THREE NEW SPECIES OF *SENNIUS* FROM MEXICO AND CENTRAL AMERICA, WITH NEW HOST RECORDS FOR OTHER *SENNIUS* (COLEOPTERA: BRUCHIDAE)

CLARENCE DAN JOHNSON

Department of Biological Sciences,
Northern Arizona University,
Flagstaff, AZ 86011

ABSTRACT

The new species *Sennius colima* from Mexico and *S. lawrencei* and *S. panama* from Panama are described. The dorsal aspects, hind legs and male genitalia of each are figured. *S. colima* develops in the seeds of *Cassia berlandieri*; *S. lawrencei* in the seeds of *C. reticulata*; and *S. panama* in the seeds of *C. undulata*. *Bruchus rufescens* Motschulsky was found to be a *Sennius* and the senior synonym of *Sennius celatus* (Sharp). Five species of *Sennius* had no previous host plants recorded for them. These bruchids and their hosts are *S. breveapicalis (Cassia densiflora, C. undulata); S. ensiculus (Cassia patellaria); S. militaris (Cassia emarginata); S. obesulus (Cassia wrightii); S. trinotaticollis (Cassia maxonii, C. oxyphylla).* New host records for other species of *Sennius* are as follows: *S. auricomus (Cassia xiphoidea); S. rufescens (Cassia leptocarpa, C. reticulata, C. tora); S. fallax (Cassia berlandieri, C. hintoni); S. guttifer (Cassia nicaraguensis); S. instabilis (Cassia biflora, C. leptocarpa, C. tora).*

INTRODUCTION

After Bridwell (1946) named the genus *Sennius*, little systematic work was done on the species in the genus until Johnson and Kingsolver (1973) revised the North and Central American species of the genus. Since 1973, Center and Johnson (1973, 1974, 1976), Whitehead and Kingsolver (1975a, 1975b), and Pfaffenberger and Johnson (1976) have published papers that, at least in part, are concerned with host plants, evolution, new species, and larvae of *Sennius*. Because there is considerable current interest in the ecology of the Bruchidae and names are needed for these studies, 3 new species of *Sennius* are described in this paper.

With the exception of *Sennius willei*, reported to develop "in alfalfa seed" (Kingsolver 1968), all verified hosts for species of *Sennius* are in the genus *Cassia* (Leguminosae). Because *Sennius* is mostly limited to hosts in the genus *Cassia*, the genus is of great interest for comparative studies on the ecology of the Bruchidae. The genus *Cassia* contains about 600 species which are mostly tropical and subtropical in distribution (Heywood 1971). The predominant bruchids that prey on seeds of Old World *Cassia* are in the genus *Caryedon*, whereas species of *Sennius* are the most common bruchids in the seeds of New World *Cassia*. Apparently, then, adaptive radiations of these 2 bruchid genera have occurred into a similar niche, the seeds of species of *Cassia*. The complex interrelationships between these bruchids and their seed hosts will be the subject of future research.

Host plants were not known for 8 of the 27 species of *Sennius* treated by Johnson and Kingsolver (1973). Hosts for 5 (*S. breveapicalis, S. ensiculus, S. militaris, S. obesulus, S. trinotaticollis*) of these 8 species are known and are reported below along with additional host records for species with previously recorded hosts.

For ease of access to host records, Tables 1 and 2 are cross-referenced between host plants and the species of *Sennius* included in this paper.

Methods used by Johnson (1970) for collecting and rearing were followed. In the text of this paper C. D. Johnson is abbreviated CDJ, and L. J. Bottimer is abbreviated LJB.

Acknowledgments

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Thanks are also due D. E. Bright and E. C. Becker, Canadian National Collection of Insects, Ottawa, for lending specimens collected by Bottimer to me. I thank R. Liesner and T. Croat, Missouri Botanical Garden, for plant identifications, and J. Kingsolver for critical reading of the manuscript.

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A New Synonymy and New Combination in *Sennius*

Motschulsky (1874, p. 222) described *Bruchus rufescens* from Colombia. J. M. Kingsolver recently examined the type of this species and found that it was conspecific with *Sennius celatus* (Sharp 1885, p. 499), described from Panama. Therefore, *Sennius rufescens* (Motschulsky), **new combination**, becomes the senior synonym of *S. celatus* (Sharp), **new synonymy**. A junior primary homonym, *Bruchus rufescens* (Schaeffer 1907) is now known as *Acanthoscelides schaefferi* (Pic 1912).

New Species of *Sennius*

Sennius colima Johnson, **new species**

(Figs. 1-2; 5-6)

Length (Pronotum-elytra) 2.5-3.3 mm. Width 1.85-2.5 mm. Maximum thoracic depth 1.5-2.0 mm.

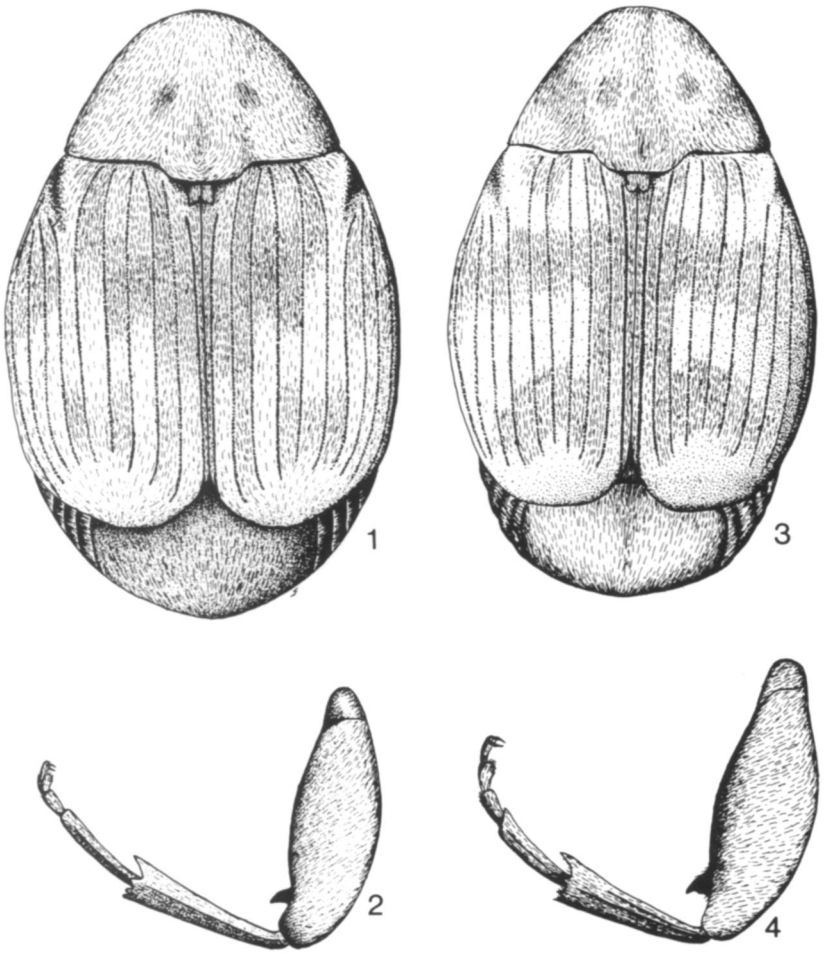
Male

Integument color

Head dark brown; antennae with basal 5 segments and 11th red orange, sometimes 5th dark brown on upper surface, remaining segments dark brown. Prothorax dark brown, meso- and metathoracic sterna varying from red orange to dark brown. About basal 1/2 of elytron red orange, about apical 1/2 of elytron light brown due to slightly darker pigmentation and cover of dark brown hairs (fig. 1); sometimes dark-brown line extending for about 1/4 length of elytron on interval between striae 3 and 4; pygidium, remainder of undersurfaces, and legs red orange.

Vestiture

With recumbent white, yellow, brown, and dark brown hairs as follows: eye with medial fringe of white hairs; postocular lobe with short white hairs; dense postocular patch of white hairs; remainder of head with intermixed moderately dense brown and white hairs; pronotum with vague pattern, usually slender line of yellow to white hairs along midline flanked by 2 lines of hairs on about basal 1/2 of pronotum, usually 2 spots of white hairs near lateral margins about 1/2 way from base to apex (fig. 1), remainder of pronotum with intermixed brown and white hairs; vestiture of elytron variable but usually about basal 1/2 with moderately dense white to yellow hairs, apical 1/2 usually covered with dark brown hairs, often vague white patches of hairs amongst dark brown hairs on intervals between striae 2 and 3, 4 and 5, and 6 and 7; pygidium, undersurfaces, and legs covered with moderately dense to dense white to yellow hairs.



Figs. 1-2, *Sennius colima*: 1, habitus; 2, hind leg; Figs. 3-4, *S. panama*: 3, habitus; 4, hind leg.

Structure

Head.—Slightly elongate, densely punctulate; frons with median, glabrous, finely punctulate line extending from frontoclypeal suture to vertex; vague transverse sulcus between upper limits of eyes; width of eye slightly wider than width of frons; ocular sinus about 1/3 as long as width of eye; posterior margin of eye protruding from adjacent surfaces; postocular lobe strong, rounded, not angulate; distance from base of antennae to apex of labrum about 1/2 as long as distance from upper limits of eyes to apex of labrum; antennal segments 1 and 3 usually filiform, 2 and 4 usually moniliform; 5 to 10 eccentric, 11th subacute apically; 5 to 11 slightly broader than long; antenna reaching to or almost to humerus.

Prothorax.—Disk campanulate (fig. 1), with many punctations, punctations more coarse at base and lateral margins; cervical sulcus shallow, extending from near coxal cavity to about 1/3 distance to pronotal midline; lateral prothoracic carina vague, extending about 1/3 distance from base to coxal cavity; short median impressed line on median basal lobe usually obscured by pubescence; prosternum separating procoxae for about 0.8 their length.

Mesothorax and Metathorax.—Scutellum small, slightly transverse, with lateral posterior teeth, clothed with dense recumbent white hairs; elytron slightly less than twice as long as broad; striae shallow, punctate, strial intervals punctulate; striae 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae (fig. 1); without spines at base of elytron; humerus rugulose, usually at least partially glabrous; undersurfaces punctate; all of hind coxa punctate; hind femur constricted basally and apically, expanded medially to slightly less than width of coxa (fig. 2); inner ventral surface with a well-marked longitudinal carina, sometimes carina with up to 3 widely spaced, small spines, lateral longitudinal carina vague; femur armed with an inner subapical acuminate spine about as long as width of tibial base; tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, without lateroventral carina; dorsal surface without fossa; tibial corona with 3 to 4 spinules, mucro about 0.1 as long as 1st tarsomere; with slight sinus at base of mucro; 1st tarsomere with ventral, lateral and vague mesal glabrous longitudinal carinae.

Abdomen.—Sterna not flattened medially; 1st sternum about 1/2 as long as abdomen, posterior margin straight; sterna 2 to 4 unmodified, 5th emarginate; pygidium punctulate, convex in lateral view.

Genitalia.—Figs. 5, 6. Median lobe moderately long; in ventral view, ventral valve triangular, lateral margins arcuate, base about 3/4 as wide as apex of median lobe, arcuate in lateral view; hinge sclerites large, curved; armature of internal sac consisting of about 2 rows of fine spicules basally which connect to a large T-shaped mass of spines medially, medial mass of spines connected to paired elongate strands of fine spicules on either side of internal sac extending to apex of sac; apex with large, round heavily sclerotized gonopore sclerite. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 6).

Female

Dark brown line on interval between elytral striae 3 and 4 usually present; apex of last abdominal sternum convex, about as long as 2 preceding sterna.

Host Plants

Cassia berlandieri Bentham vel sp. aff.: Mexico. Colima: 7 mi NE Manzanillo, 7-III-73 (CDJ #401-73). Nayarit: 29 mi SW Compostela, 1-III-73 (CDJ #302-73).

Type Series

Holotype male, allotype female, and 55 paratypes: Mexico. Colima: 7 mi NE Manzanillo, 7-III-73, reared seeds *Cassia berlandieri*, C. D. Johnson collector, #401-73. USNM #72781. One paratype: Mexico. Nayarit: 27 mi SW Compostela, 1-III-73, reared seeds *Cassia berlandieri*, C. D. Johnson collector, #302-73.

Holotype, allotype, and numerous paratypes deposited in the U.S. National Museum of Natural History, Washington, D. C. Paratypes retained in the author's collection and also deposited in the following collection: California Academy of Sciences, San Francisco; Canadian National Collection of Insects, Ottawa; and Museum of Comparative Zoology, Harvard University, Cambridge, Mass.

Discussion

Sennius colima is closely related to *S. breveapicalis* (Pic), *S. lateapicalis* (Pic), and to a new species also described in this paper, *S. panama*. *S. colima* differs from all 3 of these species in its larger size, an elytral color pattern that is less contrasting (fig. 1), and in the characters of the male genitalia including the large T-shaped mass of spines medially in the internal sac. Both *S. colima* and *S. panama* have paired elongate strands of spines or spicules on either side of the internal sac that neither *S. breveapicalis* nor *S. lateapicalis* has. The hinge sclerites of *S. lateapicalis* are more slender, curved, and elongate than in the other species. There is little variation among individuals of *S. colima* other than size.

Because of its close relationship to *S. breveapicalis, S. colima* is tentatively placed in species group 1 of Johnson and Kingsolver (1973), pending further systematic studies in *Sennius*. *S. colima* keys to couplet 7 of Johnson and Kingsolver (1973) and is separated from *S. breveapicalis* by the characters given above.

Cassia berlandieri is the only known host for *S. colima*, whereas both *S. breveapicalis* and *S. panama* develop in seeds of *Cassia undulata*.

The specific epithet *colima* is a noun in apposition to *Sennius*.

Sennius lawrencei Johnson, **new species**

(Figs. 7-11)

Length (pronotum-elytra) 2.0-2.6 mm. Width 1.2-1.8 mm. Maximum thoracic depth 1.0-1.5 mm.

Male

Similar to *Sennius colima* but with the following exceptions:

Overall size smaller, less robust, elytral vestiture not contrasting.

Integument Color

Usually head black, sometimes head black with red-orange mouthparts and/or small red-orange postocular spot; basal 4-5 antennal segments red orange, apical 6-7 reddish brown, undersurfaces of antennal segments usually red orange. The remainder of the body has 2 color phases, one with solid red-orange elytra (light phase), the other with black elytra with a medial red-orange maculation (dark phase); there is slight overlap between the 2 phases but they are generally distinct; the *light phase* (fig. 8) varies from being all red orange, except for the black head, to the more usual specimens with dark brown to black pronota, thoracic sterna and hind coxa; sometimes elytra of *light phase* individuals with a very narrow dark brown to black border around entire periphery; *dark phase* individuals usually all black except for red-orange elytral maculation (fig. 7), basal 5 antennal segments, pro- and mesothoracic legs, and about apical 1/2 of hind femur; color of hind leg varies from mostly black to mostly red orange; elytral maculation nearer base than apex, usually occupying area between striae 2-9, and about 4/7 length of elytron; humerus always black so that maculation extends toward base and lateral margin.

Vestiture

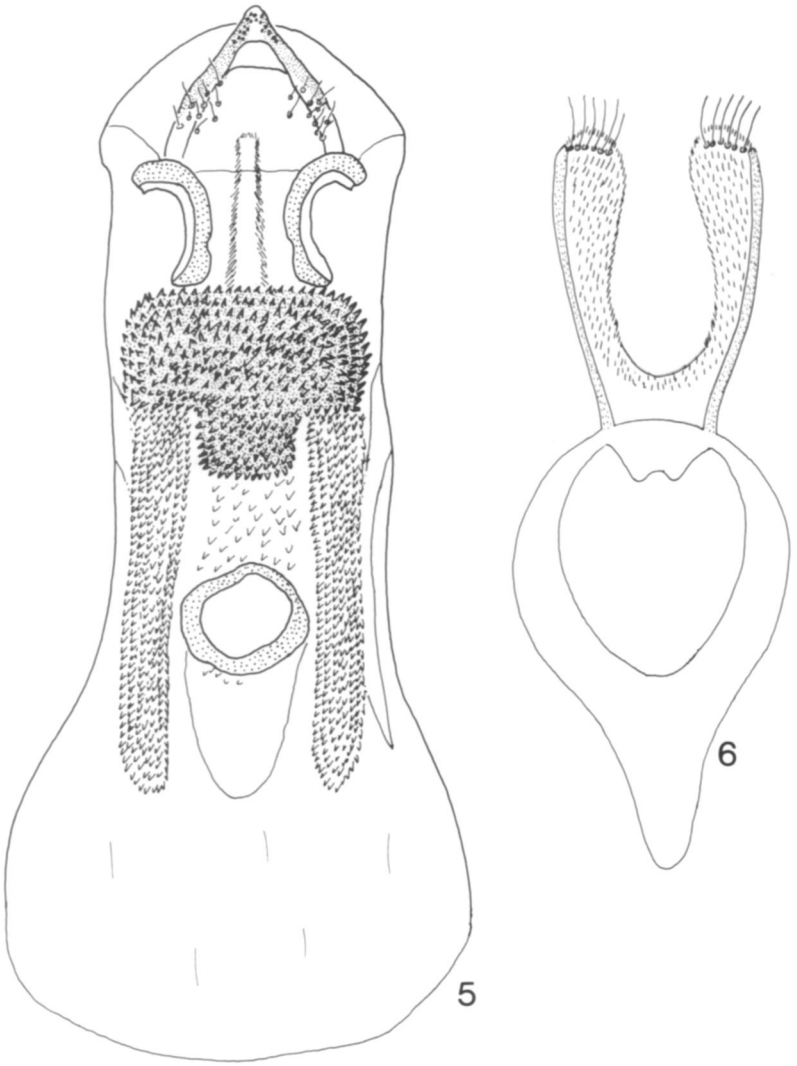
With recumbent white, brown, and golden hairs; *dark phase*: pronotum with intermixed brown and golden hairs on disk, dense patches of white hairs on median basal lobe and on either side between median lobe and lateral margin (fig. 7); lateral margins of pronotum with dense white hairs; elytron with intermixed golden and brown hairs except for line of moderately dense white hairs extending from base to apex between stria 2 and medial margin; pygidium with moderately dense, uniform white hairs, midline with very dense line of white hairs extending from base to apex; undersurfaces and legs with moderately dense to dense white hairs; *light phase*: similar to dark phase except elytron without brown hairs, white line of hairs along medial margin sparse but present (fig. 8).

Structure

Head.—Eyes slightly more prominent; ocular sinus about 1/2 as long as width of eye; antennal segments 1 and 2 usually moniliform, 3 and 4 usually filiform.

Prothorax.—Disk subcampanulate (figs. 7, 8); lateral prothoracic carina vague, extending about 2/3 distance from base to coxal cavity.

Mesothorax and Metathorax.—Scutellum small, quadrate; elytron about twice as long as broad; striae deep, punctate, strial intervals punctulate; striae 2, 3 and 4, and 5 and 6 closer to one another at base than to adjacent striae (figs. 7, 8); hind femur constricted basally and apically, expanded medially to about width of coxa (fig. 9); femur armed with an inner subapical acuminate spine slightly longer than

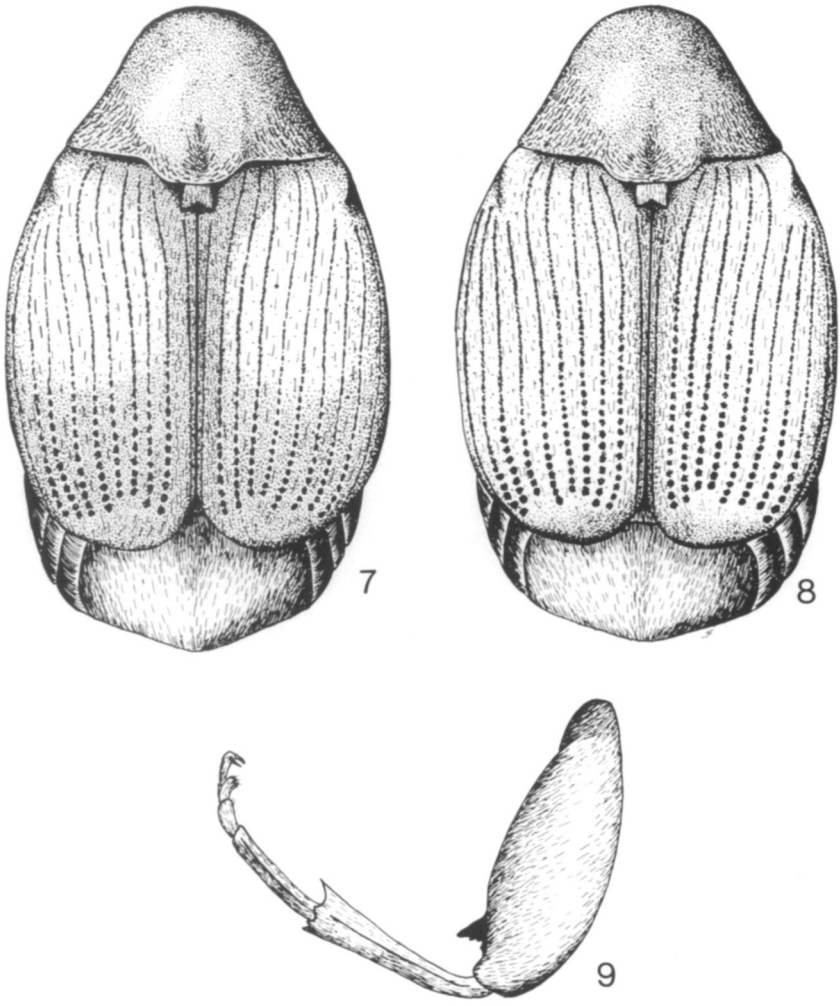


Figs. 5-6, *Sennius colima*, male genitalia: 5, median lobe; 6, lateral lobes.

width of tibial base, spine usually with 1 or 2 serrations on posterior margin; latero-ventral carina of tibia usually absent, when present vague; mucro about 0.15 as long as 1st tarsomere.

Abdomen.—1st sternum about 2/3 as long as abdomen, posterior margin straight; 5th sternum deeply emarginate.

Genitalia.—Figs. 10, 11. Median lobe moderately long; in ventral view, ventral valve subtriangular, lateral margins concave, base about 1/2 as wide as apex of median lobe, arcuate in lateral view; hinge sclerites large, curved, broader at apex; armature of internal sac consisting of 2 medial clumps of small spines, 2 subtriangular elongated masses of spines (one on either side) near apex, a convoluted mass of spicules apically, and a rounded gonopore sclerite at apex. Lateral lobes expanded apically, cleft to about 0.66 their length (fig. 11).



Figs. 7-9, *Sennius lawrencei*: 7, habitus dark phase; 8, habitus light phase; 9, hind leg.

Female

Apex of last abdominal sternum convex, about as long as 2 preceding sterna.

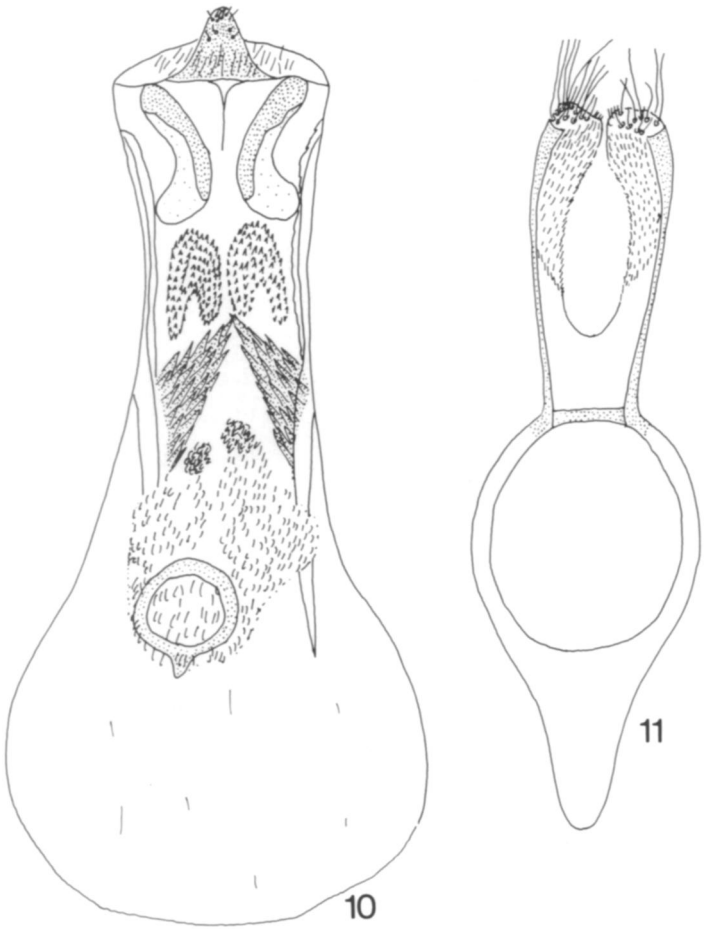
Host Plants

Cassia sp.: Panama. Canal Zone: Rio Ciri Grande, 15-I-64, R. L. Dressler collector (LJB #119b).

Cassia reticulata Willdenow: Panama. Canal Zone: Frijoles, 24-I-64 (LJB #119g); Gatun, 3-III-64 (LJB #122c-A); Gamboa, 4-III-64 (LJB #122j).

Type Series

Holotype male, allotype female, and 101 paratypes: Panama. Canal Zone: Frijoles, 24-I-64, reared seeds *Cassia reticulata*, L. J. Bottimer collection #119g. CNC #15059. Numerous additional paratypes from localities listed under HOST PLANTS.



Figs. 10-11, *Sennius lawrencei*, male genitalia: 10, median lobe; 11, lateral lobes.

Holotype, allotype, and numerous paratypes deposited in the Canadian National Collection of Insects, Ottawa. Paratypes retained in the author's collection and also deposited in the following collections: California Academy of Sciences, San Francisco; Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; and U.S. National Museum of Natural History, Washington, D.C.

Discussion

Sennius lawrencei is more similar to *S. instabilis* (Sharp) than to any other *Sennius* known to me. They resemble each other in color pattern and general overall morphology. However, *S. lawrencei* is larger; its elytral color is usually solid red orange, none having solid black elytra; the pygidium lacks 3 basal white spots; and the subapical acuminate spine on the femur is slightly longer than the width of the tibial base. The male genitalia are similar to those of *S. instabilis* but the internal sac of *S. lawrencei* has 2 medial clumps of small spines (compared to one clump in *S. instabilis*) and 2 subtriangular elongated masses of spines on either side near the apex (*S. instabilis* has 2 smaller, less well-defined clumps of spines near the apex). *S. lawrencei* keys to couplet 14 of Johnson and Kingsolver (1973). It is separated from *S. instabilis* by characters given above.

Because of its close relationship to *S. instabilis*, *S. lawrencei* is tentatively placed in species group 2 of Johnson and Kingsolver (1973), pending further systematic studies in *Sennius*.

This beautiful species at first appeared to be composed of 2 species, the dark form with red maculations on the elytra and the light form with all red elytra. However, except for color the external characters and male genital characters vary hardly at all, so I consider these forms to be members of the same species. Moreover, in 3 of the 4 rearings from seeds both color phases emerged, and the fourth rearing consisted of only one specimen!

S. lawrencei has been reared only from the seeds of *Cassia reticulata*, whereas *S. instabilis* has been reared from *Cassia occidentalis* and *C. uniflora* (Johnson and Kingsolver 1973).

This species is named for Lawrence J. Bottimer, collector of the species, and long time gatherer of bruchid host plant data.

Sennius panama Johnson, **new species**

(Figs. 3-4; 12-13)

Length (pronotum-elytra) 2.0-2.8 mm. Width 1.5-2.0 mm. Maximum thoracic depth 1.2-1.7 mm.

Male

Similar to *Sennius colima* but with the following exceptions:

Overall size smaller, less robust, elytral vestiture more contrasting.

Integument Color

Usually entire body reddish brown, with head, pronotum, thoracic sterna and hind coxa a darker reddish brown; apical 2/5 of elytron appears darker in color due to cover of sparse dark brown hairs (fig. 3); when occasionally thoracic sterna and hind leg very dark brown, then apical 2/5 of elytron appearing almost black.

Vestiture

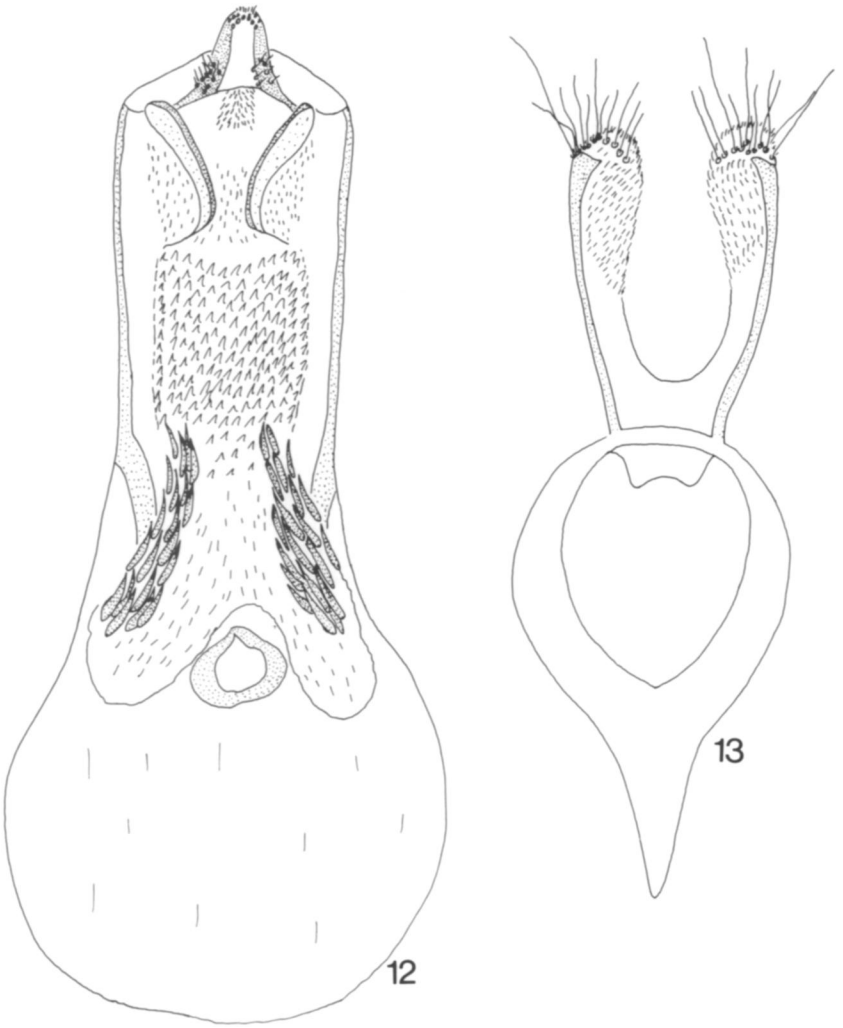
With recumbent yellow hairs predominantly; pronotum sometimes with dense line of hairs on midline with patches of dense hairs lateral to it and near base, usually without definite pattern; elytron often with dark hairs on apical 2/5 and

with dense patches of yellow hairs in center so that a band of hairs reaches almost completely across elytron, interval between striae 7 and 8 never with dense yellow hairs.

Structure

Head.—Ocular sinus about 1/2 as long as width of eye.

Prothorax.—Fig. 3. Cervical sulcus shallow, extending from near coxal cavity to about 1/2 distance to pronotal midline; lateral prothoracic carina vague, extending about 2/3 distance from base to coxal cavity; prosternum separating procoxae for about 0.9 their length.



Figs. 12-13, *Sennius panama*, male genitalia: 12, median lobe; 13, lateral lobes.

Mesothorax and Metathorax.—Scutellum small, quadrate; striae deep, punctate (fig. 3); hind femur constricted basally and apically, expanded medially to about width of coxa (fig. 4); tibia with ventral, lateral, and dorsomesal glabrous longitudinal carinae, lateroventral carina well-marked at base but faint or obsolete at apex; tibial corona with about 3 spinules, mucro about 0.15 as long as 1st tarsomere.

Abdomen.—1st sternum about 2/3 as long as abdomen.

Genitalia.—Figs. 12, 13. Median lobe moderately long; in ventral view, ventral valve triangular, lateral margins arcuate, base about 1/2 as wide as apex of median lobe, arcuate in lateral view; hinge sclerites large, only slightly curved; armature of internal sac consisting of a large medial mass of spines, medial mass of spines connected to paired elongate strands of strong spines on either side of sac extending almost to apex; round gonopore sclerite at apex. Lateral lobes expanded apically, cleft to about 0.75 their length (fig. 13).

Female

Dark brown line on interval between elytral striae 3 and 4 present.

Host Plants

Cassia undulata Bentham: Panama. Canal Zone: Frijoles, 10-II-64 (LJB #120o); Salud Basin, near Frijoles, 8-III-64, N. G. Smith collector, (LJB #122m).

Type Series

Holotype male, allotype female, and 374 paratypes: Panama. Canal Zone: Frijoles, 10-II-64, reared seeds *Cassia undulata*, L. J. Bottimer collector, #120o. CNC #13912. Fourteen paratypes: Panama. Canal Zone: Salud Basin, near Frijoles, 8-III-64, N. G. Smith collector, L. J. Bottimer #122m.

Holotype, allotype, and numerous paratypes deposited in the Canadian National Collection of Insects (CNC), Ottawa. Paratypes retained in the author's collection and also deposited in the following collections: California Academy of Sciences, San Francisco; Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; and U.S. National Museum of Natural History, Washington, D.C.

Discussion

S. panama is closely related to *S. breveapicalis*, *S. colima*, and *S. lateapicalis*. Characters used to separate the 4 species are discussed under *S. colima*. The shape of the ventral valve of the male genitalia (figs. 5, 12) differs quite strikingly between *S. colima* and *S. panama*. These can be used as additional characters to separate the 2 species.

Elytral apices of most specimens of *S. panama* are a darker brown than the rest of the elytra and some are almost black. This variation does not seem to be correlated with variations in other characters.

Because of its close relationship to *S. breveapicalis*, *S. panama* is tentatively placed in species group 1 of Johnson and Kingsolver (1973), pending further systematic studies in *Sennius*. *S. panama* keys to couplet 7 of Johnson and Kingsolver (1973) and is separated from *S. breveapicalis* by characters given in the discussion of *S. colima*.

The specific epithet *panama* is a noun in apposition to *Sennius*.

New Host and Locality Records for Species of *Sennius*

Nineteen new host records for species of *Sennius* are presented below. These and the records listed for the new species are summarized in Tables

Table 1. Sennius *species and their host plants (Supplement to Johnson and Kingsolver 1973)*

Sennius *spp.*	Cassia *host plant species*
auricomus	biflora; xiphoidea
breveapicalis	densiflora; undulata
colima	berlandieri
ensiculus	patellaria
fallax	berlandieri; bicapsularis; hintoni; occidentalis; reticulata
guttifer	bicapsularis; nicaraguensis
instabilis	biflora; leptocarpa; occidentalis; tora; uniflora
lawrencei	reticulata
leucostauros	bicapsularis
medialis	leptocarpa
militaris	emarginata
morosus	covesii; leptocarpa; occidentalis
obesulus	wrightii
panama	undulata
rufescens	bicapsularis; biflora; leptocarpa; occidentalis; reticulata; tora
simulans	leptadenia
trinotaticollis	maxonii; oxyphylla

Table 2. Plants infested by Sennius *(supplement to Johnson and Kingsolver 1973)*

Cassia *host plant species*	Sennius *spp.*
berlandieri	colima; fallax
bicapsularis	fallax; guttifer; leucostauros; rufescens
biflora	auricomus; instabilis; rufescens
covesii	morosus
densiflora	breveapicalis
emarginata	militaris
hintoni	fallax
leptadenia	simulans
leptocarpa	instabilis; medialis; morosus; rufescens
maxonii	trinotaticollis
nicaraguensis	guttifer
occidentalis	instabilis; fallax; morosus; rufescens
oxyphylla	trinotaticollis
patellaria	ensiculus
reticulata	fallax; lawrencei; rufescens
tora	instabilis; rufescens
undulata	breveapicalis; panama
wrightii	obesulus
xiphoidea	auricomus
sp. (reticulata?)	fallax; rufescens

1 and 2. The locality records presented here supplement the records of Johnson and Kingsolver (1973) and Whitehead and Kingsolver (1975a).

It is of interest that those species of *Sennius* reported by Johnson and Kingsolver to have a wide range of hosts are shown to have many additional hosts. As would be expected, the converse is true for the bruchids with a narrow range; few new hosts are reported for them.

Sennius auricomus Johnson and Kingsolver

1. *Cassia biflora* Linnaeus: Mexico. *Sonora:* Lake Mocuzari, 24-XII-72 (CDJ #145-72); Lake Mocuzari, 22-XII-76 (CDJ #134-76); 2 mi S Lake Mocuzari, 22-XII-76 (CDJ #143-76); 8 mi S Lake Mocuzari, 22-XII-76 (CDJ #148-76); 5 mi W Alamos, 26-XII-76 (CDJ #184-76); 14 mi E Navojoa, 26-XII-76 (CDJ #188-76). *Sinaloa*: 4 mi S Culiacan, 26-XII-72 (CDJ #183-72); 33 mi S Escuinapa, 6-I-73 (CDJ #118-73).
2. *C. xiphoidea* Bertol. vel sp. aff.: Mexico. *Sinaloa*: 53 mi S Culiacan, 26-XII-72 (CDJ #189-72).

Sennius breveapicalis (Pic)

1. *C. densiflora* Mart. & Gel.: Mexico. *Guerrero*: Acapulco, January 1963 (intercepted in San Antonio, TX, LJB #113s).
2. *C. undulata* Bentham: Panama. El Valle, 18-XII-63 (LJB #117t); *Canal Zone*: Barro Colorado Island, 22-III-64 (LJB #120d).

Sennius ensiculus Johnson and Kingsolver

1. *C. patellaria* DC.: Panama. El Valle, 17-XII-63 (LJB #117s).
2. *Cassia (Chaemaecrista)* sp.: Panama. *Chiriqui*: Volcan de Chiriqui, 7-I-64 (LJB #118u).

Sennius fallax (Boheman)

1. *C. berlandieri* Bentham vel sp. aff.: Mexico. *Colima*: 7 mi E Manzanillo, 7-III-73 (CDJ #401-73).
2. *C. bicapsularis* Linnaeus: Mexico. *Colima*: 3 mi E Cuyutlan, 7-III-73 (CDJ #397-73); 4 mi NE Cuyutlan, 7-III-73 (CDJ #398-73); 1 mi W Manzanillo, 7-III-73 (CDJ #409-73). *Jalisco*: 2 mi NW Barra de Navidad, 8-III-73 (CDJ #427-73). *Sinaloa*: 3 mi N Los Mochis, 24-II-73 (CDJ #182-73).
3. *C. hintoni* Sandwith: Mexico. *Jalisco*: 22 mi N Barra de Navidad, 8-III-73 (CDJ #435-73); 56 mi S Puerto Vallarta, 9-III-73 (CDJ #452-73).
4. *C. occidentalis* Linnaeus: Mexico. *Colima*: 8 mi W Manzanillo, 8-III-73 (CDJ #413-73).
5. *C. reticulata* Willdenow: Panama. *Canal Zone*: Gatun, 3-III-64 (LJB #122c); Morgan Gardens near Ft. Clayton, 25-III-64 (LJB #122r-A).

Sennius guttifer (Sharp)

1. *C. bicapsularis* Linnaeus: Mexico. *Jalisco*: 8-III-73 (CDJ #427-73). *Sinaloa*: 6 mi N Los Mochis, 24-II-73 (CDJ #182-73).
2. *C. nicaraguensis* Bentham: Mexico. *Jalisco*: ca. 1200′, 18 mi N Barra de Navidad, 2-I-73 (CDJ#12-73).

Sennius instabilis (Sharp)

1. *C. biflora* Linnaeus: Mexico. *Sonora*: Lake Mocuzari, 24-XII-72 (CDJ #145-72); 5 mi W Alamos, 26-XII-76 (CDJ #184-76). *Sinaloa*: 4 mi S. Culiacan, 26-XII-72 (CDJ #183-72); 4 mi S Culiacan, 25-II-73 (CDJ #186-73).
2. *C. leptocarpa* Bentham: Mexico. *Colima*: 16 mi E Manzanillo, 2-I-73 (CDJ #39-73). *Jalisco*: ca. 3000′, 18 mi W Magdalena, 5-I-73 (CDJ #66-73). *Nayarit*: ca. 3500′, 24 mi NW Ixtlan Del Rio, 5-I-73 (CDJ #80-73). *Sonora*: 4 mi W Alamos, 25-XII-72 (CDJ #164-72); Lake Mocuzari, 22-XII-76 (CDJ #136-76); 8 mi NW Alamos, 23-XII-76 (CDJ #173-76); 1 mi W Alamos, 26-XII-76 (CDJ #176-76); 5 mi W Alamos, 26-XII-76 (CDJ #181-76).
3. *C. occidentalis* Linnaeus: Mexico. *Jalisco*: 4 mi N Barra de Navidad, 2-I-73 (CDJ #7-73). *Sinaloa*: 38 mi S Culiacan, 25-II-73 (CDJ #205-73). Nayarit: 10 mi NE Sayulita, 1-III-73 (CDJ #300-73). *Sonora*: 8 mi NW Alamos, 23-XII-76 (CDJ #172-76); 5 mi W Alamos, 26-XII-76 (CDJ #182-76).
4. *C. tora* Linnaeus: Mexico. *Colima*: 7 mi E Manzanillo, 7-III-73 (CDJ #403-73).

Sennius leucostauros Johnson and Kingsolver

1. *C. bicapsularis* Linnaeus: Mexico. *Colima*: 3 mi E Cuyutlan, 7-III-73 (CDJ #397-73); 4 mi NE Cuyutlan, 7-III-73 (CDJ #398-73); 1 mi W Manzanillo, 7-III-73 (CDJ #409-73). *Jalisco*: 2 mi NW Barra de Navidad, 8-III-73 (CDJ #427-73).

Sennius medialis (Sharp)

1. *C. leptocarpa* Bentham: *Arizona*. Cochise Co.: ca. 5000′, Ramsey Cyn. Rd. at Hwy. 90, 6-X-72 (CDJ #109-72); ca. 5500′, Carr Cyn., Huachuca Mts., 6-X-72 (CDJ #112-72). Pima Co.: ca. 4600′, mouth, Box Cyn., Santa Rita Mts., 7-X-72 (CDJ #129-72). Santa Cruz Co.: ca. 4200′, 3 mi NW Ruby, 15-X-76 (CDJ #71-76). Mexico. *Colima*: 16 mi E Manzanillo, 2-I-73 (CDJ #39-73).

Sennius militaris (Sharp)

1. *C. emarginata* Linnaeus: Mexico. *Colima:* 11 mi NE Armeria, 7-III-73 (CDJ #390-73). *Jalisco*: 21 mi N Barra de Navidad, 8-III-73 (CDJ #434-73).

Sennius morosus (Sharp)

1. *C. covesii* A. Gray: Mexico. *Sonora*: 0.5 mi W San Carlos Bay, 12-VIII-70 (CDJ #72-70); 17 mi S Navojoa, 13-VIII-70 (CDJ #99-70).
2. *C. leptocarpa* Bentham: Mexico. *Colima*: 16 mi E Manzanillo, 2-I-73 (CDJ #39-73). *Jalisco*: ca. 3000′, 18 mi W Magdalena, 5-I-73 (CDJ #66-73). *Nayarit*: ca. 3500′, 24 mi NW Ixtlan Del Rio, 5-I-73 (CDJ #80-73). *Sonora*: Lake Mocuzari, 22-XII-76 (CDJ #136-76); 8 mi NW Alamos, 23-XII-76 (CDJ #173-76); 1 mi W Alamos, 26-XII-76 (CDJ #176-76); 5 mi W Alamos, 26-XII-76 (CDJ #181-76).
3. *C. occidentalis* Linnaeus: Mexico. *Sonora*: 5 mi W Alamos, 26-XII-76 (CDJ #182-76).

Sennius obesulus (Sharp)

1. *Cassia wrightii* Gray: *Arizona*. Santa Cruz Co.: ca 4300′, 3 mi W Pena Blanca Lake, 15-X-76 (CDJ #58-76).

Sennius rufescens (Motschulsky)

1. *C. bicapsularis* Linnaeus: Mexico. *Nayarit*: 12 mi N Rosamorada, 12-VII-68 (CDJ #277-68). *Sinaloa*: 3 mi N Los Mochis, 24-II-73 (CDJ #182-73). *Colima*: 3 mi E Cuyutlan, 7-III-73 (CDJ #397-73); 4 mi NE Cuyutlan, 7-III-73 (CDJ #398-73); 1 mi W Manzanillo, 7-III-73 (CDJ #409-73). *Jalisco*: 2 mi NW Barra de Navidad, 8-III-73 (CDJ #427-73).
2. *C. biflora* Linnaeus: Mexico. *Sinaloa*: 4 mi S Culiacan, 25-II-73 (CDJ #186-73).
3. *C. leptocarpa* Bentham: Mexico. *Colima*: 16 mi E Manzanillo, 2-I-73 (CDJ #39-73). *Jalisco*: ca. 3000′, 18 mi W Magdalena, 5-I-73 (CDJ #66-73). *Nayarit*: ca. 3500′, 24 mi NW Ixtlan Del Rio, 5-I-73 (CDJ #80-73).
4. *C. occidentalis* Linnaeus: Mexico. *Colima*: 8 mi W Manzanillo, 8-III-73 (CDJ #413-73). *Jalisco*: 4 mi E Cihuatlan, 8-III-73 (CDJ #425-73); 4 mi N Barra de Navidad, 2-I-73 (CDJ #7-73). *Nayarit*: 13 mi S Rosamorada, 6-I-73 (CDJ #112-73); 10 mi NE Sayulita, 1-III-73 (CDJ #300-73). *Sinaloa*: 38 mi S Culiacan, 25-II-73 (CDJ #205-73). *Sonora*: 8 mi NW Alamos, 23-XII-76 (CDJ #172-76); 5 mi W Alamos, 26-XII-76 (CDJ #182-76).
5. *C. reticulata* Willdenow: Panama. *Canal Zone*: Gatun, 3-III-64 (LJB #122c); Morgan Gardens near Ft. Clayton, 25-III-64 (LJB #122r-A).
6. *C. tora* Linnaeus vel sp. aff.: Mexico. *Colima*: 7 mi E Manzanillo, 7-III-73 (CDJ #403-73).

Sennius simulans (Schaeffer)

1. *C. leptadenia* Greenm.: *Arizona*. Cochise Co.: ca. 5500′, Carr Cyn., 6-X-72 (CDJ #113-72).

Sennius trinotaticollis (Pic)

1. *C. maxonii* (Britt. & Rose) Schery: Panama. *Canal Zone*: Gamboa, 12-II-64 (LJB #120r).
2. *C. oxyphylla* Kunth. vel sp. aff.: Panama. *Canal Zone*: Gamboa, 12-III-64 (LJB #122p).

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