

DESCRIPTION OF A NEW EPIGEAN *NEOBISIUM* (*NEOBISIUM*) SPECIES (PSEUDOSCORPIONES: NEOBISIIDAE) AND REDESCRIPTION OF *NEOBISIUM* (*N.*) *GOLOVATCHI* FROM RUSSIA

Mahrad Nassirkhani¹, Nataly Snegovaya² & Yu. A. Chumachenko³

¹ Entomology Department, Faculty of Agriculture and Natural Resources, Islamic Azad University, Arak branch, Arak, Iran.
greenartificialturfgrass@gmail.com

² Institute of Zoology NAS of Azerbaijan, Baku, Azerbaijan.

³ Maykop State Technological University, ul. Pervomayskaya 191, Maykop, Adygea, Russia.

Abstract: There are seven species belonging to the subgenus *Neobisium* (*Neobisium*) Chamberlin, 1930 previously reported from Russia (Harvey, 2013). Description of *Neobisium* (*N.*) *artaxerxes* n. sp. occurring in soil and redescription of *Neobisium* (*N.*) *golovatchi* Schawaller, 1983 inhabiting in wood and leaf litter are given in the present study.

Key words: Arachnida, Pseudoscorpions, taxonomy, new species, distribution, Caucasian State Nature Biosphere Reserve, Russia.

Descripción de una nueva especie epigea de *Neobisium* (*Neobisium*) (Pseudoscorpiones: Neobisiidae) y redescrpción de *Neobisium* (*N.*) *golovatchi* de Rusia.

Resumen: Hay siete especies que pertenecen al subgénero *Neobisium* (*Neobisium*) Chamberlin, 1930 registradas previamente de Rusia (Harvey, 2013). En el presente estudio se describe *Neobisium* (*N.*) *artaxerxes* n. sp. habitante del suelo y se redescrbe *Neobisium* (*N.*) *golovatchi* Schawaller, 1983 habitante de la madera y hojarasca.

Palabras clave: Arachnida, Pseudoscorpiones, taxonomía, nuevas especies, distribución, Reserva de la Biosfera de la Naturaleza del Estado del Cáucaso, Rusia.

Taxonomy/Taxonomía: *Neobisium* (*Neobisium*) *artaxerxes* n. sp.

Introduction

There are a total of 14 species belonging to the family Neobisiidae Chamberlin, 1930 occurring in Russia (Harvey, 2013). Currently, the sub-genus *Neobisium* (*Neobisium*) Chamberlin, 1930 in Russia contains seven species distributing mostly in southern parts of the country. The species which have been reported from Russia until yet are (Harvey, 2013): *Neobisium* (*N.*) *anatolicum* Beier, 1949; *Neobisium* (*N.*) *carcinoides* (Hermann, 1804); *Neobisium* (*N.*) *golovatchi* Schawaller, 1983; *Neobisium* (*N.*) *granulatum* Beier, 1937; *Neobisium* (*N.*) *labinskyi* Beier, 1937; *Neobisium* (*N.*) *speleophilum* Krumpál, 1986 and *Neobisium* (*N.*) *vilcekii* Krumpál, 1983.

In this contribution, description and illustrations of the diagnostic characters of a new species, *Neobisium* (*N.*) *artaxerxes* n. sp. which was discovered in soil during the recent collection of pseudoscorpions in northern Russia are presented.

The only present description of the species, *Neobisium* (*N.*) *golovatchi* was originally prepared by Schawaller (1983) based on the male holotype found in Lazarevskoye–Sochi–Krasondar Province–southern Russia. Subsequently, Schawaller & Dashdamirov (1988) recorded this species for a few other localities around Krasondar Province. Accordingly, the poor known pseudoscorpion species, *N.* (*N.*) *golovatchi*, is redescribed and illustrated here on the basis of the males which were collected during recent faunistic surveys in Russia.

Material and methods

The examined pseudoscorpions were collected by Barber soil traps in the foothill near Maykop city, in the north Caucasus region of European Russia and mountain areas of the northern macroslope of the Main Caucasus Range, within the territory of the Caucasian State Natural Biosphere Reserve. Separately, pseudoscorpions were collected in a yew-box grove, which is a natural complex of mixed deciduous forests of the Black Sea coastline, isolated from the main territory of the Caucasian Reserve.

The specimens used for morphological study were cleared with 60% solution of lactic acid, and prepared as temporary and permanent slides. The temporary slide mounts were made ready in glycerin, and returned to small microtubes filled by 75% ethanol after study. A number of specimens were permanently mounted on microscope slides in Hoyer's medium. Microscopical examination and drawings were carried out with an Olympus CH–2 compound microscope. Measurements were made with an ocular graticule. The specimens were deposited in the Collection of Acarology Laboratory, Islamic Azad University of Arak, Iran (IAUA). The morphological terminology and mensuration follow Chamberlin (1931), Harvey (1992), Harvey *et al.* (2012), Judson (2007) and Zaragoza (2008).

The following abbreviations are used: Institutions: DEUA: Departamento de Ecología, Universidad de Alicante, Spain; IAUA: Islamic Azad University of Arak, Iran. L = length; W = width; D = depth; mm = millimeter. Chaetotaxy: *Em* = external microseta; *Im* = internal microseta; *Mm* = medial microseta; T, TS = tactile seta.

Result

FAMILY *Neobisiidae* Chamberlin, 1930

GENUS *Neobisium* Chamberlin, 1930

Subgenus *Neobisium* (*Neobisium*) Chamberlin, 1930

Neobisium (*Neobisium*) *artaxerxes* new species

Fig. 1–10.

MATERIAL EXAMINED. RUSSIA: holotype ♂, Caucasian State Nature Biosphere Reserve [44°20'N, 40°11'E], yew-box wood grove, box-wood forest, soil traps, May 2016, leg. Yu. Chumachenko. Paratypes: 3♀ collected with holotype; 3♂, Caucasian State Nature Biosphere Reserve [undetermined], yew-box wood grove, beech forest, soil traps, June 2006, leg. Yu. Chumachenko.

ETYMOLOGY. This species is named in honor of Artaxerxes, the fifth king of kings of the Achaemenid Empire who was named "long-handed" (Latin: *Longimanus*) in Greek sources. The specific name refers to the movable chelal finger which is distinctly longer than the chelal hand and the pedipalpal femur.

DIAGNOSIS. *Neobisium* (*N.*) *artaxerxes* n. sp. differs from all other species of the genus by the following combination of characters: carapace with four convex eyes, movable cheliceral finger with a large sub-median tooth, pedipalpal segments entirely smooth, the position of notch on the median side of patella expanding slightly more than distal third of the club length, movable chelal finger distinctly longer than chelal hand (with pedicel) and pedipalpal femur, trichobothrium *ist* situated distinctly distad to middle of fixed chelal finger, cusped teeth of movable chelal finger restricted to approximately distal third and the other teeth on basal two thirds extremely flattened, and morphometric characters, e.g. pedipalpal femur 1.77–2.12 mm long and 3.85–4.35x longer than broad (♀♂), pedipalpal patella 1.35–1.55 mm long and 2.69–2.87x longer than broad (♀♂), and chela (with pedicel) 3.25–3.75 mm long and 3.50–4.33x times longer than broad (♀♂).

DESCRIPTION. Adults.

Males, females in parentheses, variations within species in square brackets

Carapace (fig. 1): dark brown or reddish brown, posterior border pale and not sclerotized; entirely smooth; sub-quadrate, 0.90–0.96x longer than broad; with 2 pairs of corneate eyes, anterior eyes slightly larger than posterior ones, anterior eyes located less than one diameter from anterior margin, distance from anterior margin 0.095–0.112 mm, diameter of anterior eyes 0.107–0.135 mm, separation between eyes 0.047–0.060 mm; with 23–24 setae, anterior margin with 4 setae, preocular microsetae absent, 1 seta situated each side between eyes, posterior margin with 7–9 setae, chaetotaxy (fig. 1): 4:6–7:4–6:7–9 (24=4:6:6:8); setae long and acute; transverse furrows absent; epistome (fig. 1) short, wide and apically rounded, length 0.032–0.050 mm, width 0.040–0.060 mm; anterolateral corners without protuberances; 2 microlyrifissures situated in ocular zone [1♂, 1♀ with 2 microlyrifissures in ocular zone and 2 microlyrifissures located near posterior margin].

Tergites: brown, apparently lighter in colour than carapace; smooth; all setae simple and acute; X–XI with 2 slightly long setae (shorter than tactile setae) situated sub-laterally and 2

tactile setae located medially or sub-medially; chaetotaxy: 6–7:6–8:9–14:12–14:12–14:12–14:12–13:12–13:4T1T4–4T2T4:3T1T3–3T2T3:2 (6–7:9–10:11–12:13–14:13–15:13:12–14:12–13:12–14:13:10–12:2).

Sternites: brown, lighter in color than tergites; entirely smooth; without median suture line; genital area of males with 8–9 setae on anterior operculum, 30–40 setae on posterior operculum, of which 12–15 setae located medially along posterior margin of genital aperture (fig. 2); genital area of females with 6–7 setae on anterior operculum, and 26–30 on posterior operculum; male genital organ with long and stout lateral genital sacs, median genital sac medium in size and enlarged terminally, 6 internal setae located each side (6+6) (fig. 3); anterior spiracles with 3–5 and posterior spiracles with 4 short and acute suprastigmal setae; all setae acute and simple; IV–XI uniseriate; XI with 2 sub-median tactile setae; chaetotaxy: 8–9:(3–5)30–40(3–5):(4)16–21(4):17–21:16–18:16–18:14–18:14–16:12–15:T2T:2 (6–7:(4)26–30(4):(4)19(4):13–18:15–20:15–18:17–18:15–18:15:4–6:2).

Pleural membrane: distinctly granulated.

Chelicera: brown; hand with 7 acuminate setae [1♂ with 6 setae]; galea very short, knob-like, with a rounded hyaline convexity (figs. 4–5); galea of females larger and more obvious than that of males; galeal seta situated sub-medially (figs. 4–5); fixed finger with 11–18 small and close-set teeth reaching to base, sub-median tooth largest (fig. 5) [in 1♂, 3♀, fixed finger wrinkled and without defined teeth (fig. 4)]; movable finger with 7–12 teeth reaching proximad to galeal seta, with 1 sub-median large tooth (fig. 5) [in 1♂, 3♀, movable finger only with 1 sub-median large tooth (fig. 4)]; serrula exterior with 32–42 and interior with 24–29 blades; rallum with 9 blades, 7 posterior blades simple, smooth and acuminate, 2 anterior blades long and denticulate, 2–3 proximalmost blades smallest, 2 basal blades slightly isolated and located on a hyaline promontory [in 1♂, rallum with 9 blades, 3 anterior blades denticulate, 6 posterior blades simple!; in 1♀, rallum with 10 blades, 2 anterior blades denticulate, 8 posterior blades simple!].

Pedipalps: blackish brown or reddish brown, darker in colour than carapace; entirely smooth (Figs. 6–8); coxa including manducatory process with 10–13 setae, manducatory process with 5 acuminate setae; trochanter with small but prominent dorsal ridge, dorsal ridge without stout setae, L/W 2.09–2.14 (2.12–2.15); femur with short pedicel, without microprotuberance on retrolateral/prolateral margins, most setae on prolateral margin longer than those on retrolateral margin, with 3–4 long setae without enlarged alveoli situated basally and sub-medially (fig. 6), L/W 3.85–4.35 (4.24–4.25); patella with stout pedicel, L=0.39–0.41 mm (0.44–0.45 mm); patella shorter and wider than femur, notch on the median side not reaching to middle of the club length [in ♀ more extended than in ♂ but still not reaching to middle of the club length], with 4 lyrifissures situated basally, L/W 2.81–2.87 (2.69–2.82); chela (with pedicel) L/W 3.90–4.33 (3.50–3.72); chela (without pedicel) L/W 3.67–4.00 (3.27–3.50); chelal setae simple and acute; movable finger 1.26–1.29x (1.25–1.37x) longer than hand (with pedicel); chelal hand (with pedicel) L/W 1.90–2.13 (1.67–1.73); fixed finger with 8 and movable finger with 4 trichobothria (figs. 7–8); fixed finger with trichobothria *et*, *it*, *est*, and *ist* aggregated in distal third of the finger, trichobothrium *it* located slightly proximad to *et* [in 1♂, located at same level as *et*], *ist* located distinctly distad to

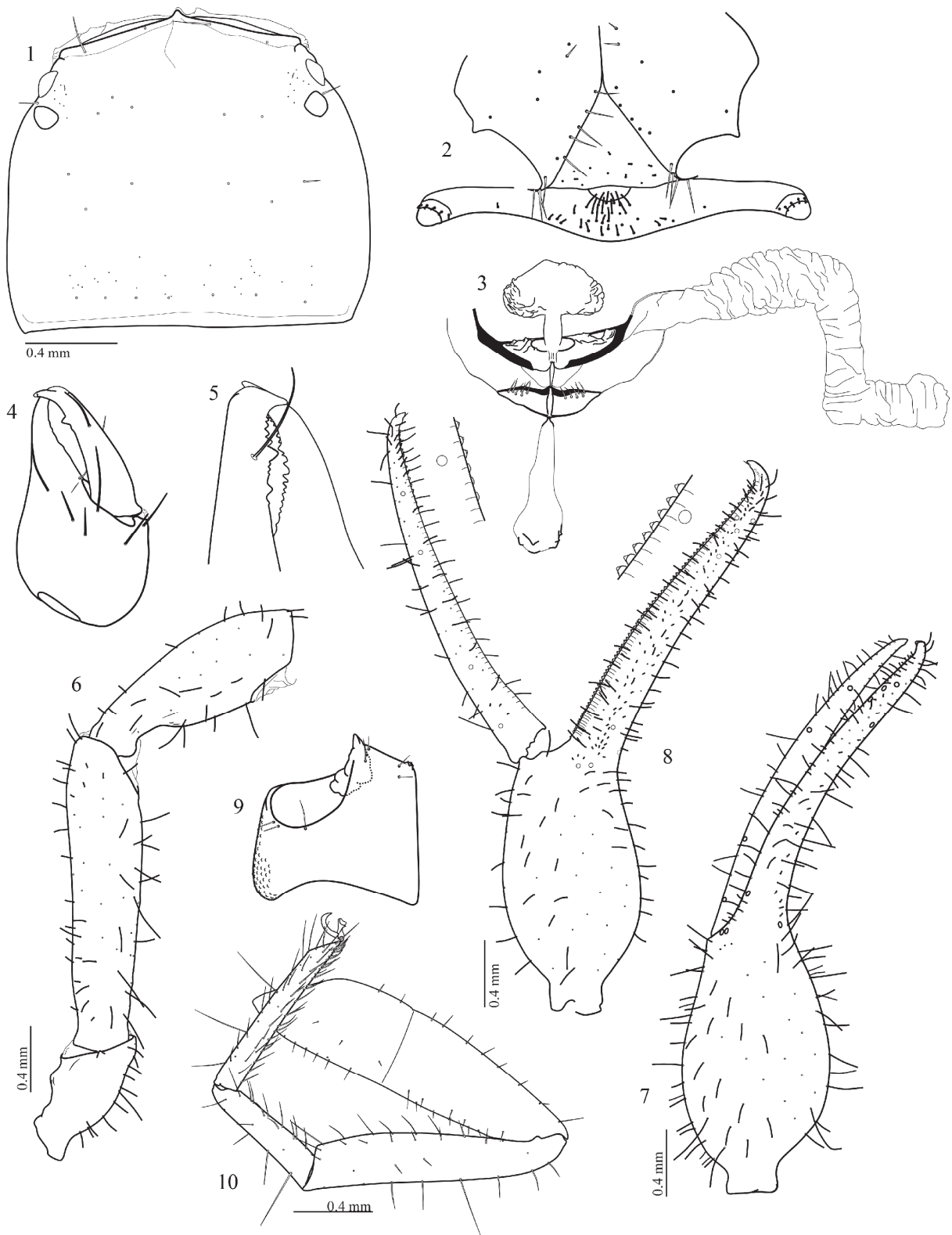


Fig. 1–10. *Neobisium (Neobisium) artaxerxes* n. sp., holotype ♂: 1. carapace, dorsal view; 2. genital operculae; 3. internal genitalia, in part; 4. right chelicera, dorsal view; 5. left cheliceral fingers, in part and magnified; 6. left pedipalp (without the chela), dorsal view; 7. left chela, dorsal view; 8. left chela, lateral view, with magnification of some teeth; 9. right coxa I, ventral view; 10. right leg IV (trochanter omitted), retrolateral view.

middle of the finger, *isb* on retrolateral face, *ib* in midway between *isb* and *esb*, *eb* and *esb* located sub-basally; movable finger with trichobothrium *st* situated distinctly closer to *t* than to *sb*, distance *b-sb* slightly longer than *t-st*; 9–14 short sensory setae situated distad to trichobothria *eb* and *esb*, prox-

imal to trichobothrium *isb* in lateral view; base of fixed finger with 10–15 sensory setae in dorsal view, *Em*=6–9, *Mm*=0, *Im*=4–6; base of fixed finger with 3 glandular pores on pro-lateral surface in lateral view; movable chelal finger with 3–5 sensory setae located basally in lateral view; prolateral face of

chelar hand with at least 2 long setae at base of fixed finger in lateral view; fixed finger with 66–72 (73–75) even, retroconical and contiguous teeth, reaching to proximad of trichobothrium *ib*, 2 distal teeth smallest, all teeth with dental canal; movable finger with 43–51 (♀47–59) teeth, 12–15 distal large and retroconical teeth, reaching to proximad or at same level as trichobothrium *t*, 3–5 of next teeth small and blunt, the others extremely flattened, only recognizable by the dental canals, and reaching to slightly proximad to or at same level as trichobothrium *b*; nodus ramosus of venom duct in fixed chelar finger situated distinctly distad to *et* (fig. 8).

Legs: brown, lighter in colour than tergites; smooth; coxa I with short, triangular, chitinous and apically thin and pointed anterolateral process, mediolateral process denticulate (fig. 9); coxal chaetotaxy: 7:6:4–6:12–13 (5:5:4–5:9–10); sub-terminal setae bifid, longer ramus with denticulations; claws simple; arolia simple and shorter than claws. Leg I: femur L/D 4.54–5.50 (5.60–6.25); patella L/D 3.79–3.84 (3.73–3.75); femur 1.37–1.46x (1.49–1.52x) longer than patella; tibia L/D 5.20–6.23 (5.53–5.81); metatarsus L/D 4.17–5.00 (4.00–4.36); tarsus L/D 6.67–8.11 (7.00–7.30). Leg IV (fig. 10): femur L/D 1.67–1.81 (1.82–2.05); patella L/D 2.15–2.21 (2.38–2.68); femur + patella L/D 3.78–4.05 (4.15–4.73); tibia with a tactile seta situated proximad to middle, TS=0.39–0.43, L/D 6.36–7.35 (6.23–7.75); metatarsus with one tactile setae situated basally, TS=0.14–0.15, L/D 4.37–4.60 (4.69–4.75); tarsus with two tactile setae, either located sub-basally TS=0.27–0.31, the other situated medially/slightly distad to middle, TS=0.50–0.55, L/D 7.92–9.00 (8.58–9.18).

Dimensions (in mm.): ♂ *Body length:* 4.00–4.27 mm. *Carapace:* 1.22–1.40/1.25–1.55. *Pedipalp:* trochanter 0.90–0.92/0.42–0.43; femur 1.77–1.87/0.43–0.46; patella 1.35/0.47–0.48; chela (with pedicel) 3.25–3.32/0.75–0.85; chela (without pedicel) 3.00–3.12; hand (with pedicel) L.1.57–1.62; movable finger L. 2.02–2.10. *Leg I:* femur 1.00–1.10/0.20–0.22; patella 0.72–0.73/0.19; tibia 0.72–0.82/0.13–0.14; metatarsus 0.45–0.50/0.10–0.12; tarsus 0.60–0.73/0.09–0.10. *Leg IV:* femur 0.74–0.76/0.42–0.45; patella 0.93–0.97/0.42–0.45; femur + patella 1.70; tibia 1.30–1.47/0.20–0.22; metatarsus 0.66–0.70/0.15–0.16; tarsus 0.93–0.99/0.09–0.12. ♀ *body length:* 4.50–4.65 mm. ♀: *Carapace:* 1.37–1.45/1.50. *Pedipalp:* trochanter 0.97–1.02/0.45–0.48; femur 2.00–2.12/0.47–0.50; patella 1.40–1.55/0.52–0.55; chela (with pedicel) 3.72–3.75/1.00–1.07; chela (without pedicel) 3.27–3.50; hand (with pedicel) L.1.67–1.73; movable finger L. 2.30–2.32. *Leg I:* femur 1.12–1.25/0.20; patella 0.75–0.82/0.20–0.22; tibia 0.83–0.93/0.15–0.16; metatarsus 0.48–0.52/0.11–0.13; tarsus 0.73–0.77/0.10–0.11. *Leg IV:* femur 0.82–0.84/0.41–0.45; patella 1.07–1.10/0.41–0.45; femur + patella 1.87–1.94; tibia 1.55–1.62/0.20–0.26; metatarsus 0.75–0.76/0.16; tarsus 1.01–1.03/0.11–0.12.

REMARKS. The new species, *Neobisium* (*N.*) *artaxerxes* n. sp. from Russia resembles *Neobisium* (*N.*) *distinctum* (Beier, 1928) from Croatia and Italy, *N.* (*N.*) *labinskyi* from Azerbaijan, Bulgaria, Georgia, Russia, and Turkey, and the female of *N.* (*N.*) *validum* (L. Koch, 1873) from southern Caucasus and Georgia because of the presence of two pairs of eyes with developed lenses, the trichobothriotaxy, e.g. trichobothrium *ist* located distinctly distad to middle of the fixed chelar finger and trichobothria *it* and *et* located distad to *t*, the similar shape and size of teeth in distal half of the fixed chelar finger, the position of notch on the median side of patella not reaching to

middle of the club length, lacks of any microprotuberances on the pedipalpal femur sides, the glabrous pedipalpal femur, the presence of a small but obvious ridge on dorsal face of the pedipalpal trochanter, and the morphometric characters, e.g. the pedipalpal femur length is more than 1.50 mm (ratio $\leq 5.20x$), and the movable chelar finger is distinctly longer than the chelar hand (with pedicel) and the pedipalpal femur.

Neobisium (*N.*) *distinctum* and *N.* (*N.*) *labinskyi* differ from *N.* (*N.*) *artaxerxes* by the position of notch on the median side of the patella which is extended utmost to distal fourth of the club length (see Beier, 1928: fig. 5B; Beier, 1937: fig. 2; Beier, 1963: figs 98, 103, 116; Ćurčić, 1984: fig. 39; Schawaller, 1983: figs. 8, 11; Petrov & Šťáhlavský, 2007: fig. 10). In addition, the position of trichobothria in the movable chelar finger of *N.* (*N.*) *distinctum* and *N.* (*N.*) *validum* is dissimilar with those of the new species from Russia. The trichobothrium *st* is located at same level as trichobothrium *ist* in *N.* (*N.*) *distinctum* and *N.* (*N.*) *validum* whereas trichobothrium *st* is situated proximad to *ist* in *N.* (*N.*) *artaxerxes*. Also, *N.* (*N.*) *validum* can be differentiated from *N.* (*N.*) *artaxerxes* by the lack of denticles on mediolateral process of male coxa I (in Beier 1963). Moreover, *N.* (*N.*) *labinskyi* has different dentition in the movable chelar finger. The cusped teeth extend further basally in *N.* (*N.*) *labinskyi* (see Schawaller, 1983: fig. 9; Petrov & Šťáhlavský, 2007: fig. 9) than in *N.* (*N.*) *artaxerxes* (cusped teeth are restricted to distal third of the movable chelar finger and teeth in basal two thirds of the finger are extremely flattened as far as those cannot be easily observed in *N.* (*N.*) *artaxerxes*, fig. 8). Also, the apical incurvation of lateral apodeme and the length of the median genital sac are different between *N.* (*N.*) *labinskyi* and *N.* (*N.*) *artaxerxes* (see Dashdamirov & Schawaller, 1992: fig. 8B; fig. 3).

Noticeably, the dentition of the cheliceral fingers is varying between the adults recently found in Russia. Sometimes, the movable cheliceral finger bears a row of teeth, of which the sub-median tooth is largest (fig. 5). In some specimens, the supplemental teeth which commonly locate proximad and distad of the large sub-median tooth are lost. If the supplemental teeth were absent, the fixed cheliceral finger is wrinkled and finely notched (fig. 4).

Neobisium (*Neobisium*) *golovatchi* Schawaller, 1983

Fig. 11–18.

Neobisium golovatchi Schawaller, 1983: 13–14, figs 36–40.

MATERIAL EXAMINED. RUSSIA: 3♂, Adygeya, Maykop Distr. [44°39'N, 40°00'E], near sanatorium “Lesnaya skazka”, Polkovnitskaya balka Distr., soil traps, May 2011, leg. Yu. Chumachenko. 2♂, Caucasian State Nature Biosphere Reserve [44°20'N, 40°11'E], yew-box wood grove, box-wood forest, soil traps, May 2016, leg. Yu. Chumachenko. 2♂, Caucasian State Nature Biosphere Reserve [undetermined], yew-box wood grove, beech forest, soil traps, June 2006, leg. Yu. Chumachenko.

REDESCRIPTION.

Carapace (fig. 11): dark brown, posterior border pale and not sclerotized; entirely smooth; sub-quadrate, 1.03–1.24x wider than length (inflated specimens); with 2 pairs of corneate eyes, anterior eyes larger than posterior ones (two specimens with two corneate anterior eyes and two posterior eyespots), anterior eyes locating approximately as long as one diameter from anterior margin (distance from anterior margin 0.087–0.100 mm, diameter of anterior eyes 0.087–0.100 mm, separa-

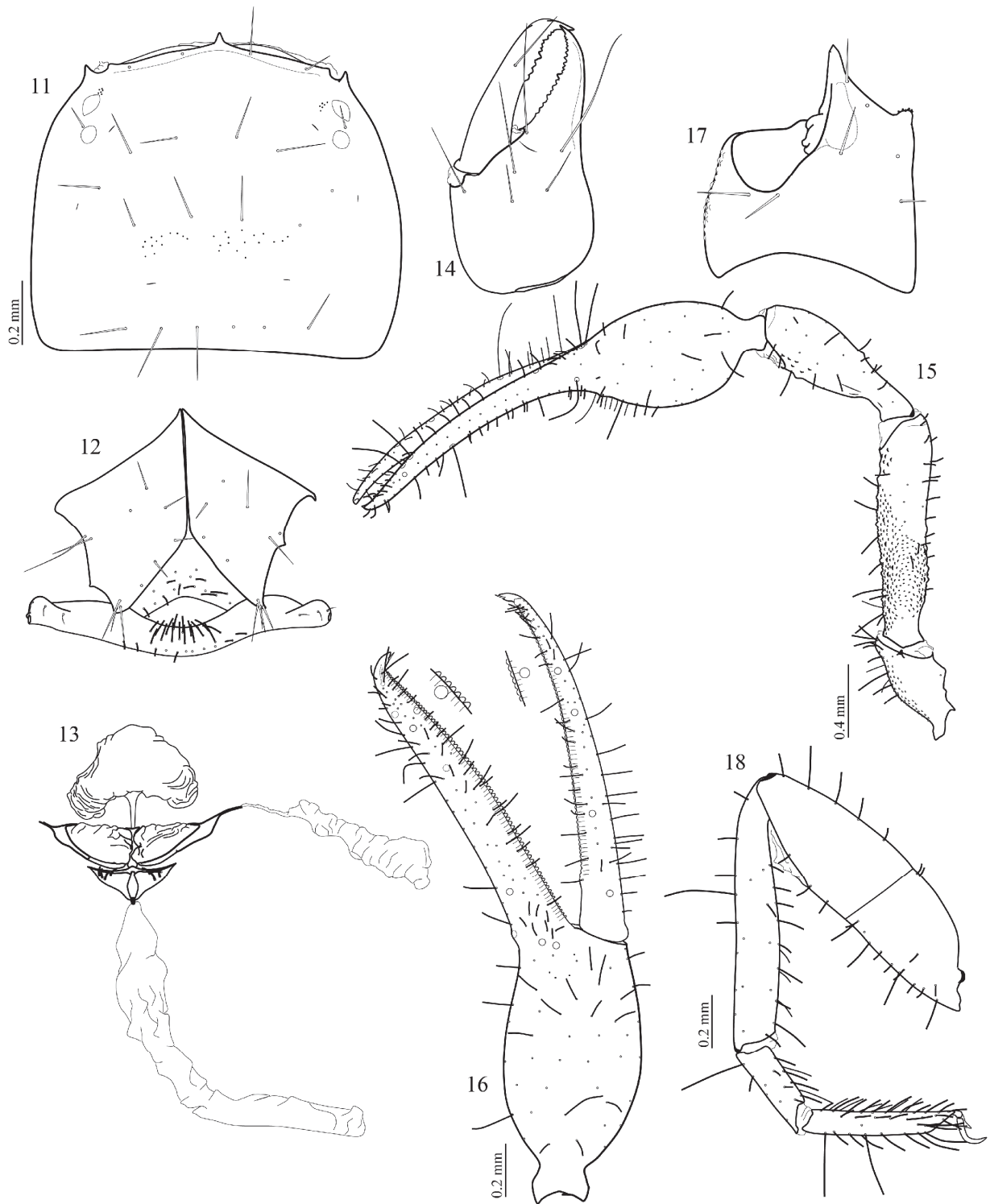


Fig. 11–18. *Neobisium (Neobisium) golovatchi* Schawaller, 1983, ♂: **11.** carapace, dorsal view; **12.** genital operculae; **13.** internal genitalia, in part; **14.** left chelicera, dorsal view; **15.** right pedipalp, dorsal view; **16.** right chela, lateral view, with magnification of some teeth; **17.** right coxa I, ventral view; **18.** left leg IV (trochanter omitted), retrolateral view.

tion between eyes 0.032–0.047 mm); with 22 setae, anterior margin with 4 setae, preocular setae absent, 1 seta situated each side between eyes, posterior margin with 6 setae, chaetotaxy (fig. 11): 4:6:6:6; setae long and acute; transverse furrows absent; epistome, triangular in shape and apically pointed (length 0.032–0.035 mm, width 0.037–0.040 mm); anterior margin with a prominent protuberance on each anterolateral corner at same level of the carapace surface; 6 microlyrifissures, 2 situated in ocular zone, 2 located medially,

and 2 located near posterior margin.

Tergites: brown, distinctly lighter in colour than carapace; smooth; all setae simple; X–XI with 4 long tactile setae (two specimens with 2 long tactile setae on tergite X); tactile setae located sub-laterally and medially in tergite X, and laterally and sub-medially in tergite XI; chaetotaxy: 6:6:6–8:7–9:9–10:9–10:9–10:9–10:1T1T1T1T1–3T2T3–4T2T4:T2T1T2T:2.

Sternites: pale brown, lighter in color than tergites; entirely smooth; genital area with 11–14 setae on anterior operculum, 20–27 setae on posterior operculum, of which 8–11 setae located along posterior margin of genital aperture (fig. 12); genital organ with relatively long lateral genital sacs, basal half of lateral genital sac narrow but suddenly enlarged in distal half, median genital sac very long and stout, 3–5 of internal setae located each side (4+4, 4+3, 5+5) (fig. 13); anterior spiracles with 3 and posterior spiracles with 3–4 short and acute suprastigmal setae; all setae simple; X with 4 median and sub-median long tactile setae (two specimens with 2 long tactile setae on sternite X); XI with 2 long sub-median tactile setae; chaetotaxy: 11–14:(3)20–27(3):(3–4)8–10(3–4):12–14:12–14:12–14:12–14:12–14:4T1T1T1T2–4T1T1T1T4–4T1T4–5TT5:T2T–T3T:2.

Pleural membrane: distinctly granulated.

Chelicera: brown; hand with 6 acuminate setae; galea very short, knob-like, with an indistinct rounded hyaline convexity (fig. 14); galeal seta situated sub-medially, distad to last tooth (fig. 14); fixed finger with 15–19 small and close-set teeth not reaching to base, sub-median tooth largest (fig. 14); movable finger with 9–11 teeth reaching proximad to galeal seta, sub-median tooth slightly larger than others (fig. 14); serrula interior with 19–24 and exterior with 26–29 blades; rallum with 8–9 blades on a hyaline promontory, 7–8 posterior blades simple, smooth and acuminate, 2 anterior blades long and denticulate, 2–3 proximalmost blades smallest, proximalmost blade slightly isolated from others and located on a hyaline promontory.

Pedipalps: dark brown, slightly lighter in colour than carapace; chela entirely smooth; trochanter, femur, and patella somewhat granulate (fig. 15); coxa including manducatory process with 5–7 setae, manducatory process with 4 acuminate setae, distal seta longest, seta located proximad to manducatory process very long; trochanter with prominent dorsal ridge, dorsal ridge with one stout setae, prolateral margin obviously granulate, L/W 2.25–2.52; femur with short pedicel, coarsely granulate with additional rough granules in basal and also in a small parts of distal half (fig. 15) (in three specimens, femur only with coarse granules), most setae on prolateral margin longer than those on retrolateral margin, with 3–4 long setae without enlarged alveoli situated basally and sub-medially, L/W 4.52–4.81; patella with stout pedicel (L=0.29–0.32 mm); patella distinctly shorter and wider than femur, notch on the median side reaching to about distal third of the club length, with 3 lyrifissures situated basally, distal half of patellar club with a number of coarse granules (fig. 15), L/W 2.76–3.09; chela (with pedicel) L/W 3.92–4.15; chela (without pedicel) L/W 3.66–3.87; chelal setae simple and acute; movable finger 1.35–1.44x longer than hand (with pedicel); chelal hand (with pedicel) L/W 1.75–1.92; fixed finger with 8 and movable finger with 4 trichobothria (figs. 15–16); fixed finger with trichobothria *et*, *it*, and *est* aggregated in distal third of the finger, trichobothrium *it* located slightly distad to *et*, *ist* located distinctly distad to middle of the finger, *isb* on retrolateral face, *ib* slightly closer to *esb* than to *isb*, *eb* and *esb* located sub-basally; movable finger with trichobothrium *st* situated distinctly closer to *t* than to *sb*, distance *b–sb* distinctly longer than *t–st*; 6–9 short sensory setae situated distad to trichobothria *eb* and *esb*, proximad to trichobothrium *isb* in lateral view; base of fixed finger (between trichobothria *isb* and *eb*) with 8 sensory setae in dorsal

view ($Em=4$, $Mm=0$, $Im=4$); base of fixed finger with 4–5 glandular pores on prolateral surface, and 3–4 on retrolateral surface in lateral view; movable chelal finger with 2–6 sensory setae located basally in lateral view; prolateral face of chelal hand without long setae at base of fixed finger in lateral view; fixed finger with 74–78 even, retroconical and contiguous teeth, reaching to base, 2 distal teeth smallest, all teeth with dental canal; movable finger with 67–75 similar contiguous teeth, not reaching to level of trichobothrium *b*, all teeth with dental canal; nodus ramosus of venom ducts in fixed chelal finger situated distinctly distad to *et* (fig. 16).

Legs: light brown, lighter in colour than tergites, darker than sternites; smooth; coxa I with long, triangular, chitinous and apically thin and pointed anterolateral process, mediolateral process prominent and denticulate (fig. 17); coxal chaetotaxy: 4–7:4–5:3–5:9–10; sub-terminal setae bifid, longer ramus with denticulations; claws simple; arolia simple and shorter than claws. Leg I: femur L/D 4.70–5.00; patella L/D 3.54–4.25; femur 1.37–1.48x longer than patella; tibia L/D 4.82–6.11; metatarsus L/D 4.12–4.57; tarsus L/D 6.57–7.00. Leg IV (fig. 18): femur L/D 1.51–1.96; patella L/D 1.81–2.28; femur + patella L/D 3.29–4.03; tibia with a tactile seta situated proximad to middle (TS=0.40–0.48), L/D 5.24–6.50; metatarsus with one tactile setae situated basally (TS=0.13–0.19), L/D 3.00–3.90; tarsus with two tactile setae (one specimen only with one tactile seta situated proximad to middle of tarsus), either located basally (TS=0.12–0.16), the other situated proximad to middle (TS=0.37–0.41), L/D 6.00–7.62.

Dimensions (in mm.): ♂ *Carapace*: 0.85–1.02/1.00–1.20. *Pedipalp*: trochanter 0.57–0.72/0.25–0.31; femur 1.15–1.37/0.25–0.30; patella 0.92–1.05/0.30–0.38; chela (with pedicel) 1.92–2.35/0.48–0.60; chela (without pedicel) 1.77–2.20; hand (with pedicel) L.0.90–1.05; movable finger L. 1.30–1.47. *Leg I*: femur 0.65–0.75/0.13–0.15; patella 0.45–0.51/0.11–0.14; tibia 0.48–0.59/0.09–0.11; metatarsus 0.30–0.35/0.07–0.08; tarsus 0.40–0.46/0.06–0.07. *Leg IV*: femur 0.48–0.56/0.28–0.37; patella 0.57–0.67/0.28–0.37; femur + patella 1.05–1.22; tibia 0.99–1.10/0.16–0.21; metatarsus 0.33–0.42/0.10–0.14; tarsus 0.58–0.61/0.08–0.12.

REMARKS. *Neobisium* (*N.*) *golovatchi* can be easily recognized from the other species of the subgenus by the presence of large granules in the pedipalpal femur and patella. Noticeably, there are no obvious differences between the original description of the male holotype and the recently collected males from Russia. It is worthy to notice that the pedipalpal femur of a number of the specimens examined here is coarsely granulated surrounding with additional small granules (fig. 15), whereas the pedipalpal femur of the other specimens only bears large granules. Hitherto, this variation was mentioned by Schawaller & Dashdamirov (1988) and Dashdamirov & Schawaller (1992).

Neobisium (*N.*) *golovatchi* was previously collected from wood and leaf litters of *Taxus* (*Taxus* sp.), *Box* (*Buxus* sp.), beech (*Fagus* sp.), maple (*Acer* sp.), fir (*Abies* sp.), and *Rhododendron* (*Rhododendron* sp.) woody plants in southern Russia (Schawaller & Dashdamirov 1988). The newly studied males have been found in the same microhabitats including soil and litter of the florae generally and naturally occurring in the northern Caucasus (Russia).

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Literature cited

- BEIER, M. 1928. Die Pseudoskorpione des Wiener Naturhistorischen Museums. I. Hemictenodactyli. *Annalen des Naturhistorischen Museums in Wien*, **42**: 285-314.
- BEIER, M. 1937. Zwei neue Neobisien (Pseudoscorp.) aus dem Kaukasus. *Zoologischer Anzeiger*, **117**: 107-109.
- BEIER, M. 1963. Ordnung Pseudoscorpionidea (Afterskorpione). In Bestimmungsbücher zur Bodenfauna Europas. *Bestimmungsbücher zur Bodenfauna Europas*. Berlin, p. vi, 313 pp.
- CHAMBERLIN, J. C. 1931. The arachnid order Chelonethida. *Stanford University Publications, Biological Sciences*, **7**(1): 1-284.
- ĆURČIĆ, B. P. M. 1984. The genus *Neobisium* Chamberlin, 1930 (Neobisiidae, Pseudoscorpiones, Arachnida): on new species from the USSR and the taxonomy of its subgenera. *Glasnik Muzeja Srpske Zemlje, Beograd* (B), **39**: 124-153.
- DASHDAMIROV, D. & W. SCHAWALLER 1992. Pseudoscorpions of the Caucasian fauna (Arachnida: Pseudoscorpionida). *Arthropoda Selecta*, **1**(4): 31-72.
- HARVEY, M. S. 1992. The phylogeny and classification of the Pseudoscorpionida (Chelicerata: Arachnida). *Invertebrate Taxonomy*, **6**: 1373-1435.
- HARVEY, M. S. 2013. *Pseudoscorpions of the World*, version 3.0. Western Australian Museum, Perth. <http://www.museum.wa.gov.au/catalogues/pseudoscorpions>
- HARVEY, M.S., P.B. RATNAWEERA, P.V. RANDENIYA & M.R. WIJESINGHE 2012. A new species of the pseudoscorpion genus *Megachernes* (Pseudoscorpiones: Chernetidae) associated with a threatened Sri Lankan rainforest rodent, with a review of host associations of *Megachernes*. *Journal of Natural History*, **46**: 2519-2535.
- JUDSON, M.L.I. 2007. A new and endangered species of the pseudoscorpion genus *Lagynochthonius* from a cave in Vietnam, with notes on chelal morphology and the composition of the Tyrannochthoniini (Arachnida, Chelonethi, Chthoniidae). *Zootaxa*, **1627**: 53-68.
- PETROV, B.P. & F. ŠTÁHLAVSKÝ 2007. New species of pseudoscorpions (Arachnida: Pseudoscorpiones) for the fauna of Bulgaria. *Historia naturalis bulgarica*, **18**: 15-27.
- SCHAWALLER, W. 1983. Pseudoskorpione aus dem Kaukasus (Arachnida). *Stuttgarter Beiträge zur Naturkunde*, (A) **362**: 1-24.
- SCHAWALLER, W. & S. DASHDAMIROV 1988. Pseudoskorpione aus dem Kaukasus, Teil 2 (Arachnida). *Stuttgarter Beiträge zur Naturkunde*, (A) **415**: 1-51.
- ZARAGOZA, J.A. 2008. On the status of the subspecies of *Roncocreagris galeomuda* (Pseudoscorpiones: Neobisiidae): importance of the chelal microsetae pattern. Remarks on the genus *Roncocreagris* Mahnert. *Revista Ibérica de Aracnología*, **15**: 35-46. Available at www.sea-entomologia.org