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**SMINTHURUS MENCENBERGAE, NEW SPECIES FROM CANADA
AND MICHIGAN (COLLEMBOLA: SMINTHURIDAE)**

Richard J. Snider¹

ABSTRACT

A new species, *Sminthurus (Sminthurus) mencenbergae* Snider, is described from Canada and Michigan.

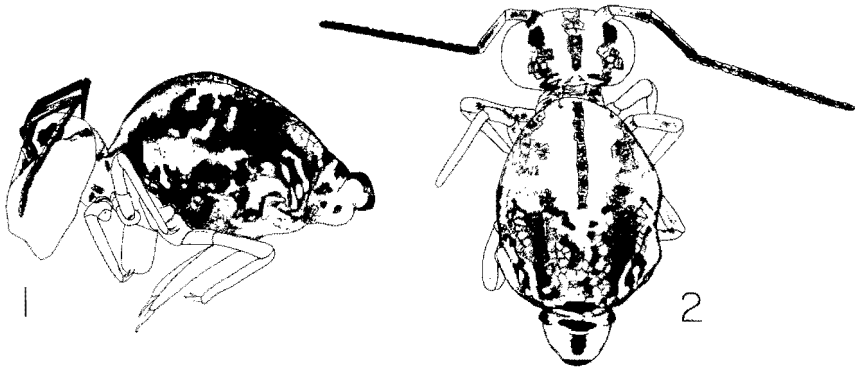
During the summer of 1960 I collected a single specimen of what, 23 years later, could be confirmed as a new species. While sweeping roadside grass in St. Clair County, Michigan, a colorful specimen of *Sminthurus* was taken. Repeated sweeps in the area did not yield additional individuals. The habitat was a dried pond that had grown grassy. It was an overcast day, with a temperature of approximately 22°C. In the summer of 1982 a student, Lisa Mencenberg, enrolled in a class that visited the mountain regions of the northwestern United States and Canada. She collected Collembola from tall vegetation. Among the specimens returned to my laboratory was the species I had taken in Michigan 22 years earlier. The purpose of this paper is to describe that new species.

Sminthurus mencenbergae, new species

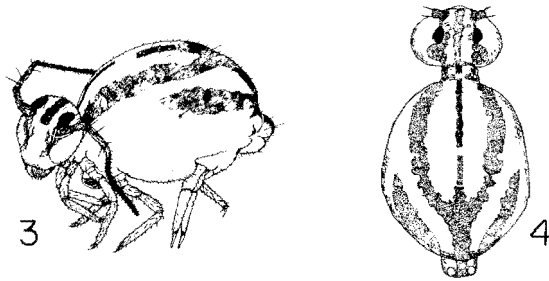
COLOR AND PATTERN (female): (Figs. 1–2). Background creamy white. Color distributed as polygons. Head with purple dorso-medial stripe extending from behind the eyepatches to frons, ending in line with the bases of the antennae; short, irregular patches of purple-brown below antennal bases, gradually fading into light purple on lower third of frons, with lacunae and dots; genae with median cluster of light purple-brown polygons; antennae uniformly purple brown, becoming darker distally. Body with dark purple dorso-medial stripe originating on anterior of abdomen and ending ½ its length; dark purple paramedial stripes forming on posterior of abdomen, becoming abruptly lighter at midpoint and extending to thoracic segments; lateral oblique, dark purple stripe ending at a line with terminus of mid-dorsal line, irregular patches of purple-brown forming a broad continuation of stripe to thoracic region; abdominal segment V with dark macula surrounding base of bothriothrix, with dark purple dorsally; abdominal segment VI with dorsal dark purple patch, and terminal dark purple patch. Legs light purple, with few lacunae and dots, darkest distally. Furcula light, with light purple-brown distally on manubrium and dens, mucrones darkest. The Michigan specimen (Figs. 3–4) differs from Canadian in color and markedly defined pattern. Head mid-dorsal stripe is orange, blending to olive brown; subocular pattern blackish-olive; oral region orange. Body with a broken dorso-medial stripe ending at midpoint of abdomen, anal segments dark olive black.

HEAD: Eyes 5–8 with dark pigment; ocellus D ½ diameter of A (Fig. 5). Antennal segment ratio 1:2:3:7; ANT IV with 17 subsegments, lateral apical papilla, sense setae and no bulb, subsegments with or without fine setulae in the following distribution: I, II and XVII with none, III-2, IV-1, V-VIII-2, VIII-1, IX-X-2, XI-1, XII-XIV-2, XV-1, XVI-2 (Fig. 6); ANT III with 8 heavy, outstanding setae (Fig. 7), subapical sensillae in deep invagination, accessory seta short, lanceolate and lying in a shallow depression (Fig.

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Figs. 1-2. *Sminthurus mendenbergae*; 1. Habitus, holotype, lateral view; 2. dorsal view.

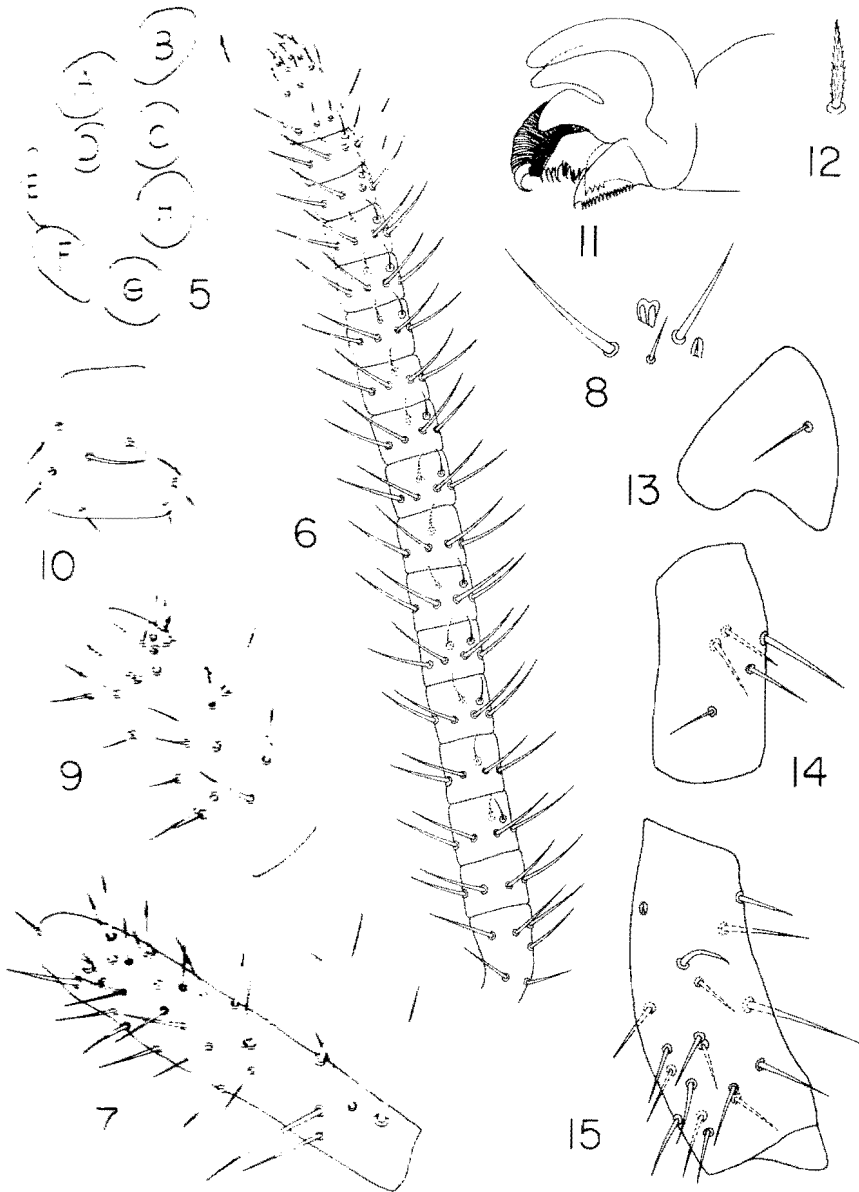


Figs. 3-4. *Sminthurus mendenbergae*; 3. Habitus, Michigan specimen, lateral view; 4. dorsal view.

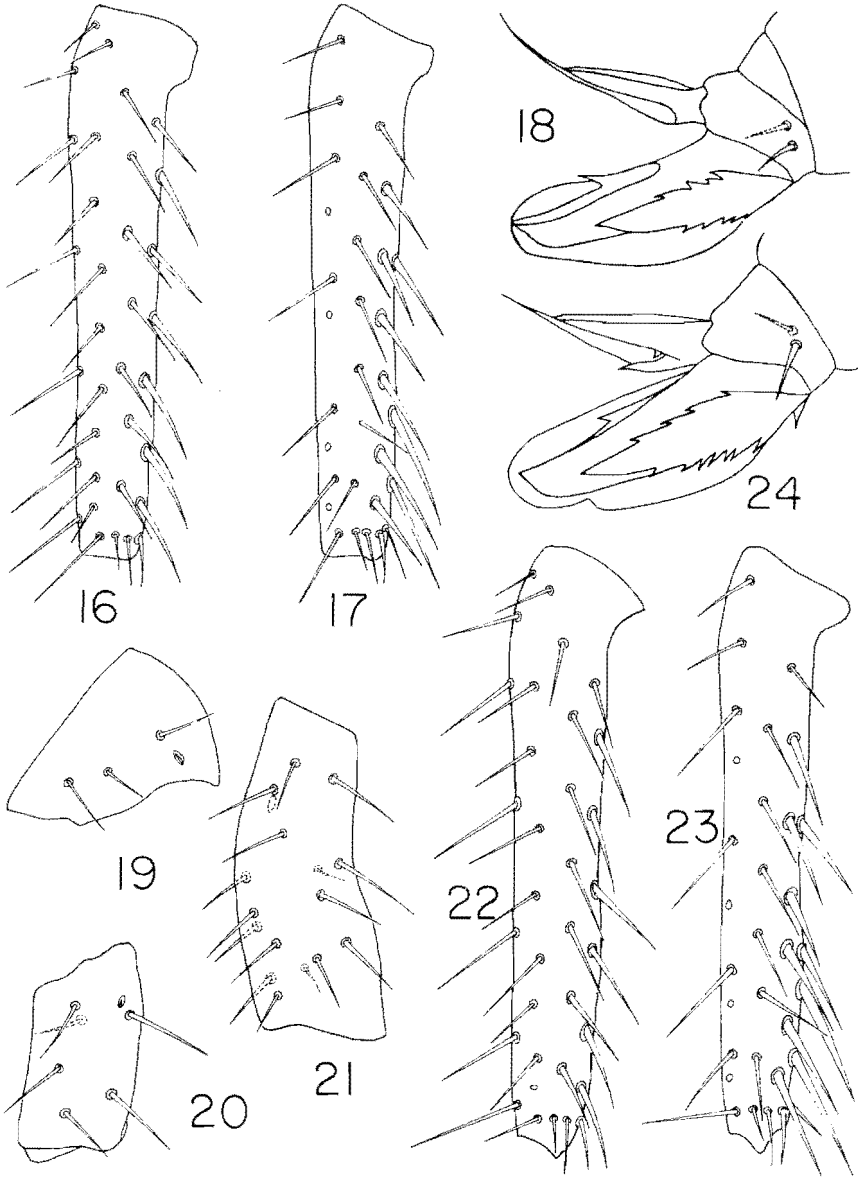
8); ANT II with 4 ventral setulae (Fig. 9); ANT I with 3 fine distal setae and 4 dorsal setae (Fig. 10). Maxilla with 3 galeal teeth, 4 lacinial lamellae (Fig. 11). Interocular cephalic setae A-G typical of genus, seta D small, lanceolate and ciliate (Fig. 12); 2 unpaired frontal setae. Frons with 2 oval organs near antennal base, 1 close to seta D, other in line with seta A, and 3rd located on lower frons in line with 2nd unpaired frontal seta; 3 posterior oval organs forming right triangle on lower gena.

FORELEG: coxa with 1 seta and no oval organ (Fig. 13); trochanter with 3 anterior and 2 posterior setae (Fig. 14); femur with anterior oval organ, 8-9 anterior and 7-8 posterior setae (Fig. 15); anterior surface of tibiotarsus with 1 subapical oval organ, sometimes replaced with a seta, AE file with 9 setae, AL file with 8 setae, AI file with 8 setae (Fig. 16); posterior surface with 4 oval organs near external edge, setae L_3 , L_4 and L_6 missing, tenent hairs acuminate (Fig. 17); pretarsus with anterior and posterior setulae; unguis with tunica and serrate anterior and posterior pseudonychia, large inner tooth; unguiculus lacks corner tooth, tapering to subapical filament, ca. 1.80 times as long as filament (Fig. 18).

MESOLEG: coxa with 3 setae and oval organ (Fig. 19); trochanter with 2 oval organs, 5 anterior and 1 posterior setae (Fig. 20); femur with 12 anterior and 6 posterior setae, 1 posterior oval organ (Fig. 21); anterior surface of tibiotarsus with 1 subapical oval organ, all setal files typical of genus (Fig. 22); posterior surface with 4 oval organs near external



Figs. 5-15. *Sminthurus mendenbergae*: 5. left ocellar patch; 6. antennal segment IV; 7. antennal segment III; 8. antennal segment III, distal sensillae; 9. antennal segment II; 10. antennal segment I; 11. maxilla; 12. D seta from head; 13. foreleg, coxa; 14. foreleg, trochanter; 15. foreleg, femur.



Figs. 16-24. *Sminthurus mendenbergae*; 16. foreleg, anterior surface of tibia; 17. foreleg, posterior surface of tibia; 18. foreleg, claw; 19. mesoleg, coxa; 20. mesoleg, trochanter; 21. mesoleg, femur; 22. mesoleg, anterior surface of tibia; 23. mesoleg, posterior surface of tibia; 24. mesoleg, claw.

edge, L_2 and L_3 missing, otherwise typical of genus (Fig. 23); pretarsus with anterior and posterior setulae; unguis with tunica and serrate anterior and posterior pseudonychia, large inner tooth, strong outer basal tooth; unguiculus with corner tooth (sometimes two), lanceolate, ca. 2.30 times as long as filament (Fig. 24).

METALEG: coxa with 4 setae and oval organ (Fig. 25); trochanter with 5 anterior setae, 1 posterior setula, and 2 oval organs (Fig. 26); femur with 12-15 anterior setae, 3 posterior setae and 2 setulae (Fig. 27); anterior surface of tibiotarsus with 7 E setae, 9 AE, AL and AI setae, 1 subapical oval organ (Fig. 28), posterior surface with 4 oval organs near external edge, 7 PE, 8 PL, 9 PI setae with L_5 missing (Fig. 29). Pretarsus with anterior and posterior setulae; unguis with tunica and anterior and posterior pseudonychia, large inner tooth, strong outer basal tooth; unguiculus with 2 corner teeth, lanceolate, ca. 5.75 times as long as filament (Fig. 30).

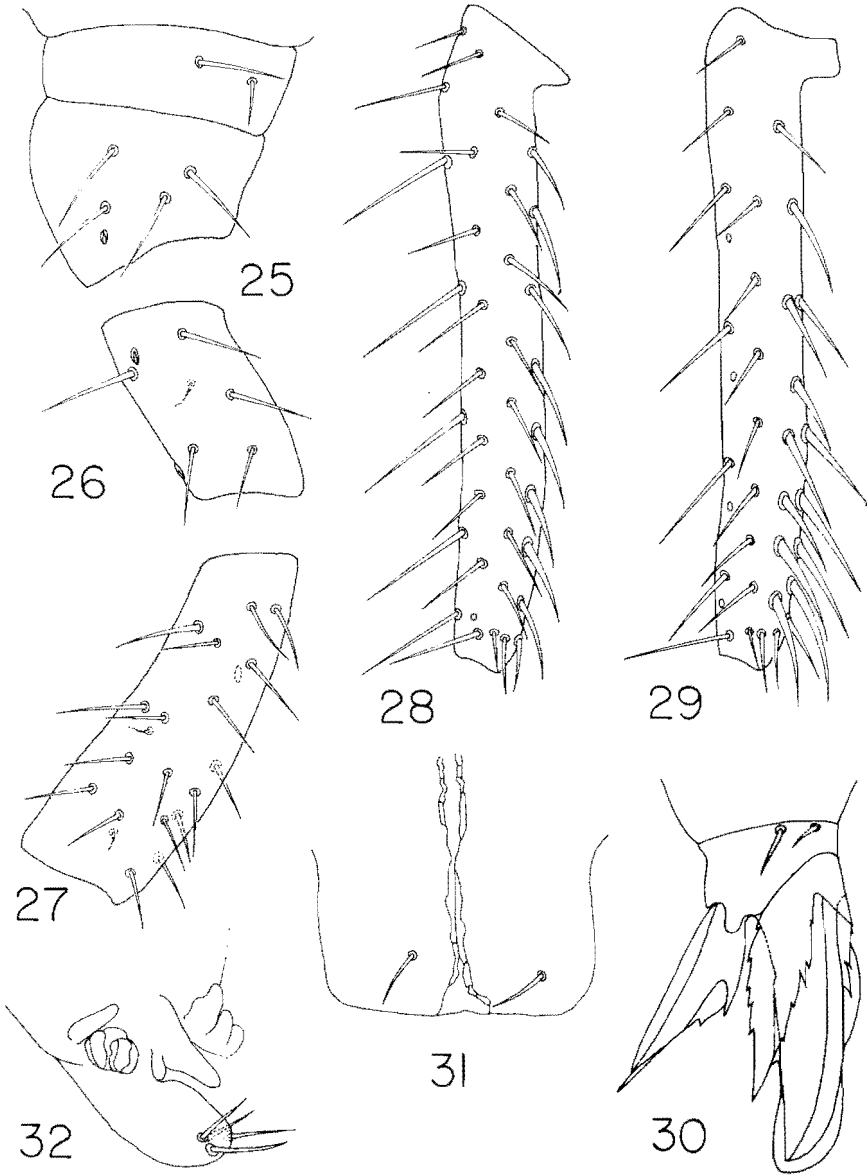
BODY: Collophore with 1+1 subapical setae (Fig. 31); sacs warty. Corpus of tenaculum with 4 setulae, ramus with 3 teeth (Fig. 32). Manubrium with 8+8 dorsal setae, 1-1 ventral (Fig. 33). Dens with 7 V_2 and 6 L setae, ID accessory seta absent (Figs. 34-35). Mucro with toothed outer and inner edges, ca. 2.75 times length of its seta (Figs. 36-37). Female circumanal setae A_0-3 , P and Q typical of genus; subanal appendage acuminate, curved in lateral view, gladiform-serrate in ventral view (Figs. 38-39); bothriothrix D complex typical, P seta ciliated (Fig. 40). Body setae spine-like, serrate (Fig. 41). Length 1.25-2.0 mm.

DIAGNOSIS: *Sminthurus mendenbergae* Snider keys out nearest to the *banksi-butcheri-fichi-packardi* complex in Christiansen & Bellinger (1981); of those three species, it comes closest to *S. banksi* using their key characteristics. In Stach (1956) it comes closest to *S. marginatus* and *S. echinatus*. *Sminthurus mendenbergae* is easily separated from *Sminthurus marginatus* Schott and *Sminthurus echinatus* Stach on the basis of their color patterns as well as the female subanal appendages, which in *S. mendenbergae* are serrate, while in the others dissected or palmate. The distinction of two corner teeth on the unguiculus, serrate subanal appendage, lateral apical papilla on the fourth antennal segment will easily separate *S. mendenbergae* from *Sminthurus banksi* Christiansen & Bellinger, *Sminthurus butcheri* Snider, *Sminthurus fichi* Folsom and *Sminthurus packardi* Folsom. In a recent paper, a new species was described that superficially resembles *S. mendenbergae*. This species, *Sminthurus fischeri* Snider (1982), has a color pattern of similar configuration, two teeth on the metaunguiculus, and similar leg chaetotaxy. However, the two species can be distinguished as follows:

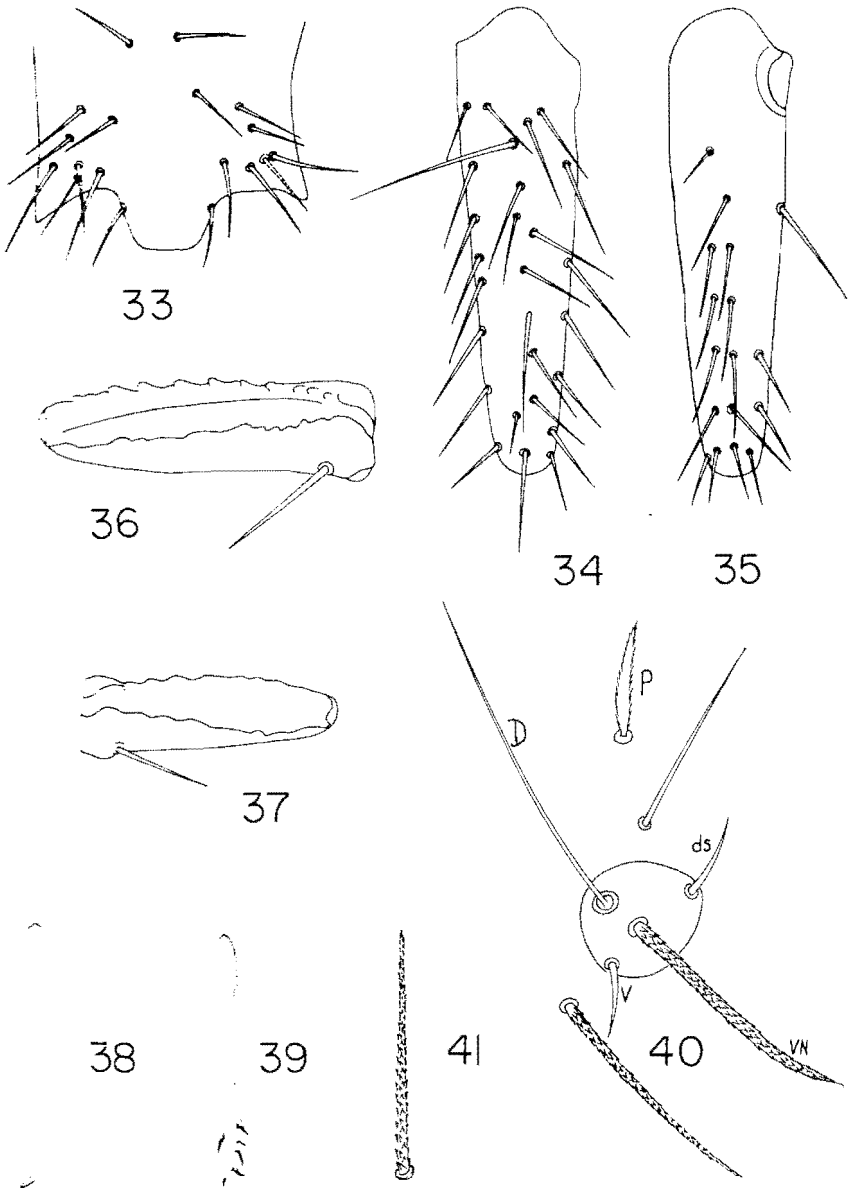
<i>S. mendenbergae</i>	<i>S. fischeri</i>
ocelli C and D not subequal	ocelli subequal
female subanal appendage serrate	not serrate
mucro with outer edge smooth	outer edge toothed or wavy
metatibiotarsus with PI_3 seta	PI_3 seta absent
collophore without 1+1 lateral setae	with 1+1 lateral setae
dens with 6 L setae	with 9 L setae

It is my pleasure to name this species for Lisa Mendenberg, a student at Michigan State University, who took the time to collect Collembola while on a class expedition.

TYPES: Holotype (female), allotype (male) and eight paratypes in alcohol; three paratypes on slides. Holotype, allotype, and paratypes deposited in the Entomology Museum, Michigan State University. Collection data: Canada, Alberta, Banff National Park, Camp Two Jacks. Elev. 2000 ft, pine forest, grass, 12.7°C, clover-dandelion patch; Castle Meadows. Elev. 4500 ft, 26.6°C, clover meadow, 22 August 1982. British Columbia, Mt. Assiniboine National Park, O'Brian Meadows Camp, Elev. 7200 ft, 12.7°C, short grass; Elev. 7000-7300 ft, 23.8°C, short grass; Sunburst Valley, 7000 ft,



Figs. 25-32. *Sminthurus mendenbergae*; 25. metaleg, coxa; 26. metaleg, trochanter; 27. metaleg, femur; 28. metaleg, anterior surface of tibia; 29. metaleg, posterior surface of tibia; 30. metaleg, claw; 31. collophore, posterior view; 32. retinaculum.



Figs. 33-41. *Sminthurus mendenbergae*; 33. manubrium, posterior view; 34. dens, dorsal view; 35. dens, ventral view; 36. mucro, specimen from O'Brian Meadows, British Columbia; 37. mucro, specimen from St. Clair County, Michigan; 38. female subanal appendage, lateral view; 39. female subanal appendage, dorsal view; 40. bothriothrix D complex; 41. typical body seta.

23.8°C, 1 September 1982. British Columbia, Takkakaw Falls, Elev. 6800–7000 ft, 10–12.7°C, short grass, 7 September 1982, Lisa Mencenberg, collector. Michigan, St. Clair County, Lakeport State Park, grass sweeping, 26°C, 2 August 1960, Richard J. Snider, collector.

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