TROPICAL LEPIDOPTERA, 9 (Suppl. 2): 19-25

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

**GEORGE T. AUSTIN**

Nevada State Museum and Historical Society, 700 Twin Lakes Drive, Las Vegas, Nevada 89107, USA

ABSTRACT.– The pyrgine genera *Anastrus* Hübner, 1824, and *Tosta* Evans, 1953 (Hesperiidae), found in the vicinity of Cacaulândia in central Rondônia, Brazil, are discussed and illustrated. Two new species, *Anastrus virens* **n. sp.** and *Tosta capra* **n. sp.**, are described. Taxonomic comments and comparisons with material from other areas are made in some instances.

KEY WORDS: ***Anastrus virens*** n. sp., ants, Argentina, Bolivia, Central America, Colombia, Costa Rica, *Echelatus*, Ecuador, Formicidae, Guatemala, Hymenoptera, Mexico, Neotropical, Peru, South America, symbiosis, taxonomy, ***Tosta capra*** n. sp., Venezuela.

This continues a series of papers on the Hesperiidae from the vicinity of Cacaulândia in central Rondônia, Brazil (for description of the area, see Emmel and Austin, 1990; Austin and Johnson, 1995). A discussion of *Anastrus*, with the description of a new species, and the description of a new species of *Tosta* (Hesperiidae: Pyrginae) are included in this paper.

## *ANASTRUS* Hübner, 1924

Evans (1953) recognized eight species and several subspecies of this Neotropical genus which occurs from Mexico to Argentina. Four of these species plus an undescribed one occur near Cacaulândia.

*Anastrus* is a variable genus in the presence of a hind tibial tuft on males and in the morphology of the genitalia of both sexes. Males of taxa assigned to *Anastrus sempiternus* (Butler & Druce, 1872), *Anastrus tolimus* (Plötz, 1884), *Anastrus meliboea* (Godman & Salvin, [1894]), and *Anastrus ulpianus* (Poey, 1832) have no tibial tuft and those of *Anastrus petius* (Möschler, 1876), *Anastrus obliqua* (Plötz, 1884), *Anastrus obscurus* Hübner, [1824], and the new species described below have tibial tufts; their occurrence on the remaining species included in the genus, *Anastrus peruvianus* (Mabille, 1883), is unknown (Evans, 1953).

The male genitalia of *A. obscurus* (the type species of *Anastrus*), *A. meliboea*, and the new species are similar in form with a narrow and constricted tegumen (dorsal view), closely spaced arms of the uncus, a relatively narrow gnathos (ventral view), a style from the ampulla, a harpe having a dentate dorsal edge and a prominent spike cephalad, and a relatively stout aedeagus having a series of small teeth on the left side caudad (see Evans, 1953 and Fig. 10-12 herein). Female genitalia are likewise similar among these species with a roughly rectangular lamella postvaginalis, an oblong lamella antevaginalis, and a broad antrum (Fig. 16-17).

Males of *A. sempiternus* (the type species of *Echelatus* Godman & Salvin, [1894]) and *A. tolimus* have a broad tegumen, widely spaced arms of the uncus, a short and broad gnathos, no style from the ampulla, an elongate and rather elaborate harpe with no spike-like dorsal projection, and a very slender aedeagus (Fig. 7, 8). Female genitalia have a trapozoidal genital plate, a long and relatively thin ductus bursae, and a relatively small oval or globular corpus bursae (Fig. 13-14).

Finally, the male genitalia of *A. petius* and, judging from the figures in Evans (1953), perhaps also *A. obliqua* have a broad tegumen, rather closely spaced arms of the uncus, somewhat broad and triangular arms of the gnathos, no style from the ampulla, a rather simple or bifurcate harpe, a prominent dorsal process from the anterior portion of the sacculus, and a moderately slender aedeagus (see figure in Evans, 1953 and Fig. 9 herein). Female genitalia of *A. petius* (Fig. 15) have a rectangular genital plate with the lamella antevaginalis as a narrow band cephalad, a very thin antrum and ductus bursae, and a broad corpus bursae. The genitalia of *A. ulpianus* and *A. peruvianus* were not examined; *A. peruvianus*, at least from the figures in Evans (1953), appears to have male genitalia very different from any of the other taxa now included in *Anastrus*.

These differences among the genitalia, as described above, suggest that *Anastrus* may not be monophyletic. Burns (1996) noted that "congeneric species tend to have essentially similar copulatory parts" reflecting the conclusions of previous authors (*e.g.*, Steinhauser, 1983, 1989, 1991; Burns, 1990). In this context, there may well be at least three genera among those presently included within *Anastrus* (*sensu* Evans, 1953). An in depth study of all taxa is warranted and towards that end, the genitalia of all species at hand are here illustrated for comparison. Initial speculations would include retaining *A. obscurus*, *A. meliboea*, and the new species in *Anastrus*, recognizing *Echelatus* as a valid genus for *A. sempiternus* and probably *A. tolimus*, erecting a new genus for *A. petius* to also possibly include *A. obliqua*, and further examining the relationships of *A. ulpianus* and *A. peruvianus*.

### *Anastrus sempiternus simplicior* (Möschler, 1876)

(Fig. 1-2, 7, 13)

*Anastrus sempiternus* is uncommon in central Rondônia, with records for March, April, and September to December. It flies in the forest, occasionally associated with army ants (*Eciton*, Hymenoptera: Formicidae), and attracted to paper lures (see Austin *et al.*, 1993).

The male genitalia are variable, especially in the configuration of the harpe (Fig. 7). This latter is long, its dorsal "crest" bends somewhat inward, and it is variably finely dentate and undulate. Similar variation was seen among material of *A. s. sempiternus* from Central America. The differences between published figures of the genitalia (Godman and Salvin, 1879-1901; Hayward, 1948; Evans, 1953) are attributed to both the variability alluded to above and to

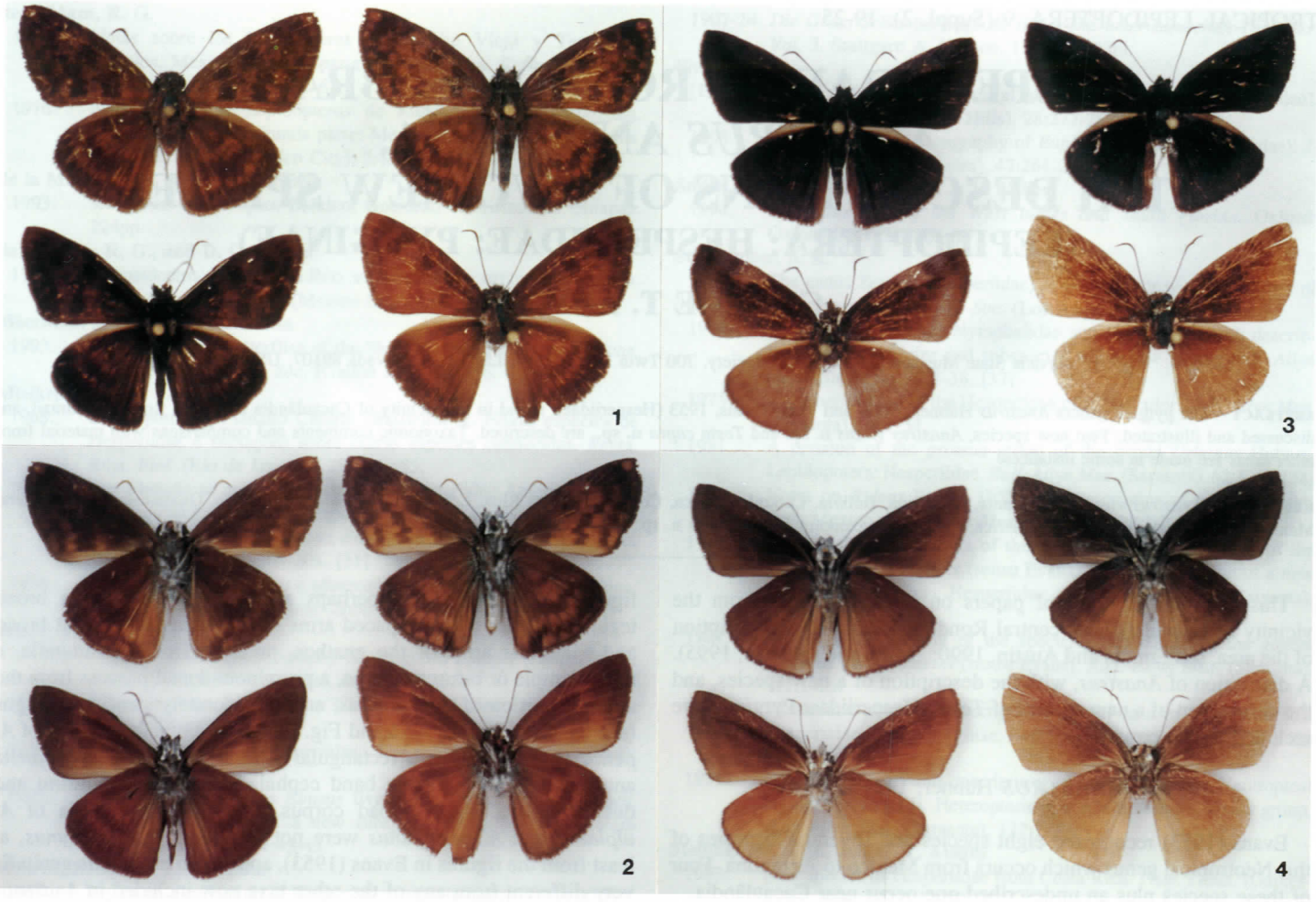



Fig. **1**. *Anastrus* species, dorsal surface (all from BRAZIL: Rondônia; vicinity of Cacaulândia). **Upper left** - *A. sempiternus simplicior*, male, 18 Nov 1994; **upper right** - *A. sempiternus simplicior*, female, 10 Nov 1995; **lower left** - *A. tolimus robigus*, male, 2 Apr 1995; **lower right** - *A. tolimus robigus*, female, 19 Mar 1989.
Fig. **2**. *Anastrus* species, ventral surface. Same specimens as in Fig. 1.
Fig. **3**. *Anastrus* species, dorsal surface (all from BRAZIL: Rondônia; vicinity of Cacaulândia). **Upper left** - *A. obscurus narva*, male, 18 Aug 1993; **upper right** - *A. virens*, holotype male, 18 Jun 1993; **lower left** - *A. obscurus* group (*A. o. narva*?), female, 23 Jul 1995; **lower right** - *A. obscurus* group (*A. virens*? n. sp.), female, 5 Nov 1989. Fig. **4**. *Anastrus* species, ventral surface. Same specimens as in Fig. 3.

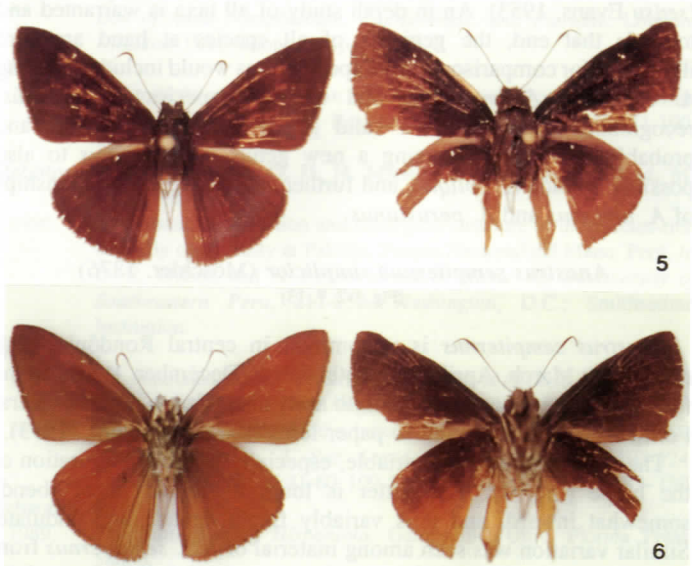



Fig. **5**. *Anastrus* and *Tosta* species, dorsal surface (both from BRAZIL: Rondônia; vicinity of Cacaulândia). **Left** - *A. petius petius*, male, 17 Nov 1994; **right** - *T. capra*, holotype male, 12 Nov 1992.
Fig. **6**. *Anastrus* and *Tosta* species, ventral surface. Same specimens as in Fig. 5.

the angle at which the harpe is viewed and not to taxonomic differences. Further study, however, is warranted as potential sympatry (in Venezuela) between *A. s. sempiternus* and *A. s. simplicior* was indicated by Evans (1953).

Female genitalia of *A. sempiternus* (Fig. 13) have a wide lamella postvaginalis with a broad central notch on the caudal edge; a still broader, but thin, lamella antevaginalis; a long, slender, and unadorned ductus bursae; and a globular corpus bursae with a signa having the appearance of a "mat" of hair. No genital differences were seen between single females of *A. s. sempiternus* (from Costa Rica) and *A. s. simplicior* (from Rondônia).

### ***Anastrus tolimus robigus*** (Plötz, 1884)
(Fig. 1-2, 8, 14)

*Anastrus tolimus* is relatively common near Cacaulândia, was recorded in all months except February and December, and has an apparent peak of abundance in the early wet season (October-November). Its habits are similar to those of *A. sempiternus*.

Like *A. sempiternus*, the valva of the male genitalia of *A. tolimus* (Fig. 8; also illustrated by Godman and Salvin, 1879-1901; Evans, 1953) is long and somewhat variable in the length, breadth, and degree of undulation of the harpe. No differences were seen between

the male genitalia of *A. t. tolimus* from Central America and those of *A. t. robigus* from Rondônia.

Female genitalia of *A. tolimus* (Fig. 14) have a relatively narrow lamella postvaginalis with a narrow V-shaped notch on its caudal edge; a somewhat broader and long lamella antevaginalis also with a prominent V-shaped notch on its caudal edge; a long, slender, and unadorned ductus bursae; and a small and oblong corpus bursae. No appreciable differences were observed in the genitalia between a single female of *A. t. robigus* seen from Rondônia and those of two *A. t. tolimus* examined from Guatemala. As for *A. sempiternus*, further study is needed because of potential sympatry (both taxa reported for Mexico, Colombia, Venezuela) between the subspecies of *A. tolimus* (Evans, 1953). Vargas *et al.* (1996) and Warren *et al.* (1998) treated this taxon as a full species.

### ***Anastrus petius petius*** (Möschler, 1876)
(Fig. 5-6, 9, 15)

*Anastrus petius* is a rare species in central Rondônia with one record for August and five for November. Its behavior seems to be similar to that of the preceding species.

The male genitalia of *A. petius* (Fig. 9) do not appear to differ from those illustrated by Evans (1953). Female genitalia (of *Anastrus petius peto* Evans, 1953, from Costa Rica, Fig. 15) have a quadrate lamella postvaginalis with a shallow U-shaped notch on its caudal edge, a relatively indistinct and thin lamella antevaginalis, a long and very slender ductus bursae, and a large and more or less oblong corpus bursae.

### ***Anastrus obscurus narva*** Evans, 1953
(Fig. 3-4, 11)

*Anastrus obscurus* is the most abundant species of *Anastrus* near Cacaulândia and was recorded from February and May to December. Nearly 70% of the records were from within the forest in association with army ants or at paper lures; males also perch with their wings spread in light gaps.

The male genitalia of *A. o. narva* are like those of *Anastrus obscurus neaeris* (Möschler, 1878), from Central America and the valva appears similar to the valva illustrated by Evans (1953) for *A. o. obscurus*. The identity of the female of *A. obscurus* among samples from Rondônia is not clear, but it may be those illustrated in Fig. 3 (lower left), 17a, and 17b (see below under the following species). These have the broad and flaring lamella postvaginalis and the lateral caudal lobes of the lamella antevaginalis as seen on *A. o. neaeris* (Fig. 17d).

Additional study of the relationships of the subspecies of *A. obscurus* is needed as Evans (1953) noted both *A. o. neaeris* and *A. o. narva* from Panama and both *A. o. narva* and *Anastrus obscurus chaqua* Evans, 1953, from Carabaya, Peru and from Bolivia. In addition, Evans (1953) remarked on the similarity in the genitalia of *A. obscurus* and *A. meliboea* and thought their "specific separation" to be "somewhat doubtful". They are obviously of the same species group within *Anastrus* (see above) as their superficial appearance and male genitalia are indeed very similar (Fig. 10-11) and there is a resemblence in the female genitalia (Fig. 16-17). *A. meliboea*, however, is larger [male forewing length = 23mm (Ecuador); female forewing length = 24mm (Costa Rica)] than *A. obscurus* (see below), its males have no tuft on the hind tibia, and it is apparently broadly sympatric with *A. o. neaeris*, *A. o. narva*, and *A. o. chaqua* (Evans, 1953).

### ***Anastrus virens*** Austin, **new sp.**
(Fig. 3-4, 12)

**Description**.– MALE.– Forewing length = 20.5mm (20.1-21.2, N = 10); forewing with narrow costal fold, apex pointed, outer margin slightly convex; hindwing more or less triangular, outer margin convex; dorsum black; forewing with broad, somewhat iridescent blue-green marginal band curving proximad (leaving apex black) to costal margin, costal margin with similar color distad, gradually more purple-blue proximad, band broadest subapically entering anterior distal corner of discal cell; hindwing distal 2/3 somewhat iridescent blue-green vaguely divided in middle by narrow and darker postmedian line, color extending nearly to base posterior of discal cell, wing base iridescent purple-blue, costal margin pale yellow-brown, anal margin brown; fringes of both wings gray.

Ventral forewing dark purple-brown, vague blue and purple iridescence along costa, outer and anal margins paler gray-brown, shining gray on both sides of basal 1/3 of vein 2A and beneath base of discal cell; hindwing dark brown anterior to discal cell and vein Rs, gradually grading to paler gray-brown posteriad; vague to obsolete postmedian and submarginal bands of darker brown.

Head dark brown, palpi black with numerous white scales, white beneath eyes, antennae black with narrow but distinct white at segments on inner surface, ochreous on venter distad and beneath club, nudum gray, 18 (N = 2) or 19 (N = 1) segments; thorax dark brown above, mixed black and white beneath, legs blackish with numerous white scales, tibiae smooth, mid-tibia with single pair of long spurs, hind tibiae with two pairs of spurs plus a long black hair tuft fitting into thoracic pouch; abdomen black on dorsum, pale gray-brown on venter.

Genitalia: tegumen flat continued to claw-like uncus in lateral view, constricted caudad in middle in dorsal view; uncus divided, arms relatively closely spaced, parallel; gnathos divided, arms thin; vinculum broad; saccus broad; valva with margin of costa/ampulla relatively straight, ampulla continued as caudal process (style) with slight angle dorsad, ampulla also with triangular ventral extension on inner side of valva; harpe extended caudad, narrow, caudal end expanded and with blunt teeth on dorsal edge, thin projection dorsad from dorsal edge cephalad near ampulla; aedeagus tubular, phallobase with ventro-cephalad orientation out of line with remainder of aedeagus, aedeagus with one or two rows of small teeth near dorsal edge of the left side caudad.

FEMALE.– not identified with certainty (see discussion).

**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 / 18 June 1993 / leg. G. T. Austin / (at paper lures / 1030-1100); white, printed and handprinted - Genitalia Vial / GTA-3717; red, printed - HOLOTYPE / *Anastrus virens* / Austin.

Paratypes (same location as holotype unless noted): BRAZIL.– Rondônia: 13 Jun 1993, associated with *Eciton burchelli*, 1000-1030 (1 ♂); 18 Jun 1993, at paper lures, 1300-1330 (1 ♂); 19 Jun 1993, at paper lures, 1100-1130 (1 ♂); 16 Aug 1993, associated with *Eciton burchelli*, 1200-1230 (1 ♂); 19 Aug 1993, associated with *Eciton burchelli*, 1200-1230 (1 ♂); 20 Aug 1993, associated with *Eciton burchelli*, 0930-1000 (2 ♂); 21 Aug 1993, associated with *Eciton burchelli*, 1200-1230 (1 ♂); 25 Sep 1992 (1 ♂); 6 Oct 1993, at paper lures, 0930-1000 (1 ♂); 10 Oct 1993, at paper lures, 1030-1100 (1 ♂); 22 Oct 1992, associated with *Eciton burchelli* (2 ♂); 9 Nov 1991 (1 ♂); 10 Nov 1992 (1 ♂); 16 Nov 1995, at paper lures, 1030-1100 (1 ♂); 18 Nov 1994, at paper lures, 1130-1200 (1 ♂); 20 Nov 1991, associated with *Eciton burchelli* (1 ♂); 20 Nov 1992, associated with *Eciton burchelli*, 1300-1330 (1 ♂); 22 Nov 1992, at paper lures, 1130-1200 (1 ♂). Linha 10, 5 km S of Cacaulândia, 3 Oct 1993 (1 ♂); 17 Nov 1996 (1 ♂).

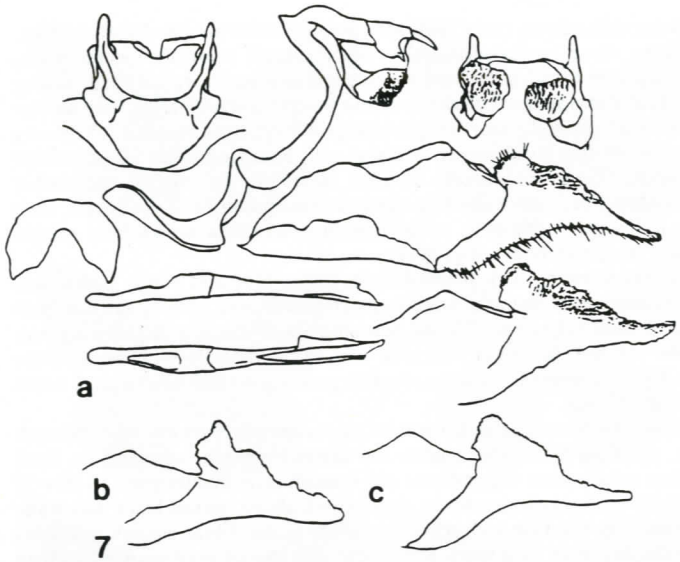
**Deposition of types**.– The holotype male will be deposited at the Dept. de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil. The paratypes will be distributed among various collections.

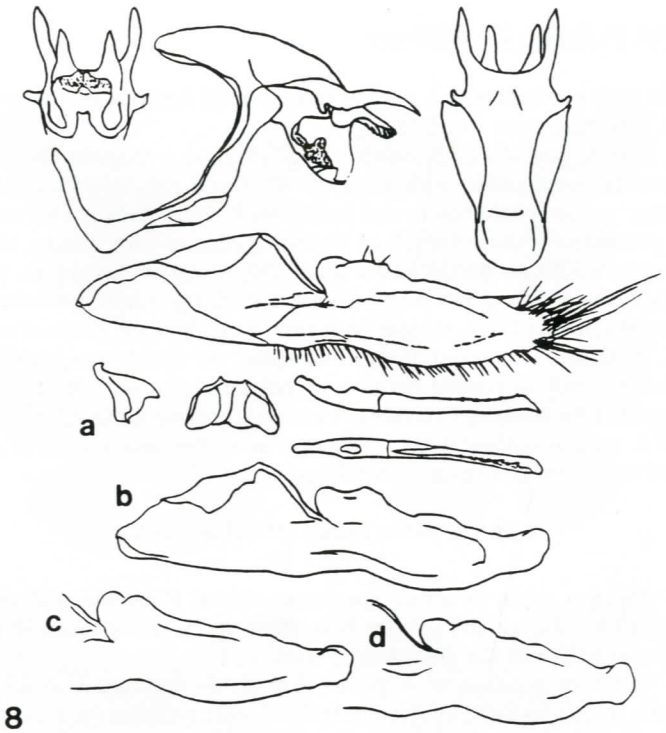
**Type locality**.– BRAZIL: Rondônia; 62 km south of Ariquemes, Linha C-20, 7 km (by road) east of route B-65, Fazenda Rancho Grande, 180m elevation. This is approximately 5 km northeast of Cacaulândia in typical lowland tropical rainforest.

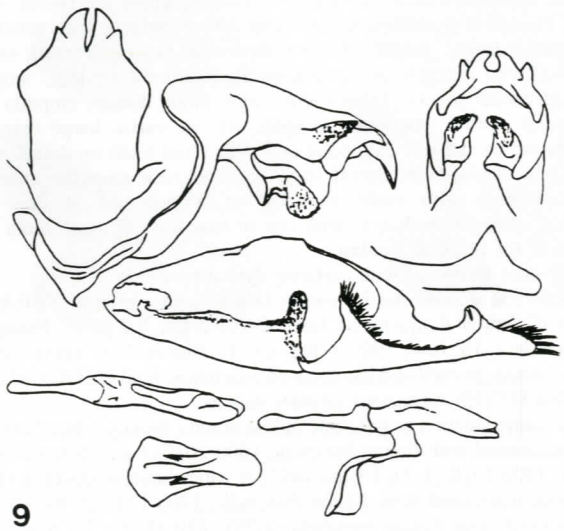
**Etymology**.– The name means green, referring to the green iridescence on the dorsal surface of both wings.

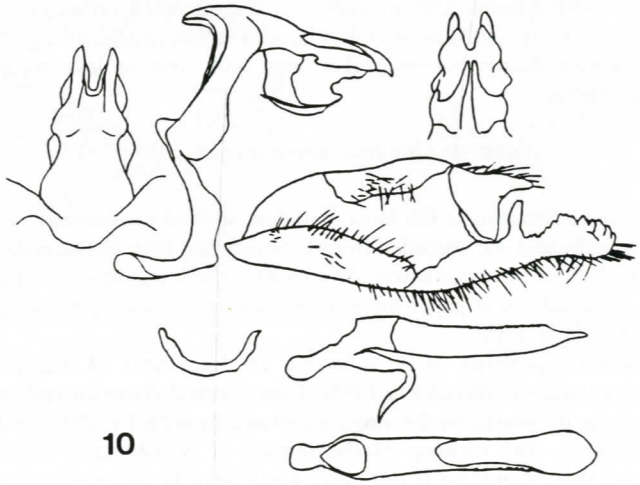
**Distribution and phenology**.– To date, *A. virens* is known only from the type locality and vicinity, with records for June and August to November. This species is often found in association with army ants, is attracted to paper lures, and perches in light gaps with the wings spread.

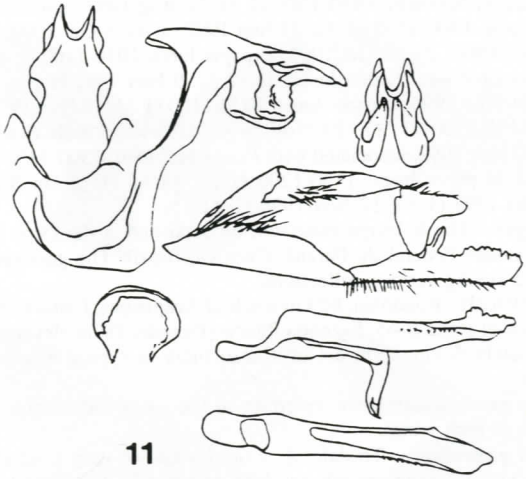
**Diagnosis and discussion**.– *A. virens* is very similar to the sympatric and synchronic *A. o. narva*. It is at once distinguished by its broad greenish margins; these are narrower (especially on the forewing) and purple-blue on *A. o. narva*. The hindwing of *A. virens* is slightly



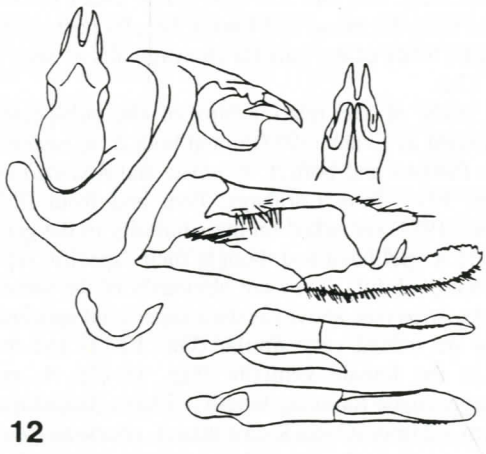




Fig. **7-12**. Male genitalia of *Anastrus* species (all from BRAZIL: Rondônia; vicinity of Cacaulândia, unless noted). Structures shown are lateral view of tegumen, uncus, gnathos, vinculum, and saccus; dorsal view of tegumen and uncus; ventral view of uncus, gnathos, and anterior tegumen; internal view of right valva; lateral and dorsal views of aedeagus; ventral view of juxta. **7a.** *A. sempiternus simplicior*, 15 Apr 1992 (GTA #3126), including view of flattened caudal end of valva, **b.** 13 Dec 1990 (GTA #1377), caudal end of valva, **c.** 17 Sep 1992 (GTA #2527), caudal end of valva. **8a.** *A. tolimus robigus*, 16 Aug 1993 (GTA #3883), including lateral view of juxta, **b.** 19 Jun 1993 (GTA #3706), valva, **c.** 12 Nov 1992 (GTA #2922), caudal end of valva, **d.** 17 Nov 1992 (GTA #2857), caudal end of valva. **9.** *A. petius petius*, 17 Nov 1994 (GTA #6600), including flattened caudal end of valva and lateral view of juxta. **10.** *A. meliboea meliboea*, ECUADOR: Tinalandia Hotel, 13 km E of Santo Domingo de los Colorados, 24 Dec 1981 (GTA #4841), including lateral view of juxta. **11.** *A. obscurus narva*, 8 Nov 1989 (GTA #353), including lateral view of juxta. **12.** *A. virens*, 19 Jun 1993 (GTA #3738), including lateral view of juxta.

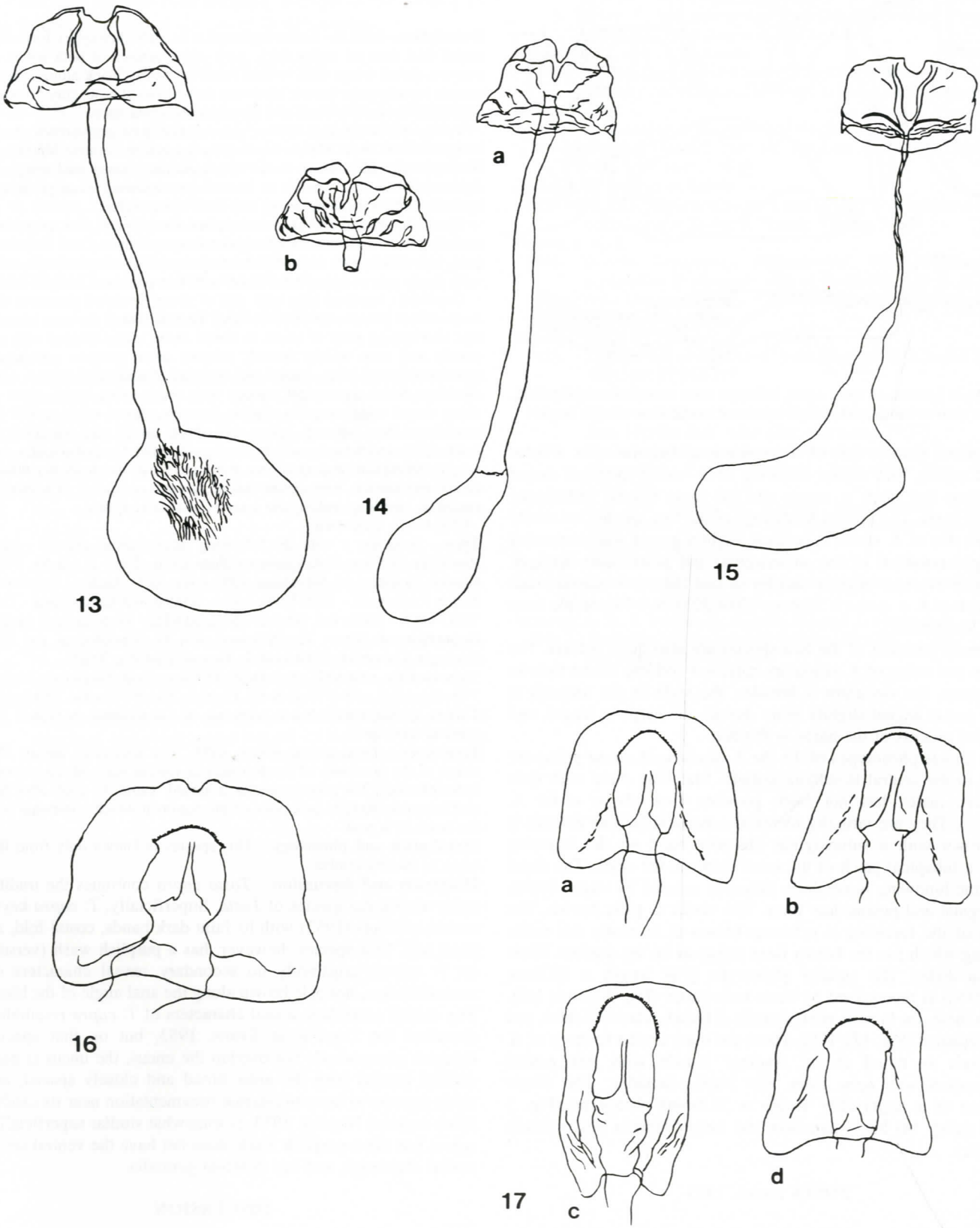



Fig. **13-17**. Female genitalia (ventral view) of *Anastrus* species (all from BRAZIL: Rondônia; vicinity of Cacaulândia, unless noted). **13.** *A. sempiternus sempiternus*, COSTA RICA: Alajuela Prov., 6.8 km W of Atenas, 25 Dec 1984 (GTA #7185). **14a.** *A. t. tolimus*, GUATEMALA: Petén; Parque Nac. Tikal, 2 Feb 1992 (GTA #7186), **b.** *A. t. robigus*, 19 Mar 1989 (GTA #6605). **15.** *A. petius peto*, COSTA RICA: Limon Prov.; Playa Bananito, 2 Sep 1987 (SRS #3188). **16.** *A. meliboea meliboea*, COSTA RICA: Limon Prov. Rio Blanco Rd. to Petroleo, 4 Sep 1987 (SRS #3189). **17a.** *A. obscurus narva*(?), 3 Sep 1994 (GTA #6205); **b.** *A. o. narva*(?), 23 Jul 1995 (GTA #6587); **c.** *A. virens*(?), 5 Nov 1989 (GTA #354); **d.** *A. o. neaeris*, GUATEMALA: Petén; Parque Nac. Tikal, 24 May 1992 (GTA #4682).

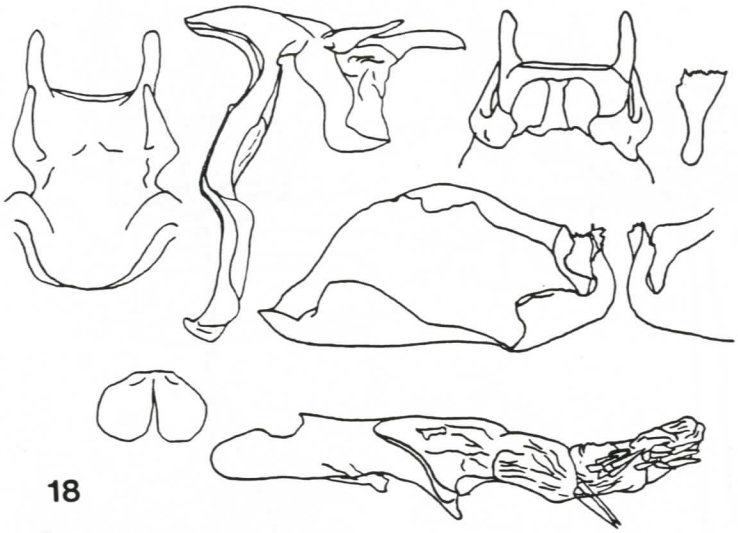



Fig. **18**. Male genitalia of *Tosta capra*, holotype; same structures as in Fig. 7-12, plus outer view of caudal end of right valva and caudal view of right harpe.

more convex than is that of *A. o. narva* giving the apex a more rounded aspect. The ventral forewing of *A. virens* averages darker brown than that of *A. o. narva* and has more intense iridescence along the costa. The ventral hindwings of the two species are nearly identical; that of *A. virens* is perhaps slightly grayer with somewhat less vague remnants of the submarginal and postmedian lines. *A. virens* also averages slightly smaller in size than *A. o. narva* [male FW length of *A. o. narva* = 21.4mm (20.4-22.0, N = 10; sample from central Rondônia)].

The male genitalia of the two species are also quite similar. The tegumen and uncus of *A. virens* are narrower and less robust than on *A. o. narva*, the vinculum is broader, the style of the ampulla is thinner and is angled slightly more dorsad, the harpe is longer, and the dorsal process of the harpe is thinner.

Two female phenotypes of the the *A. obscurus/A.virens* group are present in the central Rondônia sample. Matching these with their respective males has not been possible (see above under *A. obscurus*). They are virtually identical superficially. The dorsum is dark brown with a submarginal lilaceous band on the forewing joining a subapical patch of the same color on the costa. The distal 2/3 of the hindwing is similarly lilaceous crossed by vague brown submarginal and postmedian lines. The venter is paler brown. The margin of the forewing is ochreous-brown as is nearly the entire hindwing which has the brown lines vague as on the dorsum. Their genitalia differ. The smaller phenotype [FW length = 20.7mm (20.3-20.9)] is represented by three individuals (Fig. 3 [lower left], 14). On these, the lamella postvaginalis is broad, relatively short, and flares cephalad (Fig. 17a-17b). These are most similar to those of *A. o. neaeris* as noted above. Another female with this genital configuration was seen from Rio Napo, Ecuador. The single specimen of a larger (FW length = 21.6mm) phenotype (Fig. 3 [lower right], 14) has a narrower and longer lamella postvaginalis (Fig. 17c).

## *TOSTA* Evans, 1953

Evans (1953) erected *Tosta* to include five apparently very rare species represented, at that time, by a total of eight specimens at The Natural History Museum. Nicolay (1973) described an additional species based upon a single male. A male *Tosta* from central Rondônia is of a new species. The genus occurs from Central America to Peru and western Brazil (Evans, 1953; and this study).

### *Tosta capra* Austin, **new sp.**

(Fig. 5-6, 18)

**Description**.– MALE.– Forewing length = 21.3mm (holotype); forewing with costal fold, internal scales thick, pure white; termen of both wings evenly convex; dorsal wings dark brown; forewing nearly black along costa, outer margin broadly paler brown; hindwing dark brown at base, gray-brown distad with faint brown postbasal and discal bands, costa gray.

Ventral forewing dark brown, paler distad, pale gray-brown along anal margin where basal scales form shiny speculum; ventral hindwing dark brown basad, paler brown distad and, especially, along anal margin where ochreous brown, dark bands as on dorsum, hindwing costa produced over speculum and with short, stout, and erect black scales.

Head, thorax, and abdomen dark brown above; palpi dark gray; antennae entirely black, nudum with 27 segments; ventral thorax and abdomen dark gray; legs dark brown with whitish on outer surface, tibiae smooth, mid-tibia with single pair of spurs, hind tibiae with two pairs and without hair tuft.

Genitalia - tegumen long with pair of sharply pointed processes directed caudad from lateral edge at caudal end, these dorsad of uncus in lateral view, tips overlapping arms of uncus in dorsal view; uncus divided with narrow, evenly and very widely spaced, parallel arms; gnathos undivided with prominent lateral lobes, caudal end cephalad of undivided portion of uncus; vinculum relatively straight; saccus very short; valva broad, costa curved along dorsal edge, ampulla slightly concave, dorsal edge curved inward, caudal end bent ventrad, harpe very short, caudal end triangular, facing caudad, directed dorsad, partially overlapping caudal end of ampulla, sacculus roughly triangular; aedeagus very short and stout, much shorter than valva, caudal end narrow, bent ventro-caudad, cornuti consisting of a small nipple cephalad, two long spikes, and a series of shorter spikes.

FEMALE.– Unknown.

**Type**.– Holotype ♂ with the following labels: white, printed - BRASIL: Rondonia / 65 km S Ariquemes / linea C-20, 7 km E / B-65, Fazenda / Rancho Grande / 12 November 1992 / leg. G.T. Austin / associated with *Eciton / burchelli* - 1200-1230; white, printed and handprinted - Genitalic Vial / GTA - 2921; red, printed - HOLOTYPE / *Tosta capra* / Austin.

**Deposition of type**.– The holotype will be deposited at the Dept. de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil.

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

**Etymology**.– *Tosta taurus* Evans, 1953, was apparently named after the shape of the processes of the tegumen in ventral view which resemble the horns of a bull. The present species is named "capra" (= goat) after the short and relatively straight processes of the tegumen which somewhat resemble the horns of a goat.

**Distribution and phenology**.– This species is known only from the type taken in mid-November.

**Diagnosis and discussion**.– *Tosta capra* continues the tradition of rarity among the species of *Tosta*. Superficially, *T. capra* keys to *T. taurus* in Evans (1953) with its faint dark bands, costal fold, and no tibial tuft. That species, however, has a purplish wash (versus gray on *T. capra*), apparently no secondary sexual characters on the ventral surface, nor pale brown along the anal angle of the hindwing. The ventral secondary sexual characters of *T. capra* resemble those described for *Tosta tosta* Evans, 1953, but on that species the tegumen processes do not overlap the uncus, the uncus is narrowly divided caudad with the arms broad and closely spaced, and the valva appears to have an internal ornamentation near its caudal end. *Tosta sapasoa* Nicolay, 1973, is somewhat similar superficially to *T. capra*, but has a purplish wash, does not have the ventral secondary sexual characters, and has different genitalia.

## DISCUSSION

Several genera of Hesperiidae heretofore examined from the Rondônia study area have included undescribed species (e.g., Austin, 1995, 1996; Austin and Steinhauser, 1996). Whether this represents considerable local endemism, is a function of less rigorous sampling elsewhere, or is the failure to recognize these new taxa as different

remains to be seen. A combination of all three seems likely and stresses the need for continued sampling throughout the Neotropics and for followup taxonomic studies of those samples.

## ACKNOWLEDGMENTS

I thank S. R. Steinhauser (SRS) and O. H. H. Mielke for sharing and discussing their extensive knowledge of Neotropical Hesperiidae with me, and A. D. Warren for reviewing the paper. T. C. Emmel, J. D. Turner, and the Harald Schmitz family continue to provide assistance and encouragement in studies of the Rondônia fauna. R. and A. Albright, G. Bongiolo, J. P. Brock, O. Gomes, J. D. Turner, W. Ward, A. Warren, and F. and A. West assisted in the field. The Conselho Nacional de Desenvolvimento Científico e Tecnológico kindly issued the authorization permits from the Ministério da Ciência e Tecnologia for our studies in Rondônia in collaboration with EMBRAPA/CPAC and Universidade Federal do Paraná.

## LITERATURE CITED

**Austin, G. T.**
1995. Hesperiidae of Rondônia, Brazil: comments on *Drephalys*, with descriptions of two new species (Lepidoptera: Hesperiidae: Pyrginae). *Trop. Lepid.* (Gainesville), 6:123-128.
1996. Hesperiidae of central Rondônia, Brazil: three new species of *Narcosius* Steinhauser. *J. Lepid. Soc.* (Los Angeles), 50:53-59 [correction to this: *J. Lepid. Soc.* (Los Angeles), 50:172].

**Austin, G. T., J. P. Brock, and O. H. H. Mielke**
1993. Ants, birds, and skippers. *Trop. Lepid.* (Gainesville), 4 (suppl. 2):1-11.

**Austin, G. T., and K. Johnson**
1995. Theclinae of Rondônia, Brazil: *Arcas*, with descriptions of three new species (Lepidoptera: Lycaenidae). *Trop. Lepid.* (Gainesville), 6:31-39.

**Austin, G. T., and S. R. Steinhauser**
1996. Hesperiidae of central Rondônia Brazil: *Celaenorrhinus* Hübner (Pyrginae), with descriptions of three new species and taxonomic comments. *Insecta Mundi* (Gainesville), 10:25-44.

**Burns, J. M.**
1990. *Amblyscirtes*: problems with species, species groups, the limits of the genus, and genus groups beyond - a look at what is wrong with the skipper classification of Evans (Hesperiidae). *J. Lepid. Soc.* (Los Angeles), 44:11-27.
1996. Genitalia and the proper genus: *Codatractus* gets *mysie* and *uvydixa* - in a compact *cyda* group - as well as a *hyster*ectomy, while *Cephise* gets part of *Polythrix* (Hesperiidae: Pyrginae). *J. Lepid. Soc.* (Los Angeles), 50:173-216.

**Emmel, T. C., and G. T. Austin**
1990. The tropical rainforest butterfly fauna of Rondonia, Brazil: species diversity and conservation. *Trop. Lepid.* (Gainesville), 1:1-12.

**Evans, W. H.**
1953. *A Catalogue of the American Hesperiidae in the British Museum (Natural History). Part III. Pyrginae. Section 2.* London: Brit. Mus. (Nat. Hist.). 246pp.

**Godman, F. D., and O. Salvin**
1879-1901. *Biologia Centrali-Americana. Zoologia. Lepidoptera-Rhopalocera.* London: Taylor & Francis. 1269pp.

**Hayward, K. J.**
1948. Insecta, Lepidoptera (Rhopalocera), familia Hesperiidarum, subfamiliae Pyrrhopyginarum et Pyrginarum. *In* H. R. Descole (ed.), *Genera et species animalium argentinorum.* Guillermo Kraft: Buenos Aires. 389pp.

**Nicolay, S. S.**
1973. Descriptions of new Neotropical Hesperiidae. *J. Lepid. Soc.* (Los Angeles), 27:243-257.

**Steinhauser, S. R.**
1983. Notes on *Ridens* Evans, 1952 with description of a new species from Mexico. *Bull. Allyn Mus.* (Sarasota), 79:1-7.
1989. Taxonomic notes and descriptions of new taxa in the Neotropical Hesperiidae. Part I. Pyrginae. *Bull. Allyn Mus.* (Sarasota), 127:1-70.
1991. Six new species of skippers from Mexico (Lepidoptera: Hesperiidae: Pyrginae and Heteropterinae). *Insecta Mundi* (Gainesville), 5:25-43.

**Vargas F., I., A. Luis M., J. Llorente B., and A. D. Warren**
1996. Butterflies of the state of Jalisco, Mexico. *J. Lepid. Soc.* (Los Angeles), 50:97-138.

**Warren, A. D., I. Vargas F., A. Luis M., and J. Llorente B.**
1998. Butterflies of the state of Colima, Mexico. *J. Lepid. Soc.* (Los Angeles), 52:40-72.