Opusc. Zool. Budapest, 2013, 44 (suppl. 1): 139–156

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 phenolmenon, 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 glycerine gelatine.

urn:lsid:zoobank.org:pub:09BB3764-6052-4BDF-9D73-36947C16F95A
HU ISSN 2063-1588 (online), HU ISSN 0237-5419 (print)

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 (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.

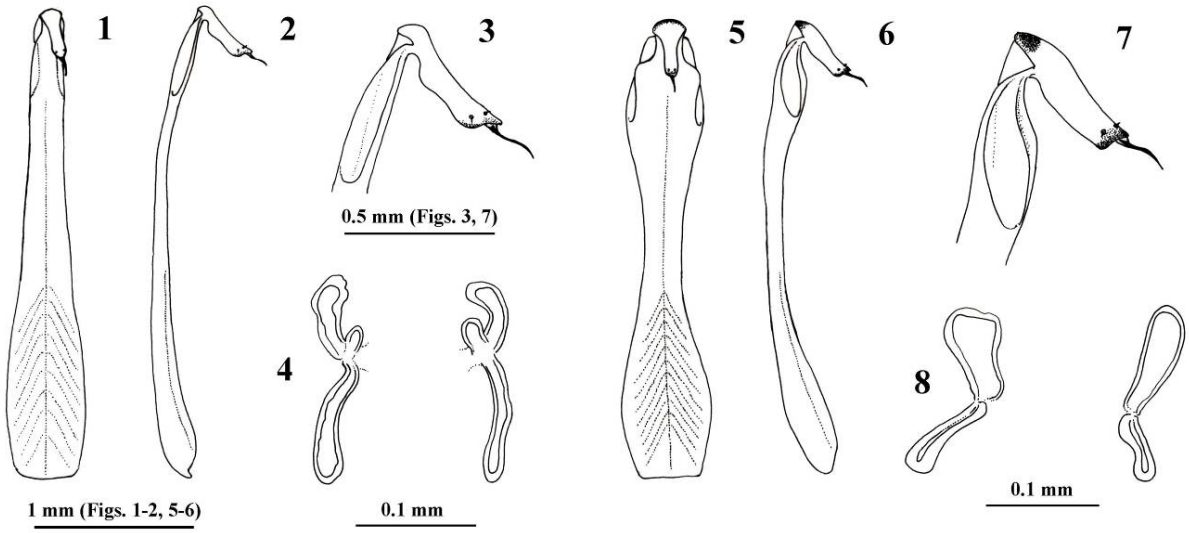
Distribution. The species has a Central European and Balkanic distribution. In the Balkan it is widely distributed in Slovenia, Croatia, Bosnia-Herzegovina and Bulgaria, the present North Albanian localities are the southernmost ones in the Dinaric region (Fig. 20).

Opilio putnik Karaman, 1999

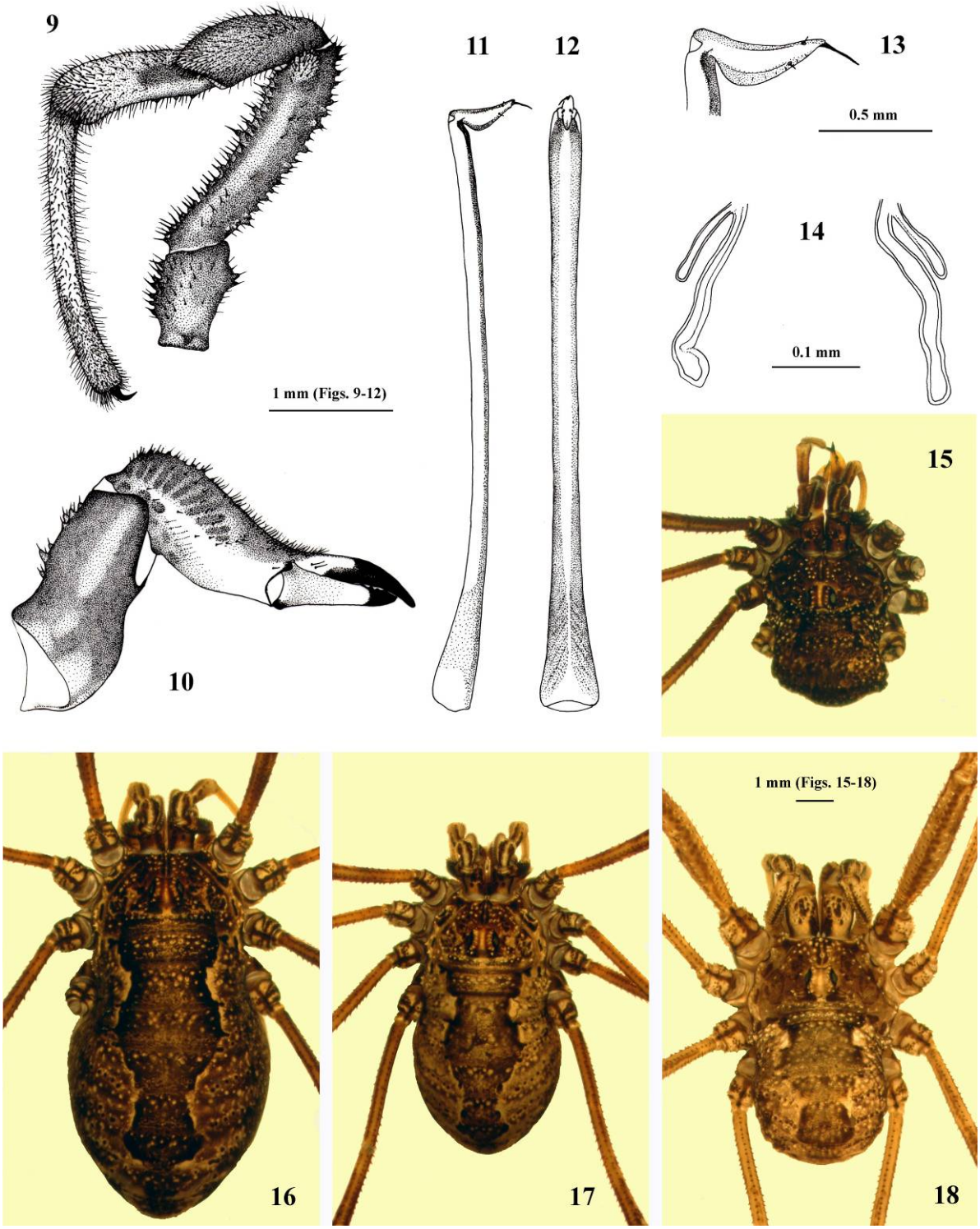
(Figures 5–8, 19, 64, 69)

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

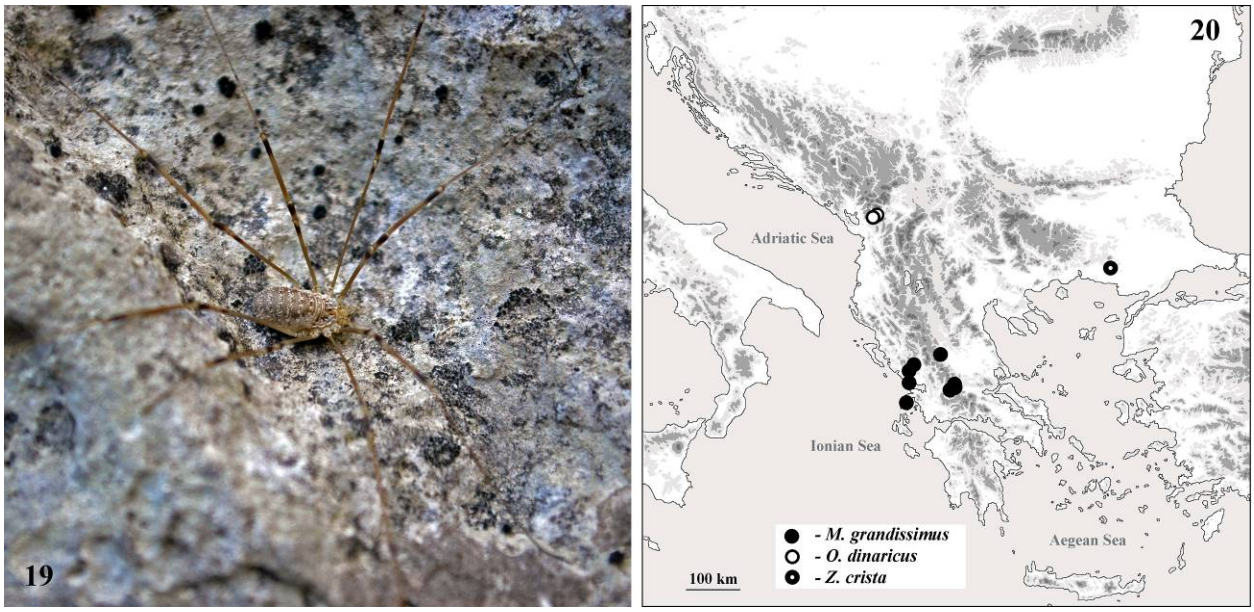
*Material examined. Albania***:** Shkodër district, Prokletije Mts., Mollë, limestone walls by the Shallë River at its influx to Koman Lake (loc. 2012/31), N42°11.982' E19°49.121', 180 m, 18.06.2012, leg. Z. Fehér, T. Kovács, D. Murányi: 1♀; Tropojë district, Palc, limestone gorge of Kapon Brook on the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

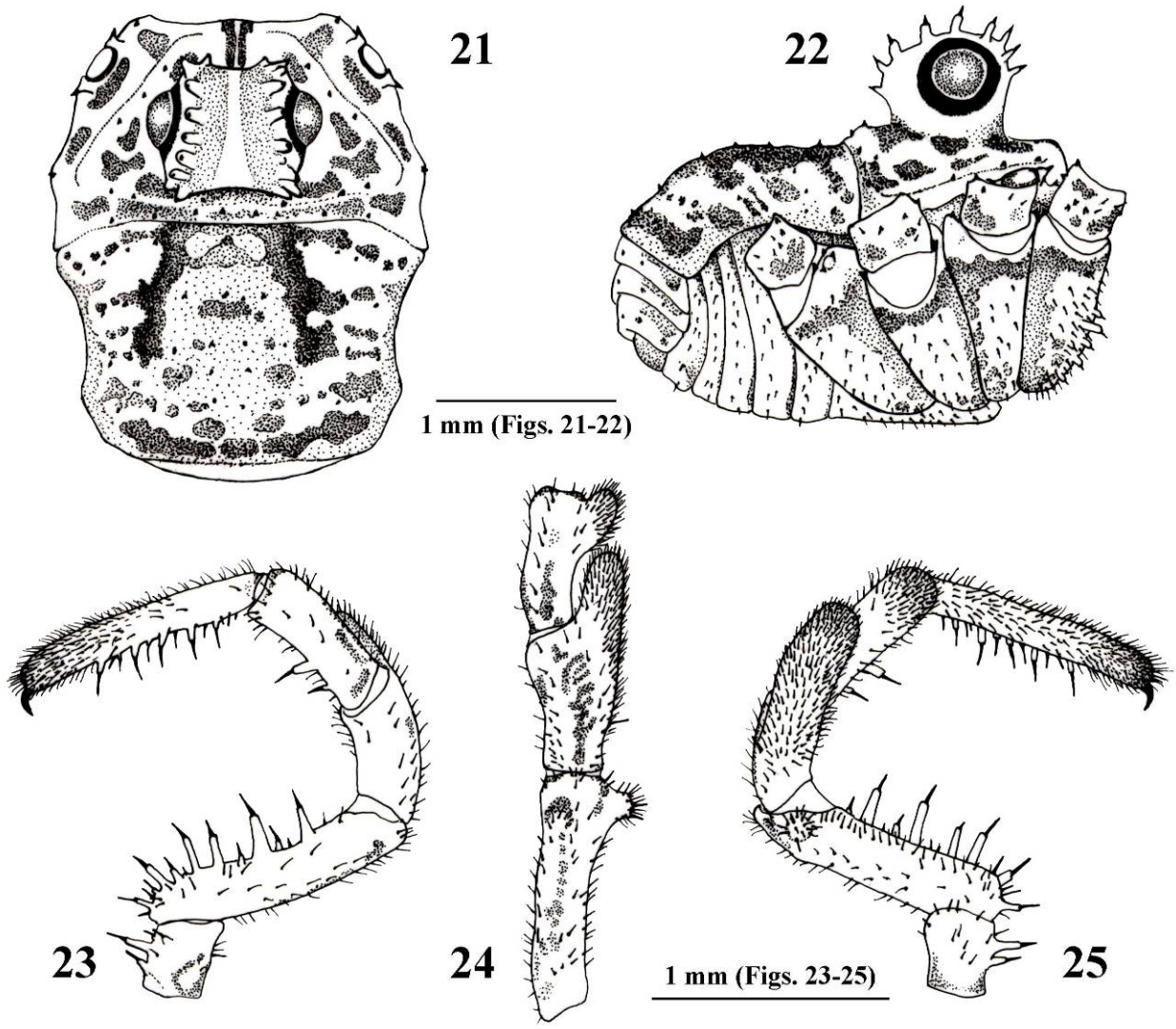
(Figures 63, 70)

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.

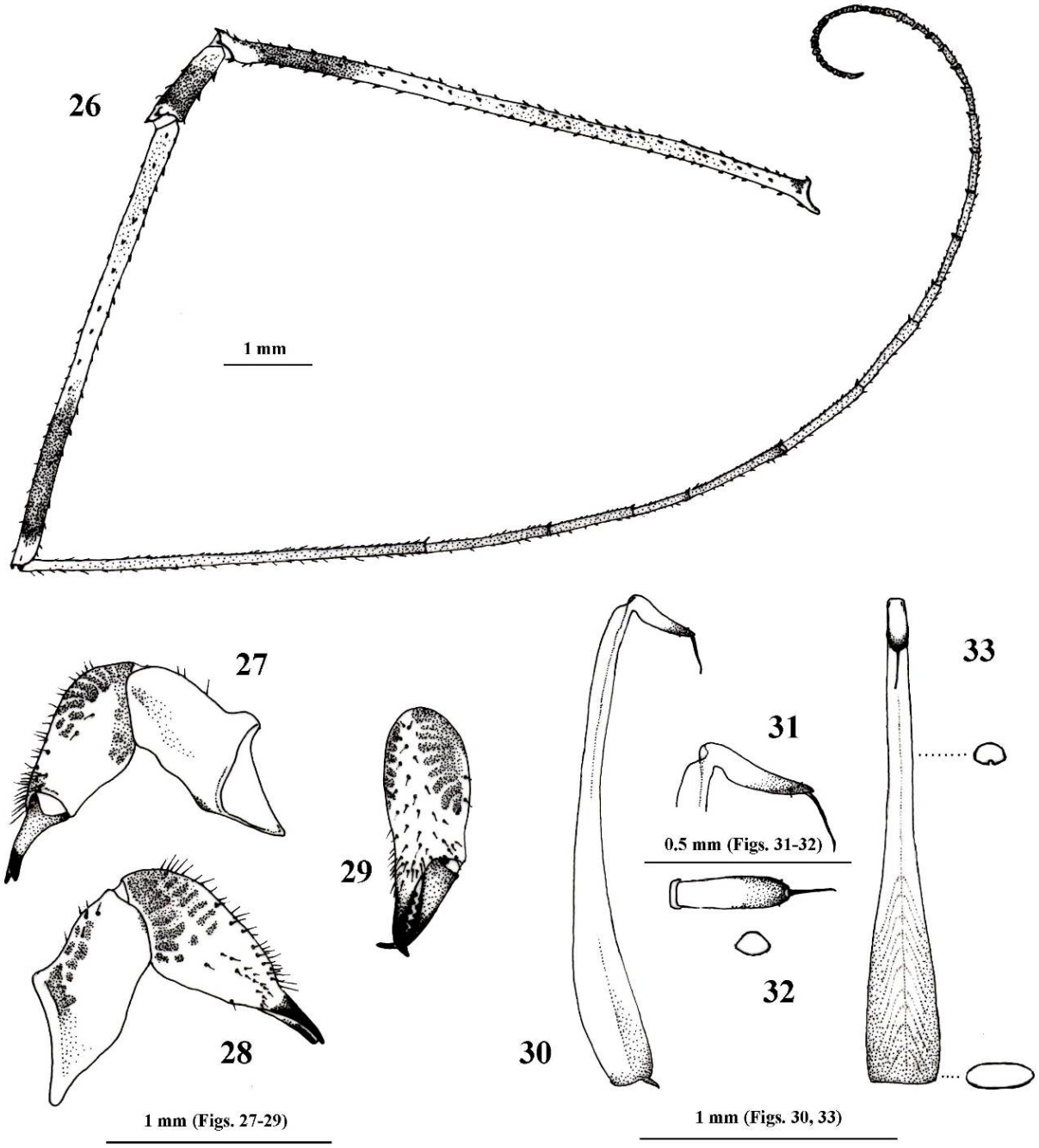
Venter (Fig. 22). Surface imbricate, setae on areoles; genital operculum and coxae densely setose, forecoxa with twice as high as wide spiny tubercles. Genital operculum trapezoid, twice as long as wide at the basis, anterior margin convex.

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.

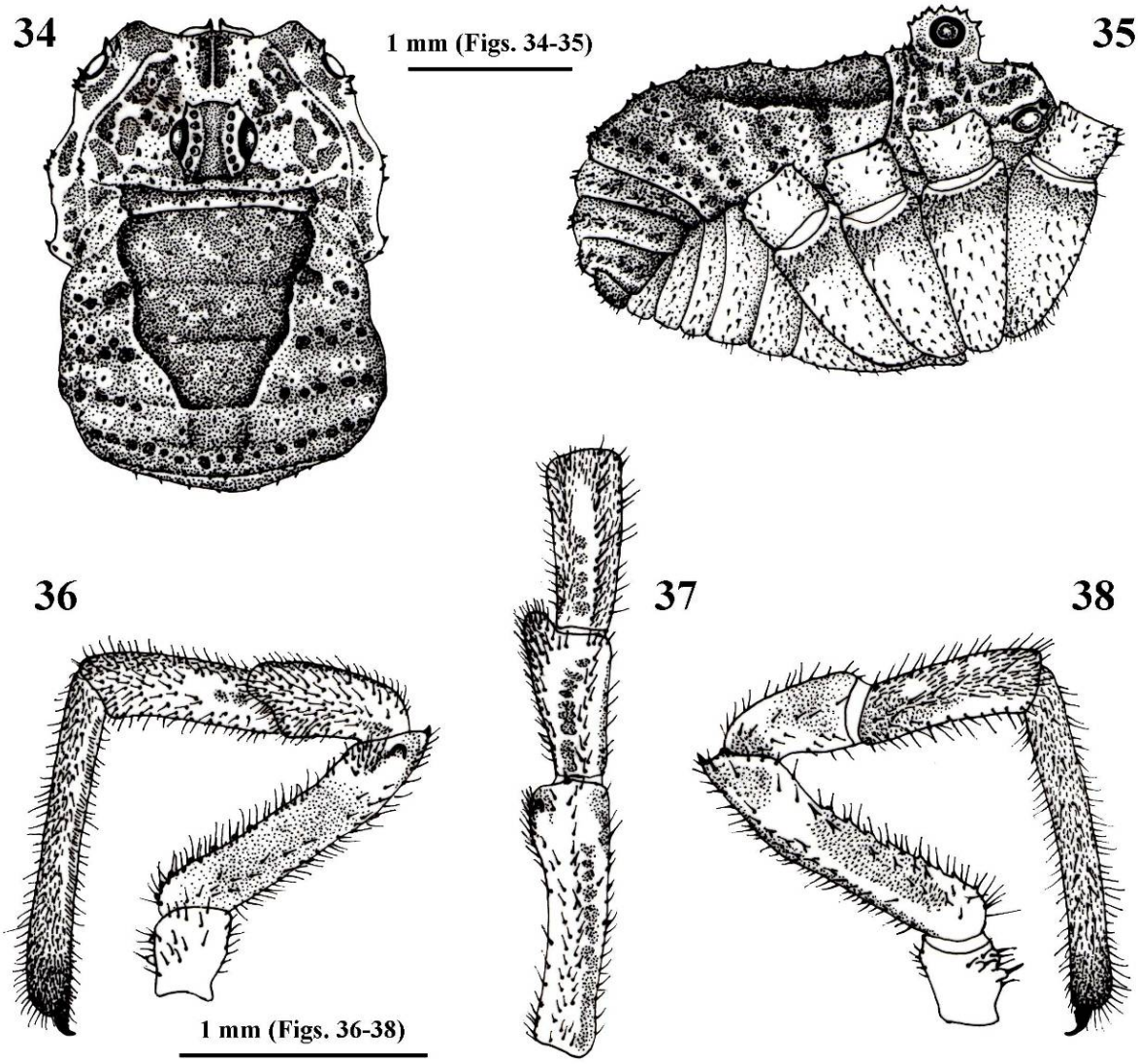
Description. Body shape and proportions are typical for the genus (Figs. 34–35). Length: male 3.1 mm; width: male 2.1 mm.

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.

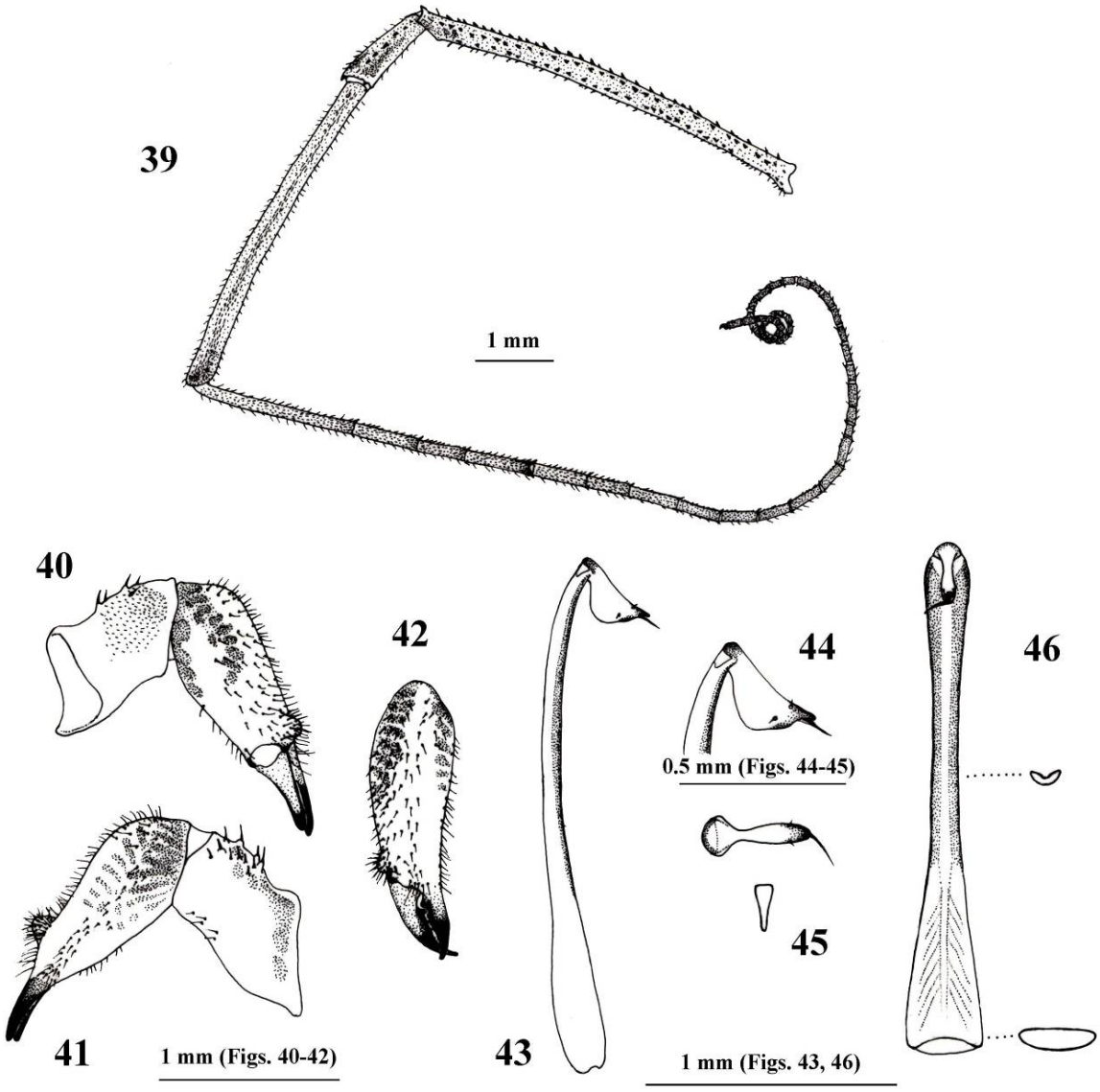
Chelicerae (Figs. 40–42). Relatively small, distal segment with a process above the movable finger. Surface mostly glabrous, lateral sides of



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)

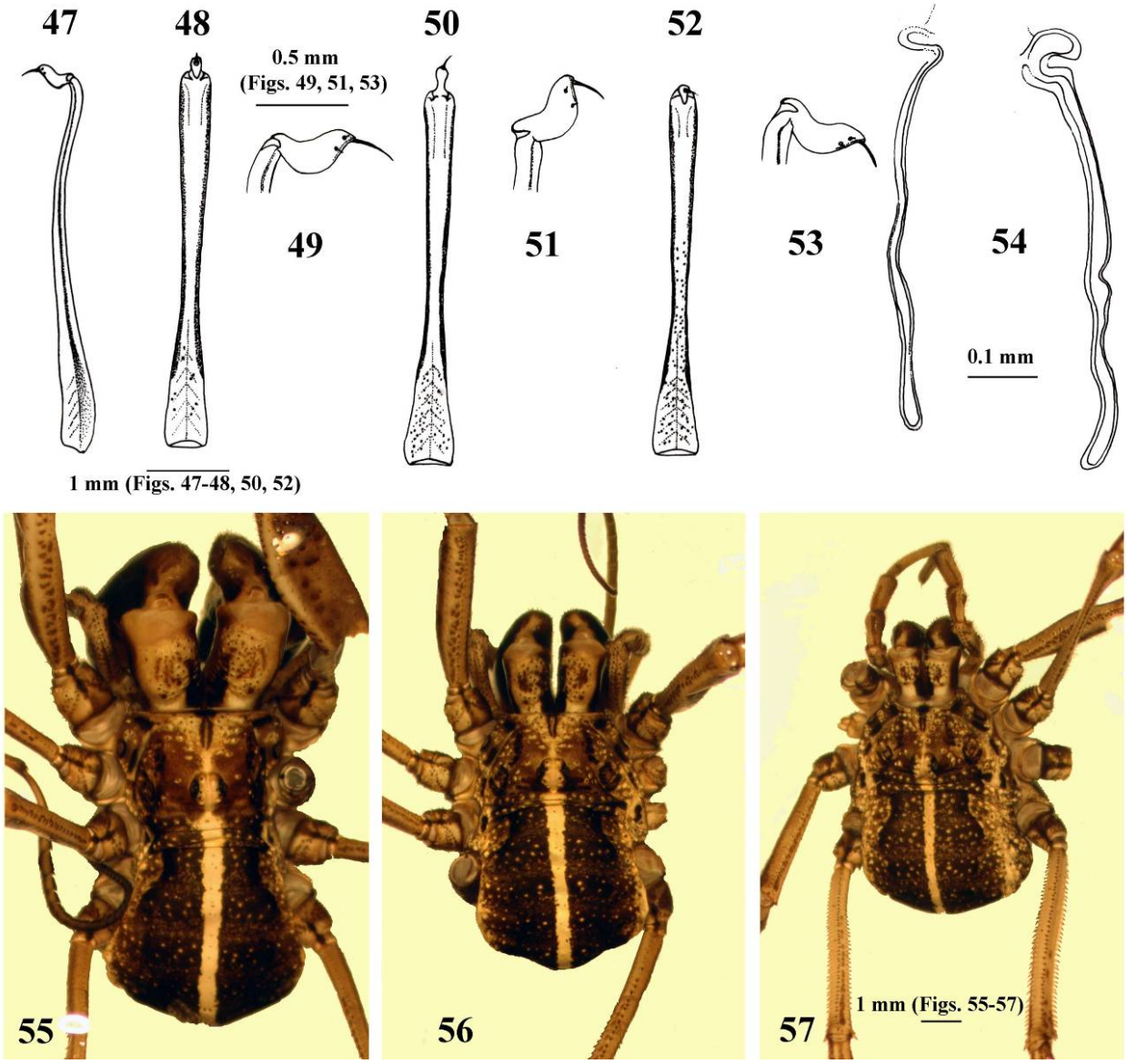
Phalangium crista Brullé, 1832: 60 (original description).
Zacheus crista (Brullé, 1832): Roewer, 1923: 820 (redescription); Šilhavý 1965: 384 (complementary description); Staręga 1976: 372 (redescription and synonymy: *Paropilio lineatus* Roewer, 1956); Martens 1978: 301 (redescription and synonymy: *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♀.

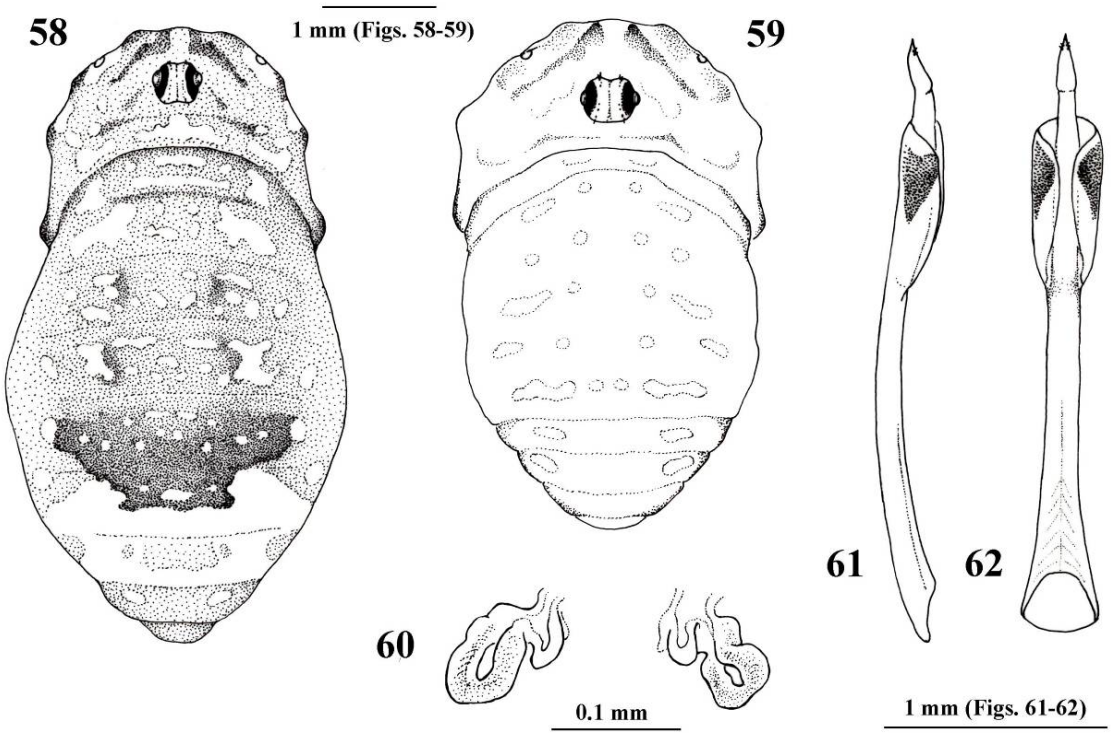
Diagnosis. Medium-sized *Leiobunum*, with pale, weakly ornamented body and middle long legs. Shaft of penis relatively slender; trunk pockets elongated, folded dorsally; glans short and stout. Receptacula seminis robust, bilobed, lower lobe well sclerotized.

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).

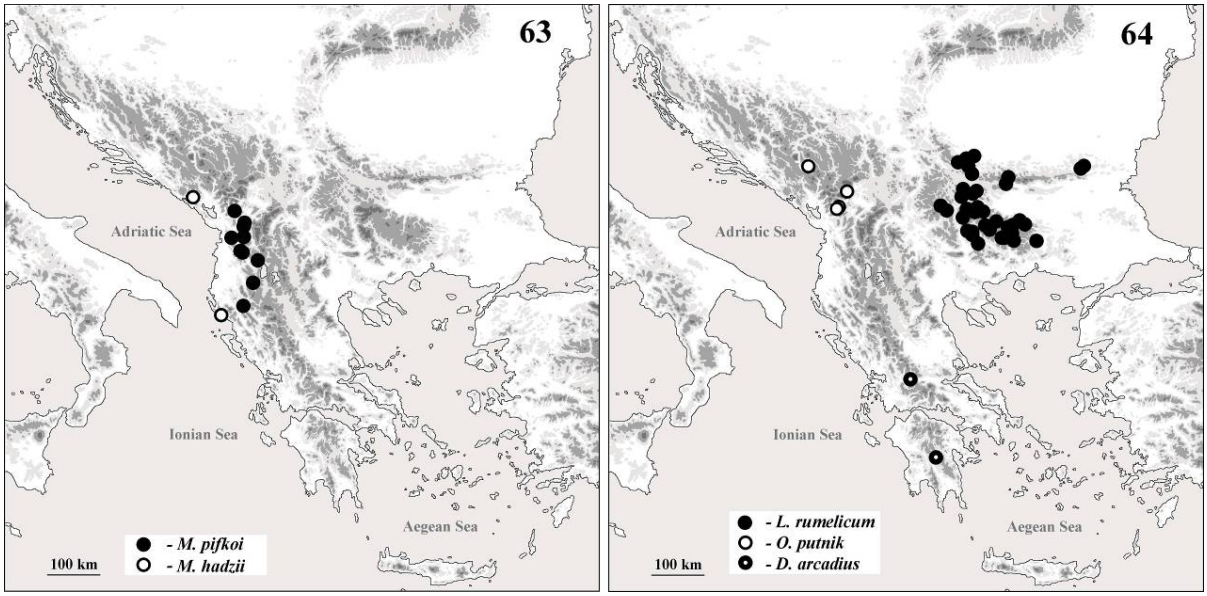
Remarks. The species was described on the basis of a single female from the Rila Mts. (Šilhavý, 1965). As the specimen was collected more than 30 years earlier, lacks pattern and was rather pale, so the habitus drawn by Šilhavý (1965: Fig. VIII/5) is misleading. Though the male was described together 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

Acknowledgements. I owe thanks to Tone Novak for his comments and corrections, Ivo M. Karaman for informations on *Opilio putnik*, and to my friends and colleagues who took part in the collectings: Zoltán Barina, Zoltán Fehér, Jenő Kontschán, Tibor Kovács, László Lőkös, Hedvig Mező, Dániel Pifkó, Balázs Pintér, Tímea Szederjesi and Zsolt Ujvári. The research was supported by the Hungarian Scientific Research Fund (OTKA 72744).

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