tipped tubercles, which lengths do not reach femur width. Patella with large, rounded medo-distal apophysis that overhangs more than half tibia. Tibia ventrally with one large and one small spine, and medio-distal rounded apophysis slightly overhanging tarsus. Tarsus with seven moderately large tubercles; tarsal claw smooth.

Legs (Fig. 22, 26, Table 1). Relatively long, second pair more than ten times as long as body; surface mostly imbricate. Hindcoxa with two small denticles latero-apically, first three coxae with medio-dorsal apical denticle; forecoxa with middle large tubercles. Trochanter with a few denticles. Femur with conical teeth in irregular arrangement, and two or three large, dorso-apical teeth. Patella slightly swollen, with a few denticles and two or three large, dorso-apical denticles. Tibia with sparse denticles. Tarsi with dense setation, claw smooth.

Penis (Figs. 30–33). Length 1.9 mm, width at the base 0.3 mm; colour pale brown, except dark



Figures 26–33. Male *Megabunus hadzii* (Kratochvíl, 1935) comb. n., Albania, loc. 100328_37. 26 = 2nd leg, lateral view; 27 = chelicera, lateral view; 28 = chelicera, medial view; 29 = chelicera, frontal view; 30 = penis, lateral view; 31 = glans of penis, lateral view; 32 = glans of penis, dorsal view, and its frontal cross section; 33 = penis and its cross sections, dorsal view.

brown glans apex. Shaft slightly dorsally bent; widened basally, then tapering, distally nearly parallel-sided. Musculature limited to basal third. Shaft oval in basal portion and sulcated with shallow dorsal sulcus in distal three quarters. Glans rather elongated, ventrally slightly convex, dorsally slightly concave, apex pointed. Cross section broad fusiform; glans tongue-shaped in dorsal view. Stylus more than half as long as glans; pairs of setae vestigial, hardly visible because of dark colour of glans apex.

Affinities. Staręga (1981) first supposed that this is a *Megabunus* species. *Megabunus hadzii* is closest to *M. pifkoi*, differing from it by pale coloration, smaller size, tubercled forecoxa and more elongated glans. Besides, it is similar to the East Alpine *M. lesserti* Schenkel, 1927.

Distribution. The species is known from coastal Montenegro and Albania. It was described from a cave entrance in the Kotor region. We found here presented male in the mouth of a limestone gorge near the Ionian Sea, at the Northernmost corner of the Epirus region protruding from South Western Albania to North Western Greece (Figs. 63, 68).

Dasylobus arcadius (Roewer, 1956)

(Figures 34–46, 64–65, Table 2)

Eudasylobus arcadius Roewer, 1956: 254 (original description).

Dasylobus arcadius: Chemini 1989: 97 (synonymy of *Eudasylobus* Roewer, 1911 with *Dasylobus* Simon, 1879a).

Material examined. Central Greece, Evrytania peripheral unit, Timfristos Mts., Ano Kalesmeno, spruce forest along a brook, E of the village (loc. 2011/30, Fig. 67), N38°54.931' E21°43.825', 980 m, 07.05.2011, leg. J. Kontschán, D. Murányi, T. Szederjesi, Zs. Ujvári: 1♂.

Diagnosis. Medium sized, greyish brown *Dasylobus* with middle long legs. Peltidium with stout, distinct denticles; pedipalpal patella with large apophysis. Chelicerae relatively small, distal segment with a distinct process above movable finger. Glans rather expanded, highest subapically.

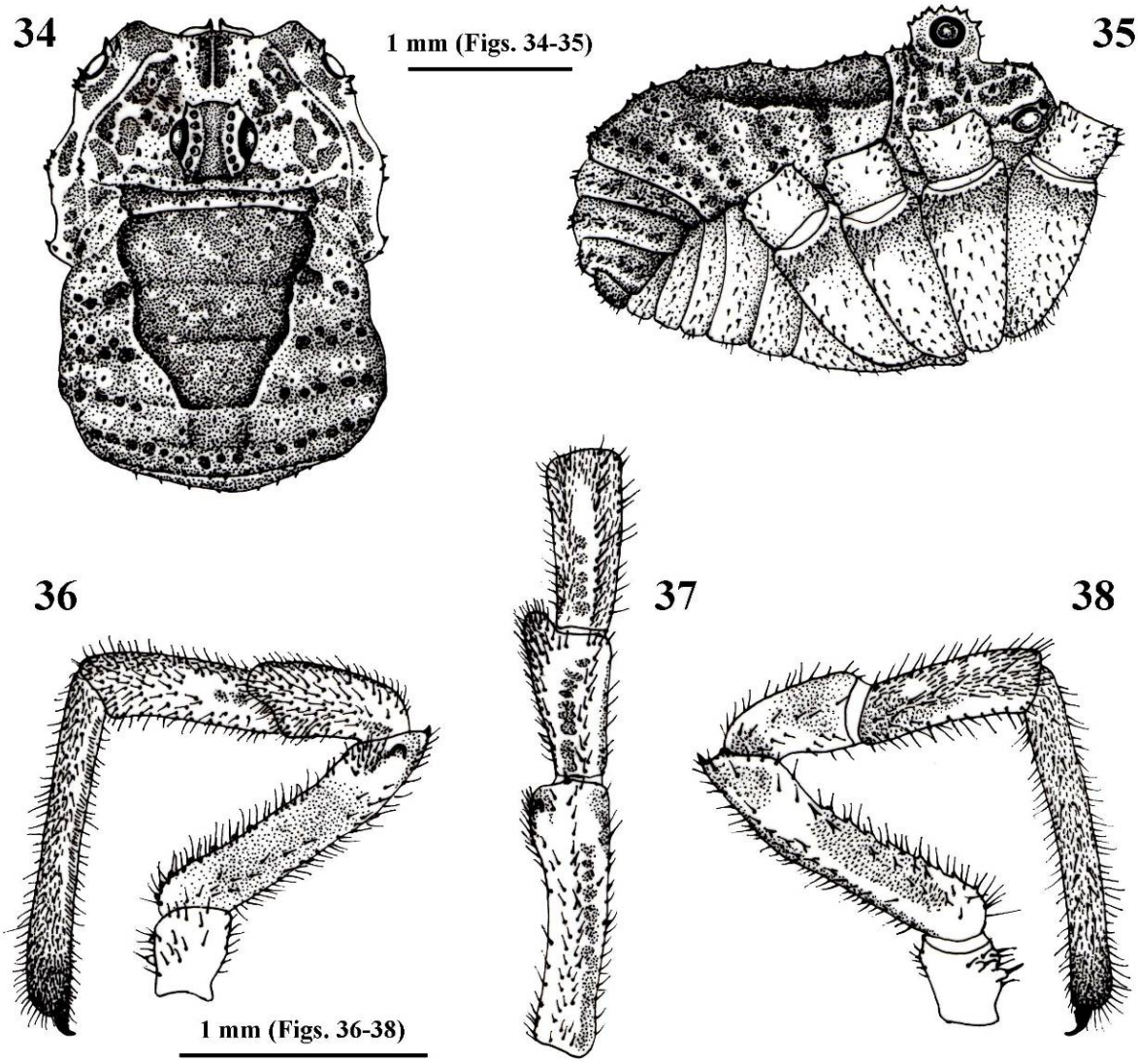
Description. Body shape and proportions are typical for the genus (Figs. 34–35). Length: male 3.1 mm; width: male 2.1 mm.

Colour. Dorsum greyish brown with dark patches (Figs. 34–35). Propeltidium with elongated, dark patch divided with thin medial pale line in front of ocularium, lateral patches and patches between denticle lines of mesopeltidium hardly separated; metapeltidium with transverse dark line of dotted patches. Saddle pattern on opisthosoma triangle-trapezoid, posteriorly narrowing, abruptly ending between 3rd and 4th opisthosomal tergits, dark brown with irregular pale dots, and white borders; lateral margins sinuous. Abdominal surface bears transverse lateral lines of dark and few white dots. Ocularium golden-brown laterally, and around tubercles light brown, tubercles pale. Venter pale, coxae with subapical brown band, genital operculum entirely pale (Fig. 35). Basic colour of chelicerae pale but both segments bear dark patches; fingers light brown, teeth and apical parts black (Figs. 40–42). Ground colour of pedipalps pale (Figs. 36–38); femur, patella and tibia bear dark patches, tarsus proximally dark brown, tarsal claw black. Legs light brown with darker patches on femora, patellae and tibiae; terminal articles of tarsi dark brown, claws black (Fig. 39).

Dorsum (Figs. 34–35). Surface imbricate and tuberculate, peltidium with setae on denticles, abdominal setae on areoles. Denticles on peltidium stout; propeltidium with a few denticles, each side of ocularium with two posteriorly diverging rows of denticles. Supracheliceral lamina with small, simple denticles. Ozopores with pairs of large, anterior and posterior denticles, metapeltidium with transverse row of denticles. Ocularium small, with medial groove and rows of small, acute tubercles. Setae on abdominal scutum arranged in transverse rows.

Venter (Fig. 35). Surface imbricate, setae on areoles; genital operculum and coxae densely setose. Genital operculum trapezoid, anterior margin convex, less than twice as long as posterior margin.

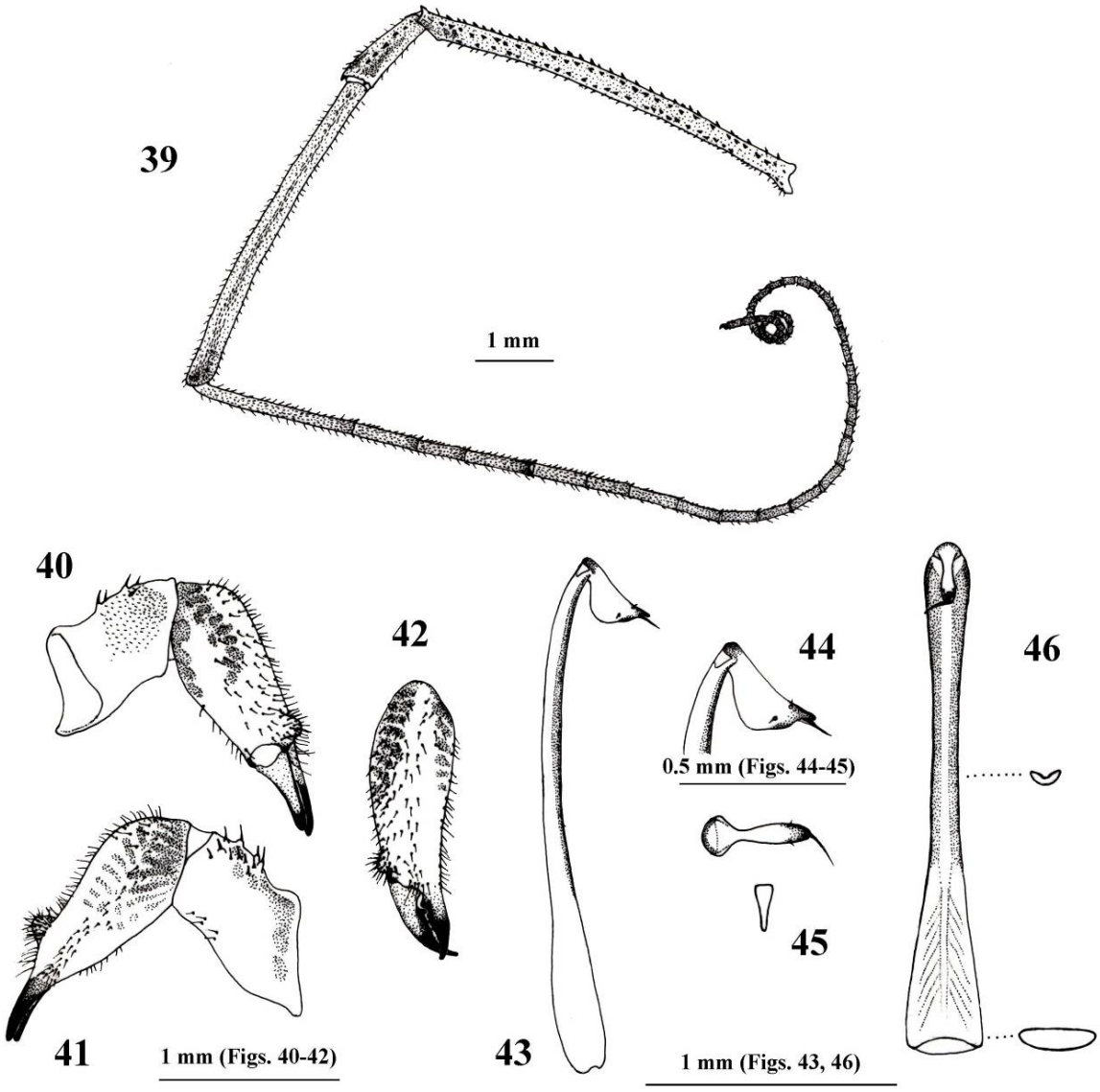
Chelicerae (Figs. 40–42). Relatively small, distal segment with a process above the movable finger. Surface mostly glabrous, lateral sides of



Figures 34–38. Male *Dasylobus arcadius* (Roewer, 1956), Greece, loc. 2011/30. 34 = body, dorsal view; 35 = body, lateral view; 36 = pedipalpus, medial view; 37 = pedipalpus, dorsal view; 38 = pedipalpus, lateral view.

Table 2. Length of the leg segments of *Dasylobus arcadius* (Roewer, 1956) in mm; abbreviations: Fe – femur, Pt – patella, Ti – tibia, Mt – metatarsus, Ta – tarsus

Leg	Fe	Pt	Ti	Mt	Ta	full length
male						
Pp	1.3	0.6	0.8		1.4	4.1
I	3.0	1.0	2.3	3.0	5.6	14.9
II	5.2	1.2	4.4	4.5	11.5	26.8
III	3.2	1.0	2.8	3.7	6.3	17.0
IV	4.9	1.1	3.4	5.7	7.8	22.9



Figures 39–46. Male of *Dasylobus arcadius* (Roewer, 1956), Greece, loc. 2011/30. 39 = 2nd leg, lateral view; 40 = chelicera, lateral view; 41 = chelicera, medial view; 42 = chelicera, frontal view; 43 = penis, lateral view; 44 = glans of penis, lateral view; 45 = glans of penis, dorsal view, and its frontal cross section; 46 = penis and its cross sections, dorsal view.

basal segment imbricate. Setae scarce, dorsal ones on basal segment with tubercles. Both fingers with large basal tooth, then with small, saw-like teeth.

Pedipalps (Figs. 36–38, Table 2). Proportions characteristic for the genus; surface glabrous but partly imbricate, setae diverse. Trochanter with small ventral tubercles and simple setae. Femur with small, setose meso-distal apophysis and spine-tipped tubercles on ventral and lateral surfaces with strong distal dorsal spine, and large scale at base of apophysis. Patella with large, rounded and slightly overhanging distal apophysis. Tibia lacks apophysis, covered with simple setae of different lengths. Tarsus densely setose, and with ventral, comb-like row of small setae. Tarsal claw ventrally with a few small, basal teeth.

Legs (Fig. 39, Table 2). Relatively long, second leg more than eight times as long as body; surface mostly imbricate. First three coxae with one medio-dorsal, and hindcoxa with two lateral denticles apically. Trochanter with a few denticles. Femur with triangular teeth arranged in rows, and two large, dorso-apical teeth. Patella slightly swollen, with a few triangular teeth arranged in lines and bears two or three large, dorso-apical teeth. Tibia distinctly carinated. Tarsi with dense setation, claw smooth.

Penis (Figs. 43–46). Length 2.0 mm, width at base 0.3 mm; colour pale brown, except dark brown sides of shaft and glans apex. Shaft slightly dorsally bent; widened basally and tapering until half of its length, then distinctly widened and forming distal spoon. Musculature limited to basal third. Shallow dorsal sulcus deriving from basal fifth gradually widening into spoon. Glans expanded ventrally, highest in distal quarter, dorsally slightly concave, cross section elongated triangular. In dorsal view, glans abruptly constricted after a wide base, apical two thirds tongue-shaped. Stylus below apical glans pointed protrusion, reaches less than half length of glans; dorsal pair of short setae placed more apically than the ventral pair.

Affinities. Though some other *Dasylobus* have process on distal segment of chelicerae (Chemini 1989), they differ by much smaller process, their basal segment bears dorsal apophysis (lacking in *D. arcadius*), and they differ in glans as well.

The genus has two other valid species described from the Balkans: *D. beschkovi* (Staręga, 1976) and *D. egaenoides* Simon, 1885. The Bulgarian *D. beschkovi* distinctly differs in glans of penis. *D. egaenoides* was described from Thessaly of Greece and can be conspecific with *D. arcadius*, but as the description is based on an immature specimen and lacks essential information it should be regarded as *nomen dubium*.

The cheliceral process of *D. arcadius* reminds to certain species of *Rilaena* Šilhavý, 1965. In addition, the distinct anterior spine on pedipalpal femur reminds to those in *Platybunoides* Šilhavý, 1955 (Zhang & Zhang 2012).

Distribution. This is the second report of this species described from the Peloponnes (Arcadia). As we collected it in Central Greece, *D. arcadius* is probably distributed at least in the whole Southern Greece (Figs. 64–65).

Zachaeus crista (Brullé, 1832)

(Figures 20, 47–57, 67)

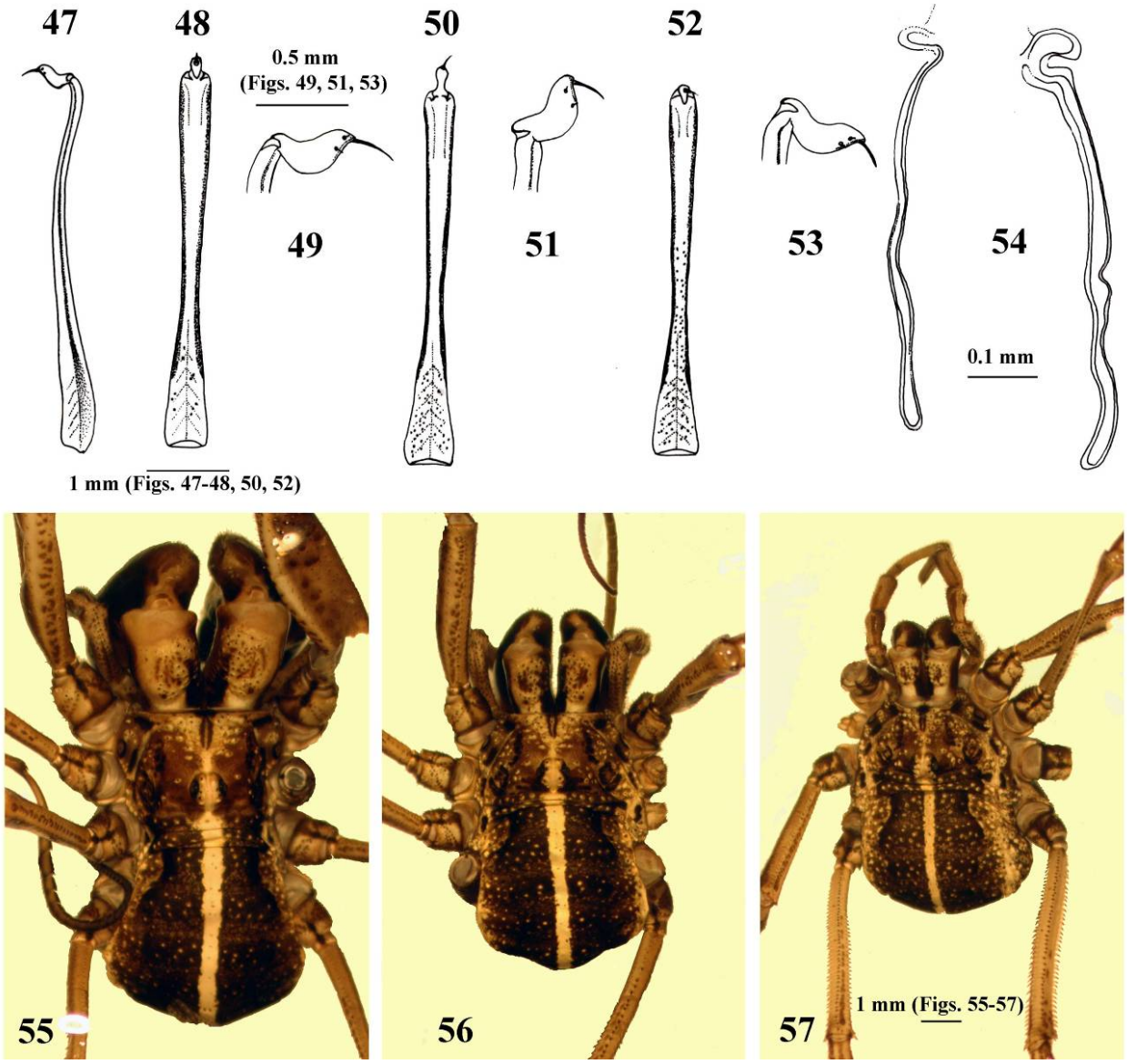
Phalangium crista Brullé, 1832: 60 (original description).
Zacheus crista (Brullé, 1832): Roewer, 1923: 820 (redescription); Šilhavý 1965: 384 (complementary description); Staręga 1976: 372 (redescription and synonymy: *Paropilio lineatus* Roewer, 1956); Martens 1978: 301 (redescription and synonymy: *Egaenus variegatus* Lendl, 1894, *E. hungaricus* Lendl, 1894).
Zachaeus crista (Brullé, 1832): Simon 1879b: Ixxi (synonymy: *Zachaeus mordax* C. L. Koch, 1839); Snegovaya & Staręga 2009: 42 (redescription of *Zachaeus*).

Material examined. Greece. Thrace, Rhodope peripheral unit, Sapka Mts., Nea Sanda, oak forest along a brook E of the village (loc. 2012/03, Fig. 69), N41°07.672' E25°53.223', 650 m, 26.05. 2012, leg. J. Kontschán, D. Murányi, T. Szederjesi: 5♂ 8♀, 5 juvenile.

Diagnosis. Medium-sized to large *Zachaeus*, with distinct dorsal medial pale line. Chelicerae and first femora widened and strongly armed; supracheliceral lamellae unidentate. Shaft of penis relatively short, slightly dorsally bent, narrowest in the middle, with dark brown margins. Receptacula seminis very long, reaching from segment 5 to segment 11 in the ovipositor.

Distribution. The species is known from the Carpathian Basin, Dobrudzha, South Eastern part of the Appeninian Peninsula, most of the Balkans (but is lacking on the Aegean isles), Western part of Anatolia and the Anatolian Isles. The studied Greek specimens are from the centre of the species' distribution (Figs. 20, 67).

Remarks. As it was already explained by Šilhavý (1965), the species displays large variability in body shape, armature and even in the morphology of the penis. Figs. 47–53 show the variability of the penis, while Figs. 55–57 show the variability of body shape and chelicerae in the Greek specimens.



Figures 47–57. *Zachaeus crista* (Brullé, 1832), Greece, loc. 2012/03. 47 = penis, lateral view; 48, 50, 52 = penis, dorsal view; 49, 51, 53 = glans of penis, lateral view; 54 = receptacula seminis, ventral view; 55–57 = habitus, male.

Leiobunum rumelicum Šilhavý, 1965

(Figures 58–62, 64, 66)

Leiobunum rumelicum Šilhavý, 1965: 404 (original description); Staręga 1976: 345 (redescription).

Material examined. Bulgaria. Kărdžhali province, Zălti Djal Mts., Sedlarci, spring and limestone gorge NW of the village (loc. 2012/24, Fig. 68), N41°33.073' E25°01.783', 585 m, 30. 05.2012, leg. J. Kontschán, D. Murányi, T. Szederjesi: 3♂ 2♀.

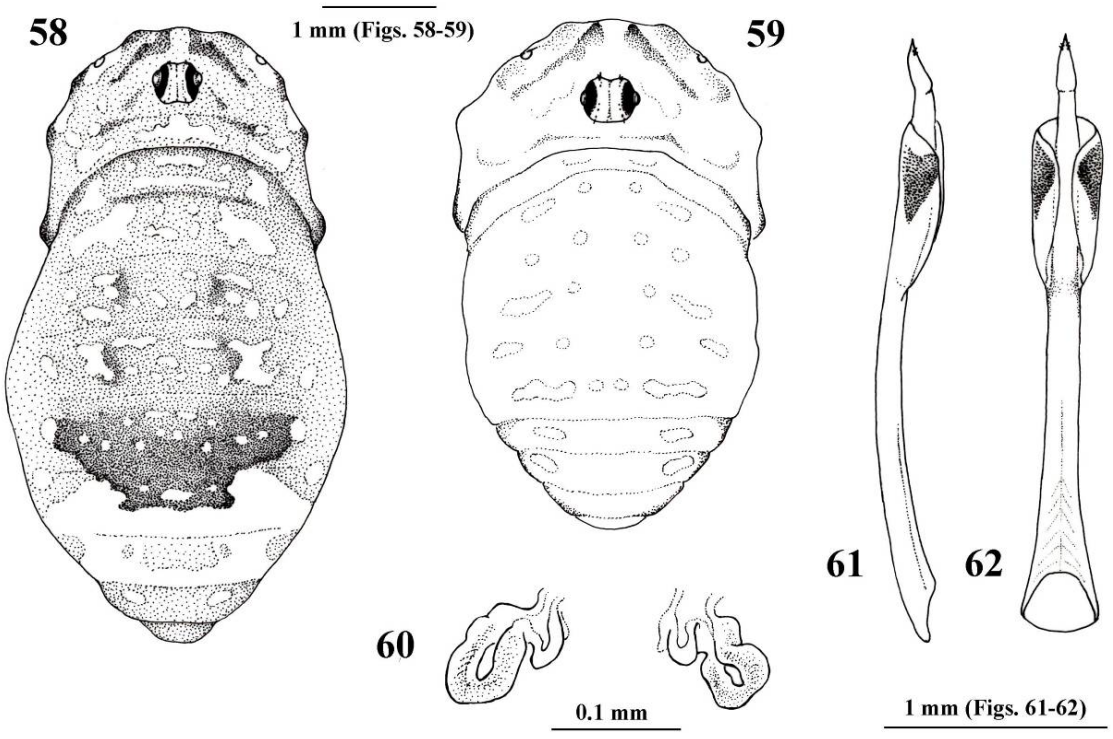
Diagnosis. Medium-sized *Leiobunum*, with pale, weakly ornamented body and middle long legs. Shaft of penis relatively slender; trunk pockets elongated, folded dorsally; glans short and stout. Receptacula seminis robust, bilobed, lower lobe well sclerotized.

Description. Body shape and proportions typical of the genus. Length: male 3.7−4.5 mm, female 4.8−5.3 mm; width: male 2.4−2.8 mm, female 2.8−3.1 mm.

Colour of male (Fig. 59). Dorsum pale orange-brown with indistinct dark patches on peltidial and white dots on abdominal surface. Peltidium with pair of oblique dark patches; interrupted dark line present behind ocularium and darker margins. Ozopores small. Abdominal surface with shiny, white dots arranged in transverse lines; central ones well separated and rounded, lateral ones elongated and usually fused. Ocularium white but with large, distinct black rings around eyes; tubercles pale, medial groove indistinct. Venter entirely pale.

Colour of female (Fig. 58). Dorsum pale brown with distinct dark and white patches on abdominal surface. Peltidium with pair of oblique dark patches, a transverse, interrupted dark line present behind ocularium and darker margins; white patches are around the small ozopores, on margins and in a transverse line behind ocularium. Basal half of abdominal surface with shiny, white, symmetrically arranged patches of various size; darker patches may present medially to largest paired white patches. Apical half of abdominal surface with distinct transverse, dark brown pattern, followed by a white one of similar size. Dark pattern terminates at two thirds of length of abdomen with abrupt tapering sharply ending in a sinuous line; small white dots present inside the pattern. White pattern surrounds the posterior part of dark pattern; pale brown patches present inside. Subterminal tergite with pairs of white dots. Ocularium similar to that of male. Venter entirely pale.

Distribution. The species is known from most of mountainous ranges of Bulgaria (Stara Planina, Vitosha, Osogovska, Rila, Pirin, Western Rho-



Figures 58–62. *Leiobunum rumelicum* Šilhavý, 1965, Bulgaria, loc. 2012/24. 58 = body, female, dorsal view; 59 = body, male, dorsal view; 60 = receptacula seminis, ventral view; 61 = penis, lateral view; 62 = penis, dorsal view.

Figures 65–71. Habitat types of the Balkanic Opiliones discussed in this paper. 65 = Greece, loc. 2011/30 (*Dasylobus arcadius* (Roewer, 1956)); 66 = Bulgaria, loc. 2012/24 (*Leiobunum rumelicum* Šilhavý, 1965); 67 = Greece, loc. 2012/03 (*Zachaeus crista* (Brullé, 1832)); 68 = Albania, loc. 100328_37 (*Megabunus hadzii* (Kratochvíl, 1935), photo B. Pintér); 69 = Albania, loc. 2012/37 (*Opilio putnik* Karaman, 1999); 70 = Albania, loc. 2012/51 (*Megabunus pifkoi* Murányi, 2008); 71 = Greece, 2011/35 (*Metaplatybunus grandissimus* (C. L. Koch, 1839)).

dopes) but not yet reported from the coastal region, nor from other countries of the Balkan. The studied specimens were found in the Eastern Rhodopes (Figs. 64, 66).

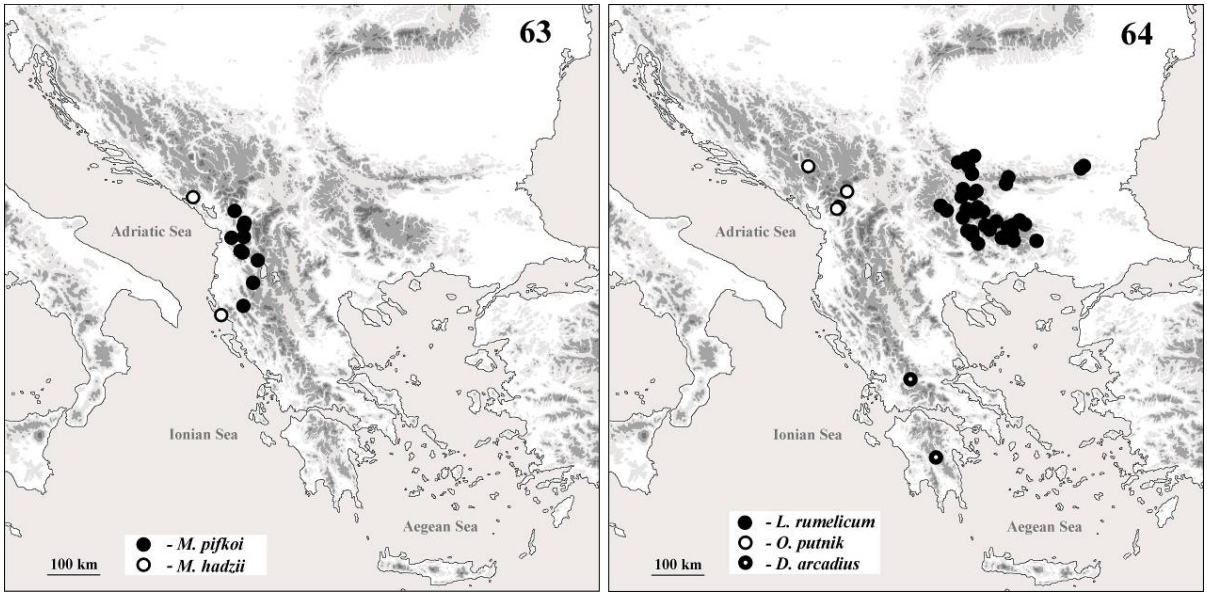
Remarks. The species was described on the basis of a single female from the Rila Mts. (Šilhavý, 1965). As the specimen was collected more than 30 years earlier, lacks pattern and was rather pale, so the habitus drawn by Šilhavý (1965: Fig. VIII/5) is misleading. Though the male was described together with redescription of the female by Staręga (1976), their habitus were not figured. Figs. 58–59 show the male and the female body of the freshly collected specimens.

ZOOGEOGRAPHY AND ECOLOGY

Among the eight species dealt with herein, three have wider distribution while five are endemic to the Balkans. Three endemics have well defined chorology: *Leiobunum rumelicum* is a Moesian, *Opilio putnik* is a South Dinaric, and *Dasylobus arcadius* a South Aegean species (Fig. 64). The two Balkanic *Megabunus* species possess a disjunct area with respect to the other members of the genus in the Alps and Western Europe (Murányi, 2008). *Megabunus pifkoi* is a Central and South Albanian species, while *M. hadzii* has been recorded in coastal Montenegro and Southern Albania (Fig. 63).

Regarding to their ecology, the eight species use rather different habitats and have different phenology. *Opilio putnik* was found on vertical limestone walls in shady gorges (Fig. 69), while *Opilio dinaricus*, *Megabunus pifkoi* and *Leiobunum rumelicum* were found also on smaller rocks in forest habitats (Figs. 66, 70). *Megabunus hadzii* probably use rocky habitats, like seaside limestone walls (Fig. 68). *Zachaeus crista* inhabits floors of various deciduous forests (Fig. 67), and *Dasylobus arcadius* was found in a shady, wet spruce forest (Fig. 65). *Metaplatybunus grandissimus* was mainly found in bushy lowland habitats, often close to water flows (Fig. 71).

Mature specimens of the two *Opilio* can be found mainly in summer, *Leiobunum rumelicum* in summer and early autumn, *Zachaeus crista* from spring to autumn, while *Metaplatybunus grandissimus* and *Megabunus pifkoi* mostly in spring and early summer. *Dasylobus arcadius* is probably a spring species and also the male *Megabunus hadzii* was found in early spring.



Figures 63–64. Distribution of the Balkan endemic Opiliones included in this papers. 63 = Balkanian species of genus *Megabunus* Meade, 1855; 64 = *Opilio putnik* Karaman, 1999, *Dasylobus arcadius* (Roewer, 1956) and *Leiobunum rumelicum* Šilhavý, 1965

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Additional description of *Scheloribates* (*Bischeloribates*) *mahunkai* Subías, 2010 (Acari: Oribatida: Scheloribatidae) on the basis of Vietnamese specimens

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Abstract. The oribatid mite, *Scheloribates* (*Bischeloribates*) *mahunkai* Subías, 2010 is redescribed in details on the basis of specimens from Vietnam. The size of body structures, morphology of the gnathosoma and legs are presented for the first time. Morphological differences of Vietnamese and Malaysian specimens are discussed.

Keywords. Oribatida, redescription, *Scheloribates* (*Bischeloribates*) *mahunkai*, Vietnam

INTRODUCTION

Scheloribates (*Bischeloribates*) *mahunkai* Subías, 2010 (Acari, Oribatida, Scheloribatidae) was described as *Bischeloribates heterodactylus* Mahunka, 1988. However, Subías (2004, online version 2006) has suggested to consider the genus *Bischeloribates* as subgenus of *Scheloribates* Berlese, 1908 because *Bischeloribates* differs from *Scheloribates* only by a single main character (leg tarsi with two claws versus with three claws). I support the subgeneric status for *Bischeloribates*, following the concept of Subías, because the number of leg claws is not apomorphic character at genus-level in Oripodoidea. Also, as the name *heterodactylus* is preoccupied by *Scheloribates* (*Topobates*) *heterodactylus* Pletzen, 1963 (see system of *Scheloribates* in Weigmann 2006), therefore Subías (2010) has proposed a replacement name – *mahunkai*.

At present, *Scheloribates* (*Bischeloribates*) *mahunkai* is recorded only in Malaysia and India (Subías 2004, online version 2012). In the course of taxonomic identification of Vietnamese oribatid mites, my friend (A. E. Anichkin) and I have found several specimens of this species; hence, it is first record in Vietnam.

Scheloribates (*Bischeloribates*) *mahunkai* is the type species of the subgenus *Bischeloribates*, therefore providing detailed morphological data on this species is needed, especially because, the original description (see Mahunka 1988) is incomplete and brief (lacking information on the measures of morphological structures, leg setation and solenidia, morphology of gnathosoma). The main goal of this paper is to present an additional description of *Scheloribates* (*Bischeloribates*) *mahunkai*, on the basis of the specimens found in Vietnam.

MATERIAL AND METHODS

Material examined. Ten specimens (three males and seven females) of *Scheloribates* (*Bischeloribates*) *mahunkai* found in Southern Vietnam, Dong Nai Province, Dong Nai Culture and Nature Reserve, pine (*Pinus kesiya* Royle ex Gordon, 11°16' N, 107° 40' E) and acacias (*Acacia auriculiformis* A.Cunn. ex Benth, 11°18' N, 107°3' E) plantations, in soil, leaves and litter, collected by A.E. Anichkin and S.G. Ermilov in July 2012.

Specimens were mounted in lactic acid on temporary cavity slides for measurement and il-

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lustration. All body measurements are presented in micrometers. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the ventral plate, to avoid discrepancies caused by different degrees of notogastral distortion. Notogastral width refers to the maximum width in dorsal aspect. Lengths of body setae were measured in lateral aspect. Formulae for leg setation (famulus included) are given in parentheses according to the sequence trochanter–femur–genu–tibia–tarsus. Formulae for leg solenidia are given in square brackets according to the sequence genu–tibia–tarsus.

The general morphological terminology used in the description follows that summarized by Coetzer (1967–1968) and Norton & Behan-Pelletier (2009).

TAXONOMY

Scheloribates (*Bischeloribates*) *mahunkai* Subías, 2010

(Figs. 1–17)

Scheloribates (Bischeloribates) mahunkai Subias, 2010: 38, nom. nov. pro *Scheloribates heterodactylus* Mahunka, 1988 non *Scheloribates (Topobates) heterodactylus* (Pletzen, 1963)

Diagnosis. Body size 365–431 × 232–249. Rostrum rounded. Translamellar line present, interrupted medially. Prolamellar lines complete or incomplete. Rostral, lamellar and interlamellar setae long, setiform, barbed. Sensilli long, clavate, with barbed head. Four pairs of short notogastral setae (h_1, p_1–p_3) present; the other setae represented only by alveoli. Sacculi *Sa* with elongate openings, *S1*, *S2* and *S3* with rounded openings. Anogenital setae short and smooth.

Measurements. Ten specimens: body length 365–431 (mean 403); notogaster width without pteromorphs 232–249 (mean 242).

Integument (Figs. 1–5). Body light brown. Body surface smooth. Lateral surfaces of prodorsum microgranulate (diameter of granules less than 1). Epimeres IV with muscle sigillae. Circumgastric band of sigillae weakly visible.

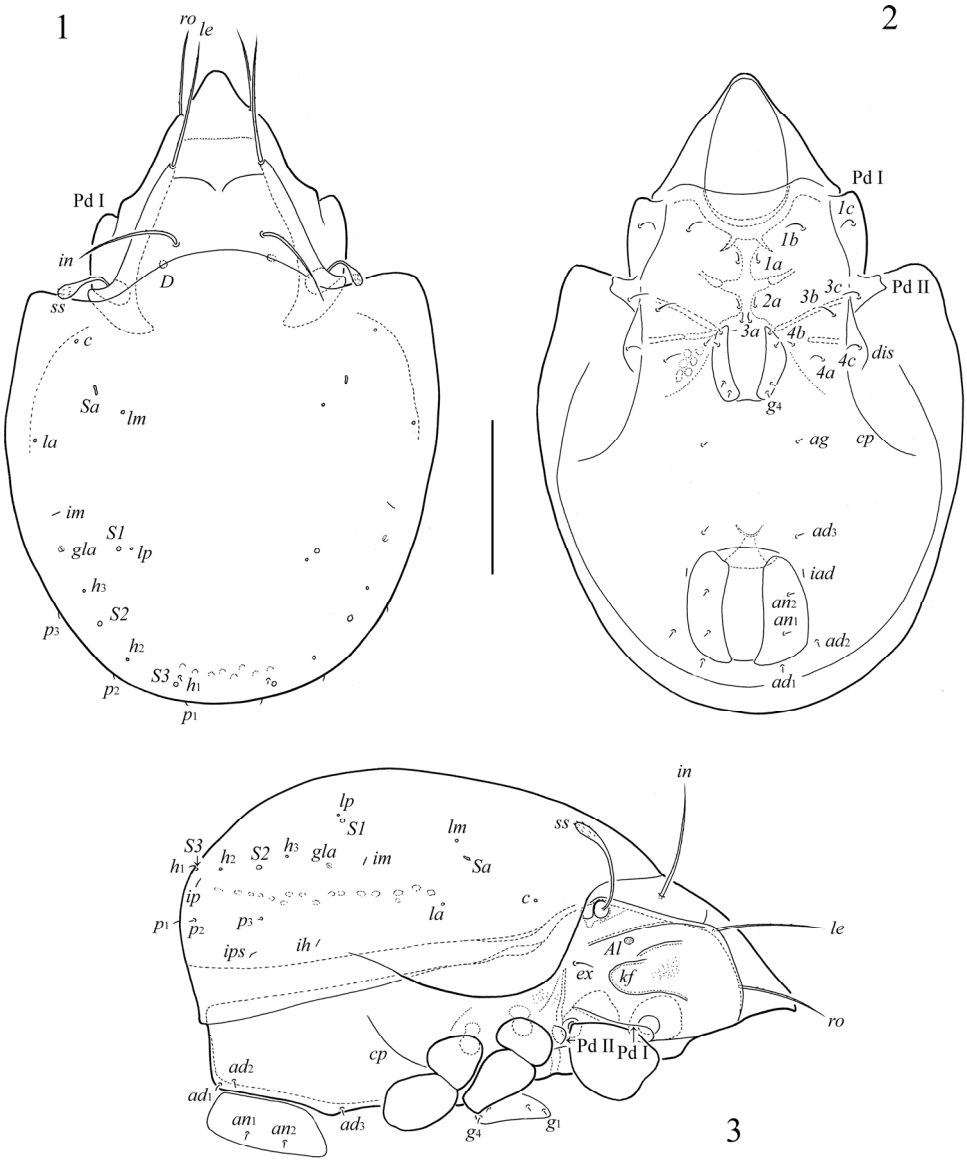
Prodorsum (Figs. 1, 3, 4, 6, 7). Rostrum rounded, weakly protruding in dorsal view. Lamellae equal approximately to half of prodorsum. Translamellar line present, interrupted medially. Prolamellar lines complete (in nine specimens) or incomplete, only its basal part developed (in one specimen). Sublamellar lines long and thin. Sublamellar porose areas (*Al*) small and rounded (4–6). Keel-shaped chitinized ridges (*kf*) distinct. Rostral (*ro*, 53–61), lamellar (*le*, 73–86) and interlamellar (*in*, 73–86) setae setiform, barbed. Sensilli (*ss*, 57–65) with long (32–41) stalk and shorter (20–24), barbed and distally rounded head. Exobothridial setae (*ex*, 12–24) setiform, thin and indistinctly barbed.

Notogaster (Figs. 1, 3, 4, 5). Anterior margin convex medially. Dorsophragmata (*D*) small and rounded. Four pairs of short, thin and smooth notogastral setae (h_1, p_1–p_3) present; other six pairs (rarely seven, including also h_1) represented only by alveoli. Sacculi *Sa* with elongate openings, *S1*, *S2* and *S3* small, with rounded openings. Lyrifissures *ia* inconspicuous; *im*, *ip*, *ih* and *ips* developed in typical arrangement for *Scheloribates*. Opisthonotal gland openings (*gla*) located posteriorly to *im* and laterally to *S1*.

Gnathosoma (Figs. 8–10). Subcapitulum longer than wide (86–94 × 49–57). Subcapitular setae setiform and slightly barbed; *h* and *a* (both 16–20) longer than *m* (8–12). Two pairs of adoral setae (or_1, or_2, 6–8) thickened, barbed and hook-like distally. Palps (53–57) with setation 0–2–1–3–9(+ω). Solenidion thickened, blunt-ended, attached with eupathidium *acm*. Chelicerae (94–98) with two setiform and barbed setae; *cha* (24–28) longer than *chb* (16–20). Trägårdh's organ (Tg) distinct.

Epimeral and lateral podosomal regions (Figs. 1–4, 11). Epimeral setal formula 3–1–3–3. Setae setiform and slightly barbed; *1a*, *2a*, *3a*, *4b* (6–12) shorter than others (16–20). Pedotecta I (Pd I) convex, pedotecta II (Pd II) rectangular and weakly concave distally. Discidia (*dis*) rounded distally. Circumpedal carinae (*cp*) distinct.

Anogenital region (Figs. 2, 3, 12, 13). Four pairs of genital (g_1–g_4, 4–8), one pair of aggenital

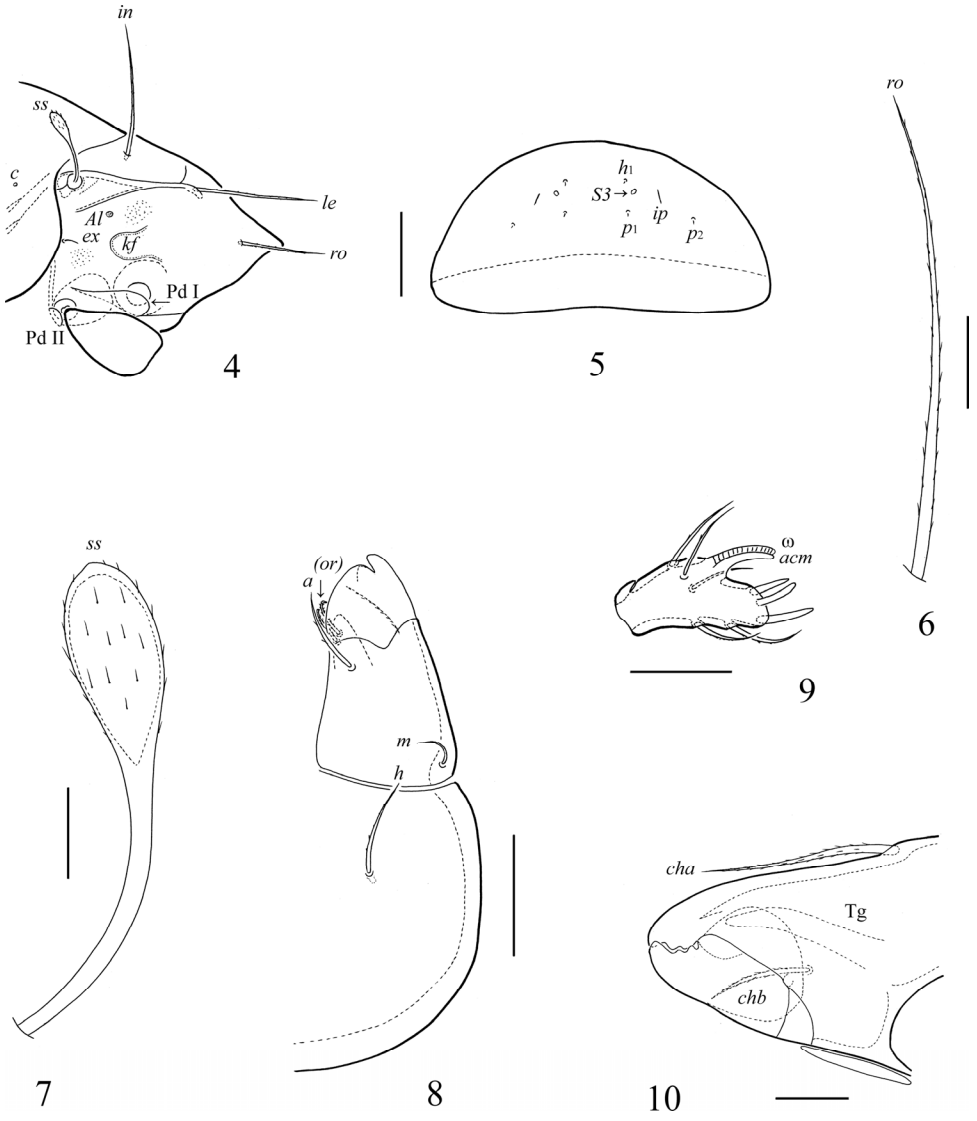


Figures 1–3. *Scheloribates (Bischeloribates) mahunkai* Subías, 2010. 1 = Dorsal view of body, 2 = ventral view of body (gnathosoma and legs not shown), 3 = lateral view of body (gnathosoma, epimeral setae, leg I and distal parts of legs II–IV not shown). Scale bar 100 μm.

Table 1. Leg setation and solenidia of *Scheloribates (Bischeloribates) mahunkai* Subías, 2010

Leg	Trochanter	Femur	Genu	Tibia	Tarsus
I	*v′*	*d, (l), bv″, v″*	*(l), v′*, σ	*(l), (v)*, φ_1, φ_2	*(ft), (tc), (it), (p), (u), (a), s, (pv), v′, e*, ω_1, ω_2
II	*v′*	*d, l′*$_1$, *l′*$_2$, *bv″, v″*	*(l), v′*, σ	*(l), (v)*, φ	*(ft), (tc), (it), (p), (u), (a), s, (pv)*, ω_1, ω_2
III	*l′, v′*	*d, l′, ev′*	*l′*, σ	*l′, (v)*, φ	*(ft), (tc), (it), (p), (u), (a), s, (pv)*
IV	*v′*	*d, ev′*	*d, l′*	*l′, (v)*, φ	*ft″, (tc), (p), (u), (a), s, (pv)*

Roman letters refer to normal setae (*e* – famulus), Greek letters refer to solenidia. One apostrophe (') marks setae on anterior and double apostrophe (") setae on posterior side of the given leg segment. Parentheses refer to a pair of setae.



Figures 4–10. *Scheloribates* (*Bischeloribates*) *mahunkai* Subías, 2010. 4 = Lateral view of prodorsum (specimen with incomplete prolamellar line) and anterior part of notogaster (gnathosoma, epimeral setae, leg I and distal part of leg II not shown), 5 = posterior view of notogaster, 6 = rostral seta, 7 = sensillus, 8 = subcapitulum, ventral view of left half, 9 = palptarsus, 10 = chelicera, anterior part. Scale bars (4, 5) 50 μm, (6, 7, 9, 10) 10 μm, (8) 20 μm.

(*ag*, 4–8), two pairs of anal (an_1, an_2, 6–10) and three pairs of adanal (ad_1–ad_3, 6–10) setae setiform, thin and smooth. Lyrifissures *iad* short, located anteriorly to the level insertions of an_2.

Legs (Figs. 14–17). Both claws smooth. Formulae of leg setation and solenidia: I (1–5–3–4–17) [1–2–2], II (1–5–3–4–15) [1–1–2], III (2–3–1–3–15) [1–1–0], IV (1–2–2–3–12) [0–1–0]; homology of setae and solenidia indicated in Table 1. Famulus (*e*) short, straight, blunt-ended. Solenidia ω_2 on tarsi I, ω_1 and ω_2 on tarsi II, σ on genua III setiform, thickened and blunt-ended; other solenidia thinner (φ_1 on tibiae I longest).

Remarks. The present Vietnamese specimens of *Scheloribates* (*Bischeloribates*) *mahunkai* are morphologically and in general appearance similar to the Malaysian specimens (see the original description of Mahunka (1988), but there are

slight differences as well; i.e. body size (365–431 × 232–249 in Vietnamese specimens versus 282–302 × 188–213 in Malaysian specimens), development of prolamellar lines (well developed, complete, exception – incomplete in Vietnamese specimens versus only its basal part developed in Malaysian specimens). I believe these differences represent intraspecific (perhaps geographical) variability, and it should be indicated in any future diagnosis of *Scheloribates* (*Bischeloribates*) *mahunkai*.

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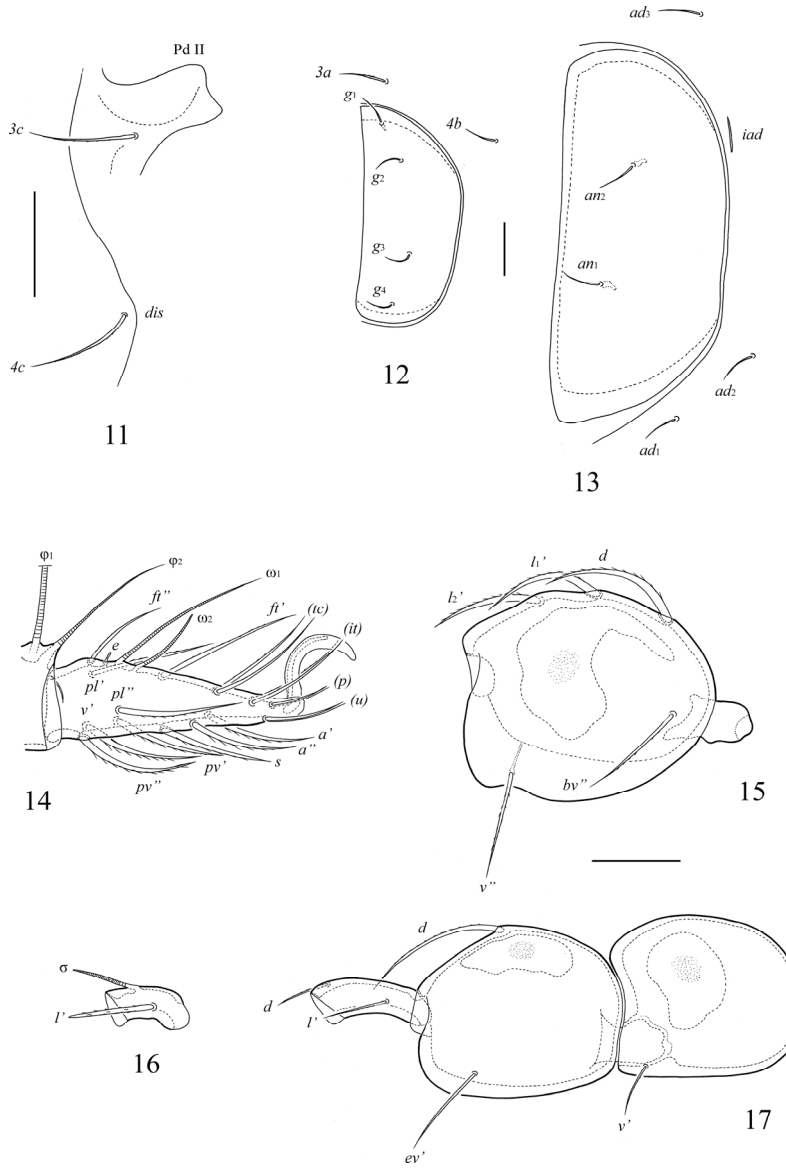

Figures 11–17. *Scheloribates* (*Bischeloribates*) *mahunkai* Subías, 2010. 11 = Pedotectum II, discidium and epimeral setae *3c*, *4c* in dissected specimen, 12 = left genital plate and epimeral setae *3a*, *4b*, 13 = left anal plate, adanal lyrifissures and adanal setae, 14 = tarsus and anterior part of tibia of leg I (right, antiaxial view), 15 = femur of leg II (left, antiaxial view), 16 = genu of leg III (right, antiaxial view), 17 = trochanter, femur and genu of leg IV (right, antiaxial view).
Scale bars (11, 14–17) 20 μm, (12, 13) 10 μm.

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Distinguishing characters of *Niphargus gebhardti* Schellenberg, 1934 and *Niphargus molnari* Mehely, 1927 (Crustacea: Amphipoda): a clarification

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Abstract. Two endemic *Niphargus* species, *N. gebhardti* Schellenberg, 1934 and *N. molnari* Méhely, 1927 are known from two caves of the Mecsek Mts. (SW Hungary). The species are morphologically close to each other and differ only in few characters. Although, the original descriptions contain only scattered information and few drawings, more characters can be found in the additional literature. The purpose of this paper is to summarize the available distinguishing morphological characters and to provide sufficient drawings to ease the identification of *N. gebhardti* and *N. molnari*.

Keyword. Niphargidae, Mecsek Mts., caves, taxonomy

INTRODUCTION

The eyeless amphipod genus, *Niphargus* is one of the most neglected aquatic troglobiont taxon in Hungary so far. While globally, the number of the *Niphargus* species and subspecies has reached 300, taxonomic state of the few described Hungarian species remained uncertain. The checklist of Hungarian Malacostraca published by Muskó (2007) lists 15 *Niphargus* species and furthermore, gathers all records available in the literature, yet without commenting on their validity. In the last six decades elapsed since the descriptions, many new caves had been discovered without biospeleological examinations in the country. Therefore the data about the distributions and the species does not match the possibilities provided by the geological knowledge. Most of the descriptions provide insufficient morphological information and few drawings, and often even the type locality cannot be exactly identified. In most cases the holotypes are no more available in the type collections either because they were sent abroad and never returned or perished in the fire which ravaged the Hungarian Natural History Museum during the revolution in 1956. In such cases collecting new samples from the type locality can help to gather information about the species.

The morphology of niphargids is highly variable, therefore collecting and analyzing samples from the whole potential distribution area of the species can serve as a proof of the reliability of the characters.

Among the five known endemic *Niphargus* species of Hungary, two, *Niphargus gebhardti* Schellenberg, 1934 and *Niphargus molnari* Méhely, 1927 were described from the caves of the Mecsek Mts. *N. gebhardti* was first found in the pools formed by dripping water of the Abaligeti Cave. It was originally described as *Niphargus foreli gebhardti* by Schellenberg in 1934. The description contains two drawings about the telson and the propodus of the second gnathopod and little information about the pereopods, antennae, maxilliped and first maxilla (Schel-

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lenberg 1934). Later on, Schellenberg (1935) mentioned some additional data about the telson and the body size. The comparative study of Méhely (1941) contains a figure on the retinacles of the third pleopod and mentions the number of the teeth of the right lacinia mobilis.

N. molnari was described from the stream and pools of the Mánfai-kőlyuk Cave, and then it was also found in the stream of the Abaligeti Cave (Gebhardt 1963). The description is rather poor with only two drawings about the pereion segments and the epimeral plates. The species was originally described as *N. molnari* (Méhely 1927), and later on it was mentioned as a subspecies, *N. leopoliensis molnari* by Schellenberg (1933). In the paper of Schellenberg (1935) the species appeared again with its original name and taxonomic rank. A figure about the right lacinia mobilis can also be found in one of Méhely's papers (Méhely 1941). A single data about the number of the setae of the first maxilla's palpus was also given (Schellenberg 1935).

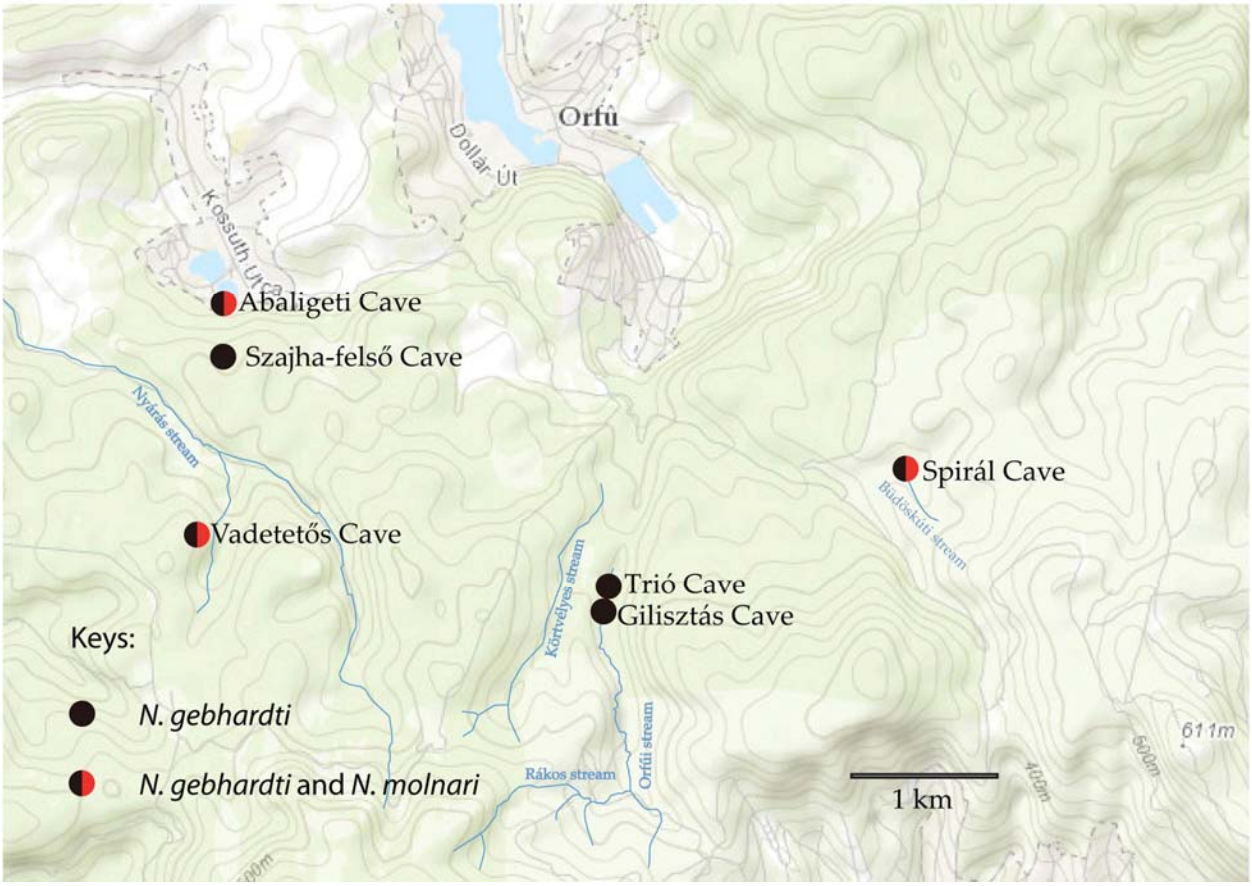


Figure 1. Locations of *N. gebhardti* and *N. molnari* in the six examined caves in Western-Mecsek

MATERIALS AND METHODS

Samples were collected between May 2010 and October 2011 in six caves from the Western–Mecsek (Figure 1.). Most of the caves examined were sinkholes with various length and vertical extensions (Table 1.). 40 individuals were collected by singling, fixed and stored in 96% ethanol. The material was identified by Cene Fišer and the authors. Preparation techniques were used after Fišer *et al*., (2009).

Specimens were cooked in 10% KOH solution, rinsed with HCl and washed in distilled water. Cleared exoskeletons were stained with chlorazol black in glycerol, and then dissected under a Leica MZ75 stereomicroscope. Two slides were made of each specimens, one contained the left side appendages and the mouth parts, while the other contained the whole body with the right side appendages. The slides were examined using a Leica DM 1000 light microscope. Drawings were made using a drawing tube.

Table 1. Names and basic data of the caves where the two *Niphargus* species were collected

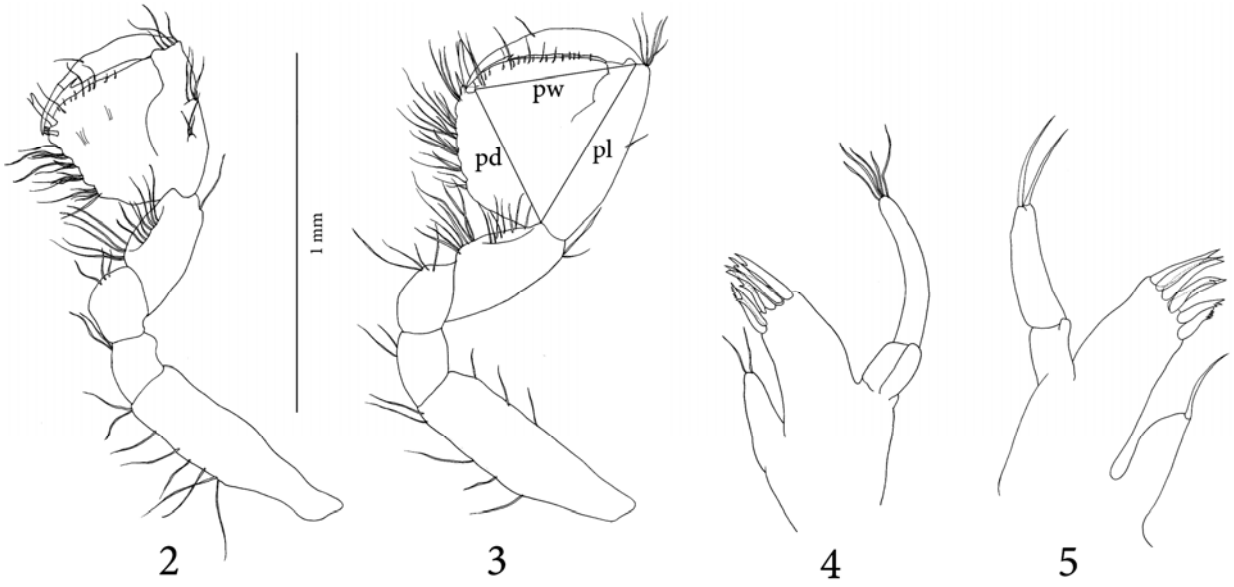
Name of cave	**Type of cave**	**Cadastre number**	**Entrance's altitude above sea level (m)**	**Y (Decimal degree)**	**X (Decimal degree)**	**Length of cave (m)**	**Vertical extension of cave (m)**
Abaligeti Cave	spring cave	4120–1	218,77	578056,43	88434,52	1712	48,7
Vadetetős Cave	sinkhole	4120–27	320,701	577872,84	86795,058	177	35
Trió Cave	sinkhole	4120–71	301,035	580722,26	86347,182	250	58
Gilisztás Cave	sinkhole	4120–70	307,704	580693,26	86268,727	134	51,1
Spirál Cave	sinkhole	4120–130	350,28	582719,93	87242,072	1000	86,4
Szajha-felső Cave	sinkhole	4120–16	283,508	578056,14	88041,665	98	40

Table 2. The seven distinguishing characters of *N. gebhardti* and *N. molnari*

Character	***N. gebhardti***	***N. molnari***
Body size	6–8 mm	9–10 mm
Number of setae on the palpus of maxilla I	5	3
Number of retinacles of pleopods	> 2 (3)	2
Shape of the propodus of gnathopod II, Ratio of propodus length (pl), propodus diagonal (pd) and propodus width (pw)	rectangular 26/24/26	elongated 30/24/29
Number of teeth of the lacinia mobilis on the right mandible	4–5	12–13
Shape of the telson Ratio of telson length (tl) and telson width (tw)	a bit longer then wide 11/10	significantly longer then wide 11/7
Shape of the epimeral plate 3	distoposterior angle is rounded	distoposterior angle is sharply inclined

RESULTS

N. gebhardti was collected in six caves (Abaligeti Cave, Vadetetős Cave, Szajha-felső Cave, Trió Cave, Spirál Cave, and Gilisztás Cave). *N. molnari* was not found in the type locality, however the species occurred in the Abaligeti Cave and in two other caves (Vadetetős Cave and Spirál Cave). In three out of the six caves both species occurred, but as it was suggested by Gebhardt (1963) coexistence in the same micro habitat within the same cave was never found. Examining all the literature related to the two species, seven distinguishing characters were gathered (Table 2, Figure 2–17). In case of the second gnathopod and the telson, measurement ratios were added according to the modern standard (Fišer *et al*. 2009). The seven characters proved stable in all the 23 specimens of *N. gebhardti* and all the 17 specimens of *N. molnari*, regardless the locality where the individuals were collected from. It seems that using combination of characters is a reliable method for distinguishing the two species.



Figures 2-5. 2 = gnathopod II, *N. gebhardti* (Abaligeti Cave), 3 = gnathopod II, *N. molnari* (Abaligeti Cave), pw = propodus width, pl = propodus length, pd = propodus diagonal, 4 = maxilla I, *N. gebhardti* (Szajha-felső Cave), 5 = maxilla I, *N. molnari* (Vadetetős Cave)

DISCUSSION

The new distributional data suggests that exploration of more caves for the two species would be required for determining the whole distribution area of *N. gebhardti* and *N. molnari* in the Mecsek Mts. The absence of *N. molnari* in the type locality can be due to the artificial changes of the hydrological system of the cave. The intrusive introduction of waterworks has led to the disappearance of endemic fauna elements and the appearance of distracted, urban habitat–dwelling species (Angyal 2012).

Because of the stability of the character combination, samples from other subterranean habitats of the Mecsek Mts. could also be dependably identified. However, redescription of both species is necessary to fulfil the modern *Niphargus* taxonomical requirements.

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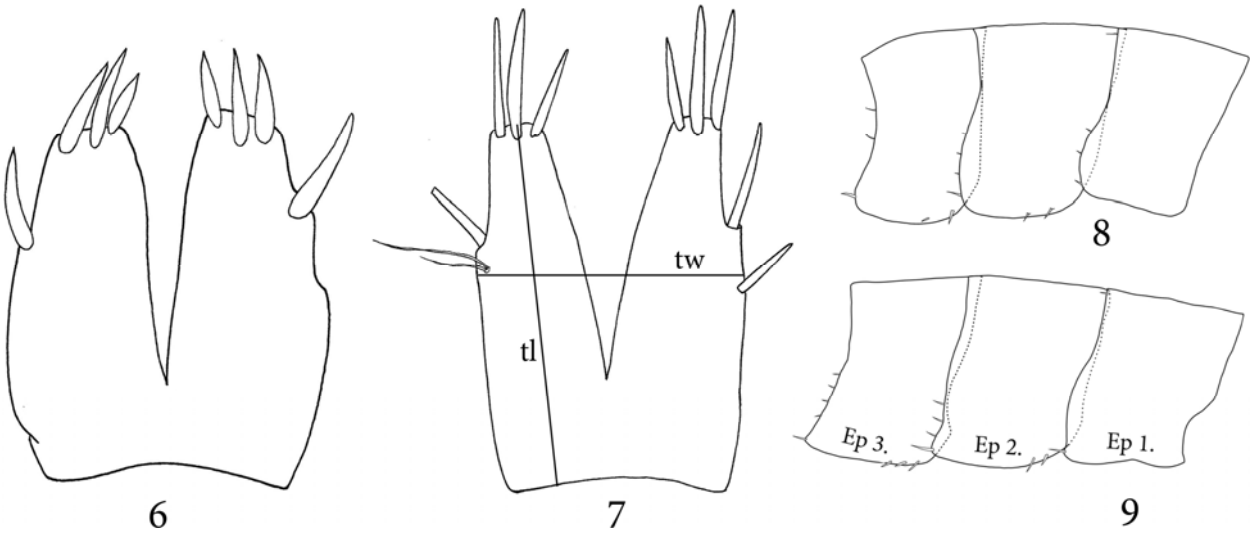
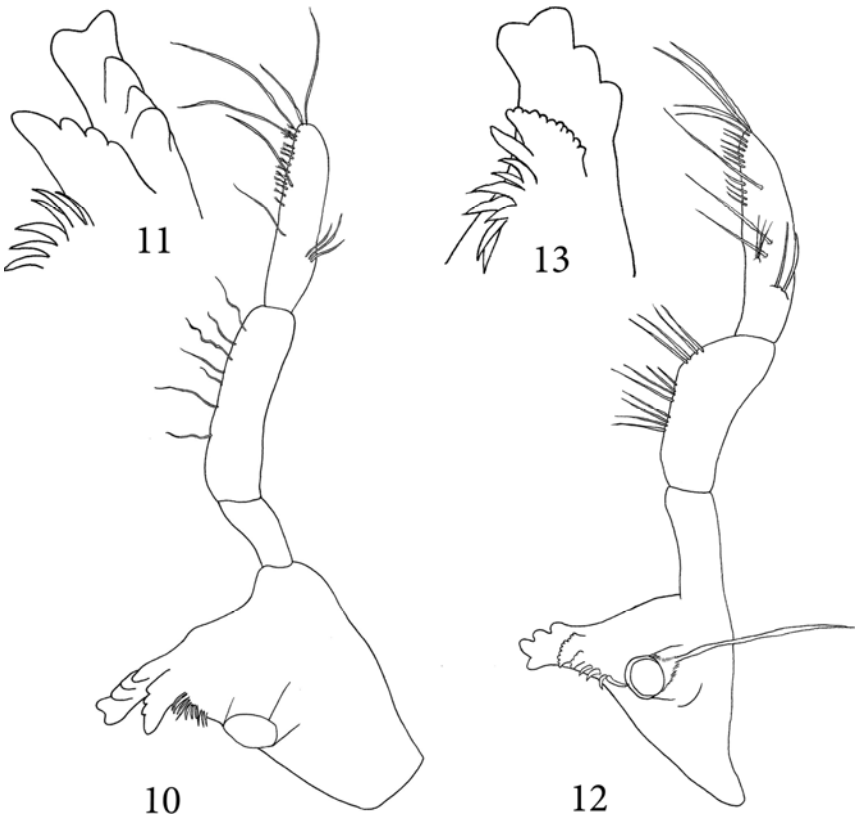
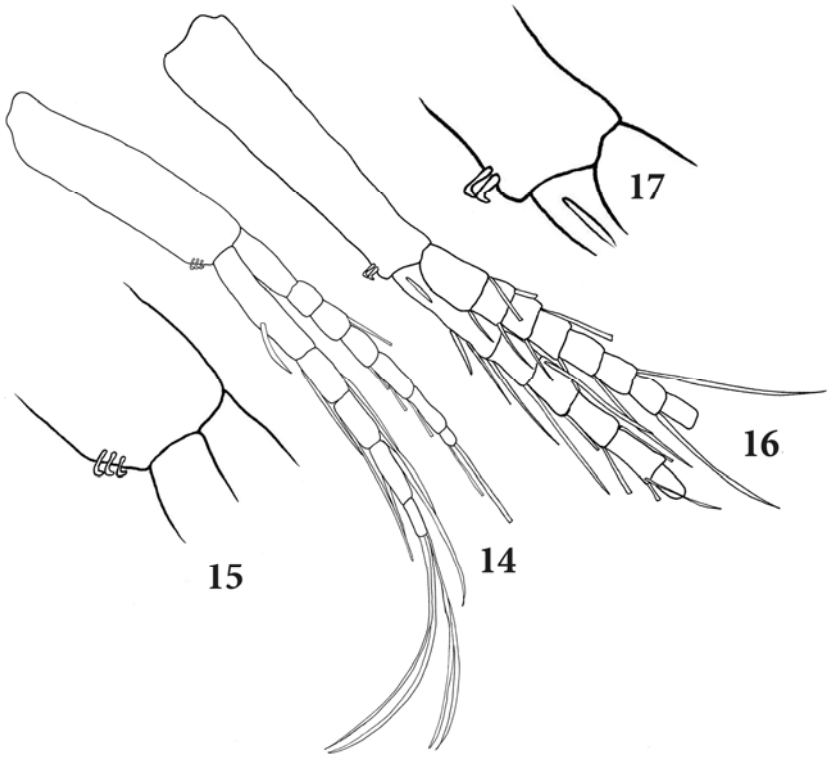


Figures 6-9. 6 = telson, *N. gebhardti* (Abaligeti Cave), 7 = telson, *N. molnari* (Abaligeti Cave), tl = telson length, tw = telson width, 8 = epimeral plate 1–3 *N. gebhardti* (Abaligeti Cave), 9 = epimeral plate 1–3 *N. molnari* (Abaligeti Cave)



Figures 10-13. 10 = right mandible, *N. gebhardti* (Abaligeti Cave), 11 = lacinia mobilis and incisor of the right mandible *N. gebhardti* (Abaligeti Cave), 12 = right mandible, *N. molnari* (Abaligeti Cave), 13 = lacinia mobilis and incisor of the right mandible*, N. molnari* (Abaligeti Cave)



Figures 14-17. 14 = pleopod II, *N. gebhardti* (Szajha-felső Cave), 15 = retinacles of pleopod II, *N. gebhardti* (Szajha-felső Cave),16 = pleopod II, *N. molnari* (Vadetetős Cave), 17 = retinacles of pleopod II, *N. molnari* (Vadetetős Cave)

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