

A new species of *Anastrepha* from Colombia related to Mexican fruit fly (Diptera: Tephritidae)

Nueva especie de *Anastrepha* de Colombia relacionada con la mosca de la fruta mexicana (Diptera: Tephritidae)

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Summary. *Anastrepha manizaliensis* Norrbom & Korytkowski, new species, is described from Colombia. It breeds in fruit of *Juglans neotropica* Diels (Juglandaceae), commonly known in Colombia as "cedro negro". The new species was previously confused with Mexican fruit fly, *Anastrepha ludens* (Loew), a major pest of citrus and mango, leading to quarantine problems, but true *A. ludens* does not occur in Colombia.

Key words: *Anastrepha*. Tephritidae. Fruit flies. Taxonomy. *Juglans*.

Resumen. Se describe una nueva especie de *Anastrepha* de Colombia, *Anastrepha manizaliensis* Norrbom & Korytkowski. Esta especie se crió en frutos de *Juglans neotropica* Diels (Juglandaceae), comúnmente conocido en Colombia como "cedro negro". La nueva especie fue previamente confundida con la mosca Mexicana de la fruta, *Anastrepha ludens* (Loew), la principal plaga que ataca cítricos y mangos, lo cual indujo un problema cuarentenario pero realmente *A. ludens* no se presenta en Colombia.

Palabras clave: *Anastrepha*. Tephritidae. Mosca de la fruta. Taxonomía. *Juglans*.

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 and the native host plant relationships are poorly known. In this paper, we describe a new species from Colombia that was previously confused with *A. ludens* (Loew), the Mexican fruit fly, a major pest of citrus, mango, and other crops from the Rio Grande Valley to Panama.

Materials and Methods

Morphological terminology follows White *et al.* (1999). Examined specimens are

deposited in the Colección Taxonómica Nacional de Insectos "Luis María Murillo", Tibaitatá (CTNI) and the National Museum of Natural History, Smithsonian Institution (USNM).

Anastrepha manizaliensis Norrbom & Korytkowski, new species

Figs. 1-2

Recognition. This species belongs to the *fraterculus* species group and is most similar to *A. ludens* (Loew), *A. distincta* Greene, *A. minensis* Lima, and especially *A. schultzi* Blanchard and *A. inca* Stone, which also have relatively long female terminalia (see Table 1). In the key of Steyskal (1977), most specimens will key to *A. ludens* (p. 10, 30). *Anastrepha manizaliensis* differs from *A. ludens* in having shorter terminalia (compare

oviscape length, oviscape/mesonotum ratio, and aculeus length in Table 1) but a longer and broader aculeus tip. It differs from *A. distincta* by its longer and broader aculeus tip and frequently in the markings of the subscutellum and mediotergite (in *A. manizaliensis* the subscutellum is always dark brown laterally, but the mediotergite is usually not, whereas in most *A. distincta* only the mediotergite is brown laterally). *Anastrepha manizaliensis* also differs from *A. minensis* in having the subscutellum brown laterally, and by its fewer hook-like dorsobasal denticles on the eversible membrane (more than 100 in *A. minensis*). It differs from *A. schultzi* and *A. inca*, in which the subscutellum and mediotergite are both always dark brown laterally, in having the aculeus tip more extensively serrate. Additionally, in *A. manizaliensis* the serrations are distinct,

Table 1. Terminalia measurements and ratios in *Anastrepha manizaliensis* and related species

species	oviscape length*	ovisc In / meson In	aculeus length*	tip length*	tip width*	tip length / width	serrate In / tip In	phallus length*	phall In / meson In
<i>distincta</i>	2,45-3,33	0,79-1,13	2,25-3,42	0,33-0,43	0,11-0,16	2,56-3,58	0,41-0,56	2,7-4,3	0,9-1,31
<i>ludens</i>	3,4-6,2	1,08-1,55	3,35-5,76	0,32-0,42	0,115-0,14	2,50-3,36	0-0,50	5,2-6,1	1,51-1,90
<i>manizaliensis</i>	2,65-3,40	0,86-1,05	2,7-3,3	0,50-0,66	0,16-0,19	2,94-3,56	0,39-0,49	4,5-4,7	1,3-1,55
<i>schultzi</i>	2,44-2,91	0,79-0,92	2,25-2,90	0,43-0,55	0,16-0,18	2,53-3,44	0-0,22	3,9-4,0	1,3-1,4
<i>inca</i>	3,63	1,01	3,3	0,64	0,19	3,37	0		
<i>minensis</i>	2,5	0,81	2,0-2,5	0,47-0,55	0,16	3,5-4,0	0,33-0,38		

* measurements in mm

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Figure 1. *Anastrepha manizaliensis*, dorsal habitus, female.

whereas in *A. schultzi* they are weak if present.

Description. Mostly yellow to orange. Setae dark brown to black. Body length, female 8-11 mm, male 6,0-7,5 mm. **Head:** Yellow to orange except ocellar tubercle brown. Facial carina, in profile, concave. 4-6 frontal setae. 2 orbital setae (in all 37 specimens). Ocellar seta weak, short to minute, less than 2 times as long as ocellar tubercle. Antenna extended 0,72-0,87 distance to ventral facial margin. Arista short pubescent. **Thorax (Fig. 1):** Mostly orange, postpronotal lobe, scutellum (except sometimes extreme base of dorsum, extending less than halfway to level of basal scutellar seta), scutal vittae and dorsal

margin of anepisternum white; medial scutal vitta sometimes less differentiated than other white areas, very slender, slightly broadened and rounded posteriorly, but not extended laterally beyond acrostichal seta. Scuto-scutellar suture medially with brown mark, usually dark, and always much broader than long. Subscutellum with dark brown mark on lateral 1/5-1/3 (Figs. 2B-C). Mediotergite usually entirely orange, rarely (1 male and 1 female of 37 specimens) with lateral mark from subscutellum extended along dorsal half of lateral margin. Mesonotum 2,57-3,65 mm long, entirely microtrichose. Scutal setulae yellow medially, brown laterally. Chaetotaxy as usual for genus, katapisternal seta moderately developed, usually longer but

weaker than postocellar seta, pale to moderate brown. **Wing (Fig. 2A):** Length 6,3-8,1 mm, width 2,4-3,3 mm, ratio 2,37-2,63. Cell c 1,20-1,49 times as long as pterostigma. Apex of vein R1 at 0,52-0,56 wing length. Vein R2+3 nearly straight. Vein M moderately curved apically; cell r4+5 0,83-1,05 times as wide at apex as at level of DM-Cu. Crossvein R-M at 0,67-0,71 length of cell dm. Distal lobe of cell bcu moderately long, bcu 1,42-1,66 times as long as its anterior margin. Pattern mostly orange to yellow brown; most margins of bands, most of pterostigma, distal part of S-band, and posterior parts of V-band brown. C- and S- bands usually narrowly connected (in 32 of 39 specimens) or narrowly separated along vein R4+5 (if

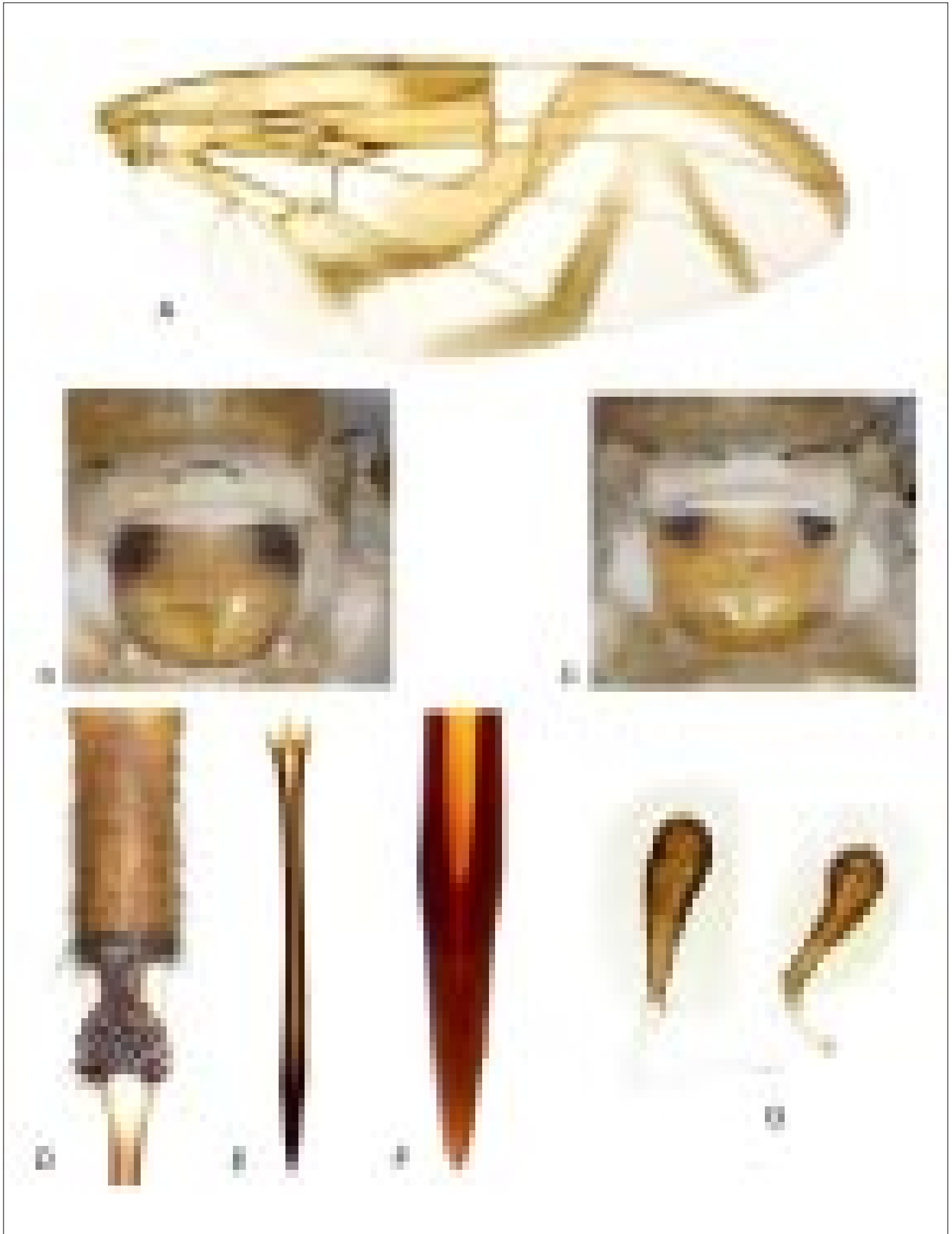


Figure 2. *Anastrepha manizaliensis*. A, wing; B-C, subscutellum and mediotergite; D, eversible membrane; E, aculeus; F, aculeus tip; G, spermathecae (2 of 3 shown).

bands separated, hyaline area distinctly narrowed). S-band with distal section relatively narrow, at apex of vein R2+3 0,53-0,50 times width of cell r2+3; not extended to apex of vein M. V-band separated from S-band; usually complete, distal arm rarely narrowly isolated (5 of 37 specimens); proximal arm extended basally along posterior wing margin almost to vein A1+Cu2 but not connected to base of S-band. Microtrichose except cell bc, much of cell c (except anterior margin), extreme base and usually part(s) of subapical hyaline area of br, most of bm, part of basal hyaline area in dm, anterior and posterior areas in bcu, most of alula, and usually small basal area in cu1 and small anterobasal area in a1+cu2. **Abdomen:** Tergites yellow to orange with posterior margins paler. **Male terminalia:** Similar to *A. ludens*. Lateral surstylus in posterior view elongate triangular; medial margin straight to slightly concave; apex often truncate. Proctiger with lateral fold separating sclerotized areas. Phallus 4,5-4,7 mm long; 1,30-1,55 times as long as mesonotum. Glans 0,6 mm long. **Female terminalia:** Oviscape (Fig. 1) 2,65-3,40 mm long, 0,86-1,05 times as long as mesonotum, entirely yellow to orange; spiracle at basal 0,29-0,35. Eversible membrane (Fig. 2D) with 40-60 long, slender, hook-like dorsobasal scales in triangular pattern. Aculeus (Fig. 2E) 2,7-3,3 mm long; base 0,27-0,31 mm wide; shaft 0,13-0,16 mm wide at midlength; tip (Fig. 2F) 0,50-0,66 mm long, 0,16-0,19 mm wide, 2,94-3,56 times as long as wide, distal 0,39-0,49 finely but distinctly serrate; tip gradually tapered except for slight expansion at base of serrate part. Spermathecae (Fig. 2G) elongate teardrop-shaped.

Type data. Holotype female (National Museum of Natural History, Washington, DC (USNM); USNM00213557), COLOMBIA: Caldas: Manizales [5°3'17"N 75°29'37"W, 2.150 m.], emerged 1-Oct -2003 reared ex fruit of cedro negro, *Juglans neotropica* Diels, ICA. Paratypes: COLOMBIA: Caldas: La Merced, trampa McPhail, Mar-2002, *E. Arévalo* EA 62, 1f (USNM; USNM00213434); Manizales, emerged 1-Oct -2003 reared ex fruit of cedro negro, *Juglans neotropica* Diels, ICA, 7m6f (USNM, CTNI; USNM00213554-56, USNM00213558-67); Manizales, trapped Oct-2003, 3m5f (USNM; USNM00213697-704), 2m2f (CTNI); Manizales, McPhail traps, Oct-2003, *J. Rodríguez*, 5m6f (USNM, CTNI; USNM00213542-52). Cundinamarca: Fusagasugá [4°20'38"N 74°22'4"W, 1.730 m.], 2000, 1f (USNM USNM00213696), 2f (CTNI).

Other specimens examined. COLOMBIA: Cundinamarca: Cachipay [4°42'8"N 74°29'24"W], Finca Mesitas de Santa Inés, trampa en cítricos, Apr-1975, *L. Núñez*, 1f (CTNI); same, SV577, 1f (USNM; USNM00213641); same, SV571, 1f (USNM; USNM00213461); same, 11-May-1975, SV576, 1f (USNM; USNM00213460).

Biology. Some of the type specimens were reared from fruit of *Juglans neotropica* Diels (Juglandaceae), commonly known in Colombia as "cedro negro".

Distribution. This species is known only from the Andean region of Colombia. The collection localities are from middle elevations, up to 2.150 m altitude, similar to the altitudinal range of the only known host plant, *Juglans neotropica* (Bartholomäus *et al.* 1990). Because the distribution of *J. neotropica* extends to Ecuador, Peru, and western Venezuela, it is possible that *A. manizaliensis* also occurs in those countries.

Comments. The examined specimens from Cachipay in the USNM were tentatively identified as *Anastrepha ludens* by George Steyskal in 1977, leading to the report of that species occurring in Colombia (Núñez Bueno 1981). This has caused occasional problems for the export of certain fruits, particularly citrus, from the country. Unfortunately, the terminalia of the three female specimens that were retained by Steyskal are missing their terminalia except for the oviscape on one specimen. This prevented the verification of their identity, but one of us (F. Gonzalez) was able to find a female with intact terminalia in the CTNI collection that came from the same series that was sent to Steyskal. Study of that specimen as well as external characters in all of the Cachipay series led us to conclude that those specimens are conspecific with the types of *A. manizaliensis*, and are not *A. ludens*. Murillo (1931) also reported specimens from Colombia as possibly *A. ludens*, but the whereabouts of those specimens are unknown. They may also have been *A. manizaliensis*. No verified records of *A. ludens* from Colombia are known to us, and the currently known southern limit of the range of that species is western Panama.

Etymology. The name of this species is an adjective derived from the type locality.

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