

Checklist of Pseudoscorpions (Arachnida, Pseudoscorpiones) of Albania

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A checklist is presented comprising 42 species in 21 genera and 10 families of the arachnid order Pseudoscorpiones from Albania. Two taxa are identified only to the genus level – *Neobisium* Chamberlin, 1930 and *Roncus* L. Koch, 1873. The checklist was constructed according to available published data, material deposited in the Natural History Museum in Vienna and newly collected material. Individual families contained the following numbers of species: Chthoniidae (8), Neobisiidae (13), Garypinidae (1), Geogarypidae (2), Olpiidae (1), Cheiridiidae (1), Atemnidae (1), Cheliferidae (7), Chernetidae (7) and Withiidae (1). Sixteen species and four families (Garypinidae, Cheiridiidae, Atemnidae, Withiidae) are recorded for the first time in Albania – *Chthonius jonicus* Beier, 1931, *C. rhodochelatus* Hadži, 1933, *C. tenuis* L. Koch, 1873, *Ephippiochthonius serbicus* (Hadži, 1937), *E. tuberculatus* (Hadži, 1937), *Amblyolpium dollfusi* Simon, 1898, *Geogarypus italicus* Gardini, Galli and Zinni, 2017, *Apocheiridium ferum* (Simon, 1879), *Atemnus syriacus* (Beier, 1955), *Beierochelifer peloponnesiacus* (Beier, 1929), *Hysterochelifer cyprius* (Beier, 1929), *H. meridianus* (L. Koch, 1873), *Rhacochelifer peculiaris* (L. Koch, 1873), *Dinocheirus panzeri* (C.L. Koch, 1837), *Lamprochernes chyzeri* (Tömösváry, 1883) and *Withius piger* (Simon, 1878). Moreover, *A. dollfusi* and *G. italicus* are newly recorded from the Balkans. Data on European distribution, habitat preferences and taxonomic considerations are reported. The Albanian pseudoscorpion fauna is compared with that of other Balkan countries.

Key words: Balkans, Distribution, Diversity, New records, Southeast Europe.

BACKGROUND

Albania is located in the southwestern part of the Balkan Peninsula in Southeast Europe. It lies at the interface between the mountainous Balkans and the Mediterranean region. Despite the fact that Albania is a small country, it is rich in biological landscape and is ranked among the European countries with the highest biodiversity. This is due to the country's geographic position as well as its geological, hydrological, climatic, soil and relief factors. The high diversity of ecosystems and habitats offers ideal conditions for rich species diversity and conservation of relict and endemic species

(Zeneli et al. 2014). Despite that, current knowledge remains poor for Albanian invertebrate fauna, including pseudoscorpions.

The first pseudoscorpion records in Albania were presented by Ellingsen (1910): *Dactylochelifer latreillii* (Leach, 1817), *Geogarypus minor* (L. Koch, 1873) and *Roncus lubricus* L. Koch, 1873. Müller (1931) briefly described *Neobisium albanicum* (Müller, 1931), a subterranean and endemic species. Other neobisiid species from Albania were recorded by Caporiacco (1949): *Neobisium hellenum* (Simon, 1885), *N. doderoi* (Simon, 1896) [as *N. erythrochylum mediterraneum* (Beier, 1929)] and the new species

Roncus lonai Caporiacco, 1949. Beier (1928 1929 1963) mentioned eight pseudoscorpions, six of which were new for Albanian fauna – *Dendrochernes cyrneus* (L. Koch, 1873), *Chelifer cancroides* (Linnaeus, 1758), *Neobisium cephalonicum* (Daday, 1888), *N. fuscimanum* (C.L. Koch, 1843), *N. sylvaticum* (C.L. Koch, 1835) and *Lasiochernes graecus* Beier, 1963. Pseudoscorpion research started to progress in the 21st century, still focusing mainly on soil and subterranean pseudoscorpions. New endemic and troglobitic species, *Neobisium albanorum* Ćurčić, Dimitrijević, Rađa and Vujčić-Karlo, 2006 and *N. georgecastriotae* Ćurčić, Dimitrijević, Rađa, Dudić, Šimić and Vujčić-Karlo, 2006, were described by Ćurčić et al. (2006a b). Later, Gardini (2018) synonymised *N. albanorum* with *N. georgecastriotae* and described two new cavernicolous species: *Neobisium latellai* Gardini, 2018 and *N. valsuanii* Gardini, 2018 and documented the first record of *Neobisium* cf. *vjetrenicae* Hadži, 1932 from Albania. Three new species of Chthoniidae were recorded in Albania: *Ephippiochthonius rogoi* Ćurčić, Rađa and Dimitrijević, 2008, *Globochthonius argirocastronis* (Ćurčić, Rađa and Dimitrijević, 2007) and *Chthonius gjirokastroi* Ćurčić, Rađa and Dimitrijević, 2008 (Ćurčić et al. 2007 2008).

The latest updated catalogue of Albanian fauna was published by Dhora (2010) and included five families of pseudoscorpions with the following number of species: Chthoniidae (3), Neobisiidae (10),

Geogarypidae (1), Cheliferidae (2) and Chernetidae (2). In several recent papers, three new chernetid species—*Lamprochernes nodosus* (Schrank, 1803), *Pselaphochernes lacertosus* (L. Koch, 1873) and *P. scorpioides* (Hermann, 1804)—were added to the Albanian pseudoscorpion fauna (Christophoryová and Jablonski 2017; Christophoryová et al. 2017). The last newest pseudoscorpion species in the Albanian fauna were *Rhacochelifer maculatus* (L. Koch, 1873) and *Calocheiridius libanoticus* Beier, 1955 recorded by Naumova (2020).

Despite this progress, the full extent of pseudoscorpion diversity remains unknown. The primary aim of the present paper is to present a checklist of Albanian pseudoscorpions based on a review of all available published records, a re-examination of the published museum material and the identification of the newly collected specimens from our own field work.

MATERIALS AND METHODS

The checklist was compiled using all available published records, material deposited in the Natural History Museum in Vienna (NHMW) and material obtained during several field trips in Albania. The new material was collected over five years (2015–2019) from 45 localities (in Table 1 marked with an asterisk *, Fig. 1). Pseudoscorpions were collected from natural

Table 1. List of the studied localities in Albania

Code	Localities	N	E	a.s.l.
1	Apollonia, Fier*	40°43'16"	19°28'19"	75
2	Benjë*	40°14'34"	20°25'46"	336
3	Berat*	40°42'14"	19°57'09"	54
4	Berat*	40°42'37"	19°56'41"	178
5	Berat, Paftal, Vrma ë dragoi	40°41'28"	19°52'42"	433
6	Bënçë*	40°15'23"	20°00'17"	255
7	Bërdicë	42°00'28"	19°28'48"	7
8	Bilisht	40°37'37"	20°59'45"	957
9	Bogë, Helmit Abyss	42°23'53"	19°38'44"	1540
10	Çibërraka	41°09'32"	20°10'44"	156
11	Dajt Mt., National Park*	41°21'07"	19°55'16"	1052
12	Dajt Mt., National Park*	41°21'56"	19°54'30"	1044
13	Dajt Mt., National Park*	41°22'10"	19°54'28"	1058
14	Delvinë	39°55'22"	20°06'37"	298
15	Delvinë*	39°56'21"	20°03'08"	73
16	Dukat	40°15'07"	19°34'00"	388
17	Durrës	41°18'57"	19°27'00"	3
18	Elbasan*	40°59'56"	20°01'18"	109
19	Frashër*	40°51'36"	19°56'21"	37
20	Fushe-Okol*	42°23'47"	19°41'47"	1187
21	Gjallica e Lumës Mt., Kukës•	42°01'26"	20°30'32"	1200
22	Gjirokastër	40°04'00"	20°08'00"	391

Table 1. (Continued)

Code	Localities	N	E	a.s.l.
23	Hundëkuq*	40°12'28"	20°05'28"	168
24	Kardhikaq*	39°56'55"	20°09'23"	269
25	Kardhikaq*	39°57'09"	20°09'06"	239
26	Klos*	40°30'18"	19°42'12"	44
27	Krumë•	42°12'00"	20°25'00"	485
28	Kurvelesh, Shpella ë Leke Petres	40°14'00"	19°54'00"	667
29	Lapardha*	40°45'33"	19°59'20"	151
30	Limni Mikri Préspa*	40°41'01"	20°59'49"	866
31	Liçeni i reshpanit*	40°37'13"	19°36'15"	106
32	Liçeni i Vrisceres*	39°53'27"	20°20'09"	317
33	Llogarë Pass	40°11'42"	19°35'52"	1028
34	Lumë•	42°04'13"	20°26'46"	300–350
35	Macukull, Shpella Bushiti	41°25'44"	20°03'58"	1131
36	Macukull, Shpella Haruska	41°39'53"	20°07'54"	1480
37	Macukull, Shpella Linozi-Leftari	41°42'00"	20°05'00"	1868
38	Mallakastër*	40°32'14"	19°42'38"	36
39	Mezhgoran, Mezhgoranit cave•	40°19'08"	20°05'38"	850
40	New Balldren*	41°48'10"	19°37'50"	0
41	Oblikë*	42°01'06"	19°27'18"	7
42	Palasë*	40°11'44"	19°35'54"	1028
43	Parku Kombëtar "Mali i Tomorrit"*	40°35'49"	20°13'06"	1566
44	Pashtrik Mt. •	42°12'38"	20°31'24"	1200–1400
45	Peca*	39°56'05"	20°11'42"	386
46	Poçem*	40°30'21"	19°44'01"	39
47	Poçem*	40°30'48"	19°44'36"	49
48	Poçem*	40°31'06"	19°44'28"	42
49	Pogradec	40°53'52"	20°40'58"	697
50	Progonat, Pusi i Kerpajt Pit	40°12'48"	19°56'41"	926
51	Progonat, Shpella ë Kasarit	40°12'38"	19°57'24"	1100
52	Progonat, Shterra ë Cikes	40°13'19"	19°51'43"	800
53	Projekti Shterreni, Liçeni i Treganit*	41°01'02"	20°05'06"	216
54	Pustec*	40°47'17"	20°54'18"	850
55	Qafe e T'thores*	42°23'20"	19°44'30"	1610
56	Qafe e T'thores*	42°23'23"	19°43'32"	1606
57	Rruga Cerrik Elbasan*	41°02'36"	20°01'23"	84
58	Saranda	39°44'38"	19°59'43"	8
59	Saranda	39°47'56"	20°00'02"	56
60	Shëngjin i Madh*	41°19'35"	20°04'27"	582
61	Shtërmen*	41°00'49"	20°00'42"	120
62	Stjar	39°55'58"	20°03'36"	93
63	Tartar Mt.	40°19'17"	19°44'38"	1156
64	Theth*	42°22'37"	19°47'46"	650
65	Theth*	42°22'51"	19°47'10"	676
66	Theth*	42°23'22"	19°46'55"	740
67	Theth*	42°24'04"	19°45'10"	1204
68	Uznovë	40°41'08"	20°00'38"	59
69	Vajkan*	40°46'28"	19°35'22"	14
70	Valbonë, Shpella ë Haxhise	42°28'00"	19°51'00"	1720
71	Vermosh•	42°35'34"	19°40'50"	1100
72	Vlorë	40°27'54"	19°29'06"	2
73	Vlorë*	40°28'26"	19°27'21"	0
74	Vlorë, Oriku*	40°19'06"	19°25'48"	8
75	Vodicë*	40°40'44"	20°01'34"	111
76	Zvërnec*	40°31'06"	19°24'39"	8

Abbreviations: a.s.l. – above sea level, E – longitude, N – latitude, * indicates new localities, • indicates localities of the deposited material.

biotopes, as well as in biotopes affected by humans and from four habitats: decomposed organic material (compost heaps and cow-dung), in leaf litter and soil, under tree bark and under stones. Samples from the soil, leaf litter and decomposed material were sifted or heat-extracted in Tullgren funnels. Specimens under tree bark

and stones were sampled individually using forceps. Afterwards, all obtained specimens were preserved in 75% or 95% ethanol.

The material deposited in the Natural History Museum in Vienna (published by Beier 1928 1929 1963) includes pseudoscorpions from six localities (Fig. 1,

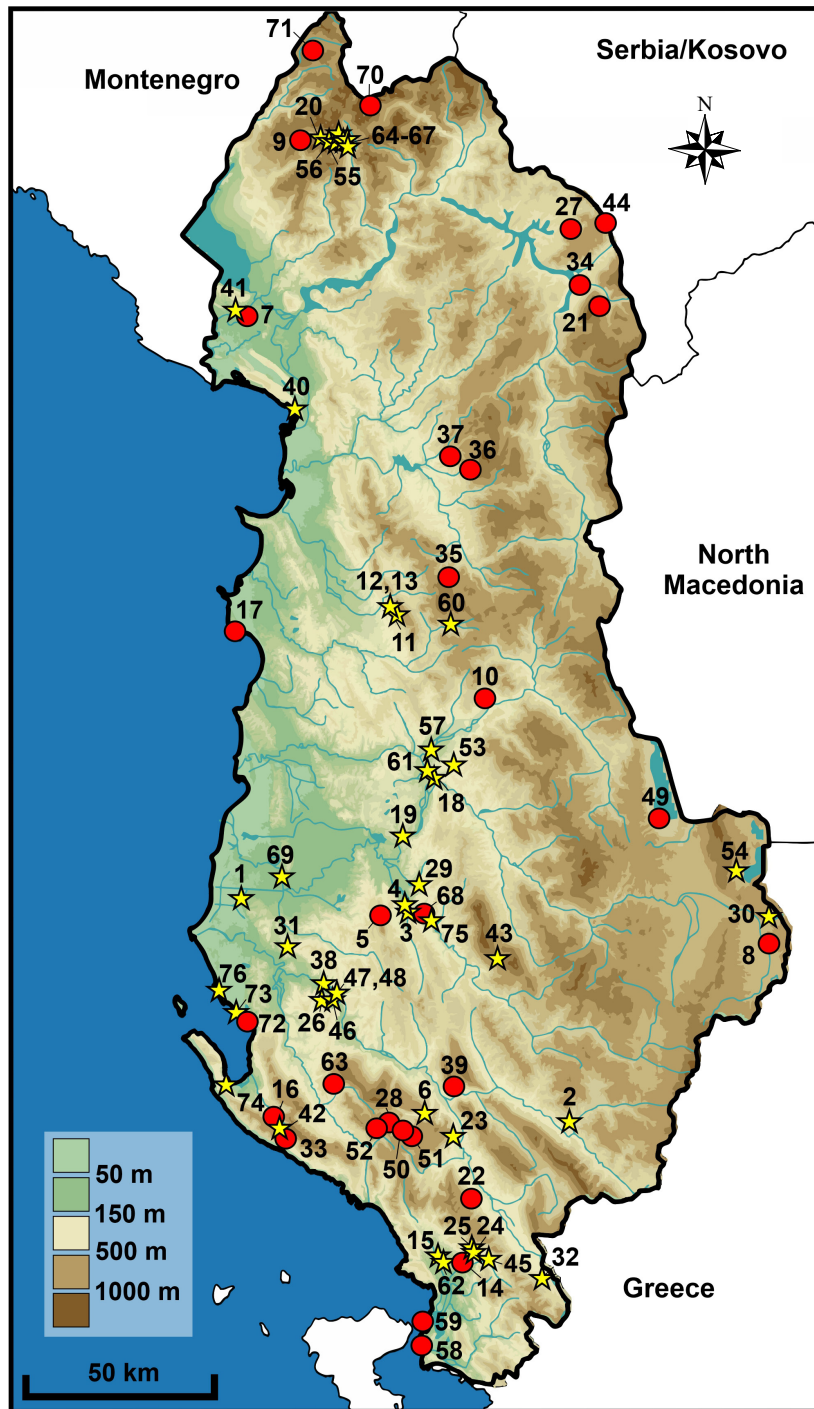


Fig. 1. Map of all studied localities in Albania. Red circles indicate the published data, yellow stars indicate the new data. For the locality codes, see table 1.

in Table 1 marked with a black circle •). Some of the missing data, mainly regarding particular developmental stages, were added to the present checklist.

The remaining 25 unmarked localities in Table 1 represent records from all available published data on Albanian pseudoscorpions (Ellingsen 1910; Müller 1931; Caporiacco 1932 1949; Ćurčić et al. 2006a b 2007 2008; Christophoryová and Jablonski 2017; Christophoryová et al. 2017; Gardini 2018; Naumova 2020; Fig. 1).

Pseudoscorpions were studied as temporary slide mounts prepared by immersing the specimens in lactic acid for clearing. After the study, they were rinsed in water and returned to 75% ethanol. Some specimens remained in 95% ethanol without mounting. All specimens were examined using a Zeiss Stemi 2000 stereomicroscope and for identification the keys in Beier (1932a b 1963), Christophoryová et al. (2011b), Gardini et al. (2017) and Hernández-Corral et al. (2018) were used. Digital photographs were taken using a Canon EOS 5D Mark II camera attached to a Zeiss Axio Zoom V16 stereomicroscope. Image stacks were produced manually, combined using the Zerene Stacker software and subsequently edited in Adobe Photoshop CC. The maps were created by QGIS Geographic Information System.

Most specimens were deposited in the zoological collection of the Department of Zoology, Comenius University in Bratislava, Slovakia, and a few specimens of *Chthonius jonicus* Beier, 1931 (five males and five females) in the private collection of Giulio Gardini, Italy.

Format of checklist

Nomenclature for all taxa follows Harvey (2013b), Zaragoza (2017) and Gardini (2018). The order of the families follows Harvey (2013a), while the genera and species in each family are in alphabetical order. The year of the description of *Lamprochernes chyzeri* (Tömösváry, 1883) was changed according to Judson (2018). The new records for Albania are marked with a black triangle ▲. For newly collected material, the following information is provided for each record: locality numerical code (refer to Table 1), biotope, habitat, collecting method, date, developmental stage (♀ – female, ♂ – male, T – tritonymph, D – deutonymph, P – protonymph), and collector name. The same information (if data were available) is provided for re-examined material in the NHMW and published records, with the addition of the concrete depository number and references. All localities are listed in table 1. Some coordinates and altitudes not reported in the original papers were added to the present checklist.

Data on European distribution, habitat preferences and taxonomic considerations are also reported.

RESULTS

In total, 794 newly collected specimens of 25 taxa from nine families were identified (Table 2). Specimens from the genera *Neobisium* and *Roncus* were identified only to the genus level. The abundances of the newly collected pseudoscorpions in the examined habitats are listed in table 2. Sixteen species and four families are recorded for the first time in Albania (Table 2, marked with ▲), of which *Amblyolpium dollfusi* and *Geogarypus italicus* are new in the Balkan fauna. The families Cheliferidae and Chernetidae were the most species-rich, while five families were presented with one species each. The most abundant species was *Chthonius jonicus*. In contrast, *Ephippiochthonius serbicus*, *Dendrochernes cyrneus* and two unidentified neobisiid species were represented by one specimen each. The highest number of species were collected from tree bark. The most abundant species in this habitat were *Hysterochelifer meridianus* and *Rhacochelifer maculatus*. The highest number of specimens was collected from the leaf litter and soil, with more than half of them represented by *Roncus* specimens. In the decomposed material, the most abundant were *Lamprochernes chyzeri* and *Roncus* specimens in the leaf litter and soil. Only three specimens of two species were collected under stones.

In total, 64 specimens of eight species belonging to three families were re-examined in the material deposited in the Natural History Museum in Vienna. The missing data on the developmental stages for these species (*Neobisium cephalonicum*, *N. doderoi*, *N. fuscimanum*, *N. sylvaticum*, *Roncus lubricus*, *Chelifer cancroides*, *Dendrochernes cyrneus* and *Lasiochernes graecus*) were added.

The present checklist of Albanian pseudoscorpions comprises 42 species belonging to 21 genera and 10 families (Table 3). Individual families contain the following number of species: Chthoniidae (8), Neobisiidae (13), Garypinidae (1), Geogarypidae (2), Olpiidae (1), Cheiridiidae (1), Atemnidae (1), Cheliferidae (7), Chernetidae (7) and Withiidae (1). In addition, specimens identified only to the genus level are included in the checklist – *Neobisium* and *Roncus*.

The presence of the recorded Albanian pseudoscorpions in other Balkan countries is reported in table 3. Albanian pseudoscorpion fauna is represented by species distributed widely across the Balkans, as well by endemic and rare species with Mediterranean-Oriental distribution (Table 3).

Checklist of Pseudoscorpions of Albania**Order Pseudoscorpiones de Geer, 1778****Family Chthoniidae Daday, 1889*****Chthonius gjirokastrii* Ćurčić, Rađa and
Dimitrijević, 2008**

(Fig. 2A)

Published data: 22: rotten wood, 5.viii.2003, 1 ♀, leg. Rađa T., Vujčić-Karlo S. (Ćurčić et al. 2008).

European distribution: Albania (Ćurčić et al. 2008).

Notes: This litter- and soil-dwelling species is considered as an endemic relict form of the Albanian

Dinaric karst by Ćurčić et al. (2008).

***Chthonius jonicus* Beier, 1931**

(Figs. 2A, 3A) ▲

New data: 66: beech forest, leaf litter, sifting, 29.ix.2016, 32 ♀, 46 ♂, 26 T, 12 D, leg. Christophoryová J.

European distribution: Albania (present paper), Greece, Italy, Malta, Portugal, Romania, Spain (Harvey 2013b).

Notes: *Chthonius jonicus* is newly recorded in Albania and its distribution is limited to the Mediterranean area. The species prefers plant detritus

Table 2. Newly collected pseudoscorpions in four different habitats in Albania

Taxa	DM	LL	TB	US	Σ
Chthoniidae					
<i>Chthonius jonicus</i> ▲	.	116	.	.	116
<i>Chthonius rhodochelatus</i> ▲	.	.	.	2	2
<i>Chthonius tenuis</i> ▲	.	6	.	.	6
<i>Ephippiochthonius serbicus</i> ▲	1	.	.	.	1
<i>Ephippiochthonius tuberculatus</i> ▲	1	6	.	.	7
Neobisiidae					
<i>Neobisium</i> sp. 1	.	1	.	.	1
<i>Neobisium</i> sp. 2	.	1	.	.	1
<i>Roncus</i> spp.	.	227	1	1	229
Garypinidae					
<i>Amblyolpium dollfusi</i> ▲	.	.	2	.	2
Geogarypidae					
<i>Geogarypus italicus</i> ▲	.	18	.	.	18
Cheiridiidae					
<i>Apocheiridium ferum</i> ▲	.	.	49	.	49
Atemnidae					
<i>Atemnus syriacus</i> ▲	.	.	2	.	2
Cheliferidae					
<i>Beierochelifer peloponnesiacus</i> ▲	.	.	8	.	8
<i>Dactylochelifer latreillii</i>	.	.	41	.	41
<i>Hysterochelifer cyprius</i> ▲	.	.	6	.	6
<i>Hysterochelifer meridianus</i> ▲	.	.	66	.	66
<i>Rhacochelifer maculatus</i>	.	.	60	.	60
<i>Rhacochelifer peculiaris</i> ▲	.	.	21	.	21
Chernetidae					
<i>Dendrochernes cyrneus</i>	.	.	1	.	1
<i>Dinocheirus panzeri</i> ▲	.	.	13	.	13
<i>Lamprochernes chyzeri</i> ▲	86	.	.	.	86
<i>Lamprochernes nodosus</i>	16	.	.	.	16
<i>Pselaphochernes lacertus</i>	1	.	5	.	6
<i>Pselaphochernes scorpioides</i>	28	.	.	.	28
Withiidae					
<i>Withius piger</i> ▲	8	.	.	.	8
Σ	141	375	275	3	794

Abbreviations: DM – decomposed organic material, LL – leaf litter and soil, TB – tree bark, US – under stone, Σ – total specimen number, ▲ – new species record for Albania.

Table 3. Presence of the recorded Albanian pseudoscorpions in Balkan countries

Species / Country	BA	BG	HR	GR	ME	MK	RO	RS/KS
Chthoniidae								
<i>Chthonius gjirokastrii</i>
<i>Chthonius jonicus</i>	.	.	.	+	.	.	+	.
<i>Chthonius rhodochelatus</i>	.	.	+	+
<i>Chthonius tenuis</i>	.	+	.	+	+	+	+	+
<i>Ephippiochthonius rogoi</i>
<i>Ephippiochthonius serbicus</i>	.	+	.	.	.	+	.	.
<i>Ephippiochthonius tuberculatus</i>	.	.	.	+	.	+	+	.
<i>Globochthonius argirocastronis</i>
Neobisiidae								
<i>Neobisium (Blothrus) albanicum</i>
<i>Neobisium (B.) georgecastriotae</i>
<i>Neobisium (B.) latellai</i>
<i>Neobisium (B.) valsuanii</i>
<i>Neobisium (B.) vjetrenicae</i>	+
<i>Neobisium (Neobisium) cephalonicum</i>	.	+	+	+	+	+	+	+
<i>Neobisium (N.) doderoi</i>	+	.	+	+	+	+	.	+
<i>Neobisium (N.) fuscimanum</i>	+	+	+	+	+	.	+	+
<i>Neobisium (N.) hellenum</i>	.	+	.	+
<i>Neobisium (N.) sublaeve</i>
<i>Neobisium (N.) sylvaticum</i>	+	+	+	+	+	.	+	+
<i>Roncus lonai</i>
<i>Roncus lubricus</i>	+	+	+	+	.	.	+	.
Garypinidae								
<i>Amblyolpium dollfusi</i>
Geogarypidae								
<i>Geogarypus italicus</i>
<i>Geogarypus minor</i>	.	+	+	+
Olpiidae								
<i>Calocheiridius libanoticus</i>	.	.	.	+
Cheiridiidae								
<i>Apocheiridium ferum</i>	.	+	+	.
Atemnidae								
<i>Atemnus syriacus</i>	.	.	.	+
Cheliferidae								
<i>Beierochelifer peloponnesiacus</i>	.	+	.	+
<i>Chelifer cancroides</i>	+	+	+	+	.	+	+	+
<i>Dactylochelifer latreillii</i>	.	+	+	+	.	.	+	+
<i>Hysterochelifer cyprius</i>	.	.	.	+
<i>Hysterochelifer meridianus</i>	.	+	.	+	.	+	+	.
<i>Rhacochelifer maculatus</i>	+	.	+	+	+	+	.	+
<i>Rhacochelifer peculiaris</i>	.	.	+	+
Chernetidae								
<i>Dendrochernes cyrneus</i>	.	+	+	.	.	.	+	.
<i>Dinocheirus panzeri</i>	+	+	+
<i>Lamprochernes chyzeri</i>	.	+	+	.	+	+	+	.
<i>Lamprochernes nodosus</i>	.	+	.	+	.	.	+	.
<i>Lasiochernes graecus</i>	.	.	.	+
<i>Pselaphochernes lacertosus</i>	+	+	.	+
<i>Pselaphochernes scorpioides</i>	.	+	.	+	.	.	+	.
Withiidae								
<i>Withius piger</i>	.	.	+

Abbreviations: BA – Bosnia and Herzegovina, BG – Bulgaria, HR – Croatia, GR – Greece, ME – Montenegro, MK – North Macedonia, RO – Romania, RS/KS – Serbia/ Kosovo.

in xerothermic biotope (Beier 1963; Mahnert 1997). The present records correspond to the known habitat preferences of the species, but the species is clearly not just limited to xerothermic biotopes, but also found in mountain environments.

***Chthonius rhodochelatus* Hadži, 1933**

(Figs. 2A, 3B) ▲

New data: **25:** maple forest, under the stone, individual sampling, 13.viii.2019, 2 ♀, leg. Christophoryová J.

European distribution: Albania (present paper), Croatia, France, Greece, Italy, Slovenia, Switzerland (Harvey 2013b).

Notes: The distribution of *C. rhodochelatus* is restricted to the Mediterranean area and is recorded for the first time in Albania. *Chthonius rhodochelatus* is usually found in soil and leaf litter and a single specimen was found accidentally in a fallen bird's nest (Gardini 2004; Turienzo et al. 2010). The present discovery of the species under a stone corresponds to its known habitat preferences.

***Chthonius tenuis* L. Koch, 1873**

(Figs. 2A, 3C) ▲

New data: **20:** beech forest at roadside, leaf litter, sifting, 30.ix.2016, 4 ♂, 1 T, leg. Christophoryová J.; **55:** between rocks, beech leaf litter, sifting, 28.ix.2016, 1 ♂, leg. Christophoryová J.

European distribution: Albania (present paper), Austria, Belgium, Bulgaria, Czech Republic, France, Germany, Greece, Italy, Luxembourg, Malta, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Spain, Switzerland, United Kingdom (Harvey 2013b).

Notes: *Chthonius tenuis* is distributed widely in Europe and occurs mainly in soil, leaf litter and under stones (Beier 1963; Legg and Jones 1988; Gardini 2004). It is recorded for the first time in Albania and the studied habitats corresponds to the known species preferences.

***Ehippochthonius rogoi* (Ćurčić, Rađa and Dimitrijević, 2008)**

(Fig. 2B)

Published data: **22:** rotten wood, 5.viii.2003, 1 ♀, leg. Rađa T., Vujčić-Karlo S. (Ćurčić et al. 2008).

European distribution: Albania (Ćurčić et al. 2008).

Notes: This litter- and soil-dwelling species was considered by Ćurčić et al. (2008) as an endemic relict

form of the Albanian Dinaric karst and a remnant of some ancient ancestor. The original description of this species was based on two specimens – a female holotype and a male allotype by Ćurčić et al. (2008). But in addition, the male allotype identified as *E. rogoi* was re-examined and describe as new endemic species *Globochthonius argirocastronis* by Ćurčić et al. (2007). The paradox is that the redescription of allotype male assigned to *G. argirocastronis* (Ćurčić et al. 2007) was published earlier as a description of allotype male as *E. rogoi* (Ćurčić et al. 2008).

***Ehippochthonius serbicus* (Hadži, 1937)**

(Figs. 2B, 3D) ▲

New data: **29:** roadside, compost heap, sifting, 29.iv.2017, 1 ♀, leg. Christophoryová J.

European distribution: Albania (present paper), Bulgaria, North Macedonia (Harvey 2013b).

Notes: Within Europe, *E. serbicus* is distributed only in the Balkans. This species is new for Albanian fauna. The published records from Bulgaria and North Macedonia were from soil and caves (Hadži 1937 1939; Petrov 1997). The female from Albania was collected in a compost heap.

***Ehippochthonius tuberculatus* (Hadži, 1937)**

(Figs. 2B, 3E) ▲

New data: **13:** forest, soil, heat extracted in Tullgren funnels, 22.ix.2016, 1 T, leg. Fend'a P.; **29:** roadside, compost heap, sifting, 29.iv.2017, 1 ♀, leg. Christophoryová J.; **55:** between rocks, beech leaf litter, sifting, 28.ix.2016, 2 T, leg. Christophoryová J.; **65:** beech forest, leaf litter, sifting, 29.ix.2016, 1 T, leg. Christophoryová J.; **66:** beech forest, leaf litter, sifting, 29.ix.2016, 1 ♀, leg. Christophoryová J.; **74:** xerothermic grassland, soil, heat extracted in Tullgren funnels, 23.ix.2016, 1 ♀, leg. Fend'a P.

European distribution: Albania (present paper), Germany, Greece, Hungary, North Macedonia, Romania, Slovakia (Harvey 2013b).

Notes: *Ehippochthonius tuberculatus* is newly recorded for Albanian pseudoscorpion fauna. This species lives in the soil and leaf litter (e.g., Beier 1963; Mahnert 1978), which corresponds to the present findings. One female from Albania was collected in a compost heap.

***Globochthonius argirocastronis* (Ćurčić, Rađa and Dimitrijević, 2007)**

(Fig. 2A)

Published data: **22:** rotten wood, 5.viii.2003, 1 ♂,

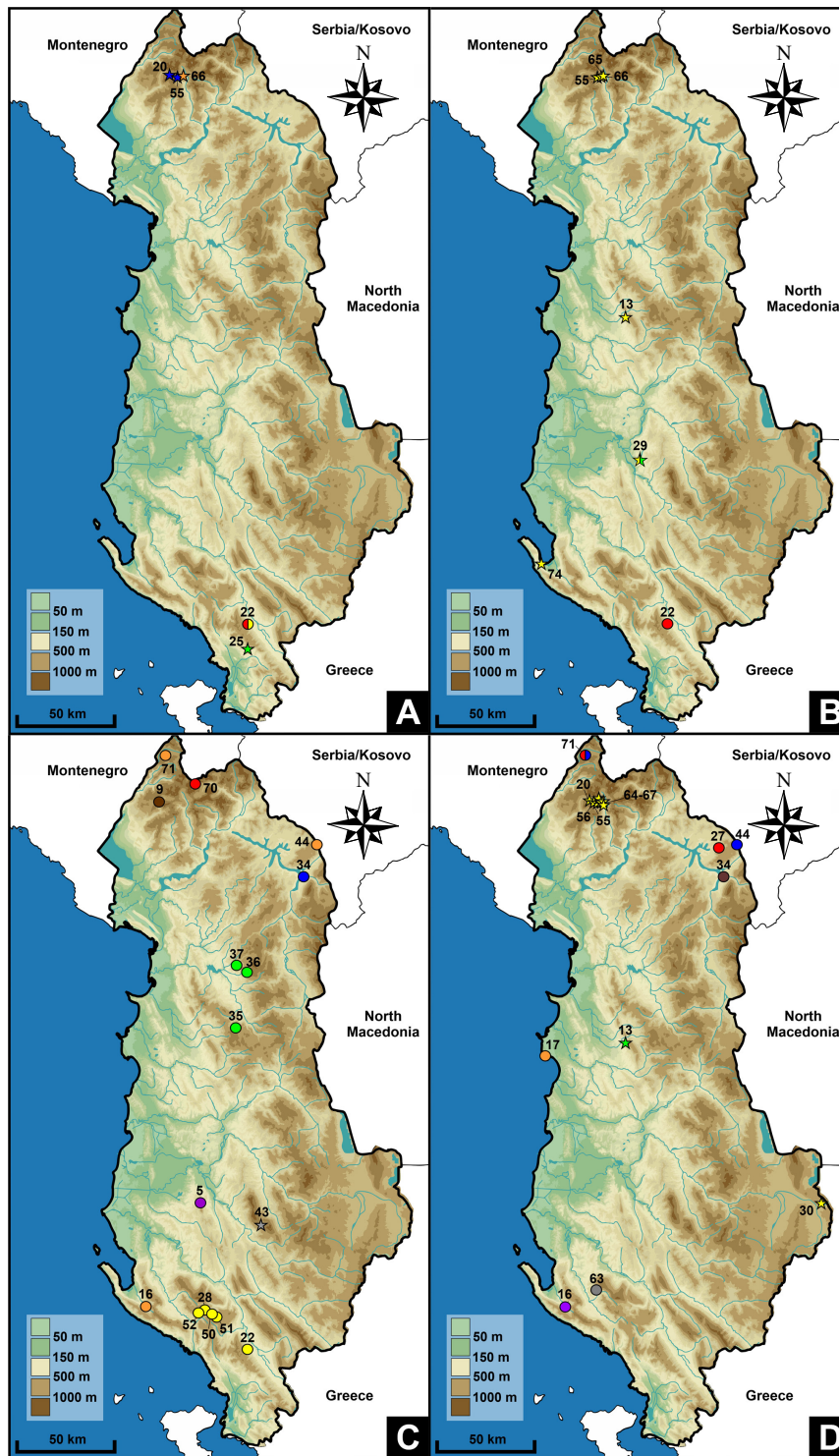


Fig. 2. Distribution of the Chthoniidae and Neobisiidae taxa in Albania. A, *Chthonionus gjirokastrii* (red colour), *Chthonionus jonicus* (orange colour), *Chthonionus rhodochelatus* (green colour), *Chthonionus tenuis* (blue colour), *Globochthonionus argirocastronis* (yellow colour). B, *Ephippiochthonionus rogoi* (red colour), *Ephippiochthonionus serbicus* (green colour), *Ephippiochthonionus tuberculatus* (yellow colour). C, *Neobisium albanicum* (purple colour), *Neobisium doderoi* (orange colour), *Neobisium georgecastriotae* (yellow colour), *Neobisium latellai* (red colour), *Neobisium sylvaticum* (blue colour), *Neobisium valsuanii* (green colour), *Neobisium cf. vjetrenicae* (brown colour), *Neobisium sp. 1* (grey colour). D, *Neobisium cephalonicum* (red colour), *Neobisium fuscimanum* (blue colour), *Neobisium hellenum* (grey colour), *Neobisium sublaeve* (orange colour), *Neobisium sp. 2* (green colour), *Roncus lonai* (purple colour), *Roncus lubricus* (brown colour), *Roncus spp.* (yellow colour). Circles indicate the published data, stars indicate the new data. For the locality codes, see table 1.

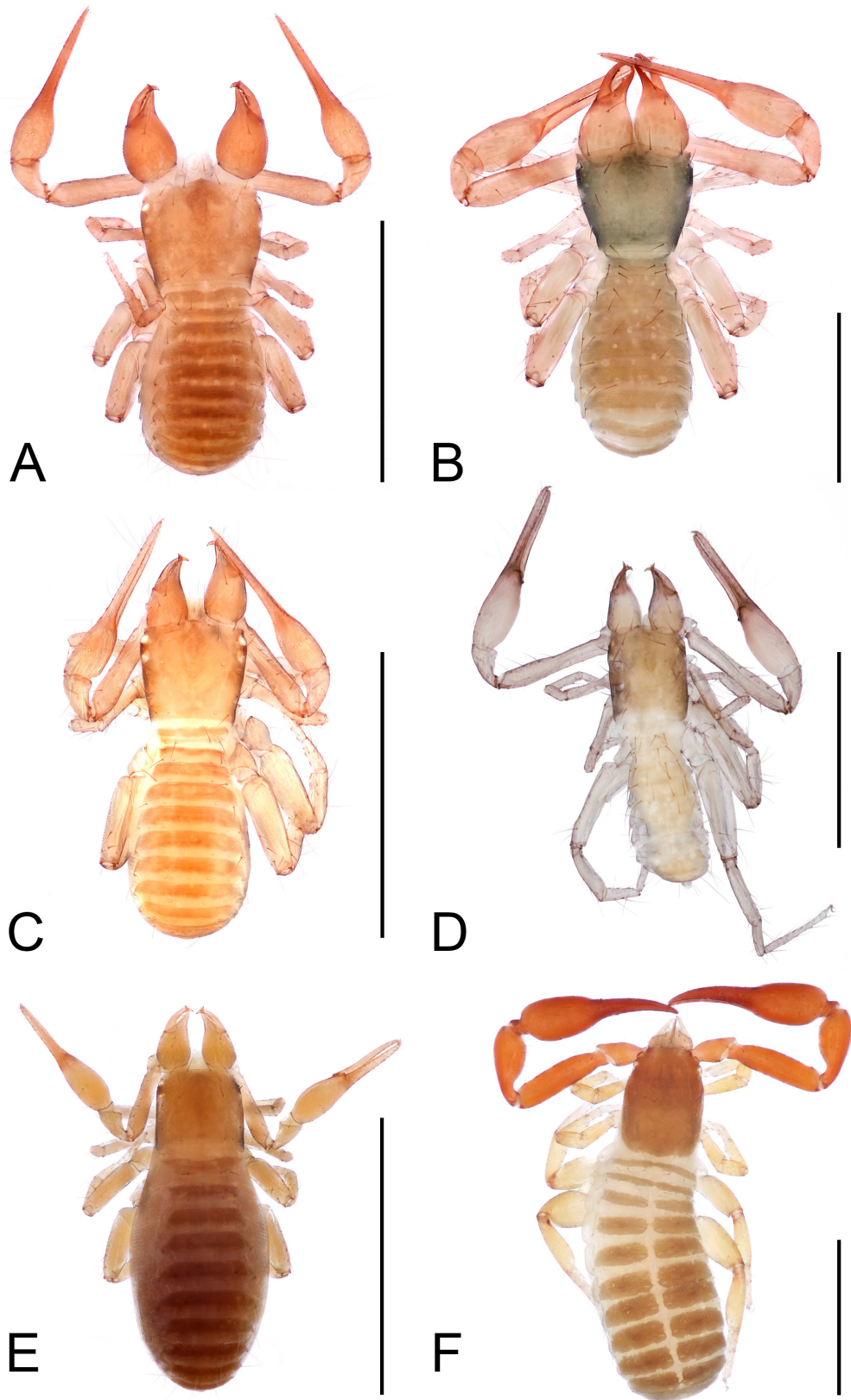


Fig. 3. First pseudoscorpion records for Albania from the families Chthoniidae and Garypinidae. A, *Chthonius jonicus* (female). B, *Chthonius rhodochelatus* (female). C, *Chthonius tenuis* (male). D, *Ephippiochthonius serbicus* (female). E, *Ephippiochthonius tuberculatus* (female). F, *Amblyolpium dollfusi* (male). Scale bars = 1 mm.

leg. Rađa T., Vujčić-Karlo S. (Ćurčić et al. 2007).

European distribution: Albania (Ćurčić et al. 2007).

Notes: Ćurčić et al. (2007) considered *Globochthonius argirocastronis* as an endemic relict species of the Albanian Dinaric karst. This male was firstly described by Ćurčić et al. (2008) as an allotype of *Ephippiochthonius rogoi*, subsequently redescribed as *G. argirocastronis* (Ćurčić et al. 2007).

Family Neobisiidae Chamberlin, 1930
***Neobisium (Blothrus) albanicum* (G. Müller, 1931)**
 (Fig. 2C)

Published data: 5: cave, 1922, 3 adults (sex unknown), leg. Ravasini (Müller 1931).

European distribution: Albania (Müller 1931).

Notes: *Neobisium albanicum* is a troglobitic species (Gardini 2018) and could be considered as an endemic form of the Albanian Dinaric karst.

***Neobisium (Blothrus) georgecastriotae* Ćurčić, Dimitrijević and Rađa, 2006**
 (Fig. 2C)

Published data: 22: Pusi i Zylihasë cave, 12.viii.2003, 1 ♀, 1 ♂, leg. Rađa T., Vujčić-Karlo S. (Ćurčić et al. 2006b); 28: cave, 10.viii.2003, 1 ♀, 1 ♂, 1 T, leg. Rađa T., Vujčić-Karlo S. (Ćurčić et al. 2006b); 50: cave, 11.viii.2003, 1 ♂, leg. Rađa T. (Ćurčić et al. 2006a); 51: cave, 2.viii.1994, 1 T, leg. Didonna F. (Gardini 2018); 52: cave, 3.viii.1994, 1 ♂, leg. Didonna F. (Gardini 2018).

European distribution: Albania (Ćurčić et al. 2006a b).

Notes: *Neobisium georgecastriotae* inhabits caves and pits and belongs to the species of highly-specialised cave dwellers (Ćurčić et al. 2006a b). It is considered as an endemic relict form of the Albanian Dinaric karst (Ćurčić et al. 2006a). Specimens from caves near the localities Gjirrokäster and Kurvelesh were originally described as a new endemic species *Neobisium albanorum* Ćurčić, Dimitrijević, Rađa and Vujčić-Karlo, 2006 (Ćurčić et al. 2006b), later proposed as a synonym of *N. georgecastriotae* (Gardini 2018).

***Neobisium (Blothrus) latellai* Gardini, 2018**
 (Fig. 2C)

Published data: 70: cave, 8.vii.1993, 6 ♀, 2 ♂, leg. Gobetti A., Latella L. (Gardini 2018).

European distribution: Albania (Gardini 2018).

Notes: *Neobisium latellai* is subterranean species

(Gardini 2018) and could be considered an endemic form of the Albanian Dinaric karst.

***Neobisium (Blothrus) valsuanii* Gardini, 2018**
 (Fig. 2C)

Published data: 35: cave, April 2014, 1 ♂, leg. Valsuani A. (Gardini 2018); 36: cave, 28.vi.2015, 1 ♀, 1 ♂, leg. Valsuani A. (Gardini 2018); 37: cave, 10.vii.2015, 1 ♀, leg. Valsuani A. (Gardini 2018).

European distribution: Albania (Gardini 2018).

Notes: *Neobisium valsuanii* is a subterranean troglomorphic species (Gardini 2018) and an endemic form of the Albanian Dinaric karst.

***Neobisium (Blothrus) cf. vjetrenicae* Hadži, 1932**
 (Fig. 2C)

Published data: 9: abyss, August 1995, 1 ♂, leg. Meggiorini S. (Gardini 2018).

European distribution: Albania, Bosnia and Herzegovina (Harvey 2013b; Gardini 2018).

Notes: The distribution of this species within Europe is restricted to the Balkans (Beier 1963; Harvey 2013b). This species is known from subterranean habitats in Bosnia and Herzegovina, as well as in Albania (Hadži 1932; Gardini 2018). Gardini (2018) provisionally assigned the male specimen to *N. vjetrenicae*, it shares the main diagnostic characters with the original description excepting the differences in the position of trichobothrium *ist* on fixed chelal finger and in the number of teeth on chelal fingers.

***Neobisium (Neobisium) cephalonicum* (Daday, 1888)**
 (Fig. 2D)

Deposited material: 27: 1.vi.–5.vi.1918, 1 ♀ (NHMW 26355), leg. Penther A. (Beier 1928); 71: beech leaf litter, sifting, 7.vi.–10.vi.1914, 1 ♀, 2 ♂ (NHMW 26352) (Beier 1928); 71: 17.vi.1914, 1 ♀ (NHMW 26356) (Beier 1928).

European distribution: Albania, Bulgaria, Croatia, Greece, Montenegro, North Macedonia, Romania, Serbia, Turkey (Harvey 2013b).

Notes: The distribution of *Neobisium cephalonicum* within Europe is restricted to the Balkans and the European part of Turkey (Harvey 2013b). It occurs in the soil and leaf litter in forested or bushed areas (e.g., Beier 1963). The published data from the locality Vermosh (code 71) are listed by Beier (1928) under Croatia, because this locality belonged to former Yugoslavia at that time.

***Neobisium (Neobisium) doderoi* (Simon, 1896)**
(Fig. 2C)

Deposited material: **44:** near the river Beli Drim and Kosovo border, 2.vi.1918, 1 ♀, 2 ♂, 1 T, one specimen damaged badly, sex unknown (NHMW 26458), leg. Zerny (Beier 1928); **44:** near the river Beli Drim and Kosovo border, 5.vii.1918, 2 ♂ (NHMW 26459), leg. Penther A. (Beier 1928); **71:** beech leaf litter, sifting, 7.vi.–10.vi.1914, 1 ♂, 1 T (NHMW 26456) (Beier 1928); **71:** 17.vi.1914, 1 ♂ (NHMW 26457) (Beier 1928).

Published data: **16:** 1931, 1 ♀, leg. Lona (Caporiacco 1949).

European distribution: Albania, Austria, Bosnia and Herzegovina, Croatia, France, Greece, Italy, Montenegro, North Macedonia, Portugal, Serbia, Slovenia, Spain, Switzerland (Harvey 2013b; Ćurčić and Dimitrijević 2016).

Notes: *Neobisium doderoi* is distributed widely in the southern part of Europe (Harvey 2013b; Ćurčić and Dimitrijević 2016) and occurs in leaf litter and moss in forested areas (e.g., Beier 1928 1963; Zaragoza 2007; Gardini 2009). Beier (1928) mentioned nine *N. doderoi* specimens from the Pashtrik Mt. locality (code 45). Nevertheless, only eight of them have been presented to the NHMW. The female specimen from the Dukat locality (code 16) was identified by Caporiacco (1949) as *Neobisium erythrodactylum mediterraneum* (Beier, 1929). The published data from the locality Vermosh (code 71) are listed by Beier (1928) under Croatia, because this locality belonged to former Yugoslavia at that time.

***Neobisium (Neobisium) fuscimanum* (C. L. Koch, 1843)**
(Fig. 2D)

Deposited material: **44:** near the river Beli Drim and Kosovo border, 2.vi.1918, 1 ♀, 2 ♂ (NHMW 25914), leg. Zerny (Beier 1928); **44:** near the river Beli Drim and Kosovo border, 13.vii.1918, 1 ♂ (NHMW 25906), leg. Penther A. (Beier 1928); **71:** valley of Vermosh brook, beech leaf litter, sifting, 7.vi.–10.vi.1914, 2 ♀, 4 ♂ (NHMW 25911) (Beier 1928); **71:** valley of Vermosh brook, 7.vi.–10.vi.1914, 1 ♀, 2 ♂ (NHMW 25932), not correlate with specific reference; **71:** valley of Vermosh brook, 17.vi.1914, 2 ♀, 3 ♂ (NHMW 25905) (Beier 1928).

European distribution: Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Greece, Hungary, Italy, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia (Harvey 2013b).

Notes: *Neobisium fuscimanus* is distributed widely

in Europe and prefers mainly moist soil, leaf litter, moss and tussocks (e.g., Beier 1963; Drogla and Lippold 2004). Data on three deposited specimens (NHMW 25932) of *N. fuscimanum* from the locality Vermosh (code 71) were not possible to assign to the concrete references (Beier 1928 1932a 1963). The published data from the locality Vermosh (code 71) are listed by Beier (1928) under Croatia, because this locality belonged to former Yugoslavia at that time.

***Neobisium (Neobisium) hellenum* (Simon, 1885)**
(Fig. 2D)

Published data: **63:** 1931, 1 ♀, leg. Lona (Caporiacco 1949).

European distribution: Albania, Bulgaria, Greece (Harvey 2013b).

Notes: *Neobisium hellenum* is distributed within Europe in the Balkan countries and is known to live only in caves (Mahnert 1979; Petrov 1997; Harvey 2013b). In Albania, this species was documented by Caporiacco (1949) but with no mention of its habitat.

***Neobisium (Neobisium) sublaeve* (Simon, 1879)**
(Fig. 2D)

Published data: **17:** 1 ♀, leg. Parenzan P. (Caporiacco 1932).

European distribution: Albania, France, Italy (Harvey 2013b).

Notes: Albania is the only country in the Balkans with a distribution of this species. It was collected from caves in Italy and France (Beier 1973; Gardini 2000; Delfosse 2003). Unfortunately, Caporiacco (1932) did not mention the habitat in Albania.

***Neobisium (Neobisium) sylvaticum* (C. L. Koch, 1835)**
(Fig. 2C)

Deposited material: **34:** 18.v.–20.v.1918, 1 ♂ (NHMW 26845), leg. Penther A. (Beier 1928).

European distribution: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Montenegro, Moldova, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Switzerland, Ukraine (Henderickx 2005; Harvey 2013b).

Notes: *Neobisium sylvaticum* is distributed widely in Europe and has a wide range of habitat preferences. It occurs in soil, leaf litter, moss, tussocks and in compost heaps (e.g., Beier 1963; Drogla and Lippold 2004; Petrov 2004; Henderickx 2005; Zaragoza 2007). The species can be found in bird's nests or under tree bark

due to its ability to climb onto tree trunks, plants and shrubs (Beier 1963; Turienzo et al. 2010). Beier (1928) mentioned the presence of the species in Albania, but with no particular habitat.

Neobisium (Neobisium) sp. 1

(Fig. 2C)

New data: **43:** beech forest, leaf litter, sifting, 9.viii.2019, 1 ♀, leg. Christophoryová J.

Notes: The precise identification at species level was impossible because of the presence of only one specimen, a high diversity and endemism of neobisiid species in neighbouring countries and the inaccessibility of some type material.

Neobisium (Neobisium) sp. 2

(Fig. 2D)

New data: **13:** forest, soil, heat extracted in Tullgren funnels, 22.ix.2016, 1 ♂, leg. Fend'a P.

Notes: See above under *Neobisium* sp. 1.

Roncus lonai Caporiacco, 1949

(Fig. 2D)

Published data: **16:** May 1931, four adults (sex unknown), leg. Lona (Caporiacco 1949).

European distribution: Albania (Caporiacco 1949).

Notes: This species, endemic in Albania, was described by Caporiacco (1949), but without mentioning a particular habitat.

***Roncus lubricus* L. Koch, 1873**

(Fig. 2D)

Deposited material: **34:** valley of Luma river, 23.v.1918, 2 ♀ (NHMW 27562), leg. Penther A. (Beier 1928).

Published data: unspecified locality, one adult (sex unknown), leg. Verhoeff (Ellingsen 1910).

European distribution: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Ireland, Italy, Malta, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland, Ukraine, United Kingdom (Harvey 2013b).

Notes: *Roncus lubricus* is distributed widely in Europe (Harvey 2013b). Among its known distributions, Harvey (2013b) also mentioned Serbia. However, Ćurčić et al. (2020) did not include the species in the pseudoscorpion checklist of Serbia. The reason was the earlier redescription of *R. lubricus* as *R. jarilo*

Ćurčić, 1991 and *R. pannonius* Ćurčić, Dimitrijević and Karamata, 1992 (Ćurčić 1991 1992; Ćurčić et al. 1992 2004). *Roncus lubricus* is a typical soil-dwelling pseudoscorpion living in soil, leaf litter and moss and under stones in forested areas (e.g., Beier 1963; Legg and Jones 1988; Wijnhoven 2003).

***Roncus* spp.**

(Fig. 2D)

New data: **20:** beech forest at roadside, leaf litter, sifting, 30.ix.2016, 12 ♀, 7 ♂, 4 T, 5 D, 2 P, leg. Christophoryová J.; **30:** reed by the water, under the stone, individual sampling, 3.x.2016, 1 ♂, leg. Christophoryová J.; **55:** between rocks, beech leaf litter, sifting, 28.ix.2016, 9 ♀, 1 ♂, 6 T, leg. Christophoryová J.; **56:** valley in the mountains, beech leaf litter, sifting, 28.ix.2016, 1 ♂, leg. Meszároš M.; **64:** under the rock wall, leaf litter, heat extracted in Tullgren funnels, 17.ix.2017, 1 ♀, 1 T, leg. Kosejová Z., Purkart A.; **65:** beech forest, leaf litter, sifting, 29.ix.2016, 8 ♀, 13 ♂, 7 T, 4 D, 2 P, leg. Christophoryová J.; **66:** beech forest, under *Fagus* sp. bark, individual sampling, 29.ix.2016, 1 ♀, leg. Christophoryová J.; **66:** beech forest, leaf litter, sifting, 29.ix.2016, 7 ♀, 11 ♂, 15 T, 17 D, leg. Christophoryová J.; **67:** beech forest, leaf litter, sifting, 28.ix.2016, 33 ♀, 23 ♂, 19 T, 16 D, 3 P, leg. Christophoryová J.

Notes: In the Balkans, 89 *Roncus* species are currently known; many of them are cave dwellers (Ćurčić et al. 2012c d f g h 2013a 2014a b d; Harvey 2013b; Mahnert and Gardini 2014). In general, the genus includes several species complexes with often unclear diagnostic boundaries between them (Šťáhlavský et al. 2013). Modern methods, such as cytology and molecular biology, could reveal the real species diversity in this genus and resolve relations between closely related species (Šťáhlavský et al. 2013). For these reasons, the specimens were identified only to the genus level.

Family Garypinidae Daday, 1888

***Amblyolpium dollfusi* Simon, 1898**

(Figs. 4A, 3F) ▲

New data: **25:** maple forest, under *Acer* sp. bark, individual sampling, 13.viii.2019, 1 ♀, 1 ♂, leg. Christophoryová J.

European distribution: Albania (present paper), France, Italy, Spain (Harvey 2013b; Hernández-Corral et al. 2018).

Notes: *Amblyolpium dollfusi* is a newly recorded species in the Albanian pseudoscorpion fauna. Moreover, Albania is the first country with occurrence

of the species within the Balkans and represents its easternmost distribution in Europe. This species has been found in leaf litter (e.g., Callaini 1983a b; Gardini 2008), which corresponds to its habitat preference found during the present research (Table 2).

Family Geogarypidae Chamberlin, 1930
***Geogarypus italicus* Gardini, Galli and Zinni, 2017**
 (Figs. 4A, 5A) ▲

New data: **2:** rocks near thermal spring, leaf litter and soil, sifting, 30.iv.2016, 1 ♂, leg. Christophoryová J.; **4:** coniferous trees on castle hill, soil, heat extracted in Tullgren funnels, 22.ix.2016, 1 ♂, leg. Fend'a P.; **74:** xerothermic grassland, soil, heat extracted in Tullgren funnels, 23.ix.2016, 2 ♀, 10 ♂, 3 T, 1 D, leg. Fend'a P.

European distribution: Albania (present paper), Italy (Gardini et al. 2017).

Notes: *Geogarypus italicus* represents a new species for the Albanian pseudoscorpion fauna. Albania is only the second-known country of its distribution in Europe; it is the first country within the Balkans with occurrence of the species. Gardini et al. (2017) described the species in Italy and the adjacent islands. In both published and present records, the species was collected mainly from the soil and under tree bark (Gardini et al. 2017).

***Geogarypus minor* (L. Koch, 1873)**
 (Fig. 4A)

Published data: **72:** 1887, 1 ♂ (ZMB 31863), leg. Oertzen E. (Ellingsen 1910; Vrenozzi and Dunlop 2013).

European distribution: Albania, Austria, Bulgaria, Croatia, France, Greece, Italy, Malta, Portugal, Spain, Turkey (Harvey 2013b).

Notes: The species is distributed in the Mediterranean region and occurs mainly in leaf litter, soil, under tree bark and occasionally in bird's nests (e.g., Beier 1963; Turienzo et al. 2010; Harvey 2013b; Gardini et al. 2017). Ellingsen (1910) recorded the species in Albania, but its depository number was not mentioned until Vrenozzi and Dunlop (2013).

Family Olpiidae Banks, 1895
***Calocheiridius libanoticus* Beier, 1955**
 (Fig. 4A)

Published data: **14:** 28.ix.–4.x.2018, 1 ♀ (Naumova 2020); **59:** 28.ix.–4.x.2018, 1 T (Naumova 2020).

European distribution: Albania, Greece, Italy, Malta (Harvey 2013b; Naumova 2020).

Notes: The distribution of *Calocheiridius*

libanoticus within Europe is restricted to the Mediterranean area (Harvey 2013b). Habitats in Europe were not mentioned (Lazzeroni 1969 1970; Mahnert 1975), but outside Europe, the species has been found under stones and tree bark (Beier 1955 1957; Schawaller and Dashdamirov 1988). This rare species was first documented in Albania only recently (Naumova 2020), but without habitat. Albania represents the second-known country with occurrence in the Balkans.

Family Cheiridiidae Hansen, 1894
***Apocheiridium ferum* (Simon, 1879)**
 (Figs. 4A, 5B) ▲

New data: **60:** plane trees near brook, under *Platanus orientalis* barks, individual sampling, 15.x.2019, 29 ♀, 18 ♂, 2 T, leg. Červená M., Selnekovič D.

European distribution: Albania (present paper), Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Poland, Portugal, Romania, Spain, Switzerland (Harvey 2013b; Christophoryová and Červená 2020).

Notes: *Apocheiridium ferum*, widely distributed in Europe, is recorded in Albania for the first time. Albania is the third-known country in the Balkans to show occurrence. During the field trip in Albania, specimens of *A. ferum* were observed together with a few specimens of *Beierochelifer peloponnesiacus* under the bark of the same trees. It is a typical bark-dwelling species, which can be found in the autumn and winter months in greater numbers under the dry tree bark (e.g., Beier 1963; Weygoldt 1969; Drogla and Lippold 2004; Machač et al. 2018; Novák et al. 2019; Christophoryová and Červená 2020).

Family Atemnidae Kishida, 1929
***Atemnus syriacus* (Beier, 1955)**
 (Figs. 4A, 5C) ▲

New data: **46:** river bottom land by the roadside, under *Salix* sp. bark, individual sampling, 28.iv.2017, 1 T, leg. Christophoryová J., Jablonski D., Mikulíček P.; **47:** rural zone by the river, under the bark of broken tree, individual sampling, 28.iv.2017, 1 ♂, leg. Christophoryová J., Jablonski D., Mikulíček P.

European distribution: Albania (present paper), Greece (Harvey 2013b).

Notes: *Atemnus syriacus* is a rare species with distribution within Europe restricted to the Balkans (Harvey 2013b). The species is recorded in Albania for the first time. Albania is the second-known country with occurrence of the species and the northernmost country of its distribution in Europe. *Atemnus syriacus* is considered a typical bark-dwelling species, which was

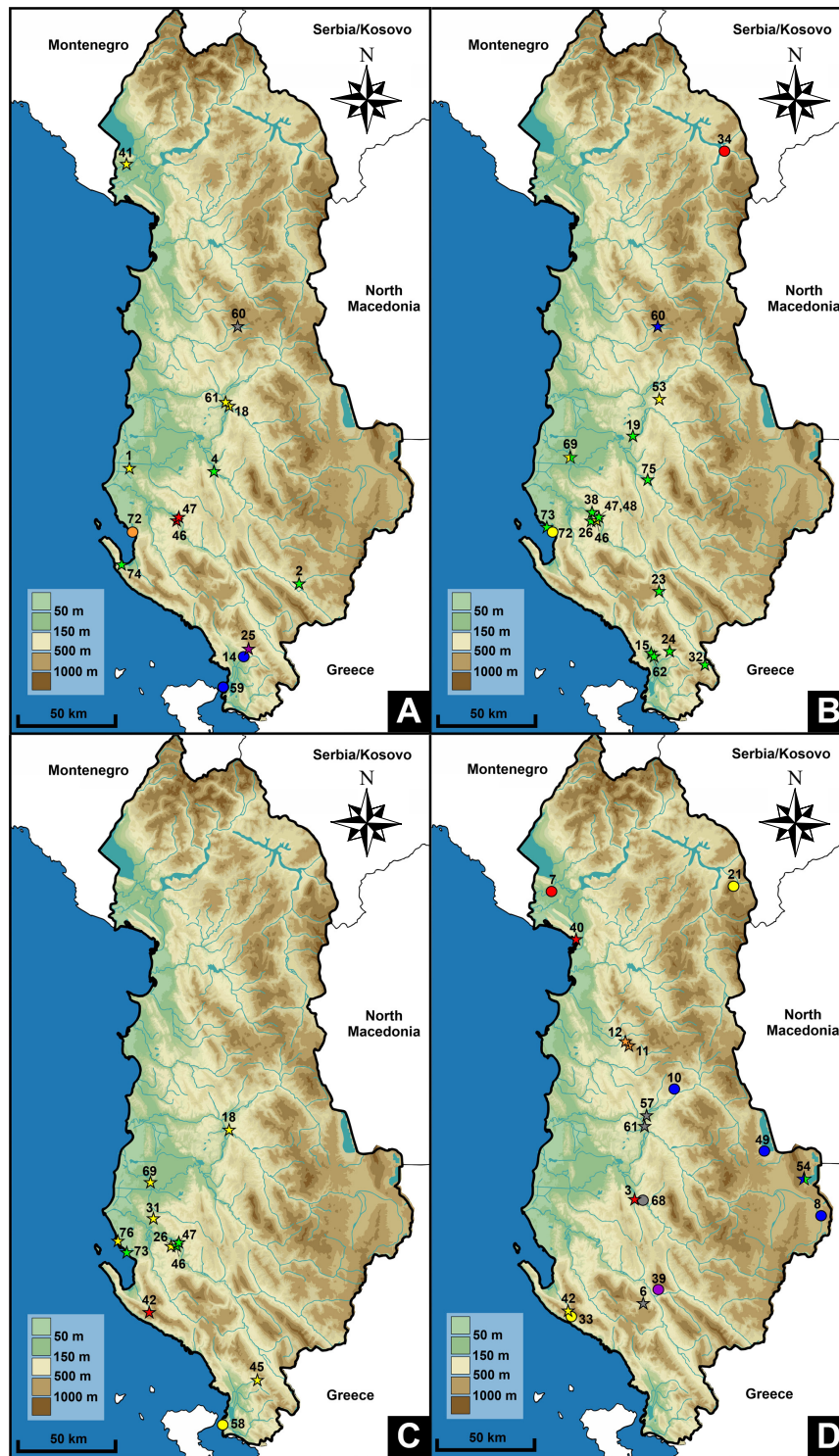


Fig. 4. Distribution of the Olpiidae, Cheiridiidae, Atemnidae, Garypinidae, Geogarypidae, Cheliferidae, Chernetidae and Withiidae taxa in Albania. A, *Amblyolpium dollfusi* (purple colour), *Apocheiridium ferum* (grey colour), *Atemnus syriacus* (red colour), *Calocheiridius libanoticus* (blue colour), *Geogarypus italicus* (green colour), *Geogarypus minor* (orange colour), *Withius piger* (yellow colour). B, *Beierochelifer peloponnesiacus* (blue colour), *Chelifer cancroides* (red colour), *Dactylochelifer latreillii* (yellow colour), *Hysterochelifer meridianus* (green colour). C, *Hysterochelifer cyprius* (green colour), *Rhacochelifer maculatus* (yellow colour), *Rhacochelifer peculiaris* (red colour). D, *Dendrochernes cyrneus* (yellow colour), *Dinocheirus panzeri* (orange colour), *Lamprochernes chyzeri* (green colour), *Lamprochernes nodosus* (grey colour), *Lasiochernes graecus* (purple colour), *Pselaphochernes lacertosus* (red colour), *Pselaphochernes scorpioides* (blue colour). Circles indicate the published data, stars indicate the new data. For the locality codes, see table 1.

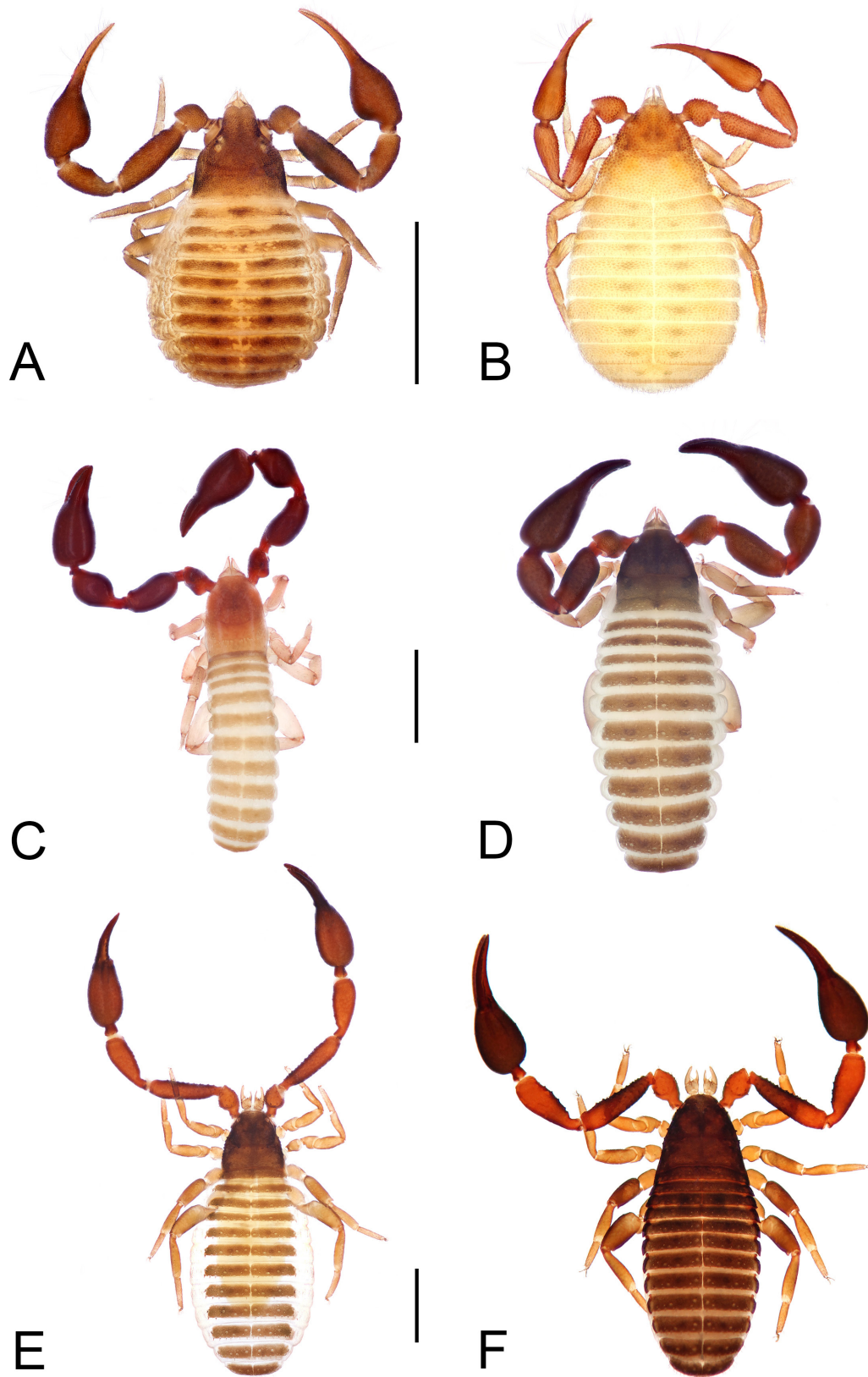


Fig. 5. First pseudoscorpion records for Albania from the families Geogarypidae, Cheiridiidae, Atemnidae and Cheliferidae. A, *Geogarypus italicus* (female). B, *Apocheiridium ferum* (female). C, *Atemnus syriacus* (male). D, *Beierochelifer peloponnesiacus* (female). E, *Hysterochelifer cyprius* (female). F, *Hysterochelifer meridianus* (male). Scale bars = 1 mm.

proved by the present records, a record from Greece (Mahnert 1977), and from its distribution outside Europe: in Turkey and Syria (Beier 1955 1964).

Family Cheliferidae Risso, 1827
***Beierochelifer peloponnesiacus* (Beier, 1929)**
 (Figs. 4B, 5D) ▲

New data: **60:** plane trees near brook, under *Platanus orientalis* barks, individual sampling, 15.x.2019, 1 ♀, 4 T, 3 D, leg. Červená M., Selnekovič D.

European distribution: Albania (present paper), Bulgaria, Greece, Italy, Slovakia, Spain, Switzerland (Blick et al. 2004; Harvey 2013b; Krajčovičová and Christophoryová 2017; Hernández-Corral et al. 2018).

Notes: The species is new to the Albanian pseudoscorpion fauna; Albania represents the third-known country in the Balkans with its distribution. During the study, it was found together with *Apocheiridium ferum* under the bark of plane trees. In Europe, the species is found commonly under tree bark (e.g., Beier 1963; Petrov 2004; Krajčovičová and Christophoryová 2017), and, more rarely, in leaf litter and tree hollows (e.g., Krajčovičová and Christophoryová 2017; Hernández-Corral et al. 2018).

***Chelifer cancroides* (Linnaeus, 1758)**
 (Fig. 4B)

Deposited material: **34:** 8.vi.–12.vi.1918, 1 ♂ (NHMW 23125), leg. Penther A. (Beier 1929).

European distribution: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, North Macedonia, Norway, Poland, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland, United Kingdom (Harvey 2013b; Krajčovičová et al. 2018).

Notes: *Chelifer cancroides* was observed in Albania for the first time by Beier (1929), but without mention of its habitat. This cosmopolitan species is synanthropic and also occurs in bird's nests (e.g., Beier 1963; Turienzo et al. 2010; Harvey 2014).

***Dactylochelifer latreillii* (Leach, 1817)**
 (Fig. 4B)

Published data: **72:** 1 ♀, leg. Oertzen E. (Ellingsen 1910).

New data: **46:** river bottom land by the roadside, under *Salix* sp. bark, individual sampling, 28.iv.2017, 2 ♀, 2 T, leg. Christophoryová J., Jablonski D., Mikulíček

P.; **53:** by the river, under *Acer* sp. bark, individual sampling, 7.viii.2019, 1 ♀, 3 D, leg. Christophoryová J.; **69:** alley near the road, under the *Eucalyptus* sp. bark, individual sampling, 27.iv.2017, 22 ♀, 10 ♂, 1 T, leg. Christophoryová J., Jablonski D., Mikulíček P.

European distribution: Albania, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Luxembourg, Netherlands, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom (Blick et al. 2004; Harvey 2013b).

Notes: The record of *D. latreillii* in Albania was presented for the first time by Ellingsen (1910) but without its habitat. This species is distributed widely in Europe and is considered a typical inhabitant of tree microhabitats and bird's nests (e.g., Beier 1963; Droglá and Lippold 2004; Turienzo et al. 2010). The present findings correspond to the known habitat preferences of *D. latreillii* and extended its distribution in Albania by three new localities.

***Hysterochelifer cyprius* (Beier, 1929)**
 (Figs. 4C, 5E) ▲

New data: **46:** river bottom land by the roadside, under the *Salix* sp. bark, individual sampling, 28.iv.2017, 1 ♀, 2 T, leg. Christophoryová J., Jablonski D., Mikulíček P.; **47:** rural zone by the river, under the bark of broken tree, individual sampling, 28.iv.2017, 1 ♀, 1 D, leg. Christophoryová J., Jablonski D., Mikulíček P.; **73:** by the roadside, under *Eucalyptus* sp. bark, individual sampling, 29.iv.2017, 1 ♀, leg. Christophoryová J., Jablonski D., Mikulíček P.

European distribution: Albania (present paper), Cyprus, Greece (Harvey 2013b).

Notes: *Hysterochelifer cyprius* is a rare species known until now only in Cyprus and Greece (Harvey 2013b). Albania is the third-known country of its occurrence in Europe and represents the northernmost distribution of the species in Europe. As during the present study, the species was found under the bark of different trees in Cyprus and Greece (Beier 1963; Mahnert 1977).

***Hysterochelifer meridianus* (L. Koch, 1873)**
 (Figs. 4B, 5F) ▲

New data: **15:** by the roadside, under *Platanus* sp. bark, individual sampling, 14.viii.2019, 1 ♀, leg. Christophoryová J.; **19:** by the roadside, under *Eucalyptus* sp. bark, individual sampling, 11.viii.2019, 6 ♀, 10 ♂, 1 T, 2 D, leg. Christophoryová J.; **23:** fig grove, under *Ficus* sp. bark, individual sampling, 12.viii.2019, 3 ♀, 1 ♂, 4 D, 1 P, leg. Christophoryová

J.; **24**: road by the mountain valley, under *Acer* sp. bark, individual sampling, 13.viii.2019, 1 ♀, leg. Christophoryová J.; **26**: olive grove, under *Olea* sp. bark, individual sampling, 28.iv.2017, 1 ♂, 1 D, leg. Christophoryová J., Jablonski D., Mikulíček P.; **32**: droughty river, under *Platanus* sp. bark, individual sampling, 12.viii.2019, 1 ♂, Christophoryová J.; **38**: field by-road, under *Olea* sp. bark, individual sampling, 11.viii.2019, 1 ♀, 1 ♂, 2 D, leg. Christophoryová J.; **47**: rural zone by the river, under the bark of broken tree, individual sampling, 28.iv.2017, 1 ♀, leg. Christophoryová J., Jablonski D., Mikulíček P.; **48**: olive grove by the roadside, under *Olea* sp. bark, individual sampling, 28.iv.2017, 1 ♂, leg. Christophoryová J., Jablonski D., Mikulíček P.; **62**: roadside, under *Eucalyptus* sp. bark, individual sampling, 13.viii.2019, 7 ♀, 6 ♂, 2 D, 4 P, leg. Christophoryová J.; **69**: alley near the roadside, under *Eucalyptus* sp. bark, individual sampling, 27.iv.2017, 1 ♂, leg. Christophoryová J., Jablonski D., Mikulíček P.; **73**: by the roadside, under *Eucalyptus* sp. bark, individual sampling, 29.iv.2017, 1 ♂, leg. Christophoryová J., Jablonski D., Mikulíček P.; **75**: by the small river, under *Acer* sp. bark, individual sampling, 30.iv.2017, 4 ♀, 2 ♂, leg. Christophoryová J., Gežová S., Jablonski D., Mikulíček P.

European distribution: Albania (present paper), Austria, Bulgaria, France, Greece, Italy, North Macedonia, Romania, Spain (Harvey 2013b).

Notes: *Hysterochelifer meridianus* is distributed widely in the Mediterranean region, including the Balkans (Harvey 2013b). The species is recorded in Albania for the first time. This species is considered bark-dwelling, which is proved by the present records, as well as by the previous findings in Europe (e.g., Beier 1963; Mahnert 1977; Petrov 2004; Zaragoza 2007). During the study, *H. meridianus* was collected from under the bark of olive and eucalyptus trees in natural and anthropic biotopes. It was found mainly at the roadside and in places containing garbage. Based on the present findings, it is obvious that species has a wide range of biotope preferences.

***Rhacochelifer maculatus* (L. Koch, 1873)**

(Fig. 4C)

Published data: **58**: under *Eucalyptus globules* bark, 28.ix.–4.x.2018, 1 ♀ (Naumova 2020).

New data: **18**: natural parking area, under *Acer* sp. bark, individual sampling, 8.viii.2019, 1 ♂, 1 D, 5 P, leg. Christophoryová J.; **26**: olive grove, under *Olea* sp. bark, individual sampling, 28.iv.2017, 1 ♀, 2 ♂, 4 T, leg. Christophoryová J., Jablonski D., Mikulíček P.; **31**: olive grove, under *Olea* sp. bark, individual sampling, 20.vii.2017, 2 ♀, 2 ♂, leg. Jablonski

D.; **45**: olive grove, under *Olea* sp. bark, individual sampling, 13.viii.2019, 1 ♀, leg. Christophoryová J.; **69**: alley by the roadside, under *Eucalyptus* sp. bark, individual sampling, 27.iv.2017, 6 ♀, 7 ♂, 11 T, 1 D, leg. Christophoryová J., Jablonski D., Mikulíček P.; **76**: olive grove, under *Olea* sp. bark, individual sampling, 29.iv.2017, 7 ♀, 3 ♂, 5 T, 1 D, leg. Christophoryová J., Jablonski D.

European distribution: Albania, Bosnia and Herzegovina, Croatia, France, Greece, Italy, Malta, Montenegro, North Macedonia, Serbia, Spain (Harvey 2013b; Naumova 2020).

Notes: *Rhacochelifer maculatus* is distributed in the Mediterranean region mainly in the Balkans (Harvey 2013b). It is a typical inhabitant of tree microhabitats and bird's nests (e.g., Beier 1963; Zaragoza 2007; Gardini 2008; Turienzo et al. 2010). *Rhacochelifer maculatus* was observed in Albania for the first time by Naumova (2020) under the bark of the eucalyptus tree. During the present study, it was also collected under eucalyptus bark, but more often under olive bark. The present findings extended the species distribution in Albania by six new localities.

***Rhacochelifer peculiaris* (L. Koch, 1873)**

(Figs. 4C, 6A) ▲

New data: **42**: pine trees on a hill, under *Pinus nigra* barks, individual sampling, 26.iv.2016, 3 ♀, 2 ♂, leg. Christophoryová J.; **42**: pine trees on a hill, under *Pinus nigra* barks, individual sampling, 27.iv.2016, 3 ♀, 3 ♂, 8 T, 1 D, 1 P, leg. Christophoryová J.

European distribution: Albania (present paper), Austria, Croatia, Cyprus, France, Greece, Hungary, Italy, Slovakia, Spain, Switzerland (Harvey 2013b).

Notes: *Rhacochelifer peculiaris* is recorded in Albania for the first time. Albania represents the third-known country of its distribution in the Balkans. Beier (1963) mentioned the occurrence of the species in leaf litter and under tree bark, which corresponds to the present findings. Comparison of both recorded *Rhacochelifer* species shows that *R. peculiaris* was found only under the bark of one coniferous tree, whereas *R. maculatus* was more common and was collected from under the bark of different types of deciduous tree.

Family Chernetidae Menge, 1855

***Dendrochernes cyrneus* (L. Koch, 1873)**

(Fig. 4D)

Deposited material: **21**: phoretic on *Asemum striatum* (L., 1758), 14.vi.1918, 2 ♀ (NHMW 24156), 1 ♂ (NHMW 24163), leg. Penther A. (Beier 1929).

Published data: 33: subalpine pine-forest, under *Pinus nigra* bark, 27.iv.2016, 1 ♂, leg. Christophoryová J. (Christophoryová and Jablonski 2017).

New data: 42: pine trees on a hill, under *Pinus nigra* barks, individual sampling, 27.iv.2016, 1 ♂, leg. Christophoryová J.

European distribution: Albania, Austria, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Luxembourg, Norway, Poland, Romania, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom (Blick et al. 2004; Harvey 2013b; Sammet et al. 2016; Krajčovičová et al. 2018).

Notes: *Dendrochernes cyrneus* is distributed widely in Europe, but it is a rare species in the entire area and is considered as a relict of primeval forests (Muster 1998; Droglá and Lippold 2004; Esser 2011; Muster and Blick 2016). It lives mainly under the loose bark of old tree trunks and branches and beneath the dry bark of fallen and dead trees (e.g., Beier 1963; Droglá and Lippold 2004; Esser 2011; Krajčovičová and Christophoryová 2014; Machač et al. 2018). As well as under tree bark, the species occurs regularly in bird's nests or occasionally in tree hollows (e.g., Turienzo et al. 2010; Krajčovičová and Christophoryová 2014). In Albania, this species was recorded for the first time by Beier (1929) in phoretic association. The latest record from Albania was of one male found under the bark of a pine tree (Christophoryová and Jablonski 2017). In the present study, another male was found under the bark of a pine tree, in a new locality in Albania.

***Dinocheirus panzeri* (C. L. Koch, 1837)**

(Figs. 4D, 6B) ▲

New data: 11: beech forest with pine and plane trees, under *Acer pseudoplatanus* barks, individual sampling, 11.x.2019, 2 ♂, 1 T, leg. Červená M., Selnekovič D.; **12:** beech forest with pine and plane trees, under *Acer pseudoplatanus* barks, individual sampling, 12.x.2019, 2 ♀, 3 ♂, 4 T, 1 P, leg. Červená M., Selnekovič D.

European distribution: Albania (present paper), Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom (Harvey 2013b; Sammet et al. 2016).

Notes: *Dinocheirus panzeri* is distributed widely in Europe and is newly recorded within the Balkans in Albania. This species occurs in different habitats with no obvious preference. It is found in tree hollows, bird's nests, in the litter of barns and stables and in hay

and compost heaps; hence, it is often considered as hemisynanthropic (e.g., Beier 1963; Legg and Jones 1998; Droglá and Lippold 2004; Turienzo et al. 2010; Krajčovičová and Christophoryová 2014; Muster and Blick 2016). During the present study, *D. panzeri* was collected under the bark of maple trees; its occurrence in this habitat is considered accidental (Krajčovičová and Christophoryová 2014).

***Lamprochernes chyzeri* (Tömösváry, 1883)**

(Figs. 4D, 6C) ▲

New data: 54: town residential area, cow-dung, sifting, 4.x.2016, 28 ♀, 41 ♂, 11 T, 4 D, leg. Christophoryová J.; **54:** town residential area, compost heap, 4.x.2016, 2 T, leg. Christophoryová J.

European distribution: Albania (present paper), Austria, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Italy, Latvia, Montenegro, North Macedonia, Norway, Poland, Romania, Slovakia, Sweden, Switzerland, United Kingdom (Harvey 2013b; Sammet et al. 2016; Christophoryová and Jablonski 2018).

Notes: *Lamprochernes chyzeri* is distributed widely in Europe, including the Balkans (Harvey 2013b; Christophoryová and Jablonski 2018). The species is recorded for the first time in Albania. Harvey (2013b) listed Serbia in the pseudoscorpion catalogue; however, Čurčić et al. (2020) did not include *L. chyzeri* in the pseudoscorpion checklist of Serbia. Čurčić (1974) reported its occurrence in the former Yugoslavia, but no previous references confirmed this to mean Serbia (S. Čurčić, pers. comm.). The species occurs mainly under the bark of old or decaying trees, in compost heaps, in phoretic association and accidentally in bird's nests (e.g., Beier 1963; Legg and Jones 1988; Droglá and Lippold 2004; Petrov 2004; Turienzo et al. 2010; Christophoryová et al. 2011a; Kaňuchová et al. 2015; Christophoryová and Jablonski 2018). The present discovery of the species in compost heaps correspond to its known habitat preferences.

***Lamprochernes nodosus* (Schrank, 1803)**

(Fig. 4D)

Published data: 68: compost heap near field, 24.ix.2015, 1 ♀, leg. Gruľa D., Jablonski D. (Christophoryová et al. 2017).

New data: 6: cliff edge, compost heap, sifting, 11.viii.2019, 9 ♀, 2 ♂, leg. Christophoryová J.; **57:** by the roadside, cow-dung, sifting, 8.viii.2019, 1 ♀, leg. Christophoryová J.; **61:** town residential area, compost heap, sifting, 8.viii.2019, 1 ♀, 3 ♂, leg. Christophoryová J.

European distribution: Albania, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, United Kingdom (Harvey 2013b; Christophoryová et al. 2017).

Notes: *Lamprochernes nodosus* is distributed widely in Europe, including the Balkans (Harvey 2013b). It is a typical inhabitant of decomposed organic material, but it occasionally lives in bird's nests or under tree bark and it is often found in phoretic associations (e.g., Beier 1963; Poinar et al. 1998; Droglá and Lippold 2004; Turienzo et al. 2010; Krajčovičová and Christophoryová 2014; Červená et al. 2019). *Lamprochernes nodosus* was recorded in Albania for the first time by Christophoryová et al. (2017) in a compost heap, similar to the present research. The new findings extend its occurrence in Albania by three new localities.

***Lasiochernes graecus* Beier, 1963**

(Fig. 4D)

Deposited material: **39:** cave, 31.v.1961, 8 ♀, 11 ♂, 4 T (NHMW 24351) (Beier 1963).

European distribution: Albania, Greece (Harvey 2013b).

Notes: *Lasiochernes graecus* until now has been known only in Greece (Harvey 2013b). Albania is at the same time the second-known country of occurrence of the species in the Balkans and the northernmost country of its distribution in Europe. The species is considered as troglophile (Beier 1963 1965; Mahnert 1978). Beier (1963) published the first species record in Albania but without the precise faunistic data that were later added by Christophoryová and Jablonski (2017). Unfortunately, the year on the label of the deposited material was incorrect in Christophoryová and Jablonski (2017): 1956 rather than 1961.

***Pselaphochernes lacertosus* (L. Koch, 1873)**

(Fig. 4D)

Published data: **7:** compost heap near the road, 27.ix.2016, 1 ♂, leg. Christophoryová J. (Christophoryová and Jablonski 2017).

New data: **3:** urban vegetation, under *Aesculus hippocastanum* bark, individual sampling, 16.x.2019, 1 ♀, 2 T, 1 D, 1 P, leg. Červená M., Selnekovič D.; **40:** garden by the road, cow-dung, sifting, 26.iv.2017, 1 ♂, leg. Christophoryová J.

European distribution: Albania, Bosnia and Herzegovina, Bulgaria, Cyprus, France, Greece, Hungary, Italy, Malta, Portugal, Spain (Harvey 2013b;

Christophoryová and Jablonski 2017).

Notes: The distribution of *P. lacertosus* in Europe is restricted to the Mediterranean region (Harvey 2013b). This species is a common inhabitant under tree bark, in wood mould and bird's nests, and occasionally occurs in the soil and under stones (e.g., Beier 1963; Zaragoza 2007; Turienzo et al. 2010). The first finding of *P. lacertosus* in Albania was recorded in a compost heap (Christophoryová and Jablonski 2017). The present findings correspond to the known habitat preference of *P. lacertosus* and extend its occurrence in Albania by two new localities. During the study, both recorded *Pselaphochernes* species were collected in synanthropic biotopes, but from different habitats. *Pselaphochernes scorpioides* was collected in decaying material, whereas *P. lacertosus* was found mainly under tree bark, and only a single specimen was observed in a compost heap.

***Pselaphochernes scorpioides* (Hermann, 1804)**

(Fig. 4D)

Published data: **8:** compost heap, 3.x.2016, 1 ♀, leg. Christophoryová J. (Christophoryová and Jablonski 2017); **10:** compost heap near the road, 2.x.2016, 1 ♀, 1 ♂, leg. Christophoryová J. (Christophoryová and Jablonski 2017); **49:** compost heap near the road, 27.ix.2015, 7 ♀, 1 ♂, leg. Christophoryová J. (Christophoryová and Jablonski 2017).

New data: **54:** town residential area, compost heap, sifting, 4.x.2016, 10 ♀, 17 ♂, leg. Christophoryová J.; **54:** town residential area, cow-dung, sifting, 4.x.2016, 1 ♂, leg. Christophoryová J.

European distribution: Albania, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom (Harvey 2013b; Sammet et al. 2016; Christophoryová and Jablonski 2017; Krajčovičová et al. 2018).

Notes: *Pselaphochernes scorpioides* is distributed widely in Europe, including the Balkan countries (Harvey 2013b). In general, *P. scorpioides* prefers rich decaying organic material; it occurs in cow-dung, compost heaps or straw debris, especially in synanthropic habitats (e.g., Beier 1963; Legg and Jones 1998; Krajčovičová and Christophoryová 2014). This agrees with previous reports (Christophoryová and Jablonski 2017), as well as with the present records from Albania. It is less commonly found in leaf litter, tree hollows, under tree bark, in decaying wood and in bird's or ant's nests (e.g., Droglá and Lippold 2004; Petrov 2004; Turienzo et al. 2010; Krajčovičová and Christophoryová 2014). The present findings extend

species occurrence in Albania by one new locality.

Family Withiidae Chamberlin, 1931
***Withius piger* (Simon, 1878)**
 (Figs. 4A, 6D) ▲

New data: **1:** archaeological park, compost heap, sifting, 26.ix.2015, 1 ♂, leg. Gruľa D.; **18:** natural parking area, compost heap, sifting, 8.viii.2019, 5 ♀, leg. Christophoryová J.; **41:** garden at roadside, cowdung, sifting, 26.iv.2017, 1 ♂, leg. Christophoryová J.; **61:** town residential area, compost heap, sifting, 8.viii.2019, 1 ♂, leg. Christophoryová J.

European distribution: Albania (present paper), Austria, Croatia, Denmark, France, Germany, Hungary, Italy, Malta, Netherlands, Portugal, Spain, Switzerland,

United Kingdom (Harvey 2013b).

Notes: *Withius piger* is recorded for the first time in Albania, the second-known country of its distribution in the Balkans. The species is considered to be synanthropic and is recorded mostly in warehouses, grain storages and farms, but sometimes also under tree bark (e.g., Beier 1963; Legg and Jones 1988; Tooren 2005). The obtained records correspond to the known habitat preferences of the species.

DISCUSSION

The pseudoscorpion fauna of the Balkan Peninsula is relatively well known, and is proved by the following pseudoscorpion species numbers per

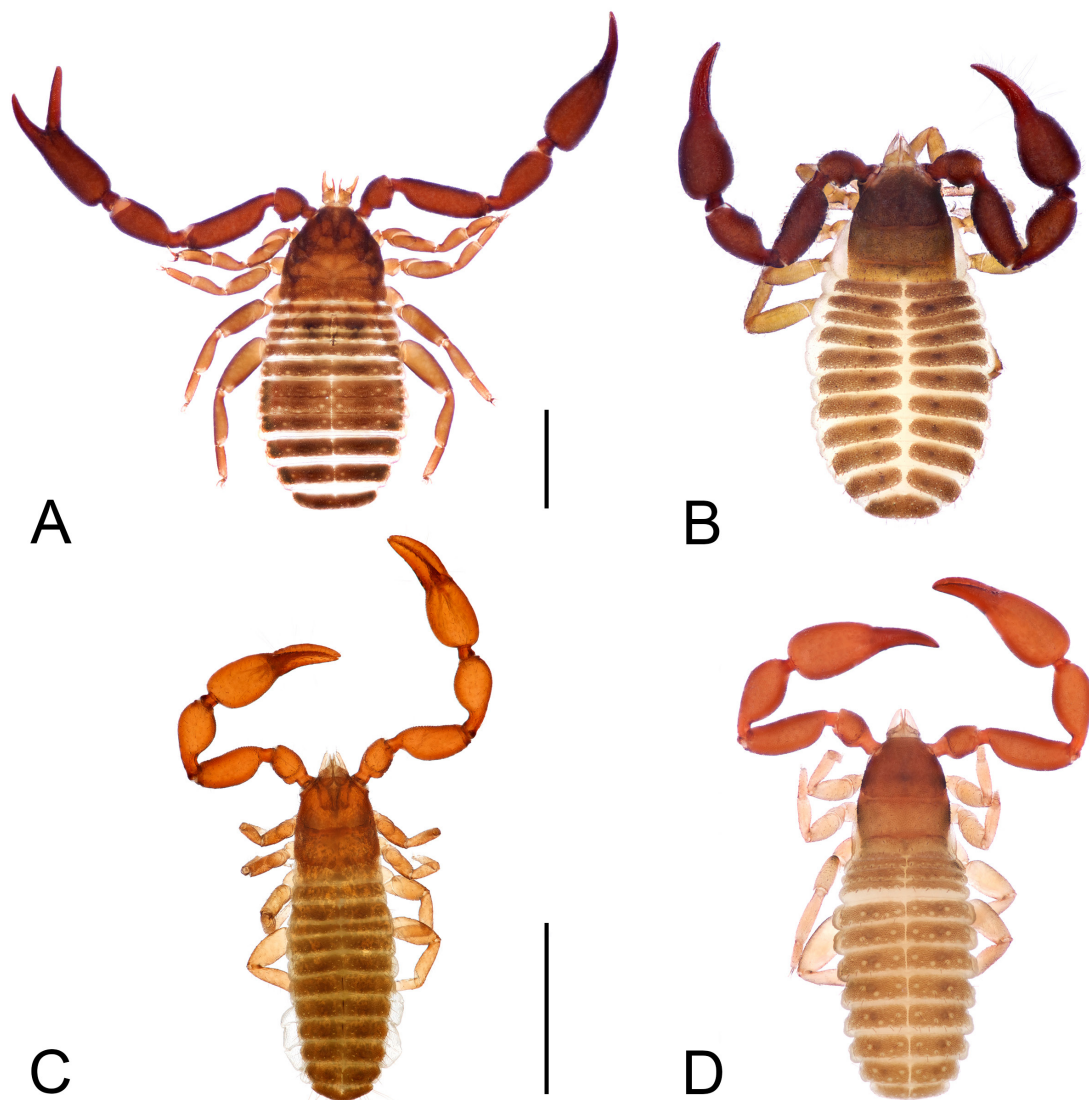


Fig. 6. First pseudoscorpion records for Albania from the families Cheliferidae, Chernetidae and Withiidae. A, *Rhacochelifer peculiaris* (male). B, *Dinocheirus panzeri* (male). C, *Lamprochernes chyzeri* (male). D, *Withius piger* (female). Scale bars = 1 mm.

country (the approximate species number was adjusted according to the recent proposed synonymies): Bosnia and Herzegovina – 61 (Harvey 2013b; Ćurčić et al. 2014b d e; Dimitrijević and Rađa 2017; Novák and Hörweg 2017; Christophoryová et al. 2018), Bulgaria – 59 (Harvey 2013b; Novák and Harvey 2015), Croatia – 125 (Ozimec 2004; Dimitrijević and Rađa 2009 2016; Ćurčić et al. 2012a b e f g 2013b c d e 2014b c; Harvey 2013b; Gardini 2014; Novák et al. 2019), Greece – 125 (Harvey 2013b; Gardini 2014; Mahnert and Gardini 2014), Montenegro – 55 (Harvey 2013b; Gardini 2014; Ćurčić and Dimitrijević 2016), North Macedonia – 46 (Harvey 2013b; Christophoryová and Jablonski 2018), Romania – 74 (Harvey 2013b; Ćurčić et al. 2014f; Gardini 2014; Novák 2014 2017; Novák and Harvey 2015; Novák and Hörweg 2017; Novák et al. 2019), Serbia/ Kosovo – 76 (Ćurčić et al. 2020). Compared to other Balkan countries, Albania has the fewest recorded species (26 species from five families) (Harvey 2013b; Christophoryová and Jablonski 2017; Christophoryová et al. 2017; Gardini 2018; Naumova 2020). Besides the political situation, the low diversity was also caused by researchers focusing mainly on cave-dwelling pseudoscorpions. The collection in less-studied habitats during the present study, such as tree bark, tree hollows or compost heaps, has increased pseudoscorpion diversity by 16 species.

CONCLUSIONS

The present paper updates the knowledge of the species richness and composition of pseudoscorpions in Albania. Due to our own field works in Albania, the species richness of pseudoscorpions has increased to 42. Albanian pseudoscorpion fauna is represented by species distributed widely throughout the Balkans, as well by endemic and rare species with Mediterranean-Oriental distribution. The present paper can help with future monitoring and selecting areas for the next sampling of pseudoscorpions.

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Authors' contributions: MČ, JCH and DJ collected the specimens. MČ, JCH and GG identified specimens. MČ and JCH re-examined the deposited material from Natural History Museum in Vienna. MČ and JCH wrote the manuscript. GG and DJ revised the manuscript. MČ, JCH and DJ created the maps and the figures.

Competing interests: MČ, GG, DJ and JCH declare that they have no conflict of interests.

Availability of data and materials: The specimens are deposited in the Natural History Museum in Vienna (NHMW), in the zoological collection of the Department of Zoology, Comenius University in Bratislava and in the private collection of GG.

Consent for publication: All authors agree to submit the manuscript to Zoological Studies, and agree to publish if accepted.

Ethics approval consent to participate: Not applicable.

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