

REVISIONARY NOTES ON THE GENUS *SYSTEMUS* LOEW WITH  
THE DESCRIPTION OF A NEW SPECIES  
(DIPTERA: DOLICHOPODIDAE)

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**ABSTRACT**—The species of *Systemus* (7 palaearctic, 6 nearctic, and 1 neotropical) are listed and the males keyed. One new species, *S. eucercus* (Connecticut; Virginia), is described, and notes concerning *S. californicus* Harmston, *S. minutus* (Van Duzee), and *S. shannoni* Wirth are given. *S. oregonensis* and *S. utahensis*, both described in 1966 by Harmston and Miller, are referred to the genus *Achalcus* Loew.

These notes are the result of a study made in the course of determining specimens received from E. James Cole, Jr., of the University of Connecticut, most of which represent a new species closely related to *Systemus albimanus* Wirth. A key to the 14 known species of *Systemus* Loew (7 palaearctic, 6 nearctic, and 1 neotropical) is given, the species are listed, and notes and figures relating to *S. californicus* Harmston, *S. minutus* (Van Duzee), and *S. shannoni* are also given. Two North American species, *S. oregonensis* and *S. utahensis*, both described by Harmston and Miller in 1966, are referred to the genus *Achalcus* Loew.

***Systemus californicus* Harmston**  
(Fig. 3a-c)

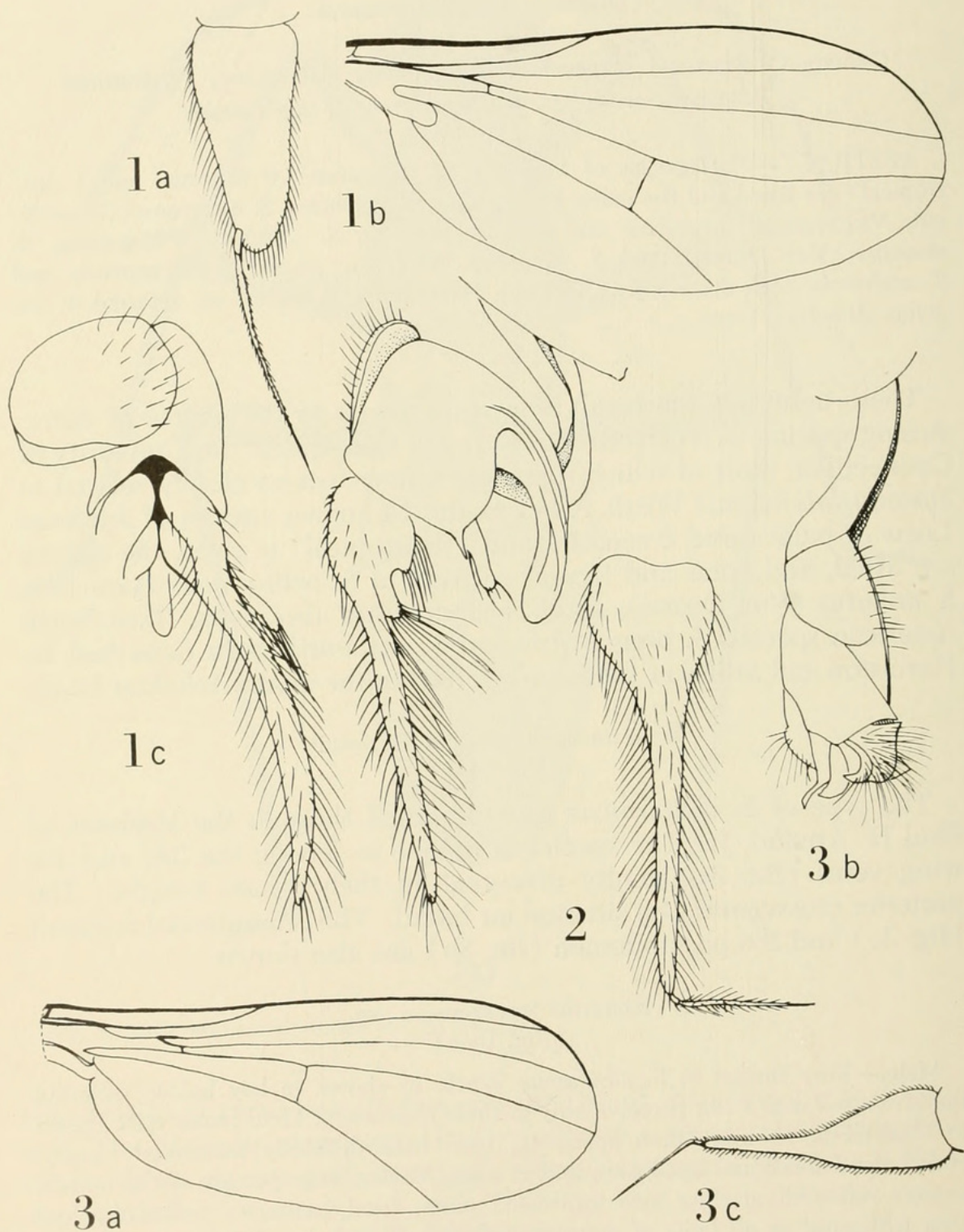
The type of *S. californicus* was examined through the kindness of Paul H. Arnaud, Jr. The species is unique in having the 3rd and 4th wing veins (fig. 3a) gently divergent in their whole lengths. The posterior crossvein is also situated far basad. The 3rd antennal segment (fig. 3c) and the postabdomen (fig. 3b) are also shown.

***Systemus eucercus*, n. sp.**  
(Fig. 1a-c)

Male.—Very similar to *S. albimanus* Wirth, as shown in key below, differing therefrom so far as I can perceive only in these characters: Hind femur dark brown to blackish in no more than apical  $\frac{1}{4}$ ; hind tibia distinctly infuscated basally, except slender extreme basal part, and at apex, leaving large portion of the middle section yellowish grading into infuscated parts; hind basitarsus yellowish; fore coxa with most or all hairs of anterior surface yellowish or whitish, at most with a few blackish hairs mesally; antenna with 3rd segment as in fig. 1a, mesal side of 2nd and a small part of mesobasal surface of 3rd segment sometimes dark yellowish or brown; hypopygial lamella (cercus) as in fig. 1c, 0.44 mm. long; wing as in fig. 1b, distance between tips of 3rd and 4th veins averaging 0.498 of dis-

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Details of *Systemenus* species. Fig. 1, *S. eucercus*, n. sp.: a, profile of left 3rd antennal segment and arista of holotype; b, wing of holotype; c, postabdomen (hypopygium), dorsal view (less larger part of one side of lamellae) and profile of Storrs paratype. Fig. 2, *S. minutus* (Van Duzee), 3rd antennal segment and arista of male from Alabama. Fig. 3, *S. californicus* Harmston, holotype: a, wing; b, profile of postabdomen (dry); c, 3rd antennal segment and arista.



tance between tips of 2nd and 3rd veins (this figure in *S. albimanus* is 0.42, but there is considerable overlapping variation).

Female.—Similar to male except in genitalic and antennal characters, which latter are apparently same as in *S. albimanus*.

Holotype (male) and allotype, Manchester, Connecticut, emerged 23 August 1968 from immatures collected on 30 July 1968 in flux on oak tree (J. Cole), notebook no. 012; paratype ♂, same locality, emerged 29 July 1968 from immature collected on 11 June 1968 in flux on elm tree (J. Cole), notebook no. 010; paratype ♂, Storrs, Connecticut, emerged 6 September 1968 from immature collected on 23 July 1968 in flux on elm tree (J. Cole), notebook no. 013 (U. S. Nat. Mus. type no. 70471). The following material, also in U. S. Nat. Mus., has also been examined: 1 ♂, Falls Church, Virginia, 19 April 1913, reared ex *Liriodendron tulipifera* (C. T. Greene); 1 ♂, Alexandria, Virginia, emerged 6 May 1952 from beech tree hollow debris collected in September 1951 (W. W. Wirth); 1 ♂, Alexandria, Virginia, emerged 7 January 1952 from beech tree hollow debris collected in November 1951 (W. W. Wirth); 1 ♂, Alexandria, Virginia, 12 April 1953 (W. W. Wirth). The specimen from Falls Church is a paratype of *S. albimanus* Wirth, and those from Alexandria were also determined by Wirth as *S. albimanus*. There is therefore doubt concerning the identity of the larvae described by Wirth as of *S. albimanus*; they could pertain to the other species known from the area, *S. apicalis*, *S. shannoni*, or the new species.

The specific name is an adjective of Greek derivation, signifying "with well developed cerci."

***Systemus minutus*** (Van Duzee)  
(Fig. 2)

The holotype female and 2 males determined by Harold Robinson are in U. S. Nat. Mus. The 3rd antennal segment and arista of a male from Alabama are shown.

***Systemus shannoni*** Wirth

Described from 2 males collected on Plummers Island, Potomac River, Maryland, in 1914. A single female emerged on 8 August 1968 from an immature collected in elm tree flux on 19 July 1968 at Rockport, Massachusetts, by J. Cole. This specimen agrees well with the type material except for its short, ovoid 3rd antennal segment, and will with that exception run to *S. shannoni* in the following key.

KEY TO SPECIES OF ***Systemus*** LOEW (MALES)

(Palearctic species marked with \*; all others are American)

- 1 (10) 3rd and 4th wing veins strongly convergent, separation at costa less than half length of *tp* crossvein. Note: *S. lamelliger* Mueller, with



"dritte und vierte Ader genähert," is run both here and in the alternate section; it should be compared with *S. obscurior* Becker, described from ♀ only.

- 2 (3) Posterior margin of wing concave before tip; black spot at tip of wing posterad of 4th vein ..... **\*S. scholtzii** (Loew)
- 3 (2) Wing margin wholly convex; wing wholly hyaline, without apical spot.
- 4 (5) Femora, at least  $F_3$ , black; hypopygial lamella long, attaining base of abdomen, narrowly spatulate, blackish brown, with 4 bristles on ventral margin and fine hairs on dorsal margin ..... **\*S. lamelliger** Mueller
- 5 (4) Femora yellow; hypopygial lamella short, yellowish.
- 6 (7) Length 3.5 mm; 3rd antennal segment cuneiform, evenly tapering from base to apex ..... **\*S. pallipes** (Roser)
- 7 (6) Length 2.5 mm.; 3rd antennal segment otherwise.
- 8 (9) 3rd antennal segment roundish in profile in basal third, remainder much narrower and gently tapering (fig. 2); apical section of 5th vein 1.75 times as long as *tp* (North American) ..... **S. minutus** (Van Duzee)
- 9 (8) 3rd antennal segment elongate ovoid; apical section of 5th vein 4.6 times as long as *tp* (South American) ..... **S. raptor** Becker
- 10 (1) 3rd and 4th wing veins separated at costa by no more than half length of *tp*, gently convergent to slightly divergent apically.
- 11 (12) Apex of wing whitish, preceded by blackish transverse bar across whole width of 1st posterior cell;  $F_3$  wholly yellow; palpus yellowish ..... **S. apicalis** Wirth
- 12 (11) Wing wholly hyaline or slightly, evenly infumate.
- 13 (14)  $F_3$  black ..... see *S. lamelliger*, 4 above.
- 14 (13)  $F_3$  yellow, often more or less blackish at tip.
- 15 (18) Arista approximately equal in length to 3rd antennal segment; antenna wholly black, at most yellowish on mesal side of 2nd and base of 3rd segments;  $F_3$  with apical infuscation; palpus blackish; exterior bristle of  $cx_3$  black.
- 16 (17)  $F_3$  blackish in apical  $\frac{1}{3}$ ;  $T_3$  nearly wholly infuscated; basitarsus<sub>3</sub> largely infuscated; most of hairs of anterior surface of  $cx_1$  blackish; antenna wholly black; hypopygial lamella 0.24 mm long -- **S. albimanus** Wirth
- 17 (16)  $F_3$  infuscated in apical  $\frac{1}{4}$ ;  $T_3$  infuscated subbasally and lightly apically, much of mid-section yellowish; basitarsus<sub>3</sub> not infuscated;  $cx_1$  with all hairs of anterior surface yellowish or with only a few mesal ones black; antenna with mesal side of 2nd segment sometimes yellowish; hypopygial lamella 0.44 mm long (fig. 1c) --- **S. eucercus**, n. sp.
- 18 (15) Arista much shorter than 3rd antennal segment; antenna wholly black or yellowish at base;  $F_3$  wholly yellowish or apically infuscated;  $T_3$  wholly yellowish or infuscated; palpus yellowish; exterior bristle of  $cx_3$  yellowish. (Note: last two characters not known for *S. bipartitus*).
- 19 (24) Antenna with at least apex of basal segment yellowish.
- 20 (21)  $F_3$  infuscated in apical  $\frac{1}{3}$  ..... **\*S. tener** Loew
- 21 (20)  $F_3$  wholly yellowish.
- 22 (23) 3rd and 4th wing veins gently divergent; apical section of 5th vein 4.25 times as long as *tp* (fig. 3a) ..... **S. californicus** Harmston



- 23 (22) 3rd and 4th wing veins distinctly convergent; apical section of 5th vein 2.3 times as long as *tp* ..... **S. shannoni** Wirth
- 24 (19) Antenna wholly black.
- 25 (26) 3rd antennal segment conical, arista shorter than segment; T<sub>2</sub> with 1 pair of dorsal bristles near base; F<sub>3</sub> with black subapical ring ..... **\*S. bipartitus** (Loew)
- 26 (25) 3rd antennal segment long and pointed, arista not half as long as segment; T<sub>2</sub> with subbasal and median pairs of dorsal bristles; F<sub>3</sub> slightly blackish near apex above ..... **\*S. leucurus** Loew

CHECKLIST OF SPECIES OF **Systemus** LOEW

- (*S. adpropinquans* [Lw.] = *S. pallipes* [Roser]).
- S. albimanus* Wirth, 1952, Proc. Ent. Soc. Wash. 54:240, figs. 2a-c.
- (*S. americanus* Van Duzee = *Rhaphium melampus* Loew).
- S. apicalis* Wirth, 1952, Proc. Ent. Soc. Wash. 54:237, figs. 1a-d.
- S. bipartitus* (Loew), 1850, Stettin. Ent. Ztg. 11:114, pl. 1, fig. 7 (*Rhaphium*).
- S. californicus* Harmston, 1968, Ent. News 79:16.
- S. eucercus* Steyskal, n. sp., see above.
- S. lamelliger* Mueller, 1924, Verhandl. Zool.-Bot. Gesell. Wien 73:87, fig. 48 (p. 97).
- S. leucurus* Loew, 1859, K. Realschule Meseritz, Programm 1859 (Neue Beitr. 6):14.
- S. minutus* (Van Duzee), 1913, Ann. Ent. Soc. Am. 6:60 (*Neurigona*).
- S. obscurior* Becker, 1918, Abhandl. K. Leop.-Carol. Deutsch. Akad. Naturforscher, Nova Acta 103(3):258. Female only.
- (*S. oregonensis* Harmston and Miller, 1966, Proc. Ent. Soc. Wash. 68:91 = *Achalcus oregonensis* [H. and M.], **new combination**).
- S. pallipes* (Roser), 1840, Korresp. Wurttemb. Landwirtsch. Ver. 1:55 (*Rhaphium*). Syn., *S. adpropinquans* (Loew), type of genus by designation of Foote, Coulson, and Robinson in Stone et al., 1965.
- S. raptor* Becker, 1921, Abhandl. Zool.-Bot. Gesell. Wien 13(1):158, figs. 61, 62.
- S. scholtzii* (Loew), 1850, Stettin. Ent. Ztg. 11:115, pl. 1, figs. 8-10 (*Rhaphium*).
- S. shannoni* Wirth, 1952, Proc. Ent. Soc. Wash. 54:240, fig. 3.
- S. tener* Loew, 1859, K. Realschule Meseritz, Programm 1859 (Neue Beitr. 6): 13.
- (*S. utahensis* Harmston and Miller, 1966, Proc. Ent. Soc. Wash. 68:92 = *Achalcus utahensis* [H. and M.], **new combination**).

I am indebted to Harold Robinson for establishing from examination of paratypes deposited in U. S. Nat. Mus. that *S. oregonensis* and *S. utahensis* should be transferred to *Achalcus*.



Steyskal, George C. 1970. "Revisionary notes on the genus *Systemus* Loew with the description of a new species (Diptera: Dolichopodidae)." *Proceedings of the Entomological Society of Washington* 72, 107–111.

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