REVISION AND PHYLOGENETIC ANALYSIS OF ACCINCTAPUBES SOLIS (PYRALIDAE: EPIPASCHINAE) 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 (Drueze), A. apicalis (Schaus), A. chionopheralis (Hampson), and from Costa Rica A. amplissima Solis & Styer, new species. Stericta leucoplagialis var. parusalis is a new synonym of A. albifasciata. Accinctapubes anthimusalis (Schaus) is transferred to Quadragorina 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 veraguenensis, 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 Epipaschiinae, 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 dicitralis 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 (Drueze), 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 were collected by D. Janzen and W. Hallwachs and by paratationists of the Instituto Nacional de Biodiversidad (INBIO), 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-
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 R₃ is proximal to the discocellular cell and 3A is coincident with 1A+2A and in the hindwing Sc+R₁ 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 M₁/M₃ 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.

<table>
<thead>
<tr>
<th>Character</th>
<th>State 1</th>
<th>State 2</th>
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<tbody>
<tr>
<td>1. Male scape extension length</td>
<td>0 less than or equal to 3.5 mm</td>
<td>1 greater than 3.5 mm</td>
</tr>
<tr>
<td>2. 3rd segment of male maxillary palpus</td>
<td>0 as long as 2nd segment</td>
<td>1 less than 2/3 as long as 2nd segment</td>
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<tr>
<td>3. Apex of 2nd segment of male maxillary palpus</td>
<td>0 pointed</td>
<td>1 rounded</td>
</tr>
<tr>
<td>4. Length of 2nd segment of male maxillary palpus</td>
<td>0 greater than or equal to 1.5 mm</td>
<td>1 less than 0.15 mm</td>
</tr>
<tr>
<td>5. Apex of 3rd segment of male labial palpus</td>
<td>0 rounded</td>
<td>1 pointed</td>
</tr>
<tr>
<td>6. Patch of a thick, sclerotized hooked setae on apex of male forewing</td>
<td>0 absent</td>
<td>1 present</td>
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<tr>
<td>7. Color of antemedial area in male forewing</td>
<td>0 same as basal color of wing</td>
<td>1 white</td>
</tr>
<tr>
<td>8. Outer margin of discal cell of male forewing</td>
<td>0 bent inwards medially</td>
<td>1 linear and angled upward</td>
</tr>
<tr>
<td>9. Male and female entire forewing apical area white</td>
<td>0 absent</td>
<td>1 present</td>
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<tr>
<td>10. Width of male forewing</td>
<td>0 less than or equal to 0.9 cm</td>
<td>1 greater than 0.9 cm</td>
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<tr>
<td>11. Sc+R, vein of male and female hindwing point where M, splits from R</td>
<td>0 curves toward costa in the area prior to the outer margin of discal cell</td>
<td>1 not curved in this area</td>
</tr>
<tr>
<td>12. Location of M/M, vein junction of male and female hindwing</td>
<td>0 distal from outer margin of discal cell</td>
<td>1 contiguous with outer margin of discal cell</td>
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<tr>
<td>13. Apex of male frenulum</td>
<td>0 tapered</td>
<td>1 bulbous</td>
</tr>
<tr>
<td>14. Length, apex to base, of signum</td>
<td>0 less than or equal to 0.3 mm</td>
<td>1 greater than 0.3 mm</td>
</tr>
<tr>
<td>15. Shape of signum shaft</td>
<td>0 curved</td>
<td>1 straight</td>
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<tr>
<td>16. Setae of papillae anales</td>
<td>0 simple</td>
<td>1 spatulate, then terminally branched</td>
</tr>
<tr>
<td>17. Medial lobe of juxta</td>
<td>0 absent</td>
<td>1 present, elongated</td>
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</table>

(character 5); outer margin of the discal cell of the male forewing linear and angled upward (character 8); Sc+R, of hindwing not curved in the area prior to the point where M, splits from R (character 12); 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/M, 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/M, 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 cm (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 cm (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 absent; male and female forewing apical area to postmedial line white (Fig. 6) ........................................... apicalis

**SYSTEMATICS**

*Accinctapubes* Solis, 1993


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, Species exhibit sexual dimorphism in wing pattern and antennae. In the forewing of both sexes, the medial line and reniform spot are not prominent, and, in the hindwing, the postmedial line is prominent from the costal margin to A.

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

*Cecidiptera* [sic] *albifasciata* Druee, 1902:325.  
*Stericta leucoplagialis* var. purusalis Holland & Schaus, 1925:115, **new synonym**.  

**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 brown distally, brownish red basally; male scape length 2.25 mm (n = 7), anteriorly reddish, posteriorly reddish scales with brown tips, with longer reddish brown 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 CuA2 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 M1 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 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 chyphus yellow. Labrum white with brown ventral margin. Capsule area on either side of chyphus highly sclerotized. T1–3 and A1–10 integument smooth, pinacula dark brown. Pinacula ring at base of SD1 on A5. Prothoracic shield beige with 6 complete longitudinal lines and an incomplete line extending to SD1 from anterior margin and less brown.

![Figure 2](image-url)

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

<table>
<thead>
<tr>
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<td><em>ampullina</em></td>
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**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 *Carathara* were combined and used as the outgroup. (? = missing data.)
FIGS. 3–10. Adults of Accinctapus. 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.
Fl cs. 15 - 19. Frontal view of dissected adult heads. 15, A. albifasciata ♂, scape length = 2.25 mm; 16, A. api calis ♂, scape length = 4.5 mm; 17, A. chionophoralis ♂, scape length = 4.22 mm; 18, A. amplissima ♂, scape length = 4.6 mm; 19, A. amplissima ♀.
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 pinaculum. 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 A6 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 pinaculum, medially with light brown maculation and lighter colored, almost white, medial line. A1–2 with SV setae on dark brown pinaculum, 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 A5 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 anterovenital line; D1, D2, and SD1 on separate pinaculum. 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
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, *Ocotéa veraguensis* (Meissn.) Mez (Lauraceae); feeding 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.
Type material examined. Cecidiptera [sic] albifasciata Druce, holotype ♂, Sarayacu, Ecuador, C. Buckley (TMSA). Stericta leucaeplagialis Hampson, holotype ♂, Guyana, Mapiri, Stewart (BMNH). Jocara him Dyar, holotype ♀, Teapa, Tabasco, Mexico, Dec. 13, R. Müller Collector, Type no. 19285 (USNM).

te, C. V. Covell, Jr., 100 m, 12–1811 1986, 1; September 1988, 1; 13–1811 1986, 1; Limon: 9.4 km W. Bribri, Suretka, DH Janzen & W. Hallwachs, 9–11 Jun 1983, 1; Cerro Tortuguero, F. N. Tortuguero, 100 m, Dec 1989, 1; Braide, 1; Sisola River, March, Schaus & Barnes, 4; Hacienda La Suerte/Tapezzo, 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. Tapezzo, 29 air km W of Tortuguero, el. 40 m, J. Donahue, D. Panny, D. Mueller, & C. Lewis, 6–23, iii 1978, 3; 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 Jun 1981, 2; 23 Mar 1984, 1; 15–25 Mar 1983, 1; 19–27 Mar 1981, 1; May 1984, 2; 10–12 Aug 1960, 8; C. Chaver & 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; Estación Quebrada Borita, R. B. Carara, 50 m, R. Zamuga, Oct 1990, 1; Boca de Batranca, Hogue & Dooclewer, 12–14June 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, 1; LA Vega: Constanza, 1164 m, Hotel Nueva Suiza, Don & Mignon Davis, 29 May 1973, 3; Convento, 12 km S. Of Constanza, Flitet & 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, 0–500, 78–111; J. Rawlins, R. Davidson, 14 July 1983, 3; 1°. Piyamra, Rosenberg, 1500 m, 4; Cotopaxi: Las Fampas, Casa Ces­sar Tapia, 500–750 m, Feb 2000, 12; at UVMV. 1; 1°. Esmeraldas: 5 km E Alto Tambo, 900 m, Jan Hillman, 8 Dec 1995, 1; Rio Durango, 27 km W Alto Tambo, 200 m, Jan Hillman, 5 Dec 1995, 1; Loja: Zamora, 1805, 2; 1 July 1896, 1; Environs de Loja, 1898, 5; El Monje near Loja, 1963; Morona­Santiago: Macas, 1; Pichincha: Tinalandia, el. 700 m, C.V. Cov­ell, Jr., 5–24 1983, 1; 10–18 1983, 1; 15 km E Santo Domingo de los Colorados, el. 600 m, 5–11 May 1990, R. H. Leuchner, 1; 17 km SE St. Domingo de los Colorados, 3000', Blt It, Oct 21, 1998, 1; 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; St. Laurent, 2 km S. RTE. 1 at pk 244 W. Cayenne, 50 m, April 27, 1994, 1; Mana River, May 1917, 5; Cayenne: Pied Saint, Oyapok River, S. M. Klages, Dec 1917, 1; Feb 1918, 4; March 1918, 5; GUATEMALA: Cayagua, Schaus & Barnes, April, 1; May, 1; June, 1; Sept. 1; October, 1; Quirigua, Schaus & Barnes, Jan, 2; April, 2; May, 3; August, 3; September, 2; October, 1; December, 3; no date, 19; Purulha, Schaus & Barnes, April, 1; May, 1; Rio Dulce, UV, 16–1986, 1; 17 km SE Santo Domingo de los Colorados, 3000', Blt It, Oct 21, 1998, 1; 37, A. albofaciata, note inset a magnified trifurcate seta from ovipositor lobes; 38, A. apicalis; 39, A. chionephorlids; 40, A. amplissima.

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

Jocara apicalis Schaus, 1906:141.


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

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 ocellae and chaetotaxis. Antenna with each segment brown distally, white basally, male scale 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. Tegulae basally 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. Antemeral 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 CuA1 and CuA2 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 M1 and reddish white, remainder white. Abdomen (Fig. 6): white, peppered with black dorsially, 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: male 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 \( \delta \), Orizaba, Mexico, Coll. Wm. Schaus, Type no. 9623 (USNM) (mistakenly identified as a female in the description). Scecidoptera apicalis Schaus, holotype \( \delta \), Januly-1, Juan Vinas, C[atuaí R[jenal], Type no. 17573 (USNM). Coccilota apicalis Schaus, holotype \( \delta \), J. Janzen, 1957 (USNM). C. chionophoralis Schaus, holotype \( \delta \), J. Janzen, 1959 (USNM).


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

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

Accinctapubes chionophoralis [sic]; Solís, 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).
ACcinctapubes amphilissa Bolívar, new species

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

Description. Male. Head (Figs. 14, 18): fringe gray with longer, reddish scales dorsally; beige scales behind ocellus and clavata area. 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 gray, 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 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. Antenmial line white, bordered by brown, becoming more distinct towards posterior edge. Antemnal 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 antemnal and postmedial lines extending posteriorly for two-thirds of wing width. Postmedial line white bordered by brown, curving toward outer margin at M4. 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** (Fig. 29): female foreleg with only % 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.


**Etymology.** The species name amphilissa is derived from the Latin meaning “largest.” The name refers to the largest wing size in **Acinaptapus**.
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 (Solís 1993).

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LITERATURE CITED


Holland, W. J. & W. Schaus. 1925. II. The Epipaschiinae of the Western Hemisphere: a synonymic catalog of the species hitherto described, with figures of many, which have not heretofore been depicted. Ann. Carn. Mus. 16:89–130.


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