

# HESPERIIDAE OF RONDÔNIA, BRAZIL: *DREPHALYS*, WITH DESCRIPTIONS OF TWO NEW SPECIES (LEPIDOPTERA: HESPERIIDAE: PYRGINAE)

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**ABSTRACT.**— Five species of *Drephalys* (Hesperiidae: Pyrginae) occur in the Cacaúlândia area, Rondônia, Brazil: *D. phoenice*, *D. oriander*, *D. alcmon*, *D. croceus* n. sp., and *D. tortus* n. sp. Genitalia of the male of *D. oriander*, female of *D. phoenice*, and both sexes of *D. croceus*, *D. tortus*, *D. alcmon*, and, for comparison, *D. dumeril* are illustrated, those of females and new species for the first time. *Drephalys* appears as a number of species groups defined by genitalic morphology.

**KEY WORDS:** distribution, *Drephalys croceus* n. sp., *Drephalys tortus* n. sp., Formicidae, French Guiana, genitalia, Guatemala, Guyana, Hymenoptera, Neotropical, Peru, South America, Surinam, taxonomy.

*Drephalys* Watson (Hesperiidae: Pyrginae) is a Neotropical genus of rather colorful skippers. Most are relatively rare and poorly known. Evans (1952) recognized 13 species and Mielke (1968, see also Casagrande and Mielke, 1992) described an additional two. Five species of *Drephalys* were encountered during studies of the butterfly fauna near Cacaúlândia in central Rondônia, Brazil (Emmel and Austin, 1990; Austin *et al.*, 1993). Three represent known species, but two are undescribed. In this paper, I discuss and illustrate (including genitalia) these species and describe the two new taxa.

## *Drephalys phoenice* (Hewitson, 1867)

(Fig. 1-2, 8)

The illustrated female, taken in September 1994, was the only one seen in the Cacaúlândia area; the genitalia of this sex have not been previously figured. The lamella postvaginalis is broad with a prominent central indentation between the caudal lobes and the lamella antevaginalis consists of a narrow central band and broad lateral lobes. The antrum is prominent and quadrate leading to a long, thin and caudally looped ductus bursae. The corpus bursae is globular.

This species was previously known from northeastern South America (Guyana; French Guiana; Pará and Ega, Brazil) as reported by Evans (1952).

## *Drephalys oriander oriander* (Hewitson, 1867)

(Fig. 1-3)

The male genitalia of *D. oriander* illustrated by Evans (1952) are probably identifiable, but may be somewhat misleading, and are shown here in more detail. The ampulla of the valva has a broad and decurved caudal process which is strongly dentate

towards the tip on its dorsal edge. This process overlaps (on the outside) and slightly exceeds caudad a long and narrow dorsal projection from the caudal end of the harpe, this dentate on its caudal edge near its base. A narrow dorsal projection from the sacculus is just cephalad of mid valva. The penis is stout and sharply angulate near its caudal end with a short ventral lip; the numerous cornuti are spike-like.

This subspecies was previously reported from Guyana, Surinam, northeastern Brazil, and central Peru (Evans, 1952; Mielke, 1973; de Jong, 1983). It is rarely encountered in the Cacaúlândia region, with five records of males between mid July and early October. Two of these were attracted to white paper lures in the mid afternoon.

## *Drephalys croceus* Austin, new sp.

(Fig. 1-2, 5, 11)

**Description.**— MALE: forewing length = 22.0mm (21.2-22.5, N = 3); forewing with costal fold, apex produced, termen slightly and evenly convex; hindwing termen broadly convex, tornus slightly produced; dorsum brown; forewing with yellow hyaline macules as follows: two small subapical in cells R<sub>3</sub>-R<sub>4</sub> and R<sub>5</sub>-M<sub>1</sub> and vague minute point in R<sub>4</sub>-R<sub>5</sub>; CuA<sub>1</sub>-CuA<sub>2</sub>, the largest, more-or-less rhomboidal, centered under origin of CuA<sub>1</sub>; M<sub>3</sub>-CuA<sub>1</sub>, square, slightly distad of origin of M<sub>3</sub>; mid discal cell, distal edge excavate and over middle of macule in CuA<sub>1</sub>-CuA<sub>2</sub>, proximal edge variable; distal end of discal cell, horizontal, ovoid; wing base yellow-orange extended broadly on costa to mid discal cell macule, then narrowly to distal macule in discal cell, also broadly along anal margin from posterior of middle of CuA<sub>2</sub>-2A to beneath macule in CuA<sub>1</sub>-CuA<sub>2</sub>. Hindwing with base yellow-orange extending along anal margin to connect with broad median and narrower submarginal bands of same color; median band continuous through distal end of discal cell, separated by brown vein from macule of same color in Rs-M<sub>1</sub>, slightly offset distad; submarginal band continued to M<sub>3</sub> and usually with some



Fig. 1. *Drephalys*, dorsal surface (left two columns), ventral surface (right two columns), all from BRAZIL: Rondônia, vic. Cacaulândia, unless noted. Left to right each column: COLUMN 1-2.— Top row: *D. phoenice* - female, 27 Sep 94; *D. oriander* - male, 15 Aug 93. Second row: *D. alcmon* - male, 12 Jun 93; *D. alcmon* - female, 8 Oct 93. Third row: *D. croceus* - holotype male; *D. croceus* - paratype female, 24 Apr 92. Fourth row: *D. tortus* - holotype male; *D. tortus* - paratype female, 14 Nov 94. Bottom row: *D. dumeril* - male, GUAT: Petén; Parque Nacional Tikal, 27 Feb 92; *D. dumeril* - female, GUAT: Petén; Parque Nacional Tikal, 3 Feb 92. COLUMN 3-4.— Same sequence as in columns 1-2.

vague yellow scaling in  $M_1$ - $M_3$  to distal edge of macule in  $Rs$ - $M_1$ ; costa pale yellow; fringes of both wings brown proximad, paler gray-brown distad.

Ventral forewing similar to dorsum; apex broadly yellow-brown; ochreous scaling extending from yellow on anal margin to hyaline macule in  $CuA_1$ - $CuA_2$ ; ventral hindwing yellow-brown with slight purplish reflections; base yellowish from mid costa to basal 1/3 of anal margin; anal margin broadly pale yellowish; broad comma-shaped median white macule from distal end of discal cell to vein 2A; white submarginal band from 1A to  $CuA_2$  dividing large dark brown tornal macule.

Head brown with three pale yellow macules caudad between eyes, pale yellow line between antennae and before palpi, white beneath and behind eyes, palpi white with slight ochreous tinge anteriorly, gray-brown on inner surface, antennae black, some ochreous scaling distad below, especially on apiculus, nudum brown, 30-31 segments ( $N = 2$ ); dorsal thorax and abdomen yellow-orange; ventral thorax including pectus pale yellow, legs with ochreous hair-like scales, tibiae smooth, mid tibia with single pair of spurs, hind tibiae with two pairs; ventral abdomen very pale yellow (nearly white) with narrow yellow-orange at

segments along midline.

Genitalia: uncus undivided, blunt caudad; gnathos undivided, robust, broader than uncus, noticeably expanded terminally in lateral view; valva broad, ampulla with narrow, nearly straight process extended caudad overlapping outside of dorsal tooth of harpe but not exceeding it caudad; dorsal edge finely serrate, harpe broad cephalad, caudal end with relatively narrow tooth-like process directed dorsad, this serrate on both edges, sacculus with prominent projection dorsad just cephalad of midvalva; penis about length of valva, stout, angulate, caudal lip elongate; cornuti as numerous prominent spikes.

FEMALE: forewing length = 21.9mm ( $N = 1$ ); similar to male; hyaline macules smaller, paler; dorsal yellow paler, less extensive; ventral surface virtually identical to male but with smaller hyaline macules also on dorsum; antennal nudum of 31 segments ( $N = 1$ ).

Genitalia: lamella postvaginalis with long, broad, and deeply divided caudal lobes; lamella antevaginalis somewhat quadrate centrally, narrower than caudal lobes of lamella postvaginalis, with a pair of relatively broad and twisted caudal lobes and broadly ovate lateral flaps; antrum short, broad, sclerotized; ductus bursae short and broad, expanded into oblong corpus bursae.

**Types.**—*Holotype* ♂ with the following labels: [white, printed] BRASIL: Rondonia / 62 km S Ariquemes / linea C-20, 7 km E / B-65, Fazenda / Rancho Grande / 24 April 92 / leg. G. T. Austin; [white, printed and handprinted] Genitalia Vial / GTA - 3384; [red, printed] - HOLOTYPE / *Drephalys croceus* / Austin. Deposited at the Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil.

**Paratypes:** same data as holotype except 19 Apr 92 (2 ♂s); 24 Apr 92 (1 ♀).

**Type locality.**— BRAZIL: Rondônia; 62 km south of Ariquemes, Linea C-20, 7 km (by road) east of route B-65, Fazenda Rancho Grande, 180m. This is approximately 5 km northeast of Cacaupônia in typical lowland tropical rainforest.

**Etymology.**— The name means saffron-colored referring to the yellow-orange color of the markings.

**Distribution and phenology.**— This species is known only from the types taken in April at flowers on the edge of the forest.

**Diagnosis and discussion.**— This and the following species will key to *Drephalys dumeril* (Latreille, [1824]) in Evans (1952). *Drephalys croceus* differs from *D. dumeril* by its marked sexual dimorphism (the male of *D. croceus* having notably more extensive yellow markings than its female or either sex of *D. dumeril*; Fig. 1-2) and different genitalia. On males of *D. dumeril* (Fig. 4), the process of the ampulla is curved and it exceeds and does not overlap the caudal end of the harpe. Additionally, the dorsal projection of the harpe is recurved cephalad and short.

The female with its narrower yellow bands is more similar to the female of *D. dumeril* (Fig. 1-2) than is the male. The genitalia are readily distinguishable; those of female *D. dumeril* (Fig. 10, illustrated for the first time) have very broad caudal lobes of the lamella postvaginalis, the caudal lobes of the lamella antevaginalis widely spaced and divergent throughout their length, the antrum longer, and the ductus bursae expanded into a lateral sac.

#### *Drephalys tortus* Austin, new sp.

(Fig. 1-2, 6, 12)

**Description.**— MALE: forewing length = 21.4mm (20.5-22.1, N = 8); forewing with costal fold, apex produced, termen nearly straight to vein  $M_1$  before curving to costa; hindwing termen slightly produced at  $M_3$ , convex anterior to this, slightly concave posteriorly to relatively distinct tornal lobe; dorsum dark brown; forewing with yellow hyaline macules as follows: two small subapical in cells  $R_3$ - $R_4$  and  $R_5$ - $M_1$  with minute point in  $R_4$ - $R_5$ ;  $CuA_1$ - $CuA_2$ , the largest, rhomboidal, more-or-less centered under origin of  $CuA_1$ ;  $M_3$ - $CuA_1$ , square, distad of origin of  $M_3$ ; mid discal cell, distal edge slightly concave and over proximal 1/3 of macule in  $CuA_1$ - $CuA_2$ , proximal edge straight; distal end of discal cell, horizontal, ovoid; wing base pale yellow-orange extended broadly on costa to mid discal cell macule, then narrowly to distad of that macule, also broadly along anal margin from posterior of middle of  $CuA_2$ -2A to beneath macule in  $CuA_1$ - $CuA_2$ . Hindwing with base pale yellow-orange extending along anal margin to connect with broad median and narrower submarginal bands of same color; median band continuous through distal end of discal cell, separated inconspicuously by brown vein from macule of same color in  $R_5$ - $M_1$ , slightly offset distad; submarginal band continued to  $M_3$  and with a small yellow macule in posterior portion of  $M_1$ - $M_3$ ; costa pale yellow-orange; fringes of both wings brown proximad, paler gray-brown distad.

Ventral forewing similar to dorsum; apex paler with bright purple iridescence; pale yellow orange scaling extending from yellow on anal margin to hyaline macule in  $CuA_1$ - $CuA_2$ ; ventral hindwing as forewing apex with bright purple iridescence; base pale yellow-orange from

beyond mid costa to basal 1/4 of anal margin; anal margin broadly pale yellow; broad comma-shaped median white macule from distal end of discal cell to vein 2A; white submarginal band from 1A to  $CuA_2$  dividing large blackish tornal macule.

Head brown with three pale yellow macules between eyes, pale yellow line between antennae and before palpi, white beneath and behind eyes, palpi very pale yellow, dark gray on inner surface, antennae black with ochreous scaling beneath, especially distad, nudum brown, 28 (N = 1), 29 (4), 30 (1) or 31 (1) segments; dorsal thorax and abdomen yellow-orange; ventral thorax including pectus pale yellow, legs with pale yellow hair-like scales, tibiae smooth, mid tibia with single pair of spurs, hind tibiae with two pairs; ventral abdomen pale ochreous.

Genitalia: similar to those of *D. croceus*; uncus and gnathos less robust; valva with ampulla process narrower, longer, not serrate, dorsal tooth of harpe narrower, less strongly serrate, constricted at base, twisted to plane of valva and facing somewhat caudad; penis less angulate with shorter caudal lip.

FEMALE: forewing length = 21.9mm (20.8-22.6, N = 7); similar to male; hyaline macules smaller, paler; dorsal yellow less extensive; venter virtually identical to male but with smaller hyaline macules as on dorsum; purple iridescence more intense; antennal nudum of 29 (N = 1) or 30 (2) segments.

Genitalia: similar to those of *D. croceus*; caudal lobes of lamella antevaginalis shorter and broader; lamella antevaginalis narrower; ductus bursae much longer and broadly expanded.

**Types.**—*Holotype* ♂ with the following labels: [white, printed] BRASIL: Rondonia / linea C-2.5 off / B-65, 12.5 mi [sic = km] S / Cacaupônia / 12 Nov 90 / leg. G.T. Austin; [white, printed and handprinted] Genitalia Vial / GTA - 2131; [red, printed] - HOLOTYPE / *Drephalys tortus* / Austin. Deposited at the Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil.

**Paratypes:** BRAZIL: Rondônia; 62 km S Ariquemes, Linea C-20, 7 km E B-65, Fazenda Rancho Grande, 3 Oct 92, leg. G. Bongioiolo (1 ♂); 14 Aug 93, leg. A. Warren, attracted to white paper lure, 1445 (1 ♂); 19 Aug 93, leg. A. Warren, attracted to white paper lure, 1705 (1 ♂); 20 Aug 93, leg. G. T. Austin, associated with *Eciton burchelli*, 1500-1530 (1 ♂); Linea 20, 10 km E B-65, 3 km E Fazenda Rancho Grande, lot 18, 18 Jul 94, leg. G. T. Austin (1 ♂); Linea 10, 5 km S of Cacaupônia, 15 Jun 94 (1 ♀), 8 Jul 93 (1 ♀), 17 Jul 94 (1 ♂), 18 Jul 1994 (1 ♂), 9 Aug 93 (1 ♂), 22 Sep 94 (1 ♀), 11 Oct 93 (1 ♀), 10 Nov 94 (2 ♀), 14 Nov 94 (1 ♀), all leg. O. Gomes.

**Type locality.**— BRAZIL: Rondônia; Linea 2.5 off road B-65, 12.5 km south of Cacaupônia, ca. 200m. This area is located in what was (now destroyed through cutting and burning) typical lowland tropical rainforest. The holotype was taken perching in the sun in a light gap.

**Etymology.**— The name means twisted referring to the orientation of the dorsal tooth at the end of the harpe.

**Distribution and phenology.**— This species is known only from the types taken in June through November.

**Diagnosis and discussion.**— This species is very similar to *D. croceus* and was at first confused with it. The forewing has a nearly straight outer margin on *D. tortus* making it appear narrower than the more rounded forewing of *D. croceus*. The hindwing of *D. tortus* is also more quadrate with a more distinct tornal lobe. The ground color is somewhat darker than on *D. croceus* and the pale markings are yellower, lacking the orange aspect of that species. The dark areas on the venter are strongly iridescent purple on *D. tortus*; these areas are a rather flat yellow-brown on *D. croceus* and weakly iridescent. The genitalia differ as noted above. Differences between *D. tortus* and *D. dumeril* are the same as those for *D. croceus* as discussed under that species.

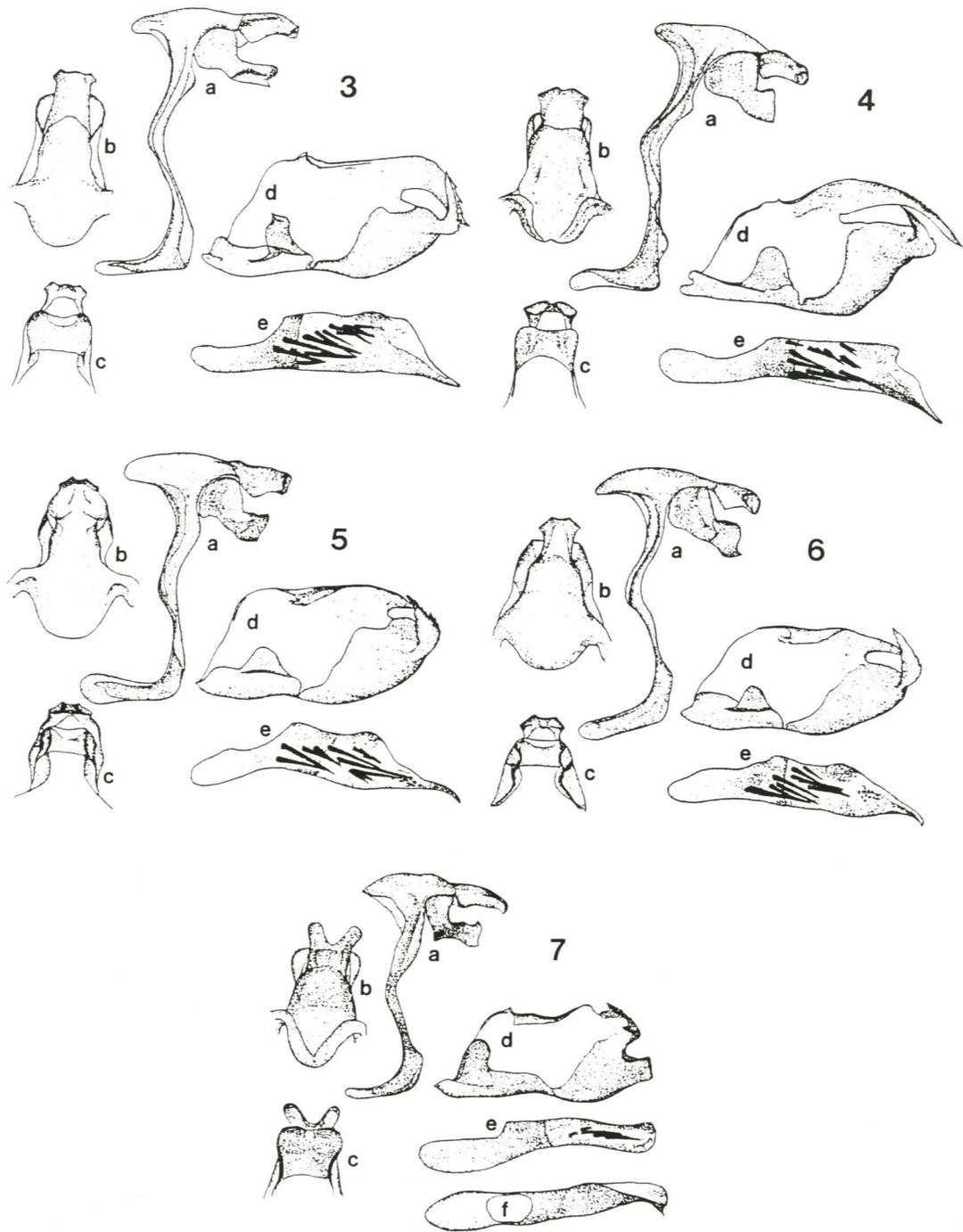


Fig. 3-7. Male genitalia of *Drephalys* (all from BRAZIL: Rondônia; vic. Cacauplandia, unless noted): 3) *D. oriander* (GTA #3823) - (a) lateral view of tegumen, uncus, gnathos, vinculum, and saccus; (b) dorsal view of tegumen, uncus, and gnathos; (c) ventral view of uncus and gnathos; (d) interior view of right valva; (e) lateral view of penis. 4) *D. dumeril* (GTA #4892) - GUAT: Petén; Parque Nacional Tikal, same structures as Fig. 3. 5) *D. croceus* (GTA #3384) - same structures as Fig. 3. 6) *D. tortus* (GTA #2131) - same structures as Fig. 3. 7) *D. alcmon* (GTA #4209) - same structures as Fig. 3 plus (f) dorsal view of penis.

***Drephalys alcmon* (Cramer, [1780])**

(Fig. 1-2, 7, 9)

The male genitalia of *D. alcmon* illustrated by Evans (1952) represent this species well but fail to show the dorsal projection from the cephalad end of the sacculus; the cornuti are a small cluster of long spikes and 1 or 2 shorter spikes. The female of *D. alcmon* is similar to the male but the wings (especially the hindwing) are broader and more rounded, the forewing macules

are broader as is the white band on the hindwing. The female genitalia have not been previously illustrated. The lamella postvaginalis is broad with a narrow indentation on the caudal margin. The lamella antevaginalis has a broad central lobe with an irregularly concave caudal edge and narrow membranous lateral flaps. The antrum is prominent and well sclerotized. The ductus bursae is long, thin caudad, and expands cephalad to an elongate corpus bursae.

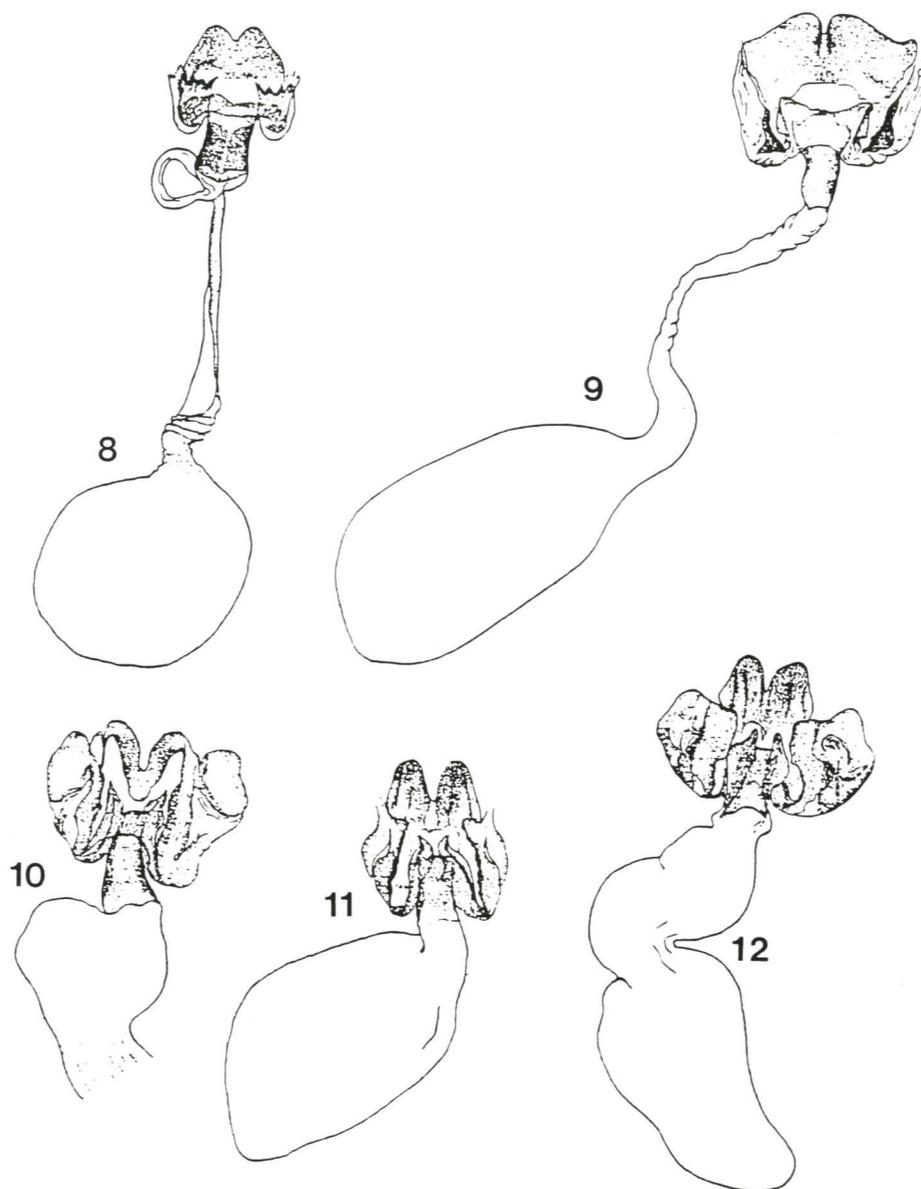


Fig. 8-12. Female genitalia of *Drephalys* (all from BRAZIL: Rondônia; vic. Caaculândia unless noted, ventral view): 8) *D. phoenice* (GTA #5305). 9) *D. almon* (GTA #5379). 10) *D. dumeril* (GTA #3385) - GUAT: Petén; Parque Nacional Tikal. 11) *D. croceus* (GTA #2155). 12) *D. tortus* (GTA #5133).

This species, previously known from northeastern South America (Evans, 1952; Mielke, 1973; de Jong, 1983), is rarely seen in central Rondônia with six records in May, June, October, and November. Males may be attracted to paper lures or associated with *Eciton burchelli* (Hymenoptera: Formicidae).

#### DISCUSSION

There appear to be a number of species groups in *Drephalys* with quite different genitalia of both sexes. Such species as *D. dumeril*, *D. oriander*, *D. tortus*, and *D. croceus* have male genitalia with a very shallowly divided uncus, a long and pointed caudal extension of the ampulla, a pointed dorsad projecting process of the harpe, a sacculus with a dorsal flap near the middle of the valva, and a stout penis with cornuti as a dense cluster of broad spikes. The female genitalia of these have broad lamellae

with the lamella postvaginalis deeply divided on its caudal margin and the lamella antevaginalis bilobate centrally, a rather short and very broad ductus bursae, and an elongate corpus bursae.

A second group, including at least *D. phoenice*, has very different female genitalia with the lamella postvaginalis shallowly divided on its caudal margin, no prominent central structure to the lamella antevaginalis, a long, thin, and looped ductus bursae, and a globular corpus bursae.

A third group, exemplified by *D. almon*, has male genitalia with a deeply divided uncus, an ampulla with a short and blunt caudal projection which is curved mesad at its caudal end, a broad and blunt caudal projection of the harpe, a sacculus with a dorsal flap at the cephalad end of the valva, and a narrow penis with its caudal end twisted to a lateral point and few long cornutal spikes. The female genitalia have broad lamellae, an unlooped ductus bursae, and an elongate corpus bursae.

The figures of other species (Godman and Salvin, 1879-1901; Bell, 1942; Evans, 1952; Mielke, 1968) show still other configurations of the male genitalia. The only commonality appears to be the undivided gnathos which is broader than the uncus. Wing patterns also exhibit a number of different patterns. I hesitate to formally define species groups at this time; this requires study of all included species and is beyond the scope of this paper. Thus *Drephalys*, as conceived by Evans (1952), is a variable genus which is in need of a careful review.

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