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A new Palaearctic *Thornburghiella* from Transcaucasia (Diptera: Psychodidae)

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Abstract. One new moth fly species (Diptera: Psychodidae: Psychodinae) is described and illustrated on the basis of male morphological characters: *Thornburghiella veve* sp. nov. was collected in the vicinity of Pambak River in the mountains of Armenia. Differential diagnoses are given for males of four additional species of *Thornburghiella* from Transcaucasia, Asia Minor and Central Asia.

Key words. Diptera, Psychodidae, moth flies, taxonomy, new species, Armenia, Palaearctic Region

Introduction

Ježek (1992) catalogued the world species of the genus *Thornburghiella* Vaillant, 1982 (a total of 35 species). Three species mentioned there, namely *Thornburghiella alaeoensis* (Kaul, 1971), *T. hamtensis* (Kaul, 1971) and *T. mixta* (Brunetti, 1911), originally described in the genus *Pericoma* Walker, 1856, were in the past placed in the subgenus *Stupkaiella* Vaillant, 1973 of the genus *Thornburghiella* by Duckhouse (1987, p. 85). His view was not mentioned in Ježek (1992). These three species were subsequently returned by Curler & Moulton (2010: 59) rather to the subgenus *Thornburghiella* s. str. of the genus *Thornburghiella*. The latter work corroborated and clarified the diagnosis of the genus *Stupkaiella* in concordance with Ježek (2001: 64). Ježek's (1992) list of *Thornburghiella* must again be updated by including eight species on the basis of Wagner & Joost (1985), Ježek (1993, 1994), and Wagner (1994, 2003): *T. kovari* Ježek, 1993 – Tajikistan; *T. navoii* Ježek, 1994 – Kazakhstan; *T. nilssoni* Wagner, 1994 – Russia, Far East; *T. platystyla* Wagner, 1994 – Russia, Far East; *T. sidorenkoi* Wagner, 1994 – Russia, Far East; *T. weidneri* Wagner & Joost, 1985 – Mongolia; *T. withersi* Wagner, 1994 – Russia, Far East; *T. xinjiangensis* Wagner, 2003 – China. *Thornburghiella* now comprises 44 species from the Holarctic and Oriental Regions (including *T. veve* sp. nov.).

Material and methods

Specimens of *Thornburghiella* examined in this study were collected with a sweep net by J. Oboňa, P. Manko and Ľ. Hrivniak. Captured moth flies were preserved in 70% ethanol, cleared in chloralphenol, transferred to xylol and finally mounted in Canada balsam on glass slides. Observations were completed using the following microscopes: Carl Zeiss Jena (Germany) and Reichert (Austria), equipped with a mirror arm for drawing. Outlines of pertinent characters were integrated into calligraphic pen pictures with Indian ink. The drawings were edited in Corel DRAW X7 and Corel PHOTO-PAINT X7 graphic software. Type and voucher specimens are deposited in the National Museum, Department of Entomology, Prague, Czech Republic (NMPC). Slides were numbered using two separate series of numbers: Inv. No. = Inventory Slide Number of the family Psychodidae and Cat. No. = Catalogue Number of the slide to be included in the NMPC Diptera collection (see Tkoč et al. 2014). Wing indices are based on distances between the following points: A = tip of R_5, B = radial fork, C = medial fork, D = tip of CuA_2. Maximum wing length is approximately equal to the distance from the line connecting the bases of the basal costal node and neala to the wing top. Terminology used in the species description generally follows Cumming & Wood (2009), general terms follow Curler & Moulton (2010). Special terms are applied in sense of Duckhouse (1987) – ventral plate of epandrium, Stark et al. (1999) – wing venation, Kvifte (2014) – parameral sheath and surstyli. Ratios of the lengths of the femur, tibia and first tarsomere, and one of the fore, middle and hind legs were indicated by P_1, P_2 and P_3, respectively. The following abbreviations were used throughout the text: NMPC = collection of the National Museum in Prague, SW = by sweep netting.

Taxonomy

Thornburghiella Vaillant, 1982

Thornburghiella Vaillant, 1973: 361 (unavailable name, type-species not designated).
Thornburghiella Vaillant, 1982: 299; Vaillant (1983: 324); Ježek (1992: 367); Ježek (1993: 32); Ježek (1994: 69); Ježek (2001: 64); Wagner (1994: 75); Wagner (2003: 107); Wagner & Joost (1985: 171).
Thornburghiella (*Stupkaiella* Vaillant, 1973 as subgenus), partim; Duckhouse (1987: 85).

Type species. *Psychoda albitarsis* Banks, 1895.

Differential diagnosis. Flagellomere 1 with single row of 4–9 strong sensory spines, wings ovate without sensory fold. Apical flagellomere with apiculus shorter than base or absent. Gonostyli mostly simple, conical, not completely bifurcated; sometimes forked with branches of varying shape. Aedeagal complex ovoid to angulate or divided into a pair of elongate, narrow, pointed or truncate extensions. In *Stupkaiella*, gonostyli are clearly bifurcated, both parts mostly similar, hardly distinguished in qualitative parameters. Aedeagal complex mostly articulated by two apical recurrent and fusiform ear-shaped projections.

Thornburghiella veve Oboňa & Ježek sp. nov.

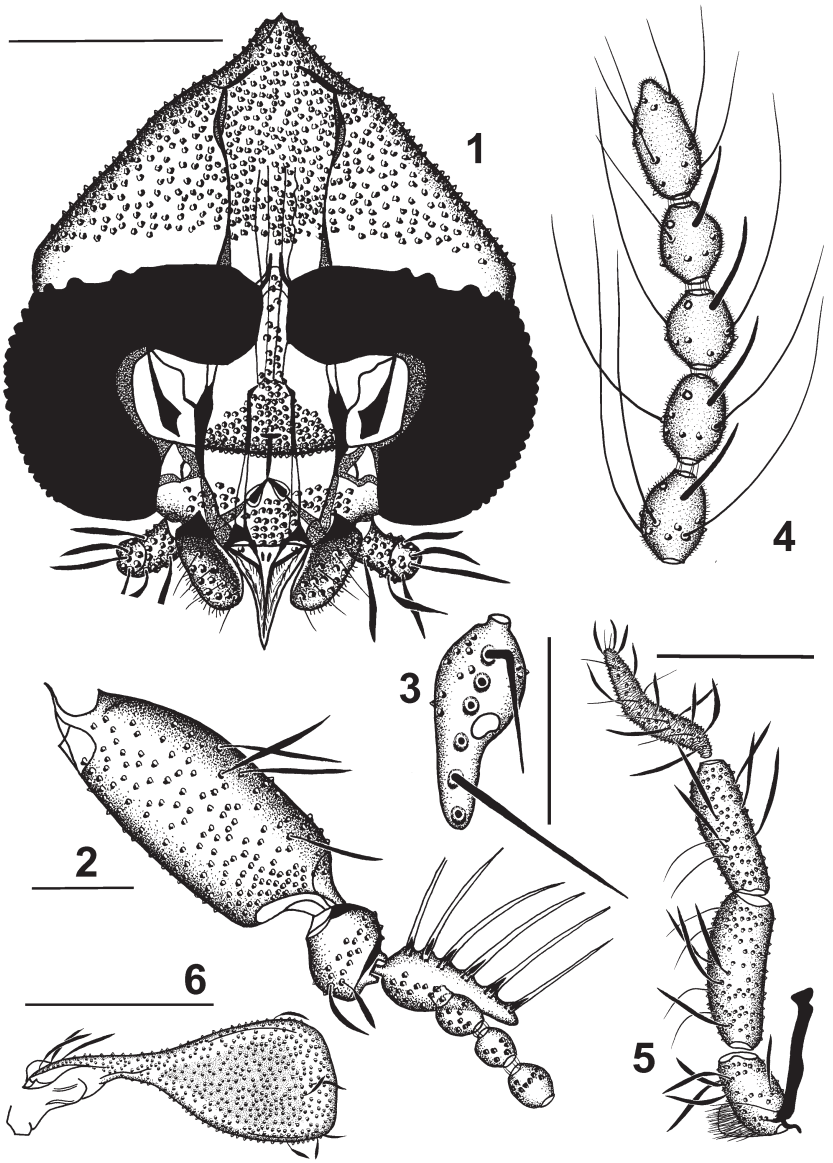
(Figs 1–18)

Type locality. Armenia, the Small Caucasus, eastern slopes of the Bazum Mountain ridge; small, steep brook (0.3–1 m wide, 0.01–0.15 m deep) in a relatively dry landscape, stony substrate with depositions of fine particulate organic matter, surrounded by woody and herbaceous vegetation (Fig. 19). GPS coordinates 40°56′52.7″N, 44°37′37.2″E.

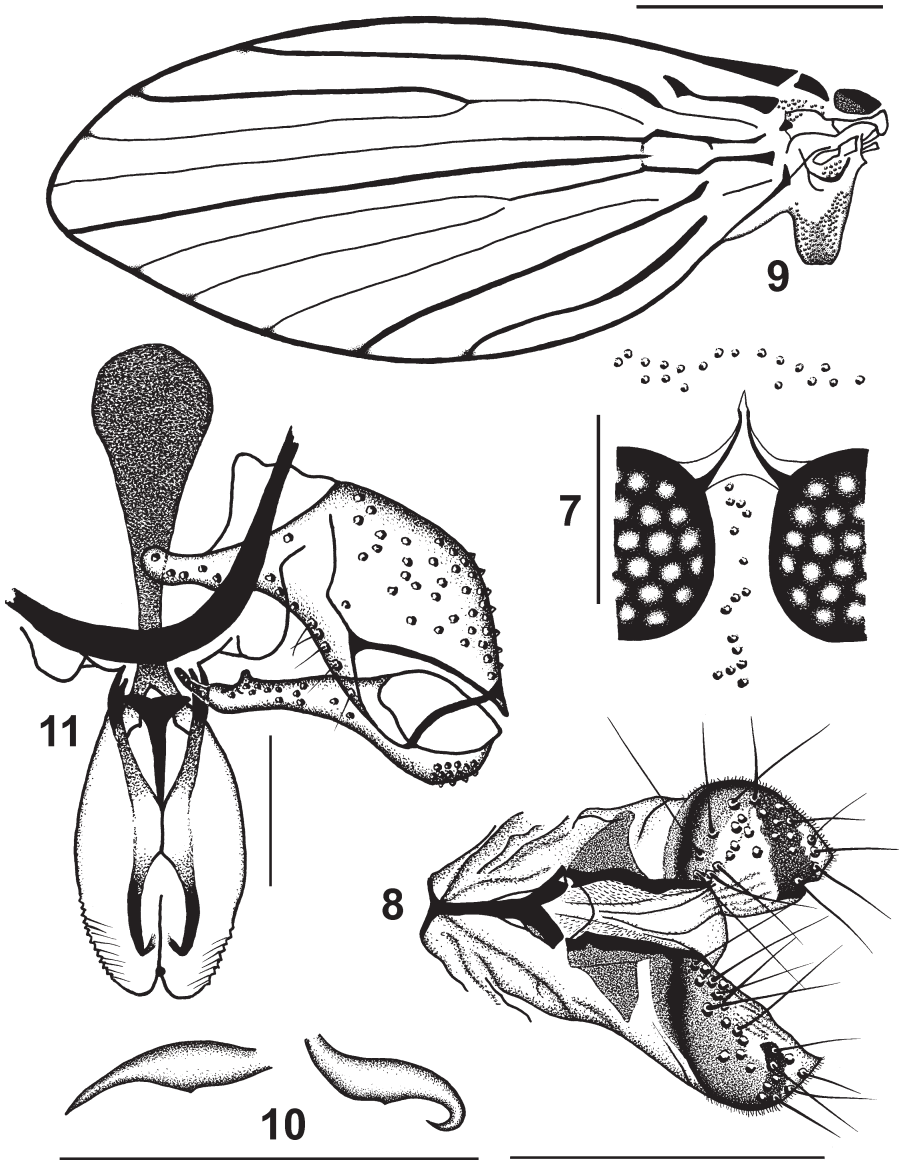
Type material. Holotype: ♂, Armenia, Lori Province near Dzoraget village, tributary of the Pambak River at the H24 road serpentine (Fig. 19), 1030 m a.s.l., 1.ix.2015, SW, J. Oboňa, P. Manko & Ľ. Hrivniak leg. Slide with a dissected specimen, Cat. No. 34708, Inv. No. 22620 (NMPC). Paratypes: 2 ♂♂ (slides, NMPC): The same locality, date and collectors, Cat. No. 34709–34710, Inv. No. 22621–22622 (NMPC). All material J. Oboňa, P. Manko & Ľ. Hrivniak leg. (by sweep netting).

Description. ***Male.*** Head as long as broad (measured without mouth parts, Fig. 1); vertex conically inflated dorsally, with numerous setae alveoli almost regularly spaced over its entire surface. Eyes separated (Figs 1, 7); interocular suture conspicuously sclerotized, inverted V-shaped, sclerotized parts gradually tapering from eyes to median, but not fused medially; the suture is framed by triangular outline with concave ventral margin, extended dorsally to lanceolate apex (Fig. 7); eye bridge formed generally by six facet rows, numbers of facets in more dorsal rows are lower, with dorsal margins of eyes undulated; minimum distance between eyes corresponds roughly to three facet diameters; index of distance from tangential points of eye apices to minimum of frons 8.6, to facet diameter 26.9. Setae alveoli of frontoclypeus arranged in triangular, centrally placed patch near base of antennae, tapering to irregularly arranged and interrupted dorsoventral stripe of hairs below frontal suture (Figs 1, 7). Antenna with 15 articles; scape almost cylindrical (Fig. 2), 2.5 times as long as its maximum width, narrowed at base, somewhat widened apically, with two tapering lobes to which pedicel is jointed; pedicel almost globular, slightly asymmetrical. Flagellomere 1 pear-shaped (as long as three following flagellomeres together), with flagellomere 2 inserted at mid length, with pointed protuberance extending beyond flagellomere 2; postpedicel with six conspicuous, strong bristles arranged in row, inserted in longitudinal axis (Figs 2, 3); scape and pedicel with stiletto-shaped scales in contrast to needle-shaped macrosetae of flagellomeres (Fig. 4); flagellomeres 2–14 ovoid, apical flagellomere twice length of previous one, with conical apiculus in longitudinal axis; ascoids almost straight, needle-shaped, paired, 1.2 times as long as flagellomeres in which they are inserted. Mouthparts extending beyond basal palp segments; length ratio of maxillary palp segments 1.0 : 1.6 : 1.5 : 1.6; apical segment annulated (Fig. 5); terminal labial lobes (Fig. 8) without rows of spines; ratio of maximum length of cibarium (Fig. 12) to length of epipharynx 2 : 1.

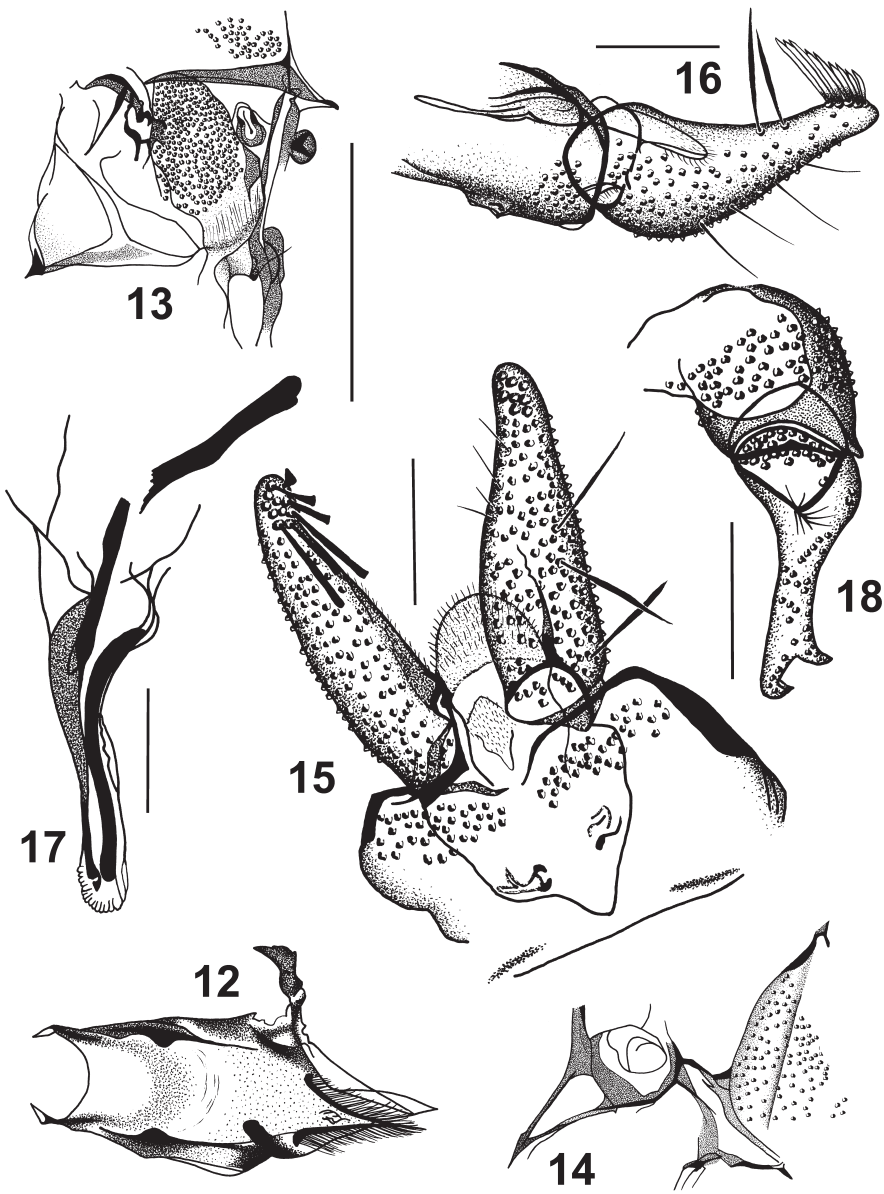
Thorax (Figs 13, 14) with mesothoracic allurement protuberance ovoid, almost flattened, with dense insertions of hairs; with thoracic spiracle inserted anteriorly; spiracle shape reminiscent of savoie biscuit (Fig. 13). Prothoracic allurement organ (patagium, Fig. 13) almost globular, approximately of the same size as spiracle. Anepisternum with triangular setose patch (Fig. 14). Wings (Fig. 9) 3.5 mm long (holotype and both paratypes), well sclerotized, widely lancet-shaped, not enlarged in anal and humeral areas, with rounded apex, slightly clouded by brownish shade; wing membrane bare, mostly without infuscation except for inconspicuous spots at apices of R_1, R_2, R_3, M_1, M_2, M_3, CuA_1, and CuA_2; medial fork (put



Figs 1–6. *Thornburghiella veve* Oboňa & Ježek sp. nov., male. 1 – head, frontal view; 2 – scape, pedicel and flagellomeres 1–4; 3 – flagellomere 1, dorsal view (some bristles omitted); 4 – apical flagellomeres; 5 – maxilla and palpus maxillaris; 6 – haltere, lateral view. Scale: 1, 5, 6 = 0.2 mm; 2–4 = 0.1 mm.



Figs 7–11. *Thornburghiella veve* Oboňa & Ježek sp. nov., male. 7 – frons and facets in detail, frontal view; 8 – terminal lobes of labium; 9 – wing; 10 – tarsal claw of P_1, lateral and diagonal views; 11 – aedegal complex, hypandrium and gonopod, dorsal view. Scale: 9 = 1 mm; 8 = 0.2 mm; 7, 10, 11 = 0.1 mm.



Figs 12–18. *Thornburghiella veve* Oboňa & Ježek sp. nov., male. 12 – cibarium, labrum and epipharynx, dorsal view; 13 – patagium, thoracic spiracle and adjacent sclerites, lateral view; 14 – pteropleurite and insertion of haltere, lateral view; 15 – epandrium and surstyli, dorsal view; 16 – epandrium and surstyli, lateral view; 17 – aedeagal complex, lateral view (ejaculatory apodeme is broken); 18 – gonocoxite and gonostyle, lateral view. Scale: 13 = 0.5 mm; 12, 14 = 0.2 mm; 15–18 = 0.1 mm.

Fig. 19. Photographs of the landscape (left) and detailed view (right) of the type locality of *Thornburghiella veve* Oboňa & Ježek sp. nov. Photo by P. Manko.

back to basal wing cell) incomplete, placed proximally to radial one (BCD 142°, Fig. 9); basal costal nodes distinct, Sc strengthened and thickened on both ends, slightly bent and narrowed at mid-length; the following veins or their parts strengthened: R_1 nearly entire (not in a basal part), R_2, whole R_5 and parts of veins of prolonged basal cell, CuA_1 and CuA_2 for entire length with some differences (the first vein additionally with a thickened basis, half of the second vein conspicuously thickened in contrast to the rest); M_3 and CuA_2 without connection on CuA_1; R_5 extending distally to reach wing margin behind apex of wing; wing index 2.4. Halteres (Fig. 6) spatula-shaped, asymmetrical, with prolonged stem; setae on haltere lance-shaped, thin; ratio of maximum length of halteres to their maximum width approximately 2.8 : 1. Ratios of lengths of femora, tibiae and first tarsal segments: P_1 2.3 : 2.4 : 1.0, P_2 2.4 : 2.8 : 1.3, P_3 2.7 : 3.3 : 1.3; paired tarsal claws of P_1 (Fig. 10) twice pointed (medial point is rudimentary, not conspicuous) and curved distad.

Aedeagal complex (Figs 11, 17) with smooth surface exteriorly (only small distal part is inconspicuously wrinkled), almost oval in dorsal view with apical cleft (Fig. 11), compressed in lateral view (Fig. 17); internal aedeagal structure with T-shaped sclerite proximally and pair of ligaments fused medially (Fig. 11), ended by paired sclerotized ribs proximally and distally. Ejaculatory apodeme spatula-shaped, almost circular proximally, tapering in

Table 1. Comparison of diagnostic characters for males of selected species of *Thornburghiella* from Transcaucasia, Asia Minor and Central Asia.

	T. jankai	*T. kovari*	*T. navoii*	*T. umbrosa*	*T. veve*
Shape of flagellomere l, number of bristles	oval, with conical lateral protuberance, 5 bristles	cylindrical, constricted subapically, 7 bristles	cylindrical, not constricted subapically, 4 bristles	oval, with conical lateral protuberance, 6 bristles	oval, with conical lateral protuberance, 6 bristles (Figs 2, 3)
Wing angle (BCD)	180°	185°	180°	180°	142° (Fig. 9)
Coloration of wing membrane	clear	clouded in fore and hind margin; dark spots at the ending of all veins	clear	more definite dark spots at the ending of all veins, not in Sc	not patterned, tinge spots at the ending of all veins, not R_4 and R_5 (Fig. 9)
Aedeagal structures	with a skittle--shaped sclerite proximally and a pair of basally sclerotized ligaments, fused in the middle, distally inconspicuous	J-shaped, paired, prolonged, with conspicuous sclerotized hooks out of parameral sheath	mace-shaped, sclerotized, similar to stone fruit in a cross-section: pit and pulp in medial part of spatula	harpoon-shaped, sclerotized, with five spikes directed caudally and two spurs bent back proximally	T-shaped sclerite in basal part and a pair of ligaments fused in the middle (Fig. 11), ended by paired sclerotized ribs proximally and distally
Ventral plate of epandrium	missing (not detected)	triangular, lateral sides strangulated, free protuberances distally	V-shaped with thickened arms	missing (not detected)	equilateral triangular, inconspicuously marked (Fig. 15)
Tenacula, number and shape	10, pointed	26, frayed	18, pointed	10, pointed	9–11, pointed (Figs 15, 16)

middle and divided distally (Fig. 11); apodeme not quite straight in lateral view, narrow (Fig. 17). Gonocoxites almost cylindrical, only slightly inflatedat mid-length (Figs 11, 18), 1.2 times as long as gonostyli, both parts haired. Gonostyli slightly sinuous in dorsal view, bulky basally, tapering to apex, with apical ¼ bifurcated (Figs 11, 18). Epandrium (Figs 15, 16) not bare (see two divided areas of insertions of hairs distally), with posterior margin emarginate; basal, paired apertures conspicuous, separated, with irregular margins; ventral epandrial plate almost entirely reduced (Fig. 15), equilateral triangular, only inconspicuously marked in a rough outline. Hypandrium narrow, slightly lengthened at median, bare (Fig. 11). Epiproct inconspicuous, setose, almost rhomboidal; hypoproct conspicuous, setose, tongue-shaped, rounded apically (Figs 15, 16). Surstyli approximatelly C-shaped in lateral view (Fig. 16), almost straight in dorsal view (Fig. 15), widened in basal two thirds, divergent in dorsal view, 1.6 times as long as epandrium, without apices bifurcated, subapically with cluster of 9–11 tenacula inserted; tenacula gradually shortening in length

from those inserted more basally to those inserted more apically (Fig. 16), with their apices pointed, not frayed; longest tenacula twice as long as diameter of surstylus (as measured exactly below the cluster of tenacula).

Female. Unknown.

Differential diagnosis. Important diagnostic characters of five species from Transcaucasia, Asia Minor and Central Asia, are compared in the Table 1. This includes *Thornburghiella jankai* Ježek, 1992 from Turkey, Anatolia; *T. kovari* Ježek, 1993 from Tajikistan; *T. navoii* from Kazakhstan; *T. umbrosa* Ježek, 1992 from Uzbekistan, and *T. veve* sp. nov. from Armenia. Selected diagnostic characters detailed in the table are as follows: shape of flagellomere 1 and number of bristles, wing angle (BCD), patterns of wing membrane, aedeagal structures, shape of ventral plate of epandrium, and number and shape of tenacula.

Etymology. The new species name is dedicated to the daughter of the first author, whose nickname Veve is derived from her name Veronika; noun in apposition.

Biology. Unknown. Adults were collected near a small tributary of a mountain river, at an elevation greater than 1000 m.

Distribution. Currently recorded only from Armenia.

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