

## The first species of the genus *Megabunus* Meade, 1855 (Opiliones: Phalangiidae) in the Balkan region

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**Abstract.** *Megabunus pifkoi* sp. n., the first Balkanian species of the genus *Megabunus* Meade, 1855, is described from two localities in Albania. The new species is compared with all other members of the genus, and some additional closely related Balkanian Phalangiinae taxa. General diagnosis, key to the species and notes on the distribution of the species belonging to *Megabunus* are given.

### INTRODUCTION

During the last few years, Balkanian researches of the Hungarian Natural History Museum revived on the traditions of more than hundred years of history (Fehér *et al.*, 2004). Albania is one of the main target of both the zoological and botanical collecting expeditions, and numerous results were already published both in zoology (Mollusca: Eröss *et al.*, 2006; Fehér, 2004; Fehér *et al.*, 2001; Riedel *et al.*, 1999; Sudai & Fehér, 2006. Acari: Kontschán, 2003; Mahunka & Mahunka-Papp, 2008. Collembola: Traser & Kontschán, 2004. Odonata: Murányi, 2007b. Plecoptera: Murányi, 2007a. Reptilia: Korsós *et al.*, 2008). Botany (Barina & Pifkó, 2008a, 2008b) and additional groups will be elaborated soon (e.g. Amphipoda, Psocoptera).

The harvestmen fauna of Albania is rather poorly known. The literature was recently discussed by Mitov (2000) who gave the first data of ten species from the country, rised the number of species recorded for Albanian to 41. During a botanical collecting trip to South Albania in April 2008, a remarkable new *Megabunus* Meade, 1855 species was found in the Dhëmbel Mts. In July, additional specimens were captured in the Jablanica Mts. As the presence of this genus in the Balkan is quite surprising, I describe this species separately from the faunistical elaboration of the rest of the material compiled during the last years.

As already asserted by Karaman (2002), it is difficult to discuss the validity and relationship of the genera of Phalangiinae, especially in the Balkans. Moreover, Novak (2004, 2005) showed that the real features of some poorly known species do not agree with the original descriptions. Thus, I diagnose herein the genus *Megabunus*, propose a key to the species included and discuss the affinities of the new species with some other Balkanian taxa belonging to different but closely related genera.

### MATERIAL AND METHODS

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

Ovipositor of the allotype was cleared in 10% KOH and prepared on slide in glycerin gelatine. SEM photos were made using golden-palladium coating after critical point drying.

Distributional data of the *Megabunus* species was discussed and depicted after Martens (1978), completed by those of Chemini (1985) and Muster *et al.* (2005), and confirmed by Blick & Komposch (2004), Novak & Gruber (2000) and Stol (2007).

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## TAXONOMY

### *Megabunus* Meade, 1855

*Megabunus* Meade, 1855: 406.; Roewer 1923: 853.; Schenkel 1927: 265.; Martens 1978: 273.; Chemini 1985: 4.

The genus was established with the type species *M. insignis* Meade, 1855 (*Phalangium diadema* Fabricius, 1779, syn. fide Roewer 1923) by Meade (1855). Subsequently, Roewer (1923) transferred *Platylophus rhinoceros* Canestrini, 1872 and *Platybunus armatus* Kulczyński, 1887 to the genus, and few years later Schenkel (1927) described *M. lesserti* Schenkel, 1927. Martens (1978) redescribed on all the four species included and described a fifth one, *M. vignai* Martens, 1978. In the eighties, a sixth species *M. bergomas* Chemini, 1985 was described by Chemini (1985).

**Diagnosis.** Small Phalanginae, legs short or moderately long; ocular tubercle big. Cheliceral lamella smooth. Pedipalpal patella and tibia bear large apophyses, femur bears a small apical one; length of ventral tubercles on pedipalpal femur longer than half width of the femur; pedipalpal tibia with tubercles. Trunk of penis moderately long, more or less slender with wide base; head of penis large. Receptacula seminis monovesicular.

**Distribution.** (Fig. 28). The morphologically rather isolated *Megabunus diadema* (Fabricius, 1779) is separated geographically as well, it is known from the Pyrenees, the NW European isles and coasts. The other five formerly described species occur in the Alps exclusively, but none of them known to coexist. *M. rhinoceros* (Canestrini, 1872) occurs in the massifs of the Western part of the Swiss and Italian border zone, *M. vignai* Martens, 1978 in the Maritime Alps, *M. bergomas* Chemini, 1985 in the massifs east to the Como Lake, *M. lesserti* Schenkel, 1927 in the NE Alps, while *M. armatus* (Kulczyński, 1887) in the SE Alps. The first Balkanian species is *M. pifkoi* sp. n. that hitherto known only from two Albanian ranges.

### *Megabunus pifkoi* sp. n.

(Figs. 1–30)

**Material examined.** Holotype male: Albania, Përmet county, Dhëmbel Mts, Këlcyre, limestone rocks 2.1 km W of the city, N 40.297110° E 20.173340°, 382 m a.s.l., 19.04.2008, leg. Z. Barina, Z. Drahos, R. Gógh, D. Pifkó (HNHM). Allotype female: same locality and date (HNHM; ovipositor prepared on slide). Paratypes: same locality and date: 1 ♂ (HNHM; partly prepared for SEM); Albania, Librazhd county, Jablanica Mts, Qarishtë, limestone rock sin alpine grassland on Mt. Lapa 5 km E of the village, N41.25054° E20.50384°, 2001 m, 04.07.2008, leg. Z. Barina, D. Pifkó, A. Vojtkó: 2 ♂ 1 ♀ (HNHM).

**Diagnosis.** Ground colour of body dark; spinulation of the dorsal thoracic areae reduced; ocular tubercle big, with moderately large processes; legs relatively long and unmodified. Chelicera and cheliceral lamella smooth; length of ventral tubercles on pedipalpal femur reach the width of the femur, dorsal surface weakly armed; pedipalpal tibia with large ventral tubercles. Penis uniformly pale brown; trunk of penis slightly bent, not widened apically; head of penis pointed. Receptacula seminis rather elongated.

**Description.** Body length: holotype 3.9 mm, male paratypes 3.9–4.4 mm, allotype 5.2 mm, female paratype 5.4 mm; body width: holotype 2.5 mm, male paratypes 2.4–2.5 mm, allotype 3.1 mm, female paratype 3.2 mm.

**Body** (Figs. 1–7). Shape and proportions are typical for the genus.

**Setation.** Dorsal part covered with angular scales and rounded warts mixed with a few setae (Fig. 4), ventral part only with scales and setae. Seatae in the thoracic areae arranged in four lines diverging towards the posterior edge, a transverse row on the posterior edge and two setae before and beneath the defensive gland's opening (Fig. 5). Setae on the abdominal area arranged in transverse rows; ventral setae dense and in irregular arrangement.

**Table 1.** Length of the leg segments of *Megabunus pifkoi* sp. n. in mm; measurements of paratypes are in parentheses, abbreviations: Fe – femur, Pt – patella, Ti – tibia, Mt – metatarsus, Ta – tarsus

Leg	Fe	Pt	Ti	Mt	Ta	full length
Males						
Pp	1.6(1.1–1.5)	0.7(0.7–0.9)	1.0(0.9–1.0)		1.8(1.5–1.7)	5.1(4.2–5.1)
I	4.5(4.1–4.3)	1.0(0.9–1.0)	3.5(2.9–3.1)	4.3(4.7–4.9)	7.0(5.2–5.4)	20.3(17.8–18.7)
II	8.2(7.0)	1.8(1.2)	6.6(5.0)	5.7(4.3)	13.1(12.8)	35.4(30.3)
III	5.0(4.0–4.4)	1.0(0.9–1.0)	3.8(3.0–3.1)	4.9(3.4–3.8)	9.1(6.5–7.9)	23.8(17.8–20.2)
IV	7.1(6.3)	1.1(1.0)	5.0	6.1	12.9	32.2
Females						
Pp	2.1(2.0)	1.0(1.0)	1.1(1.0)		2.1(1.9)	6.3(5.9)
I	(3.9)	(0.9)	(3.0)	(2.8)	(5.7)	(16.3)
II	(7.3)	(1.3)	(5.8)	(5.0)	(11.6)	(31.0)
III	4.4(4.4)	1.1(1.0)	3.4(3.3)	3.6(3.8)	7.5(6.8)	20.0(19.3)
IV	6.8	1.5	4.9	4.1	12.4	29.7

The ocular tubercle big, setae placed on moderately large processes more or less arranged in lines along the lateral margins (Figs. 6–7).

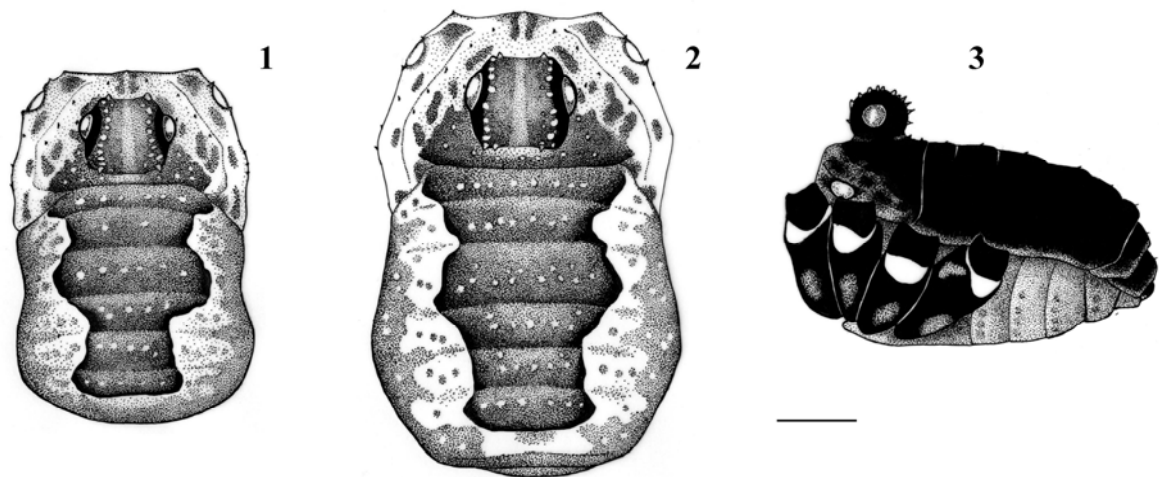
*Colour* (Figs. 1–3). Dorsal part dark, one of the male paratypes entirely black with the exceptions of pale patches on the thoracic areae; females paler and with a characteristic longitudinal pattern on the abdominal areae which can be seen also on the rest of the males. Anterior part of the thoracic areae mostly pale with a dark patch on the medioventral edge, patches along the lateral margin and between the setae lines; dorsal part mostly black with small pale spots only around the setae. Longitudinal dark pattern of the abdominal area begins at the anterior margin and reaches the apical fourth; it is flaring in the middle. The pattern bears small pale spots mostly around the setae while the remaining, pale parts of the abdominal area bears dark spots mostly around the setae again. The ocular tubercle is brown, the projections are pale and a somewhat paler longitudinal medial line usually also present; lateral areas around the eyes black. Ventral part pale or at least paler than the dorsal part (Fig. 3), with transverse rows of dark spots on the abdominal area; basal sides of the genital operculum usually darker.

*Chelicerae* (Figs. 8–9, 14). Robust, lack any process.

*Setation*. Surface smooth, scales present only on the lateral sides of the basal segment. Setae arranged on the dorsal surface of the basal and the distal segments, and in the medial part of the inner lateral surface of the distal segment; neither movable nor fixed finger bearing no setae (Figs. 8–9). Teeth on the fingers altered by a few larger and further smaller ones (Fig. 9). Cheliceral lamellae smooth.

*Colour* (Fig. 14). Ground colour of the basal segment white, the proximal part of the lateral and ventral surface light to dark brown and the dorsal surface bearing dark patches. Proximal half of the distal segment brown with darker patches on the sides and a white patch on the dorsal surface; the apical half light brown. Fingers light brown but their apical parts are black. Dark colouration more pronounced on the black male paratype.

*Pedipalps* (Figs. 10–12, 15–20). Proportions of the segments are typical for the genus. Trochanter, femur, tibia and tarsus bear well developed tubercles on the ventral surface. Coxa bears a small apophysis on the apical part of the ventral surface, femur bears a small apical apophysis on the inner lateral surface. Patella and tibia bear well developed apical apophyses directed forward on the inner lateral part of the segments; these are rounded, the one on the patella overhang the apical edge with half of the segment length, apo-



**Figures 1–3.** *Megabunus pifkoi* sp. n., habitus. 1 = holotype male, body dorsal; 2 = allotype female, body dorsal; 3 = paratype male (black form), Jablanica Mts, body lateral (scale 1 mm)

physis of the tibia slightly overhanging. Apophyses similarly developed in the males and females.

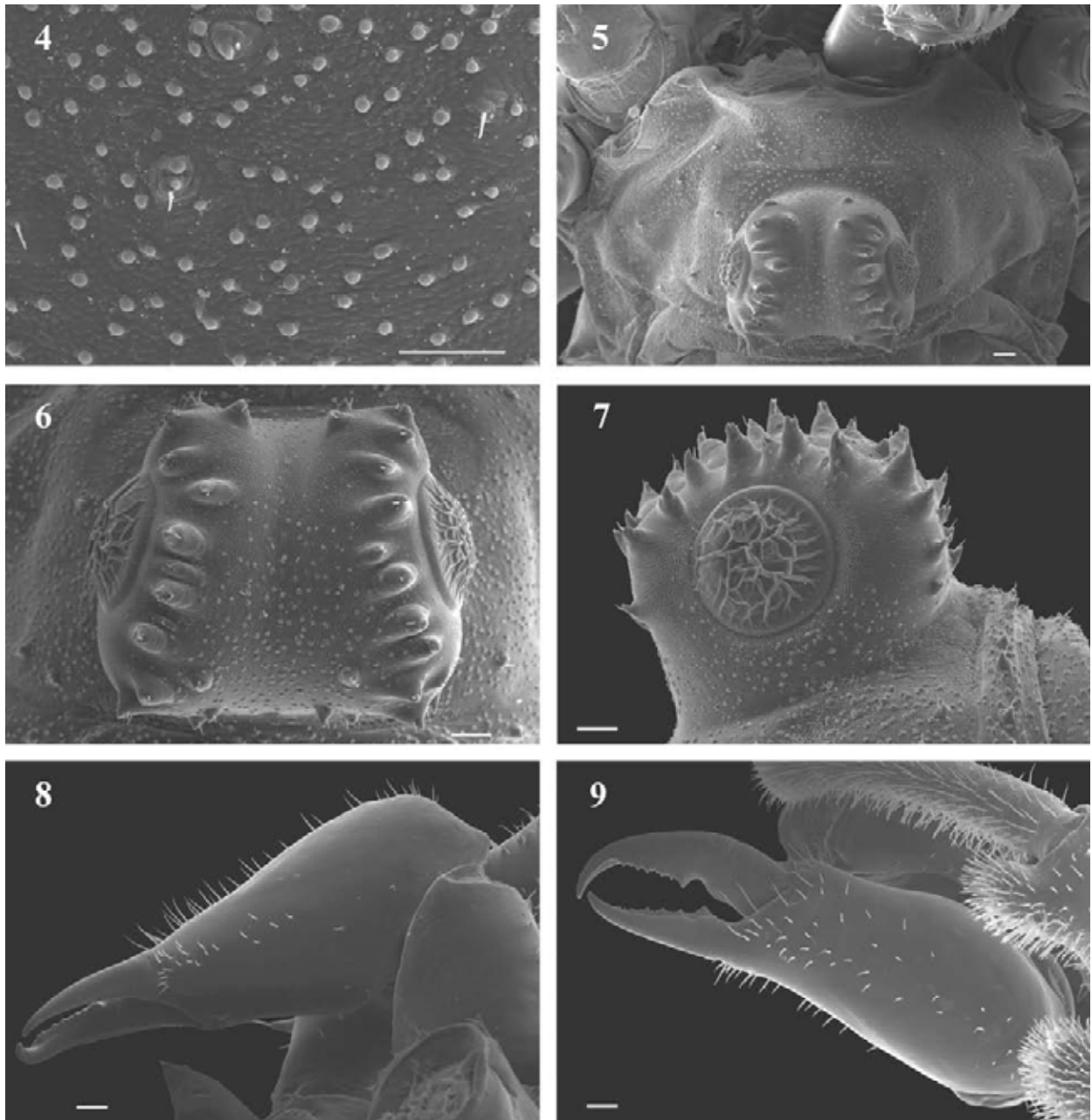
*Setation.* Surface of the pedipalps covered with minute scales, bearing both simple and ciliated setae, and large spines placed on well developed tubercles (Figs. 15–18). Coxa bears simple setae only, most of these arranged on the apophysis. Trochanter bears simple setae and one or two spines placed on moderately large tubercles, these arranged in the apical part of the ventral surface. Femur has simple setae arranged in two longitudinal lines on all the four surfaces, those on the ventral surface placed on small prominences, the ones on the apical half of the dorsal and outer lateral surfaces mixed with sharp, triangular teeth-like outgrowths of the surface. Spines on tubercles arranged in a line on the outer ventral surface, the row consists of five to six large and one or two smaller ones; the length of the larger reach the width of the femur. Ciliated setae placed only on the apophysis. Ventral and dorsal surface of the patella mostly bald, outer lateral surface covered with simple setae, larger ones arranged in lines on the margins; triangular teeth-like outgrowths of the surface also exist herein. Inner surface and the apophysis covered with dense setation of ciliated setae (Fig. 19). Simple setae on the tibia arranged in longitudinal rows on the margins and a trans-

verse row on the apical end; triangular teeth-like outgrowths scarce. Outer ventral surface bears two large and a smaller tubercle with strong spine; apophysis covered with dense ciliated setae (Fig. 20). Setation of the tarsus dense and not with a regular arrangement; ciliated setae occur mostly on the inner lateral surface, setation denser in the apical part. Outer ventral surface bears four or five moderately large tubercles with spines. Tarsal claw smooth and ordinary developed.

*Colour* (Figs. 10–12). Coxa pale; trochanter brown with paler ventral side, tubercles white. Most of the femur dark, proximal and apical parts paler and two longitudinal pale lines are more or less pronounced on the margins of the dorsal surface; tubercles white, apophysis pale. Ground colour of patella and tibia are white, but both bear conspicuous longitudinal dark patches. Setated part of apophyses brownish, or at least not as white as the ground colour; tubercles white. Tarsus pale, the apical part dark.

*Legs* (Fig. 13). Relatively long, the second pair about seven times longer than the length of the body in males, six times in females.

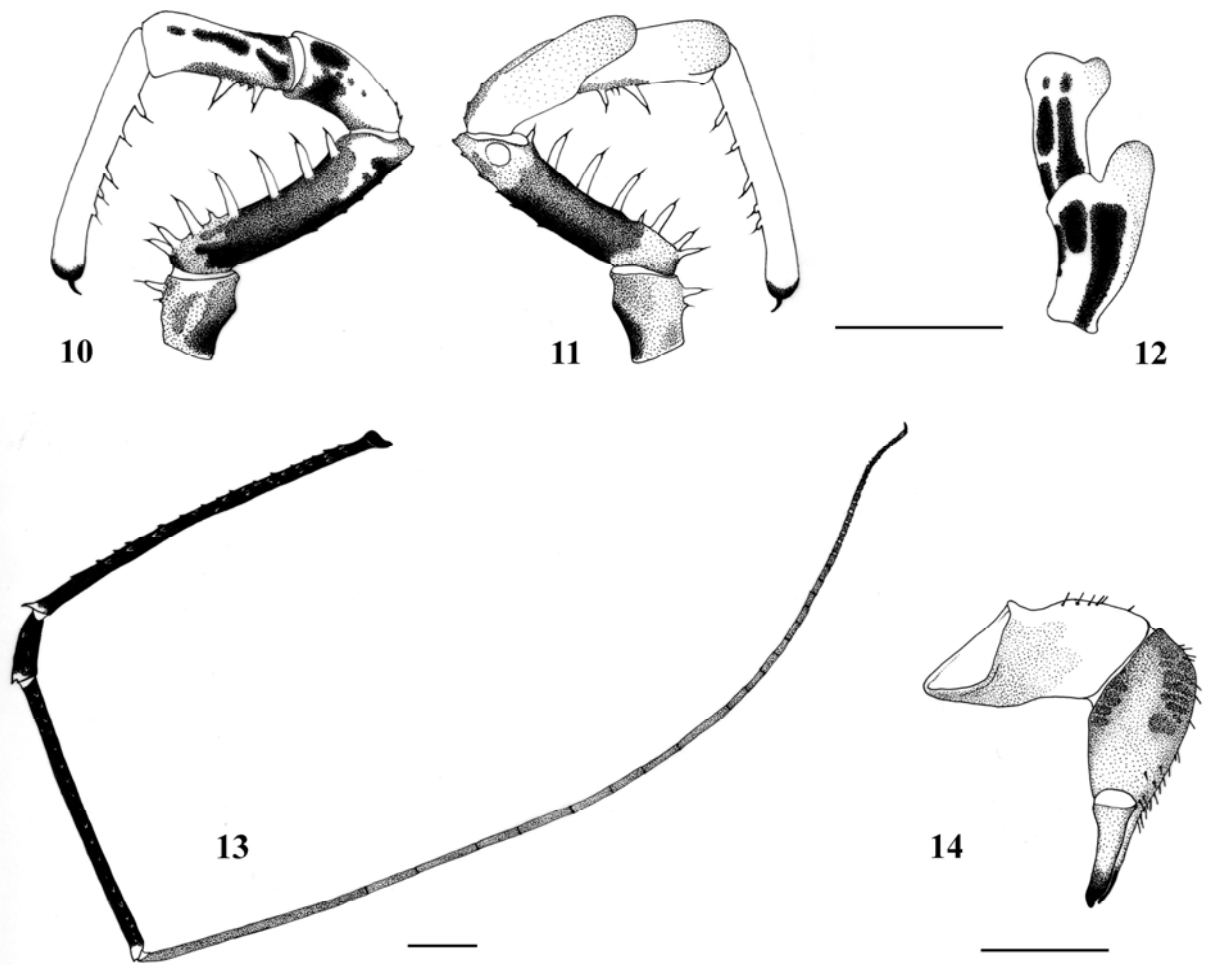
*Setation.* Surface covered with minute scales, bearing setae, triangular teeth-like outgrowths and some larger apical teeth or spine. Coxa bears sparse, irregular setation, some of the setae placed



**Figures 4–9.** *Megabunus pifkoi* sp. n., body and chelicerae. 4 = surface of the abdominal area, dorsal; 5 = thoracic area, dorsal; 6 = ocular tubercle, dorsal; 7 = ocular tubercle, lateral; 8 = chelicera, inner lateral; 9 = chelicera, frontal (scale 0.1 mm)

on small prominences on the frontal margin of forecoxa; one or two weakly developed triangular teeth also present on the lateral apical part, mediodorsal apical teeth present on the first two coxae, weakly developed one also should exist on the third coxa. Trochanter bears only a few setae and triangular teeth. Femur has very sparse setation

but covered with many triangular teeth in an irregular arrangement, and a paired larger teeth on the dorsal apical margin. The slightly swollen patella has only a few setae and triangular teeth, but paired dorsal apical teeth conspicuous and sometimes surrounded with one or two smaller teeth. Tibia has sparse setation and weakly devel



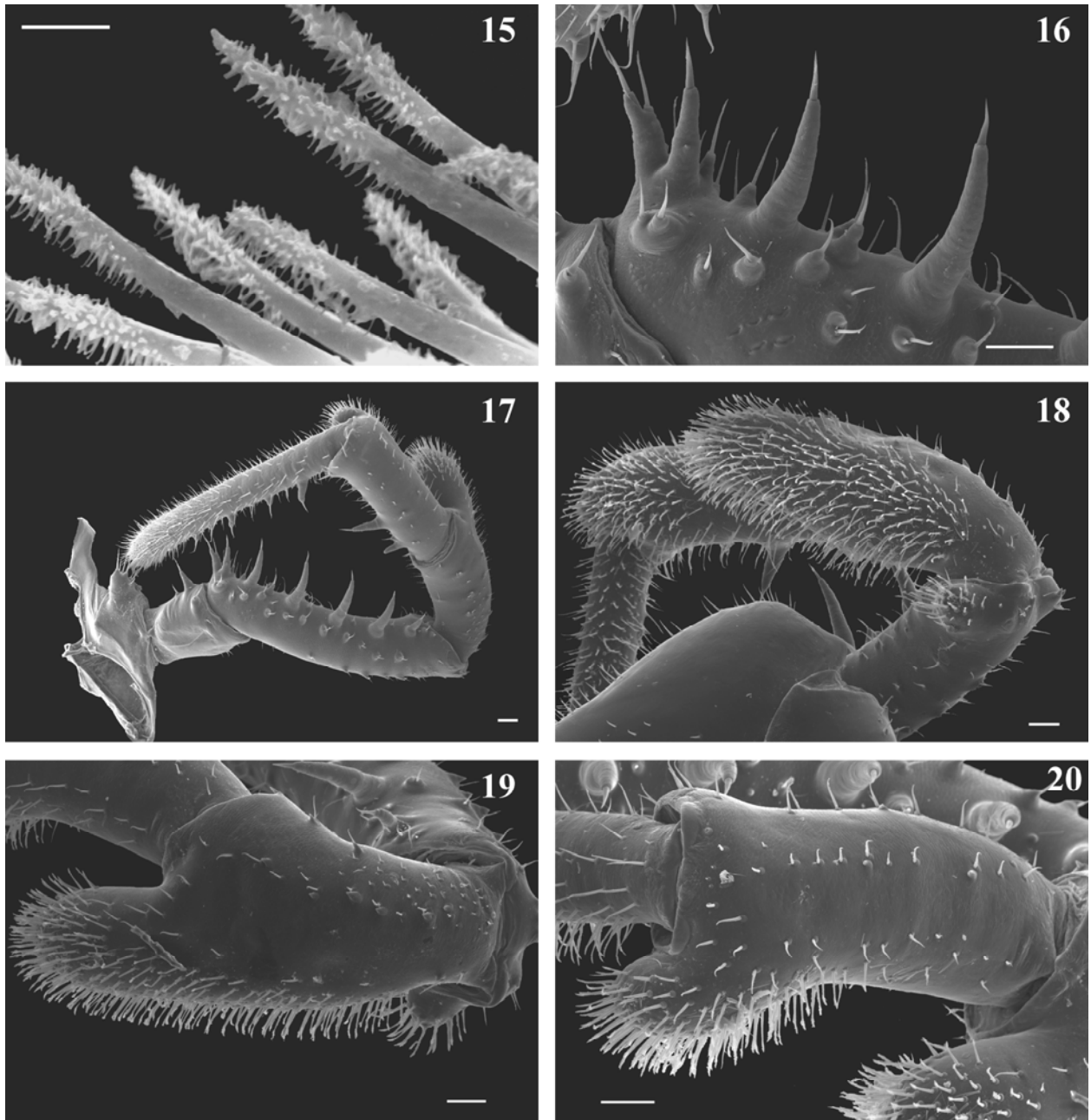
Figures 10–14. *Megabunus pifkoi* sp. n., pedipalpus, 2<sup>nd</sup> leg and chelicerae. 10 = pedipalpus, outer lateral; 11 = pedipalpus, inner lateral; 12 = pedipalpal patella and tibia, dorsal; 13 = 2<sup>nd</sup> leg, lateral; 14 = chelicera, outer lateral (scale 1 mm; setae of the pedipalpus and the leg omitted)

oped triangular teeth, the dorsal apical surface is covered with dense, short setae. Metatarsus lacks triangular teeth but has dense setation on the ventral, and scarce setation on the dorsal surface; the ventral apical margin bear a a paired spine. Tarsal articles are densely and evenly setated, with some stronger and longer setae erecting from the rest; paired spine on the ventral apical margin also present. Claw smooth and ordinary developed.

*Colour.* Proximal half of the coxa mostly pale with irregular dark patches, apical part dark brown to black; this pattern concerns also to the much smaller dorsal surface. Trochanter dark with

four pale spots on the dorsal surface. Femur uniformly dark brown to black, but the dorsal apical part is white around the apical teeth; integument also white and with the white dorsal apical part make an impression of a certain white ring on the distal margin of the segment. Patella, tibia and those integuments have a similar colouration to the femur. Metatarsi and tarsi uniformly brown and slightly paler than the previous segments, terminal articles have a somewhat darker impact.

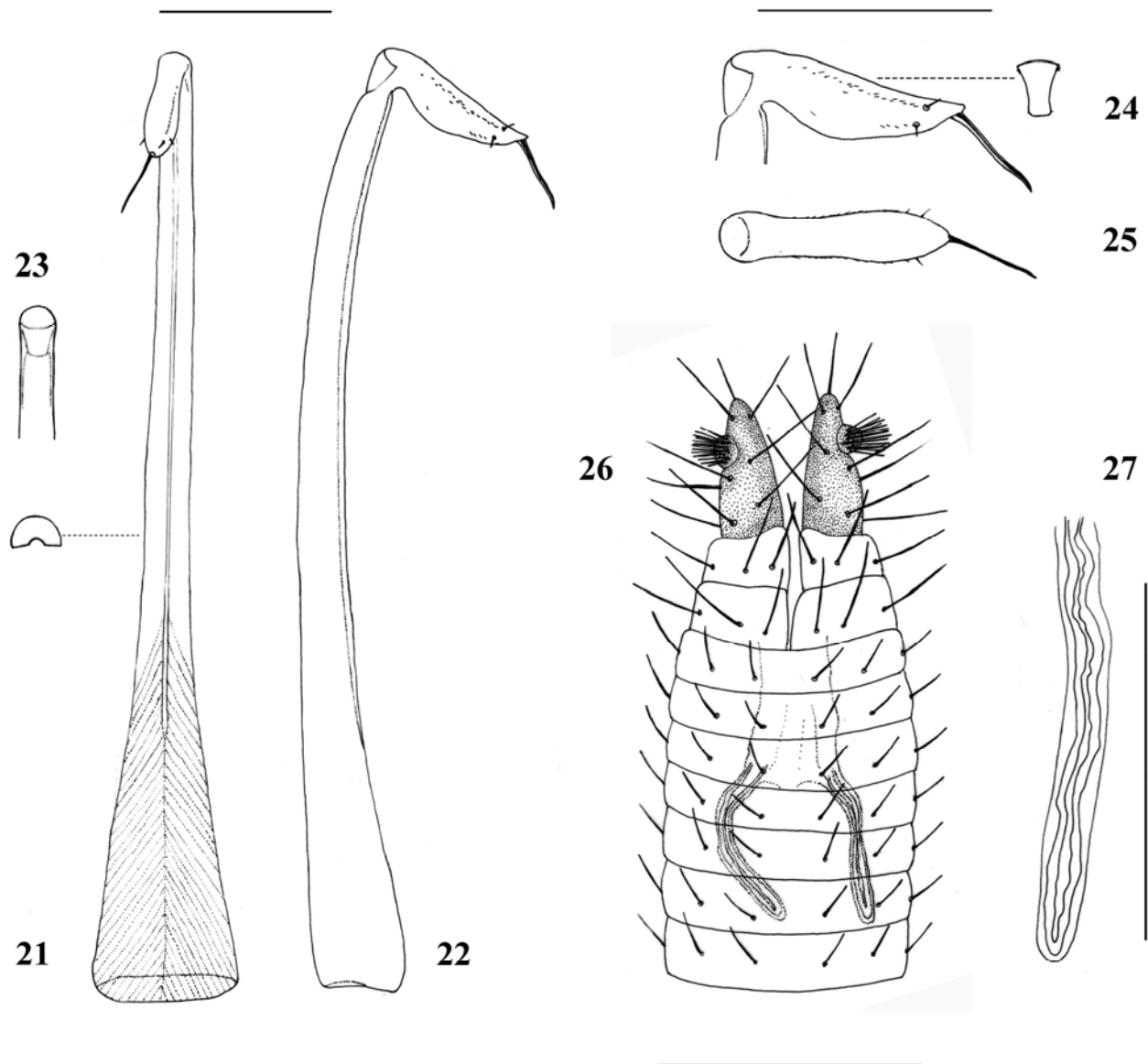
*Penis* (Figs. 21–25). Length 2.7–2.8 mm, width of the base 0.4 mm; colour uniformly pale brown. Trunk slightly bent, base triangularly widened and gradually narrows towards the apical



**Figures 15–20.** *Megabunus pifkoi* sp. n., pedipalpus. 15 = ciliated setae on the apophysis of patella; 16 = tubercles with spines on the ventral surface of femur; 17 = pedipalpus, outer lateral; 18 = patella and tibia, inner lateral; 19 = patella, dorsal; 20 = tibia, dorsal. (Scale 0.01 mm in Fig 15, and 0.1 mm in Figs. 16–20)

end which is not widened again. Musculature present in the basal third; a shallow ventral sulcus derived from the basal fourth along the ventral side, makes the cross section depressed along the apical three fourth instead of oval in the basal portion and the basal opening (Figs. 21–23). Head

elongated, dorsal edge slightly depressed, ventral margin abruptly diverge in the basal two fifth then gradually converge towards the apex forming a pointed head. Tongue-shaped in dorsal view, cross section rectangular. Apical spine long, reaches more than half the length of the head;



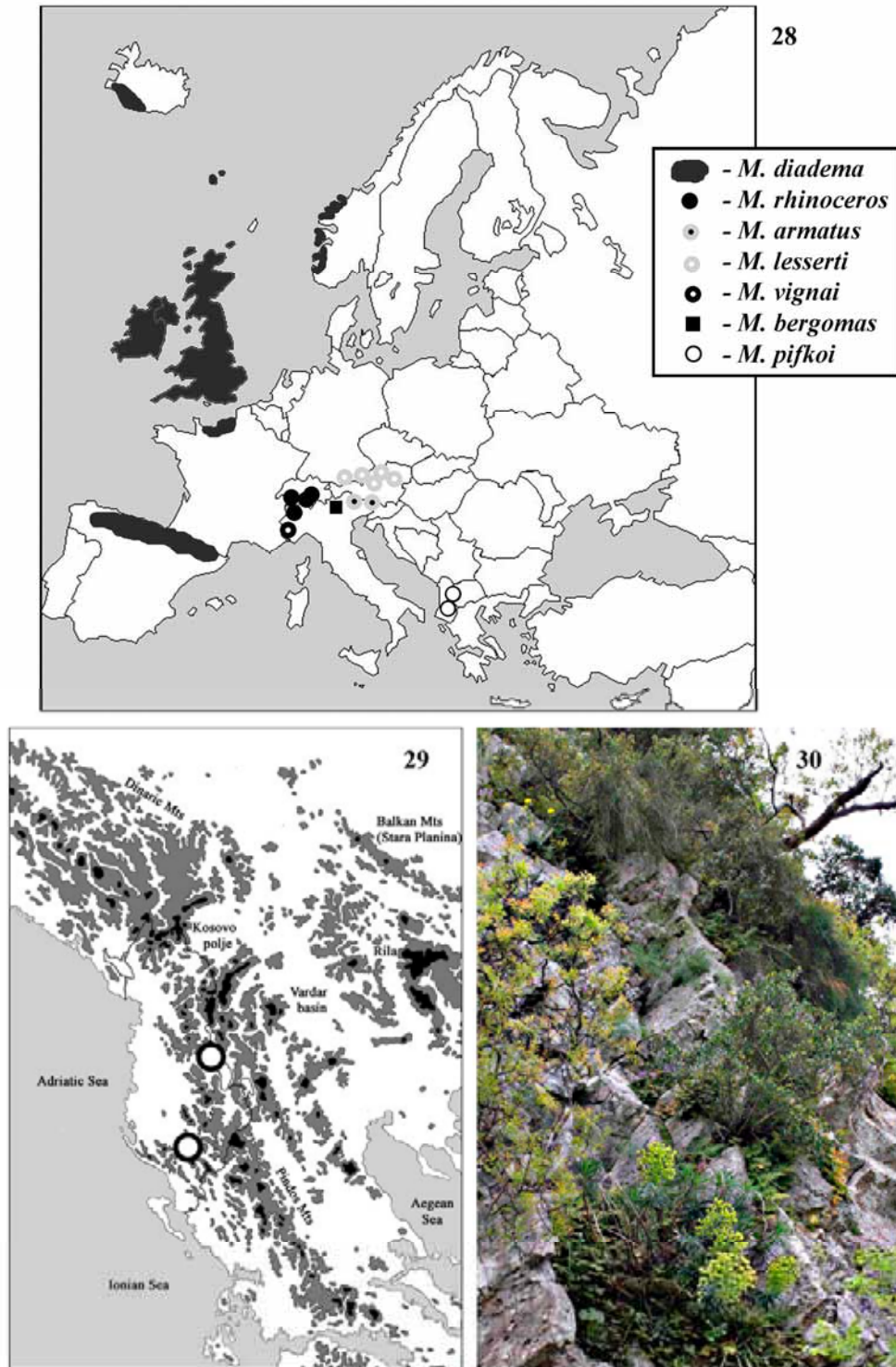
**Figures 21–27.** *Megabunus pifkoi* sp. n., genital organs. 21 = penis and its cross section, dorsal; 22 = penis, lateral; 23 = apical part of penis, ventral; 24 = head of penis and its cross section, lateral; 25 = head of penis, dorsal; 26 = apical part of ovipositor, ventral; 27 7 receptacula seminis, ventral (scale 0.5 mm in Figs. 21–26, and 0.25 mm in Fig 27)

minute spicules occur all along the dorsal, and partly along the ventral margins; paired apical setae present (Figs. 24–25).

*Ovipositor* (Figs. 26–27). Shape and proportions are typical for the genus; apical segment brown, the rest are whitish (Fig. 26). Receptacula seminis located in segments 6–9, rather elongated, monovesicular (Fig. 27).

*Affinities.* Among the species of genus *Megabunus* Meade, 1855, the new species differs from the West and North European *M. diadema* (Fabricius, 1779) by the much smaller processes on ocular tubercle, trunk of penis not widened in apical end, longer receptacula seminis, longer legs and dark body colour. From the West Alpine *M. rhinoceros* (Canestrini, 1872), *M. vignai* Martens,





**Figures 28–30.** Distributions and habitat. 28 = distribution of the genus *Megabunus* Meade, 1855; 29 = known localities of *Megabunus pifkoi* sp. n. (grey: areas above 1000 m; black: areas above 2000 m); 30 = type locality of *Megabunus pifkoi* sp. n. (photo Z. Drahos)

1978 and *M. bergomas* Chemini, 1985 it differs by the reduced spinulation of the dorsal thoracic areae and longer legs. In addition, it differs from *M. rhinoceros* by the uniformly pale brown and slightly bent penis, longer receptacula seminis and longer tubercles on pedipalpal tibia; from *M. vignai* by slightly bent penis and longer tubercles on pedipalpal tibia; from *M. bergomas* by smooth chelicera and weakly armed dorsal surface of pedipalpal femur. It is much closely related to the East Alpine *M. lesserti* Schenkel, 1927 and *M. armatus* (Kulczyński, 1887), but differs from both by the trunk of penis which is not widened apically, by the longer receptacula seminis and dark body colour. In addition, it differs from *M. lesserti* by longer tubercles on pedipalpal tibia, from *M. armatus* by pointed penial head and longer legs. Among the Balkanian species included in different genera, pedipalpus and chelicera of *Platybunus kratochvili* Hadži, 1973 similar to those of the new species, on the basis of the original description; nevertheless, it differs well by the size and the processes of the ocular tubercle and the modified femur of the first leg (Hadži 1973: Fig 67). As this species has small apical apophysis on the pedipalpal femur, it is most probably not a member of genus *Platybunus* C. L. Koch, 1848 but possibly the genus *Megabunus*; to judge its status the examination of the type specimens would be necessary. Genus *Stankiella* Hadži, 1973 also shares some similarities with the genus *Megabunus* but differs with the small teeth on the cheliceral lamella, and both species included have only small ventral projections on pedipalpal segments.

*Ecology and distribution.* The species was found in two mountain systems of Albania: the Dhëmbel Mts belong to the Pindos system of Southern Albania and Northwestern Greece while the Jablanica Mts belong to the system of Central-East Albania and Eastern Macedonia (Fig. 29). These systems are well separated and their fauna are quite different (e.g. Korsós *et al.*, 2008). Thus, it is highly probable that the species has a wider distributional area in SW Balkans. Both known localities are exposed limestone rocks with sparse shrub (Fig. 30); the East Alpine species of the

genus live in similar habitats (Martens, 1978; Muster *et al.*, 2005). At the Dhëmbel Mts locality there were no additional harvestmen collected, in the Jablanica Mts the specimens were collected together with an unmaturred male *Metaplatybunus* Roewer, 1911 specimen.

*Etymology.* The species is dedicated to my friend and colleague, Dániel Pifkó (Department of Botany, HNHM), the collector of the type series. Used as the genitive of a noun of male gender.

#### Key to the species belonging to *Megabunus*

1. Processes of the ocular tubercle nearly as long as the tubercle.....*M. diadema*  
Processes of the ocular tubercle shorter than half length of the tubercle.....2
2. Spinulation of the dorsal thoracic areae well developed..3  
Spinulation of the dorsal thoracic areae reduced .....5
3. Trunk of penis with marked dark pattern...*M. rhinoceros*  
Trunk of penis uniformly pale brown.....4
4. Trunk of penis erect, narrow in cross section .....*M. vignai*  
Trunk of penis slightly bent, wide in cross section.....  
.....*M. bergomas*
5. Head of penis blunt, legs short .....*M. armatus*  
Head of penis pointed, legs relatively long.....6
6. Trunk of penis widened in the apical end, receptacula seminis short.....*M. lesserti*  
Trunk of penis not widened in the apical end, receptacula seminis long.....*M. pifkoi*

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