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A new species, new synonymy, and taxonomic notes in the *Anastrepha schausi* group (Diptera: Tephritidae)

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Abstract

Anastrepha fuscicauda Norrbom & Korytkowski, new species, is described from Panama. *Anastrepha bellicauda* Norrbom is considered a new junior synonym of *A. lutea* Stone, a sexually dimorphic species which is redescribed.

Resumen

Se describe una nueva especie de *Anastrepha* desde Panamá, *Anastrepha fuscicauda* Norrbom & Korytkowski. *Anastrepha bellicauda* Norrbom es un sinonimo nuevo de *A. lutea* Stone, una especie con sexos dimorficos.

Key words: *Anastrepha*, Tephritidae, fruit flies, taxonomy

Introduction

Anastrepha Schiner is the most diverse genus of Tephritidae in the American tropics and subtropics, with more than 200 species (Norrbom *et al.* 1999 a, b). It is also the most economically important fruit fly genus in this region, including a number of major fruit pests. Despite its importance, however, many species remain undescribed. In this paper, we describe a new species from Panama and recognize a new synonym, both within the *schausi* species group. We also redescribe *A. lutea* Stone, which was not included in the revision of the *schausi* group by Norrbom and Kim (1988).

Methods

Morphological terminology follows White *et al.* (1999). Examined specimens are deposited in the Museo de Entomología, Universidad de Panamá (MEUP) and the National Museum of Natural History, Smithsonian Institution (USNM).

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***Anastrepha fuscicauda* Norrbom & Korytkowski, new species**
Figs. 1–4, 6–12.

Diagnosis. This species belongs to the *schausi* species group, which also includes *A. fernandezi* Caraballo, *A. hermosa* Norrbom, *A. lutea* Stone, and *A. schausi* Aldrich. This group was recognized by Norrbom & Kim (1988) and Norrbom *et al.* (1999b) based on three synapomorphies: glans of male with minute spines apically (Fig. 12); facial carina weak; and lateral surstylus acute, lateral margin usually slightly concave (Fig. 11). *Anastrepha fuscicauda* shares these character states and also belongs in this group. The male differs from those of the other species of the *schausi* group in lacking dense areas of silvery white microtrichia on the abdomen and in abdominal color pattern (Fig. 2): it has tergite 5 mostly dark brown unlike *A. schausi*, but lacks brown markings on other tergites as in *A. fernandezi*, *A. hermosa*, and *A. lutea*. Males further differ from those of *A. fernandezi*, *A. hermosa*, and *A. schausi* in lacking brown or white markings on the face. The female resembles that of *A. fernandezi* and presumably those of *A. hermosa* and *A. schausi*, which are unknown, in having the C- and S-bands widely separated, setae dark brown to black, and the aculeus tip nonserrate, but it has much shorter terminalia (oviscape less than 3.0 mm long, vs. greater than 4.0 mm in the other species). In the key of Steyskal (1977), it will run to *A. insulae* Stone (p. 15), but it differs in having vein M weakly curved apically and not reaching the apex of the S-band.

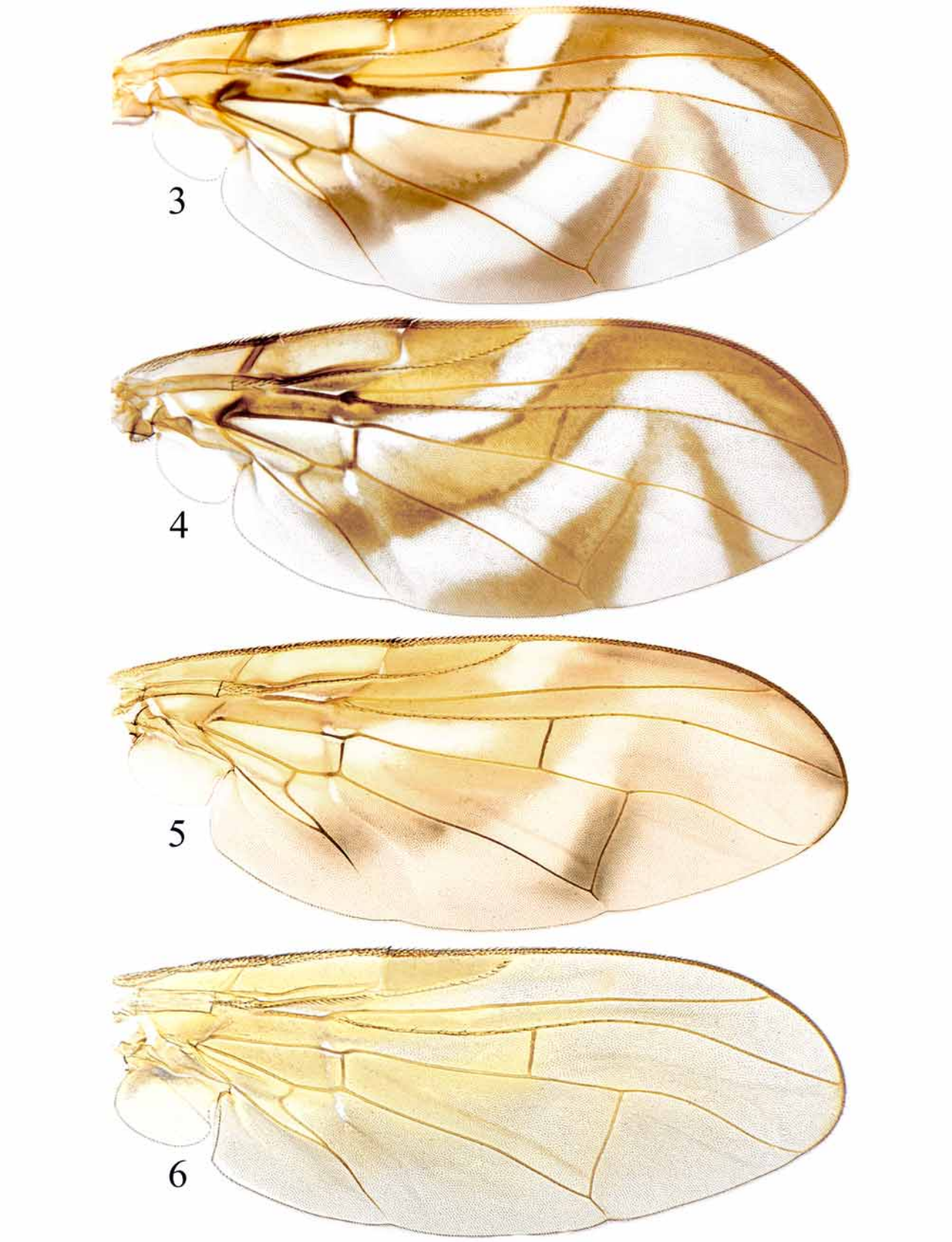
Description. Mostly yellow to orange. Setae dark brown to black. Body length: female 8–9 mm, male 6.0–7.5 mm.

Head: Yellow to orange except ocellar tubercle brown. Face entirely microtrichose and without white or brown markings in either sex, ventral margin not expanded laterally, carina weak, in profile concave. 2–4 (usually 3) frontal setae. 2 orbital setae (in all 7 specimens). Ocellar seta weak to moderately developed (sometimes almost as stout as postocellar seta), 1–2 times as long as ocellar tubercle. Antenna extended 0.67–0.85 distance to ventral facial margin. Arista short pubescent.

Thorax (Figs. 1–2): Mostly yellow to orange, without brown markings; postpronotal lobe, apex and sides of scutellum, scutal vittae and dorsal margin of anepisternum white; medial scutal vitta slender, slightly broadened and rounded posteriorly, extended laterally beyond acrostichal seta but not reaching level of dorsocentral seta. Mesonotum 2.50–3.00 mm long. Scutum nonmicrotrichose except lateral to supra-alar seta; postpronotal lobe, notopleuron and scutellum entirely microtrichose. Scutal setulae yellow anteromedially, brown laterally. Chaetotaxy as usual for genus, katepisternal seta paler and weaker than other setae but well developed, longer than postocellar seta.

Wing (Figs. 3–4): Length 5.75–7.00 mm, width 2.40–2.75 mm, ratio 2.40–2.61. Cell c 1.05–1.13 times as long as pterostigma. Apex of vein R_1 at 0.54–0.58 wing length. Vein R_{2+3} nearly straight. Vein M weakly curved apically; cell r_{4+5} 1.09–1.20 times as wide at apex as at level of dm-cu. Crossvein r-m at 0.67–0.71 length of cell dm, ratio of second to third sections of vein M 2.06–2.47. Distal lobe of cell bcu moderately long, bcu 1.40–1.49 times as long as its anterior margin. Pattern mostly orange brown; posterior part of base, margins of middle part, and apex of S-band and posterior parts of V-band darker brown. C- and S-bands separated by hyaline area from cell bm to costa distal to apex of vein R_1, hyaline area occasionally slightly narrowed along veins R_{2+3} or R_{4+5}. S-band extended basally into posterior 1/3–1/2 of cell bm; distal section moderately broad, at apex of vein R_{2+3} 0.66–0.76 times width of cell r_{2+3}; not extended to apex of vein M. V-band separated from S-band, in 2 specimens with short extensions along vein R_{4+5}; usually complete, distal arm rarely (1 male) narrowly isolated from proximal arm and vein R_{4+5}; proximal arm extended basally along posterior wing margin almost to vein A_1+Cu_2 but not connected to base of S-band. Microtrichose except cell bc, posterior half of cell c (except apex and subbasal fold), extreme base (proximal to crossvein h) and part (varying from small basal area to most) of subapical hyaline area of br, anterior 1/2–2/3 (hyaline part) of bm, most of small basal hyaline area in dm, most of bcu (microtrichose only along medial fold and often along anterior margin), very small basal area in cu_1, very small anterobasal area in a_1, and most or all of alula.

FIGURES 1–2. *Anastrepha fuscicauda*, habitus (Panama: Altos de Pacora): 1, female (Panama: Altos de Pacora, USNMENT00212778); 2, male (USNMENT00212779).



FIGURES 3–6. Wings: 3–4, *Anastrepha fuscicauda* (Panama: Altos de Pacora, USNMENT00212780; Cerro Jefe, USNMENT00214104); 5, *A. lutea*, female (Venezuela: La Chira, USNMENT00048651); 6, *A. lutea*, male (holotype, *A. bellicauda*).

Abdomen (Figs. 1–2): Tergites yellow to orange with posterior margins paler, except male tergite 5 mostly dark brown, yellow on extreme base and usually on lateral margin. Microtrichial pattern partially obscured by debris in most of type series, but tergites apparently mostly nonmicrotrichose except basal half of syntergite 1+2 and basal margins of other tergites, sometimes extending farther medially on syntergite 1+2 and tergites 3 and 4.

Male terminalia: Lateral surstylus (Fig. 11) in posterior view elongate triangular, medial margin convex, lateral margin slightly concave subapically, apex acute. Proctiger without lateral fold separating sclerotized areas. Phallus 2.50–2.85 mm long; 1.40–1.64 times as long as mesonotum. Glans (Fig. 12) 0.59–0.62 mm long.

Female terminalia: Oviscape (Figs. 1, 7) 2.65–2.95 mm long, 0.99–1.09 times as long as mesonotum, yellow basally, apical 2/5 to 1/2 dark brown; spiracle at basal 0.29–0.36. Eversible membrane (Fig. 8) with 40–50 long, slender, hook-like dorsobasal scales in triangular to semicircular pattern. Aculeus (Fig. 9) 2.30–2.65 mm long; base 0.19–0.22 mm wide; shaft 0.09–0.10 mm wide at midlength; tip (Fig. 10) 0.29–0.33 mm long, 0.11 mm wide, 2.64–3.00 times as long as wide, nonserrate, gradually tapered.

Type data. Holotype ♀ (USNM USNMENT00214102), PANAMA: Panamá: Parque Nacional Chagres, Altos de Pacora, 9°15'28"N 79°21'24"W, Desvio, trap 553, 28 Jun 2002, C. A. Korytkowski. Paratypes: PANAMA: Panamá: Same data as holotype, 2♂1♀ (USNM USNMENT00214100-101, USNMENT00214103), 1♂ (MEUP); same, McPhail trap 529, 13 May 2005, C. A. Korytkowski, 1♂2♀ (USNM USNMENT00212778-780), 1♂1♀ (MEUP); Altos de Pacora, Villa Myrtha, trap 568a, 5 Sep 1997, C. A. Korytkowski, 2♀ (USNM USNMENT00214025-026), 1♀ (MEUP); Parque Nacional Chagres, Cerro Pelon, trap 515a, 13 Jun 1999, C. A. Korytkowski, 1♂ (USNM USNMENT00214104).

Biology. The host plants of this species are unknown. Adults were trapped in May, June, and September.

Distribution. *Anastrepha fuscicauda* is known only from Panama.

Etymology. The name of this species is a noun referring to the brown apex of the male abdomen.

***Anastrepha lutea* Stone**

Figs. 5–6, 13–14.

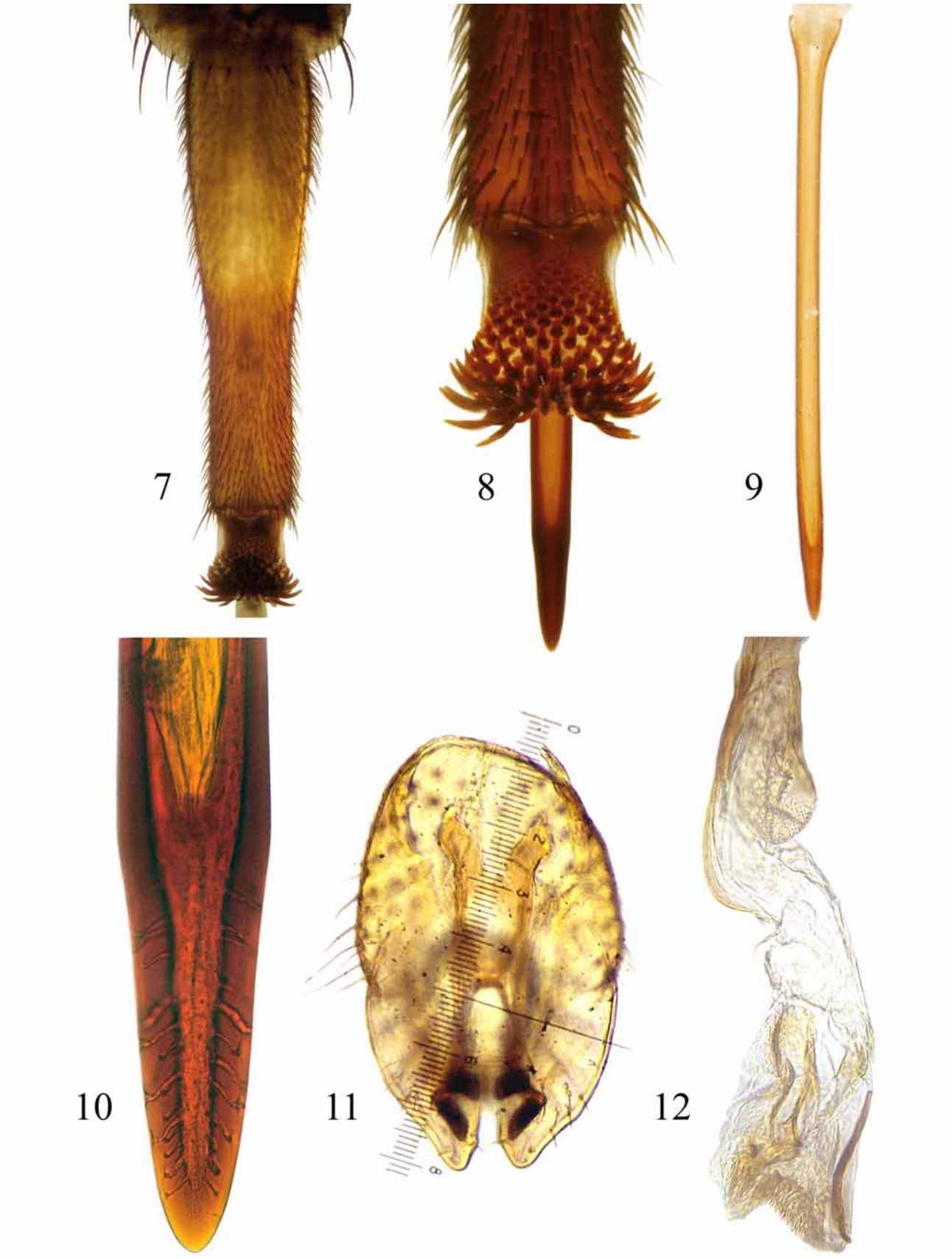
Anastrepha lutea Stone 1942: 95 [description, female; Panama]; Steyskal 1977: 27 [in key]; Norrbom *et al.* 1999a: 80 [catalog].

Anastrepha bellicauda Norrbom in Norrbom & Kim 1988: 168 [description, male]; Norrbom *et al.* 1999a: 77 [catalog; Venezuela]; Norrbom *et al.* 1999b: 321, 324; McPheron *et al.* 1999: 345. **New synonymy**.

Diagnosis. *Anastrepha lutea* also belongs to the *schausi* species group. The sexes are dimorphic in wing pattern and abdominal markings and setation. The male (Fig. 14) is easily recognized from other *Anastrepha* species by its highly reduced wing pattern, which is mostly diffuse yellow, and by the pattern of brown markings and clusters of large setae on the abdomen. The female (Fig. 13) differs from other species of the *schausi* group in having the C- and S- bands broadly connected along vein R_{4+5}. It was included in the key of Steyskal (1977).

Description. Mostly yellow to orange. Setae dark brown to black. Body length: female 9.0–11.0 mm, male 6.5–8.0 mm.

Head: Yellow to orange except ocellar tubercle brown. Face entirely microtrichose and without white or brown markings in either sex, ventral margin not expanded laterally, carina weak, in profile concave. 3–4 frontal setae. Usually 2 orbital setae (posterior seta absent on 1 side in 2 specimens and on both sides in 2 of 18 specimens). Ocellar seta weak, 1–2 times as long as ocellar tubercle. Antenna extended 0.60–0.75 distance to ventral facial margin. Arista short pubescent.



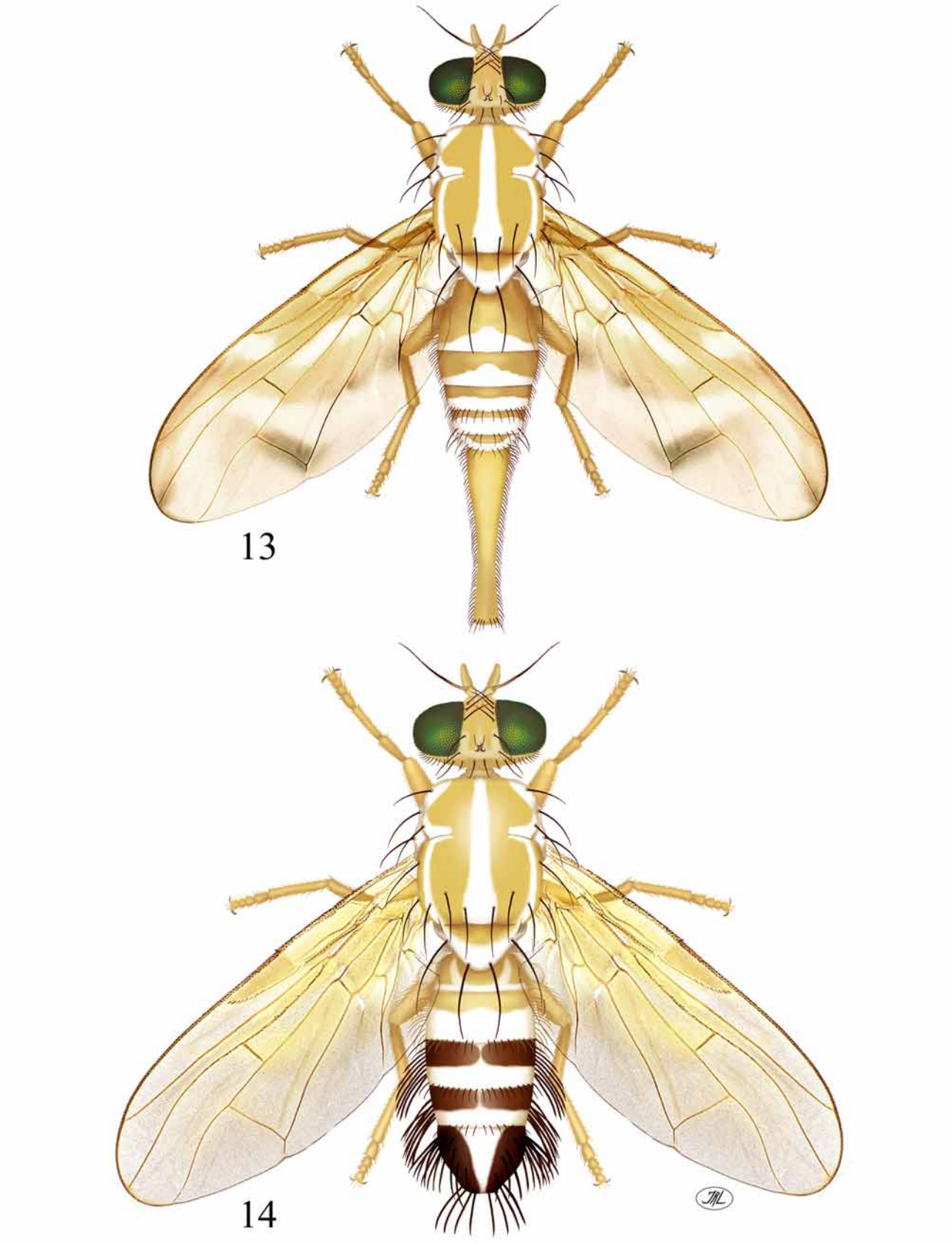
FIGURES 7–12. *Anastrepha fuscicauda*, terminalia (Panama: Altos de Pacora): 7, oviscape; 8, eversible membrane, dorsal (USNMENT00212780); 9, aculeus, ventral (USNMENT00212778); 10, aculeus tip, ventral; 11, epandrium and surstyli, anterior; 12, glans.

Thorax (Figs. 13–14): Mostly yellow to orange, without brown markings; postpronotal lobe, scutellum except base of disc, scutal vittae and dorsal margin of anepisternum white; medial scutal vitta slender, slightly broadened and rounded posteriorly, extended laterally to or slightly beyond acrostichal seta. Mesonotum 2.90–3.75 mm long. Scutum, postpronotal lobe, notopleuron and scutellum entirely microtrichose. Scutal setulae mostly yellow, brownish laterally. Chaetotaxy as usual for genus, katepisternal seta paler and weaker than other setae but moderately long, 2/3 to as long as postocellar seta.

Wing (Figs. 5–6): Length 6.7–8.5 mm, width 2.55–3.35 mm, ratio 2.47–2.73. Cell c 1.11–1.23 times as long as pterostigma. Apex of vein R_1 at 0.53–0.58 wing length. Vein R_{2+3} nearly straight. Vein M weakly curved apically; cell r_{4+5} 0.96–1.14 times as wide at apex as at level of dm-cu. Crossvein r-m at 0.66–0.70 length of cell dm, ratio of second to third sections of vein M 1.96–2.31. Distal lobe of cell bcu moderately long, bcu 1.43–1.57 times as long as its anterior margin. Pattern strongly sexually dimorphic. In male (Fig. 6) mostly hyaline with diffuse, pale yellow basal area of varying extent, usually covering cells bc, c, pterostigma, bm, bcu, base of cu_1, and cells r_{2+3}, br, and dm to level of crossvein r-m or slightly beyond, br usually with hyaline area posterior to pterostigma; crossvein dm-cu sometimes narrowly bordered with faint yellow. In female (Fig. 5; Stone 1942, pl. 20A) pattern of more typical *Anastrepha* type, mostly yellow to orange brown, posterior margin of base of S-band in cell cu_1, sometimes extending to vein R_{4+5}, distal part of S-band, and proximal arm of V-band posterior to vein M darker. C- and S-bands broadly connected along vein R_{4+5}, hyaline area distal to apex of vein R_1 with somewhat diffuse margins and usually rounded or irregular in shape, extending only to or slightly posterior to vein R_{2+3}. S-band extended basally into posterior 1/4–1/2 and distal margin of cell bm; distal section moderately broad, at apex of vein R_{2+3} 0.57–0.74 times width of cell r_{2+3}; narrowly separated from or just reaching apex of vein M. V-band separated from S-band, incomplete, distal arm absent at least posteriorly, if present anteriorly broad and diffuse, without hyaline area between it and vein M; proximal arm extended basally along posterior wing margin more than half distance from vein Cu_1 to vein A_1+Cu_2 but not connected to base of S-band. In male microtrichose except cell bc, extreme base of br (proximal to crossvein h), alula, and sometimes anterior and/or posterior areas in bcu or very small basal area in cell cu_1. In female microtrichose except cell bc, base and posterior 1/4–2/3 of cell c, extreme base (proximal to crossvein h) and posterior margin of subapical hyaline area of br, bm except distal and usually posterior margin, small basal or anterobasal area in dm, anteriorly and posteriorly in cell bcu (broadly to narrowly microtrichose along medial fold), very small basal area in cu_1, small narrow anterobasal area in a_1, and most or all of alula.

Male abdomen (Fig. 14): Syntergite 1+2 mostly yellow to orange fading to white posteriorly. Tergites 3 and 4 with dark brown band on basal half, sometimes weakly and narrowly divided medially; white posteriorly. Tergite 5 dark brown on lateral 1/3–2/5, separated by white area slightly to strongly tapered posteriorly. White areas of all tergites with dense silvery white microtrichia. Brown areas of tergite 5 nonmicrotrichose. Setae on lateral margins of tergites 3 and 4, lateral and apical margins and on brown areas of tergite 5 large and stout. Lateral surstylus in posterior view elongate triangular, medial margin convex to very slightly concave, lateral margin slightly concave subapically, apex acute. Proctiger without lateral fold separating sclerotized areas. Phallus 4.95–5.50 mm long; 1.41–1.90 times as long as mesonotum. Glans 0.60–0.65 mm long.

Female abdomen (Fig. 13): Tergites yellow to orange with posterior margins white, in Panama females tergite 3 with pair of narrow, diffuse brown bands on lateral 1/4–1/3 on basal half; basal, lateral parts of tergites 4 and 5 also slightly darker. Tergites mostly microtrichose but without denser, silvery white microtrichia; tergites 3–5 with nonmicrotrichose band at midlength on lateral 1/3–2/5. Oviscape 3.20–3.85 mm long, 0.97–1.19 times as long as mesonotum, entirely yellow to orange; spiracle at basal 0.28–0.32. Eversible membrane with about 35 long, slender, hook-like dorsobasal scales in triangular to semicircular pattern. Aculeus 2.95–3.70 mm long; base 0.19–0.23 mm wide; shaft 0.085–0.105 mm wide at midlength; tip (Stone 1942, fig. 19A) 0.21–0.27 mm long, 0.100–0.105 mm wide, 2.10–2.57 times as long as wide, nonserrate, gradually tapered. Spermathecae elongate ovoid.



FIGURES 13–14. *Anastrepha lutea*, habitus (Venezuela: La Chira): 13, female (USNMENT00048654); 14, male (USNMENT00048653).

Type data. *A. lutea*: Holotype ♀ (National Museum of Natural History, Washington, DC (USNM USNMENT00212764), PANAMA: Panamá: El Cermeño [8°44'N 79°51'W], Fruit fly trap, 3 Oct 1939, J. Zetek 4553. *A. bellicauda*: Holotype ♂ (USNM USNMENT00212763), PANAMA: El Cermeño, Fruit fly trap, Dec 1939 – Jan 1940, J. Zetek 4621.

Other specimens examined. PANAMA: Panamá: El Cermeño, 5 Dec 1939, J. Zetek 4600, 1♀ paratype (USNM USNMENT00212765); El Cermeño, Fruit fly trap, 12 Nov 1940, J. Zetek 4701, 1♀ (USNM USNMENT00212766). VENEZUELA: Trujillo: La Chira, 9°12'54"N 70°51'23"W, 300 m., emerged 15 Jul 1995, reared ex fruit of "cusco", K. P. Katiyar & J. Oroño MFAKP-00913, 8♂8♀ (USNM USNMENT00048639-54).

Biology. In Venezuela K. P. Katiyar and colleagues reared *A. lutea* from fruit of a plant identified only as "cusco", probably a species of Sapotaceae (K. P. Katiyar, pers. comm.).

Distribution. *Anastrepha lutea* is known only from Panama and Venezuela.

Comments. Norrbom described *A. bellicauda* from a male, presuming that the conspecific female would have the C- and S-bands of the wing separated as in other species of the *schausi* group, but the reared series from Venezuela indicates that it is conspecific with *A. lutea*, previously known only from females.

Acknowledgments

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