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## HESPERIIDAE OF RONDÔNIA, BRAZIL: COMMENTS ON *PROPERTIUS* EVANS, WITH DESCRIPTION OF A NEW SPECIES (LEPIDOPTERA: HESPERIIDAE: HESPERIINAE)

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**ABSTRACT:** A new species, *Propertius dejongi*, is named, described, and illustrated from central Rondônia, Brazil, where it flies with its congener *Propertius phineus* (Cramer, 1777). Specimens of the latter, including genitalia, are described and illustrated for comparison. Female genitalia of *Propertius* are illustrated for the first time. A key is provided for the species of the genus.

**KEY WORDS:** distribution, genitalia, neotropical, sympatry

Evans (1955) proposed the genus *Propertius* for distinctly-colored and patterned neotropical skippers (Hesperiidae: Hesperinae: Hesperini) within which two species are currently recognized, *Propertius propertius* (Fabricius, 1793) and *Propertius phineus* (Cramer, 1777) (Evans 1955; de Jong 1982; Bridges 1988; Mielke 2004, 2005). A history and characterization of the genus and a synonymy of its taxa were presented by de Jong (1982). Collections from central Rondônia, Brazil, indicate the existence of yet a third species of *Propertius* named herein. The new species and material of *P. phineus* from Rondônia are described and illustrated including the genitalia of both sexes. Voucher specimens are deposited at the Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil, and the McGuire Center for Lepidoptera and Biodiversity, Gainesville, Florida.

*Propertius dejongi*, Austin, new species

Figs. 1-2 (♂ paratype), 3-4 (♂ holotype), 5-8 (♀ paratypes),  
16 (♂ genitalia), 17 (♀ genitalia)

**Description.** Male - mean forewing length = 15.7mm (15.2-16.2mm, n = 10, types); forewing apex produced, pointed, termen slightly rounded anteriorly, nearly straight posteriorly; stigma gray, each element narrowly outlined with black, narrow bar near base of CuA<sub>1</sub>-CuA<sub>2</sub>, extending straight from almost CuA<sub>1</sub> to almost CuA<sub>2</sub>, small dot posterior to CuA<sub>2</sub>, still smaller dot in mid-CuA<sub>2</sub>-2A at proximal edge of macule in that cell; hindwing termen convex, produced to short lobe at tornus; dorsum very dark brown (nearly black); forewing with yellow to pale yellow-orange macules near base of M<sub>3</sub>-CuA<sub>1</sub> (rectangular), near base of CuA<sub>1</sub>-CuA<sub>2</sub> (the largest, more or less a vertical parallelogram), and in posterior 1/2 of center of CuA<sub>2</sub>-2A (the smallest, more or less oval), these aligned and angled slightly away from termen posteriorly; orange subapical macules in R<sub>3</sub>-R<sub>4</sub>, R<sub>4</sub>-R<sub>5</sub>, and R<sub>5</sub>-M<sub>1</sub>, anterior one of that series may be absent, decreasing in size anteriorly, more or less perpendicular to costa, may be indistinct orange smudge in M<sub>1</sub>-M<sub>2</sub>; basal half of costal cell pale orange; pale yellow line in extreme anterior edge of basal 1/3 of discal cell; basal half of anal margin pale yellow as are scattered scales at extreme base of CuA<sub>2</sub>-2A; fringe black except gray caudad of vein CuA<sub>2</sub>. Hindwing with median band of pale yellow macules from Rs to 2A, divided by black veins, increasing in size caudad, anterior two macules more orange and sometimes vague, pale green setiform scales in base of discal cell and basal 1/2 of 2A-3A; fringe black anteriorly, white caudad of vein CuA<sub>2</sub>.

Ventral forewing black, macules repeated from dorsum, macule in CuA<sub>2</sub>-2A expanded by white scaling, extending full width of cell and distad beyond macule in CuA<sub>1</sub>-CuA<sub>2</sub>; macule in CuA<sub>1</sub>-CuA<sub>2</sub> also sometimes extended distad by white scaling; broad, undivided subapical band from R<sub>3</sub> to CuA<sub>1</sub> (extending to outer margin), largely bright red-brown, whitish to beige (at least centrally) between R<sub>5</sub> and M<sub>1</sub>; costa bright red-brown from base to apex, apex with triangular patch of bright red-brown, this extending along outer margin to meet (or almost meet) the red-brown of the subapical band. Hindwing largely bright red-brown and very pale yellow (appearing white); red-brown occurring narrowly along basal half of costa, as elongate triangular band from basal caudal edge of discal cell and base of CuA<sub>2</sub>-2A to apex in cell Sc+R<sub>1</sub>-Rs, and along the anal margin in anal cell and continuing and narrowing along outer margin to join red-brown across mid-wing at the apex; black basad in red-brown triangular band across mid-wing and outlining whitish area posterior to vein 2A (becoming broader distad) and often continuing distad of this whitish area into cell CuA<sub>2</sub>-2A; anal margin outlined narrowly with black.

Head black with white spots; palpi black on dorsum, white with broad black central band on venter; antennae black, white distad on venter and under club, nudum 15 (n = 6) or 16 (n = 4) segments; thorax black on dorsum with greenish overscaling, venter black with white overscaling; pectus pale yellow; legs black and red-brown proximad, black and pale orange distad, mid-tibia with a few spines and a single pair of spurs, hind tibia with 2 pairs of spurs; abdomen black on dorsum, pale red-brown at segments caudad, tip white, white on venter with vague narrow tan central line (this may be black on some segments, especially cephalad).

Genitalia (Fig. 16) - tegumen broad in dorsal view; uncus not divided, broad cephalad before narrowing abruptly caudad in dorsal view, upturned caudad where

flanked by apparent (*i.e.*, de Jong 1982) processes of gnathos laterad, no space between uncus and gnathos in either lateral or ventral views; combined ventral arm of tegumen and dorsal arm of saccus sinuate, prominently bulbous just dorsad of middle; horizontal arm of saccus relatively broad, slightly curved upward cephalad; valva broad, harpe curved upward, triangular with dorsal point, spiculose at least on caudal edge; aedeagus in dorsal view narrow cephalad, expanding caudad, venter with rounded caudal end with thorn-like point oriented ventrocaudad; two pairs of cornuti, ventral pair broad cephalad with caudal spike, permanently oriented caudad, dorsal pair as simple spikes, oriented cephalad when not everted, but caudad when everted.

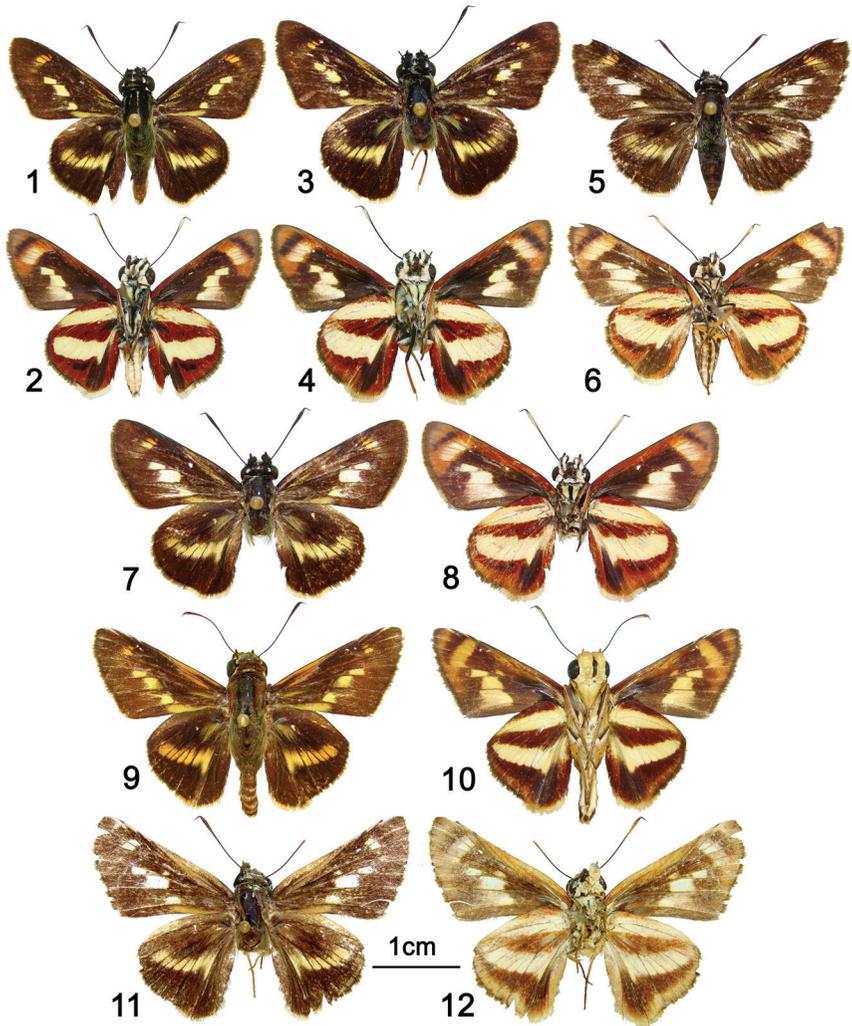
Female - mean forewing length = 16.6mm (16.3-16.9mm, n = 3, types); similar to male; wings broader and somewhat more rounded; central macules on forewing larger, white, and translucent; subapical macules broader, may extend further posteriorly; hindwing with macules broader and more well-defined. Venter as on male except macules and apical red-brown area on forewing more extensive and triangular red-brown area across middle of hindwing less extensive.

Genitalia (Fig. 17) - lamella postvaginalis broad, cephalic 3/4 sclerotized, then membranous, caudal edge of sclerotized portion pointed laterally and undulate to a central shallow depression, lateral edges fold ventrally inward cephalad of their middle, the cephalic ends of this folded portion fold again outward; lamella antevaginalis broad (width of lamella postvaginalis), shorter than lamella postvaginalis, largely membranous, central portion very lightly sclerotized especially caudad (caudal portion of sclerotization only apparent in lateral view), sclerotization narrowing cephalad where defined by ridges raised ventrally, these ridges more heavily sclerotized cephalad (where apparent in ventral view); ostium bursae opens into a short and broad moderately sclerotized and heavily ridged ductus bursae; corpus bursae broad, longer than wide, caudal 1/4 moderately wrinkled, cephalic 3/4 weakly grooved.

**Types.** Holotype male (Figs. 3, 4) with the following labels: white, printed and hand printed - / BRASIL: Rondônia / linha C-10 (at Rio / Pardo), off B-65 / 5 km S Cacaulândia / 5 August 1997 / leg. O. Gomes /; white, printed and hand printed - / Genitalia Vial / GTA - 8860 /; red, printed - / HOLOTYPE / *Propertius dejongi* / Austin /. Paratypes - same location as holotype, 9 Jan. 1997 (1 male), 28 Apr. 1995 (1 male, GTA #7591), 5 May 1995 (1 female, GTA #7592), 26 May 1997 (1 male, GTA #8861), 19 June 1993 (1 male), 29 June 1997 (1 male, GTA #8862), 14 July 1995 (1 male), 18 July 1993 (1 female), 19 July 1997 (1 male), 30 July 1993 (1 male), 19 Aug. 1997 (1 male), 10 Sept. 1994 (1 male, GTA #8863); BRAZIL: Rondônia; linha C-20, Fazenda Rancho Grande, 2 Oct. 1996 (1 male); BRAZIL: Rondônia; B-65, 12.5km S of Cacaulândia, 13 Nov. 1990 (1 female); BRAZIL: Rondônia; linha C-20, off B-65 at Rio Canas, 18 Nov. 1990, (1 female, GTA #8864). The holotype and a female paratype are deposited at the Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil. The remaining paratypes are deposited at the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, Gainesville, Florida.

**Type locality.** BRAZIL: Rondônia; Linha C-10 off road B-65, 5km south of Cacaulândia, ca. 200m. This is in typical lowland tropical rainforest in the vicinity of Rio Pardo.

**Etymology.** The species is named after Rienk de Jong who has done much to further our knowledge of Hesperidae, including resolution of nomenclatural problems that had existed within the genus *Propertius*.



**Figures 1-12.** *Propertius* from BRAZIL: Rondônia. **1)** *P. dejongi*, paratype male, BRAZIL: Rondônia, linha C-10 (at Rio Pardo) off B-65, 5 km S Cacaulândia, 19 June 1993, dorsal surface; **2)** same, ventral surface; **3)** *P. dejongi*, holotype male, BRAZIL: Rondônia, linha C-10 (at Rio Pardo) off B-65, 5 km S Cacaulândia, 5 August 1997, dorsal surface; **4)** same, ventral surface; **5)** *P. dejongi*, paratype female, BRAZIL: Rondônia; road B-65, 12.5 km S Cacaulândia, 13 November 1990, dorsal surface; **6)** same, ventral surface; **7)** *P. dejongi*, paratype female, same location as holotype, 5 May 1995, dorsal surface; **8)** same, ventral surface; **9)** *P. phineus*, male, BRAZIL: Rondônia; 62 km S Ariquemes, linha C-20, 7 km E B-65, Fazenda Rancho Grande, 5 May 1995, dorsal surface; **10)** same, ventral surface; **11)** *P. phineus*, female, BRAZIL: Rondônia, linha C-10 (at Rio Pardo) off B-65, 5 km S Cacaulândia, 28 April 1995, dorsal surface; **12)** same, ventral surface.

**Distribution and Phenology.** At present, *P. dejongi* is known only from the vicinity of the type locality. Records are scattered throughout the year, but concentrated (10 of 16 records) from May to August during the middle of the dry season.

**Diagnosis and discussion.** *Propertius dejongi* is similar to other species of the genus and may initially be identified as *Propertius propertius* using the key in Evans (1955). The characters for *P. propertius* in this key, however, indicate yellow palpi with a broad black line, yellow bands on the ventral hindwing, yellow apex on the ventral forewing, and a pale area at the mid-termen of the ventral hindwing. The latter two characters are also obvious in the photograph of *P. propertius* in de Jong (1982), who reiterated that the bands on the ventral hindwing were yellow on *P. propertius*. On *P. dejongi*, the palpi are white, the bands on the ventral hindwing are very pale yellow (appearing white without magnification and of the same color as the 'white' on the ventral hindwing of *P. phineus*), the apex of the ventral forewing is bright red-brown, and there is no pale area on the mid-termen of the ventral hindwing. Further, de Jong's (1982) figure of *P. propertius* indicates a pale streak separate from the pale band caudad of vein 2A on the dorsal hindwing (absent on *P. dejongi*), large macules on the forewing (smaller on *P. dejongi*), and the central pale area on the ventral hindwing encroaches into the red-brown band basad in cell CuA<sub>2</sub>-2A (on *P. dejongi*, the white band is of nearly even width across the wing). Additionally, de Jong (1982) stated that *P. propertius* was of the same size as *P. phineus*; *P. dejongi* is obviously smaller than *P. phineus* (see below). The figure of *P. propertius* in Hewitson (1867-1871) clearly shows the yellow on the ventral hindwing and the presence of a gray apex on the ventral forewing (this also pointed out in the text). Hewitson (1867-1871) also noted the wing expanse as 1½ in. (=37.5mm) that makes the species he describes the same size as *P. phineus*.

The male genitalia of *P. dejongi* (Fig. 16) also differ from those of *P. propertius* (see figures in Godman and Salvin 1879-1901, de Jong 1982). The lateral processes of the uncus are more sharply pointed with a more pronounced caudal orientation on *P. dejongi*. Further, the tegumen is relatively shorter and broader, the valva is proportionally less broad with the harpe more narrowly triangular and spiculate on its caudal edge (not so on *P. propertius*), and the sacculus extends further cephalad. The female genitalia of *P. propertius* have not been examined.

Other authors, however, evidently illustrate or describe a phenotype that may be *P. dejongi*. At least the male illustrated from its venter in Seitz (Draudt 1921-1924; plate 185e) appears identical to *P. dejongi* as described here. Similarly, the specimens illustrated by Hayward (1934, 1950) and Canals (2003) are unlike the insect characterized by Hewitson (1867-1871), Evans (1955), and de Jong (1982); of the size (expanse of 32mm) and phenotype of *P. dejongi*; and also likely to be that species. Records attributed to *P. propertius* from at least southern South America (e.g., Hayward 1950, Evans 1955, de Jong 1982, Lamas 1994, Robbins *et al.* 1996, Mielke and Casagrande 1997, Brown and Freitas 2000) may well actually represent *P. dejongi*.

The similarities between *P. propertius* and *P. phineus* caused de Jong (1982, see also Godman and Salvin 1879-1901) to suggest the possibility of conspecificity although, because of potential sympatry (see below), he retained them as separate species. The occurrence of two sympatric and synchronic phenotypes in Rondônia unequivocally shows that there are at least two species within the genus. There is yet the possibility that *P. dejongi* is a subspecies of *P. propertius*. The close similarities of *P. phineus* and *P. dejongi* in Rondônia and of *P. phineus* and *P. propertius* noted by de Jong (1982), however, demonstrates that species of this genus exhibit but minor differences. For that

reason and differences from both *P. propertius* and *P. phineus*, *P. dejongi* is described as a species-level taxon.

The name *Pamphila theodora* Ehrmann, 1907, described from Suapure, Venezuela, also does not apply to *P. dejongi*. Its worn female holotype (Figs. 13-15) is at the Carnegie Museum of Natural History (see Holland 1927). Although its original description is somewhat misleading, its phenotype is that of *P. propertius*. This specimen has yellowish palpi with a black line, obviously pale yellowish bands on the ventral hindwing with that across mid-wing notably narrower than on female *P. dejongi*, and has a pale yellowish area along the termen of the ventral hindwing. *Pamphila theodora* thus was apparently correctly synonymized with *P. propertius* by Holland (1927), Evans (1955), and subsequently (e.g., Mielke 2005).

***Propertius phineus* (Cramer, 1777)**

Figs. 9, 10 (♂), 11, 12 (♀), 18 (♂ genitalia), 19 (♀ genitalia)

**Description.** Male - mean forewing length = 17.2mm (17.0-17.4mm, n = 4, from Rondônia, Brazil); forewing apex produced, pointed, termen slightly rounded anteriorly, nearly straight posteriorly, stigma gray, narrowly outlined with black, narrow bar near base of CuA<sub>1</sub>-CuA<sub>2</sub>, extending straight from almost CuA<sub>1</sub> to almost CuA<sub>2</sub>, small dot posterior to CuA<sub>2</sub>, narrow triangular-shaped in mid-CuA<sub>2</sub>-2A at proximal edge of macule in that cell; hindwing termen convex, produced to short lobe at tornus; dorsum dark brown; forewing with pale yellow-orange near base of M<sub>3</sub>-CuA<sub>1</sub> (rectangular), near base of CuA<sub>1</sub>-CuA<sub>2</sub> (the largest, square to rectangular), and in posterior 1/2 of center of CuA<sub>2</sub>-2A (the smallest, more or less triangular), these aligned and angled slightly away from termen posteriorly; orange and nearly opaque subapical macules in R<sub>4</sub>-R<sub>5</sub> and R<sub>5</sub>-M<sub>1</sub>, anterior one of that series smallest, more or less perpendicular to costa; basal 3/5 of costal cell orange; orange line in extreme anterior edge of basal 1/3 of discal cell; basal half of anal margin pale yellow as are scales at extreme base of CuA<sub>2</sub>-2A; fringe black except gray caudad of vein CuA<sub>2</sub>. Hindwing with median band of pale yellow-orange macules from Rs to 2A, divided by black veins, about of equal width throughout except posteriormost that is obviously broader, pale yellow setiform scales in base of discal cell and basal 1/2 of 2A-3A; fringe black anteriorly, pale orange caudad of vein CuA<sub>2</sub>.

Ventral forewing black, macules repeated from dorsum, macule in CuA<sub>2</sub>-2A expanded by white scaling, extending full width of cell and distad beyond macule in CuA<sub>1</sub>-CuA<sub>2</sub>; macule in CuA<sub>1</sub>-CuA<sub>2</sub> also sometimes extended distad by white scaling; broad, undivided subapical band from R<sub>3</sub> to M<sub>3</sub> (extending to outer margin), largely pale ochreous; costa bright red-brown grading to yellow-brown at apex, margin from apex to vein CuA<sub>2</sub> yellow-orange, broader caudad of vein M<sub>3</sub>. Hindwing largely dark orange-brown and very pale yellow; orange-brown occurring narrowly along costa (very narrow towards apex), as elongate triangular band from basal caudal edge of discal cell and base of CuA<sub>2</sub>-2A to apex in costal cell, and along the anal margin in anal cell and continuing and narrowing along outer margin to join orange-brown across mid-wing at the apex; dark brown outlining white area in distal 2A-3A (becoming broader distad) and continuing distad of this white into cell CuA<sub>2</sub>-2A; anal margin outlined narrowly with black, outer margin paler (yellowish red-brown) from vein Rs to CuA<sub>2</sub>.

Head largely yellowish with orange macules; palpi yellow-orange; antennae black, pale yellow-orange distad on venter and under club, nudum 15 (n = 3) segments; thorax black on dorsum with greenish overscaling, venter and pectus pale yellow-orange; legs

orange, mid-tibia with a few spines and a single pair of spurs, hind tibia with 2 pairs of spurs; abdomen dark brown on dorsum, yellow-tan at segments, white on venter with narrow yellow-brown central line.

Genitalia (Fig. 18) - as illustrated by de Jong (1982), similar to *P. dejongi*, but larger, harpe more massive.

Female - mean forewing length = 18.3mm (n = 1, from Rondônia, Brazil); similar to male; wings broader and somewhat more rounded; forewing central macules larger and white; subapical macules broader, small macule in discal cell anterior to macule in CuA<sub>1</sub>-CuA<sub>2</sub>; hindwing band with macules similar to those of male. Venter as on male.

Genitalia (Fig. 19) - lamella postvaginalis broad, cephalic 3/4 sclerotized, then membranous, caudal edge of sclerotized portion weakly undulate, lateral edges curved inward cephalad of their middle; lamella antevaginalis broad (width of lamella postvaginalis), shorter than lamella postvaginalis, largely membranous, central portion very lightly sclerotized especially caudad (caudal portion of sclerotization only apparent in lateral view), sclerotization narrowing cephalad where defined by ridges raised ventrally, these ridges more heavily sclerotized cephalad (where apparent in ventral view); ostium bursae opens into a short and broad moderately sclerotized and ridged ductus bursae; corpus bursae globular, longer than wide, caudal 1/4 moderately wrinkled, cephalic 3/4 weakly grooved.

**Specimens examined.** BRAZIL: Rondônia; Linha C-20, 7km E of B-65, Fazenda Rancho Grande, 5 May 1995 (1 male), 14 Aug. 1997 (1 male), 10 Nov. 1994 (1 male); BRAZIL: Rondônia; Linha C-20, 10km E of B-65, 3km E of Fazenda Rancho Grande, lot 18, 15 Nov. 1992 (1 male, GTA #8866); BRAZIL: Rondônia; Linha C-10, 5km S of Cacaulândia, 28 April 1995 (1 female, GTA #7593), 2 July 1995 (1 male, GTA #8865); FRENCH GUIANA: Shrimp Ponds Trail at Cacao, 31 Mar. 1986 (1 male). Deposited at McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, Gainesville, Florida.

**Discussion.** *Propertius phineus* is the second species of the genus known from central Rondônia. Its wings (the type) and male genitalia were illustrated by de Jong (1982); these are shown again herein for comparison with the latter in additional detail and with *P. dejongi*. Female genitalia are illustrated for the first time.

*Porphyrogenes phineus*, identified as *Propertius albistriga* (Tessmann, 1928) by Evans (1955, see de Jong 1982) is similar to *P. dejongi*, but differs by being larger (see above), the macules on the forewing are larger and pale yellow-orange (white on females), the subapical macules are white and translucent on the female, the costa of the dorsal forewing is more broadly red-brown, the band of macules on the dorsal hindwing is yellow-orange (paler on the female), the red-brown on the ventral forewing is much paler and more extensive (usually extending posteriorly along the margin to vein 2A), the portion of the subapical band on the ventral forewing that is white of *P. dejongi* is yellow on *P. phineus*, there is a narrow whitish band along the termen of the hindwing, there are no white macules on the head, and the palpi are pale yellow-orange ventrally. Male genitalia differ principally by the more massive valva of *P. phineus* compared with *P. dejongi*. Female genitalia of *P. phineus* lack the prominent lateral sclerotized points of the lamella postvaginalis seen on *P. dejongi* and have a less ridged sclerotization of the ductus bursae.

The distribution of *P. phineus* had been given as Venezuela, Guyana, Suriname, French Guiana, and Peru (Evans 1955, de Jong 1982) and is sympatric with *P. propertius* in some locations. Both *P. propertius* and *P. phineus* (as *P. albistriga*) were recorded for

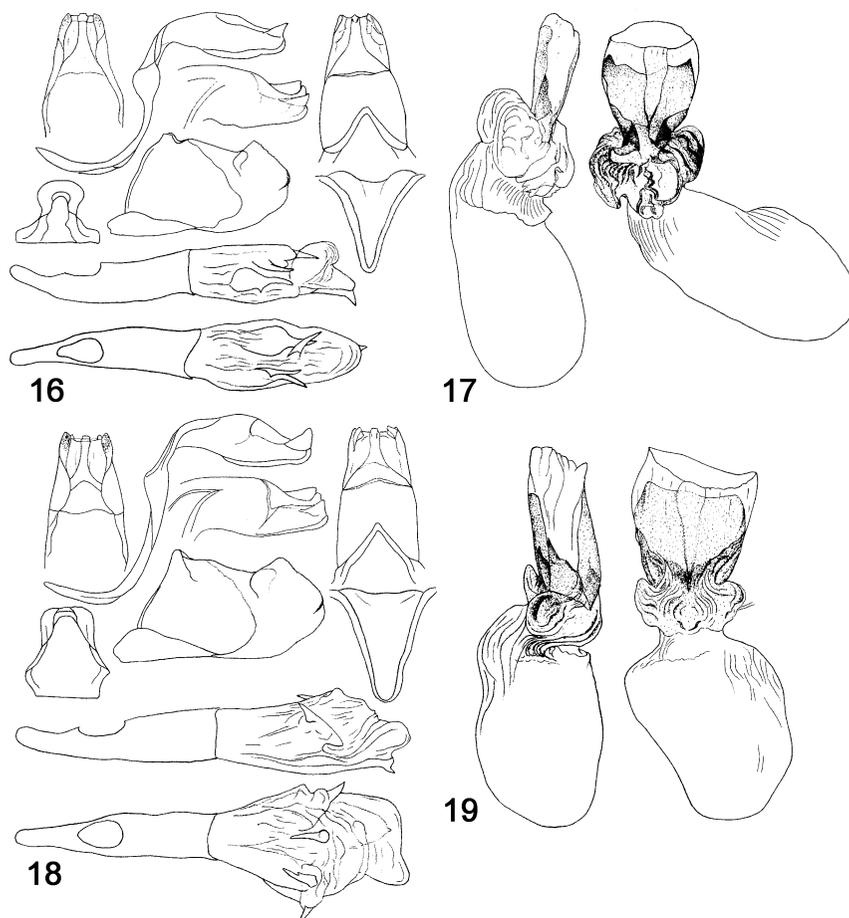
La Merced, Peru by Evans (1955). The latter flies with *P. propertius* (if correctly identified) in Espírito Santo, Brazil (Brown and Freitas 2000). Records of *P. phineus* from Rondônia extends the distribution into the upper basin of the Amazon River in western Brazil.

**Key to the species of *Propertius***

- 1. Palpi white on venter with black central line, bands on ventral hindwing white, apex of ventral forewing apex bright red-brown, mid-termen of ventral hindwing without pale area .....*P. dejongi*  
Without above combination of characters .....2
- 2. Palpi yellow on venter with black central line, bands on ventral hindwing yellow, apex of ventral forewing yellow .....*P. propertius*  
Palpi yellow on venter without black central line, bands on ventral hindwing white, apex of ventral forewing fulvous.....*P. phineus*



**Figures 13-15.** Holotype of *Pamphila theodora* Ehrmann, 1907. 13) holotype female, dorsal surface; 14) holotype female, ventral surface; 15) type labels.



**Figures 16-19.** Genitalia of *Propertius* from BRAZIL: Rondônia. Male genital structures shown include lateral view of uncus, gnathos, tegumen, and saccus; lateral dorsocaudal view of uncus, gnathos, and caudal portion of tegumen; ventral view of uncus, gnathos, and caudal portion of tegumen; dorsal view of gnathos, uncus, and tegumen; ventral view of juxta; ventral view of saccus; internal lateral view of right valva; lateral and dorsal views of aedeagus and partly everted vesica. Female genital structures include lateral and ventral views. **16)** *P. dejongi*, holotype male, data in text (GTA #8860); **17)** *P. dejongi*, paratype female, linha C-10, 5 km. S of Cacaulândia, 26 May 1997 (GTA #7592); **18)** *P. phineus*, male, linha C-20, 10 km E of B-65, 3 km E of Fazenda Rancho Grande, 15 November 1992 (GTA #8866); **19)** *P. phineus*, female, linha C-10, 5 km S of Cacaulândia, 28 April 1995 (GTA #7593).

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