

## Redescription of *Roncus crassipalpus* Rafalski, 1949 (Pseudoscorpiones: Neobisiidae) from western Georgia

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### Abstract

The epigeal species *Roncus crassipalpus* Rafalski, 1949 is redescribed and illustrated, based on the specimens collected from Georgia. Males are described for the first time.

**Keywords:** epigeal species • microsetae • new record • Sairme gorge • taxonomy

### Introduction

Six species of *Roncus* L. Koch, 1873 have been recorded from Georgia: *R. lubricus* L. Koch, 1873 (recorded from Svaneti region, northern-western Georgia), *R. microphthalmus* (Daday, 1889) (recorded from southern slopes of whole Great Caucasus, Meskheta range), *R. crassipalpus* Rafalski, 1949 (recorded from Meskheta range), *R. corimanus* Beier, 1951 (known from western Georgia including mountainous Guria, Abkhazia and Mingrelia), *R. caucasicus* (Beier, 1962) (recorded from Nasakirali, Guria district), and *R. birsteini* Krumpál, 1986 (found in Snezhnaia cave, Abkhazeti) (Rafalski 1949; Kvavadze, Arabuli & Murvanidze 2008; Harvey 2013).

*Roncus crassipalpus* is a small, epigeal species with stout pedipalps. The species was originally described based on a female collected from Meskhet'is K'edi (Meskish Mountains), Caucasus, Georgia by Rafalski (1949), and subsequently briefly redescribed by Beier (1963). There are no other published records of this species. In addition, males of this species have never been described. In this contribution, redescription of several adults of both sexes with some morphometric and morphological variations of the species are presented.

### Material and methods

The specimens used for morphological study were cleared with 60% lactic acid, and permanently mounted on cavity slides in Swann's fluid. Microscopical examination and drawings were carried out with using an Olympus CH-2 compound microscope. Measurements were made with an ocular graticule. Morphological terminology and measurements follow Chamberlin (1931), Harvey (1992), Harvey *et al.* (2012), Judson (2007) and Zaragoza (2017). Examined

specimens are deposited in the Zoological Museum of Ilia State University, Tbilisi, Georgia (ISUTG). All measurements are in mm.

The following abbreviations are used: ISUPS = Ilia State University, Pseudoscorpions; L = length, W = width, D = depth, T = tactile seta; chelal lyrifissures: *fa* = retrolateral lyrifissure of fixed chelal finger, *fb* = dorso-retrolateral lyrifissure of fixed chelal finger, *fd* = dorso-distal lyrifissure of fixed chelal finger, *ma*<sub>1</sub>, *ma*<sub>2</sub>, *ma*<sub>3</sub> = retrolateral lyrifissures of movable chelal finger.

### Neobisiidae Chamberlin, 1930

#### *Roncus* L. Koch, 1873

#### *Roncus crassipalpus* Rafalski, 1949 (Figs. 1–10)

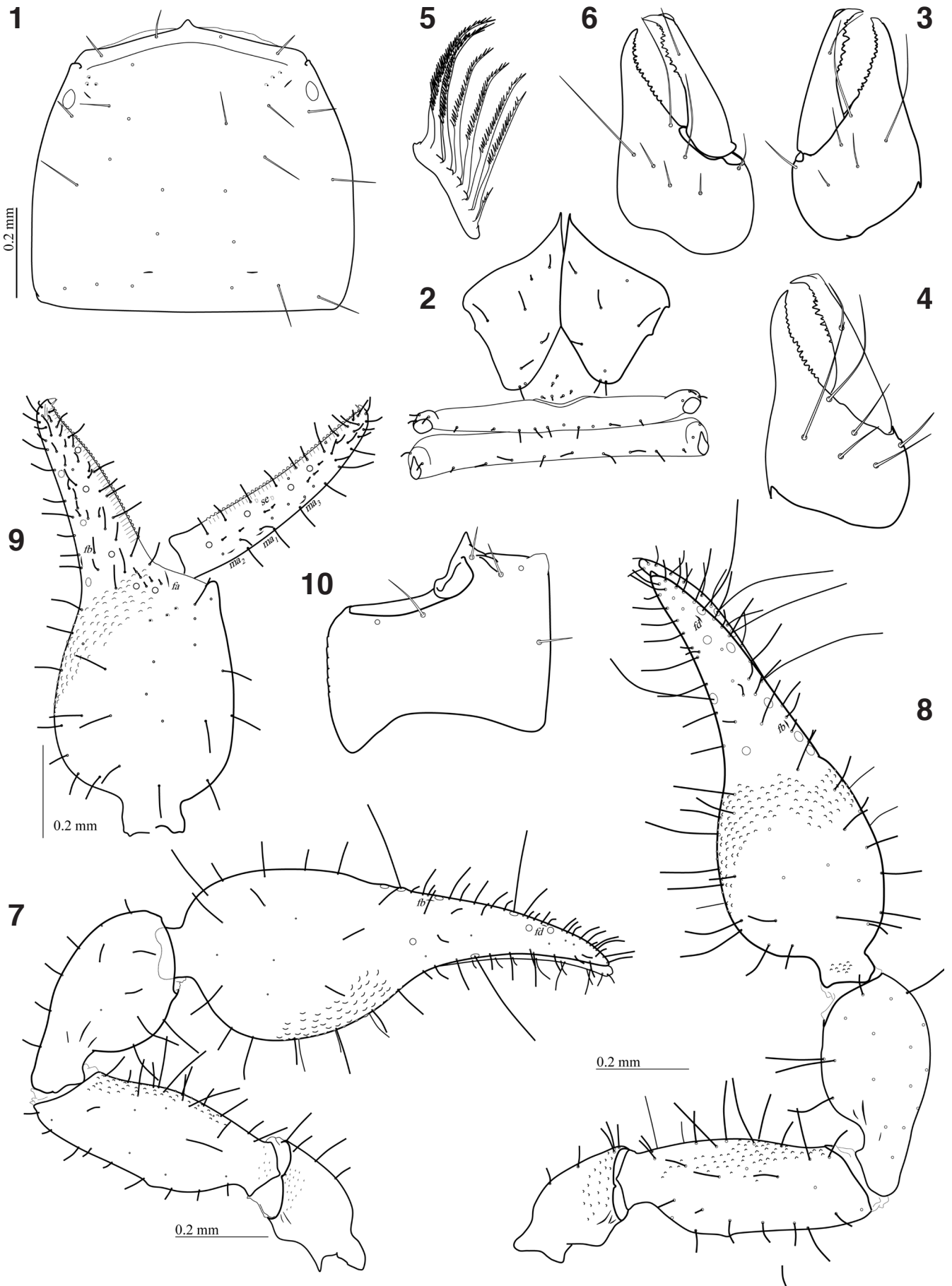
*Roncus (Roncus) crassipalpus* Rafalski, 1949: 110–116, figs 16, 17a.

**Material examined:** GEORGIA: Sairme gorge, 3♂♂, 2♀♀, Kutaisi-Baghdati-Abastumani-Benara 41.8556°N 42.79153°E, 1940 m, June 2013 (ISUPS23); 1♂, 2♀♀, 41.88367°N 42.75867°E, 1420 m, June 2013 (ISUPS17).

**Redescription of adults** (♂ in parentheses): body length 1.85–1.95 (1.91–2.25). Carapace brown (reddish brown); entirely smooth; wider than length, widest at the middle, 0.83–0.91× longer than broad (0.94–0.95× longer than broad; in one male, as long as broad); with one pair of reduced eyes with flat lens; with 24 (24–26) setae, anterior margin with 4 setae on median line (in one male, with 6 setae), posterior margin with 6 setae, chaetotaxy (Fig. 1): 4:6–7:2:3–4:2:6 (4:6:2–4:4:2:6); transverse furrows absent (Fig. 1); epistome moderately prominent, isosceles triangle shaped, and apically rounded (Fig. 1); anterolateral corners not prominent; glandular pores present, 3–4 on each side between anterior margin and ocular zone; with 4 lyrifissures, one pair situated in ocular zone, close to each eye and one pair located on posterior margin.

Tergites yellowish brown to light brown (darker in colour than females); slightly sclerotized; chaetotaxy: 6:7–8:11:10:10–11:11:11:11–2T1T2T1T2:1T1T1T1T1:T1T1T1T–TT1TT:2 (6:7:9–10:10–11:10:10:10:10:10:1T1T1T1T1–3T2T3:T1T1T1T–TT2TT:2).

Sternites yellowish brown (darker in colour than females), slightly lighter in colour than tergites; entirely smooth; slightly sclerotized; without median suture line; genital area with 6–8 short setae on anterior operculum, 10 setae with unequal length on posterior operculum (Fig. 2) (anterior operculum with 16–21 setae, of which 13 longer setae located along anterior margin of genital aperture; posterior operculum with 12–15 setae, 4–5 of them situated along posterior margin of genital aperture); female genital organ with one cribriform plate elongated across genital aperture (male genital organ with two very long lateral genital sacs and one short median genital sac, genital opening with 3+3 internal setae); anterior spiracles with 3–4 and posterior spiracles with 2–3 short and acute suprastigmal setae; all setae simple; chaetotaxy: 6–8:(3)10(3–4):(3)9(2–3):13–14:14:13–14:12–14:13:4TT4–5T1T5:2T2T2–T1T



Figs. 1–10: *Roncus crassipalpus* Rafalski, 1949, adult. **1** carapace (♀), dorsal view; **2** coxae IV and sternites II–IV (♀), ventral view (showing chaetotaxy); **3** left chelicera (♀), dorsal view; **4** right chelicera (♂), dorsal view; **5** rallum (♀); **6** right chelicera (♀), dorsal view; **7** left pedipalp (♀, coxa omitted), dorsal view; **8** right pedipalp (♂, coxa omitted), dorsal view; **9** right chela (♀), retrolateral view; **10** right coxa I (♀), ventral view. See Material and methods for abbreviations.

:2 (16–21:(3)12–15(3):(2–3)8–10(3):13–14:13–14:11–15:12–13:12–13:4T1T5:T1T1T1T–T1T:2). Pleural membrane granulate.

Chelicera brown; hand with 6 acuminate setae; galea knob-like, with a flatted hyaline convexity; galeal seta situated sub-medially; base of movable finger without granulation; fixed finger with 13–15 short and close-set teeth (14–19 teeth); movable finger with 10–11 teeth, one distinctly large tooth located distad to middle (Fig. 3) (11–12 teeth, 2–3 sub-median teeth larger than others (Fig. 4)); serrula interior with 11–20 (15–16) and exterior with 23–25 (22–24) blades; rallum with 8 denticulate blades, proximal blade shortest (Fig. 5); in one female, 7 setae located on right cheliceral hand and median large tooth absent (Fig. 6).

Pedipalps reddish brown; trochanter with dorsal granular surface, retrolateral surface of femur with distinct granulations, patella entirely smooth, chelal hand with granular surface at base of fixed finger (Fig. 7) (more granulated than females, as in Fig. 8); pedipalpal setae simple and acute; coxa including manducatory process with 8–10 setae, manducatory process with 4–5 acuminate setae, seta located at base of manducatory process longest; trochanter L/W 1.83–1.84 (1.89–2.06); femur with short pedicel, prolateral margin without tubercle, one tubercle located proximad to middle on retrolateral margin, most setae on prolateral margin longer than those on retrolateral margin, long setae without enlarged alveoli mostly located in basal half (Figs. 7–8), L/W 2.19–2.73 (2.75–2.85); patella with short and stout pedicel (L = 0.14–16 ♂♀), distinctly shorter than femur, with 3 lyrifissures situated basally, L/W 1.57–1.90 (1.87–2.04); chela (with pedicel) L/W 2.43–2.51 (2.81–3.30); chela (without pedicel) L/W 2.25–2.34 (2.57–2.74); hand (with pedicel) 1.02–1.04× longer than movable finger (in two males, movable finger 1.02× longer than chelal hand (with pedicel)); hand (with pedicel) L/W 1.38–1.40 (♀♂); 5 microsetae situated between *eb* and *esb* in retrolateral view, microsetae below trichobothria *eb* and *esb* absent; fixed finger with 3 lyrifissures: one (*fb*) located approximately at same level as *isb* and one (*fa*) close to base of fixed finger in retrolateral view, and one (*fd*) at same level as *et*; movable finger with 3 lyrifissures in retrolateral view: one (*ma*<sub>2</sub>) located slightly distad to *b*, one (*ma*<sub>1</sub>) at same level as *sb*, and one (*ma*<sub>3</sub>) at same level as *st*; two sensilla present, situated between trichobothria *sb* and *st*; fixed finger with 39–40 (39–46) similar contiguous teeth, reaching to the level of trichobothrium *isb*; movable finger with 36–40 (39–47) similar contiguous teeth, not reaching to the level of trichobothrium *b*; nodus ramosus of fixed chelal finger short and situated distinctly distad to *et* (Fig. 9).

Trichobothriotaxy: fixed finger with 8 and movable finger with 4 trichobothria (Fig. 9); fixed finger with trichobothrium *it* located in halfway between *et* and *est*, *est* situated approximately in the middle of the finger, *ist* located proximad to middle of the finger, *isb* on retrolateral face, *ib* situated basally, *eb* and *esb* located sub-basally; movable finger with trichobothrium *st* situated distinctly closer to *t* than to *sb*, distance *b–sb* longer than distance *t–st*.

Legs light brown, lighter in colour than carapace, darker than anterior tergites; smooth; coxa I with distinct, short triangular and pointed anterolateral process, mediolateral face with rounded membranous projection (Fig. 10); coxal

chaetotaxy: 5–7:7:5–6:7–8 (4–6:5:5–6:6–8); sub-terminal setae bifid; claws symmetric; arolium simple and shorter than claws. Leg I: femur L/D 2.23–2.30 (2.63–3.00); patella L/D 1.90–2.00 (2.11–2.50); femur 1.42–1.45× longer than patella (♂♀); tibia L/D 3.57–4.00 (♂♀); metatarsus L/D 2.00–2.33 (♂♀); tarsus L/D 3.34–3.80 (2.83–4.00). Leg IV: femur L/D 1.10–1.23 (1.21–1.35); patella L/D 1.17–1.33 (1.50–1.61); femur + patella L/D 2.23–2.30 (2.40–2.44); tibia with a long tactile seta situated slightly distad to middle (TS = 0.52–0.58♂♀), L/D 3.46–3.82 (4.30–4.60); metatarsus with a long tactile seta situated basally (TS = 0.17–0.25 ♂♀), L/D 2.12–2.40 (♂♀); tarsus with a tactile seta situated sub-basally (TS = 0.29–0.38♂♀), L/D 3.00–3.43 (3.50–3.57).

Dimensions: Female carapace 0.58–0.64/0.70. Pedipalp: trochanter 0.33–0.35/0.18–0.19, femur 0.52–0.57/0.19–0.26, patella 0.44–0.48/0.23–0.26, chela (with pedicel) 0.88–0.95/0.35–0.39, chela (without pedicel) 0.82–0.88, hand (with pedicel) L.0.49–0.54, movable finger L. 0.47–0.52. Leg I: femur 0.29–0.30/0.13, patella 0.20–0.21/0.10–0.11, tibia 0.25–0.28/0.07, metatarsus 0.12–0.14/0.06, tarsus 0.19–0.20/0.05–0.06. Leg IV: femur 0.22–0.26/0.21–0.23, patella 0.27–0.28/0.21–0.23, femur + patella 0.47–0.52, tibia 0.42–0.45/0.11–0.13, metatarsus 0.16–0.17/0.07–0.08, tarsus 0.21–0.24/0.07. Male carapace 0.59–0.65/0.62–0.67. Pedipalp: trochanter 0.33–0.34/0.16–0.18, femur 0.54–0.57/0.19–0.20, patella 0.45–0.46/0.22–0.24, chela (with pedicel) 0.90–0.95/0.31–0.33, chela (without pedicel) 0.83–0.88, hand (with pedicel) L.0.48–0.53, movable finger L. 0.49–0.52. Leg I: femur 0.27–0.29/0.09–0.11, patella 0.19–0.21/0.08–0.09, tibia 0.25–0.27/0.07, metatarsus 0.11–0.14/0.05–0.06, tarsus 0.17–0.20/0.05–0.06. Leg IV: femur 0.20–0.27/0.18–0.22, patella 0.23–0.29/0.18–0.22, femur + patella 0.44–0.53, tibia 0.43–0.46/0.10–0.12, metatarsus 0.16–0.17/0.07, tarsus 0.21–0.25/0.06–0.07.

*Remarks:* On the basis of the granulation pattern of the pedipalp (the femur and the chelal hand somewhat granulate, patella entirely smooth), the pedipalpal shape (see Rafalski 1949: fig. 16), the trichobothriotaxy (e.g. trichobothrium *ist* located proximad to middle of the fixed chelal finger), and the pedipalpal size, the newly collected specimens from Georgia are assigned to *Roncus crassipalpus*.

However, there are some discrepancies. In the original description, the carapace of the holotype is slightly longer than wide, whereas it is slightly wider than length/as long as broad in the newly collected specimens from Georgia. Also, the movable chelal finger is slightly longer than the chelal hand (with pedicel) in the type, while it is slightly shorter than the chelal hand (with pedicel) in the recently found females in Georgia (movable chelal finger is slightly longer than chelal hand (with pedicel) in two males). These variations in size are considered here as the morphometric range within this species.

*Roncus crassipalpus* seems very similar to *R. caucasicus* and *R. tenuis* Hadži, 1933.

There are a few differences between Beier's (1962, 1963) descriptions of the female type of *Roncus caucasicus* and the newly collected adults from Georgia. The pedipalpal segments of *R. caucasicus* are slightly shorter and thinner than those of *R. crassipalpus*, e.g. in *R. caucasicus* (♀), the pedipalpal femur is 2.7× (0.46/0.17) and the patella is

2.0× (0.39/0.19), whereas the pedipalpal femur is 2.1–2.7× (0.52–0.57/0.19–0.26) and the patella is 1.5–1.9× (0.44–0.48/0.22–0.26) longer than broad in *R. crassipalpus* (♀♂). The absence of two small tubercles on the prolateral margin of the pedipalpal femur is the only other difference between these two species.

*Roncus tenuis*, originally described from Croatia, can be differentiated from *R. crassipalpus* by the absence of microsetae located distad to trichobothria *et* and *est*, and the presence of a distinct tubercle on the prolateral margin of the pedipalpal femur (see Ćurčić, Dimitrijević & Karamata 1992: figs 39–40). Also, the chela (with pedicel) of *R. tenuis* is longer (1.09–1.16 ♀♂, Rafalski 1949; Ćurčić, Dimitrijević & Karamata 1992) than that of *R. crassipalpus*.

*Roncus crassipalpus* can be easily separated from the other *Roncus* species found in the region by its robust pedipalpal femur (ratio < 3.0× : 2.1–2.8× ♀♂). The pedipalpal femur is 3.2–4.2× longer than broad in *R. lubricus* (e.g. in Rafalski 1949; Ćurčić, Dimitrijević & Karamata 1992), 3.3–3.7× in *R. microphthalmus* (e.g. in Rafalski 1949; Beier 1963, 1973), 3.1–3.6× in *R. corimanus* (Beier 1951, 1962; Nassirkhani 2016), and 3.3× in *R. birsteini* (Krumpál 1986).

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