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# PUNCTAPINELLA (LEPIDOPTERA: TORTRICIDAE), A NEW GENUS FOR THREE PREVIOUSLY KNOWN AND THREE NEW SPECIES FROM SOUTH AMERICA

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**ABSTRACT.** *Punctapinella*, new genus, is proposed for six species from northern South America: *P. conchitis* (Meyrick), new combination (type species); *P. niphastra* (Meyrick), new combination; *P. chionocarpa* (Meyrick), new combination; *P. braziliana*, new species; *P. scleroductus*, new species; and *P. theta*, new species. Adults of *Punctapinella* are characterized by a unicolorous bronze-brown to dark brown forewing with distinct roundish white spots. Putative autapomorphies for the genus include unique forewing pattern, elongate medial fusion of the gnathos arms, and compound cornutus. *Punctapinella* is morphologically most similar to *Seticosta* Razowski, 1986, and *Anopinella* Powell, 1986, among described genera. The presence of a male foreleg hairpencil confirms the assignment of the genus to Euliini (Tortricinae). The male of only one species, *P. conchitis*, is known. It possesses a row of strong spinelike setae subbasally on the costa of the valva; this character state is interpreted as a synapomorphy for *Punctapinella* and *Seticosta*.

(Additional key words: accessory bursa, Neotropical, *Seticosta*, *Anopinella*.)

## INTRODUCTION

Within the recently redefined tortricid tribe Euliini (Powell, 1986; Brown, 1990), *Seticosta* Razowski, 1986, *Anopinella* Powell, 1986, and *Apolychrosis* Amsel, 1962, form a well defined monophyletic group on the basis of the following putative synapomorphies: labial palpi elongate and porrect, male antennae with extremely long cilia (greater than  $1.5 \times$  annular segment diameter), forewing vein CuP absent, valvae narrow and usually subbasally constricted with an apical or subapical region of non-deciduous bristlelike setae (analogous with cucullus), and ductus seminalis from the corpus rather than from the ductus bursae. Females of this group are characterized by the presence of elongate slender apophyses posteriores and anteriores, a moderately long ductus bursae, and the absence of a signum. The latter character states are interpreted as symplesiomorphies because of their widespread distribution in the outgroups (i.e., Chlidanotinae, Olethreutinae, and several tribes of the Tortricinae). In most Euliini the apophyses are comparatively short, and the ductus bursae is greatly reduced and undifferentiated from the corpus.

During recent studies on Neotropical members of the polyphyletic genus *Eulia* Hübner, I discovered a homogeneous group of species that share the above characters states but differ from the above genera in several morphological characters and in

facies. *Punctapinella*, new genus, is described to accommodate *Eulia chionocarpa* Meyrick, *Eulia niphastra* Meyrick, *Eulia conchitis* Meyrick, and three previously undescribed species. Females of *Punctapinella* possess a variably developed accessory bursa from the ductus bursae, unassociated with the ductus seminalis, a character state previously considered a synapomorphy for *Seticosta* and *Anopinella* (Brown and Powell, unpubl.). Although accessory bursae are present in Chlidanotini and Hilarographini (Chlidanotinae) and in Cochylini (Tortricinae), these structures are considered independently derived among these phylogenetically distant groups (Horak, 1984; K. Tuck, personal communication). The single male of *Punctapinella* possesses a row of long, strong, spinelike setae subbasally on the costa of valva; this character state is interpreted as a synapomorphy with *Seticosta*. The male of *Punctapinella* also possesses the characteristic euliine male foreleg hairpencil, as do males of *Seticosta* (Brown, 1989, 1990). In *Anopinella* and *Apolychrosis* this structure is apparently secondarily lost. The hypothesized cladistic relationship among these four genera is presented in Figure 1.

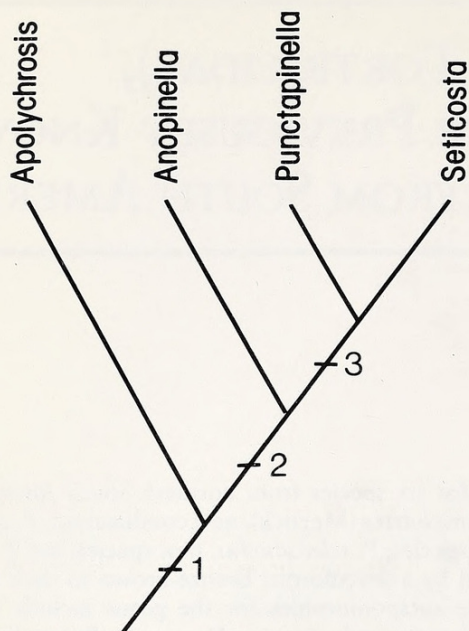
## MATERIALS AND METHODS

Taxonomic material for this study was obtained through the courtesy of J.F.G. Clarke, National Museum of Natural History, Washington, D.C. (USNM); the late F. Fernandez-Yépez, Instituto de Zoología Agrícola, Universidad Central de Venezuela, Maracay (IZAV) [currently on loan to USNM]; M. Lödl, Naturhistorisches Museum, Vi-

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**Figure 1.** Hypothesized cladistic relationship among *Apolychrosis*, *Anopinella*, *Punctapinella*, and *Seticosta*. Putative synapomorphies supporting the branching pattern are as follows: 1) Loss of forewing vein CuP; elongate, porrect labial palpi; long antennal cilia in male; valvae narrow; ductus seminalis from corpus bursae. 2) Possession of accessory bursa. 3) Row of spinelike setae on costa of valva.

enna (NHMW); and K.R. Tuck, British Museum (Natural History), London (BMNH).

Dissection methodology followed that presented in Powell (1964). Illustrations of genitalia were drawn using a microprojector. Forewing measurements were made with a standard grid mounted in a dissecting microscope. Terminology for wing ve-

nation and genitalic structures follows Horak (1984); FW = forewing; HW = hindwing; DC = discal cell.

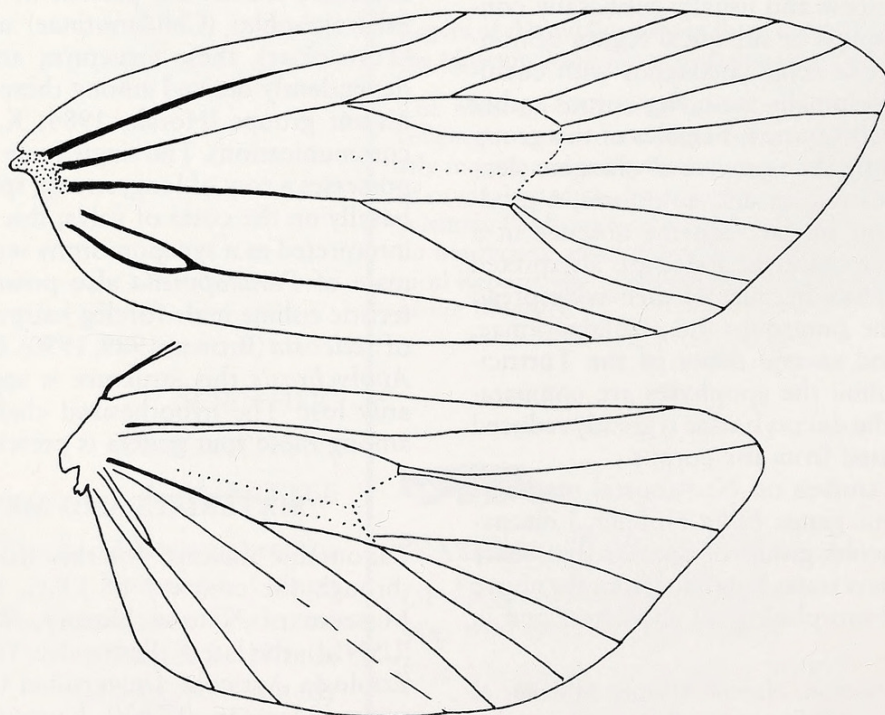
## SYSTEMATICS

### *Punctapinella* new genus

*Eulia* Hübner (in part); Meyrick, 1912:681; Meyrick, 1931:151; Meyrick, 1932:257; Clarke, 1958:120; Razowski, 1964:458, 461.

**TYPE SPECIES.** *Eulia conchitis* Meyrick, 1912.

**DESCRIPTION.** *Head:* Antennal setulae (cilia) in male  $1.6\text{--}1.8 \times$  annular segment diameter. Labial palpus porrect, elongate, broadened distally by scaling; segment II expanded distally to ca  $1.5 \times$  its basal diameter, slightly curved; segment III ca  $0.4$  as long as II, exposed. Maxillary palpus rudimentary. Frons with overhanging crown tuft. Ocelli small. Chaetosema present. *Thorax:* Male foreleg with hairpencil from proximal end of femur, extending to base of coxa. *Forewing:* Venation as in Figure 2. Length  $2.3\text{--}2.4 \times$  width; length of DC ca  $0.6 \times$  FW length; width of DC ca  $0.2 \times$  its length; CuA<sub>2</sub> originating ca  $0.60$  along length of DC; all veins separate beyond cell; R<sub>4</sub> to costa, R<sub>5</sub> to termen; CuP absent; chorda present; M-stem reduced to trace. *Hindwing:* Venation as in Figure 2. Sc+R and Rs separate; Rs and M<sub>1</sub> separate; M<sub>3</sub> and CuA<sub>1</sub> connate; CuP represented by a trace; M-stem a trace. *Abdomen:* Dorsal pits absent. *Male genitalia* (based on *P. conchitis* only): Uncus simple, unmodified, slightly curved. Socii moderately short, digitate, with fine setae; not fused to gnathos. Gnathos well developed with elongate, medial process from fusion of apices of lateral arms. Subscaphium and hami absent. Transtilla membranous mesally; well developed laterally with cuplike subbasal in-



**Figure 2.** Wing venation of *Punctapinella theta*.



vagination. Valva narrow, moderately elongate; costa with subbasal patch of large spinelike setae; venter weakly excavated ca 0.4–0.7 from base to apex; sacculus simple without free projection, confined to basal 0.5. Vinculum complete. Aedeagus moderately long, straight; a single long slender compound cornutus, attached basally. *Female genitalia* (based on all species): Papillae anales (ovipositor lobes) simple. Apophyses anteriores and posteriores long, slender. Sternum of abdominal segment VIII weakly sclerotized. Sterigma simple; lamella antevaginalis poorly developed; lamella postvaginalis a simple sclerotized transverse band, broadened meso-ventrally, often with narrow scobinate region extending toward or into ostium; ostium displaced anterad of intersegmental membrane between sterna VII and VIII. Corpus and ductus bursae usually differentiated. Ductus bursae narrow, elongate to moderately broad. Corpus bursae narrow, weakly pear-shaped, with little or no spiculae; signa lacking. Accessory bursa variously developed: Short digitate diverticulum (e.g., *braziliana*) to elongate sac from long slender ductus (e.g., *conchitis*), arising from ductus bursae (usually lost in slide-mounted preparations). Ductus seminalis from corpus bursae. Entire apparatus long and narrow. *Sexual dimorphism*: Based on *P. conchitis*, forewing shape, size, and pattern does not differ between sexes. Males can be distinguished by the possession of a foreleg hairpencil and long antennal setulae (cilia).

*Punctapinella* occurs from Colombia and Venezuela, southeast to Rio de Janeiro, Brazil. The early stages are unknown. The three previously known species were described in the polyphyletic genus *Eulia* and were known only from holotype females.

Members of the genus are characterized by a unicolorous bronze-brown to dark brown forewing with distinct roundish white spots. Forewing pattern in the closely related *Anopinella* and *Seticosta* nearly always features a dark triangular patch bordering the costa approximately 0.33–0.66 from the base and extending about half way to the dorsum. In *Punctapinella* the gnathos are well developed and possess an elongate medial rodlike process formed by the distal fusion of the lateral arms. By contrast, in *Seticosta* the gnathos are reduced; in *Anopinella* each of the arms bears a laterally flattened, usually finely dentate, semicircular process distally. The single male of *Punctapinella* has a moderately long straight aedeagus bearing a single large compound cornutus. Males of *Anopinella* have a comparatively short stout aedeagus bearing a single slender spinelike cornutus; males of *Seticosta* almost always lack cornuti and have a large dorso-anterior process above the opening of the ductus ejaculatoris. Putative autapomorphies for *Punctapinella* include the unique forewing pattern, the elongate medial fusion of the arms of the gnathos, and the unusual compound cornutus.

**ETYMOLOGY.** The Greek “puncta” means spot or spotted; “pina” refers to feather or wing; the

suffix “ella” refers to diminutive in size. The gender of the new genus is interpreted as feminine.

## KEY TO SPECIES OF *PUNCTAPINELLA* BASED ON FEMALES

1. FW silver-white with bronze-gray v-shaped transverse band (Fig. 7) ..... *conchitis*
- 1'. FW nearly unicolorous bronze-brown to chocolate brown with roundish white spots ..... 2
2. FW costa with white spot ca 0.65 from base, between large subbasal spot and apical spot(s) ..... 4
- 2'. FW costa without white spot ca 0.65 from base ..... 3
3. HW chocolate brown, concolorous with FW (Fig. 3) ..... *niphastra*
- 3'. HW light gray-brown, much lighter than FW (Fig. 5) ..... *braziliana*
4. Three white spots in medial-tornal area of FW round and equal in size ..... *scleroductus*
- 4'. Three white spots in medial-tornal area of FW irregularly rounded and unequal in size ..... 5
5. Large white spot near base of costa nearly round (Fig. 4) ..... *chionocarpa*
- 5'. Large white spot near base of costa oblong or subrectangular (Fig. 6) ..... *theta*

### 1. *Punctapinella niphastra* (Meyrick) new combination

Figures 3, 8

*Eulia niphastra* Meyrick, 1931:151; Razowski, 1964:461.

**MALE.** Unknown.

**FEMALE.** FW length 6.9 mm (n = 1). *Head*: Frons smooth scaled, white-ocherous below mid-eye, roughened, gray-brown above; vertex gray-brown with white-ocherous tufts medially. Labial palpus white-ocherous, gray-brown laterally. Antenna brown. *Thorax*: Smooth scaled, brown. *Forewing*: Chocolate brown with faint lighter brown transverse striae; small white spot at base along dorsum; large white spot at costa ca 0.20 from base; small white spot at posterior apex of DC; two slightly larger white spots nearly equidistant from the latter, one tornad, the other apicad; a pair of white costal strigulae near apex; faint ill-defined white dots in subterminal region; dorsum with several diffuse short white transverse dashes. Fringe ferruginous-gray. *Hindwing*: Chocolate brown. Fringe slightly lighter brown. *Genitalia*: As in Figure 8 (n = 1; drawn from Razowski slide no. 4339). Lamella postvaginalis a simple transverse curved band, broadened meso-ventrally. Ductus bursae long, fairly broad. Corpus bursae narrow, elongate. Origin of neither accessory bursa nor ductus seminalis detectable.

**TYPE MATERIAL.** Holotype female: BRAZIL: State of Espírito Santo, Guanda, December 1920, Fritz Hoffman (NHMW).



**ETYMOLOGY.** The Greek prefix “nipha” means snow and “astro” or “astrum” means star. Apparently the name “niphastra” refers to the round white spots of the forewing.

## 2. *Punctapinella chionocarpa* (Meyrick) new combination

Figures 4, 9

*Eulia chionocarpa* Meyrick, 1932:257; Razowski, 1964:458.

**MALE.** Unknown.

**FEMALE.** FW length 9.0 mm ( $n = 1$ ). *Head:* Frons and vertex white. Labial palpus lacking. Antenna light tan. *Thorax:* White. *Forewing:* Bronze-brown with diffuse darker reticulation; white spot at base along dorsum; large irregularly rounded spot at costa ca 0.25 from base; four smaller white spots in distal 0.5 of wing: one at costa ca 0.65 from base, one directly below latter at posterior apex of DC, one slightly larger, between and distad of latter two, one slightly oblong, at tornus; two pairs of white costal strigulae near apex, forming subconfluent white spot; subtermen with indistinct white dots. Fringe light bronze-brown. *Hindwing:* Light gray with faint darker gray marbling. Fringe gray-white. *Genitalia:* As in Figure 9 ( $n = 1$ ; drawn from Razowski slide no. 4332). Lamella postvaginalis a simple lightly sclerotized band; ostium indicated by narrow outline of sclerotization. Ductus bursae long, narrow. Corpus bursae irregularly rounded. Origin of accessory bursa and ductus seminails uncertain.

**TYPE MATERIAL.** Holotype female: COLOMBIA: [Department of Tolima (?)] Central Cordilleras, Guandin, 8500 feet [2750 m], November [no year], Eden (NHMW).

**ETYMOLOGY.** The Greek “chion” refers to snow and “carpo” or “carpus” means fruit. Apparently the name “chionocarpa” refers to the round white forewing markings.

## 3. *Punctapinella braziliana* new species

Figures 5, 10

**MALE.** Unknown.

**FEMALE.** FW length 6.8–9.0 mm ( $\bar{x} = 7.5$ ;  $n = 5$ ). *Head:* Frons and vertex white. Labial palpus white, gray-brown laterally. Antenna bronze-brown. *Thorax:* Yellow-ocherous to silver-white. *Forewing:* Bronze-brown; white spot at base along dorsum; large elongate diagonal white spot from costa ca 0.2 from base; white spot near posterior apex of DC; distal 0.2 of wing with row of three small white spots nearly parallel to termen starting at apex, apical spot formed by coalesced costal strigulae; dorsum with a few scattered tiny white transverse dashes. Fringe bronze-brown. *Hindwing:* Light gray-brown. Fringe gray to dingy white. *Genitalia:* As in Figure 10 ( $n = 3$ ; drawn from USNM slide

no. 69338). Lamella postvaginalis a simple transverse band with a scobinate, broadly v-shaped region meso-ventrally; variable rectangular patch of scobination extending to ostium; sclerotized ridge representing ventral lip of ostium. Ductus bursae moderate with short sclerotized antrum. Accessory bursa a short digitate diverticulum from near junction of ductus bursae and ostium. Corpus bursae oblong. Ductus seminalis from caudal third of corpus.

**TYPE MATERIAL.** Holotype female: BRAZIL: State of Santa Catarina, Santa Catarina, XI-20-36 [20 November 1936], Fritz Hoffman (USNM).

Four female paratypes as follows: BRAZIL: State of Paraná, Castro, 3♀♀, 1898 (E. Jones, BMNH). No locality data, Paravicini Coll[ection], 1♀, B[ritish] M[useum] [accession no.] 1937-383 (BMNH).

**ADDITIONAL MATERIAL EXAMINED.** BRAZIL: State of Rio de Janeiro, km 17, 18 km S Teresopolis, 1180 m, 1♀, IV-18/19-77 [18–19 April 1977], C.M. and O.S. Flint (USNM).

**REMARKS.** The specimen from the State of Rio de Janeiro is smaller in forewing length and has a broader ductus bursae that is not clearly differentiated from the corpus bursae. It is possible that this specimen is not conspecific with *P. braziliana*. Consequently, the specimen is not designated a paratype.

**ETYMOLOGY.** The name “braziliana” refers to the country of the type locality of this species.

## 4. *Punctapinella scleroductus* new species

Figure 11

**MALE.** Unknown.

**FEMALE.** FW length 9.2 mm ( $n = 1$ ). *Head:* Frons and vertex white. Labial palpus white, gray-brown laterally. Antenna light brown. *Thorax:* White-ocherous, darker anterad. *Forewing:* Gray-brown with faint sparse red-brown overscaling; small white spot at base along dorsum; diagonal elliptical white spot from costa ca 0.2 from base; four small round spots in distal 0.5: one at costa ca 0.60 from base, one directly below latter near posterior apex of DC, two nearly equidistant from the latter, one tornad, the other apicad; apex with irregular white spot incorporating costal strigulae; subtermen with faint indistinct white dots. Fringe gray-brown. *Hindwing:* Light gray-brown. Fringe concolorous with wing. *Genitalia:* As in Figure 11 ( $n = 1$ ; drawn from USNM slide no. 69336). Lamella postvaginalis a sclerotized band with dense patch of scobination; edge of abdominal segment VII immediately posterad of ostium with broad patch of scobination and narrow sclerotized ridge; ostium round with sclerotized perimeter. Ductus bursae broad, strongly sclerotized throughout. Corpus bursae narrow with fine ridges ventrally. Accessory bursa from long narrow ductus arising near junction of corpus and ductus bursae. Ductus seminalis from caudal portion of corpus bursae.





Figures 3–7. Adults of *Punctapinella*. 3. Holotype of *P. niphastra*. 4. Holotype of *P. chionocarpa*. 5. Holotype of *P. braziliana*. 6. Holotype of *P. theta*. 7. Female of *P. conchitis*. All photographs courtesy of Victor Krantz (USNM).

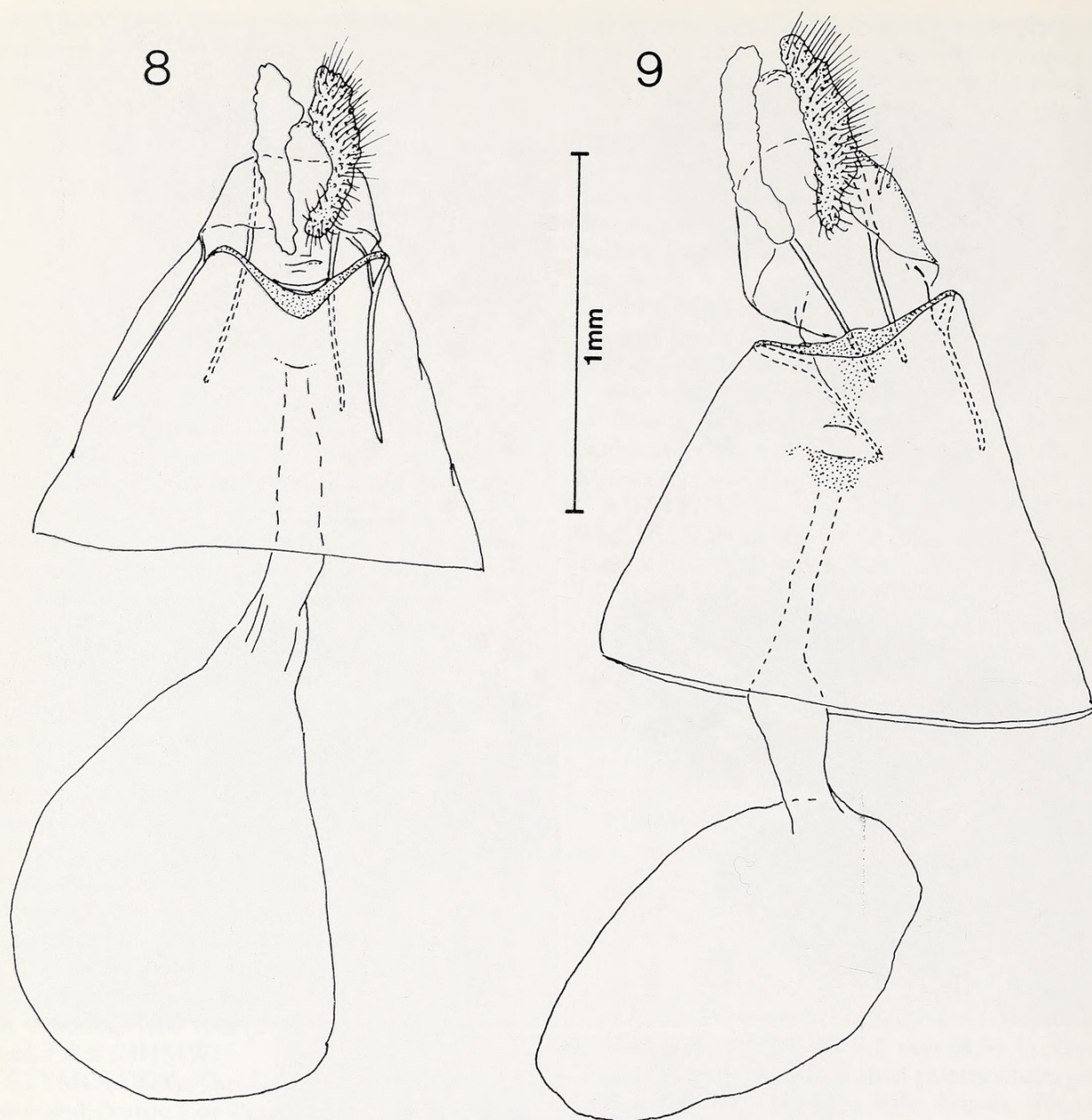
**TYPE MATERIAL.** Holotype female: BRAZIL: State of Rio de Janeiro, Rio de Janeiro, 7/3/29 [3 July 1929], J.F. Zikán (USNM).

**REMARKS.** The adult of *P. scleroductus* is not illustrated, but it is similar to *P. chionocarpa* and

*P. theta*. It can be distinguished from the latter two by the shape and size of the three white spots of the distal half of the forewing; i.e., round and equal in size in *P. scleroductus* (see key to species).

**ETYMOLOGY.** The name “scleroductus” refers





Figures 8, 9. Female genitalia of *Punctapinella*. 8. *P. niphastra*. 9. *P. chionocarpa*.

to the strongly sclerotized ductus bursae of the female genitalia.

### 5. *Punctapinella theta* new species

Figures 2, 6, 12

**MALE.** Unknown.

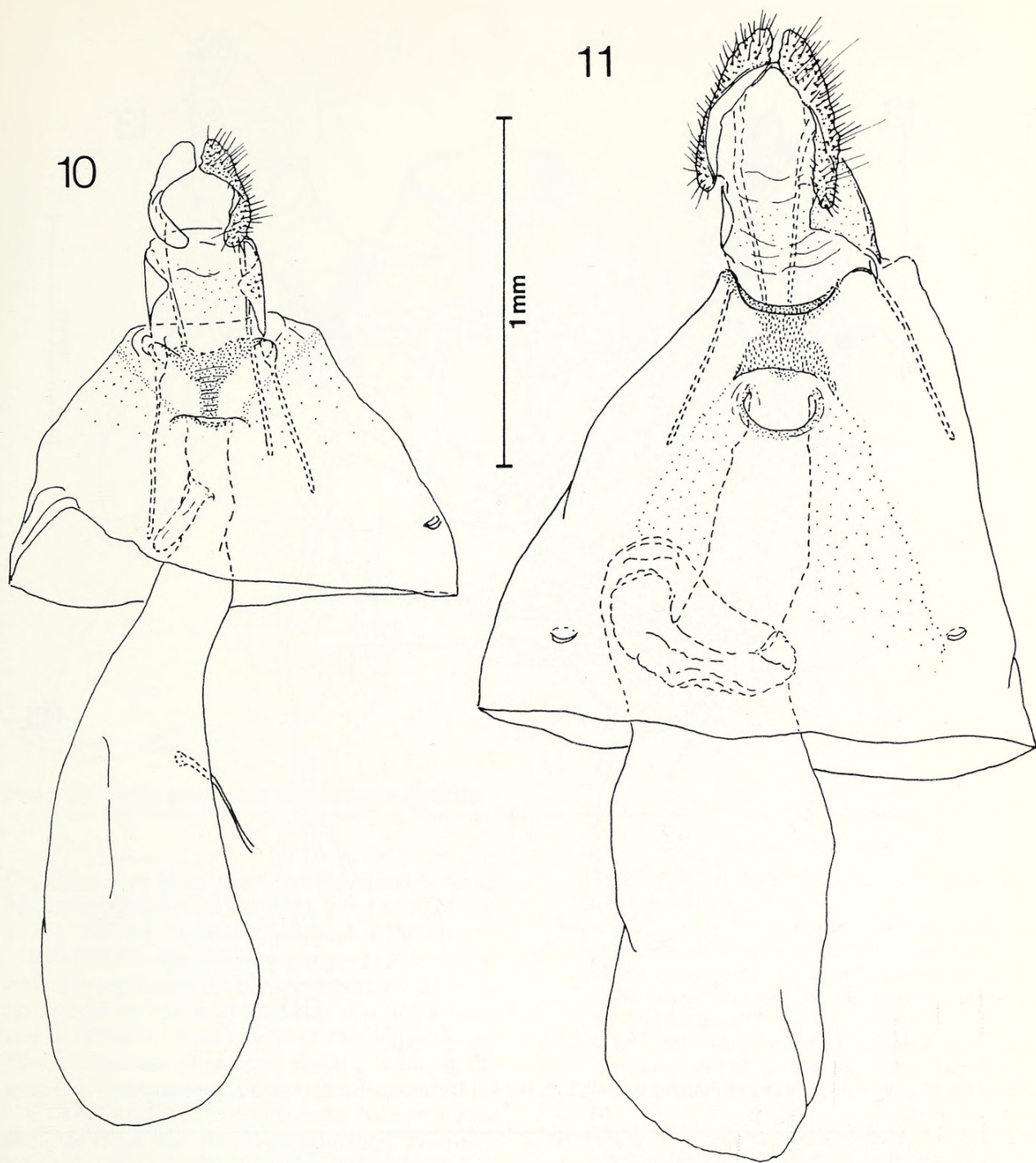
**FEMALE.** FW length 8.0–8.2 mm ( $\bar{x}$  = 8.1;  $n$  = 2). **Head:** Frons and vertex white. Labial palpus white, bronze-brown laterally. Antenna light brown. **Thorax:** White. **Forewing:** Bronze-brown; white spot at base along dorsum; larger oblong white spot from costa ca 0.2 from base; four roundish white spots in distal 0.5 of wing: one on costa ca 0.65 from base; one at posterior apex of DC; one at dorsum near tornus, the other directly above the latter; apex with irregular white area comprised of coalesced costal strigulae; subtermen with faint

white dots. Fringe red-brown. **Hindwing:** White-ocherous with sparse gray-brown overscaling. Fringe white-ocherous. **Genitalia:** As in Figure 12 ( $n$  = 2; drawn from USNM slide no. 69334). Lamella post-vaginalis a sclerotized transverse band slightly broadened meso-ventrad, with slender digitate band of sclerotization extending anterad into ostium; perimeter of ostium unsclerotized. Ductus bursae moderately broad. Corpus bursae a pear-shaped sac. Ductus seminalis from caudal 0.30 of corpus. Weak, broad ductus of accessory bursa from ductus bursae near ostium.

**TYPE MATERIAL.** Holotype female: VENEZUELA: State of Aragua, Rancho Grande, 1100 m, VIII-15/21-67 [15–21 August 1967], R. W. Poole (USNM).

One female paratype same locality as holotype, V-15-67 [15 May 1967], J. Salcedo and C. Andara (IZAV).





Figures 10, 11. Female genitalia of *Punctapinella*. 10. *P. braziliiana*. 11. *P. scleroductus*.

**ETYMOLOGY.** The specific epithet "theta" refers to the t-shaped sclerotized region of the lamella postvaginalis.

## 6. *Punctapinella conchitis* (Meyrick) new combination

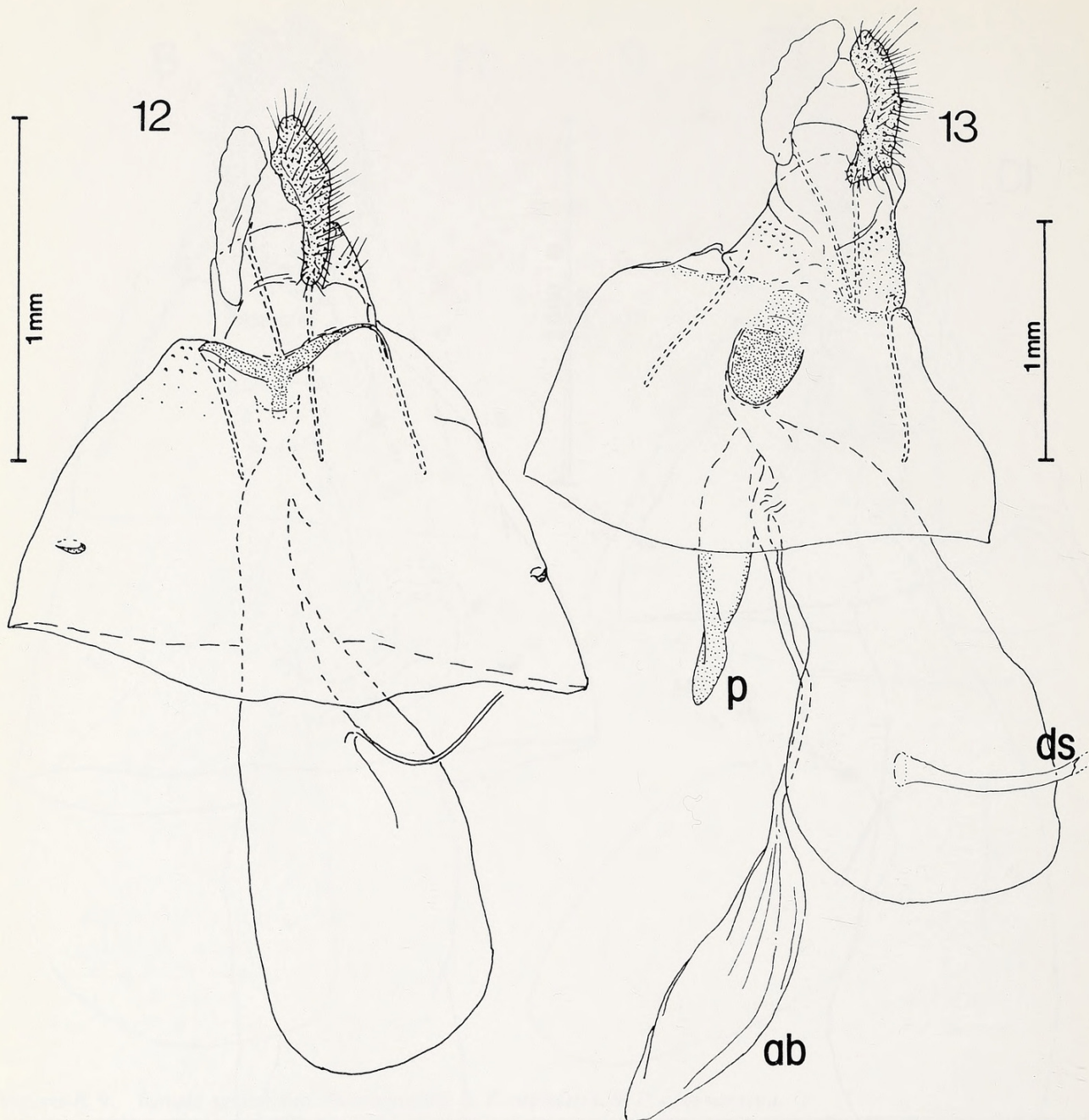
Figures 7, 13, 14

*Eulia conchitis* Meyrick, 1912:681; Clarke, 1958: 120.

**MALE.** FW length 8.0 mm ( $n = 1$ ). *Head:* Frons and vertex white. Labial palpus white, light brown

laterally. Antenna brown. *Thorax:* Silver-white. *Forewing:* Olive green-bronze, with two broad transverse white bands: one from costa ca 0.2–0.3 from base, extending to dorsum, posteriorly contiguous with white basal spot; second band occupying distal 0.3 of wing, with faint, light bronze-olive band at termen; subtermen with poorly defined bronze streak parallel to termen; white spot at costa ca 0.65 from base representing pair of confluent white costal strigulae and a second confluent pair ca 0.9 from base; a small white spot near posterior apex of DC. Fringe tan and cream-ocherous. *Hindwing:* White with gray-brown mottling. Fringe





Figures 12, 13. Female genitalia of *Punctapinella*. 12. *P. theta*. 13. *P. conchitis*. ds = ductus seminalis, ab = accessory bursa, p = pouch.

concolorous with wing. *Genitalia*: As in Figure 14 (n = 1; drawn from JWB slide no. 276). Uncus slender, rodlike, curved. Socii simple, short, digitate, setose. Gnathos with strong medial process from apical fusion of lateral arms. Transtilla weak mesally; basal region large, appearing as a strongly sclerotized basal extension of valva; a deep cuplike invagination subbasally. Valva narrow, moderately elongate, attenuate distally; costa with subbasal patch of 10–15 large spinelike setae; venter with rounded excavation ca 0.4–0.7 from base to apex; sacculus confined to basal 0.5 without free projection. Aedeagus moderately long, slender, with a single large compound cornutus.

**FEMALE.** FW length 9.0 mm (n = 2). As described for male. *Genitalia*: As in Figure 13 (n = 2; drawn from USNM slide no. 68850). Lamella

postvaginalis a broad scobinate band; lamella antevaginalis with a strongly sclerotized oval patch at ostium. Ductus bursae moderately short. Corpus bursae simple, elongate. Accessory bursa a membranous attenuate sac from long narrow weakly sclerotized ductus arising on caudal portion of corpus bursae; unusual sclerotized distally attenuate pouch attached to bursa copulatrix at junction of corpus and ductus bursae. Ductus seminalis from anterior third of corpus.

**TYPE MATERIAL.** Holotype female: COLOMBIA: Department of Norte de Santander, San Antonio. 5800 feet [1800 m], November [no year] (BMNH).

**ADDITIONAL MATERIAL EXAMINED.** COLOMBIA: Department of Norte de Santander, San Antonio, 1♀, "11-07" [November 1907] (USNM);



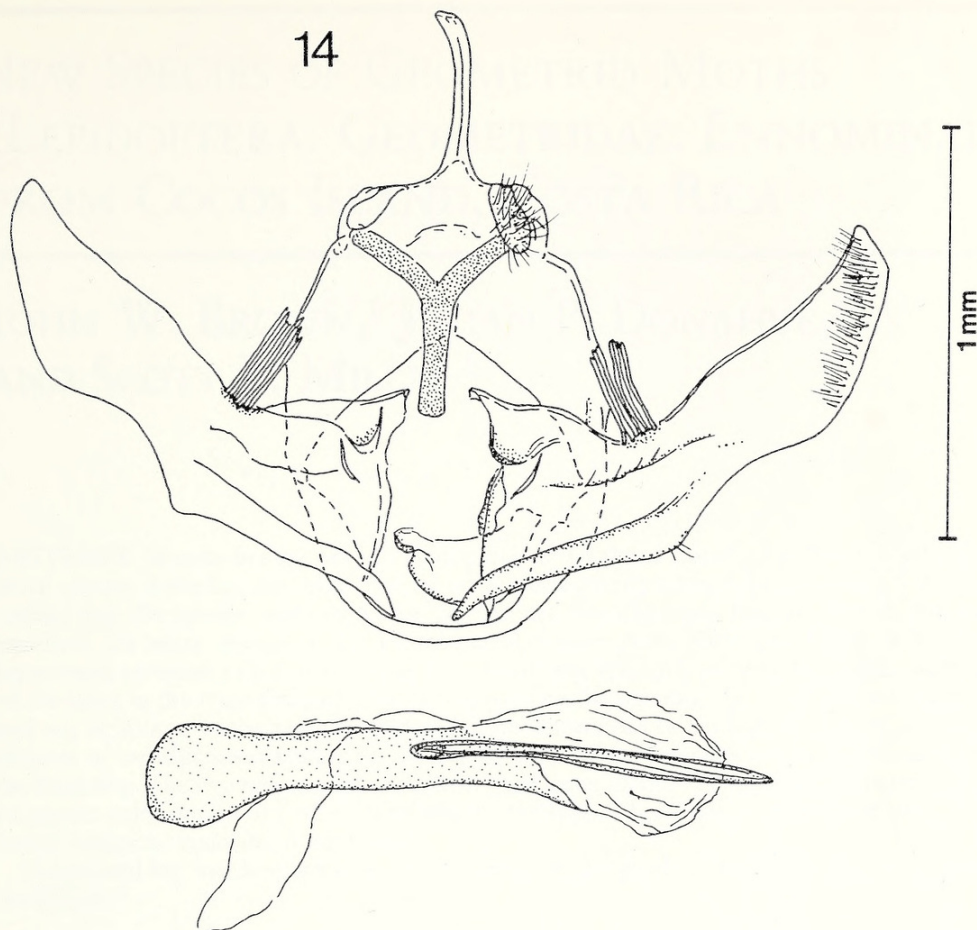


Figure 14. Male genitalia of *Punctapinella conchitis*.

Department of Magdalena, Sierra Nevada de Santa Marta, Hotel Solito, 2300 m, 1♂, VII-24-73 [24 July 1973], 7–8 PM (Oxford Expedition, BMNH).

**REMARKS.** The forewing pattern of *P. conchitis* probably represents the plesiomorphic state for the genus because it is most similar to that of *Seticosta* and *Anopinella*. Other species of *Punctapinella* exhibit an increase in melanic scaling, reducing the presumed white ground color to small round spots.

**ETYMOLOGY.** The Greek prefix “conch” means shell; the suffix “itis” means inflammation. The name may refer to the bronze-brown, somewhat triangular-shaped (shell-like?) marking of the forewing.

#### ACKNOWLEDGMENTS

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