

REVISION AND PHYLOGENETIC ANALYSIS OF *ACCINCTAPUBES SOLIS* (PYRALIDAE:  
EPIPASCHIINAE) WITH A LARVAL DESCRIPTION OF AN AVOCADO-FEEDING SPECIES

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**ABSTRACT.** *Accinctapubes* Solis from the tropical Western Hemisphere is revised. Four species of *Accinctapubes* with overlapping distributions are recognized: the type species, *A. albifasciata* (Druce), *A. apicalis* (Schaus), *A. chionopheralis* (Hampson), and from Costa Rica *A. amplissima* Solis & Styer, new species. *Stericta leucoplagiialis* var. *purusalis* is a new synonym of *A. albifasciata*. *Accinctapubes anthimusalis* (Schaus) is transferred to *Quadraforma* Solis, new combination. The larva of *A. albifasciata* that feeds on avocado is described and illustrated for the first time. A dichotomous key for the species is presented. A phylogenetic analysis of 17 morphological characters resulted in one tree with a consistency index of 0.89.

**Additional key words:** *Persea americana*, *Ocotea veraguensis*, Lauraceae, Caribbean, South America, Costa Rica.

*Accinctapubes* adults are hairy, noctuid-like pyraloids with heavy bodies and forewings in length from 1 to almost 2 cm (Fig. 1). These moths can be collected at lights in the Caribbean and from Veracruz, Mexico to Bolivia, Brazil, and Paraguay between elevations of 400 to 2500 meters. Very little is known about the biology of this genus, although larvae of *A. albifasciata* are known to feed on Lauraceae, specifically avocado trees.

During a study of the *Pococera* complex in the Epi-paschiinae, Solis (1993) discovered five New World species that were apparently a natural group in the Old World genus *Stericta* Lederer. Dissection and study of *Stericta divitalis* Guenée, the type species, showed that these species did not belong in *Stericta*, and required a new genus, for which the name *Accinctapubes* was chosen. *Accinctapubes* includes four species: *A. albifasciata* (Druce), *A. apicalis* (Schaus), *A. chionopheralis* (Hampson), and *A. amplissima* Solis & Styer, a new species from Costa Rica. The status of *A. anthimusalis* is revised. A series of specimens collected in the Dominican Republic that are probably another new species of this genus were discovered too late to be included in this study and will be dealt with in another paper.

#### MATERIALS AND METHODS

Pinned specimens were examined with an incandescent light source. Male and female genitalic dissections were prepared following Clarke (1941), using chlorazol black as a staining agent. Wings were stained with Eosin-Y. Both genitalia and wings were mounted permanently in Canada balsam. All slide preparations

were examined with dissecting and compound microscopes. Wing length measurements are from the center of the axillary area to the apex of the forewing. Wing width measurements are from anal angle to the apex of the forewing. Long series of specimens for study of variation within *Accinctapubes* were collected by D. Janzen and W. Hallwachs and by parataxonomists of the Instituto Nacional de Biodiversidad (IN-BIO), Costa Rica. Neotropical specimens were also examined at the following museums: American Museum of Natural History, New York City, USA (AMNH); Bohart Museum, University of California at Davis, California, USA (UCDC); California Academy of Natural Sciences, San Francisco, California (CAS); Canadian National Collection, Ottawa, Canada (CNC); The Natural History Museum (BMNH), London, England; Carnegie Museum, Pittsburgh, Pennsylvania, USA (CMNH); Los Angeles County Museum of Natural History, Los Angeles, California, USA (LACM); Transvaal Museum, Pretoria, South Africa (TMSA); National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA (USNM); Naturhistorisches Museum Wien, Austria (NMW); Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (ZMHB); Zoologische Staatssammlung, Munich, Germany (ZSMC). The deposition of types is indicated by acronyms following the locality data. Specific locality, collector, and date of collection are reported as written on the label.

Morphological characters for the analysis included five characters from the head, eight from the wings, and four from the genitalia (Table 1). The character matrix (Table 2) consisted of five taxa and 17 un-



FIG. 1. *A. albifasciata* perching. Photo by Kjell Sandved taken in Venezuela (specific locality unknown).

ordered binary characters. The matrix was analyzed using PAUP 4 (Swofford 1998). Each character transformation series is polarized, that is, the direction of the supposed evolution of a character from a plesiomorphic (=state 0) to apomorphic (=state 1) condition is determined. This was accomplished with the outgroup method using *Carthara* Walker. All species of *Carthara* were combined and used as a single outgroup.

The hypothesized sister group to *Accinctapubes* is the *Cecidipta-Roeseliodes* clade (Solis 1993). However, this clade was not chosen as the outgroup because it is highly derived with many reduced morphological characters and the sister group relationship between *Accinctapubes* and the *Cecidipta-Roeseliodes* clade is not well supported. These two groups share only one homoplastic character, the presence of vein CuP in the forewing, a character also found in *Deuterollyta* Lederer. Instead, *Carthara*, a genus outside this group with few autapomorphies and located in a less derived position of the tree (Solis 1993) was chosen as the outgroup for this study. It shares several homoplastic characters with *Accinctapubes*. In the forewing the origin of vein  $R_2$  is proximal to the discocellular cell and 3A is coincident with 1A+2A and in the hindwing Sc+ $R_1$  are separate. In the male genitalia the saccus and a sclerotized structure at the base of the uncus are present, the length of the

medial lobe at the base of the valva is rectangular, twice as long as wide, and the juxtal arms extend beyond the costa of the valva. The ductus ejaculatorius is subterminal at the anterior end of the aedeagus.

#### RESULTS

The phylogenetic analysis generated one parsimonious tree with a length of 19 steps, a consistency index of 0.89, and retention index of 0.60 (Fig. 2). The resulting cladogram indicates that *A. albifasciata* and *A. chionophoralis* are sister species based on the presence of white scales in the antemedial area of males (character 7). *Accinctapubes apicalis* is the sister species to these two taxa; they share an  $M_2/M_3$  vein junction of the hindwing that is contiguous (not stalked) with the outer margin of the discal cell and a signum shaft that is greater than 0.3 mm (character 14). Based on this analysis the members of this genus share a male scape extension that is greater than 3.5 mm (character 1); male maxillary palpus with the 3rd segment less than two-thirds as long as the 2nd segment (character 2); apex of the 2nd segment of the male maxillary palpus round (character 3); length of the 2nd segment of the male maxillary palpus less than 0.15 mm with the 3rd segment (character 4); apex of the 3rd segment of the male labial palpus pointed

TABLE 1. Characters and states used in construction of cladogram for *Accinctapubes*.

1. Male scape extension length	0 less than or equal to 3.5 mm 1 greater than 3.5 mm
2. 3rd segment of male maxillary palpus	0 as long as 2nd segment 1 less than 2/3 as long as 2nd segment
3. Apex of 2nd segment of male maxillary palpus	0 pointed 1 rounded
4. Length of 2nd segment of male maxillary palpus	0 greater than or equal to 0.15 1 less than 0.15 mm
5. Apex of 3rd segment of male labial palpus	0 rounded 1 pointed
6. Patch of a thick, sclerotized hooked setae on apex of male forewing	0 absent 1 present
7. Color of antemedial area in male forewing	0 same as basal color of wing 1 white
8. Outer margin of discal cell of male forewing	0 bent inwards medially 1 linear and angled upward
9. Male and female entire forewing apical area white	0 absent 1 present
10. Width of male forewing	0 less than or equal to 0.9 cm 1 greater than 0.9 cm
11. Sc+R <sub>1</sub> vein of male and female hindwing point where M <sub>1</sub> splits from R	0 curves toward costa in the area prior to the 1 not curved in this area
12. Location of M <sub>2</sub> /M <sub>3</sub> vein junction of male and female hindwing	0 distal from outer margin of discal cell 1 contiguous with outer margin of discal cell
13. Apex of male frenulum	0 tapered 1 bulbous
14. Length, apex to base, of signum	0 less than or equal to 0.3 mm 1 greater than 0.3 mm
15. Shape of signum shaft	0 curved 1 straight
16. Setae of papillae anales	0 simple 1 spatulate, then terminally branched
17. Medial lobe of juxta	0 absent 1 present, elongated

(character 5); outer margin of the discal cell of the male forewing linear and angled upward (character 8); Sc+R<sub>1</sub> of hindwing not curved in the area prior to the point where M<sub>1</sub> splits from R (character 11); apex of the male frenulum bulbous (character 13); setae of the papillae anales spatulate, then terminally branched (character 16); and medial lobe of the juxta present and elongate (character 17).

KEY TO SPECIES OF *ACCINCTAPUBES SOLIS*

1. Junction of M<sub>2</sub>/M<sub>3</sub> in hindwing not contiguous (stalked) with outer margin of discal cell (Fig. 27); forewing width greater than 0.9 cm (Figs. 9, 10) ..... *amplissima*
- Junction of M<sub>2</sub>/M<sub>3</sub> in hindwing contiguous (not stalked) with outer margin of discal cell (Fig. 24); forewing width less than 0.9 cm (Figs. 3, 6, 7) ..... 2
2. Male scape length less than or equal to 3.5 mm (Figs. 11, 15); outer margin of the male forewing discal cell bent inwards at center forming two points extending distally (Fig. 24) ..... *albifasciata*
- Male scape length greater than 3.5 mm (Figs. 12, 13); outer margin of male forewing discal cell linear and angled upward (Fig. 26) ..... 3
3. Patch of thickened, dark setae present on apex of forewing; male and female forewing apical area to postmedial line not white (Fig. 7) ..... *chionophoralis*
- Patch of thickened, dark setae on apex of male forewing ab-

sent; male and female forewing with apical area to post-medial line white (Fig. 6) ..... *apicalis*

SYSTEMATICS

*Accinctapubes* Solis, 1993  
*Accinctapubes* Solis 1993:48.

Type species: *Cecidiptera* [sic] *albifasciata* Druce, 1902:325, by original designation (TMSA). Type locality: Sarayacu, Ecuador.

**Diagnosis.** *Accinctapubes* is defined by two autapomorphies, a male frenulum that is bulbous at tip (Fig. 24) and ovipositor lobes with some spatulate setae that are bifurcate or trifurcate distally (Fig. 37).

**Identification synopsis.** *Accinctapubes* can be identified by the forewing pattern (Figs. 3–10) with the postmedial line curving toward the outer margin at M<sub>1</sub>. Species exhibit sexual dimorphism in wing pattern and antennae. In the forewing of both sexes, the median line and reniform spot are not prominent, and, in the hindwing, the postmedial line is prominent from the costal margin to A<sub>1</sub>.

**Distribution.** Caribbean, southern Mexico to Argentina and Brazil.

**Biology.** Only the biology of *A. albifasciata* is known and the caterpillars feed on leaves of Lauraceae.

*Accinctapubes albifasciata* (Druce)

(Figs. 1, 3–5, 11, 15, 20, 24, 25, 29–30, 37, 41, 42)

- Cecidiptera* [sic] *albifasciata* Druce, 1902:325.
- Stericta leucoplagialis* Hampson, 1906:143; Holland & Schaus, 1925:115; Solis, 1993:71; 1995:89.
- Stericta leucoplagialis* var. *purusalis* Holland & Schaus, 1925:115, **new synonym.**
- Stericta albifasciata*; Dyar, 1912:66; Holland & Schaus, 1925:114; Kaye & Lamont, 1927:125.
- Jocara ban* Dyar, 1916:37; Solis, 1993:71; 1995:89.
- Accinctapubes albifasciata*; Solis, 1993:71; 1995:89.

**Diagnosis.** Antemedial area white near costa with a tuft of white scales on posterior margin of discal cell (Figs. 3, 4) and male scape shortest in the genus, barely reaching thorax (Figs. 11, 15).

**Redescription. Male: Head** (Figs. 11, 15): frons brownish red, green scales behind ocellus and chaetosema. Antenna with each segment distally, brownish red basally; male scape length 2.25 mm (n = 7), anteriorly reddish, posteriorly reddish scales with brown tips, with longer, straight red scales mediolaterally throughout. Labial palpus green. **Thorax** (Figs. 3, 4): collar reddish. Tegula basally reddish with brown-tipped scales, dorsally with reddish scales, posteriorly scales are tipped dark brown and appear as two dark spots. **Legs** (Fig. 20): forecoxa basally reddish, distally light green, forefemur basally light reddish, all other segments and legs basally dark brown, peppered with green scales and white distally. **Wings** (Figs. 3, 4, 24, 25): forewing length 1.1–1.2 cm, width 0.55–0.8 cm (n = 10). Basal area near costa greenish, reddish near anal margin. Antemedial line indistinct. Antemedial area white near costa with a tuft of white scales on posterior margin of discal cell. Medial line faintly white. Medial area reddish with more green near costa and 1A+2A. Postmedial line faintly dark brown basally, white distally. Postmedial area brownish-red. Terminal line dark brown. Underside reddish white along costa, dark brown posteriorly until Cu<sub>2</sub>, white to posterior margin. Postmedial band light brown. Hindwing: beige, marginal shade darker brown separated from dark brown postmedial line by light brown scales, reddish scales on some veins. Anal area with long, straight, faintly pink scales. Underside with costa to M<sub>1</sub> reddish white, remainder white. **Abdomen:** yellowish, peppered with red and brown scales. Male genitalia (Figs. 29, 30): uncus length = 1.04 mm (n = 7), width at tip = 0.22 mm (n = 7).

**Female: Head** (Fig. 5): same as male, except scape simple. **Thorax** (Fig. 5): female with collar and tegula entirely reddish. **Legs:** same as male. **Wings** (Figs. 3–5, 24–25): forewing length 1.2–1.4 cm, width 0.55–0.8 cm (n = 10). Female similar to male, but basal color brownish red, antemedial area near costa mostly reddish with a few

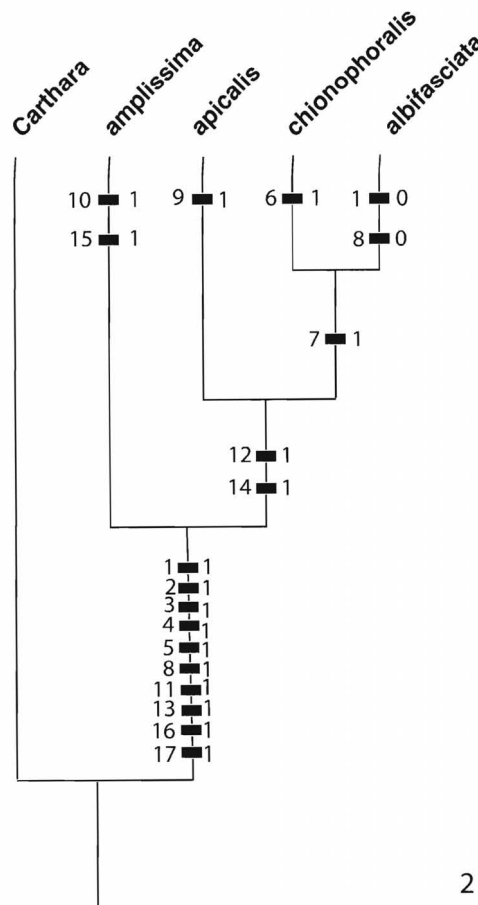


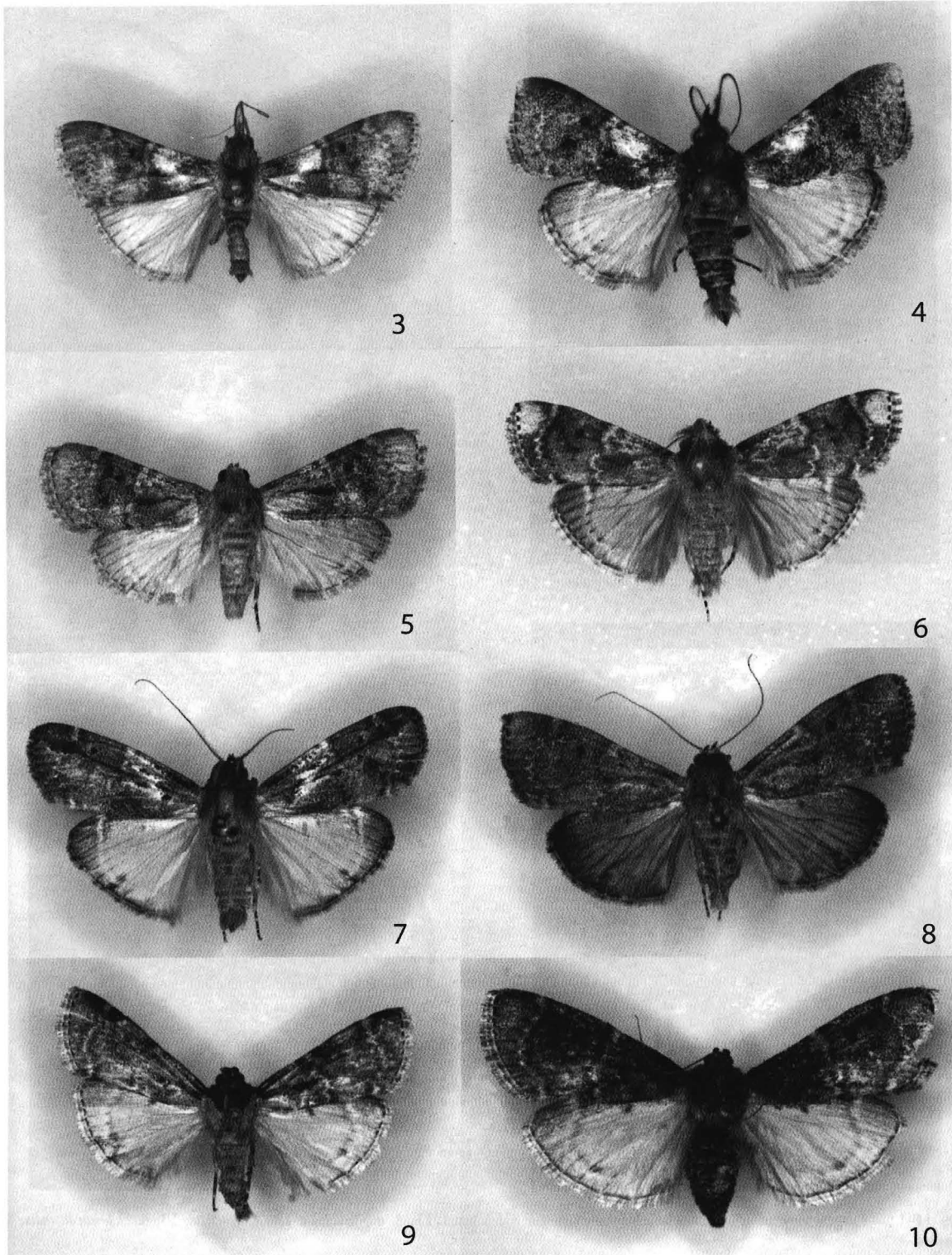
FIG. 2. Hypothesis of phylogenetic relationships of *Accinctapubes* species. Numbers on the left refer to characters, numbers on the right refer to character states.

white scales, a long tuft of brown scales on posterior margin of discal cell, antemedial line distinct, brown basally, white distally. Hindwing: Female sometimes light brown throughout and anal area always with long, straight scales reddish brown. **Abdomen:** Female genitalia (Fig. 37): signum curved, length from apex to base 0.52 mm (n = 1).

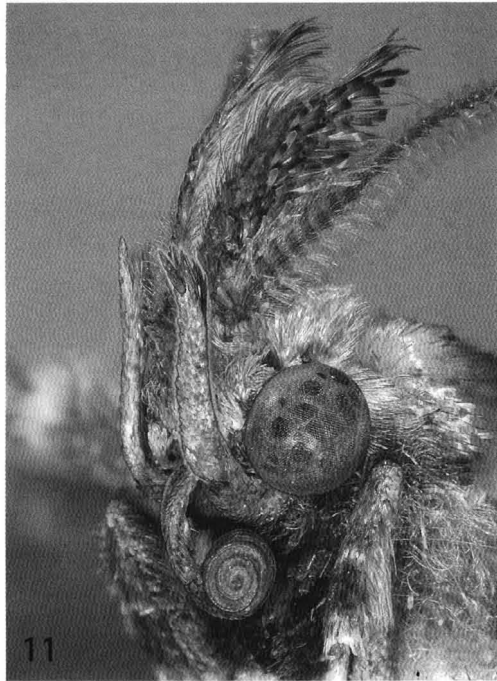
**Larval description** (Figs. 41, 42). Length 23 mm (last instar) (n = 2). Head beige and yellow ventrally, reddish anteriorly. Epicranial suture present. Ventral margin of frons and clypeus yellow. Labrum white with brown ventral margin. Capsule area on either side of clypeus highly sclerotized. T1–3 and A1–10 integument smooth, pinacula dark brown. Pinacula ring at base of SD1 on A8. Prothoracic shield beige with 6 complete longitudinal lines and an incomplete line extending to SD1 from anterior margin and less brown

TABLE 2. Matrix of characters and taxa used in the cladistic analysis of *Accinctapubes* (numbers for characters correspond with those used in the text). All species of *Carthara* were combined and used as the outgroup. (? = missing data.)

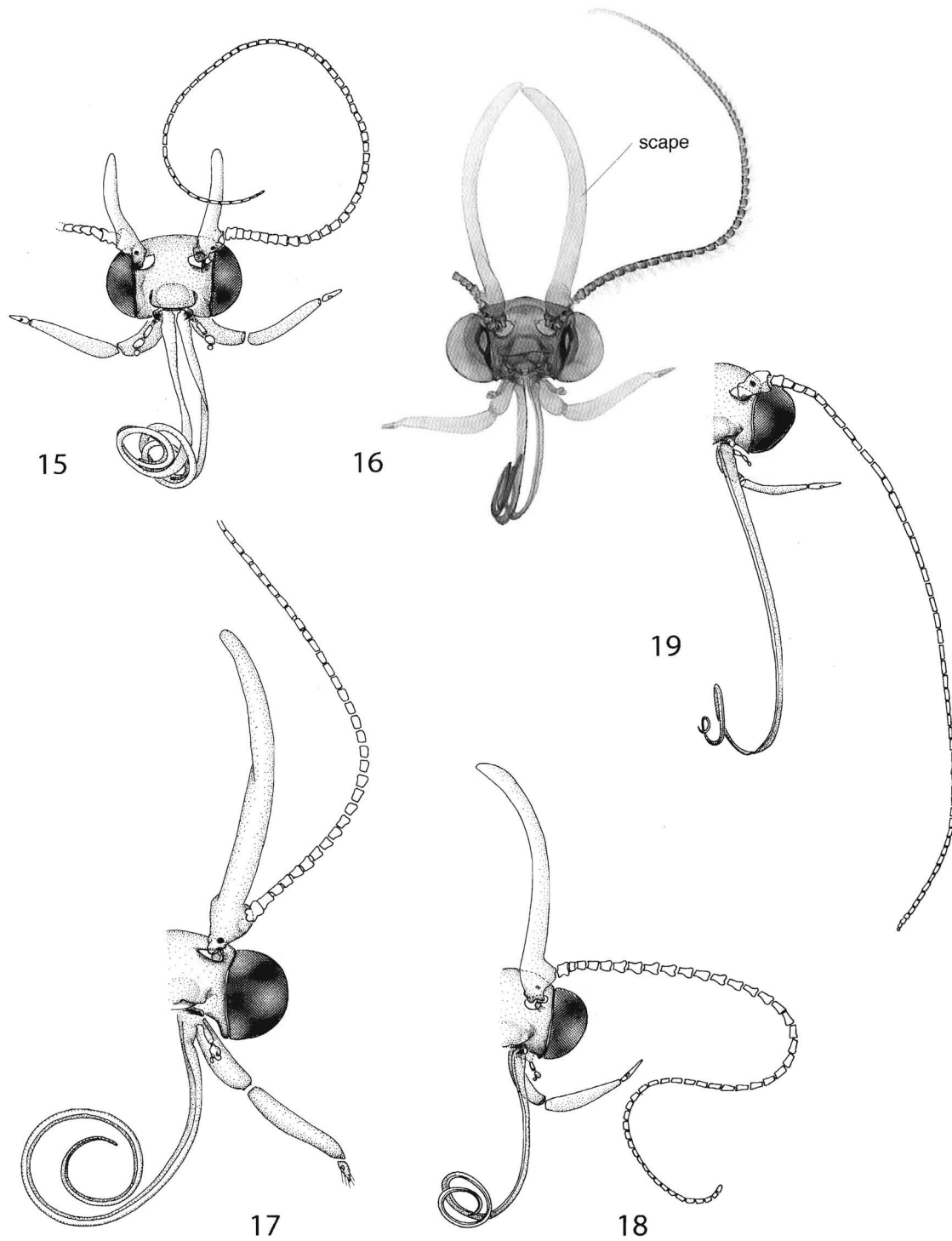
Characters	Taxa																
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
<i>Carthara</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	?	0	0
<i>albifasciata</i>	0	1	1	1	1	0	1	0	0	0	1	1	1	1	0	1	1
<i>apicalis</i>	1	1	1	1	1	0	0	1	1	0	1	1	1	1	0	1	1
<i>chionophoralis</i>	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1
<i>amplissima</i>	1	1	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1



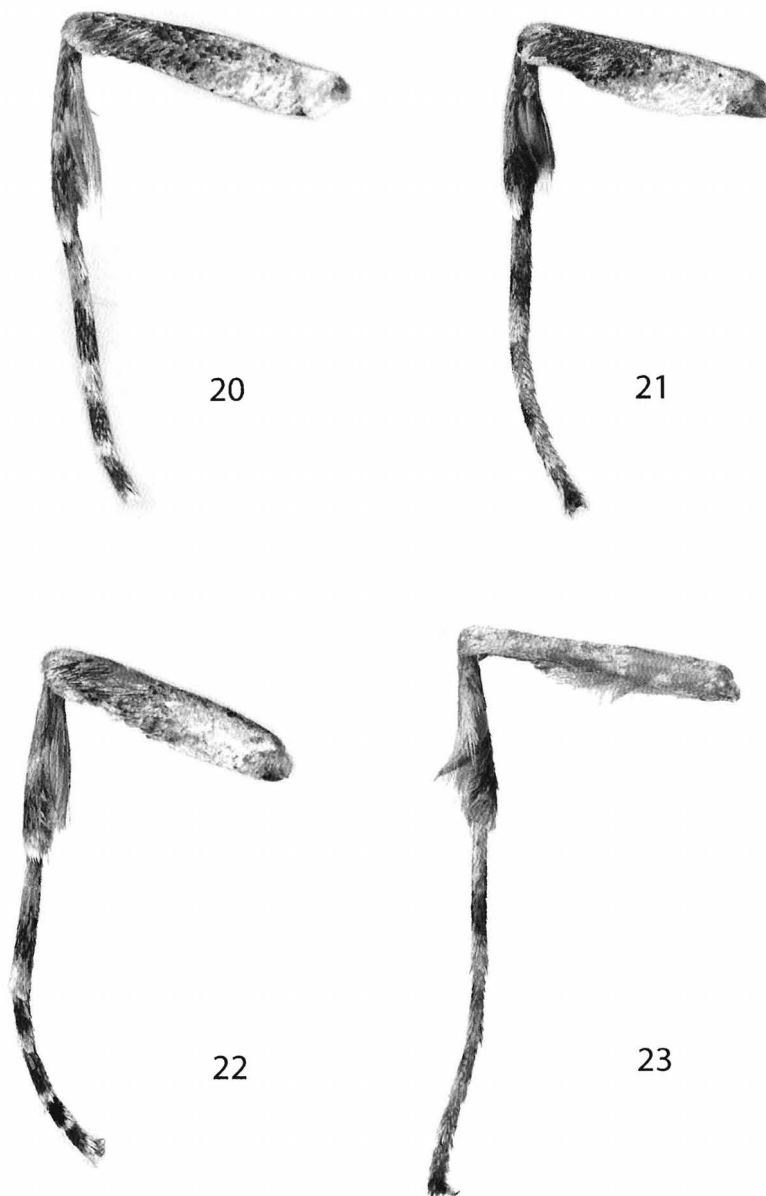
FIGS. 3–10. Adults of *Accinctapubes*. 3, *A. albifasciata* ♂, forewing length = 1.3 cm; 4, *A. albifasciata* ♂, forewing length = 1.4 cm, note difference in hindwing pattern between 3 and 4; 5, *A. albifasciata* ♀, forewing length = 1.2 cm; 6, *A. apicalis* ♂, forewing length = 1.5 cm; 7, *A. chionophoralis* ♂, forewing length = 1.4 cm; 8, *A. chionophoralis* ♀, forewing length = 1.4 cm; 9, *A. amplissima* ♂, forewing length = 1.7 cm; 10, *A. amplissima* ♀, forewing length = 1.8 cm.



FIGS. 11-14. Lateral view of adult male heads (eye diameter = 1.5 mm). 11, *A. albifasciata*; 12, *A. apicalis*; 13, *A. chionophoralis*; 14, *A. amplissima*.



FIGS. 15-19. Frontal view of dissected adult heads. **15**, *A. albifasciata* ♂, scape length = 2.25 mm; **16**, *A. apicalis* ♂, scape length = 4.5 mm; **17**, *A. chionophoralis* ♂, scape length = 4.22 mm; **18**, *A. amplissima* ♂, scape length = 4.6 mm; **19**, *A. amplissima* ♀.



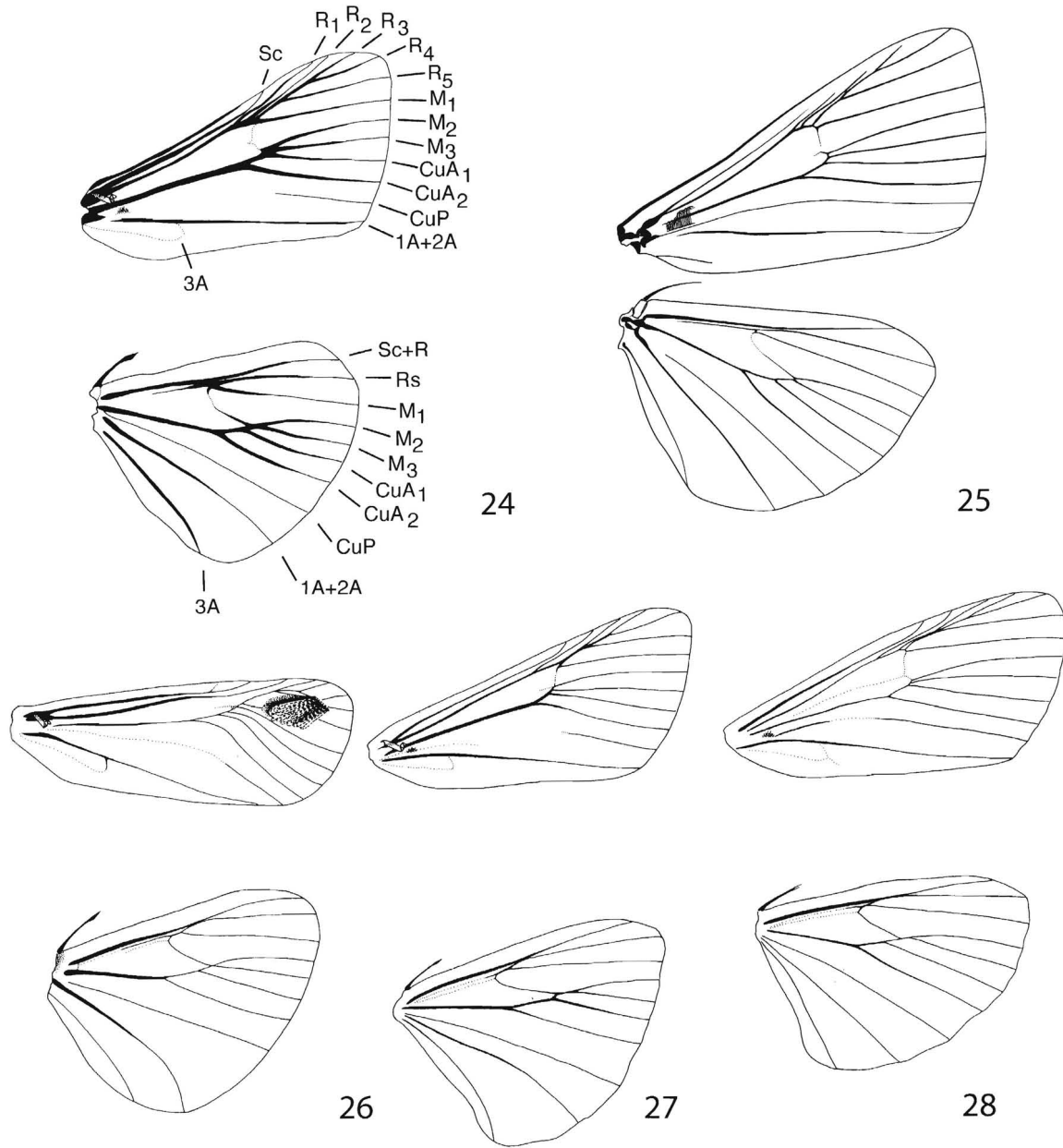
FIGS. 20–23. Lateral view of male forelegs excluding coxae. **20**, *A. albifasciata*, tibial length = 2.0 mm; **21**, *A. apicalis*, tibial length = 2.2 mm; **22**, *A. chionophoralis*, tibial length = 2.0 mm; **23**, *A. amplissima*, tibial length = 2.5 mm.

margin of prothoracic shield on each side. T1 with white and dark brown mottling anterior to thoracic legs; dark brown line to 2 L setae below and anterior to spiracle. T1–3 legs sclerotized dark brown; 2 dark brown longitudinal lines between thoracic legs. V1 on small, dark brown pinacula. T2–3 with D1–2 and SD1–2 on same pinaculum located on 2nd and 3rd longitudinal lines. SV1 with one seta. A1–8 with L1 and L2 ventral to spiracle; SD1 pinaculum on 4th longitudinal line; both D1 and D2 setae on a continuous pinaculum on 2nd longitudinal line. A1–A8 with 5th longitudinal line anterior to L1 and L2. A1 and A8 with longitudinal lines 2–5 coalesced into a dark brown square. A1–6 with 3 SV setae and A7–9 with 2 SV setae. A1–9 with V1 on small, dark brown pinacula, medially with light brown maculation and lighter colored, almost white, medial line. A1–2 with SV setae on dark brown pinacula, and dark brown maculation continuing to posterior

part of segment. A3–6 with proleg dark brown. V1 on A7 twice as far apart as on A9. A1–8 and SD2 absent. Spiracle on A8 at least twice as large and slightly more dorsal than other abdominal spiracles. A9 with L1 and L2 setae on same pinaculum, L3 separate, but in an anteroventral line; D1, D2, and SD1 on separate pinacula. A10 completely dark brown ventrally; dorsally both D1 and D2 setae together on separate dark brown maculations. SD1 and SD2 on both sides on separate dark brown maculations. Prolegs with crochets biordinal in a circle, longer crochets 4–5 times as long as short crochets.

**Biology.** *Accinctapubes albifasciata* has been reared on avocado (Lauraceae) (Dyar 1912). Kaye and Lamont (1927) reported *A. albifasciata* as a pest



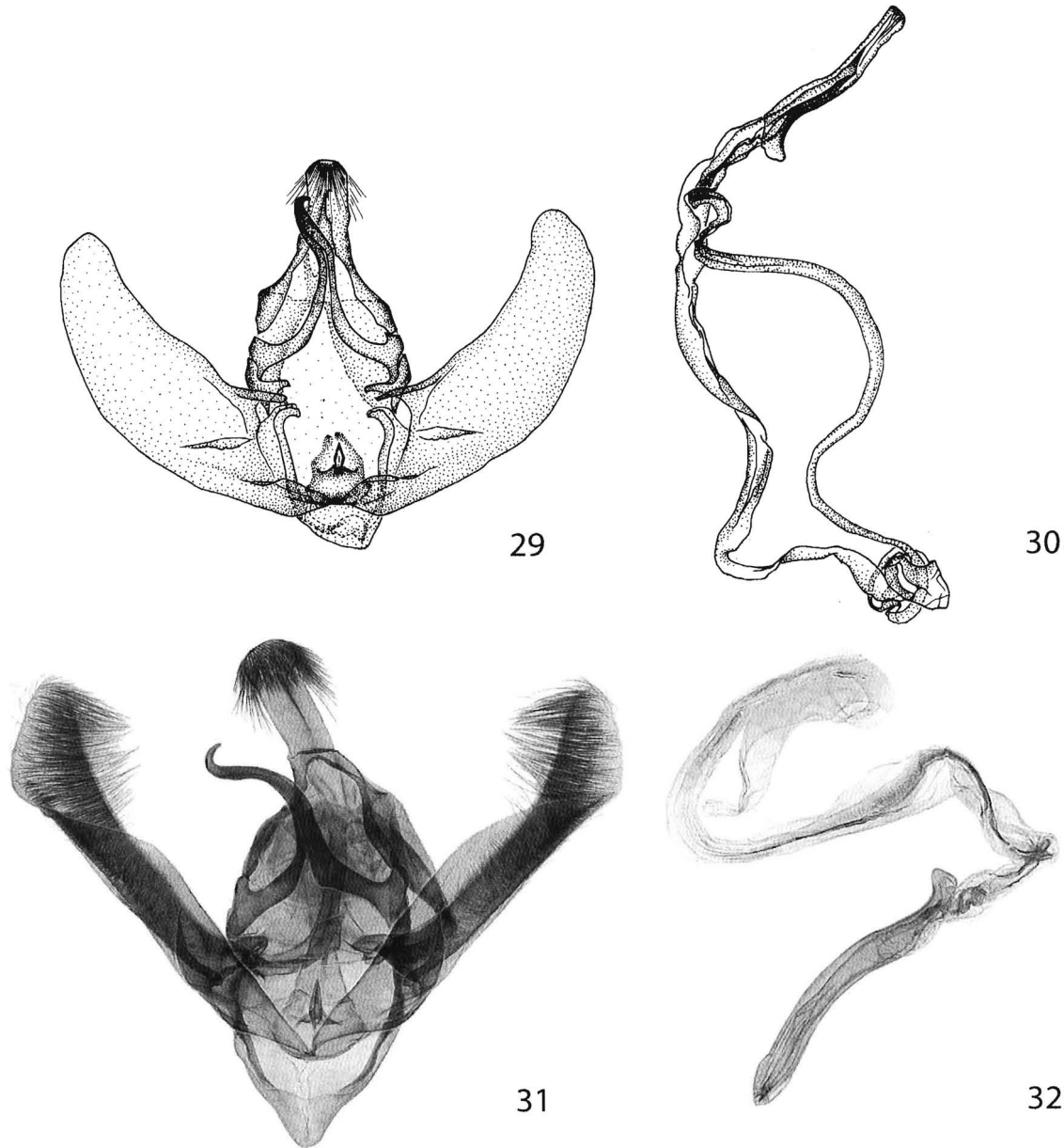


FIGS. 24-28. Forewing and hindwing venation. 24, *A. albifasciata* ♂; 25, *A. albifasciata* ♀; 26, *A. chionophoralis* ♂; 27, *A. amplissima* ♂, 28, *A. amplissima* ♀.

species on *Persea americana* Miller (Lauraceae), the common avocado, in Trinidad. Larvae live gregariously in nests made by webbing leaves and branches together with a tough silk. The following account by D. Janzen and W. Hallwachs (pers. com.) describes the life history of *A. albifasciata* from northwestern Costa Rica. This species feeds exclusively on mature green leaves of the only native lauraceous tree in its habitat, *Ocotea veraguensis* (Meissn.) Mez (Lauraceae); feed-

ing larvae may be found in any month of the year. The five to fifteen last instar larvae occasionally cluster together in loose structures of living leaves and webbing. When ready to pupate, the larvae drop from the web to the leaf litter and spin a silken cocoon with dirt and leaf parts glued to the outside.

**Distribution.** Southern and western Mexico to Brazil, and from the Caribbean known only from the Dominican Republic and Trinidad.

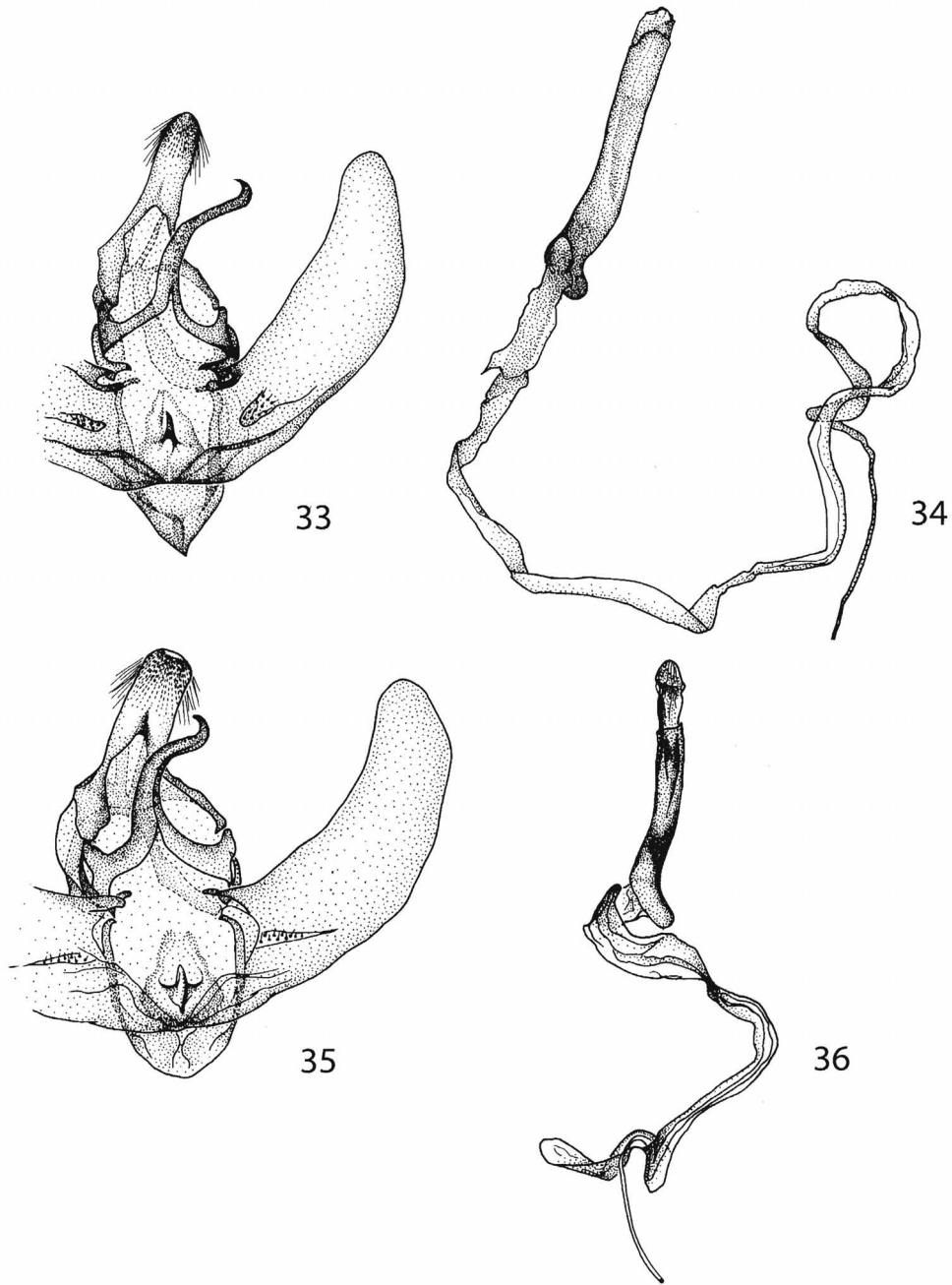


FIGS. 29–32. Male genitalia. 29, *A. albifasciata*; 30, *A. albifasciata* aedeagus; 31, *A. apicalis*; 32, *A. apicalis* aedeagus.

**Type material examined.** *Cecidiptera* [sic] *albifasciata* Druce, holotype ♂, Sarayacu, Ecuador, C. Buckley (TMSA). *Stericta leucoplagialis* Hampson, holotype ♂, Guyana, Mapiro, Stewart (BMNH). *Jocara ban* Dyar, holotype ♀, Teapa, Tabasco, Mexico, Dec. 13, R. Müller Collector, Type no. 19285 (USNM).

**Other material examined.** **ARGENTINA:** Misiones, 13/3/1909, 1 ♂. **BELIZE:** Cayo: Mtn. Pine Ridge, 1000', Falls, Linwood C. Dow, 28-VI-1990, 1 ♀. **Stann Creek:** Middlesex, E. C. Welling, August 5, 1964, 1 ♂; August 7, 1964, 1 ♀. **BOLIVIA:** Rio Songo, 750 m, Coll. Fassel, 1 ♂; Boliviae Andes, 1 ♂; Boliviae Cordillieres, 1 ♂. **La Paz:** Yungas de la Paz, 1000 m, 1 ♂. **Santa Cruz:** Buena Vista, 1 ♂; Alt. 400 m, J. Steinbach, Aug 1914, 4 ♂; Sept 1914, 4 ♂; Nov 1914, 1 ♂; Dec 1914, 1 ♂; May 1915, 2 ♂; Mar 1915, 1 ♂; Prov. del Sara, 450 m, J. Steinbach, July 1914, 1 ♂; R. Yapacani, Alt.

600 m, J. Steinbach, Sept 1914, 1 ♂; Feb 1915, 1 ♂. **BRAZIL: Amazonas:** Amathura, 1 ♂; São Paulo de Olivença, November–December, 1 ♂; Reserva Ducke, km. 26, Manaus-Itacoaiara Highway, E. G., I., & E. A. Munroe, 14–22 May 1972, 1 ♂. **Bahia:** Camacã, V. O. Becker, 21–30. ix. 1991, 1 ♀. **Espirito Santo:** Linhares, 40 m, V. O. Becker, 16–18. IX. 1991, 1 ♂. **Pará:** Unt. Amaz. Taperinha b. Santarem, Zerny, 1–10. VII '27, 5 ♂; 21–31. VI. 27, 6 ♂, 1 ♀. Hyutanahan, Rio Purus, S. M. Klages, Jan 1922, 2 ♂; Feb 1922, 4 ♂; March 1922, 5 ♂; Apr 1922, 1 ♂. **Rio de Janeiro:** Mangaratiba, 150 m, V. O. Becker, 20. i. 1993, 1 ♂. **Rondônia:** 62 km S. Ariquemes, Fazenda Rancho Grande, 165 m el., Ron Leuschner, 14–25 Nov 1993, 1 ♂. **Santa Catarina:** Jaraguá, Fr. Hoffman, 1 ♂. **São Paulo:** Bertioga, 5 m, V. O. Becker, 7–9. x. 1996, 2 ♂; São Paulo, Alto de Serra, R. Spitz, 20. V. 24, 1 ♂. **COLOMBIA: Valle:** Anhicayá, 250

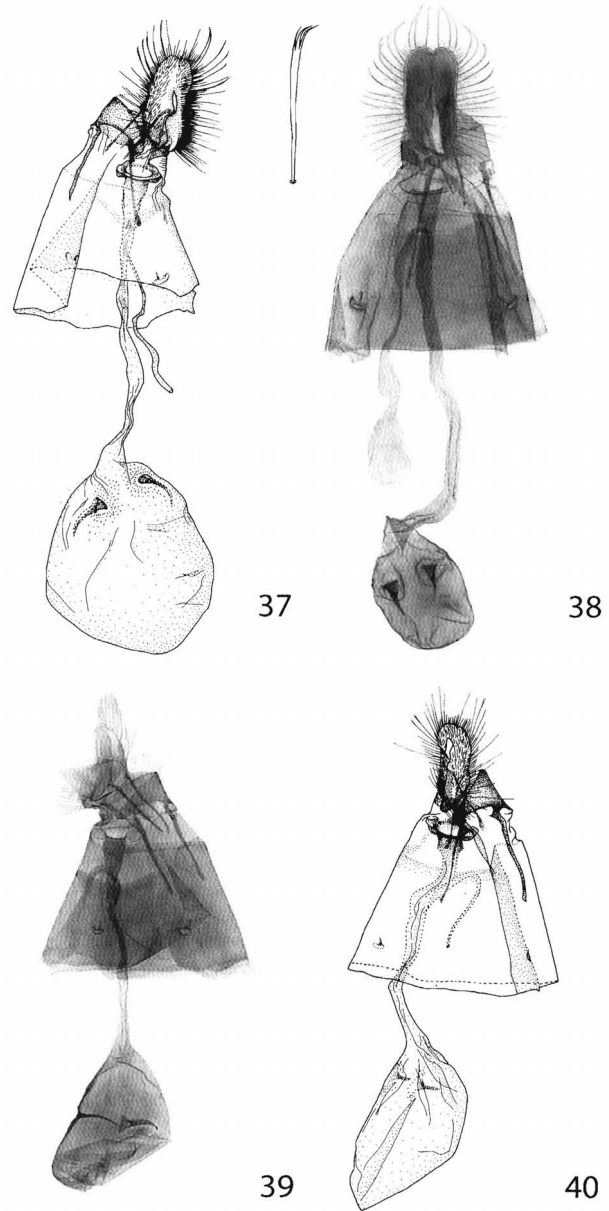


FIGS. 33–36. Male genitalia. **33**, *A. chionophoralis*; **34**, *A. chionophoralis* aedeagus; **35**, *A. amplissima*; **36**, *A. amplissima* aedeagus.

m, J. Bolling Sullivan, Feb. 3, 1989, 1 ♂. **COSTA RICA:** 1 ♂. **Alajuela:** Fca. La Campana, El Ensayo, 7 km NW Dos Rios, DH Janzen & W. Hallwachs, 15–17 Mar 1986, 2 ♂, 1 ♀; Finca San Gabriel, 16 km ENE Quebrada Grande, 650 m, I Gauld & J. Thompson, 11–15 Jun 1986, 2 ♂; DH Janzen & W. Hallwachs, 8 Feb 1983, 1 ♂; 11 Nov 1983, 1 ♂; 9 Mar 1984, 1 ♂; Estación Pitilla, 9 km S. Santa Cecilia, 700 m, M. Espinosa, M. Espinosa, Jun 1988, 2 ♂; Espinosa & Chaves, Jul 1988, 2 ♂; DH Janzen & W. Hallwachs, 20 Nov 1987, 2 ♂; 4 km W. Sta. Cecilia, 300 m, DH Janzen & W. Hallwachs, 17 Apr 1983, 1 ♂. **Cartago:** Turrialba, R. Saunders, III-

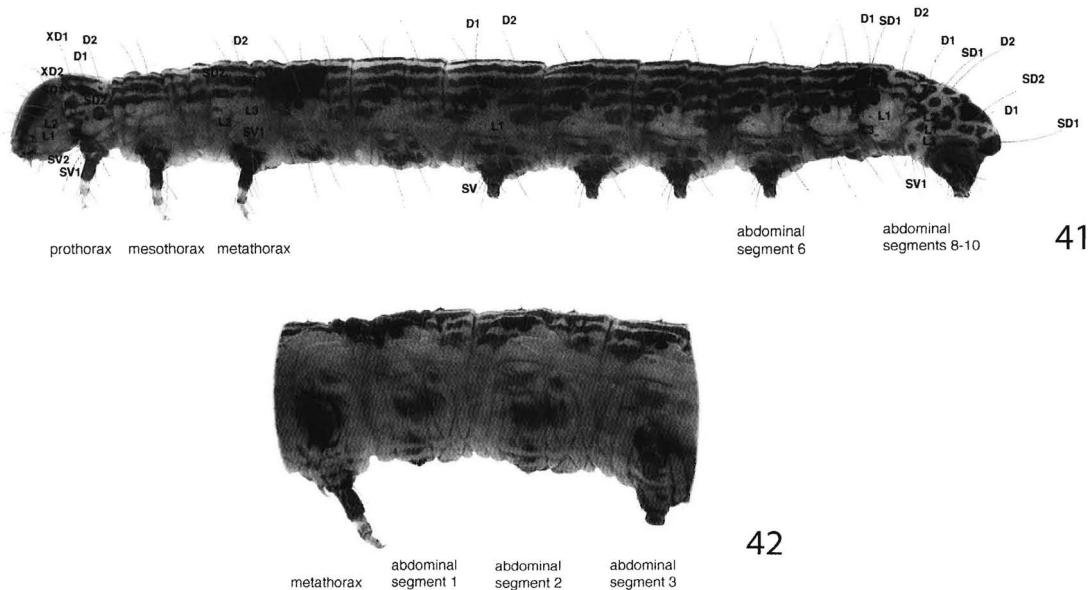
21–63, 1 ♂; V. O. Becker, 600 m, 1 ♂, 1 ♀; Pejibaye, at blacklight in cut over forest near river, W. E. Steiner, 22–24 March 1987, 1 ♀; Juan Vinas, June, 1 ♂. **Guanacaste:** Santa Rosa National Park, DH Janzen & W. Hallwachs, 2 larvae, voucher number 82-SRNP-675; Rincon Nat. Pk., 4 km E. Casetilla, 750 m, DH Janzen & W. Hallwachs, 27 Dec 1981, 6 ♂; 23 Feb 1982, 1 ♂; 14 Feb 1983, 1 ♂; 11 Apr 1983, 1 ♂; 6 Jun 1981, 1 ♂; 7 km Southeast South Hcda. Innocentes, 550 m, DH Janzen & W. Hallwachs, 18 Apr 1985, 7 ♂, 4 ♀; Estación Mengo, SW side V. Cacao, 1100 m, DH Janzen & W. Hallwachs, 24 Jan 1987, 2 ♂; 3 Jan 1987, 2 ♂; 24 Jan 1987, 4 ♂; 10

February 1988, 1 ♀; Mar 1988, 5 ♂; 13–26 Jun 1987, 3 ♂; Jun 1988, 1 ♂; La Luz, W. side V. Cacao, 1000 m, DH Janzen & W. Hallwachs, 3–8 Aug 1986, 4 ♂; La Mariksa, Hda. Orosi, 550 m, 2–5 Jun 1986, W. Hallwachs & DH Janzen, 3 ♀; 17 Jan 1986, 7 ♂, 1 ♀; W. of Carmona, Nicoya, 600–700 m, DH Janzen & W. Hallwachs, 19 Aug 1982, 2 ♂; SSW side Cerro El Hacha, 300–400 m, DH Janzen & W. Hallwachs, 26–30 Jul 1986, 1 ♂; Fca. Biesnan, Colonia Refug. Los Angeles, 11 km E. Quebrada Grande, 500 m, DH Janzen & W. Hallwachs, 13 Jun 1985, 2 ♂, 1 ♀; Estac. Cacao, SW side Volcan Cacao, 1000–1400 m, R. Blanco & C. Chaves, Sep 1989, 1 ♂; Santa Rosa National Park, 300 m, DH Janzen & W. Hallwachs, 1–15 Jan 1982, 4 ♂; DH Janzen, 12 Dec 1978–10 Jan 1979, 1 ♀; 1 Jan 1979, 1 ♀; DH Janzen & W. Hallwachs, 10–20 Mar 1982, 1 ♂; 9–17 Mar 1981, 2 ♂; DH Janzen & W. Hallwachs, 28–31 Jul 1979, 3 ♂; 28–31 Jul 1979, 1 ♀; DH Janzen & W. Hallwachs, 4–6 Jul 1980, 1 ♂; 10–12 Jul 1980, 1 ♂; 13–15 Jul 1980, 1 ♂; DH Janzen, 1–8 Aug 1979, 1 ♀; DH Janzen, 7–9 Nov 1979, 1 ♀; 10–12 Nov 1979, 1 ♂; 13–15 Nov 1979, 1 ♂; 16–18 Nov 1979, 2 ♂, 1 ♀; 20–22 Nov 1979, 2 ♀; 23–25 Nov 1979, 2 ♂, 3 ♀; 26–28 Nov 1979, 1 ♀; 4–6 Dec 1979, 3 ♂; 7–9 Dec 1979, 1 ♀; 12–14 Dec 1979, 5 ♂; 16 Dec 1978, 1 ♀; 18–20 Dec 1978, 1 ♀; 21–24 Dec 1979, 2 ♂; La Florida, 500 ft., Wm. Schaus, 1 ♂. **Heredia:** La Selva Biol. Station, Puerto Viejo de Sarapiquí, 40 m, M. M. Chavarria, May 1986, 1 ♂; 24 Feb–4 Mar 1987, 1 ♂; Mar 1987, 5 ♂, 1 ♀; Apr 1987, 4 ♂; May 1987, 1 ♀; Jun 1987, 1 ♂; Sep 1986, 1 ♀; Oct 1987, 1 ♂; Nov 1987, 1 ♂; Dec 1987, 2 ♂; M. M. Chavarria & A. Chacon, Feb 1986, 1 ♂; M. M. Chavarria, A. Chacon, W. Hallwachs & D. Janzen, 11 Jan 1986, 1 ♂; DH Janzen & W. Hallwachs, 14–15 Nov 1982, 2 ♂; La Selva Field Sta. near Puerto Viejo, W. E. Steiner, J. M. Swearingen & J. M. Mitchell, 21–28 March 1988, 1 ♂; Chilamate, C. V. Covell, Jr., 100 m, 12–VIII 1986, 1 ♂; September 8 1988, 1 ♂; 13–VIII 1986, 1 ♂. **Limón:** 9.4 km W. Bribri, Suretka, DH Janzen & W. Hallwachs, 9–11 Jun 1983, 8 ♀; Cerro Tortuguero, P. N. Tortuguero, 100 m, Dec 1989, 1 ♂; Brade, 1 ♂; Sixola River, March, Schaus & Barnes, 4 ♂; Hacienda La Suerte/Tapezco, 29 air miles W. Tortuguero, elev. 40 m, lat. 10°27'N, long 83°47', JP & KE Donahue, CC Hair, NK Moore, MA Hopkins, 13–31 Aug. 1979, 4 ♂; Tortuga Lodge N. of Tortuguero, el. ca. 20', Julian P. Donahue, 23/30 Sept. 1977, 1 ♂; Hac. Tapezco, 29 air km W of Tortuguero, el. 40 m, J. Donahue, D. Panny, D. Moeller, & C. Lewis, 6–23. iii 1978, 5 ♂, 1 ♀. **Puntarenas:** Corcovado N. P., 100 m, G. Fonseca, Est. Sirena, Feb 1990, 2 ♂, 3 ♀; Apr 1989, 1 ♂; Nov 1989, 1 ♀; Dec 1989, 1 ♀; DH Janzen & W. Hallwachs, 5–11 Jan 1981, 2 ♂; 23 Mar 1984, 1 ♀; 15–25 Mar 1981, 1 ♂; 19–27 Mar 1981, 1 ♂; 1 May 1984, 2 ♂; 10–12 Aug 1980, 8 ♂; C. Chavez & R. Aguilar, Feb 1990, 1 ♂; Isla del Cano, I. Chacon, 12 Mar 1986, 1 ♂; Monteverde, DH Janzen & W. Hallwachs, 15–16 May 1980, 1 ♂; 20–21 Jul 1982, 1 ♂; DH Janzen, 25–26 Jun 1979, 1 ♂; 10–11 Dec 1979, 2 ♂; 8–10 Dec 1978, 3 ♂; Fila Esquinas, 35 km S. Palmar Norte, 150 m elev., 7–8 Jan 1983, 1 ♂, 1 ♀; Estación Quebrada Bonita, R. B. Carara, 50 m, R. Zuniga, Oct 1989, 1 ♂; Boca de Barranca, Hogue & Dockweiler, 12–14 June 1972, 1 ♂; Monteverde, E. Giesbert, June 30, 1978, 1 ♂. **DOMINICAN REPUBLIC:** **Dajabon:** 13 km S. Loma de Cabrera, Don & Mignon Davis, ca. 400 m, 20–22 May 1973, 1 ♂. **El Seibo:** 15 km S. Miches, Don & Mignon Davis, ca. 500 m, 31 May 1973, 4 ♂. **La Vega:** Constanza, 1164 m, Hotel Nueva Suiza, Don & Mignon Davis, 29 May 1973, 3 ♂; Convento, 12 km S of Constanza, Flint & Gomez, 13 June 1969, 1 ♂. **ECUADOR:** **Carchi:** Maldonado, 1500 m, V. O. Becker, 9–11. i. 1993, 1 ♂; Chical, 1200 m, J. Rawlins, R. Davidson, 11 July 1983, 2 ♂; 15 July 1983, 1 ♂; 2 July 1983, 1 ♂; 1250 m, 0–56N, 78–11W, J. Rawlins, R. Davidson, 14 July 1983, 3 ♂, 1 ♀. Paramba, Rosenberg, 1050 m, 4 ♂. **Cotopaxi:** Las Pampas, Casa Cesar Tapia, S 00°25.5'W 78°57.5', 1200 m, 20-IV-2000, at light UV/MV, 1 ♂. **Esmeraldas:** 5 km E. Alto Tambo, 900 m, Jan Hillman, 8 Dec 1995, 1 ♂; Rio Durago, 27 km W Alto Tambo, 200 m, Jan Hillman, 5 Dec 1995, 1 ♂. **Loja:** Zamora, 1895, 2 ♂; July 1896, 1 ♂; Environs de Loja, 1889, 5 ♂; El Monje near Loja, 1893. **Morona-Santiago:** Macas, 1 ♂. **Pichincha:** Tinalandia, el. 700 m., C. V. Covell, Jr., 5.24.1983, 1 ♂; 5-18-1985, 1 ♂; 16 km E Santo Domingo de Los Colorados, el. 600 m, 5–11 May 1990, R. H. Leuschner, 1 ♂; 17 km SE Sto. Domingo de los Colorados, 3000', blt lt, Oct 21, 1988, 1



FIGS. 37–40. Female genitalia. 37, *A. albifasciata*, note inset a magnified trifurcate seta from ovipositor lobes; 38, *A. apicalis*; 39, *A. chionophoralis*; 40, *A. amplissima*.

♀; E of Santo Domingo de los Colorados, Jeffrey A. Smith, 6–11 May 1990, 2 ♂. **FRENCH GUIANA:** **Saint Laurent du Maroni:** St. Jean du Maroni, 1 ♂, 1 ♀; St. Laurent, 2 km S. Rte. 1 at pk 244 W. Cayenne, 50 m, Apr 27, 1994, 1 ♂; Mana River, May 1917, 5 ♂. **Cayenne:** Pied Saut, Oyapok River, S. M. Klages, Dec 1917, 1 ♂; Febr 1918, 4 ♂; March 1918, 6 ♂. **GUATEMALA:** Cayuga, Schaus & Barnes, April, 1 ♂; May, 1 ♂; June, 1 ♂, 1 ♀; September, 1 ♂; October, 1 ♂; Quirigua, Schaus & Barnes, Jan, 2 ♂; April, 2 ♀; May, 3 ♀; August, 3 ♀; September, 2 ♂; 2 ♀; October, 1 ♂; December, 3 ♀; no date, 1 ♀; Purulha, Schaus & Barnes, April, 1 ♀; May, 1 ♀; Rio Dulce, UV, I-16-1986, 1 ♀; Below San Lorenzo nr. Pasabien River, 300 m, P. T. Dang, 16-20-XI.1986, 3 ♂, 1 ♀. **GUYANA:** 1916, Franz Knudsen, 3 ♂.



FIGS. 41–42. *A. albifasciata* last instar larva. **41**, Lateral view. **42**, Ventro-lateral view of thoracic segment 3 and abdominal segments 1–3.

**HONDURAS:** San Pedro Sula, Mountain, blacklight, Robert D. Lehman, 8-IV-1972, 1 ♂; 15-VIII-1972, 1 ♂. **MEXICO:** **Chiapas:** Esmeralda, 19-XI-30, 1 ♂. **Oaxaca:** Metates, 2600' at UV light, John Kemmer, 4 March 1992, 1 ♂. **San Luis Potosi:** 2 mi. N Tamazunchale, 400', Duckworth & Davis, August 2, 1963, 1 ♀; Valles, V-18-1952, 1 ♂. **Sinaloa:** Coopala, 605 m, C. L. Hogue, 28 Dec.–1 Jan 78–79, 3 ♂. **Oaxaca:** Mo Cuo (Cerro Pelon), Mpio. Yolox, 2150 m, E. C. Welling, Sept. 17, 1962, 7 ♀. **Tabasco:** Teapa, R. Müller, February 1914, 1 ♂. **Veracruz:** Misantla, R. Müller, May 1910, 1 ♂; May 1912, 2 ♂; August 1912, 1 ♂; August 1915, 1 ♂; June 1911, 1 ♂; June 1912, 1 ♂; November, 1910, 1 ♂. **Yucatan:** Chichen Itza, IX-12-1952, 1 ♂. **NICARAGUA:** **Matagalpa:** Fuente Pura, 12 km N Matagalpa, 1500m, E. van den Berghe, 10 Jan 1997, 1 ♂. **PANAMA:** 1 ♂, 1 ♀; **Canal Zone:** Rincon, Reared from avocado leaf webbing caterpillar, J. Zetek & J. Molino, Aug 15, 1921, 2 ♂, 3 ♀; Coco Solo, 1946–1947, 6 ♂; Barro Colorado Isl., VII-24-63, 1 ♂; C. W. & M. E. Rettenmeyer, 16. XI.1956, 2 ♂. **TRINIDAD:** Wm. Schaus, 1 ♀; St. Joseph, nests of larvae on avocado, December & January, 1 ♂, 1 ♀; Arima Valley, 6-II 1950, 1 ♂; 2-V 1953, 1 ♂; 29-IV 1951, 1 ♂; 20-V 1951, 1 ♂; 4-III 1953, 1 ♂. **VENEZUELA:** **Amazonas:** Cerro de la Neblina, Basecamp, 0°50'N, 69°44'W, 155 m, canopy, D. Davis & T. McCabe, 1–10 Mar. 1984, 1 ♂; Rio Mavaca Cp. 65°06'W 2°2'N, 150 m, III-16/27-1989, 1 ♂. **Sucre:** Caripito, 3-VI 1942, 1 ♂. **Tachira:** Btto. Junin, ex foliage de aguacate, E. Rubio, 30-XI-1972, 1 ♂. **Trujillo:** Valera, 1 ♂, 1 ♀. **Yaracuy:** Hacienda Tropicale, ca. 10 km S San Felipe, 10°17'30"S 68°40'W, elev. 100–1400 meters, Kareoleles & Witham, 26 Jan–23 Feb. 1993, 2 ♀.

*Accinctapubes apicalis* (Schaus)  
(Figs. 6, 12, 16, 21, 31, 32, 38)

*Jocara apicalis* Schaus, 1906:141.

*Stericta apicalis* Schaus, 1912:669; Holland & Schaus, 1925:116.

*Cecidipta elphegealis* Schaus, 1934:109; Solis, 1993:71; 1995:89.

*Accinctapubes apicalis* Solis, 1993:71.

**Diagnosis.** Entire apical area to postmedial line white on forewing (Fig. 6).

**Redescription. Male: Head** (Figs. 12, 16): frons brownish red, more green scales behind ocellus and chaetosema. Antenna with each segment brown distally, white basally; male scape length is 4.5 mm ( $n = 1$ ), anteriorly reddish, posteriorly greenish with increasingly longer mediolateral white scales distally. Labial palpus mostly green. **Thorax** (Fig. 6): collar green. Tegula basally dark brown, distally light green; dorsally with light reddish scales. **Legs** (Fig. 21): forecoxa basally dark brown, distally white, forefemur basally white, distally dark brown, all other segments and legs basally dark brown, peppered with green scales and white distally. **Wings** (Fig. 6): forewing length 1.3–1.5 cm, width 0.7–0.85 cm ( $n = 10$ ). Basal area greenish white. Antemedial area greenish white, a long (half the length of basal area) tuft of green scales on posterior margin of discal cell, reddish green posterior to tuft. Antemedial line white. Medial area greenish white, reddish between  $CuA_1$  and  $CuA_2$ , white at  $1A+2A$ . Postmedial line dark brown basally, white distally. Terminal line dark brown. Apical area entirely white from terminal line to postmedial line. Underside reddish white along costa, dark brown posteriorly until  $CuA_2$ , white to posterior margin. Postmedial band light brown. Hindwing: light brown, marginal shade darker brown separated from dark brown postmedial line by light brown scales, reddish scales on some veins. Anal area with long, straight reddish scales. Underside with costa to  $M_1$  reddish white, remainder white. **Abdomen** (Fig. 6): white, peppered with black dorsally, white with yellow ventrally. Male genitalia (Figs. 31, 32): uncus length 1.0 mm ( $n = 1$ ), width = 0.2 mm ( $n = 1$ ).

**Female: Head:** similar to male except female scape simple. **Thorax:** female similar to male but tegula entirely light green. **Legs:** similar to male. **Wings:** forewing length 1.4–1.7 cm, width 0.7–0.85 cm ( $n = 10$ ). Female forewing similar to male, but basal color greenish brown, a long (half the length of basal area) tuft of yellow scales on posterior margin of discal cell, antemedial line almost invisible. Hindwing: female dark brown. Female anal area with long, straight scales reddish brown. **Abdomen:** similar to male. Female genitalia (Fig. 38): signum length from apex to base 0.45 mm ( $n = 1$ ).

**Biology.** Unknown. Specimens have been collected at elevations of 700 m to 3800 m.

**Distribution.** Southern Mexico south to Brazil.

**Type material examined.** *Jocara apicalis* Schaus, holotype ♂, Orizaba, Mexico, Coll. Wm. Schaus, Type no. 9623 (USNM) [mistakenly identified as a female in the description]. *Stericta apicalis* Schaus, holotype ♂, Jan[uary], Juan Vinas, C[osta] R[ica], Type no. 17673 (USNM). *Cecidipta elphegealis* Schaus, holotype ♀, St. Catharina, [Brazil], F. H. Hoffman, Type no. 34506 (USNM).

**Other material examined.** **BOLIVIA:** Rio Songo, 750 m, Coll. Fassl, 1 ♀. **COSTA RICA:** Sitio, May, 1 ♀. **Alajuela:** Estación Pitilla, 9 km S. Santa Cecilia, 700 m, Janzen & Hallwachs, 18 May 1988, 1 ♂; P. Rios, C. Moraga & R. Blanco, Mar 1990, 1 ♂; Finca San Gabriel, 16 km ENE Que. Grande, D. Janzen & W. Hallwachs, 9 Mar 1984, 1 ♂. **Cartago:** Juan Vinas, June, Feb, 2 ♂, 1 ♀. **Guanacaste:** 4 km E. Casetilla, Rincon Nat. Pk. Gate, 750 m, D. H. Janzen & W. Hallwachs, 14 Feb 1983, 1 ♂; 27 Dec. 1981, 2 ♂; 22 May 1982, 4 ♂; 11 April 1983, 1 ♀; Rincon Nat. Pk., 19 Nov 1979, D. H. Janzen. **Heredia:** El Angel Waterfall, 8.2 km downhill Vara Blanca, 1350 m, D. Janzen & W. Hallwachs, 5 Aug 1981, 1 ♂; 3 Jan 1981, 1 ♂; Braulio Carrillo, 1100 m, vii 1981, V. O. Becker, 1 ♂. **Puntarenas:** Monteverde, D. H. Janzen, 8–10 Dec 1978, 4 ♂; 25–26 June 1978, 1 ♀; D. H. Janzen & W. Hallwachs, 15–16 May 1980, 2 ♀; 1-20-1961, 1 ♂; 35 Km NE of San Vito at Las Alturas Field Station, 4800 ft., June 20, 1992, 1 ♀; June 26, 1992, 1 ♀; July 2, 1992, 1 ♀; Tuis, Aug. 29. 08, 1 ♂; Puntarenas, Finca Las Cruces, 6 km S San Vito, Eric Fisher, 21–25 August 1976, 1 ♂. **San Jose:** Estación Zurqui (El Tunel), Par. Nac. Braulio Carrillo, 1500 m, W. I. y A. Chacon, Aug 1985, 1 ♂; Sept. 1985, 1 ♂; La Montura, 1100 m, E. H. Janzen & W. Hallwachs, 17 Dec. 1981, 1 ♀. **ECUADOR:** **Tungurahua:** Baños, Julian Donahue, 30 June 1980, 2 ♂. **Pichincha:** Chiriboga, Reserva Botanico Palmeras, 1900 m, J. Hillman, 2 Dec. 1995, 1 ♂. **Cañar:** Cuenca Trail above Huigra, Alt. 4–5000 ft., W. J. Coxe, III. 26. 1933, 1 ♀; Dos Puentes, Alt. 1700 ft., W. J. Coxe, Jan 1929, 1 ♀. **GUATEMALA:** Chejel, June, 1 ♂; Purulha, Schaus & Barnes, July, 1 ♂, Quirigua, Dec, 1 ♀; Volcan Sta. Maria, June, July, Nov, 4 ♀. **MEXICO:** **Chiapas:** Santa Rosa, V-1932, 1 ♂. **Puebla:** Orizaba, Dognin Collection, 2 ♀. **Oaxaca:** Vista Hermosa, Mpio. Comaltepec, 1450 m, E. C. Welling, Sept. 22, 1962, 1 ♀; Sept. 24, 1962, 7 ♀; Mo Cuc (Cerro Pelon), Yolox, 2150 m, E. C. Welling, Sept. 17, 1962, 1 ♀; 24 mi S Juchatengo, E. Fisher, P. Sullivan, 9 Aug. 1970, 1 ♂; Sierra Juarez, Gulf slope, 4600', at UV light, John Kemner, 8 April 1992, 1 ♂. **Veracruz:** Misantla, R. Müller, Sept. 10, 1 ♂; S. Tiago, Tuxtla, 800 m., V. O. Becker, 30. x - 2. XI. 1973, 1 ♂, 1 ♀. **Guerrero:** 26 km NW El Paraiso, 1800 m, R. Davidson, J. Rawlins, 8 Aug 1986, 1 ♂. **NICARAGUA:** **Matagalpa:** Fuente Pura, 1600 m, van den Berghe, 3 XII 1994, 3 ♂; 26 x 1995, 1 ♂; 27 XII 1994, 1 ♀; 12 km N Matagalpa, 1500 m, van den Berghe, 10 Apr 1996, 1 ♀; 10 Jan 1997, 1 ♂. **PANAMA:** **Chiriqui:** Lagunas de Chiriqui, 750 m, UV, 6-20-94, 1 ♂. **VENEZUELA:** Las Quigas, Esteban Valley, 1 ♀. **Cojedes:** Aroa, 1 ♀. **Lara:** Yacambu Natl. Pk., 1560 m. 13 km SE Sanare, cloud forest, 1560 m, J. Heppner, 28–31 Jul 1981, 1 ♀. **Aragua:** Rancho Grande, 1100 m, R. W. Poole, Aug. 22–31 1967, 4 ♂; 1100 m, E. & I. Munroe, 19 Feb. 1971, 1 ♂; 19–24 Feb. 1971, 7 ♂; 1100 meters, J.C. & K.G. Shaffer, 16 June 1973, 1 ♂.

*Accinctapubes chionophoralis* (Hampson)

(Figs. 7, 8, 13, 17, 22, 26, 33, 34, 39)

*Stericta chionophoralis* Hampson, 1906:143; Holland & Schaus, 1925:115.

*Accinctapubes chionopheralis* [sic]; Solis, 1993:71; 1995:89.

**Diagnosis.** This species can be distinguished by an apical area with a cluster of broad red scales extending towards the outer margin over a cluster of hooked setae extending basally in the male (Figs. 7, 26).

**Redescription. Male: Head** (Figs. 13, 17): frons reddish, green scales behind ocellus and chaetosema. Antenna with each segment reddish brown; male scape length 4.22 mm (n = 5), anteriorly greenish, peppered with dark brown scales, posteriorly reddish with longer red scales mediolaterally throughout. Labial palpus mostly green, 1st segment with dark brown scales distally. **Thorax** (Figs. 7, 8): collar light green, and white distally red scales; tegula with white and distally red scales throughout; posteriorly scales are tipped dark brown and appear as two dark spots. **Legs** (Fig. 22): forecoxa basally dark brown, distally white, forefemur basally white, distally dark brown, all other segments and legs basally dark brown, peppered with green scales and white distally. **Wings** (Figs. 7, 8, 26): forewing length 1.2–1.4 cm, width 0.7–0.8 cm (n = 10). Basal area reddish, dark brown on costa. Antemedial area white, a long (half the length of basal area) tuft of green scales tipped with dark brown on posterior margin of discal cell, reddish brown posterior to tuft, a short row of dark brown scales anterior to tuft. Antemedial line absent. Medial area reddish green between Cu<sub>1</sub> and Cu<sub>2</sub>. Postmedial line dark brown basally, white distally. Terminal line dark brown. Apical area with a cluster of broad red scales extending towards outer margin over a cluster of straight scales extending towards posterior margin. Underside reddish white along costa, dark brown posteriorly until CuA<sub>2</sub>, white to posterior margin. Postmedial band light brown. Hindwing: beige, marginal shade darker brown separated from dark brown postmedial line by light brown scales, reddish scales on some veins. Anal area with long, straight reddish scales. Underside with costa to M<sub>1</sub> reddish white, remainder white. **Abdomen** (Figs. 7, 8): white, peppered with black dorsally, white with yellow ventrally. Male genitalia (Figs. 33, 34): uncus length = 1.1 mm (n = 5), width = 0.21 mm (n = 5).

**Female: Head:** similar to male except female scape simple. **Thorax** (Fig. 8): similar to male. **Legs:** similar to male. **Wings** (Fig. 8): forewing length 1.3–1.5 cm, width 0.7–0.8 cm (n = 10). Female similar to male, but basal color light green, short row of dark brown scales anterior to tuft not as prominent, antemedial line slightly more visible than in male, apical area without a cluster of broad and straight red scales, and postmedial line more prominent throughout its length. Hindwing: female dark brown. Wing underside of female similar to male but anal area with long, straight scales reddish brown. **Abdomen** (Fig. 8): similar to male. Female genitalia (Fig. 39): signum length from apex to base 0.40 mm (n = 1).

**Biology.** Unknown.

**Distribution.** Costa Rica south to Brazil and Peru.

**Type material examined.** One ♀, 32 mm, Brazil, Organ Mts., Wagner; 3 ♂, Sapucay, Paraguay, Foster (BMNH). The original description is from a type series of 4 specimens, therefore one male specimen labeled Sapucay, Paraguay, Foster is here designated lectotype in order to fix the concept of the name and to ensure universal and consistent interpretation of the same.

**Other material examined.** **BOLIVIA:** Rio Songo, 750 m, Coll. Fassl, 3 ♂; Boliviae Cordilleres, 1 ♂; Boliviae Andes, 1 ♂. **La Paz:** Yungas de la Paz, 1000 m, 2 ♂. **Santa Cruz:** Sta. Cruz de la Sierra, 450 m, J. Steinbach, Aug 1913, 2 ♂; Jan 1915, 1 ♂; R. Ypacani, Steinbach, 9 ♂; Buena Vista, 2 ♂; Dec 1914, 1 ♂; Sept. 1914, 4 ♂; Aug. 1914, 3 ♂; P. del Sara, Steinbach, Jan 1913, 1 ♀; Nov 1917, 1 ♂; Dec 1917, 1 ♂; Nov 1913, 1 ♂; no date, 4 ♂; Prov. del Sara, 450 m, J. Steinbach, June 1909, 1 ♂. **BRAZIL:** **Amazonas:** Rio Manués, 1 ♀; San Antonio, Rio Madeiras, 1 ♂; Ponte Nova, Rio Xingú, ♂; Reserva Ducke, km. 26, Manaus-Itacoaiara Highway, E. G., I., & E. A. Munroe, May 16–21, 1972, 11 ♂. **Bahia:** Morro do Chapeú, 1400 m, V. O. Becker, 23–24. iv. 1991, 1 ♀. **Espírito Santo:** Linhares, 40 m., V. O. Becker, 05–09. iv. 1992, 1 ♀. **Maranhão:** Acailandia, 150 m, V. O. Becker & G. S. Dubois, 19–27. xi. 1990, 1 ♀; RO, Vilhena, 600 m, V. O. Becker, 10–13. iv. 1996, 1 ♂. **Matto Grosso:** Chapada, 15–26S, 55–45W, 450–750 m, Herbert H. Smith, 13 ♂. **Pará:** Nova Olinda, Rio Purus, S. M. Klages, May 1922, 1 ♂; Hyutanahan, Rio Purus, S. M. Klages, 1 ♂; Feb 1922, 1 ♂, 1 ♀. **Paraná,** Marumbi, 500 mts., V. O. Becker, 16. XII 1969, 1 ♂; Campo do Tenente, 800 mts., V. O. Becker, 21-1-1974, 1 ♀; Guaratuba, 600 m, V. O. Becker, 5.VII.1975, 1 ♂; Curitiba, 920

m., V. O. Becker, 28-IV.1975, 1 ♀; Nova Teutonia, Fritz Plaumann, 1 ♂; 5. X. 1939, 1 ♂; Castro, 4 ♂, 1 ♀. **Rio de Janeiro:** 1 ♂, 1 ♀; Nova Friburgo, 600m, 10. ii. 1993, 1 ♀; Rio de Janeiro, Holland Collection, Nov, 2 ♀; Campo Bello, Zikan, 1 ♂. **Rio Grande do Sul:** Guarani, 29.iv.31, 1 ♂. **Rondônia:** Cacaúlândia, 140 m, V. O. Becker, xi. 1991, 4 ♂; xi. 1994, 4 ♂, 3 ♀; 15-18. x. 1993, 1 ♂; 15-20. iv. 1996; 62 km S. Ariqueemes. Faz. Rancho Grande, 165 m., Ron Leuschner, 18-29 Sept. 1996, 1 ♂, 1 ♀; 60 km S. Ariqueemes, C. V. Covell, Jr., March 17-22, 1991, 1 ♂. **Santa Catarina:** Rio Vermelho, S. Bento do Sul, 850 m, V. O. Becker, 24.I.1974, 2 ♀; Hansa Humboldt, 1 ♂; Blumenau, Pohl, 1 ♂; Blumenau, Nosswitz, 1 ♂; Jaraguá, Fr. Hoffman, 3 ♀; Corupa, A. Maller, IX 1956, 1 ♂; V 1956, 1 ♂; XII 1957, 1 ♂; V 1957, 1 ♂; VII 1957, 1 ♂. **São Paulo:** R. Spitz, 1 ♂; Alto de Serra, R. Spitz, 17. II.24, 1 ♂; São Paulo, V. O. Becker, 29. i. 1993, 1 ♂; Est. Biol. Boraciela nr. Salesópolis, 850 m, E. C., L., & E. A. Munroe, 24-26 IX 1971, 1 ♂. **COLOMBIA:** Vista Nueva near Santa Maria Mts., M. A. Carriner, Nov. 4 '26, 1 ♂. **COSTA RICA:** Cartago: Juan Vinas, Schaus & Barnes, Feb., May, 2 ♂; Turrialba, E. L. Todd, 2-5 XI 1967, 1 ♂; 600 m, V. O. Becker, 25. XII. 1972, 1 ♂, 1 ♀. **Alajuela:** 9 km S. Sta. Cecilia, M. Espinosa, June 1988, 4 ♂, 1 ♀; Espinosa & Chaves, Jul 1988, 5 ♂, 1 ♀; A. Chacon & M. Espinosa, Feb. 1988, 1 ♂, 1 ♀; Janzen & Hallwachs, 18 May 1988, 6 ♂, 2 ♀; D. H. Janzen & W. Hallwachs, 20 Nov 1987, 5 ♂, 2 ♀; GNP Biodiversity Survey, Mar 1989, 2 ♂; Jul 1988, 1 ♂; May 1988, 1 ♂; Nov 1988, 1 ♂, 2 ♀; Res. For. de San Ramon, 5 km N. Col. Palmarena, 900 m, I. & A. Chacon, July 1986, 1 ♂; Finca San Gabriel, 16 km East Northeast Queb. Grande, D. H. Janzen & W. Hallwachs, 9 Mar 1984, 1 ♂; 11-15 June 1986, 2 ♂, 1 ♀; 11 Nov 1988, 3 ♂; Finca La Campana. **Guacaste:** 4 km E. Casetilla, Rincon Nat. Pk., 750 m, D. H. Janzen & W. Hallwachs, 27 Dec 1981; 22 May 1982, 2 ♂; 6 June 1981, 1 ♂; 25 Jan 1982, 1 ♂; Feb 14 1983, 1 ♀; Estación Mengo, SW side Volcan Cacao, 1100 m, D. H. Janzen & W. Hallwachs, Mar 1988, 1 ♂, 2 ♀; El Ensayo, 7 km NW Dos Rios, D. H. Janzen & W. Hallwachs, 15-17 Mar 1986, 1 ♂. **Puntarenas:** Las Cruces Biol. Sta. San Vito, 1200 m, I. Chacon, 16-26 Mar 1988, 1 ♂; July 11-16, 1988, 1 ♂. **Limón:** 9.4 km W. Bribri, Suretka, 200 m, D. H. Janzen & W. Hallwachs, 9-11 June 1983, 1 ♂. **ECUADOR:** **Napo:** Parque Nacional Yasuni, 80 km S. PUCE station, Ginta Road, Jan Hillman, 15 May 1996, 1 ♂. **FRENCH GUIANA:** **Saint Laurent du Maroni:** Piste Paul Isnard, 5.15-53.50, Morton S. Adams, 17-18 January 1985, 1 ♂; Mana River, May 1917, 5 ♂. **Cayenne:** Pied Saut, Ovpok River, S. M. Klages, Mar 1918, 5 ♂, 1 ♀; Feb 1918, 1 ♂. **GUYANA:** Omai, 1 ♂. **PARAGUAY:** **Amambay:** Parq. Nac. Cerro Cora, M. Pogue & M. Solis, 7-10 April 1986, 3 ♂. **PERU:** **Cuzco:** Pilcopata, 600 m, premontane moist forest, J. B. Heppner, 11-14 XII 1979, 1 ♀. **Huánuco:** Tingo Maria, 24. XI. 46, 1 ♂; 28. X. 46, 1 ♂. **Junín:** Satipo, April, 1 ♂; Upper Rio Tapiche, 9 XI 26, 1 ♂; 10 XI '26, 1 ♂. **Loreto:** Upper Rio Maraion, 1. I. 25, 1 ♂; Iquitos, 22 XI '27, 1 ♂; Middle Rio Ucayali, 19-21 XII '26, 1 ♂. **Madre de Dios:** Tambopata Reserve, Laguna Chica, 12°51'S 69°18'W, 200 m, at light, 7 Dec 1996, 1 ♂. **VENEZUELA:** Las Quigas, Esteban Valley, 1 ♂, 1 ♀. **Aragua:** Rancho Grande, 1100 m, SS & WD Duckworth, 16-19. I. 66, 1 ♂; Duckworth & Dietz, 10-21. II. 69, 2 ♂; R. W. Poole, Aug. 1-7, 1967, 2 ♂; blacklight, cloud forest, J. B. Heppner, 20-31 III 1978, 4 ♂, 1 ♀; 25-26 I 1978, 1 ♂; 22-23 I 1978, 1 ♂; 15-16 III 1978, 2 ♂; 1-3 IV 1978, 1 ♀; 1100 m, J.C. & K.G. Shaffer, 16 June 1973, 1 ♂; 10 June 1973, 1 ♂, 1 ♀; 19 June 1973, 1 ♀; E. & I. Munroe, 19-26 Feb 1971, 13 ♂.

***Accinctapubes amplissima* Solis & Styer,  
new species**

(Figs. 9, 10, 14, 18, 19, 23, 27, 28, 35, 36, 40)

**Diagnosis.** Large wing size of both sexes (Figs. 9, 10). Female genitalia with a straight signum shaft (Fig. 40).

**Description. Male. Head** (Figs. 14, 18): frons gray with longer, reddish scales dorsally; beige scales behind ocellus and chaetosema. Antenna brown with male scape extension mostly beige with a few

reddish scales, interspersed with gray. Length of male scape 4.6 mm (n = 1). Labial palpus medially beige, laterally peppered with dark brown and red scales. **Thorax** (Fig. 9): collar dorsally green, reddish laterally, dark brown ventrally. Tegula with bands of dark brown, green, and beige; remainder of thorax mostly beige with some reddish tipped scales. **Legs** (Fig. 23): basal half of forecoxa dark brown, distal half with beige scales; forefemur with beige scales laterally, dark brown scales medially; foretibia and tarsus with alternating bands of beige and dark brown scales. Mid- and hindleg coxae and femora with beige scales; tibiae and tarsi similar to foreleg. Entire hindleg banded with alternating beige and dark brown. **Wings** (Figs. 9, 27, 28): forewing length 1.7 cm, width 0.95 cm (n = 4). Basal area dark brown anteriorly, speckled brown and beige posteriorly. Antemedial line white, bordered by brown, becoming more distinct towards posterior edge. Antemedial line variable, from very distinct to indistinguishable. Medial area with green, beige, red, and brown scales. Some specimens with dark brown patch from anterior edge of postmedial line to midpoint between antemedial and postmedial lines extending posteriorly for two-thirds of wing width. Postmedial line white bordered by brown, curving toward outer margin at M<sub>1</sub>. Patches of dark brown raised scales posterior to discal cell and along outer margin of discal cell yellow with reddish tips basally and dark brown distally. Terminal line dark brown. Apical area partially white, not extending to postmedial line. Underside with anterior half brown from base to postmedial band, and posterior half beige. Postmedial band beige, with brown border distally; red scales from postmedial line to outer margin. Hindwing: beige, costal margin brown, postmedial line beige bordered by brown. **Abdomen** (Fig. 9): light brown and beige. Male genitalia (Figs. 35, 36): uncus extends beyond valva; length 1.1 mm, width 0.3 mm (n = 1).

**Female: Head** (Fig. 19): similar to male except female scape simple. **Thorax** (Fig. 10): female similar to male but tegula without distinct bands; color variable from dark brown to beige. **Legs:** female foreleg with only ¼ basally dark brown, remainder white with a few dark brown scales; other legs similar to male but with reddish scales intermingled throughout. **Wings** (Figs. 10, 28): forewing length 1.7-1.9 cm, width 0.95-1.0 cm (n = 6). Similar to male. Hindwing: similar to male. **Abdomen** (Fig. 10): similar to male. Female genitalia (Fig. 40): signum cone shaped with straight shaft; length from apex to base 0.25 mm (n = 1).

**Biology.** Unknown. Specimens have been collected at elevations above 2400 m.

**Distribution.** Costa Rica.

**Type material.** Holotype ♂, Costa Rica, Heredia Province, Braulio Carrillo National Park, Estación Barva, 2500 meters, November 1989, L-N 233400, 523200, G. Rivera, CR1000-089184 [INBIO]. Paratypes: 1 ♂, Heredia Province, Estación Barva, Braulio Carrillo N.P., 2500 m, Oct. 1989, G. Rivera; 1 ♂ and 5 ♀. San José Province, San Gerardo de Dota, Cerro de la Muerte, 2430 m, 1981, D.H. Janzen and W. Hallwachs. USNM genitalia slide numbers 104, 238; 104,239; 106,253. Paratypes deposited in INBIO, USNM, BMNH.

**Etymology.** The species name *amplissima* is derived from the Latin meaning "largest." The name refers to the largest wing size in *Accinctapubes*.

*Accinctapubes anthimusalis* (Schaus)

*Stericta anthimusalis* Schaus, 1925:34.

*Accinctapubes anthimusalis*; Solis, 1993:71; 1995:89.

Dissection and study of the type of *Stericta anthimusalis* Schaus deposited at the Carnegie Museum, placed in *Accinctapubes* by Solis (1993), showed that it belongs to *Quadraforma* Solis, **new combination**.

*Quadraforma* is defined by a rectangular medial lobe at the base of the valva and the tegumen sclerite with the tip as broad as the base in the male genitalia, and a tubular second segment in the male labial palpus (Solis 1993).

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