ACKNOWLEDGEMENTS

Special thanks are offered to Dr. D. A. Crossley, Jr. and the Department of Entomology, University of Georgia at Athens for laboratory facilities. Thanks are also extended to Dr. Kenneth A. Christiansen for reviewing the manuscript. Mailing address of the senior author: Department of Zoology, Michigan State University, East Lansing, MI 48824 USA.

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REDESCRIPTION OF SMINTHURUS FLORIDANUS
MACGILLIVRAY, 1893 (COLLEMBOLA: SMINTHURIDAE)

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ABSTRACT

Adequate numbers of Sminthurus floridanus MacGillivray were collected from grass swineings at the Savannah River Plant, U.S. Department of Energy, Aiken, South Carolina to prepare a redescription of the species. Characteristics not presented in early reports include: presence of unequal pseudonychia, 4 tenacular setae, macroanal seta and aconinate subanal appendage. Details of metatibiotarsal and dental setae are presented.

RESUMEN

Una cantidad adecuada de ejemplares de Sminthurus floridanus MacGillivray se recolectó en pastos, con red para atrapar, en la Plana del Río Savannah, Departamento de Energía de los Estados Unidos, Aiken, Carolina del Sur, para preparar una nueva descripción de la especie. Algunas características que no se presentaron en informes anteriores incluyen: la presencia de pseudoniquias desiguales, cuatro (4) setas tenaculares, seta macroanal y apéndice sub-anal acuminado. Se presentan detalles de las setas metatibiotarsales y las setas dentales.

Recently, preliminary field investigations at the Savannah River Plant, U.S. Department of Energy, Aiken, South Carolina, produced a remarkable collembolan species. For 88 years specialists have had to rely on incomplete descriptions and a single specimen of Sminthurus floridanus MacGillivray for identification purposes and systematic studies. While making grass
sweeping samples, it was my good fortune to collect this unique species in numbers adequate for redescription.

The following is the original description of *Sminthurus floridanus* published by MacGillivray (1883):

“Black, sides lighter, hairy. Head black, with lighter lines, mouth olive. Antennae long, slender, as long as the body, basal joint black, remainder olive. Thorax and abdomen with a triangular black spot, base of the triangle at the apex of the thorax and its apex at the apex of the abdomen. Sides of the abdomen olive mottled with light brown. Underneath olive. Anal papillae with its front and upper part black, the remainder olive mottled with brown. At the median two-thirds of the back, a stout project spine; spine as broad at base and higher than anal papillae; concolorous with the black triangle, except a small olive spot on each side. Legs slender; pale olive; inner claw two-thirds the length of outer, stout and blunt. Spring short, slender; third joint elongate with an apical and two smaller inner teeth. Length, 1.5 mm.”

Forty-one years later, the single type had further darkened and grown in length! Folsom (1934) re-examined the type and commented: “Legs pale olive. Furcula unpigmented. Ant. 2:3:4 about as 2:3:10. Ant. 4 with 20 subsegments (18 intermediate segments). Unguis stout, with a tunica, an inner tooth at the middle, and an outer margin entire, inner margin with several blunt teeth, apex obliquely truncate, without mucronal setae. Body with long white setae, curving on the anterior dorsum, stiff posteriorly. Length, 1.6 mm.”

Richards (1968) comments that median dorsal protuberances have been recorded in a number of genera and that those structures may be the result of reactions to parasitic fungi. Christiansen and Bellinger (1981) follow Richards’ (1968) suggestion and incorporate his conclusion in their text (p. 1193). They further comment: “the unique type is in very poor condition; we did not mount it and cannot confirm the existence of only 2 tenacular setae.” All their illustrations are taken from Folsom (1934).

*Sminthurus floridanus* MacGillivray, Redescription

**Color and Pattern (♀, ♂):** Background white with light yellow. Head entirely covered with dark reddish-purple polygons; antennal segment I dark purple, segments II-IV light olive in mature individuals, white in juveniles and subadults; many white dots between ocellar patches and on upper gena, orbital crests ringed with white dots. Trunk with dorsal triangle of dark purple; white medial line originating behind head, extending to abdomen, few white dots on abdomen forming 2 paramedial broken lines; dorsal protuberance purple; anal papilla dorsally purple; laterally white with diffuse yellow on to greater abdomen. Legs white, mature individuals with faint olive dusting distally on tibiotarsi. Furcula white (Fig. 1-2).

**Head:** Eyes 8+8 with dark pigment; ocelli C and D 1/2 diameter A and B, their diameters slightly greater than other ocelli (Fig. 3). Antennal segment ratio 1:1.7:2.5; ANT IV with 18-19 intermedie (Fig. 4), intermedie I, II, IV, XX without setulae, III, V, VII, VIII, IX, XII, with 1, VI, X-XI, XIII-XIX with 2, apical bulb absent, papilla and sense rods present; ANT. III with 9-10 outstanding setae (Fig. 5), subapical sensillae in deep invagination, accessory seta lanceolate and lying in shallow depression
Snider: Sminthurus floridanus

Fig. 1-2. Sminthurus floridanus MacGillivray.

(Fig. 6); ANT II with 2-4 ventral setae (Fig. 7); ANT I with 3 fine ventral distal setae and 4 dorsal setae (Fig. 8). Intercellular cephalic setae A-G typical of genus, seta D may be greater than diameter of closest ocellus, lanceolate and ciliated (Fig. 9); rows F to G more spine-like; 2 unpaired frontal setae. Frons with 2 oval organs near antennal base, 1 close to seta D, other in line with seta A, lower postgena with 1 oval organ (Fig. 10).

Reny: Foreleg coxa without oval organ; trochanter with 3 anterior and 2 posterior setae (Fig. 11); femur with anterior oval organ, 9 anterior and 7 posterior setae (Fig. 12). Mesoteg coxa with oval organ and 2 setae (Fig. 13); trochanter with 2 oval organs, 5 anterior and 1 posterior setae (Fig. 14); femur with 1 posterior oval organ, 2 posterior setae (Fig. 15). Metatleg coxa with oval organ with 4 setae (Fig. 16); trochanter with 2 oval organs, 5 anterior and 1 posterior setae (Fig. 17); femur with 1 posterior oval organ and 2 setae (Fig. 18); anterior surface tibiartaus with 1 subapical pseudopore, AE file with 9 setae, AL file with 9 setae, seta Al₂ 0.68-0.90 times as long as outer edge of unguis (Al₂/L₂ of Christiansen and Bellinger, 1981), seta F₃ 1.12-1.38 times as long as outer edge of unguis, surface with 5 pseudopores near external edge (Fig. 19); posterior surface has PI file with 9 setae, L₃ missing while L₁ short and finer than normal, PL file with 7 setae, PL₉ missing, tenent hairs AE₀ and PE₀ acuminate, absent if using older classifications (Fig. 20). Pretarsus with anterior and posterior setulae; unguis with tunica, strong anterior and posterior pseudonychia, inner tooth; unguiculus of metatleg with strong corner tooth (not developed on foreleg), subapical filament tapering, unguiculus approximately 1.9 times as long as its filament (Fig. 21-22). Colophore with 1+1 subapical anterior setae, 1+1 lateral setae, saccis warty (Fig. 23). Corpus of tenaculum with 4 setulae, ramus with 3 teeth (Fig. 24). Manubrium with 8+8 dorsal setae, 1+1 ventral (Fig. 25). Dens with 12 id setae, setae Vₑ₀ 0-1 (Fig. 26), with 9 L setae (Fig. 27). Mucro with outer edge entire, sometimes abnormally with distal teeth (Fig. 28), up to 11 inner teeth, outer edge 3.0 times length of its seta (Fig. 29). Bothriotrichium D complex with seta vn 1.7 times the length of D, seta p stout and finely ciliated (Fig. 30). Female circumanal setae Aₚ-3, P and Q typical for genus (Fig. 31); subanal ap-
Fig. 16-24. Smynthurus floridanus MacGillivray. 16) Metaleg coxa. 17) Metaleg trochanter. 18) Metaleg femur. 19) Right metatibia, anterior view, arrow indicates pseudopore. 20) Right metatibia, posterior view, arrows indicate pseudopores. 21) Left foretarsus. 22) Right metatarsus. 23) Collophore. 24) Tenaculum.
pendage acuminate, strongly curved in lateral view. Oval organs on upper and lower valves of segments VI. Body setae long, slender, slightly curving. Dorsal protuberance outstanding, large in proportion to body, curving forward (Fig. 32-34). Length 1.75 mm.

Discussion: Rediscovery of *S. floridanus* has clarified a few misconceptions about the species and provided a basis from which its interrelationships within *Sminthurus* s.l. can be delineated. All specimens examined had dorsal protuberances as illustrated (Fig. 1-2). Dorsal protuberances were present on 75 individuals from 3 sample dates, 2 1/2 and 7 months apart, at the same location. Individuals ranged from juveniles to adults on the first 2 dates and adults in spring 1981. Conclusions as to the cause for this peculiar growth pattern cannot be presented here. Close examination of a well cleared slidemounted specimen showed what appeared to be round, heavy-walled

Fig. 25-34. *Sminthurus floridanus* MacGillivray. 25) Manubrium, dorsal view. 26) Left dens, dorsal view. 27) left dens, ventral view. 28) Right muco. 29) Left muco. 30) Bothriotrichium D complex. 31) ♀ circumanal setae. 32) Profile of ♀ abdomen, specimen 1. 33) Profile of ♂ abdomen, specimen 2. 34) Profile of ♂ abdomen.
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structures within the protuberance. Richards' (1968) suggestion of a fungal infection could well apply here. However, there is no morphological difference between the observation of Folsom (1934) and the present study.

Further characteristics which make this species conform to the conservativeness of Sminthurus s.l. include: presence of ungual pseudonychia, 4 tenacular setae, presence of a mucronal seta, and acuminate subanal appendage. However, the unique body shape and color pattern easily separate S. floridanus from all other members of the genus.


Acknowledgements

Grateful thanks are offered to Dr. D. A. Crossley, Jr. and the Department of Entomology, University of Georgia at Athens, for facilities; and to Dr. J. Whitfield Gibbons and Mrs. Karen Patterson of the Savannah River Ecology Laboratory of the University of Georgia for field assistance. Special thanks are offered to Dr. Peter F. Bellinger for corrections and suggestions. Field collecting was carried out under the auspices of Contract DE-AC09-76SR00819 between the U.S. Department of Energy and the University of Georgia. Mailing address: Department of Zoology, Michigan State University, East Lansing, MI 48824 USA.

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