



Two new species of *Trigonotylus* (Hemiptera: Heteroptera: Miridae: Stenodemini) from western Canada and northwestern United States

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Abstract

Two new species of stenodemine Miridae from western Canada and the United States are described. *Trigonotylus exilis* n. sp. from British Columbia to northern California and Utah, and *T. setosus* n. sp. from northern British Columbia, Yukon Territory, and adjacent northern Northwest Territories and Alaska are documented. A key to the species of *Trigonotylus* from this study region is provided to allow identification of the included fauna. Host plant species are identified. Lactic acid is proposed as an alternative to potash as a dissection medium for male genitalia.

Key words: Hemiptera, Heteroptera, Miridae, Stenodemini, *Trigonotylus*, new species, Canada, key

Introduction

Further research on collections of Canadian Heteroptera has resulted in the discovery of two new species of *Trigonotylus* Fieber, 1858 from western Canada and the United States. The systematics of *Trigonotylus* is well established (Schwartz, 2008) and the taxonomy is presented in revisions, including keys to species, for the world (Carvalho and Wagner, 1957), China (Zheng, et al. 2004), Palearctic Region (Golub, 1989), and North America (Kelton, 1970, 1971). The new species described herein can not be accommodated under any known species construct.

A key to species of the Yukon Territory, British Columbia, adjacent Northwest Territories and Alaska, as well as the northwestern United States is included and the new species are diagnosed, and described with the male genitalia, and the dorsal habitus is documented by photographs and line illustrations.

Material and methods

Collection and museum abbreviations used in the text are as follows: AMNH—American Museum of Natural History, New York, NY (R.T. Schuh); CNC—Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa, ON (R.G. Foottit); RBCM—Royal British Columbia Museum, Victoria, BC (R.A. Cannings); UBC—Spencer Entomological Collection, Beaty Biodiversity Museum, University of British Columbia, Vancouver, BC (K.M. Needham); and USNM—National Museum of Natural History, Smithsonian Institution, Washington, DC (T.J. Henry); WSU—Washington State University, Pullman, WA (R.S. Zack). The distribution map was created using SimpleMapp (Shorthouse, 2010).

It is standard practice to dissect male mirid genitalia in 10% NaOH or KOH (see Forero, 2008 for a summary of this technique). Instead all the dissections for this project were prepared using lactic acid as follows. The entire abdomen was removed and placed in a depression of a CoorsTek 60427 spot plate. Approximately 15 drops of full strength 85% lactic acid and 10 drops of distilled H₂O were then added to the depression. The spot plate was placed

on a small electric heater at low heat, with the temperature of the liquid kept below the boiling point until the muscles and cuticle of the abdomen soften and could be manipulated with forceps. After about five minutes of heating and manipulation leaving the contents of the abdomen mostly liquefied and the endosoma, in a majority of the preparations, was then inflated, projecting beyond the pygophore (Figs. 1J–K). The genitalic segments of the abdomen could be removed from the depression and the spot plate can be transferred back and forth from the heater with additional drops of lactic acid and distilled H₂O added to compensate for evaporation. At this point most endosoma will usually be inflated. The preparation is finally washed in distilled water and ethanol. The endosoma will usually achieve further inflation while it is observed in ethanol. The lactic acid is not as caustic as potash thus allowing repeated treatment without destroying the structures of the genitalia.

Taxonomy

Key to species of *Trigonotylus* from British Columbia, Yukon, adjacent Northwest Territories and Alaska, and the northwestern United States

1. Hind tibia strongly pilose *longipes* Slater and Wagner
- Hind tibia not strongly pilose 2
2. Antennal segment I thickened (Fig. 1B) *antennatus* Kelton
- Antennal segment I slender (Figs. 1A, C–G) 3
3. Antennal segment I dark, often completely dark brown to black; if segment I dark with pale mediodorsal stripe practically spanning full length of segment, than setae fine (Figs. 1E–F) 4
- Antennal segment I pale, usually pale yellowish green or greenish brown to darker orange brown, often with indistinct reddish brown to brown stripes on apical region that reach beyond the midpoint of the segment; sometimes with three distinct red to reddish brown longitudinal stripes; if segment I slightly darkened with pale mediodorsal stripe practically spanning full length of segment, than setae stiff (Figs. 1A, C, E, G) 6
4. Antennal segment I less than length of pronotum; segment II short (1.33–1.57 in males and 1.47–1.83 in females); endosomal spicule short and straight (Fig. 2) *brooksi* Kelton
- Antennal segment I equal to or longer than length of pronotum; segment II long (2.10–2.50 in males and 2.23–2.65 in females); endosomal spicule either long and straight or long and gently twisted (Figs. 1J–K, 2) 5
5. Antennal segment I with fine moderate length brown, suberect setae (Fig. 1D); endosomal spicule straight (Figs. 1J, 2) *exilis* **sp. n.**
- Antennal segment I with coarse or stout moderate length black suberect setae; (Fig. 1F) endosomal spicule gently twisted (Figs. 1K, 2) *setosus* **sp. n.**
6. Endosoma without spicule and with field of spines basal to secondary gonopore; antennal segment I with three red to reddish brown longitudinal stripes (Fig. 1C); labium longer than 1.7 mm [does not apply in Yukon Territory]; apex of clypeus rather pointed in dorsal view *caelestialium* (Kirkaldy)
- Endosoma with spicule and either with or without field of spines basal to secondary gonopore (Fig. 2); antennal segment I without three reddish stripes; possibly diffusely red or reddish brown with pale mediodorsal stripe, or with diffuse reddish brown apical crown (Figs. 1A, G); labium less than 1.7 mm [does not apply in Yukon Territory]; apex of clypeus narrow or slightly rounded in dorsal view 7
7. Endosomal spicule small and twisted (Fig. 2); body length short (3.80–4.50 in males and 4.18–5.30 in females); antennal segment I short (0.56–0.65 in males and 0.56–0.78 in females), pale green with contrasting black setae (Fig. 1E, distal segments yellowish orange; female with hemelytral membrane usually not surpassing proctiger *flavicornis* Kelton
- Endosomal spicule either large and curved or small and straight with apex somewhat expanded (Fig. 2); body length long (4.70–6.10 in males and 5.50–7.10 in females); antennal segment I long (0.60–0.86 in males and 0.60–0.94 in females) with variable coloration and setae (Figs. A, G); remaining segments with variable coloration; female with hemelytral membrane usually surpassing proctiger 8
8. Endosoma with long curved spicule, without field of spines basal to secondary gonopore (Fig. 2); Antennal segment I with stiff black setae (Fig. 1G); antennal segment II, distal portion of hind tibia, and tarsomeres I and II usually not suffused with red *viridis* (Provancher)
- Endosoma with short straight spicule, with field of spines basal to secondary gonopore (Fig. 2); antennal segment I with finer black setae (Fig. 1A); antennal segment II, distal portion of hind tibia and tarsomeres I and II usually suffused with red *americanus* Carvalho

***Trigonotylus exilis* sp. n.**

(Figs. 1D, H, J, 2, 3)

Diagnosis. Coloration of antennal segment I similar to *T. brooksi* Kelton, but in *T. exilis* the segment I is 1.2 to 1.3 times the pronotal length, whereas in *T. brooksi* segment I is less than the pronotal length. Also, in *T. exilis* antennal segments II and III are clearly thickened, with average length of segments II and III 1.40 and 1.31 mm respectively in the male, and 1.75 and 1.57 respectively in the female. In *T. brooksi* antennal segments II and III are longer and slender, and not at all thickened, with the average length of segments II and III 2.26 and 2.10 respectively in the male, and 2.40 and 2.30 respectively in the female. Additionally, antennal segments II and III are distinctly reddish-brown in *T. exilis* but are orange in *T. brooksi*. The dark antennal segment I will usually distinguish *T. exilis* from the sympatric *T. americanus*. In some specimens of *T. exilis*, the antennal segment I is relatively pale; however, the segment is usually reddish brown in *T. americanus* and the endosomal spicules of these two both species are diagnostic.

Description. *Male.* Total length 5.55 (4.70–6.00). COLORATION: Head pale green with longitudinal black line medially and vague black longitudinal line adjacent to each eye; antennal segment I black or dusky with inner margin pale (Fig. 1D), antennal segments II and III dull red. Pronotum pale green with double longitudinal fuscous line medially, and single longitudinal black line on each side medio-laterally; scutellum greenish yellow, with longitudinal fuscous lines contiguous with those on pronotum; centre of propleura slightly dusky. Hemelytra pale yellowish-green, with clavus somewhat dusky. Legs yellowish brown with tarsi dusky. Venter pale yellowish-green. STRUCTURE: Clypeus prominent, but rounded anteriorly; frons elevated well above clypeus; eye almost spherical. Antennal tubercle removed from eye by about width of base of antennal segment II; antennal segment I appearing virtually glabrous, and 1.2 to 1.3 times length of pronotum; antennal segments II and III long and slender; labium extending to base of hind coxae; hind tibia not strongly pilose. *Genitalia*—Endosoma with long straight spicule (Figs. 1J, 2), left paramere as in figure 2. MEASUREMENTS: Head width 0.72 (0.68–0.75); vertex width 0.38 (0.33–0.43); antennal measurements 0.77 (0.70–0.85): 2.26 (2.10–2.50): 2.10 (2.00–2.28): 0.68 (0.65–0.75); labial length 1.52 (1.50–1.55); pronotal width 0.90 (0.80–0.98); pronotal length 0.55 (0.50–0.60).

Female. Total length 6.44 (6.35–6.70). COLORATION: Similar male but paler and head with single medial fuscous streak; antennal segment I pale; antennal segments II and III reddish brown. Pronotum and scutellum pale green with double medial longitudinal fuscous line lateral fuscous streaks if present quite vague. STRUCTURE: Antennal segment I with very short, fine, sparse decumbent pubescence, appearing almost glabrous. MEASUREMENTS: Head width 0.78 (0.77–0.80); vertex width 0.45 (0.44–0.48); antennal measurements 0.90 (0.88–1.00): 2.40 (2.35–2.65): 2.30 (2.23–2.40): 0.74 (0.68–0.80); labial length 1.76 (1.73–1.80); pronotal width 1.08 (1.05–1.15), pronotal length 0.73 (0.68–0.78).

Holotype: ♂, CANADA: **British Columbia:** Venables Vly. Rd. entrance, Hwy. 97, 23.vi.1996 (G.G.E. Scudder), deposited in the Canadian National Collection of Insects, Ottawa [CNC].

Paratypes: CANADA: **British Columbia:** 1♂, 7 mi. E. Ind. Res., Oliver, 8.vii.1959 (L.A. Kelton) [CNC]; 1♂ 1♀, Anarchist Mt., Osoyoos, 6.vii.1959 (R. Madge) [CNC]; 1♀, Anarchist Mt., nr. Osoyoos, 2000 ft, No. 325, 13.vi.1954 (N. Anderson) [CNC]; 1♂, Carquille rest area, 7.vii.1982 (G.G.E. Scudder) [CNC]; 14♂ 24♀, Christina Lk. 12.vii.1970 (L.A. Kelton) [AMNH; CNC; USNM]; 1♂, Cranbrook, *Pinus ponderosa*, 23.vii.1959 (L.A. Kelton) [CNC]; 2♀, Fairview, White L., 11.vi.1994 (G.G.E. Scudder) [CNC]; 1♂, Fairview, White L., SATH habitat, SWm, BGxh1, pan trap WL P-10, 13.vi–20.vi.1995 (J. Jarrett) [UBC]; 2♀, Fairview, White L., 29.vi.1996 (G.G.E. Scudder) [UBC]; 5♀, Fairview, White L., big sage assoc., BGxh1, SWm, 7.vii.1996 (G.G.E. Scudder) [UBC]; 1♂ 1♀, Kamloops, 29–31.vii.1954 (G.J. Spencer) [UBC]; 2♂, Kelowna, 14.vii.1950 (B.P. Beirne) [CNC]; 1♂, McIntyre Cr., Oliver, 4.vii.1959 (L.A. Kelton) [CNC]; 1♂, Merritt, 10.vii.1963 (G.G.E. Scudder) [CNC]; 1♀, OK Falls, 8.vii.1974 (L.A. Kelton) [CNC]; 1♀, Oliver, 27.vi.1959 (L.A. Kelton) [CNC]; 1♀ 3♀, Osoyoos, Anarchist Mt., 13.ii.1970 (L.A. Kelton) [CNC]; 1♀, Osoyoos, Haynes Ecol. Res., sweeping *Hesperostipa comata* ssp. *comata*, 2.vi.1994 (G.G.E. Scudder) [UBC]; 1♂, Osoyoos, Mt. Kobau, PPxh1, WAw, pitfall trap K1-2, 14.vi–9.vii.1995 (J. Jarrett) [UBC]; 1♂ 1♀, Princeton, Old Hedley Rd., 4.5 km E, 14.vii.1991 (G.G.E. Scudder) [CNC]; 1♂ 1♀, Quilchena, 29.viii.1962 (G.G.E. Scudder) [UBC]; 1♂ 1♀, Soda Cr., 16.vi.1963 (G.G.E. Scudder) [UBC; CNC]; 1♂, *id.*, 8.vii.1949 (R. Stace-Smith) [CNC]; 2♂ 4♀, Summerland, 10.vii.1975 (L.A. Kelton) [CNC]; 1♂, *id.* [Scudder Coll.]; 3♂ 7♀, Summerland, Ag. Canada Stn., 29.vi.1990 (R.A. Cannings, H. Nadel) [RBCM]; 2♂ 2♀, Vaseux L., 4.vi.1961 (G.G.E. Scudder) [Scudder Coll.; UBC]; 2♀, Vaseux L., CWS Reserve, *Purshia* assoc., BGxh1, AN:F,

7.vii.1996 (G.G.E. Scudder) [UBC]; 1♂ 1♀, Vaseux L., Wildlife Reserve, 8.vii.1997 (G.G.E. Scudder) [CNC; UBC]; 3♂ 2♀, same data as holotype [CNC; Scudder Coll.]; 2♂ 1♀, Walhachin, 15.vi.1963 (G.G.E. Scudder) [CNC; UBC]; 1♂, Westbank, 30.vi.1955 (Wilson, Wakefield) [CNC]; 1♀, Westwick L., Cariboo, 23.vi.1961 (G.G.E. Scudder) [UBC]; 1♂ 2♀, White Lake, Oliver, 29.vi.1959 (L.A. Kelton) [CNC]; 5♂ 1♀, White Lake, Okanagan Falls, 30.vi.1990 (R.A. Cannings, H. Nadel) [RBCM]. UNITED STATES: **California:** *Lassen Co.:* 9♂ 5♀, Susanville, “muridacon grass” (Poaceae), 17.vi.1959 (L.A. Kelton) [CNC]. *Modoc Co.:* 2♂, 24.7 mi NW of Canby, 41.69638°N 121.20732°W, 1375 m, 01 Jul 1979 (R.T. Schuh and B.M. Massie) (AMNH). *Siskiyou Co.:* 1♂, 2 mi SW of Lava Beds National Monument, Medicine Lake Road, *Pseudoroegneria spicata* ssp. *spicata* (Poaceae), 26.vi.1979 (M.D. Schwartz) [AMNH]; 1♂, 3♀, 4 mi NW of Lava Beds National Monument Headquarters, *Pseudoroegneria spicata* ssp. *spicata* (Poaceae), 26.vi.1979 (M.D. Schwartz) [AMNH]. **Oregon:** *Crook Co.:* 1♂ 1♀, Ochoco National Forest, T14S R18E S11, *Achnatherum thurberianum* (Poaceae), 22.vi.1979 (M.D. Schwartz) [AMNH]. *Klamath Co.:* 1♂, 7 mi E of Bly, Poaceae, 21.vi.1980 (P.W. Oman) [AMNH]. *Lake Co.:* 4♂ 6♀ 11 mi NW of Silver Lake on Hwy 31, *Pseudoroegneria spicata* ssp. *spicata* (Poaceae), 25.vi.1979 (M.D. Schwartz) [AMNH]; 4♂ 4♀, 11 mi N of Silver Lake, 25.vi.1979 (R.T. Schuh) [AMNH]. *Wheeler Co.:* 1♀, 2 mi W of Mitchell on Hwy 26, *Pseudoroegneria spicata* ssp. *spicata* (Poaceae), 22.vi.1979 (M. D. Schwartz) [AMNH]; 2♂ 2♀, *id.*, *Pseudoroegneria spicata* ssp. *spicata* (Poaceae), 22 Jun 1979 (R.T. Schuh) [AMNH]; 1♂ Mitchell, *Ericameria nauseosa* (Asteraceae), 22.vi.1979 (M.D. Schwartz) [AMNH]. **Utah:** *Cache Co.:* 10♂ 22♀, Blacksmith Fork Canyon, on UT State route 101, 02.vii.1981, *Pseudoroegneria spicata* ssp. *spicata* (Poaceae) (M.D. Schwartz) [AMNH]; 8♂ Green Canyon Trail, Poaceae, 27.vi.1980 (M.D. Schwartz) [AMNH]. **Washington:** *Benton Co.:* 3♂ 4♀ Hanford Site ALE, dirt rd off of 1200 Ft. Rd, 46.40766°N 119.55765°W, 19.vi.1995 (R.S. Zack) (WSU); 1♀ Hanford Site ALE, radio telescope, 46.39248°N 119.58541°W, 06.iv.1995 (R.S. Zack) (WSU).

Etymology. Named in reference to the thin and slender body conformation, *exilis*, Latin.

Hosts. The species of *Trigonotylus* feed on grasses or sedges exclusively. The documented hosts of *T. exilis* are all grasses (Poaceae)—Thurber's needlegrass, *Achnatherum thurberianum* (Piper) Barkworth; needle and thread, *Hesperostipa comata* ssp. *comata* (Trin. & Rupr.) Barkworth [formerly *Stipa comata*]; and bluebunch wheatgrass, *Pseudoroegneria spicata* ssp. *spicata* (Pursh) A. Love. A number of specimens was also collected on unidentified species of Poaceae. We consider the two specimens taken on rubber rabbitbrush, *Ericameria nauseosa* (Pall. ex Pursh) G.L. Nesom & Baird (Asteraceae) and ponderosa pine, *Pinus ponderosa* C. Lawson (Pinaceae) as sitting records.

Distribution. Figure 3. In the intermountain grasslands from Soda Creek to Osoyoos in the arid southern interior of British Columbia and east of the Cascade Range in the United States from Hanford, Washington south to Lassen County, California and in apparent disjunct populations of Wasatch Range of Cache County, Utah.

Trigonotylus setosus sp. n.

(Figs. 1F, I, K, 2, 3)

Diagnosis. Distinguished from *T. viridis* (Provancher) by the darker color, including the fuscous antennal segment I in the male, as well as by the longer, more sparsely distributed semi-erect setae on the latter (viz., Figs. 1F and 1G). The longer antennal segment I with longer stout setae will distinguish *T. setosus* (Fig. 1F) from *T. flavicornis* (Fig. 1G) which also has a twisted endosomal spicule; the latter species has a shorter segment I with short suberect setae (Figs. 1K, 2).

Description. *Male.* Total length 5.44 (4.70–6.00). COLORATION: Head black, with two pale flavescent spots on post-vertex; mandibular plates pale; antennal segment I dark brown to black (Fig. 1F), segments II and III reddish brown to almost black; labium flavo-ochraceous with brown apex. Pronotum rather fuscous with lateral margins broadly pale, a narrow central longitudinal pale line, and with vague pale medio-lateral streaks; scutellum rather fuscous with narrow central longitudinal pale line and with pale patches medio-laterally. Hemelytra flavescent with clavus and medial areas of corium rather dusky. Legs pale flavescent with femora quite dusky, and tibia almost black. Venter pale flavescent with pleura medially dusky, and with posterior segments of abdomen and pygophore almost black. STRUCTURE: Frons elevated well above clypeus, with latter rounded anteriorly; antennal segment I with rather scattered, short, semi-erect setae, these set at 45° with segment surface (Fig. 1F); labium reaching to middle coxae. *Genitalia*—Endosoma with moderately long curved spicule (Figs. 1K, 2); left paramere as in figure 2. MEASUREMENTS: Head width 0.72 (0.70–0.78); vertex width 0.41 (0.40–0.43); antennal mea-

surements 0.76 (0.70–0.83): 2.27 (2.15–2.38): 2.00 (1.85–2.30): 0.53 (0.50–0.55); labial length 1.64 (1.60–1.70); pronotal width 1.10 (1.05–1.15); pronotal length 0.60 (0.50–0.65).

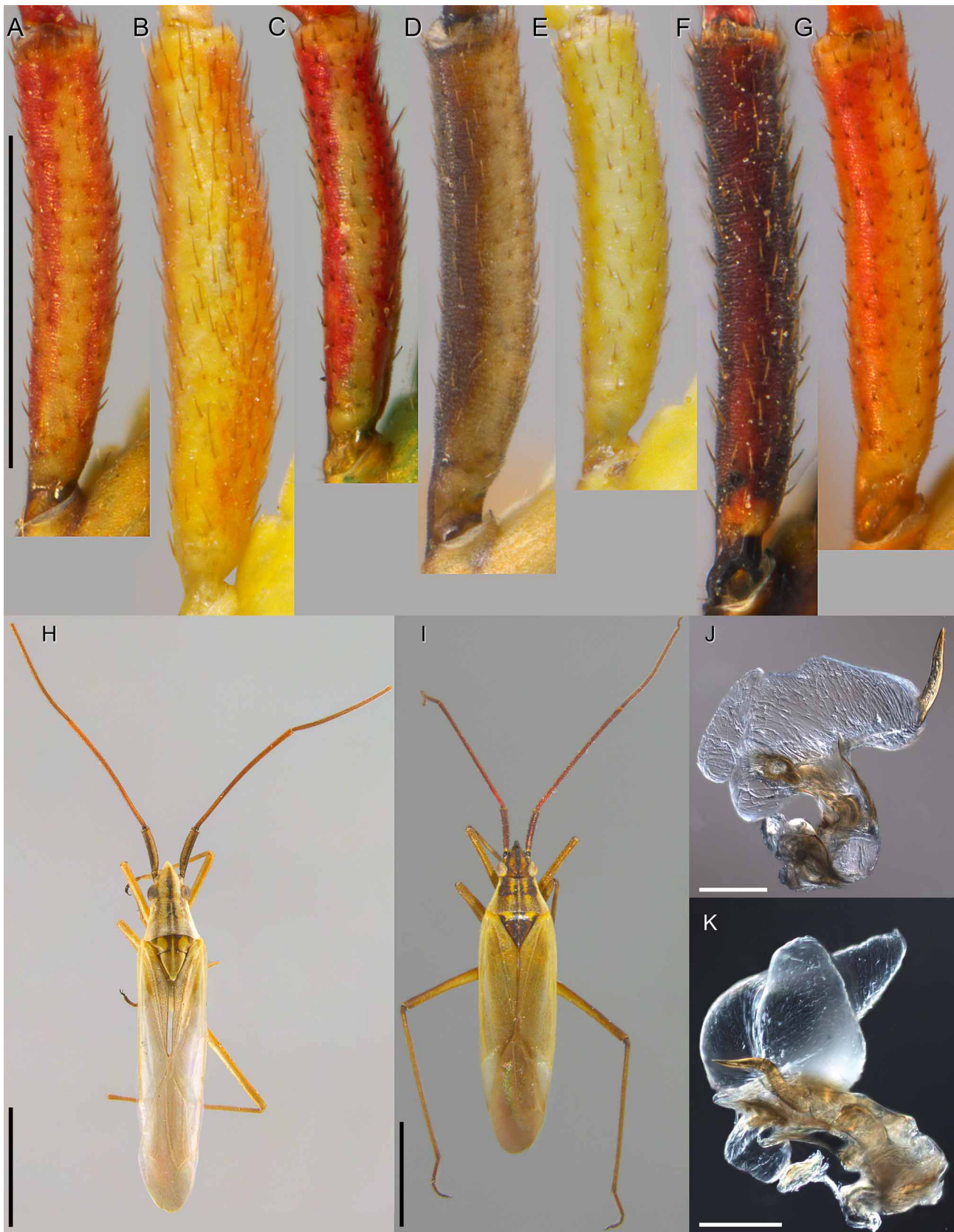


FIGURE 1. *Trigonotylus* species. A–G. Antenna, dorsal view, scale = 0.5 mm. A. *T. americanus*. B. *T. antennatus*. C. *T. caelestialium*. D. *T. exilis*. E. *T. flavicornis*. F. *T. setosus*. G. *T. viridis*. H–I. Dorsal habitus, scale = 2.0 mm. H. *T. exilis*. I. *T. setosus*. J–K. Endosoma, left lateral view, scale = 0.2 mm. J. *T. exilis*. K. *T. setosus*.

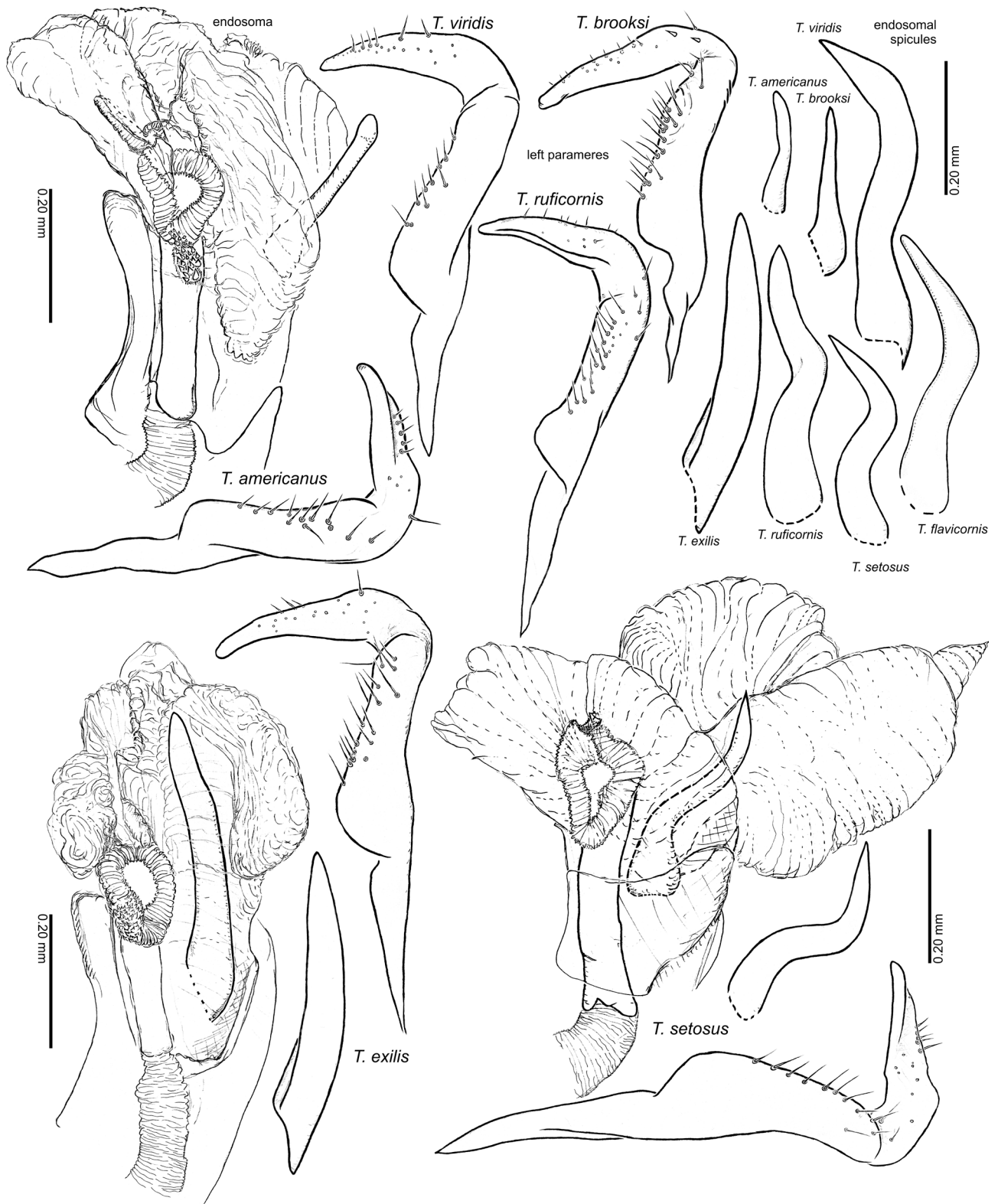


FIGURE 2. Male genitalia of *Trigonotylus* species.

Female. Total length 6.15 (5.80–6.45). COLORATION: Similar to male, but with antennal segment I pale flavo-ochraceous to red; antennal segments II–IV pale, often with reddish tinge. Head flavo-ochraceous with median longitudinal brown sulcus on vertex. Body pale yellowish dorsally with little fuscous markings, usually no more than vague brownish longitudinal lines on each side of midline on pronotum and scutellum, and with vague medio-lateral fuscous stripes on pronotum. Legs flavo-ochraceous with terminal two tarsomeres dark brown to

black. MEASUREMENTS: Head width 0.79 (0.75–0.83); vertex width 0.50 (0.45–0.53); antennal measurements 0.82 (0.75–0.90): 2.33 (2.23–2.43): 2.06 (1.88–2.12): 0.56 (0.50–0.60); labial length 1.88 (1.80–2.00). Pronotal width 1.27 (1.15–1.40), pronotal length 0.68 (0.63–0.73).

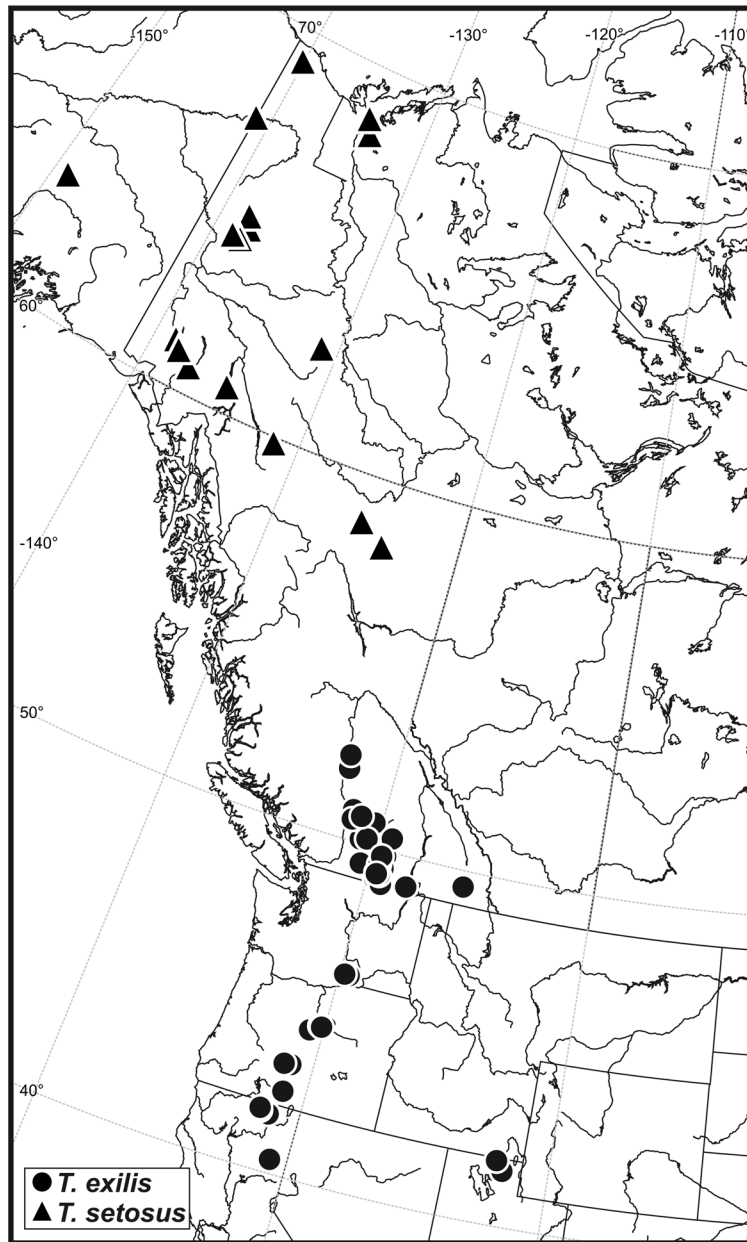


FIGURE 3. Distribution of *Trigonotylus exilis* and *T. setosus*.

Holotype: ♂, CANADA: **Yukon Territory:** Whitehorse, swept from grass, 16.vii.1982 (L.A. Kelton), deposited in the Canadian National Collection of Insects, Ottawa [CNC].

Paratypes: CANADA: **British Columbia:** 2♀, Atlin, 14.vii.1955 (H. Huckel) [CNC]; 1♂ 1♀, Atlin, 3000', 26.vii.1955 (H.J. Huckel) [CNC]; 1♀, Atlin, 2200', 30.vii.1955 (B.A. Gibbard) [CNC]; 1♂ 1♀, *id.*, 31.vii.1955 [CNC]; 1♀, Liard Hot Spring, mi 496 Alaska Hwy, 9.vii.1959 (R. E. Leech) [CNC]; 2♂ 1♀, Summit L., Mi. 392, Alaska Hwy., 4500', 2–4.vii.1959 (E.E. MacDougall) [CNC]; 1♀, *id.*, 1500', 9–10.vii.1959 (R.E. Leech) [CNC]; 1♂ 2♀, *id.*, 4200', 19–21.viii.1959 (E.E. MacDougall) [CNC]; 1♂, *id.*, ex grass & *Epilobium*, 19–21.vii.1959 (R.E. Leech) [CNC]. **Northwest Territories:** 4♂ 4♀, Inuvik, sedge, 25.vii.1983 (L.A. Kelton) [CNC]; 1♂, Reindeer Depot, Mackenzie Delta, 12.vii.1948 (J.R. Vockeroth) [CNC]; 2♀, *id.*, (W.J. Brown) [CNC]; 2♂ 2♀, *id.*, 13.vii.1948 (W.J. Brown) [CNC]; 1♂, *id.*, 14.vii.1948 (J.R. Vockeroth) [CNC]; 2♂, *id.*, 17.viii.1948 (J.R. Vockeroth) [CNC]. **Yukon Territory:** 1♂, 3♀, Alaska Hwy. Mile 1098.5, Duke R., 3.vii.1974 (G.G.E. Scudder) [Scudder]

Coll., UBC]; 1♂, Dempster Hwy. Mi 87, 4–8.viii.1973 (G. & D.M. Wood) [CNC]; 2♂ 1♀, Dempster Hwy., Engineer Cr., 27.vii.1983 (L.A. Kelton) [CNC]; 17♂ 1♀, Dempster Hwy., Tombstone, 27.vii.1983 (L.A. Kelton) [AMNH, CNC, UBC, USNM]; 1♀, Destruction Bay, 26.vii.1982 (L.A. Kelton) [CNC]; 4♂ 12♀, Firth River, 3.viii.1956 (R.E. Leech) [CNC]; 7♂ 14♀, Haines Jct., 28.vii.1982 (L.A. Kelton) [AMNH, CNC, UBC, USNM]; 2♂, North Fork Pass km 64 Dempster Hwy., 64°27'N 138°14'W, 21.vii.1982 (G.G.E. Scudder) [CNC]; 1♀, Rampart House, 17.vii.1951 (J.E.H. Martin) [CNC]; 1♂, “Sheldon Pass”, 62°44'N 131°01'W, 4.viii.1986 (S.G. Cannings) [UBC]; 1♂, same data as holotype [CNC]. UNITED STATES: **Alaska:** *Denali Co.:* Mount McKinley National Park, #4 1730 ft, 27.vii.1957 (G.W. Byers and party) [CNC] 3♂.

Etymology. Named to reference the antennal segment I with bristly stout erect setae, setosus, Latin.

Hosts. No specimens were collected on a documented plant species. Records indicate that probable hosts are unidentified species of sedge, *Carex* (Cyperaceae) and grasses (Poaceae). The only specimen taken on *Chamerion* sp. [perhaps fireweed, formerly *Epilobium*] (Onagraceae) is considered a sitting record.

Distribution. Figure 3. In Canada known mostly from the formerly glaciated areas of the Yukon Territory with additional specimens taken in adjacent far northwestern Northern Territories and northern British Columbia. In the United States found at low elevation in Denali National Park, Alaska.

Discussion. There are specimens of *T. viridis* taken from the same collecting event as *T. setosus*. In these specimens the antennal segment I have faint red streaks, where as the antennal segment I of *T. setosus* is uniformly dusky.

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