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Subterranean *Neobisium* (Pseudoscorpiones: Neobisiidae) from Albania

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Abstract: Two new subterranean pseudoscorpion species are described from caves of northern Albania: *Neobisium (Blothrus) latellai* n. sp. and *Neobisium (Blothrus) valsuanii* n. sp. A new subjective synonym [*Neobisium (Blothrus) albanorum* Ćurčić, Dimitrijević, Rađa & Vujčić-Karlo, 2006 = *Neobisium (Blothrus) georgecastriotae* Ćurčić, Dimitrijević & Rađa, 2006] is proposed and a key to adults of the *Neobisium (Blothrus)* species from Albania is provided.

Keywords: Taxonomy - new species - new synonymy - Balkans - biospeleology.

INTRODUCTION

The current knowledge about subterranean pseudoscorpions from Albania is very scanty when compared to that of neighbouring Balkan countries. Only three subterranean species of the genus *Neobisium* Chamberlin, 1930, subgenus *Blothrus* Schiödte,1847, are known from southern Albania: *Neobisium (Blothrus) albanicum* (Müller, 1931), *Neobisium (Blothrus) georgecastriotae* Ćurčić, Dimitrijević & Rađa, 2006 in Ćurčić *et al.*, 2006b and *Neobisium (Blothrus) albanorum* Ćurčić, Dimitrijević, Rađa & Vujčić-Karlo, 2006 (see Harvey, 2013). Intensive speleological investigations in Albania carried out from 1990 up till now by F. Didonna and S. Meggiorini (Gruppo Puglia Grotte, Castellana, Bari), A. Gobetti and A. Valsuani (Gruppo Speleologico Piemontese CAI-UGET, Torino) and L. Latella (Museo civico di Storia naturale, Verona) added to our knowledge also about the northern Dinaric karst of this country.

MATERIAL AND METHODS

The specimens were cleared in 5% KOH solution at 30°C for a few hours, washed in distilled water and temporarily mounted, after dissection of palp, chelicera, legs I and IV, in a slide with a well filled with 60% lactic acid. After study each specimen was rinsed in distilled water and returned to a vial with 70% ethanol together with the dissected body parts in glass capillary tubes. All specimens were studied using an Olympus BHB compound microscope; drawings were made with the aid of a Nachet drawing tube. Measurements are given in mm and proportions are given as length/breadth for carapace, chelicerae and pedipalps and as length/depth for legs. Terminology and reference points for measurements largely follow Chamberlin (1931), the relative position of trichobothria along the chelal axis is calculated following Gabbutt (1965), and the use of the terms rallum, antiaxial and paraxial follows Judson (2007).

Holotypes of the new species are deposited in the Muséum d'histoire naturelle, Geneva (Switzerland) and in the Museo civico di Storia naturale, Verona (Italy). Paratypes and other specimens are in the author's collection (Genoa, Italy).

Acronyms: CGG (Collection of Giulio Gardini), MCST (Museo civico di Storia naturale, Trieste), MHNG (Muséum d'histoire naturelle, Geneva), MSNV (Museo civico di Storia naturale, Verona).

The arrangement of species is in alphabetic order.

TAXONOMY

Neobisium (Blothrus) georgecastriotae Ćurčić, Dimitrijević & Rađa, 2006

Figs 1-10

Neobisium georgecastriotae Ćurčić, Dimitrijević & Rađa, in Ćurčić *et al.*, 2006b: 101, figs 1-8.

Neobisium albanorum Ćurčić, Dimitrijević, Rađa & Vujčić-Karlo, 2006: 3, figs 1-30**. New synonym**

Material examined: CGG; 1 male; Albania, Gjirokastër County, Tepelenë, Progonat, Shterra ë Cikes (40°13'19"N, 19°51'43"E), 800 m a.s.l.; 3.VIII.1994; F. Didonna leg. – CGG; 1 tritonymph; Progonat, Shpella ë Kasarit (40°12'38"N, 19°57'24"E), 1100 m a.s.l.; 2.VIII.1994; F Didonna leg.

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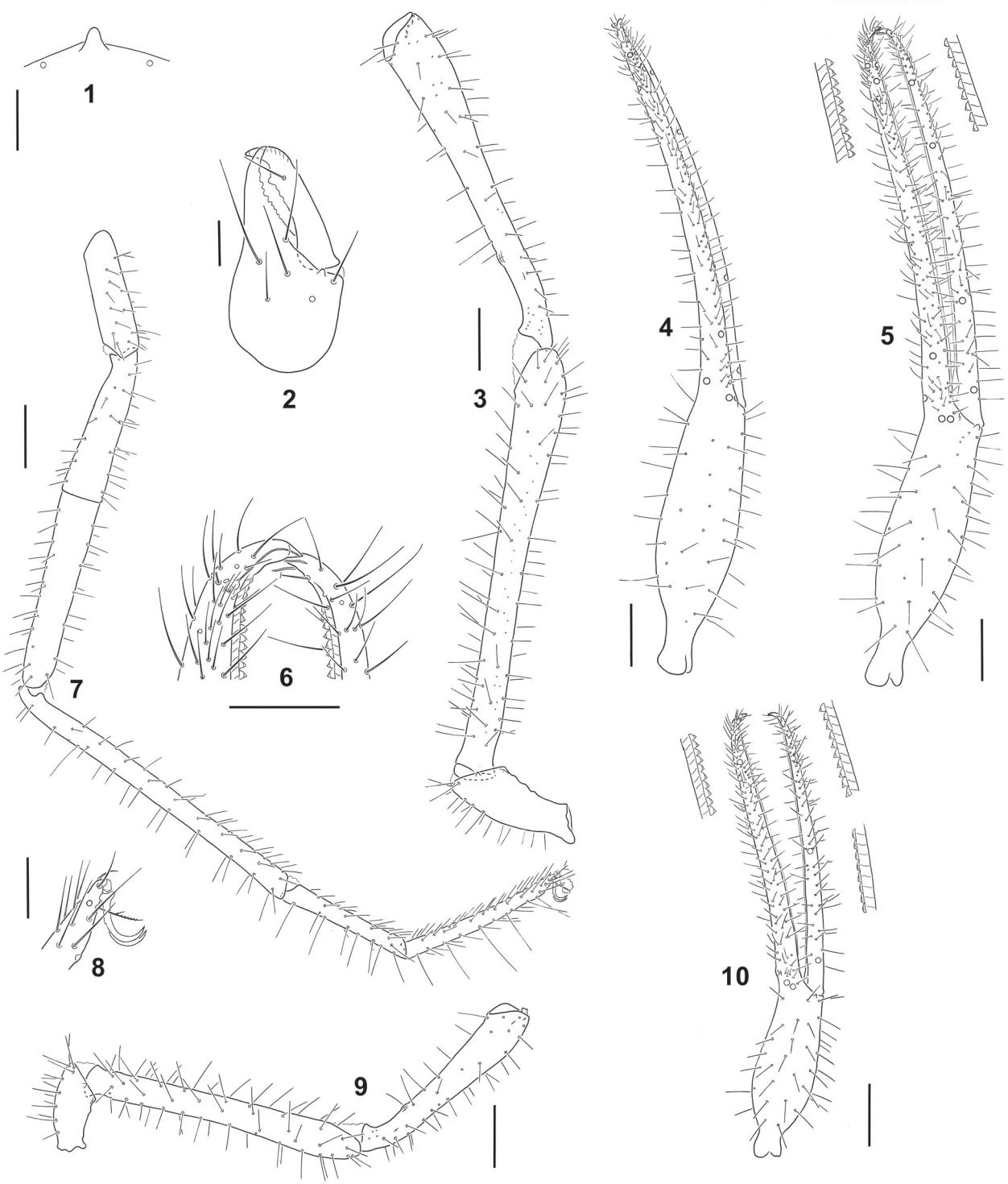
Diagnosis (male, female): A subterranean troglomorphic *Neobisium* that differs from other Balkan species of the genus in the following combination of characters: no eyes or eye-spots; carapace with 4 setae in posterior row, epistome triangular; standard chaetotaxy of tergites I-II 4:4; pedipalps smooth; chelal fingers homodentate, teeth small and contiguous; pedipalpal femur slightly longer than movable finger; ratio between movable finger and hand of chela with pedicel 1.42-1.54; ratio between club and pedicel of patella 2.4-2.6; chela with pedicel length 5.20-5.80 mm, 7.8-8.5 times as long as broad; trichobothrium *ist* just proximal to *est*, the latter midway between *ist*-*it* or closer to *it*; trichobothrium *et* at level of *it*; trichobothrium *st* closer to *t* than to *sb*; anterolateral process of coxa I squat, apically obtuse.

Description of adults (male, female): Carapace, chelicera, pedipalps and palpal coxae red-brown; pedipalps smooth, pleural membrane granular. Carapace 1.3-1.4 times as long as broad, without eyes or eye-spots, anterior margin with prominent triangular epistome, apically rounded, rarely acuminate (Fig. 1); 20 macrosetae, anterior and posterior rows each with 4 macrosetae, besides 1 or 3 "preocular" setae on each side. Chaetotaxy of tergites I-X 4:4:4-6:4-6:6:6-7:6-7:7-8:7-8:7-8; II and V rarely with 5 setae. Chaetotaxy of sternites II-X (male): 18-30:38-47(15-20 of them situated along posterior margin of genital opening):20-21:15-16:14-15:15-17:14-17:15-16:11-13, setae of genital atrium and median genital sac not seen; chaetotaxy of sternites II-X (female) 12-21:29-31:16-18:13-16:11-15:11-14:12-14:13-14:12-13; sternites III and IV (male, female) each with 2-4 (mostly 3) microsetae in front of each stigma; anal cone with 2 + 2 setae. Chelicera (Fig. 2) 2.0-2.15 (male, female) times as long as broad, palm with 6 setae; fixed finger with 12 subequal teeth proximally decreasing in size; movable finger with a prominent tooth at level of *gs*; *gs* ratio 0.70, spinneret absent or slightly prominent, with 7 silk ducts; rallum with 7-8 blades, the two distal ones dentate; serrulae interior and exterior with 35 and 38 blades, respectively. Manducatory process with 5 setae. Coxal setae: pedipalp 11, I 10, II 9, III 8, IV 13-14; anterolateral process of coxa I squat, apically obtuse. Pedipalp (Figs 3-6): trochanter 2.85 (male) times as long as broad, with a weak button-like tubercle on antiaxial face; femur 8.45-9.0 (male) or 7.7-9.3 (female) times as long as broad, smooth, weakly enlarged distally; patella 6.5-6.9 (male) or 6.6-8.1 (female) times as long as broad, club-shaped, ratio between club and pedicel 2.2-2.5 (male) or 2.6 (female); chela with pedicel 7.8-8.5 (male) or 7.8-7.85 (female) times as long as broad; hand of chela with pedicel 3.2-3.5 (male) or 3.1-3.17 (female) times as long as broad, oval, gradually narrowing towards pedicel; fixed chelal finger with 158-171 (male, female) small contiguous teeth with dental canals (Figs 5-6), venom duct short, nodus ramosus subterminal (Fig. 6); movable chelal finger with 130-138 (male, female) small contiguous teeth with dental canals (Figs 5-6) reaching back near *b*; trichobothria as in Figs 4-5, *ist* just proximal to *est*, the latter midway between *it* and *ist* or closer to *it*; *st* closer to *t* than *sb*; relative position of trichobothria along chelal axis (male from Shterra ë Cikes): *it* 0.085/*et* 0.09/*est* 0.125/*ist* 0.17/*isb* 0.80/*ib* 0.91/*esb* 0.97/*eb* 0.975/*t* 0.15/*st* 0.30/*sb* 0.68/*b* 0.90; ratio between movable finger and hand of chela with pedicel 1.42-1.52 (male) or 1.47-1.54 (female); ratio between pedipalpal femur and movable finger 1.01-1.05 (male, female); ratio between pedipalpal femur and carapace 2.1-2.3 (male, female). Leg I (male from Shterra ë Cikes): trochanter 1.6 times as long as deep, femur 8.5 times as long as deep and 1.5 times longer than patella, the latter 6.3 times as long as deep, tibia 9.9 times, basitarsus 7.2, telotarsus 9.3 times as long as deep, ratio between basitarsus and telotarsus 0.88, subterminal seta dentate, claws with small dorsal tooth; leg IV (male, female) (Figs 7-8): trochanter 3.1-3.55 times as long as deep, femur + patella 7.7-8.25 times as long as deep, tibia 12.1-13.95 times, basitarsus 6.7-7.05 times, telotarsus 9.3-11.6 as long as deep, ratio between basitarsus and telotarsus 0.75-0.82, subterminal seta dentate, claws with small dorsal tooth (Fig. 8).

Measurements: Body length 4.3-5.9 (male, female). Carapace 1.47-1.54 × 0.98-1.13 (male) or 1.51-1.59 × 1.06-1.22 (female). Chelicera 0.94-0.99 × 0.44-0.49 (male) or 1.0-1.02 × 0.48-0.51 (female); movable finger length 0.59-0.64 (male) or 0.65-0.66 (female). Pedipalp: trochanter length 1.06-1.13 (male) or 1.08-1.13 (female); femur 3.23-3.45 × 0.36-0.40 (male) or 3.43-3.54 × 0.37-0.46 (female); patella 2.66-3.02 × 0.41-0.44 (male) or 2.77-3.48 × 0.42-0.43 (female); chela with pedicel 5.20-5.66 × 0.61-0.72 (male) or 5.36-5.80 × 0.68-0.74 (female); hand with pedicel length 2.06-2.32 (male) or 2.11-2.35 (female); movable finger length 3.14-3.38 (male) or 3.25-3.45 (female). Leg I (male from Shterra ë Cikes): trochanter 1.05 x 0.30; femur 1.28 × 0.35; patella 1.59 × 0.325; tibia 2.72 × 0.20; basitarsus 1.15 × 0.17; telotarsus 1.40 × 0.13. Leg IV: trochanter 1.01-1.05 x 0.29-0.33 (male) or 1.01-1.06 x 0.285-0.315 (female); femur + patella 2.84-2.97 × 0.35-0.37 (male) or 2.86-2.91 × 0.37-0.38 (female); tibia 2.66-2.83 × 0.20-0.22 (male) or 2.71-2.76 × 0.21-0.22 (female); basitarsus 1.13-1.16 × 0.16-0.17 (male) or 1.10-1.14 × 0.16-0.17 (female); telotarsus 1.40-1.51 × 0.13-0.15 (male) or 1.40-1.52 × 0.14-0.15 (female).

Short description of tritonymph: Carapace 1.3 times as long as broad, without eyes or eye-spots, anterior margin with a triangular epistome; anterior row with 4, posterior row with 4 (5) setae. Chaetotaxy of tergites I-X 4:4 or 5:4:4 or 7:6 or 7:6:6:6:6 or 7:7. Chelicera 1.9 times as long as broad, palm with 6 setae, fixed finger with subequal teeth, movable

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Figs 1-10. *Neobisium (Blothrus) georgecastriotae* Ćurčić, Dimitrijević & Rađa, 2006, male from Shterra ë Cikes (unless otherwise stated). (1) Epistome of carapace. (2) Right chelicera, dorsal view. (3) Trochanter, femur and patella of right pedipalp, dorsal view. (4) Right pedipalpal chela, dorsal view. (5) Same (teeth omitted), antiaxial view, with details of teeth. (6) Apex of chelal fingers, antiaxial view. (7) Right leg IV, antiaxial view. (8) Apex of telotarsus of leg IV, antiaxial view. (9) Tritonymph from Shpella ë Kasarit: trochanter, femur and patella of right pedipalp, dorsal view. (10) Same, right pedipalpal chela (teeth omitted), antiaxial view, with details of teeth. Scale lines: 0.2 mm (1-2, 6, 8); 0.5 mm (3-5, 7, 9-10).

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finger with a prominent tooth in distal third; spinneret largely rounded, weakly prominent, with 6-7 silk ducts. Anterolateral process of coxa I squat, apically obtuse. Pedipalp (Figs 9-10): femur 7.9-8.2 times as long as broad, weakly enlarged distally; patella 5.4-5.7 times as long as broad, weakly and gradually enlarged distally, club 2.5 times longer than pedicel; chela with pedicel 7.05-7.3 times as long as broad; hand of chela with pedicel 2.7-2.8 times as long as broad; fixed and movable chelal fingers homodentate, with 118-121 and 98 small and contiguous teeth with dental canals, respectively; trichobothria as in Figs 9-10; relative position of trichobothria along chelal axis (tritonymph from Shterra ë Cikes): *it* 0.10/*et* 0.11/*est* 0.16/*ist* 0.24/*ib* 0.90/*esb* 0.94/*eb* 0.96/*t* 0.17/*st* 0.50/*b* 0.88; ratio between movable finger and hand of chela with pedicel 1.6; ratio between pedipalpal femur and movable finger 0.98-0.99; ratio between pedipalpal femur and carapace 1.9-2.1.

Measurements: Body length 3.6-4.3. Carapace 1.05-1.19 x 0.80-0.94. Chelicera 0.72-0.75 x 0.38-0.39, movable finger length 0.46-0.49. Pedipalp: femur 2.21-2.33 x 0.28-0.285; patella 1.71 x 0.30-0.315; chela with pedicel 3.66-3.81 x 0.50-0.54; hand with pedicel length 1.40-1.47; movable finger length 2.24-2.34.

Remarks: *Neobisium georgecastriotae* was described on the basis of a single male from the cave Pusi I Kerpajt Pit near Progonat, Gjirokastër County (southern Albania). The species was compared to *N. albanicum* (Müller, 1931), redescribed from a female topotype from the cave Vrima e Dragoit near Paftal, Berat (Beier, 1939, reproduced in Beier, 1963).

Soon afterwards, *N. albanorum* was described on the basis of two males, two females and a tritonymph from two caves near Gjirokastër and Kurvelesh, Gjirokastër County. That nominal species was also compared again to *N. albanicum* and to *N. georgecastriotae*.

However, the diagnostic differences between *N. albanorum* with *N. georgecastriotae* mentioned by Ćurčić and co-workers are based on errors or on a tenuous evaluation of characters: chaetotaxy of tergites I-II is 4:4 in both species (not 6:6 as given for *N. georgecastriotae*), and the proposed differences in size and ratios between the two nominal species (carapace breadth, male pedipalpal length and pedipalpal femur and chela length to breadth ratio, total length of leg IV, femur + patella of leg IV length to breadth ratio) are insubstantial in the light of a well-known high variability in subterranean populations of pseudoscorpions.

In spite of the fact that type specimens of *N. albanorum* and *N. georgecastriotae* (repeatedly requested by e-mail from the Institute of Zoology, University of Belgrade) seem to be currently unavailable for study, a careful comparison of descriptions, measurements and figures from the literature, together with the observation of the close proximity of both type localities (about 20 km apart) and the examination of the male and tritonymph from Progonat, allow the following synonymy to be proposed: *Neobisium albanorum* is a junior subjective synonym of *Neobisium georgecastriotae.* The name "*georgecastriotae"* was published earlier in 2006 and therefore has priority.

Neobisium georgecastriotae is probably closely related to *N. albanicum*. Two syntypes (sex not stated) of *N. albanicum*, glued to card mounts, are stored in the Museo civico di Storia naturale, Trieste. They are labelled: "*Obis. (Blothrus)* / *albanicum* m. / det. J. Müller" "Vrima e Dragoi / Paftali, Berat / Ravasini 7.22" and "*Blothrus* / *albanicus* m. / det. J. Müller" "Cotypus" "Vrima e Dragoi / Paftali, Berat / Ravasini 7.22". Thanks to the courtesy of Dr A. Colla (MCST) and F. Gasparo (Trieste), I acquired photographs, basic measurements of pedipalps and position of trichobothria which supplement the description of *N. albanicum* by Beier (1939, 1963). *Neobisium georgecastriotae* differs from *N. albanicum* in size (pedipalpal femur 3.23-3.54 mm vs. 2.74-2.87 mm; patella 2.66-3.48 mm vs. 2.25-2.32 mm; chela 5.20-5.80 mm vs. 4.40-4.55 mm), in ratio between finger and hand of chela (1.42-1.54 vs. 1.62-1.73), in chaetotaxy of tergites I-II (4:4 vs. 6:6) and in position of pedipalpal trichobothria (*ist* slightly proximal to *est* vs. *ist* slightly proximal to *st*; *et* at level or closer to *it* than to *est* vs. *et* halfway between *est* and *it*).

The above redescription of *N. georgecastriotae* incorporates data (chaetotaxy and measurements) from the original description and data proposed by Ćurčić *et al.* (2006c).

Neobisium (Blothrus) latellai n. sp.

Figs 11-18

Holotype: MSNV; female; Albania, Kukes County, Tropoië Municipality, Valbonë, slope S Mt Mali i Thatë, Shpella ë Haxhise (42°28'N, 19°51'E), 1720 m a.s.l.; 8.VII.1993; A. Gobetti & L. Latella leg.

Paratypes: CGG; 2 males 5 females; same data as for holotype.

Diagnosis (male, female): A subterranean troglomorphic *Neobisium* that differs from other Dinaric species of the genus in the following combination of characters: no eyes or eye-spots; carapace with 4 setae in posterior row, epistome triangular; standard chaetotaxy of tergites I-II 4:6; pedipalps smooth; chelal fingers homodentate, teeth small and contiguous; pedipalpal femur and hand of chela with pedicel each longer than movable finger; ratio between club and pedicel of patella 2.55-3.0 (male, female); chela with pedicel length 3.95-4.30 mm, and 5.35-5.9 (male, female) times as long as broad; trichobothrium *ist* slightly distal to middle of fixed finger; trichobothrium *st* mostly halfway between *t* and *sb*; anterolateral process of coxa I squat, apically obtuse.

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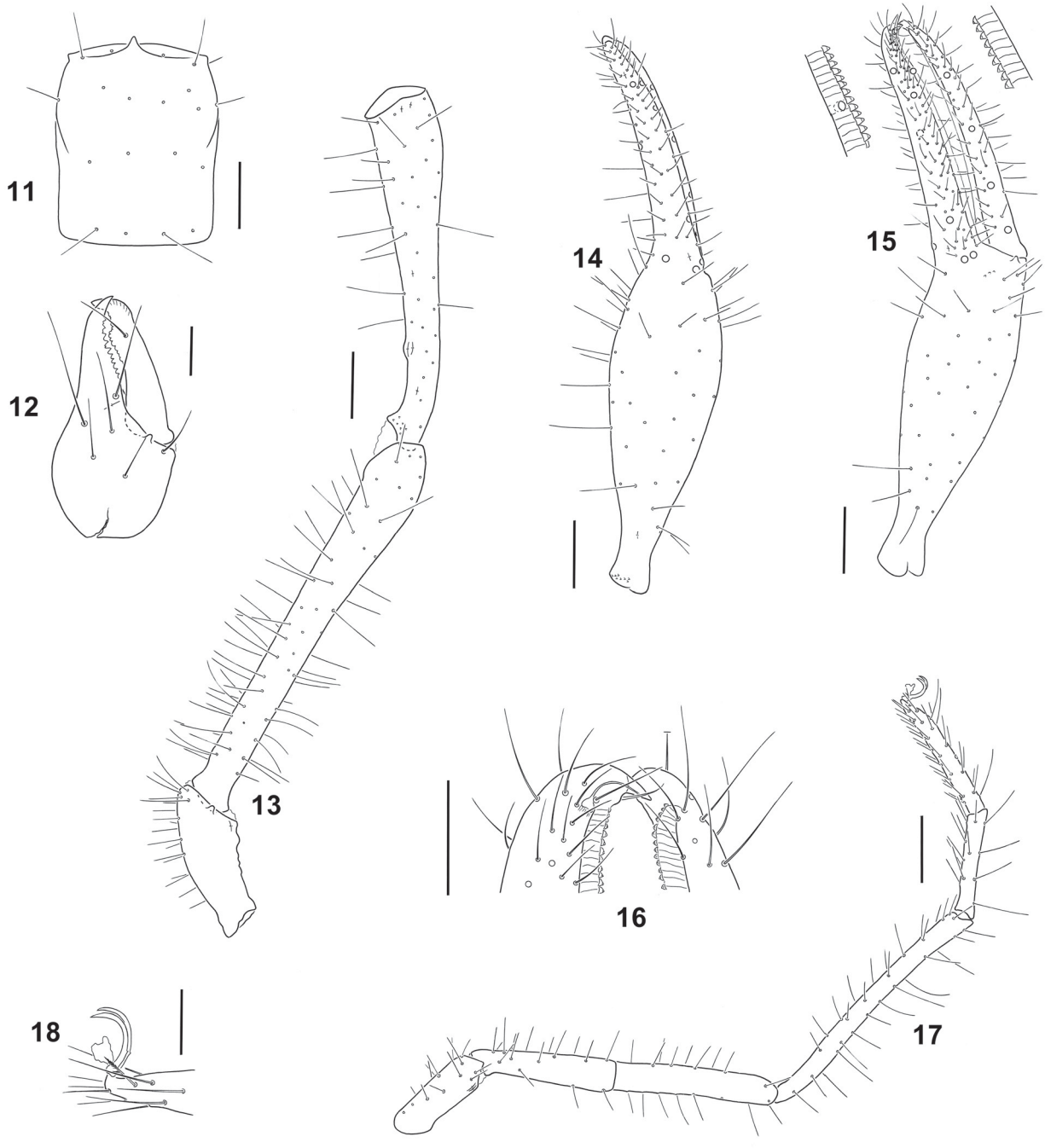
Etymology: Named in honour of Dr Leonardo Latella, entomologist and biospeleologist of the Museo civico di Storia naturale, Verona.

Description of adults (male, female): Carapace, chelicera, pedipalps and palpal coxae red-brown; pedipalps smooth, pleural membrane granular. Carapace (Fig. 11) 1.2-1.4 times as long as broad, without eyes or eye-spots, anterior margin with prominent triangular epistome; 19-21 macrosetae, 4 in anterior and 4 in posterior row, 1 or no "preocular" seta on each side. Chaetotaxy of tergites I-XI 4:6:6:5-7:7:7:7:7-10:8-10:7-10:6-8; tergite I of a male and a female with 5, II-III of two females with 4 setae. Chaetotaxy of sternites II-XI (male): 16-20:37-40(12-14 of them along posterior margin of genital opening): 18-19:15:14:12:13:14:11:10; genital chamber with 2(3) + 2 setae, median sac short and wide; chaetotaxy of sternites II-XI (female) 12-14:26-35:17-18:13-17:13-14:12-14:12-14:12-14:10-14:8-10; sternites III and IV (male, female) with 3 (rarely 2) and 2 (rarely 3) microsetae, respectively, in front of each stigma; anal cone with 2 + 2 setae. Chelicera (Fig. 12) 1.95-2.05 (male, female) times as long as broad, palm with 6 setae; fixed finger with 10-12 subequal teeth proximally decreasing in size; movable finger with 9-12 teeth, 5-6 of them prominent and together at level of *gs*; *gs* ratio 0.68-0.71, spinneret absent or slightly prominent, with 6-8 silk ducts; rallum with 8 blades, the two distal ones dentate; serrulae interior and exterior with 25 and 34-35 blades, respectively. Manducatory process with 5 setae. Coxal setae: pedipalp 8 (rarely 9 or 10), I 6 (rarely 5 or 7), II 6-9, III 6, IV 10-13; anterolateral process of coxa I squat, apically obtuse. Pedipalp (Figs 13-16): trochanter 2.5-2.7 (male, female) times as long as broad, with three or four weak button-like tubercles on antiaxial face; femur 7.27-8.2 (male) or 6.7-7.2 (female) times as long as broad, smooth, weakly and gradually enlarged distally; patella 5.65-5.9 (male) or 5.15-5.5 (female) times as long as broad, club-shaped, ratio between club and pedicel 2.85-3.0 (male) or 2.55-2.7 (female); chela with pedicel 5.45-5.9 (male) or 5.35-5.5 (female) times as long as broad; hand of chela with pedicel 2.95-3.35 (male) or 3.1-3.15 (female) times as long as broad, elongate oval, gradually narrowing towards pedicel; fixed chelal finger with 98-105 (male, female) small contiguous teeth with dental canals (Figs 15-16), venom duct short, nodus ramosus subterminal (Fig. 16); movable chelal finger with 96-103 (male, female) small contiguous teeth with dental canals (Figs 15-16) reaching back beyond *sb*; trichobothria as in Figs 14-15, *ist* slightly distal to middle of fixed finger, *st* mostly halfway between *t* and *sb*; relative position of trichobothria along chelal axis: *it* 0.15-0.17/*et* 0.17-0.19/*est* 0.25-0.28/*ist* 0.40-0.45/*isb* 0.76-0.77/*ib* 0.78-0.85/*esb* 0.91-0.93/*eb* 0.92-0.94/*t* 0.24-0.26/*st* 0.42-0.46/*sb* 0.67-0.70/*b* 0.86-0.88; ratio between movable finger and hand of chela with pedicel 0.85-0.91 (male) or 0.79-0.83 (female); ratio between pedipalpal femur and movable finger 1.52-1.55 (male) or 1.54-1.59 (female); ratio between pedipalpal femur and carapace 2.03-2.10 (male, female). Leg I (male, female): trochanter 1.55-1.65 times as long as deep, femur 6.4-7.3 times as long as deep and 1.4-1.5 times longer than patella, the latter 5.2-6.0 times as long as deep, tibia 6.8-7.8 times, basitarsus 4.25-5.1, telotarsus 5.45-6.8 times as long as deep, ratio between basitarsus and telotarsus 0.75-0.85, subterminal seta dentate, claws with small dorsal tooth; leg IV (male, female) (Figs 17-18): trochanter 2.65-2.95 times as long as deep, femur + patella 9.3-9.8 times as long as deep, ratio between femur and patella 0.75-0.9, tibia 11.3-12.6 times, basitarsus 5.6-6.15 times, telotarsus 7.7-8.15 as long as deep, ratio between basitarsus and telotarsus 0.79-0.82, subterminal seta dentate, claws with small dorsal tooth (Fig. 18).

Measurements: Body length 4.3-4.4 (male) or 5.2-5.7 (female). Carapace 1.43-1.48 × 1.05-1.15 (0.88-0.93 anteriorly) (male) or 1.48-1.55 × 1.24-1.27 (0.96-1.05 anteriorly) (female). Chelicera 0.86 × 0.44 (male) or 0.89-0.96 × 0.455-0.47 (female); movable finger length 0.56-0.63 (male, female). Pedipalp: trochanter 1.03-1.06 × 0.40-0.42 (male) or 1.05-1.20 × 0.41-0.44 (female); femur 2.90-3.11 × 0.38-0.40 (male) or 3.02-3.20 × 0.43-0.46 (female); patella 2.55-2.70 × 0.45-0.46 (male) or 2.57-2.75 × 0.47-0.51 (female); chela with pedicel 3.95-4.04 × 0.67-0.74 (male) or 4.04-4.30 × 0.74-0.80 (female); hand with pedicel length 2.18-2.24 (male) or 2.28-2.54 (female); movable finger length 1.9-2.0 (male) or 1.90-2.02 (female). Leg I: trochanter 0.45 x 0.27 (male) or 0.45-0.50 x 0.29-0.32 (female); femur 1.32 × 0.18 (male) or 1.39-1.43 × 0.20-0.22 (female); patella 0.95 × 0.17 (male) or 0.94-0.98 × 0.16-0.18 (female); tibia 0.92 × 0.135 (male) or 1.0-1.06 × 0.135 (female); basitarsus 0.51 × 0.12 (male) or 0.56-0.59 × 0.11-0.13 (female); telotarsus 0.60 × 0.11 (male) or 0.71-0.75 × 0.11-0.125 (female). Leg IV: trochanter 0.69 x 0.26 (male) or 0.71-0.83 x 0.25-0.28 (female); femur + patella 2.23 × 0.24 (male) or 2.25-2.36 × 0.23-0.25 (female); tibia 1.83 × 0.16 (male) or 1.92-2.02 × 0.16-0.17 (female); basitarsus 0.76 × 0.135 (male) or 0.76-0.85 × 0.125-0.14 (female); telotarsus 0.96 × 0.125 (male) or 0.96-1.04 × 0.12-0.13 (female).

Remarks: Among the subterranean species of *Neobisium*, subgen. *Blothrus*, from the Dinaric Alps, *N. latellai* n. sp. is probably most closely related to *Neobisium (Blothrus) peruni* Ćurčić, 1988 and *Neobisium (Blothrus) perunoides* Ćurčić & Rađa in Ćurčić *et al*., 2006a, both from caves on Mt Biokovo, Dalmatia, Croatia, with which it shares chiefly the shape of the pedipalpal chela, i.e. with elongate oval hand and short fingers. The main differences among *N. peruni*, *N. perunoides* and *N. latellai* are presented in Table 1.

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Figs 11-18. *Neobisium (Blothrus) latellai* n. sp., female holotype. (11) Carapace. (12) Right chelicera, dorsal view. (13) Trochanter, femur and patella of right pedipalp, dorsal view. (14) Right pedipalpal chela, dorsal view. (15) Same (teeth omitted), antiaxial view, with details of teeth. (16) Apex of chelal fingers, antiaxial view. (17) Right leg IV, antiaxial view. (18) Apex of telotarsus of leg IV, antiaxial view. Scale lines: 0.2 mm (12, 16, 18); 0.5 mm (11, 13-15, 17).

Neobisium (Blothrus) valsuanii n. sp.

Figs 19-26

Holotype: MHNG; male; Albania, Dibër County, Mat, Burrel, Macukull, Shpella Haruska (5 km SSE of Valgjini) (41°39'53"N, 20°07'54"E), 1480 m a.s.l.; 28.VI.2015; A. Valsuani leg.

Paratypes: CGG; 1 female; same data as for holotype. – CGG; 1 male; Albania, Dibër County, Mat, Burrel, Macukull, Shpella Bushiti (near Valgjini) (41°25'44"N, 20°03'58"E), 1131 m a.s.l.; IV.2014; A. Valsuani leg. – CGG; 1 female; Albania, Dibër County, Mat, Burrel, Macukull, Shpella Linozi-Leftari, 1868 m a.s.l.; 10.VII.2015; A. Valsuani leg.

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Table 1. Main distinctive characters between *N. peruni*, *N. perunoides* and *N. latellai* n. sp.

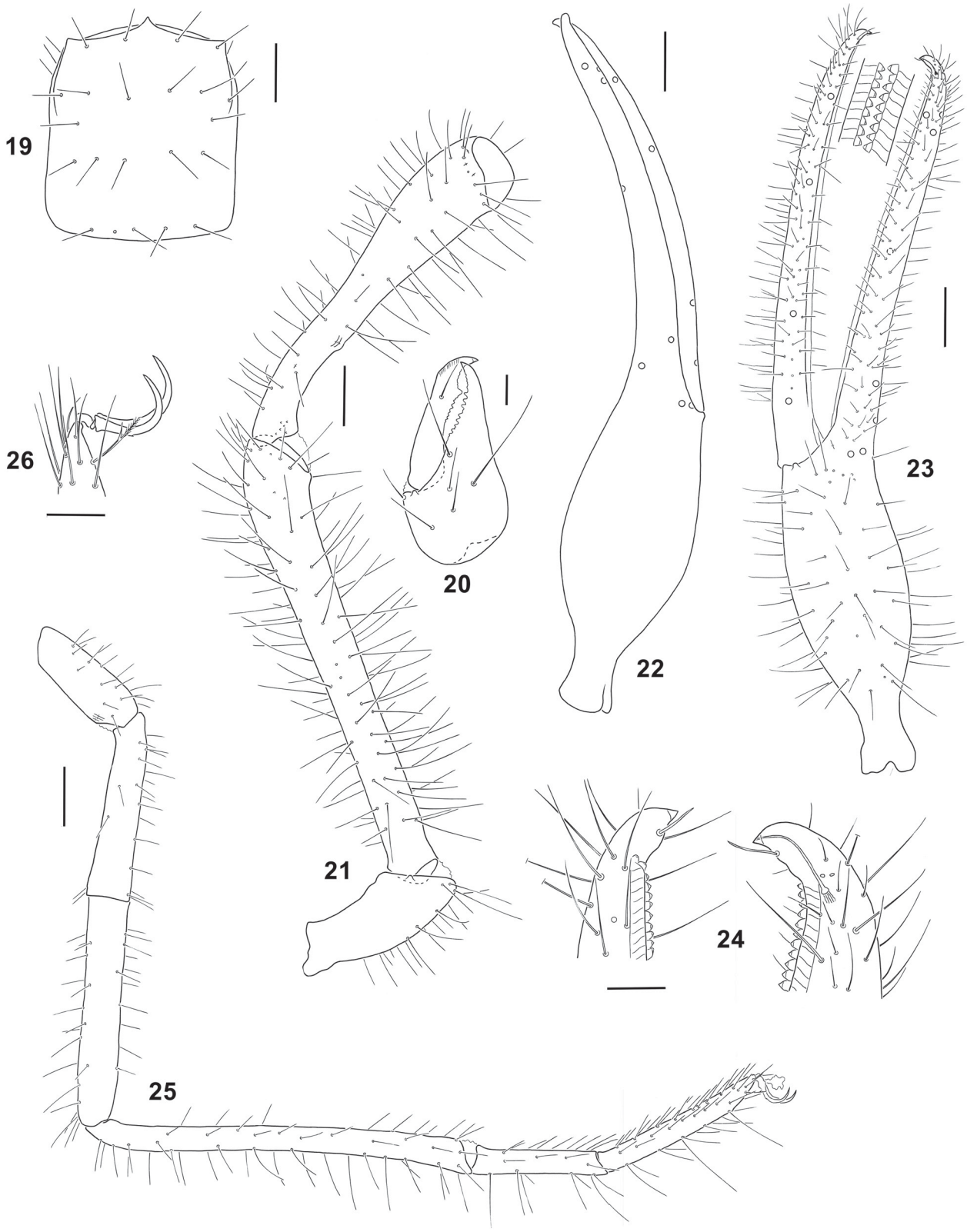
	N. peruni (male, female)	*N. perunoides* (female)	*N. latellai* n. sp. (male, female)
Carapace			
Posterior setae	6-7 (male) 4 (female)	6	4 (male, female)
Pedipalp			
Femur length	3.69-3.875 (male) 4.14 (female)	4.14	2.90-3.11 (male) 3.02-3.20 (female)
Patella length	2.95-3.155 (male) 3.46 (female)	3.45	2.55-2.70 (male) 2.57-2.75 (female)
Patella length/breadth ratio	5.12-5.44 (male) 6.47 (female)	5.23	5.66-5.87 (male) 5.14-5.50 (female)
Patella club/pedicel ratio	2.3-2.6 (male)	2.3	2.8-3.0 (male) 2.55-2.7 (female)
Chela length	5.33-5.61 (male) 6.13 (female)	6.08	3.95-4.04 (male) 4.06-4.30 (female)
Chela length/breadth ratio	6.03-6.48 (male) 7.86 (female)	5.02	5.46-5.90 (male) 5.35-5.48 (female)
Finger length	2.76-2.83 (male) 3.66 (female)	2.87	1.90-2.0 (male) 1.90-2.02 (female)
Finger/hand with ped. ratio	1.02-1.07 (male) 1.48 (female)	0.89	0.85-0.91 (male) 0.79-0.83 (female)
Femur/finger ratio	1.33-1.37 (male) 1.13 (female)	1.44	1.52-1.55 (male) 1.54-1.59 (female)
Trichobothrium *ist*	distal to middle of finger	distal to middle of finger	near middle of finger
Trichobothrium *st*	closer to *t* than to *sb*	closer to *t* than to *sb*	halfway between *t* and *sb*

Diagnosis (male, female): A large subterranean troglomorphic *Neobisium* that differs from other Dinaric species of the genus in the following combination of characters: no eyes or eye-spots; carapace with 6 setae in posterior row, epistome triangular; standard chaetotaxy of tergites I-II 6:6; pedipalps smooth; chelal fingers homodentate, teeth small and contiguous; pedipalpal femur slightly longer than movable finger, the latter longer than hand of chela with pedicel; ratio between club and pedicel of patella 1.65-1.95 (male, female); chela with pedicel length 5.8-6.35 mm, 4.75-5.6 (male, female) times as long as broad; trichobothrium *ist* near middle of fixed finger; trichobothrium *st* closer to *t* than to *sb*; anterolateral process of coxa I squat, apically obtuse.

Etymology: Named in honour of Alessandro Valsuani, who first collected the species during speleological research in Albania coordinated by A. Gobetti (Gruppo Speleologico Piemontese CAI-UGET, Torino).

Description of adults (male, female): Carapace, chelicera, pedipalps and palpal coxae red-brown; pedipalps smooth, pleural membrane granular. Carapace (Fig. 19) 1.1-1.2 times as long as broad, without eyes or eye-spots, anterior margin with prominent triangular epistome, apically rounded, rarely acuminate; 22-24 macrosetae, 4 in anterior and (5)6 in posterior row, besides 2 or 3 "preocular" setae on each side. Chaetotaxy of tergites I-XI 5-7:6-7:6-7:6-8:7-10:7-10:8-10:9-11:10-11:8-11:10; tergite I of a male and a female with 6, of a male with 5, of a female with 7 setae; sternite II of a female with 7 setae. Chaetotaxy of sternites II-XI (male): 26-29:52-53(29-30 of them along posterior margin of genital opening):19-20:15-20:18:17-18:18:17-18:17:13, setae of genital atrium and median genital sac not seen; chaetotaxy of sternites II-XI (female) 12:24-27:20-22:17-18:17-20:16-22:16-20:17-21:16-20:14-16; sternites III and IV (male, female) with 4-5 (rarely 3 or 6) and 4-5 (rarely 3) microsetae in front of each stigma, respectively; anal cone with 2 + 2 setae. Chelicera (Fig. 20) 1.95-2.1 (male, female) times as long as broad, palm with 6 (rarely 7) setae; fixed finger with 11-13 subequal teeth proximally decreasing in size; movable finger with 7-11 teeth, most of them prominent and situated together at level of *gs*; *gs* ratio 0.68-0.71, spinneret absent or slightly prominent, with 10-12 silk ducts; rallum with 13-17 blades, the two distal ones dentate; serrulae interior and exterior with 37-40 and 40-42 blades, respectively. Manducatory process with 5-7 (mostly 5) setae. Coxal setae: pedipalp 9-12 (mostly 9), I 5-9 (mostly 8), II 6-10, III 7-9 (mostly 8),

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Figs 19-26. *Neobisium (Blothrus) valsuanii* n. sp., male holotype (unless otherwise stated). (19) Carapace. (20) Left chelicera, dorsal view. (21) Trochanter, femur and patella of left pedipalp, dorsal view. (22) male paratype from Shpella Bushiti: right pedipalpal chela (setae omitted), dorsal view. (23) Left pedipalpal chela (teeth omitted), paraxial view, with details of teeth. (24) Apex of chelal fingers, paraxial view. (25) Right leg IV, paraxial view. (26) Apex of telotarsus of leg IV, paraxial view. Scale lines: 0.2 mm (20, 24, 26); 0.5 mm (19, 21-23, 25).

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IV 14-19 (mostly 19); anterolateral process of coxa I squat, apically obtuse. Pedipalp (Figs 21-24): trochanter 2.4-2.6 (male, female) times as long as broad, with a weak button-like tubercle on antiaxial face; femur 6.5-6.8 (male) or 6.15-6.5 (female) times as long as broad, smooth, weakly enlarged distally; patella 4.3-5.0 (male) or 4.45-4.5 (female) times as long as broad, club-shaped, ratio between club and pedicel 1.7-1.85 (male) or 1.65-1.95 (female); chela with pedicel 5.25-5.6 (male) or 4.7-4.75 (female) times as long as broad; hand of chela with pedicel 2.45-2.6 (male) or 2.25-2.4 (female) times as long as broad, oval, abruptly narrowed towards pedicel; fixed chelal finger with 120-140 (male, female) small contiguous teeth with dental canals (Figs 23-24), venom duct short, nodus ramosus subterminal (Fig. 24); movable chelal finger with 118-140 (male, female) small contiguous teeth with dental canals (Figs 23-24) reaching back near *b*; trichobothria as in Figs 22-23, *ist* near middle of fixed finger, *st* closer to *t* than to *sb*; relative position of trichobothria along chelal axis: *it* 0.125-0.145/*et* 0.14-0.155/*est* 0.17-0.19/*ist* 0.45-0.50/*isb* 0.75-0.85/*ib* 0.85-0.90/*esb* 0.90-1.0/*eb* 0.95-1.0/*t* 0.15-0.19/*st* 0.325-0.395/*sb* 0.68-0.79/*b* 0.88-0.935; ratio between movable finger and hand of chela with pedicel 1.26-1.32 (male) or 1.11-1.26 (female); ratio between pedipalpal femur and movable finger 1.08 (male) or 1.11-1.12 (female); ratio between pedipalpal femur and carapace 1.85-2.15 (male, female). Leg I (male, female): trochanter 1.48-1.55 times as long as deep, femur 5.9-6.4 times as long as deep and 1.4-1.5 times longer than patella, the latter 4.35-4.8 times as long as deep, tibia 6.8-7.85 times, basitarsus 4.75-5.2, telotarsus 6.2-6.8 times as long as deep, ratio between basitarsus and telotarsus 0.75-0.83, subterminal seta dentate, claws with small dorsal tooth; leg IV (male, female) (Figs 25-26): trochanter 2.7-3.1 times as long as deep, femur + patella 8.0-9.7 times as long as deep, ratio between femur and patella 0.79-0.83, tibia 12.5-13.0 times, basitarsus 5.0-5.6 times, telotarsus 7.05-8.45 as long as deep, ratio between basitarsus and telotarsus 0.73-0.77, subterminal seta dentate, claws with small dorsal tooth (Fig. 26).

Measurements: Body length 6.7 (male) or 7.3-8.1 (female). Carapace 1.87-1.98 × 1.60-1.61 (1.37-1.41 anteriorly) (male) or 1.96-1.98 × 1.70-1.79 (1.47-1.57 anteriorly) (female). Chelicera 1.36-1.48 × 0.70-0.705 (male) or 1.43-1.60 × 0.69-0.81 (female); movable finger length 0.92-1.0 (male) or 0.96-1.1 (female). Pedipalp: trochanter 1.50 × 0.58-0.59 (male) or 1.53-1.58 × 0.61-0.65 (female); femur 3.70-4.01 × 0.57-0.59 (male) or 3.90-3.99 × 0.60-0.65 (female); patella 2.90-3.22 × 0.64-0.67 (male) or 3.10-3.35 × 0.69-0.75 (female); chela with pedicel 5.8-6.0 × 1.07-1.10 (male) or 5.83-6.35 × 1.23-1.33 (female); hand with pedicel length 2.7-2.8 (male) or 2.78-3.20 (female); movable finger length 3.41-3.70 (male) or 3.50-3.55 (female). Leg I: trochanter 0.61-0.66 x 0.41-0.43 (male) or 0.62 x 0.40 (female); femur 1.98-2.06 × 0.31-0.34 (male) or 1.90 × 0.32 (female); patella 1.39 × 0.29-0.32 (male) or 1.38 × 0.31 (female); tibia 1.57-1.59 × 0.20-0.23 (male) or 1.56 × 0.23 (female); basitarsus 0.87-0.94 × 0.17-0.18 (male) or 0.86 × 0.18 (female); telotarsus 1.13-1.16 × 0.17-0.18 (male) or 1.12 × 0.18 (female). Leg IV: trochanter 1.05-1.12 x 0.36-0.39 (male) or 1.07 x 0.38 (female); femur + patella 3.40-3.49 × 0.36-0.38 (male) or 3.22 × 0.40 (female); tibia 3.25-3.39 × 0.25-0.27 (male) or 3.11 × 0.30 (female); basitarsus 1.12-1.15 × 0.20-0.23 (male) or 1.09 × 0.22 (female); telotarsus 1.48-1.52 × 0.18-0.21 (male) or 1.36 × 0.21 (female).

Remarks: Among the subterranean species of *Neobisium*, subgen. *Blothrus*, from the Dinaric Alps, *N. valsuanii* n. sp. is probably most closely related to *Neobisium (Blothrus) carnae carnae* Beier, 1938, *Neobisium (Blothrus) carnae fraternum* Beier, 1939 and *Neobisium (Blothrus) anaisae* Ćurčić & Lemaire in Ćurčić *et al*., 2009, the two former species from caves of Radoš Planina (Bosnia-Herzegovina), the latter from Krapa (Macedonia). The main differences between these species and subspecies are presented in Table 2.

Neobisium (Blothrus) cf. *vjetrenicae* Hadži, 1932

Figs 27-29

Neobisium (Blothrus) vjetrenicae Hadži, 1932: 102, figs 1-4. – Hadži, 1933: 49, figs 1-2. – Beier, 1939: 70, figs 84-85. – Beier, 1963: 151, fig. 155.

Material examined: CGG; 1 ♂; Albania, Shkodër County, Shkodër, Bogë, Dotek Pass, Helmit Abyss, 1540 m a.s.l.; VIII.1995; S. Meggiorini leg.

Short description of adult (male): Carapace, chelicera, pedipalps and palpal coxae red-brown; pedipalps smooth, pleural membrane granular. Carapace 1.2 times as long as broad, without eyes or eye-spots, anterior margin with a triangular epistome; anterior row with 4, posterior row with 5 setae. Chaetotaxy of tergites I-XI 4:4:6:7:7:7:8:9:8:9:6. Chaetotaxy of sternites III-X: (4)28(3):(3)14(3):17:16:17:16:14:8. Chelicera 2.0 times as long as broad, palm with 6 setae, fixed finger with 10 subequal teeth, movable finger with a prominent tooth in the distal third; spinneret largely rounded, weakly prominent. Anterolateral process of coxa I squat, apically obtuse. Pedipalp (Figs 27-29): trochanter 2.6 times as long as broad, with one weak button-like tubercle on antiaxial face; femur 7.6 times as long as broad, weakly enlarged distally; patella 5.3 times as long as broad, weakly and gradually enlarged distally, club 2.54 times longer than pedicel; chela with pedicel 6.3 times as long as broad; hand of chela with pedicel 3.0 times as long as broad; fixed and movable chelal fingers homodentate, with 110 and 109 small and contiguous teeth with dental canals, respectively; trichobothria as in Figs 28-29; relative position of

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Table 2. Main distinctive characters between *N. c. carnae*, *N. c. fraternum*, *N. anaisae* and *N. valsuanii* n. sp.

	N. c. carnae (female)	*N. c. fraternum* (female)	*N. anaisae* (female)	*N. valsuanii* n. sp. (male, female)
Carapace				
Posterior setae	6	6	4	6
Tergites				
Setae of tergites I-II	4:6	6:8	4:4	6:6
Chelicera				
Blades of rallum	-	-	8-9	13-17
Pedipalp				
Femur length	3.25	2.98	3.88	3.70-4.01
Femur length/breadth ratio	7.1	6.8	8.4	6.5-6.8 (male) 6.15-6.5 (female)
Patella length	2.70	2.50	3.30	2.90-3.35
Patella length/breadth ratio	5.0	4.7	6.1	4.33-5.03 (male) 4.46-4.49 (female)
Patella club/pedicel ratio	2.8	2.7	2.5	1.65-1.95
Chela with pedicel length	5.2	4.62	5.53	5.8-6.35
Chela length/breadth ratio	5.6	4.9	5.75	5.27-5.6 (male) 4.74-4.77 (female)
Finger length	2.75	2.42	3.17	3.4-3.7
Teeth on fixed/movable finger	-	-	159/121	120-140/118-140
Finger/hand with ped. ratio	1.06	1.03	1.34	1.26-1.32 (male) 1.11-1.26 (female)
Femur/finger ratio	1.18	1.23	1.22	1.08-1.12
Trichobothrium *ist*	distal to middle of finger	distal to middle of finger	near middle of finger	near middle of finger

trichobothria along chelal axis: *it* 0.14/*et* 0.18/*est* 0.22/*ist* 0.40/*isb* 0.76/*ib* 0.87/*esb* 0.90/*eb* 0.91/*t* 0.235/*st* 0.41/*sb* 0.725/*b* 0.88; ratio between movable finger and hand of chela with pedicel 1.16; ratio between pedipalpal femur and movable finger 1.30; ratio between pedipalpal femur and carapace 2.10.

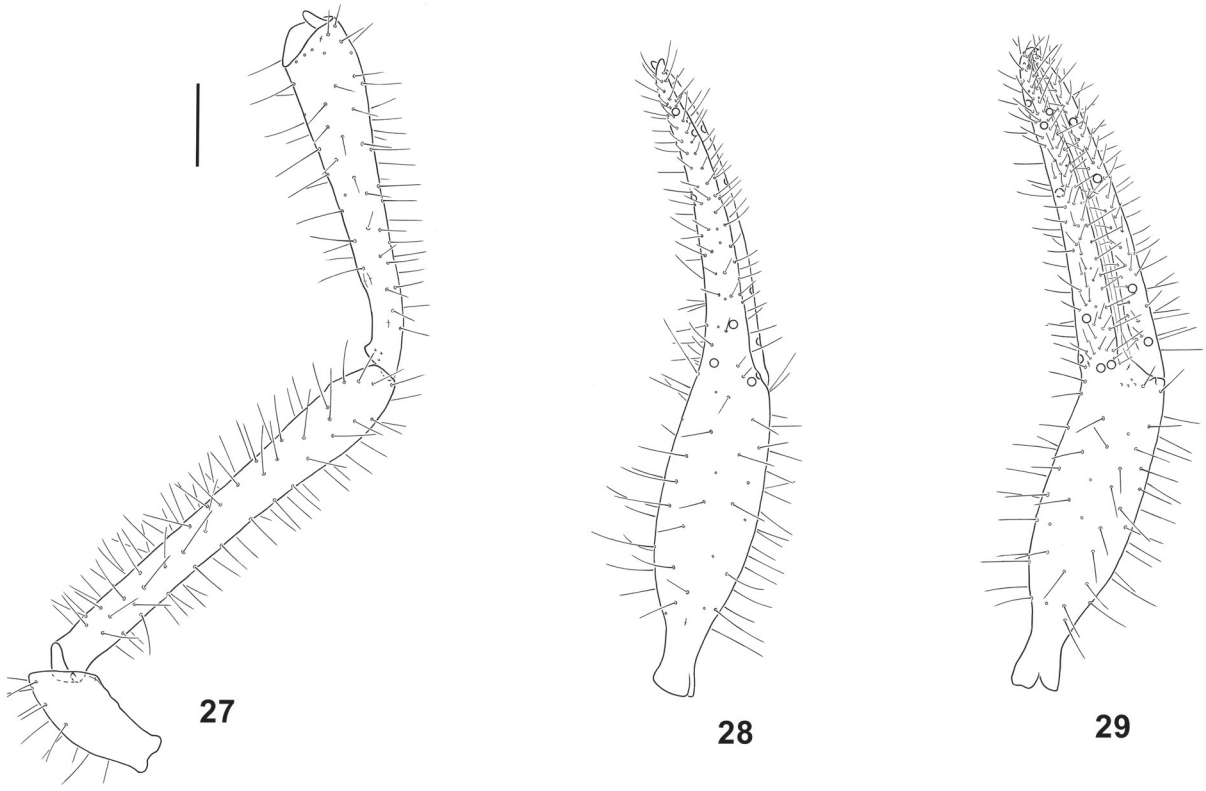
Measurements: Body length 5.3. Carapace 1.34 x 1.12 (0.91 anteriorly). Chelicera 0.88 x 0.44, movable finger length 0.57. Pedipalp: trochanter 0.99 x 0.38; femur 2.82 x 0.37; patella 2.28 x 0.43; chela with pedicel 3.90 x 0.62; hand with pedicel length 1.86; movable finger length 2.16.

Remarks: *Neobisium vjetrenicae* was described by Hadži (1932, German translation in Hadži, 1933) on the basis of a single male collected in the cave Pećina Vjetrenica (42°50'45"N, 17°59'02"E) near Zavala, Bosnia and Herzegovina. The species was subsequently redescribed by Beier (1939, reproduced in Beier, 1963) from topotypical specimens of both sexes.

The male from the Helmit Abyss, Albania, is here provisionally asigned to *N. vjetrenicae*, with which it shares the following characters: epistome triangular, posterior margin of carapace with 4 setae; tergites I-II with 4 setae; pedipalps smooth; chelal fingers homodentate, teeth small and contiguous; pedipalpal femur longer than movable finger, and movable finger longer than hand of chela with pedicel; chela with pedicel 6.3 times as long as broad; trichobothrium *ist* slightly distal to middle of fixed finger; trichobothrium *st* closer to *t* than to *sb*; anterolateral process of coxa I squat, apically obtuse.

Size and ratios of pedipalpal segments are similar in males from both caves: Vjetrenica - femur length 2.30-2.32 (x7.4), patella 1.80-1.88 (x5.0), club/pedicel of patella x2.6, chela with pedicel 3.60-3.61 (x6.2), hand with pedicel 1.73 (x3.0), finger 1.90-2.02, finger/hand with pedicel x1.17-1.20, femur/finger x1.15-1.21; Helmit - femur length 2.82 (x7.6), patella 2.28 (x5.3), club/pedicel of patella x2.54, chela with pedicel 3.9 (x6.3), hand with pedicel 1.86 (x3.0), finger 2.16, finger/hand with pedicel 1.16, femur/finger 1.30. In the male from Vjetrenica (Beier, 1939: 70, fig. 84) trichobothrium *ist* of the fixed chelal finger seems to be more distal than in the male from Helmit (Figs 28-29) and the teeth on the chelal fingers are 130 in the male from Vjetrenica (Hadži, 1933) versus 109-110 in the male from Helmit.

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Figs 27-29. *Neobisium (Blothrus)* cf. *vjetrenicae* Hadži, 1932, male from Helmit Abyss. (27) Trochanter, femur and patella of right pedipalp, dorsal view. (28) Right pedipalpal chela, dorsal view. (29) Right pedipalpal chela (teeth omitted), paraxial view. Scale line: 0.5 mm.

Key to adults of the *Neobisium (Blothrus)* species from Albania
[*N. (B.)* cf. *vjetrenicae* not included]

1A Tergites I-II with 4:4 or 6:6 setae; ratio between pedipalpal finger and hand of chela with pedicel 1.1-1.7; ratio between pedipalpal femur and finger 0.95-1.3; movable chelal finger with trichobothrium *st* closer to *t* than to *sb* 2

1B Tergites I-II with 4:6 setae; ratio between pedipalpal finger and hand of chela with pedicel 0.8-0.9; ratio between pedipalpal femur and finger 1.5-1.6; movable chelal finger with trichobothrium *st* halfway between *sb* and *t* ..... *N. (B.) latellai* n. sp.

2A Carapace with 4 setae in posterior row; pedipalps elongate: patella 5.3-8.1, chela with pedicel 6.3-8.6 times as long as broad; ratio between club and pedicel of patella 2.4-2.6 3

2B Carapace with 6 setae in posterior row; pedipalps thick: patella 4.3-5.0, chela with pedicel 4.7-5.6 times as long as broad; ratio between club and pedicel of patella 1.65-1.95 ..... *N. (B.) valsuanii* n. sp.

3A Tergites I-II with 4:4 setae; ratio between pedipalpal finger and hand of chela with pedicel 1.4-1.5; length of pedipalpal chela 5.2-5.8; fixed chelal finger with trichobothrium *ist* just proximal to *est*; trichobothrium *est* midway between *ist*-*it* or closer to *it*; trichobothrium *et* at level of *it* ..... *N. (B.) georgecastriotae*

3B Tergites I-II with 6:6 setae; ratio between pedipalpal finger and hand of chela with pedicel 1.6-1.7; length of pedipalpal chela 4.4-4.55; fixed chelal finger with trichobothrium *ist* just proximal to *st*, trichobothrium *est* closer to *it* than to *ist*; trichobothrium *et* midway between *est*-*it* ..... *N. (B.) albanicum*

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