VESICEPHALUS CROSSLEYI, NEW SPECIES FROM THE SAVANNAH RIVER PLANT AND GEORGIA (COLLEMBOLA: SMINTHURINAE)

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ABSTRACT

A new species, *Vesicephalus crossleyi* Snider, is described from the Savannah River Plant and Georgia. While the species shares similar morphological characteristics with *Vesicephalus longisetis* (Guthrie) and *Vesicephalus occidentalis* (Mills), it differs from those species by having 10-11 tenent hairs. *V. occidentalis* has a much expanded unguicular subapical filament. *V. longisetis* lacks a pronounced tunica. The type locality is Habersham County, Georgia, leaf litter.

RESUMEN

Se describe una nueva especie, *Vesicephalus crossleyi* Snider, de Savannah River Plant y Georgia. A pesar de que esta especie comparte características morfológicas con *Vesicephalus longisetis* (Guthrie) y *Vesicephalus occidentalis* (Mills), la misma se diferencia de estas dos especies por la presencia de 10-11 "tenent hairs". *V. occidentalis* posee un filamento subapical unguicular más ensanchado. *V. longisetis* carece de una túnica pronunciada. La localidad tipo es el condado de Habersham, Georgia. Habita en la hojarasca.

While working on collections of Collembola from Georgia and the Savannah River Plant, South Carolina, I had occasion to have a graduate student take some leaf litter samples from north Georgia. Tullgren funnels were used to extract samples. Among the large numbers of species taken from Tallulah Falls, Georgia was a very striking species of *Vesicephalus*. My impressions of the specimens were similar to those of the late Dr. Harlow B. Mills when he described *Vesicephalus occidentalis* (Mills). He said, "this is without doubt the most beautiful entomological gem which it has been my privilege to examine," Mills (1935). It is my purpose here to describe another new species in a small, but colorfully unique genus.

Vesicephalus crossleyi, NEW SPECIES

COLOR and PATTERN (♀): Background white with purple, orange, yellow and olive pigment in various configurations. HEAD: Eyes on bright orange patches; vertex posterior to eyepatches with dark purple stripe terminating in postgenal area with dark occipital area, gena with irregular pattern of dark purple polygons; genal grooves and lower frons with light purple; interocular area with olive pigment, yellow stripe running to interantennal area, with distal black macula, antennal bases dark black-purple; antenna purple, becoming darker distally. BODY: Dark purple dorsally, becoming lighter laterally with purple polygons; metathorax with paramedial white maculae; irregular dorsal stripe originating on thorax, made up of white, orange and light purple polygons;

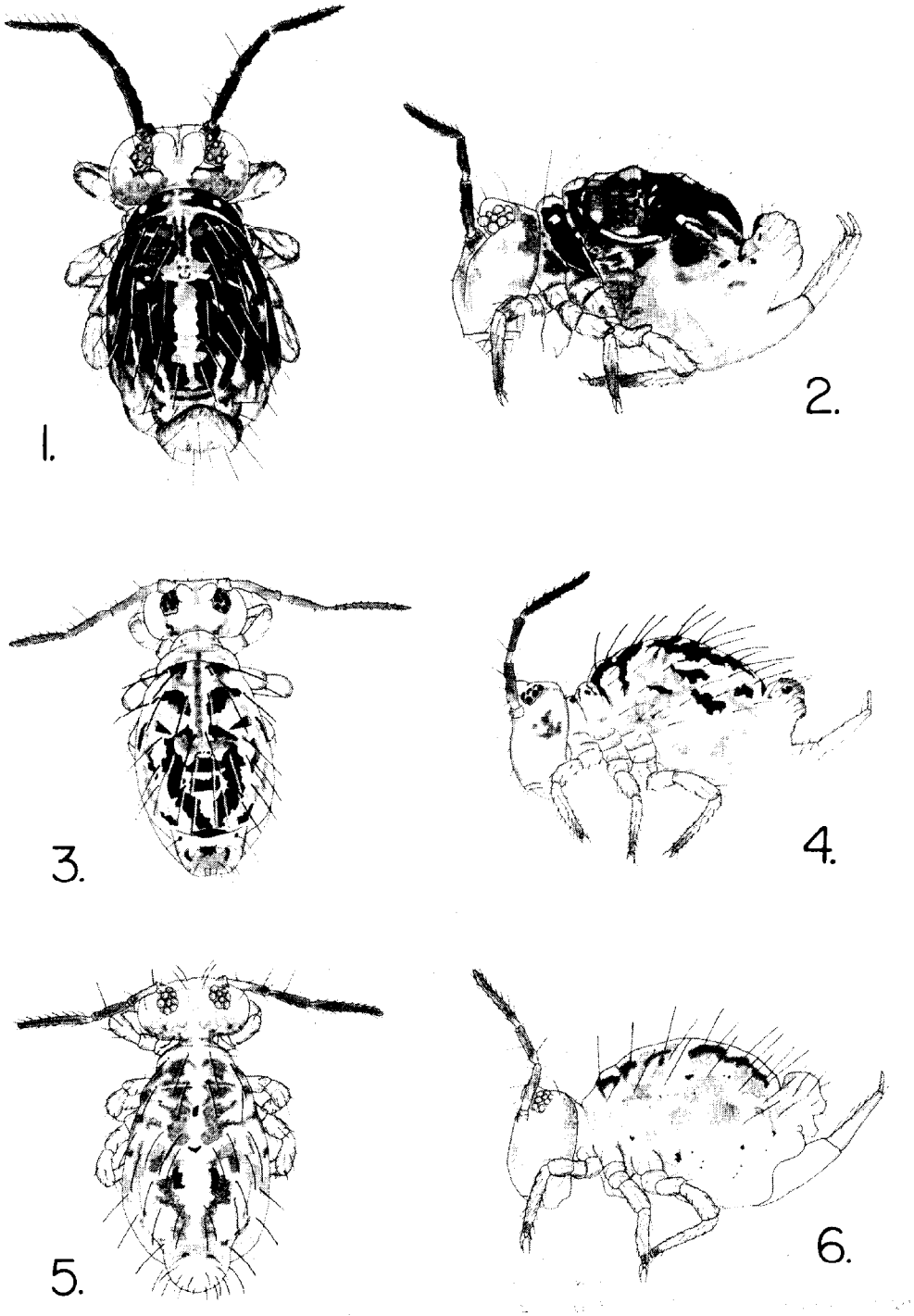
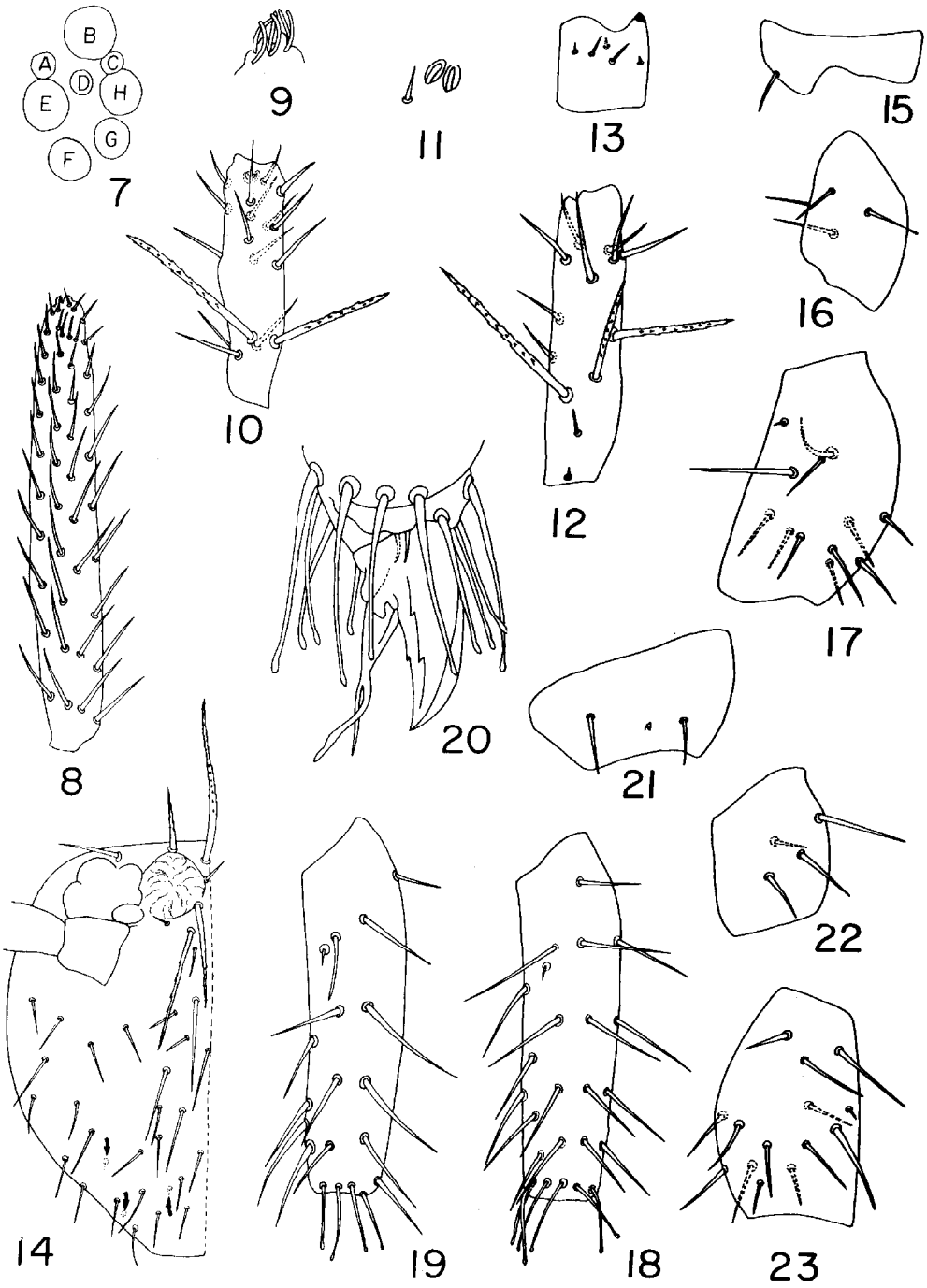


Fig. 1-6. *Vesicephalus crossleyi* n. sp. 1. ♀ Habitus, typical color pattern, dorsal view; 2. ♀ Habitus, lateral view; 3. ♀ Habitus, type II, dorsal view; 4. ♀ Habitus, lateral view; 5. ♂ Habitus, dorsal view; 6. ♂ Habitus, lateral view.



Vesicephalus crossleyi n. sp. Fig. 7-23. 7. Left eyepatch; 8. ANT IV; 9. ANT IV, distal view showing sensory setae and 2 papillae; 10. ANT III; 11. ANT III, subapical sensory pegs; 12. ANT II; 13. ANT I; 14. Facial setal pattern, arrows indicate position of posterior oval organs; 15. Forecoxa; 16. Foretrochanter; 17. Forefemur; 18. Foretibia, anterior view; 19. Foretibia, posterior view; 20. Foreclaw; 21. Mesocoxa; 22. Mesotrochanter; 23. Mesofemur.

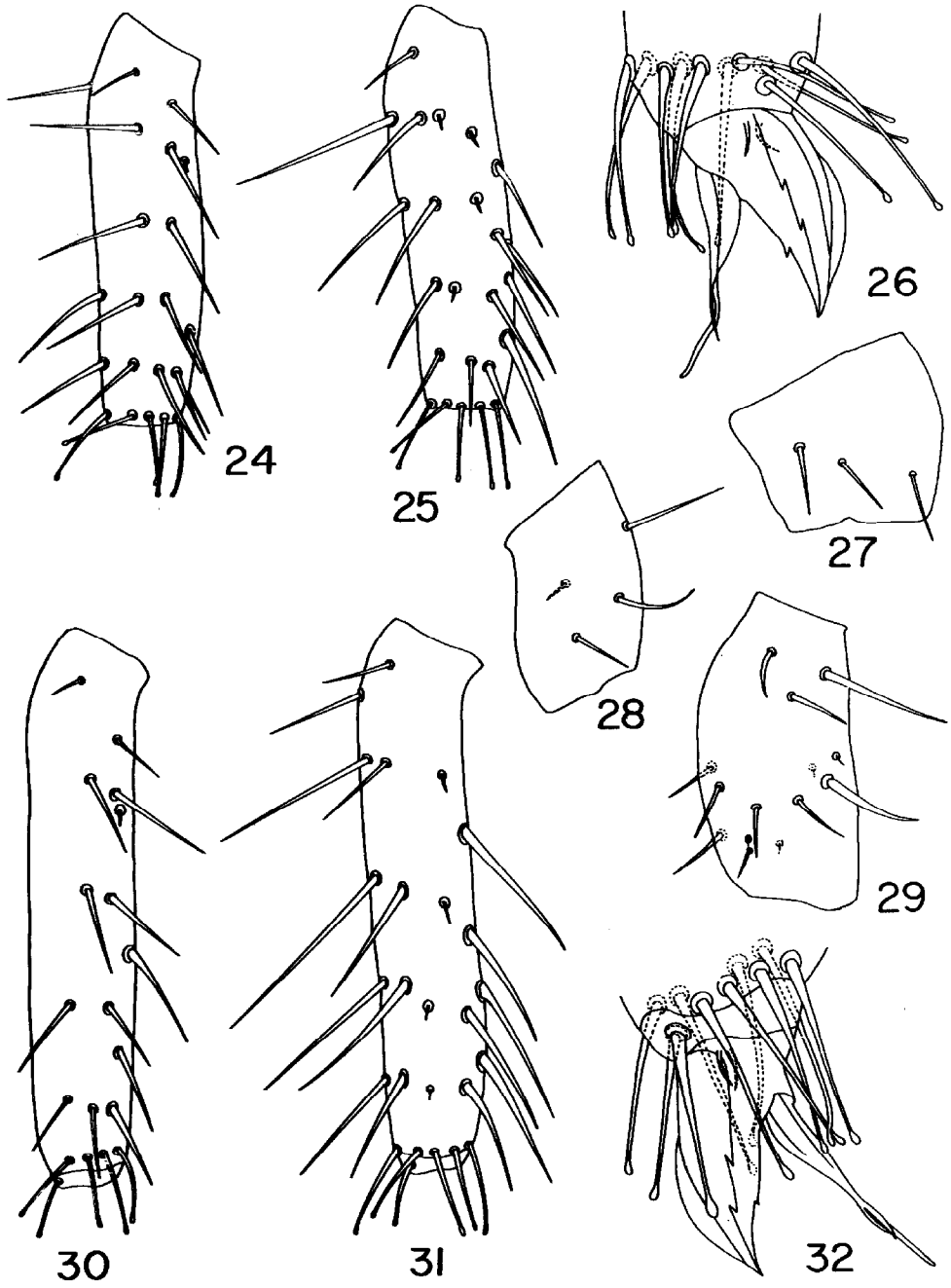


Fig. 24-32. 24. Mesotibia, anterior view; 25. Mesotibia, posterior view; 26. Mesoclaw; 27. Metacoxa; 28. Metatrochanter; 29. Metafemur; 30. Metatibia, anterior view; 31. Metatibia, posterior view; 32. Metaclaw.

ABD V with rectangular dark purple macula; distal margins of leg segments with purple, tibiotarsus becoming darker distally; furcula white (Fig. 1&2). ♀ type II. Background white with purple polygons forming various patterns. HEAD: Eyes dark brownish-orange on orange-purple patches (in life and freshly preserved specimens, more orange); interocular area with well defined light orange stripe terminating in line with posterior of eyepatches; an irregular pattern of purple and orange polygons between eyepatch and occipital area; lateral gena with central purple macula; interantennal area with rectangular orange macula, below which a black-purple spot, followed by a purple stripe blending into purple dusting around labrum; antenna orange-purple basally, becoming dark purple distally. BODY: Purple polygons forming a dorsal stripe from thoracic area to midpoint of abdomen, with broken paramedial stripes; laterally with scattered polygons forming irregular patterns; ABD VI with dorsal purple macula. Segments of legs to tibiotarsus with basal and distal purple maculae; tibiotarsus becoming darker distally. Furcula white (Fig. 3&4). ♂. Background white with various amounts of orange and purple pigments. HEAD: Eyepatches bright orange; dark spot between antennae; postgena with light olive-purple polygons, otherwise white; antenna purple, becoming darker distally. BODY: Dorsally with olive-purple and bright orange polygons defining a wide stripe terminating at ABD V with a rectangle of orange; legs lighter than ♀, tibiotarsus with purple distally; furcula white (Fig. 5&6).

HEAD: Eyes 8+8; ocelli A,C,D ½ diameter of B,E,F,G and H subequal (Fig. 7). Mean antennal ratio (♀) 1:3.5:3;5.5, (♂) 1:2.5:2.5:4, without subsegmentation; ANT IV with setae arranged in whorls, 2 apical papillae (Figs. 8&9); ANT III with 2 outstanding setae, subapical sensory sensilla lying in shallow depressions (Fig. 10&11); ANT II with 3 outstanding setae (Fig. 12); ANT I with 4 dorsal and 1 ventral setulae (Fig. 13). Vertex with paired interocular vesicles, frons with 2 unpaired setae, 3+3 hair sensilla on lower postgena (Fig. 14). FORELEGS: Coxa with 1 seta (Fig. 15); trochanter with 3 anterior and 1 posterior setae (Fig. 16); femur with posterior hair sensillum (Fig. 17); anterior surface of tibiotarsus with 1 hair sensillum and 5 clavate tenent hairs (Fig. 18); posterior surface with 1 hair sensillum and 5 clavate tenent hairs (Fig. 19); pretarsus with anterior and posterior setulae; unguis with heavy lateral teeth, inner tooth weak, tunica present; unguiculus lacks corner tooth, tapering beyond unguis, subapical filament expanded, reaching beyond terminus (Fig. 20). MESOLEG: Coxa with anterior setae and sensillum (Fig. 21); trochanter with 3 anterior and 1 posterior setae (Fig. 22); femur with 1 anterior hair sensillum (Fig. 23); anterior surface of tibiotarsus with 1 hair sensillum and 5 clavate tenent hairs (Fig. 24), posterior surface with 4 hair sensilla and 5 clavate tenent hairs (Fig. 25); pretarsus with anterior and posterior setulae; unguis with tunica, lateral and inner teeth; unguiculus tapering with subapical filament reaching beyond terminus much like foreclaw (Fig. 26). METALEG: Coxa with 3 anterior setae (Fig. 27); trochanter with 3 anterior setae and 1 posterior setula (Fig. 28); femur with an anterior hair sensillum and oval organ, 2 posterior setulae (Fig. 29); anterior surface of tibiotarsus with 1 hair sensillum and 5 clavate tenent hairs (Fig. 30), posterior surface with 4 hair sensilla and 6 clavate tenent hairs (Fig. 31); pretarsus with anterior and posterior setulae; unguis similar to mesotarsus, likewise unguiculus similar to mesotarsus (Fig. 32). GREAT ABDOMEN: Collophore with 2+2 subapical setae (Fig. 33), sacs smooth. Corpus of tenaculum with 2 distal setae, ramus with 3 teeth (Fig. 34). Manubrium with 7+7 dorsal setae (Fig. 35). Dens same as that reported for genus (Fig. 36&37). Mucro with notched inner margin, outer smooth or with few crenulations (Fig. 38&39). Female circumanal setae same as so far described for genus (Fig. 40); male circumanal setae N_o, A_2 missing, A_3 replaced by hair sensillum, "H" (Fig. 41). Female subanal appendage fimbriate (Fig. 42&43). Bothriotrix D present (Fig. 44). Many body setae multilaterally scaled, ending in 4 or more projections, others acuminate (Fig. 45&46). Length of ♀ up to 1.5 mm, ♂ 1 mm.

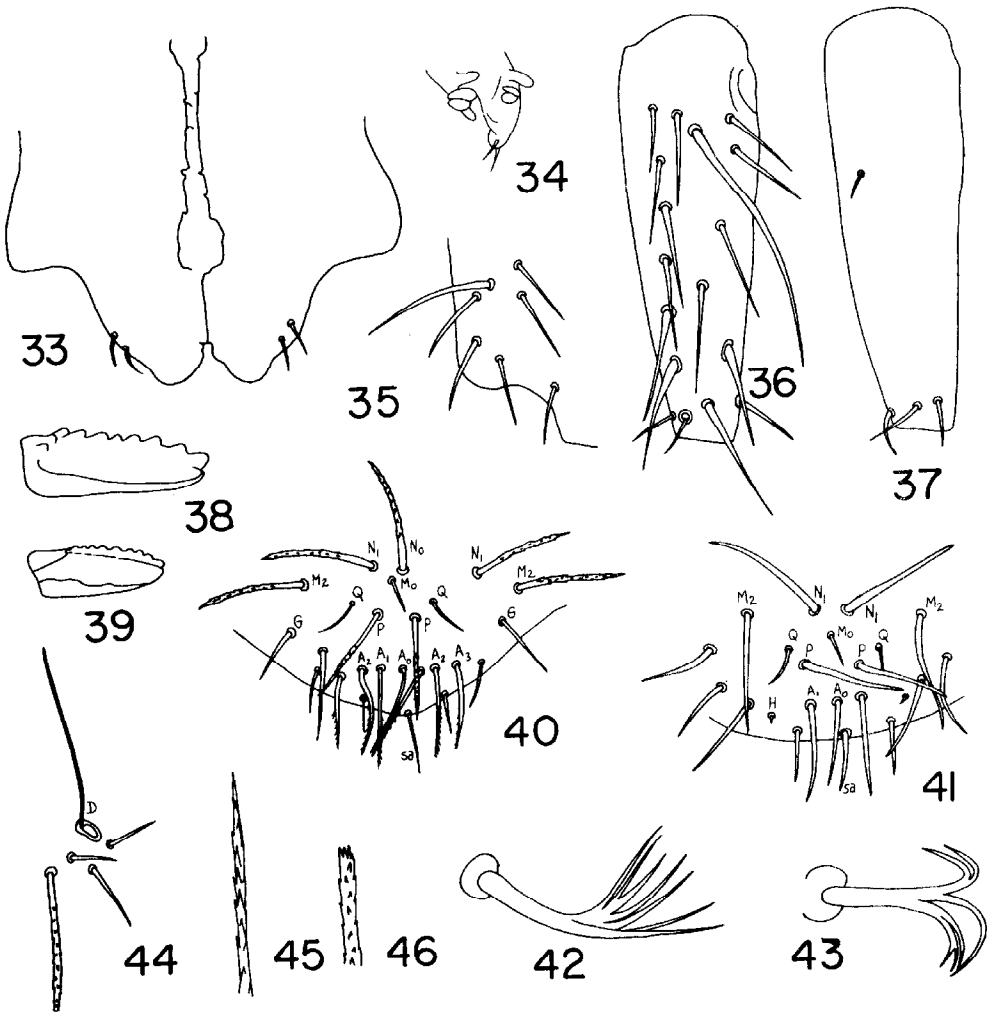


Fig. 33-46. 33. Collophore; anterior view; 34. Retinaculum; 35. Manubrial setae; 36. Dens, dorsal setae; 37. Dens, ventral setae; 38. Mucro, male specimen; 39. Mucro, small female specimen; 40. ♀ dorsal ABD VI setae; 41. ♂ dorsal ABD VI setae; 42. ♀ subanal seta; 43. ♀ subanal seta; 44. Bothriotrix D complex; 45. Acuminate body seta; 46. Truncate body seta.

DIAGNOSIS

Vesicephalus crossleyi Snider keys out nearest to *Vesicephalus longisetis* (Guthrie) in Christiansen & Bellinger (1981). It differs from that species by having a somewhat more expanded unguicular subapical filament, presence of inner ungual tooth, 10-11 tenent hairs and pronounced tunica. In some respects this species has characteristics of *Vesicephalus occidentalis* (Mills). The body setae end in four or more rounded divisions, some body setae acuminate, dental setal formula same, female subanal appendage fimbricate, and trochanteral setae same. *V. crossleyi* differs from *occidentalis* by having 10-11 clavate tenent hairs, much narrower unguicular subapical filament, circumanal seta sa fine and smooth rather than stout and serrate, and in color pattern. *V. occidentalis* is illustrated as a habitus here for the first time (Figs. 47&48).

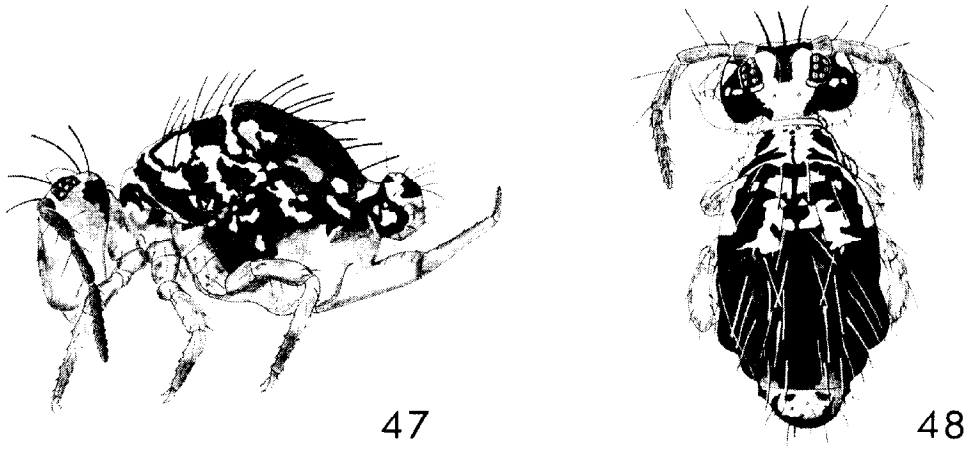


Fig. 47-48. *Vesicephalus occidentalis* (Mills). 47. ♀ Habitus, typical color pattern, lateral view; 48. ♀ Habitus, dorsal view.

Immature specimens taken at the Savannah River Plant exhibited an interesting change in cephalic chaetotaxy. Some interocular setae in very young males are short and spine-like (Fig. 49). In the subadult and adult instars these setae become fine, almost setula-like. Seta IV becomes elongated, and seta VII is added to the complex (Fig. 50).

Until further collections are made in North America, the following key is offered to separate the species.

KEY TO NEARCTIC SPECIES OF *Vesicephalus*

1. Lamella of unguiculus greatly expanded ..... *occidentalis*
1′. Lamella filament-like, slightly expanded 2
2. 5-6 clavate tenent hairs ..... *longisetis*
2′. 10-11 clavate tenent hairs ..... *crossleyi*

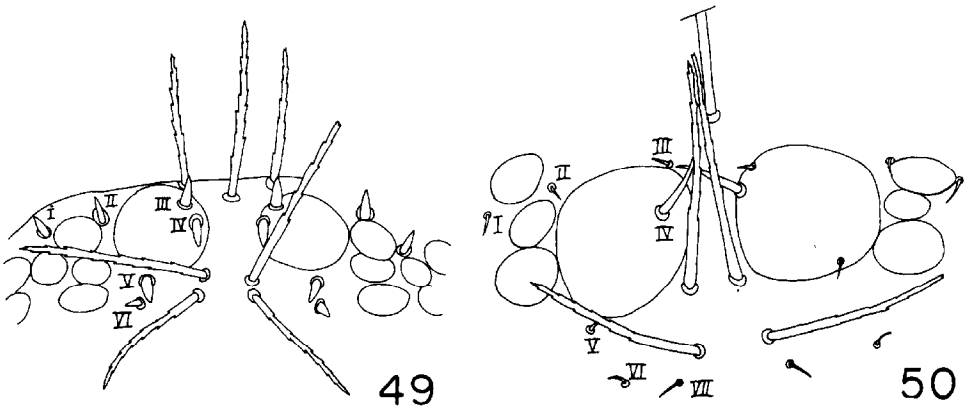


Fig. 49-50. 49. Interocular setae I-VI, immature specimen; 50. Interocular setae I-VI, subadult specimen.

It is my pleasure to name this colorful species for Dr. D. A. Crossley, Jr. who has been a friend and confidant for many years.

TYPES: Holotype (♀), Allotype (♂) and 19 paratypes in alcohol, 6 paratypes on slides. Georgia, Habersham Co., Tallulah Falls, Tallulah Gorge, leaflitter, "March 1, 1981," D. Yehling, collector; "March 7, 1981," R. J. Snider, collector. South Carolina, Aiken County, Savannah River Plant, Road F near rail bridge, low mixed deciduous woods, marshy area, sweeping, "October 27, 1983; litter and black soil, same as above; Road 4 near junction of Road E, leaf litter, "October 27, 1983"; Road F near junction of Road 4, dry Turkey Oak and Sugar Maple forest, litter, "November 18, 1983"; Barnwell County, Road B at junction of Road C, grass next to roadside ditch, sweeping, "March 2, 1984", W. Hargrove, collector.

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SMINTHURUS BIVITTATUS, NEW SPECIES FROM THE SOUTHEASTERN UNITED STATES (COLLEMBOLA: SMINTHURIDAE)

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ABSTRACT

A new species, *Sminthurus (Sminthurus) bivittatus* Snider, is described from the Savannah River Plant, Aiken, South Carolina, Florida and central Georgia. The species is closely related to *Sminthurus butcheri* Snider, *Sminthurus fitchi* Folsom and *Sminthurus packardi* Folsom. It can be separated from those three species on the basis of color pattern, position of collophore seta, presence of outer mucronal teeth, absence of subapical papilla on ANT.IV, and smooth, normal P seta of bothriotrix D complex. This species is commonly taken with *Sminthurus carolinensis* Snider in grass sweepings. The type locality is Barnwell County, South Carolina.

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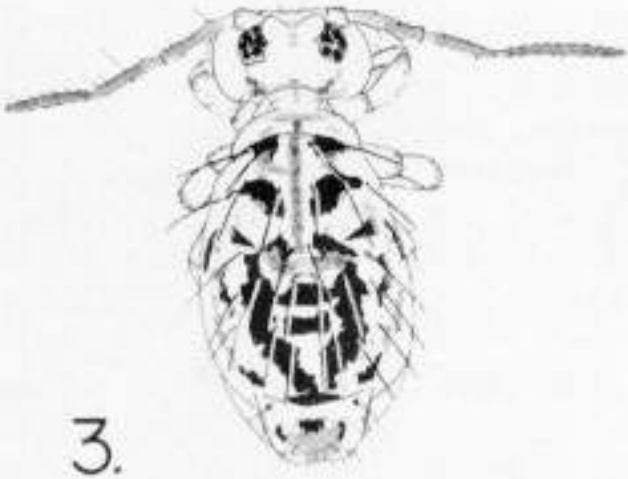

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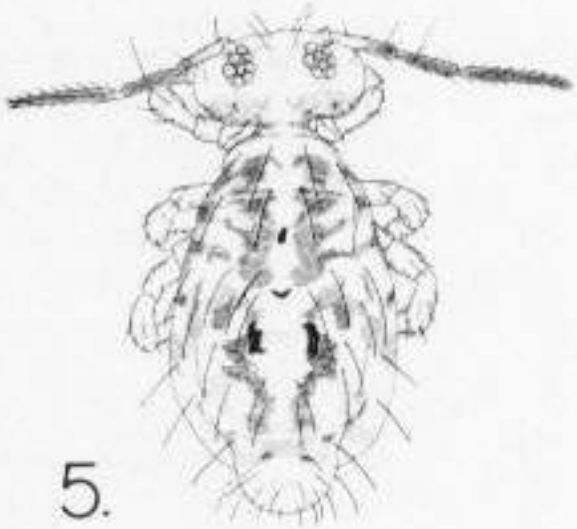

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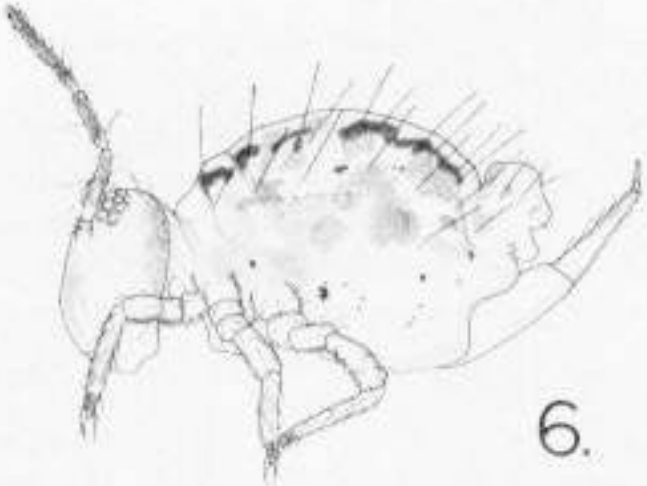

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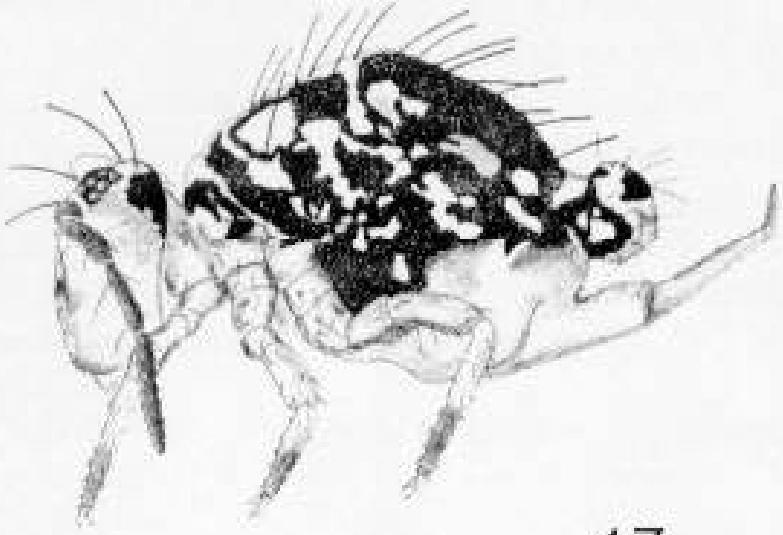

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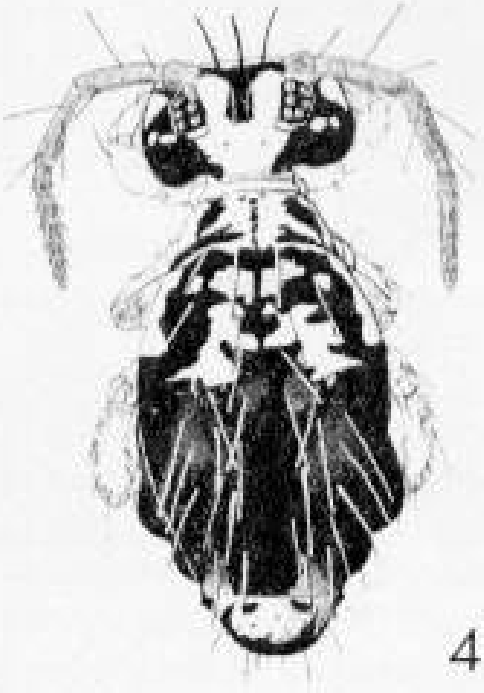

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