

First record of the genus *Graecophalangium* Roewer, 1923 (Opiliones: Phalangiiidae) from Albania, with redescription of *G. militare* (C.L. Koch, 1839)

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Abstract

The phalangiid harvestmen genus *Graecophalangium* Roewer, 1923 is reported from Albania for the first time, by collecting of *G. militare* (C.L. Koch, 1839) in the Grammos Mts on the southeastern border of the country. The species is redescribed on the basis of the Albanian male specimen. This is the 46th Opiliones reported from the country; notes on its habitat are also given. Distribution of the known *Graecophalangium* species are depicted on a map, and a key for their identification is given.

Key words: harvestmen, Balkans, Anatolia, Levant, Central Asia, distribution, identification key.

Introduction

Graecophalangium Roewer, 1923 is a small genus of distinctive phalangiid harvestmen, known to be distributed in the Balkans, Anatolia, the Levant and Central Asia with six valid species recognised, and further two currently threatened as nomina nuda (Anonymous 2014). The genus was erected for two Greek mainland species, *G. atticum* Roewer, 1923 and *G. militare* (C.L. Koch, 1839), without designation of type species (Roewer 1923). The next account on the genus was taken by Martens (1966), who described the third species from Crete, gave a revised diagnosis of the genus and a map on the distribution of known taxa. A few years later, Staręga (1973) described the fourth species, *G. punicum* Staręga, 1973 from Lebanon. Later, Crawford (1992) designated *G. atticum* as the type species of the genus. Mitov (1995) described the fifth species from the Republic of Macedonia (FYROM), and reported *G. atticum* from Bulgaria, together with a complementary description of that species (Mitov 2003). He also transferred the species *Egaenus marenzelleri* Nosek, 1905 to the genus *Graecophalangium* and announced a new species from Turkey in conference abstracts (Mitov 2008, 2009), but as those names not yet received formal publications, yet must be regarded as nomina nuda (ICZN 1999). Meanwhile, Snegovaya & Staręga (2009) published a comparative new description of the genus. Finally, the recent description of the sixth species from the Kopet Dag Mts of Turkmenistan (Tchemeris & Snegovaya 2010), extended the known range of the genus to Central Asia.

The harvestmen fauna of Albania still can be considered poorly known, with 45 species hitherto reported from the country (Mitov 2000, Murányi 2008, 2013). Herein I report the first species of

Graecophalangium found in the Grammos Mts, close to the border with Greece. The single male obviously belongs to *G. militare*, a species easily recognisable on the basis of chelicerae armed with five distinct apophyses. However, this distinct species is still incompletely known, e.g. penis was never described before and no features were figured besides chelicerae (Koch 1847, Roewer 1911, 1912, 1923), ocularium and habitus (Koch 1847). Thus, in this paper I present a detailed morphological description of the Albanian specimen, description of its habitat and a revised diagnosis of the genus, key to the formally described species and a map on their known distribution.

Material and Methods

The specimen was collected by singling. It is 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 SMZ1500 microscope, habitus photos were taken with an Olympus DP20 camera applied on the same microscope. Terminology follows Murányi (2013).

Distribution data refer to the available records in Martens (1966), Mitov (1995, 2003, 2009), Nosek (1905), Roewer (1923, 1956), Staręga (1973) and Tchemeris & Snegovaya (2010). Papers were accessed from OmniPaper (Kury 2015).

Results and discussion

Graecophalangium Roewer, 1923

(Fig. 1)

Graecophalangium Roewer, 1923 — Roewer 1923: 755. (original description); Martens 1966: 352. (comments and distribution, revised diagnosis); Crawford 1992: 22. (type species designation); Kury 2005 (catalog); Snegovaya & Staręga 2009: 42. (redescription); Anonymous 2014 (catalog).

Type species: *Graecophalangium atticum* Roewer, 1923, by subsequent designation (Crawford 1992).

Diagnosis: Medium sized Phalangiidae, with middle long or short legs and often with distinct longitudinal light stripe on saddle of abdominal scutum. Distal segment of male chelicera usually with processes. Pedipalp with small apophysis only on patella, femur armed with denticles. Legs armed, forelegs usually thickened. Shaft of penis with distinct broad basis, medial tapering and distal spoon.

Distribution (Fig. 1): The genus contains four Balkanian endemics, a further species (*G. punicum*) is known from the Levant, one was recently described from Central Asia (*G. karakalensis* Tcheremis & Snegovaya, 2010), and two Anatolian species (*Egaenus marenzelleri* Nosek, 1905 and *Graecophalangium sp. n.* sensu Mitov 2009) were also attributed to the genus but not yet published formally (Fig. 1A). All the non-Balkanian species are known only from the type specimens, although *C. karakalensis* was described from multiple localities of the western Kopet Dag. One of the Balkanian species is restricted to Crete (*G. cretaeum* Martens, 1966) while the other three are known from the mainland and the Peloponnese (Fig. 1B). *Graecophalangium drenskii* Mitov, 1995 is known from a single male collected in the southwestern part of the Republic of Macedonia. The other two species are relatively widespread: *G. militare* is known from the southwestern areas of the peninsula, while *G. atticum* is from the southern central ranges. It is worth to mention, that Mitov (1995, 2003) cited *G. atticum* from the Republic of Macedonia, referring to Martens (1966); however, the latter enumerate it only from Greek Macedonia. Martens (1966: Fig. 15) also marked several unspecified records of the genus on his map, these are also depicted herein with a question mark (Fig. 1A–B).

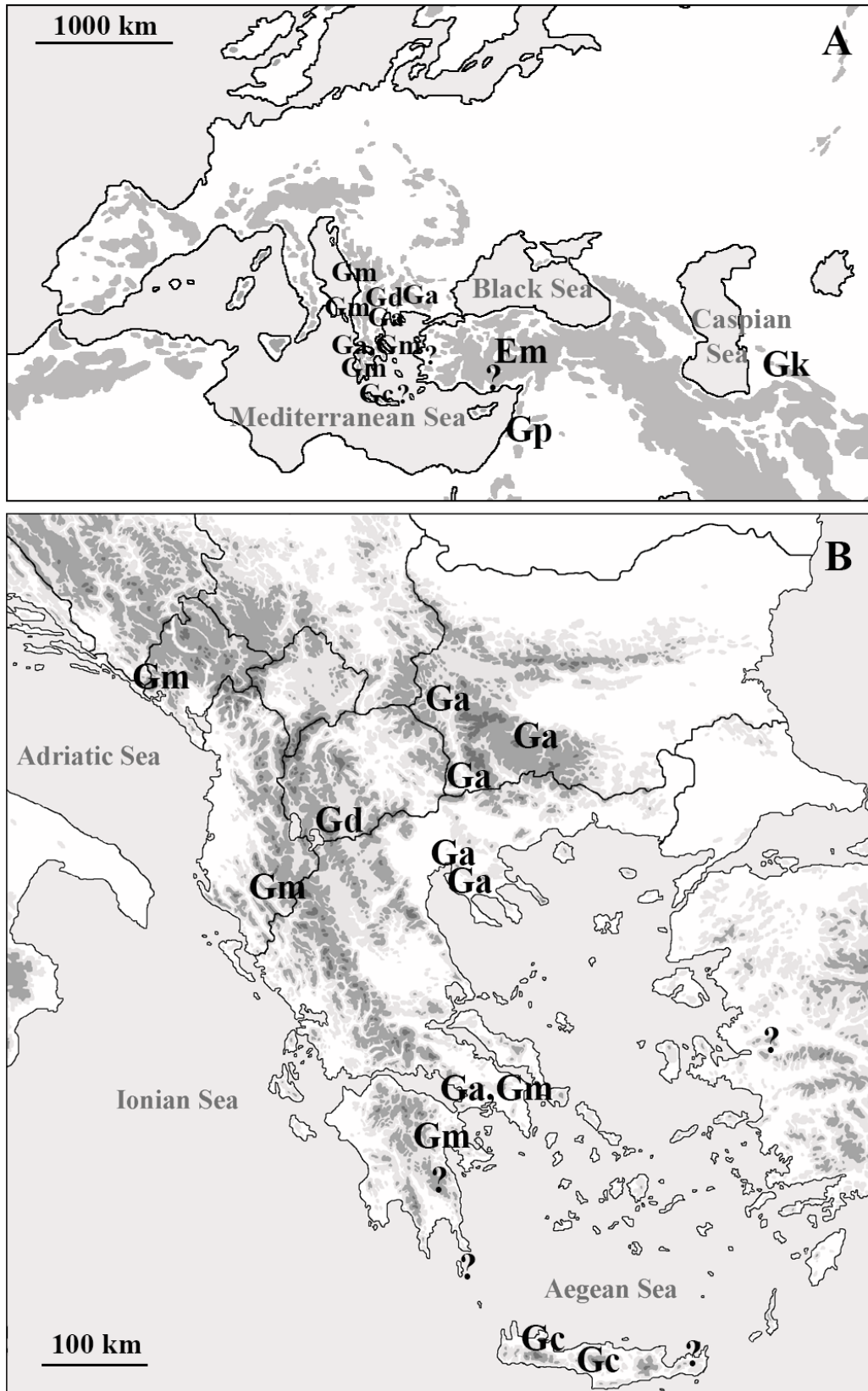


Figure 1. Known distribution of the genus *Graecophalangium* Roewer, 1923: **A** – Global distribution in the West Palearctic; **B** – known localities in the Balkans. Em: *Egaenus marenzelleri* Nosek, 1905; Ga: *G. atticum* Roewer, 1923; Gc: *G. cretaeum* Martens, 1966; Gd: *G. drensikii* Mitov, 1995; Gk: *G. karakalensis* Tchemeris & Snegovaya, 2010; Gm: *G. militare* (C.L. Koch, 1839); *G. punicum* Staręga, 1973; ?: unknown specific identity or undescribed species (altitudes above 1000 meters are shaded in grey on Fig. 1A; above 500, 1000 and 2000 meters are shaded in different grey on Fig. 1B).

Key to the species belonging to *Graecophalangium*:

(only for males, abovementioned nomina nuda also cannot be considered)

| | | |
|---|---|------------------------|
| 1 | Chelicera lacks process, glans of penis elongated | <i>G. punicum</i> |
| - | Chelicera bear process(es), glans of penis elongated or ventrally expanded | 2 |
| 2 | Glans of penis elongated, cheliceral processes less than four | 3 |
| - | Glans of penis ventrally expanded, cheliceral processes one to five | 4 |
| 3 | Only one cheliceral process at the base of digit of distal segment | <i>G. cretaeum</i> |
| - | Three cheliceral processes: one on movable finger, two on distal segment | <i>G. drenskii</i> |
| 4 | Shaft of penis with short distal spoon, chelicera with four processes | <i>G. karakalensis</i> |
| - | Shaft of penis with long distal spoon, chelicera with one to three, or five processes | 5 |
| 5 | Chelicera with one to three processes but none on movable finger | <i>G. atticum</i> |
| - | Chelicera with five processes, one of them on movable finger | <i>G. militare</i> |

***Graecophalangium militare* (C.L. Koch, 1839)**

(Figs. 2–5)

Opilio militaris C.L. Koch, 1839 — Koch 1839: 34. (original description); Koch 1847: 42. (complementary description, Fig. 1530 on Pl. DLIII).

Phalangium militare (C.L. Koch, 1839) — Roewer 1911: 11. (comb. n., Fig. 7 on Pl. II); Roewer 1912: 96. (complementary description, Fig. 26 on Pl. 2).

Graecophalangium militare (C.L. Koch, 1839) — Roewer 1923: 756. (comb. n., complementary description, Fig. 933); Roewer 1956: 262. (further Greek records); Martens 1966: 352. (comments and distribution, first record from Montenegro); Kury 2005 (catalog); Anonymous 2014 (catalog).

Material examined: Albania: Kolonjë district, Grammos Mts, rocky alpine grassland above a swampy spring, locality code 2014/37, 1940 m, N40°19.907' E20°44.586', 11.v.2014, leg. Tibor Kovács and Dávid Murányi: 1 ♂ (HNHM).

Diagnosis: Medium sized, brown *Graecophalangium* with middle long legs. Chelicera with five processes on the distal segment, one of them on movable finger. Shaft of penis with long and wide distal spoon; glans distinctly expanded ventrally.

Redescription: Body shape and proportions are typical of the genus. (Fig. 2). Length: male 7 mm; width: male 4 mm.

Colour: Dorsum brown with darker and paler patches (Figs. 2A,C). Propeltidium with elongated, paired dark patch in front of ocularium, patches along lateral borders and between denticle lines of mesopeltidium hardly separated; metapeltidium with transverse dark line of patches. Longitudinal dark pattern of opisthosomal scutum laterally delimited dark, with wide and conspicuous light brown median line; abruptly narrowing on 4th opisthomal tergum, then widened again and ending before the free tergites. Abdominal surface bear transverse lines of dark and pale dots. Ocularium pale brown dorsally, laterally darker; tubercles pale. Venter pale, coxae with numerous brown dots arranged basally and laterally, genital operculum entirely pale (Figs. 2B–C). Ground colour of chelicerae pale but both segments bear dark patches; fingers pale, teeth and apical parts black (Figs. 3A–C). Ground colour of pedipalps pale; trochanter, femur, patella and tibia bear dark patches, tarsus apically dark brown, tarsal claw black (Figs. 3D–F). Legs with pale femora bear dark patches, patellae and tibiae brown with dark patches; tarsi brown, claws black (Figs. 2D–G).

Dorsum (Figs. 2A,C): Surface imbricate and tuberculate, peltidium with setae on denticles, abdominal setae mostly on areoles. Denticles on peltidium stout and dense; propeltidium with numerous denticles, each side

of ocularium with two posteriorly diverging zigzag lines of denticles. Supracheliceral laminae with small, simple denticles (Fig. 3H). Ozopores with pairs of small, anterior and posterior denticles, metapeltidium with transverse row of denticles. Ocularium small, with medial groove and rows of small, obtuse tubercles (Fig. 3G). Setae on abdominal scutum arranged in transverse rows.

Venter (Fig. 2B–C): Surface imbricate, setae on areoles; genital operculum and coxae densely setose. Genital operculum trapezoid, anterior margin convex; length less than twice as long as posterior margin.

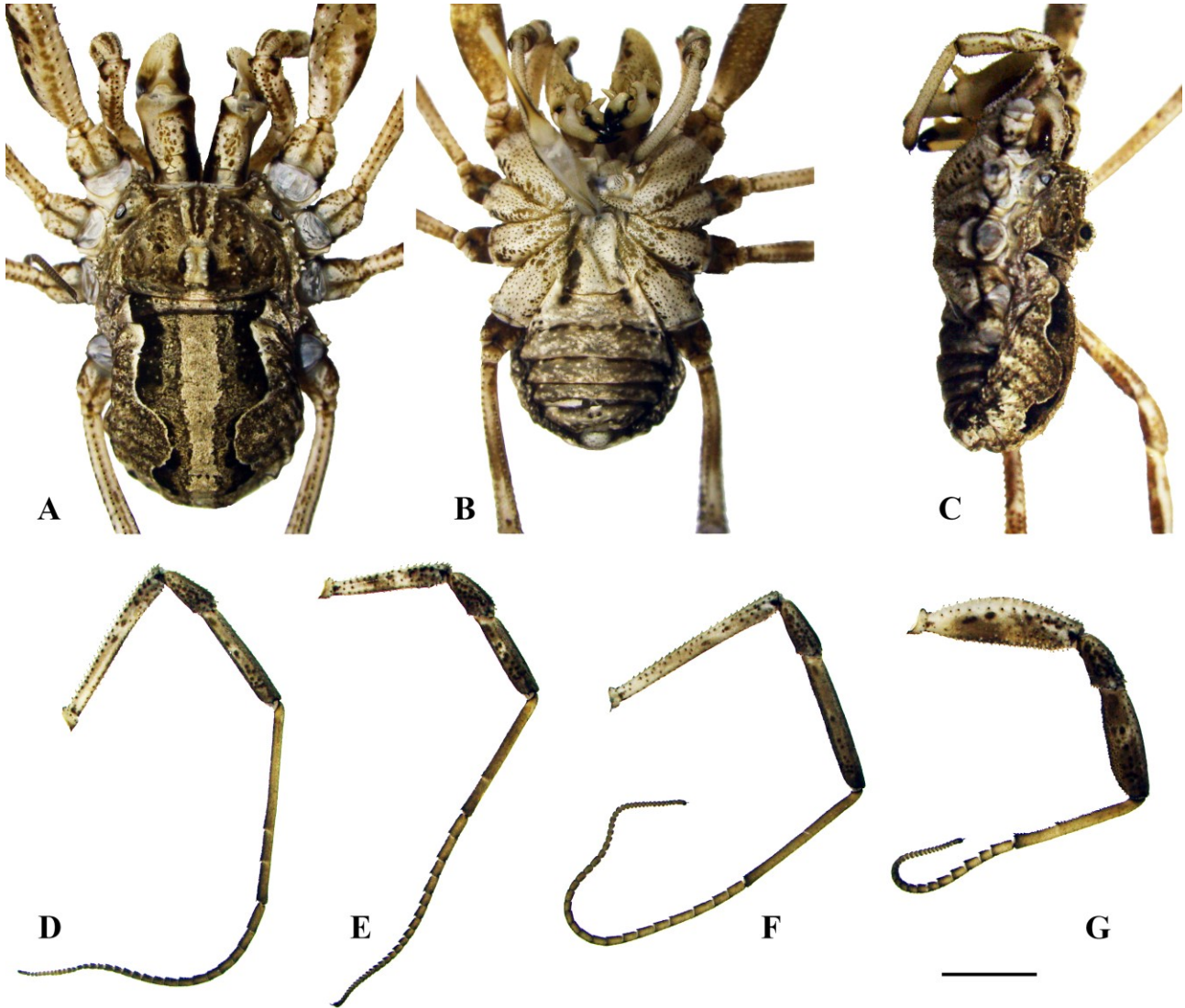


Figure 2. Male *Graecophalangium militare* (C.L. Koch, 1839), Albania: **A** – habitus, dorsal; **B** – habitus, ventral; **C** – habitus, lateral; **D** – 4th left leg, outer lateral; **E** – 3rd left leg, outer lateral; **F** – 2nd left leg, inner lateral; **G** – 1st left leg, inner lateral. Scale bar 2 mm.

Chelicerae (Figs. 3A–C): Robust and large, distal segment with five prominent processes; surface mostly glabrous but imbricate on lateral sides of basal segment. Setae scarce, dorsal ones on basal segment with small tubercles. Movable finger with large basal tooth, then smaller ones altered by minute teeth; teeth on digit of distal segment are medium sized, unequal. Two of the five processes are located on the distal half of the body of distal segment, these are setose, straight and rounded; further two are on the fixed digit of the segment, both are bald and acute, the basal one points inwards while distal one points outwards; fifth process is located on frontal basal portion of the movable finger, elongated, bald and acute, basally erect while apex points inward.

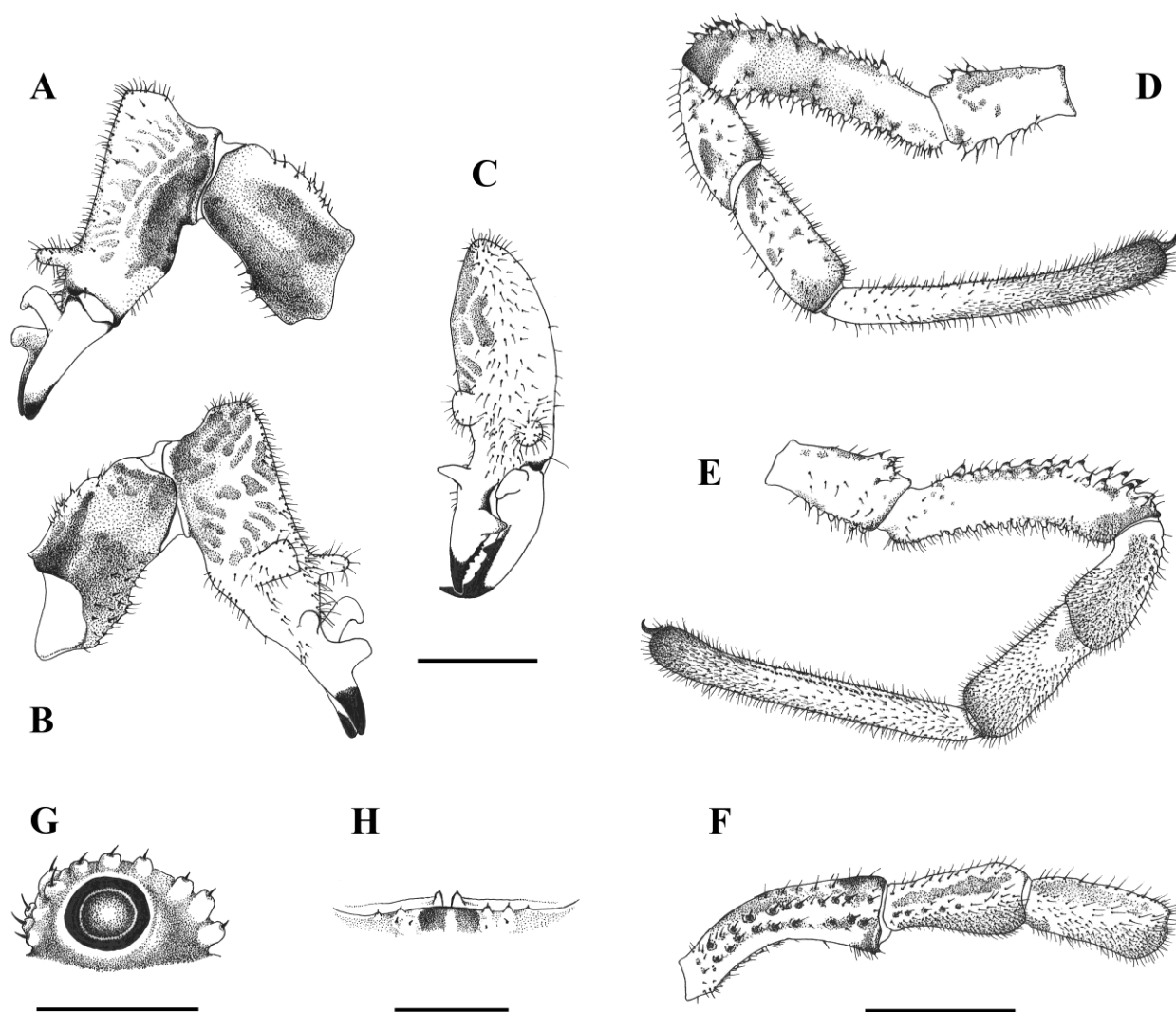


Figure 3. Male *Graecophalangium militare* (C.L. Koch, 1839), Albania: **A** – left chelicera, lateral; **B** – left chelicera, medial; **C** – left chelicera, distal segment, frontal; **D** – left pedipalpus, lateral; **E** – left pedipalpus, medial; **F** – left pedipalpus, femur, patella and tibia, dorsal; **G** – ocularium, lateral; **H** – supracheliceral laminae, dorsal. Scale bars 1 mm.

Pedipalps (Figs. 3D–F, Table 1): Proportions characteristic of the genus; surface glabrous but partly imbricate, setae diverse. Trochanter with small ventral and dorsal tubercles and simple setae. Femur lacks apophysis but medial apex swollen; ventral surface with numerous small tubercles and simple setae, lateral sides mostly bald, dorsal surface with larger tubercles especially on apical third. Patella with small, rounded medio-distal apophysis; the apophysis is densely setose, other surfaces bear only few setae, dorsally with spine-tipped tubercles. Tibia lacks apophysis but medio-distal portion densely setose. Tarsus densely setose and with two ventral rows of fine denticles; tarsal claw smooth.

Legs (Fig. 2D–G, Table 1): Relatively short, second pair less than three times longer than length of body; surface mostly imbricate. Hindcoxa with four weak teeth latero-apically, first three coxae with medio-dorsal apical tooth. Trochanter with a few denticles. Femur with triangular teeth arranged in rows on carinae, forefemur distinctly thickened. Patella slightly swollen, with a dorsal row and a few apical triangular teeth. Tibia carinated and with sparse triangular teeth on legs 2–4, while foretibia distinctly thickened and armed with many triangular teeth on ventral and dorsal surfaces. Tarsi with dense setation, claw smooth; metatarsus of the foreleg is ventrally armed.

Table 1. Length of the leg segments of *Graecophalangium militare* (C.L. Koch, 1839) specimen from Albania, in mm; abbreviations: Fe – femur, Pt – patella, Ti – tibia, Mt – metatarsus, Ta – tarsus

| Leg | Fe | Pt | Ti | Mt | Ta | full length |
|------|-----|-----|-----|-----|-----|-------------|
| male | | | | | | |
| Pp | 1.8 | 0.8 | 1.1 | | 2.3 | 6.0 |
| I | 3.2 | 1.3 | 2.3 | 2.8 | 4.4 | 14.0 |
| II | 3.8 | 1.3 | 2.9 | 3.1 | 8.6 | 19.7 |
| III | 2.4 | 1.1 | 1.8 | 2.8 | 4.9 | 13.0 |
| IV | 3.7 | 1.3 | 2.6 | 4.4 | 6.5 | 18.5 |

Penis (Fig. 4): Length 3.1 mm, width of the base 0.5 mm; colour pale brown, except dark brown medial section and lateral ridges of shaft. Shaft slightly bent ventrally at the base, medial portion straight while apical part bent back; widened basally, then tapering but apical third widened and forming distal spoon. Musculature limited to basal third. Shallow dorsal sulcus derived from basal fifth gradually widening into spoon. Glans expanded ventrally, highest in distal third, slightly concave dorsally, cross section triangular. In dorsal view, glans constricted after a wide base, apical half tongue-shaped. Stylus long, reaches more than half length of glans; dorsal paired apical setae placed more apically than the vestigial ventral pair.

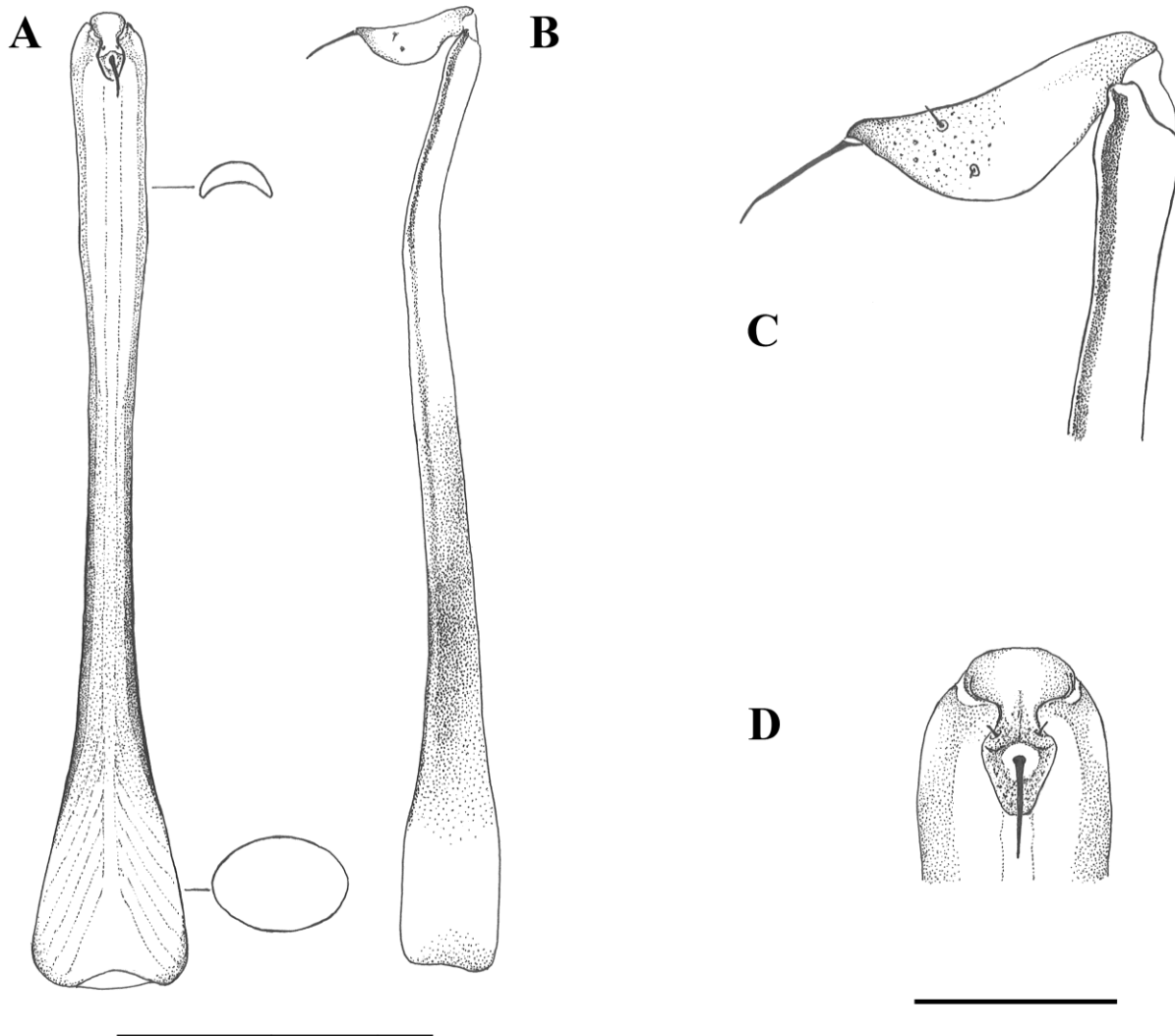


Figure 4. Male *Graecophalangium militare* (C.L. Koch, 1839), Albania: **A** – penis and its cross sections, dorsal; **B** – penis, lateral; **C** – glans of penis, lateral; **D** – glans of penis, frontal. Scale bar 1 mm for Figs. A–B, 0.25 mm for Figs. C–D.

Affinities: On the basis of similar built-up of the penis and large processes on chelicera, *G. militare* is apparently the more closely related to *G. atticum*. However, they are easy to identify on the basis of number and arrangement of cheliceral processes, more slender and less sclerotized penis of *G. militare* (compare with Fig. 932B in Roewer (1923), Fig. 3 in Mitov (2003) and Fig. 9 in Snegovaya & Starega (2009); according to Martens (1966) and Mitov (2003), number of cheliceral process may vary on *G. atticum*). *Graecophalangium drenskii*, also having large processes on the chelicera, differs from the above two by having only slightly expanded glans of penis, and one of its three cheliceral processes placed on movable finger (Mitov 1995: Figs. 2,6–7). The Central Asian *G. karakalensis* have rather wide but short distal spoon on penial shaft; in addition, its chelicera is armed with four processes (Tchemeris & Snegovaya 2010: Figs. 17–20,11–13). *Graecophalangium cretaeum* and *G. punicum* seem to be less closely related to *G. militare*: both are having elongated glans of penis, and *G. cretaeum* is having only one, while *G. punicum* is lacking any cheliceral process (Martens 1966: Figs. 9–12; Starega 1973: Figs. 24–25).

Distribution and ecology: The species was described from Greece without exact locality (Koch 1839). Roewer (1912, 1923, 1956) redescribed the species and enumerated its records from the northeastern Peloponnese. Martens (1966) published further records from Attica, Central Greece and the vicinity of Herceg Novi, Montenegro. These data are based on specimens kept in the Senckenberg Museums Frankfurt and the Naturhistorischen Museums Wien; however, they are not enumerated in details but depicted on a map. Since then, the species was not reported and the present capture is its first data from Albania.

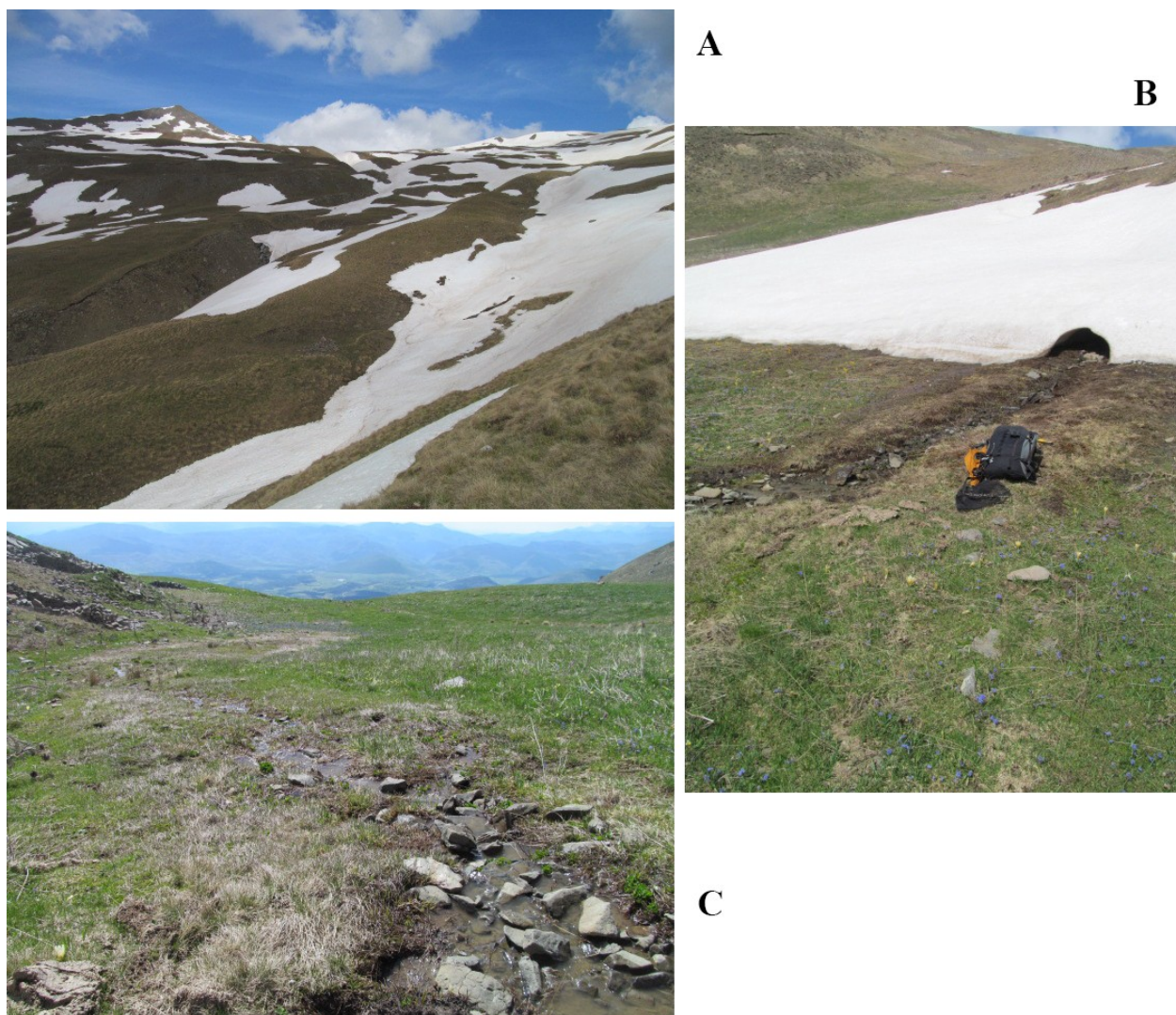


Figure 5. Habitat of *Graecophalangium militare* (C.L. Koch, 1839) in the Grammos Mts, Albania, 11 May 2014: **A** – grasslands some 100 meters above the actual spot of catching; **B–C** – swampy spring at 1940 meters, the specimen was caught above the snow-patch on Fig. 4B.

The Albanian locality is in the Grammos Mts, close to the Greek border. The Grammos belongs to the Pindos ranges of the southern Balkans, forming one of its northernmost chain. Most of the Grammos are built up from limestone, mostly deforested with higher portions covered by alpine grasslands and pastures, the highest peak is being 2520 meters tall. The specimen was found in early afternoon of 11 May at an elevation about 2000 meters, walking in a rocky alpine grassland patch above a swampy spring (Figs. 5A–C). Despite rather high daily temperature, the area still had snow packs and the vegetation was in an early spring aspect with just blooming *Colchicum* and *Scilla* fields. The existence of a fully matured male in that season indicates overwintering in the adult stage.

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