

**PENAINCISALIA, A NEW GENUS OF "ELFIN"-LIKE
BUTTERFLIES FROM THE HIGH ANDES
(LEPIDOPTERA: LYCAENIDAE)**

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Abstract.—*Penaincisalia* NEW GENUS (tribe Eumaeini) is described to include a monophyletic group of 13 species distributed in the high Andes, southward to central Patagonia. Four species are transferred from *Thecla*: *T. anosma* Draudt, *T. candor* Druce, *T. culminicola* Staudinger and *T. oribata* Weymer. Examination of types shows historical nomenclature for several common congeneric species has been misapplied: *Thecla alatus* Druce is a junior synonym of *T. culminicola* but because the latter name properly applies to common historical usage of the former, *Penaincisalia penai* NEW SPECIES subsumes "culminicola" of historical usage; *Penaincisalia candor* is distinctive from *Thecla amatista* Dognin (often wrongly synonymized). A lectotype is designated for *T. culminicola*. Other NEW SPECIES described are: *Penaincisalia bimediana*, *P. aurulenta*, *P. caudata*, *P. descimoni*, *P. downeyi*, *P. pichincha*, *P. rawlini* (all north and central Andes), and *P. patagonaevaga* (Patagonia). *Penaincisalia* is cryptic in its under surface wing pattern, like some other Andean Eumaeini, but is readily diagnosed by two androconial brands on each forewing of the males. Internal structures indicate *Penaincisalia* is a sister-group of the diverse, and primarily montane, Neotropical *loxurina*- and *arria*- groups of *Thecla*, not an immediate southern relative of cryptically marked Nearctic *Incisalia* Scudder or Palaearctic *Ahlbergia* Bryk, as sometimes believed.

Key Words.—Insecta, biogeography, Eumaeini, paramo, systematics, Theclinae

For many years lepidopterists have noted superficial similarity between Nearctic "Elfin" butterflies (*Incisalia* Scudder) and taxa of the *culminicola*-group (Draudt 1919) occurring in the high Andes of South America (Draudt 1919, Brown 1942, Descimon 1986). In a study of worldwide callophryine butterflies (Johnson 1981) (see Appendix 1), I presented a preliminary review of *culminicola*-group taxa. I questioned their purported monophyly with Nearctic *Incisalia* (Brown 1942, Gillham 1956) or the group with which *Incisalia* is often placed as a subgenus, *Callophrys* Billberg (see Appendix 1). Cladistic analyses (unpublished data) indicate the *culminicola*-group belongs to the sister-group of callophryines, a group of Neotropical taxa including Draudt's (1919) *loxurina*- and *arria*- groups and a large number of undescribed species (hereafter referred to as the callophryine sister-group or sister-group, see Appendices 1 and 2).

A separate publication, revising the *culminicola*-group, is warranted for several reasons. Twelve years elapsed in assembling samples and preparing a classification of this seldom collected group. However, the group cannot not be included with callophryines and, because of the large number of undescribed species, revision of the entire callophryine sister-group will take several years. In the meantime, some of my conclusions concerning the *culminicola*-group were summarized by Descimon (1986) and need documentation. Completion of the work was also prompted by recent specimen acquisitions from other high Andean studies (Johnson 1989a, b; Johnson et al. 1988, in press, unpublished data) and a 1987 high

Andean expedition of the Carnegie Museum of Natural History. In addition, I was able to sort and prepare the material from the American Museum of Natural History high Andean field work of F. M. Brown (Brown 1941) and J. C. Pallister (Pallister 1956). These combined samples allow the present study to represent most of the high Andean "Elfin" material currently available in world depositories.

METHODS AND MATERIALS

Methods.—Based on characters of a monophyletic group established by parsimonious distributions derived from PAUP (Swofford 1985, see below and Appendix 2), taxa of Draudt's *culminicola*-group, and numerous new species, are treated here as the new genus *Penaincisalia*. Species criteria are derived from standard taxonomic procedures involving consistent differences in characters of the wings and genitalic and tergal morphology. Morphological terminology follows Johnson (1976, 1988a, 1989a, b) and Johnson & Matusik (1988). These butterflies are termed "Elfin"-like because they superficially resemble Nearctic taxa which have taken that common name (Brown 1942, Pyle 1981).

Characters of wing, genitalic and tergal morphology in *culminicola*-group members were included in a data matrix for PAUP and compared with characters of the Callophryina and its sister-group (Appendix 2). To summarize, *Penaincisalia* taxa share a number of structural characters with other members of the callophryine sister-group listed in Appendix 1. Appendix 2 enumerates characters placing *Penaincisalia* within the morphological ground plan of the callophryine sister-group and compares these with characters of true callophryines.

For diagnostic purposes members of *Penaincisalia* are most easily distinguished by salient autapomorphies of the external secondary sexual markings in males and the genital cervix bursae in females. Males are unique among the Eumaeini in exhibiting a forewing androconial patch at the juncture of the discal cell and vein M3 in addition to the androconial "brand" (Eliot 1973) typically occurring in many eumaeines at the distal juncture of costal and cross veins of the discal cell. Sclerotinal modification of the cervix bursae exceeds that reported in any other eumaeine group; expanse of distal sclerotization of the corpus bursae often equals half the length of the ductus bursae (Figs. 1, 4–6, 8, 9).

Because these distinctions have not been previously noted, members of *Penaincisalia* have historically been confused with many other eumaeine groups. This resulted because, compared to tailed hairstreak butterflies (which exhibit spotted and banded under surface patterns), the mottled under surface patterns in generally tailless elfin butterflies were long considered an important unifying character (Brown 1942, Gillham 1956). However, these wing patterns are homoplasious, occurring in some but not all callophryines, some members of the sister-group (Appendix 1) and numerous other Theclinae (e.g., Palaearctic *Ahlbergia* Bryk, Oriental *Orthomiella* de Nicéville and various Neotropical "*Thecla*" species). Because many of these butterflies also display upper surface iridescence (usually blue or lavender), and male forewing brands, there has been further confusion.

In addition to these diagnostic features, *Penaincisalia* share additional characters. Though less diagnostic because of the structural variety within the outgroups, male genitalia of *Penaincisalia* are also distinctive, with many elements (aedeagus, valvae, vinculum and saccus [Figs. 1, 4–6, 8, 9]) diminutive compared to elaborate counterparts in callophryine and sister-group taxa. With these remarks

as historical background, *Penaincisalia* and its member taxa can be readily characterized.

Materials and Institutional Abbreviations.—Specimens were studied from the Allyn Museum of Entomology, Florida Museum of Natural History (AME); American Museum of Natural History (AMNH); British Museum (Natural History) (BM[NH]); Carnegie Museum of Natural History (CMNH); Central Entomological Collection, University of Chile (CECUC); Instituto Zoologia, Fundacion Miguel Lillo (IML); Museum National d'Histoire Naturelle (MNHN); University of California, Davis (UCD) and Zoologische Museum der Humboldt Universität zu Berlin (ZMH). Specimens from private collections of Carmela Achohido (Lima, Peru), Henri Descimon (Marseille, France) and J. Bolling Sullivan III (Beaufort, North Carolina, USA) were studied and deposited at AMNH.

TAXONOMY

Penaincisalia Johnson, NEW GENUS

Figs. 1–9

Penaincisalia Johnson: Bridges 1988: I.9 (*nomen nudum* citation referring to this paper).

Type Species.—*Thecla culminicola* Staudinger (1894) (Fig. 1) [junior synonym *T. alatus* Druce (1907), Figs. 2, 4].

Description.—*Adult.* Figs. 1, 2, 3, 7. Head with frons profusely hairy, generally fuscous. Thorax and abdomen hairy at junctures, tagmata often powdered blue, lavender or orange when structural wing color present. Eye outline prominently white. Third segment of male palpi relatively short and centrally produced, ratio of third to second segments generally 0.4 ($n = 36$) in males, 0.6 ($n = 21$) in females. Forewing base/apex length short, generally 10.0–14.0 mm, maximally 15.0 mm. Structural color prominent on most upper surfaces in males, lighter to absent in females. Forewings each with two androconial brands on males. Hindwings generally without tails (one exception). Ground colors on lower surfaces of wings brown, gray or ochre, in typically mottled, hoary patterns. Forewing with prominent postmedial band; hindwing with mottled, lunular medial band usually separating darker base ("basal disc") from lighter distal ground. Hindwing submargins often with spots, blotches, or crescents. Wing fringes sometimes checkered with alternately colored veins and interspaces. Male genitalia (Figs. 1, 4–6, 8, 9) with valval lobes (Fig. 4A) basally detached, caudal extension length (Fig. 4A) usually not exceeding curvature of falces; vinculum cephaloventrally distended to short saccus (length circa one-third caudal expanse of valval bilobes). Aedeagus short, robust (length less than expanse of genitalia from saccus tip to uncus); caecum elongate at least two-fifths of aedeagal length. Brush organs loosely attached to septum adjoining vincular arc and posterior segment of the abdomen; brushes diminutive, barely extending from vinculum to labides base. Female genitalia (Figs. 4–6, 8, 9) with ductus bursae tubelike, terminating in variously expansive, bilobate lamellae. Cervix bursae with elaborate sclerotized sculpturing, forming distal hood on corpus bursae (hood diameter directly behind the corpus bursae hereafter as "height"). Ductus seminalis emanating from variously pronounced sclerotization at base of corpus bursae hood. Corpus bursae with two, spinelike, signa. Papillae anales lobate with terminus profusely spined; apophyses extending at least one-half ductal length.

Diagnosis.—Compared to all other Eumaeini: two androconial brands on each forewing of males (one at distal juncture of costal and cross veins of discal cell; another abutting juncture of cross vein and vein M3); male genitalia with cephaloventral distension of vinculum terminating in a very small saccus (expanse not exceeding ventral valval width) and with reduced valvae (length generally not exceeding falces); female genitalia with cervix bursae modified to an elaborately

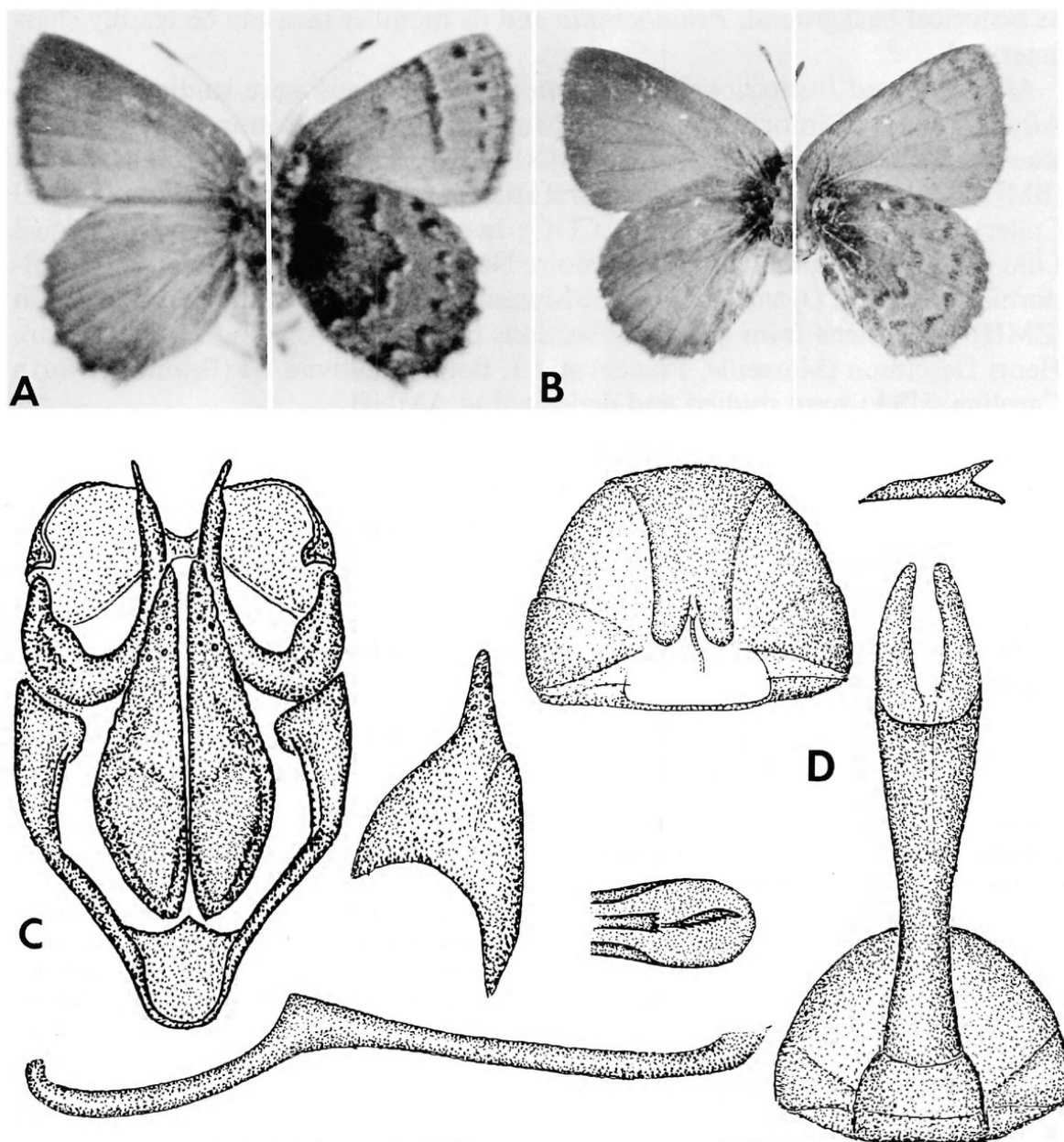


Figure 1. Characters of *Thecla culminicola*. A. lectotype male, ZMH (upper surface, left; lower surface, right). B. topotypical female, BM(NH) (same format). C. male genitalia, lectotype (format as standard to generic entries, Figure 3 forward). D. female genitalia, of B above.

sculptured distal hood on the corpus bursae. Small size (forewing base/apex 10.0–11.0 mm), generally tailless hindwings and hoary and/or mottled wing under surfaces also typify the genus but also occur in certain other Eumaeini (see above and remarks).

Biology.—*Early Stages:* Unknown. *Foodplants:* Unknown. *Ecology:* *Penaincisalia* species have been reported from high Andean paramo habitats (Draudt 1919; Brown 1941, 1942; Descimon 1986; F. Brown, H. Descimon, R. Eisele, J. Herrera, J. Rawlins, A. Shapiro, J. Sullivan, personal communications). Brown (1942) defined the paramo habitat for Ecuadorian butterflies as comprising altitudes of 3300–3900 m to snowline (4500–4900 m, depending on local conditions) and a mean annual temperature of 0–3° C. He also noted that faunal zone as-

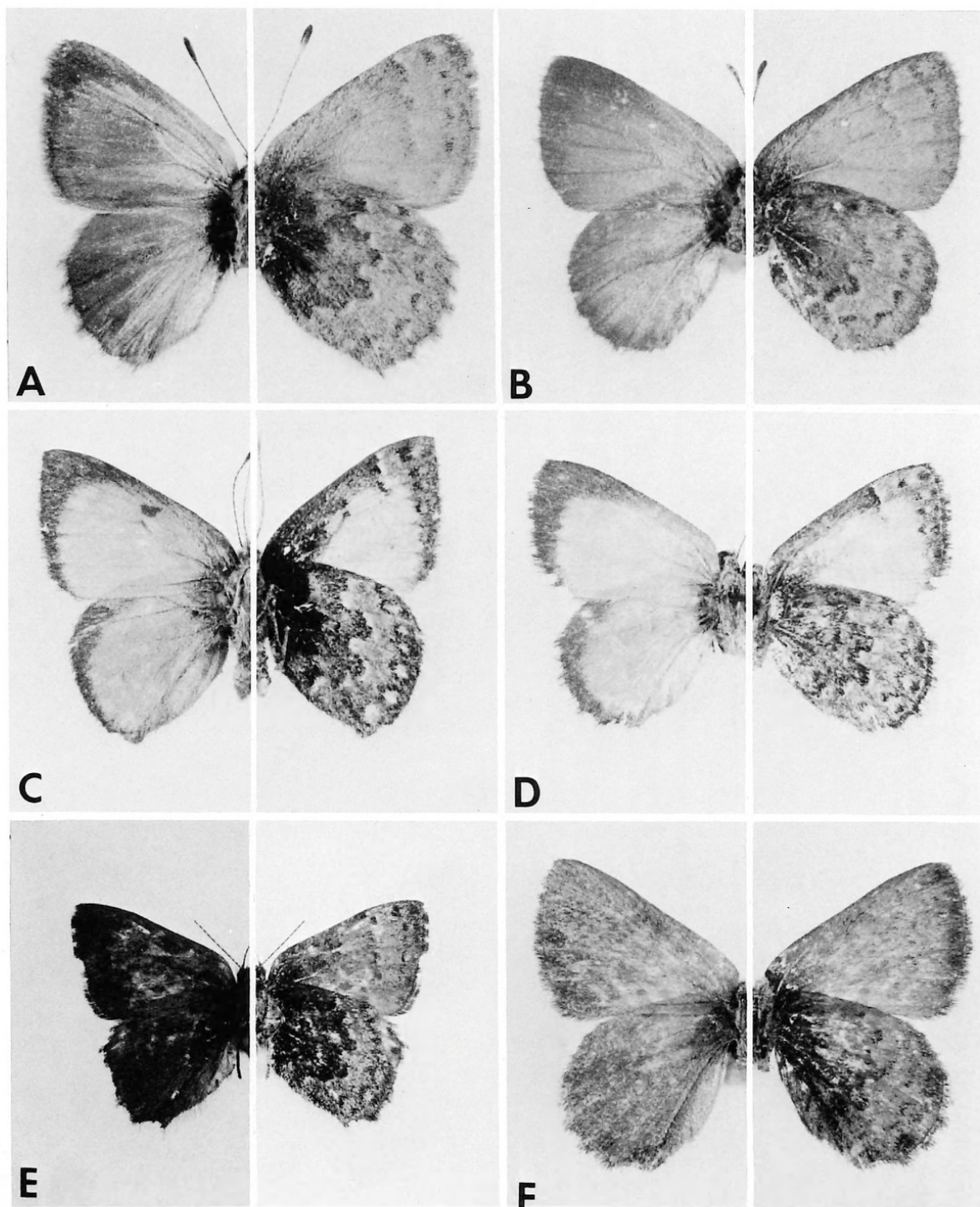


Figure 2. Adults of *Penaincisalia*, *culminicola*-group (upper surface, left; lower surface, right). A. *P. culminicola* male (Oroya, Peru, 19 Jul 1914, AMNH); B. *P. culminicola* female (Oroya, Peru, 28 Jul 1914, AMNH); C. *P. aurulenta*, holotype male; D. *P. aurulenta*, allotype female; E. *P. caudata*, holotype male (tail broken off on wing figured); F. *P. oribata* female (Corque, Bolivia, AMNH).

signment for insects is often in "sharp disagreement" with those that might be listed for other animal groups. Study of collecting data from Brown and others (Brown 1941, Pallister 1956) indicates *Penaincisalia* also inhabit temperature zone biomes adjacent to, and at altitudes slightly below, paramo (2700–2900 m to 3300–3900 m, 3–12° C [Brown 1942]). Some of these areas are now utilized for agriculture but apparently not to the detriment of the butterflies. In fact, apparently

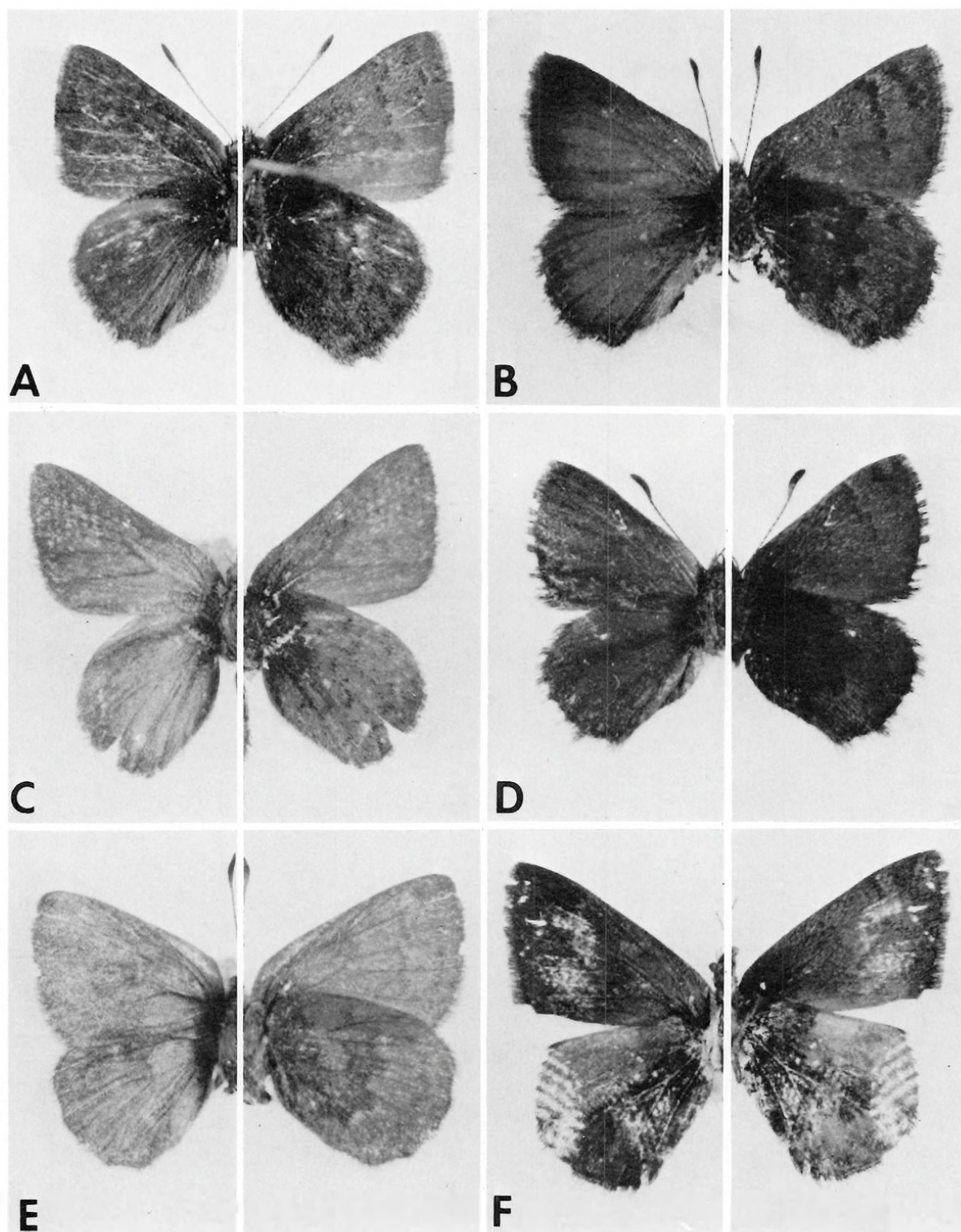


Figure 3. Adults of *Penaincisalia*, *culminicola*-group (upper surface, left; lower surface, right). A. *P. downeyi*, holotype male; B. *P. anosma* female; C. *P. rawlinsi*, holotype male; D. *P. pichincha*, holotype female; E. *P. descimoni*, holotype male; F. *P. patagonaevaga*, holotype male.

certain *Penaincisalia* have increased populations in some agricultural areas (see *P. penai*). Recent collections by H. Descimon indicate species of *Penaincisalia* occur in high montane elfin forest; collections by J. Herrera indicate occurrence in Patagonian scrub-steppe (see *Distribution* and *Remarks* in individual species entries below).

Distribution. — *Spatial* (Fig. 10): generally high Andean (to 5150 m) in disjunct

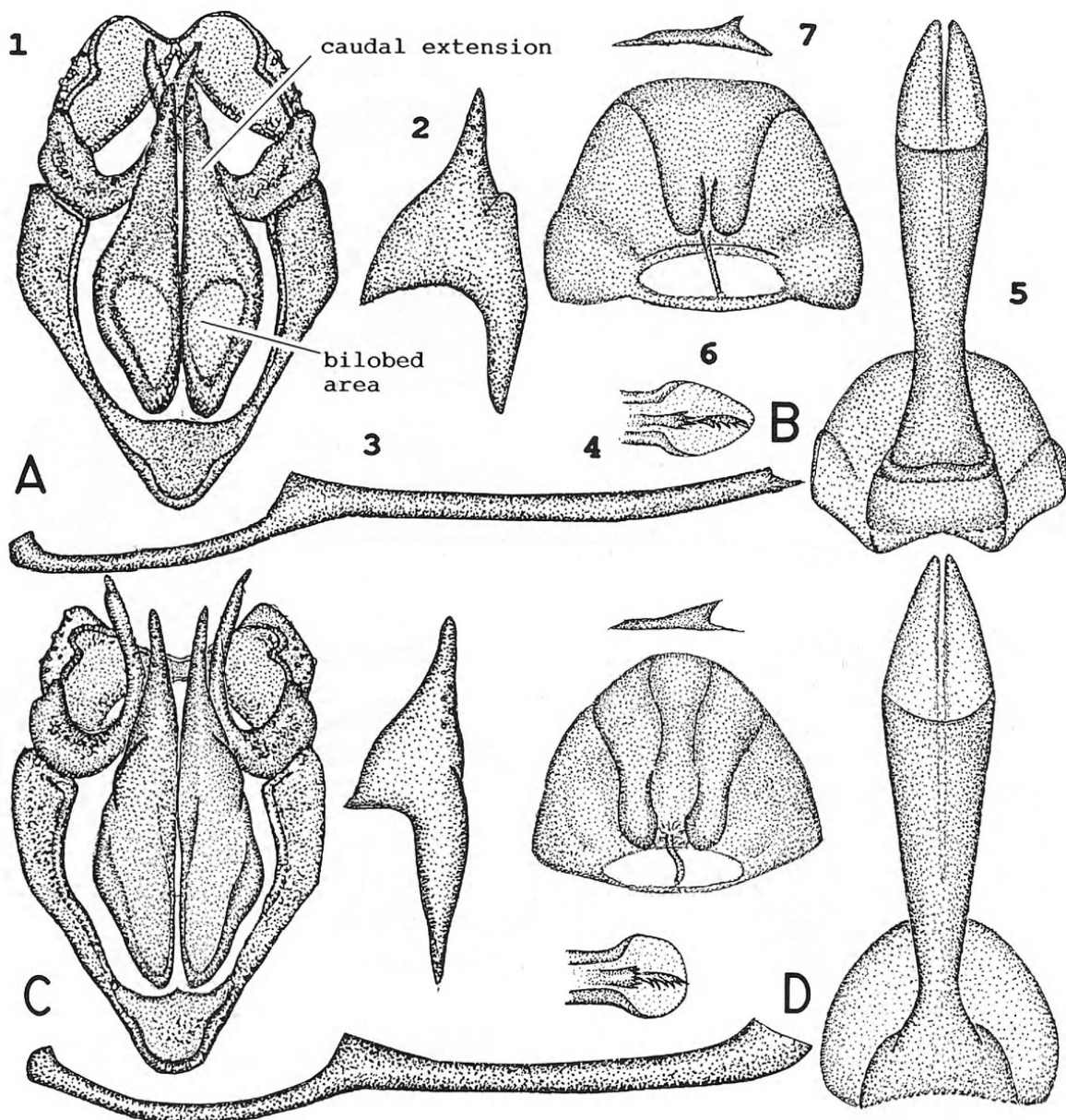


Figure 4. Genitalia of *Penaincisalia*, *culminicola*-group (format: male [A, C]—1, ventral view of genitalia with aedeagus removed; 2, lateral view of valvae; 3, lateral view of aedeagus; 4, ventral view of aedeagal terminus and cornuti; female [B, D]—5, ventral view of genitalia [cervix bursae rounded element in background]; 6, detail of cervix bursae; 7, lateral view, signum). A. *P. culminicola*, holotype male of *Thecla alatus*; B. *P. culminicola* female of Figure 1 (female of “*alatus*”); C. *P. aurulenta* holotype male; D. *P. aurulenta* allotype female.

populations from Colombia south through Bolivia and in Patagonia at altitudes ranging down to 700 m. In Fig. 10, localities with questionable spellings or identities follow Brown (1941) and IDBGN (1968). Figure 10 uses large symbols because of high species diversity, imprecise data and high frequency of synchrony and sympatry; localities generally are close to the center of the symbols. Sparse samples of *Penaincisalia* reflect inadequate collecting; consequently I do not speculate about the biogeography of the group. *Temporal*: a generalized flight period of at least October through July, along with marked synchrony, is recognizable from sparse specimen data but seasonality is often undiscernable. When data

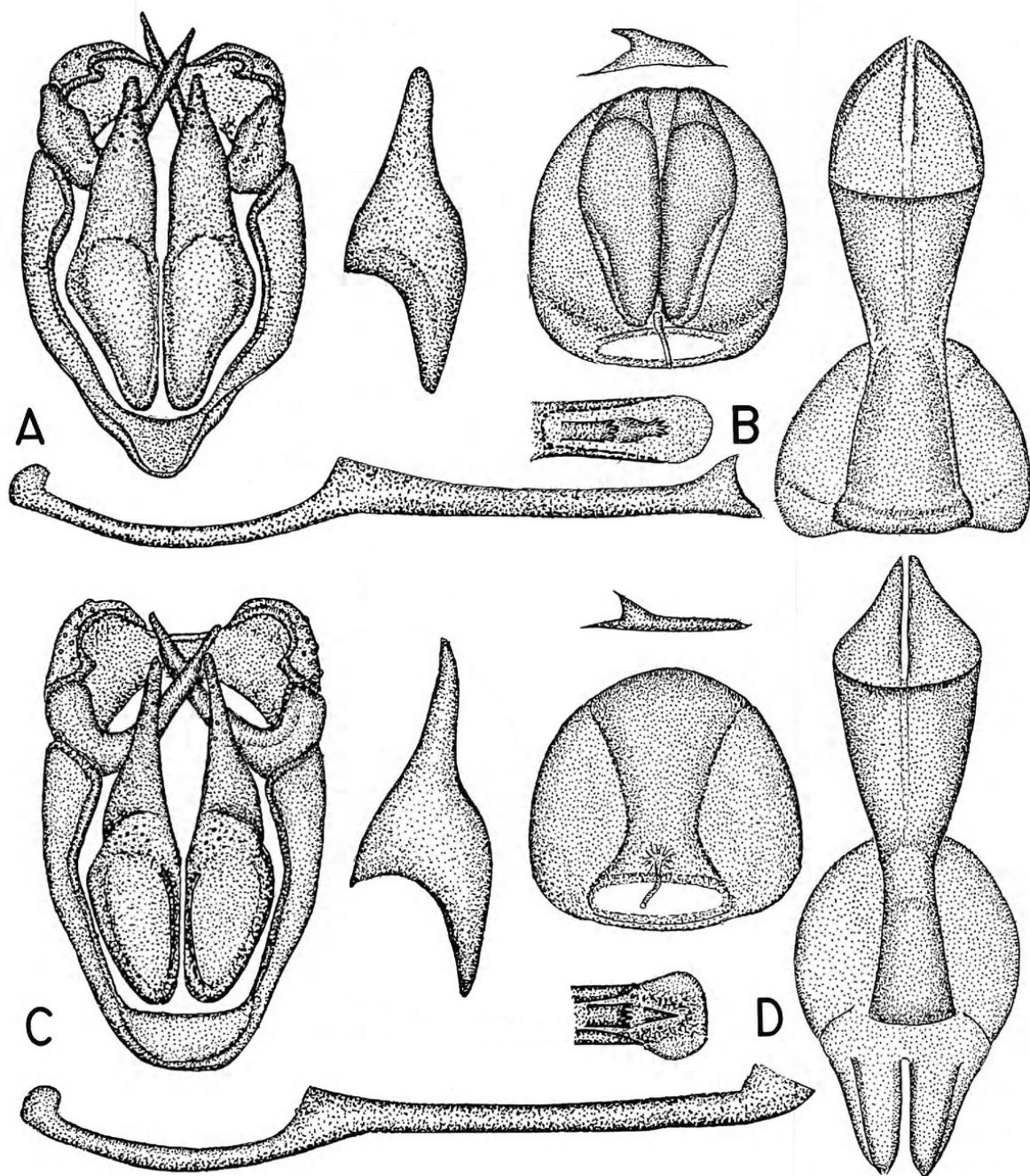


Figure 5. Genitalia of *Penaincisalia*, *culminicola*-group (format as in Figure 4). A. *P. caudata*, holotype male; B. *P. oribata* female of Figure 1; C. *P. downeyi*, holotype male; D. *P. anosma* female of Figure 2.

differentiate wet or dry season, or note occurrence in particularly nonseasonal biomes, these are noted under distribution with available dates.

Remarks.—Small size, lack of tails, and hoary and mottled under surface patterns cause *Penaincisalia* taxa to superficially resemble two callophryine genera (Nearctic *Incisalia*, Palearctic *Ahlbergia*) and one group of the callophryine sister-group (*arria*-group, Draudt 1919). Males of *Incisalia* and *Ahlbergia* have normal androconial brands; males of the *arria*-group lack androconial brands. Structural characters of *Incisalia* and *Ahlbergia* are typically callophryine (Appendix 2). The *arria*-group differs from the rest of the callophryine sister-group by having ex-

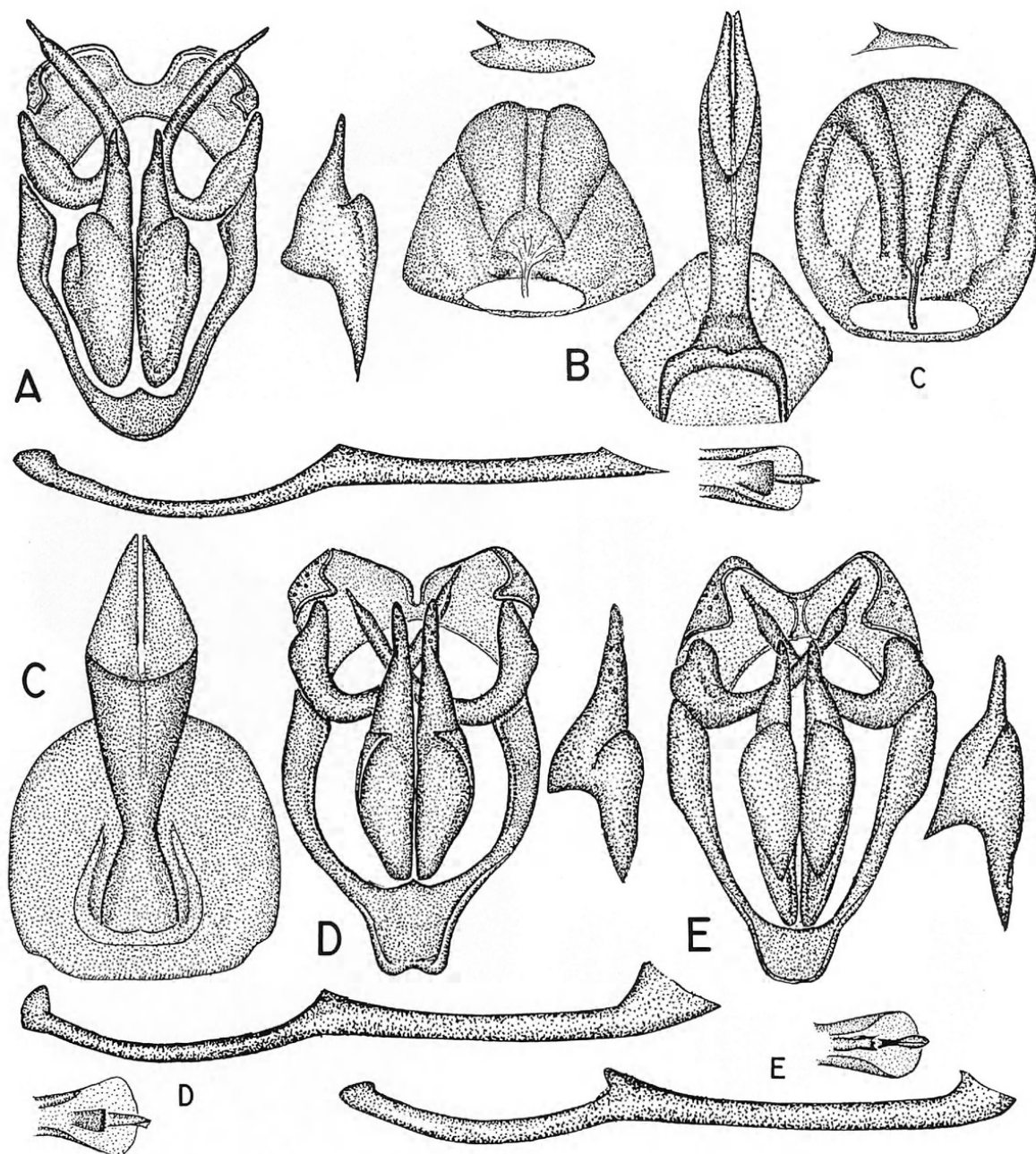


Figure 6. Genitalia of *Penaincisalia*, *culminicola*-group (format as in Figure 4). A. *P. rawlini*, holotype male; B. *P. rawlini*, allotype female; C. *P. pichincha*, holotype female (small C, cervix bursae and signum); D. *P. descimoni*, holotype male (small D, aedeagus); E. *P. patagonaevaga*, holotype male (small E, aedeagus).

traordinarily produced valval termini in the male genitalia and expansive antler-shaped modifications of the terminal lamellae in female genitalia; this group is being characterized elsewhere (Johnson et al. in press, unpublished data).

Penaincisalia are readily divided into two groups based on structural attributes and generalized wing characters. These groups, here defined, are: the *culminicola*-group (including *alatus* of historical usage) characterized by rounded hindwings, and the *penai*-group, characterized by more elongate anal hindwing lobes and rufous upper surface markings in the titular species. All *Penaincisalia* have distinctive male and female genitalic characters and wing patterns.

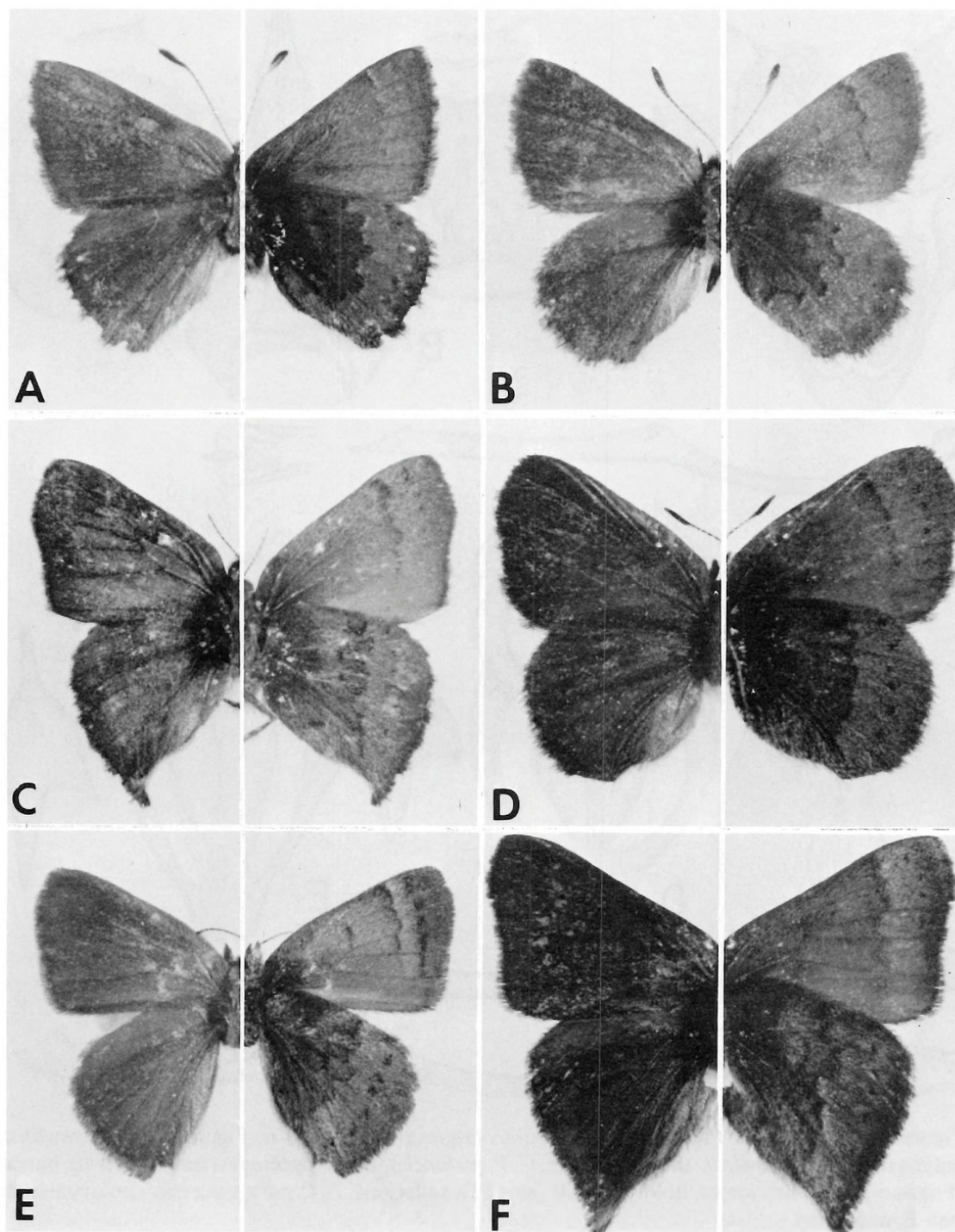


Figure 7. Adults of *Penaincisalia*, *penai*-group (upper surface, left; lower surface, right). A. *P. penai*, holotype male; B. *P. penai*, allotype female; C. *P. candor* male (Cuicocha, Ecuador, 31 May 1939, AMNH); D. *P. candor* female (El Tabano, Colombia, 1 Jul 1981, AMNH) (anal lobe broken on wing figured); E. *P. bimediana*, holotype female (anal lobe broken on wing figured); F. *Thecla amatista* Dognin (Hda. Talahua, Ecuador, 4 May 1939, AMNH).

Etymology. — The generic name is consistent with Johnson (1981 [unpublished for nomenclatural purposes]) and cited *nomen nudum* by Bridges (1988). Bridges used the generic name only as a nonbinomial (in his species index, section I) and not formally in binomials of his taxa lists (section II, p. 109) where he combines all species with *Thecla*. Therefore, I consider all combinations herein as new. The

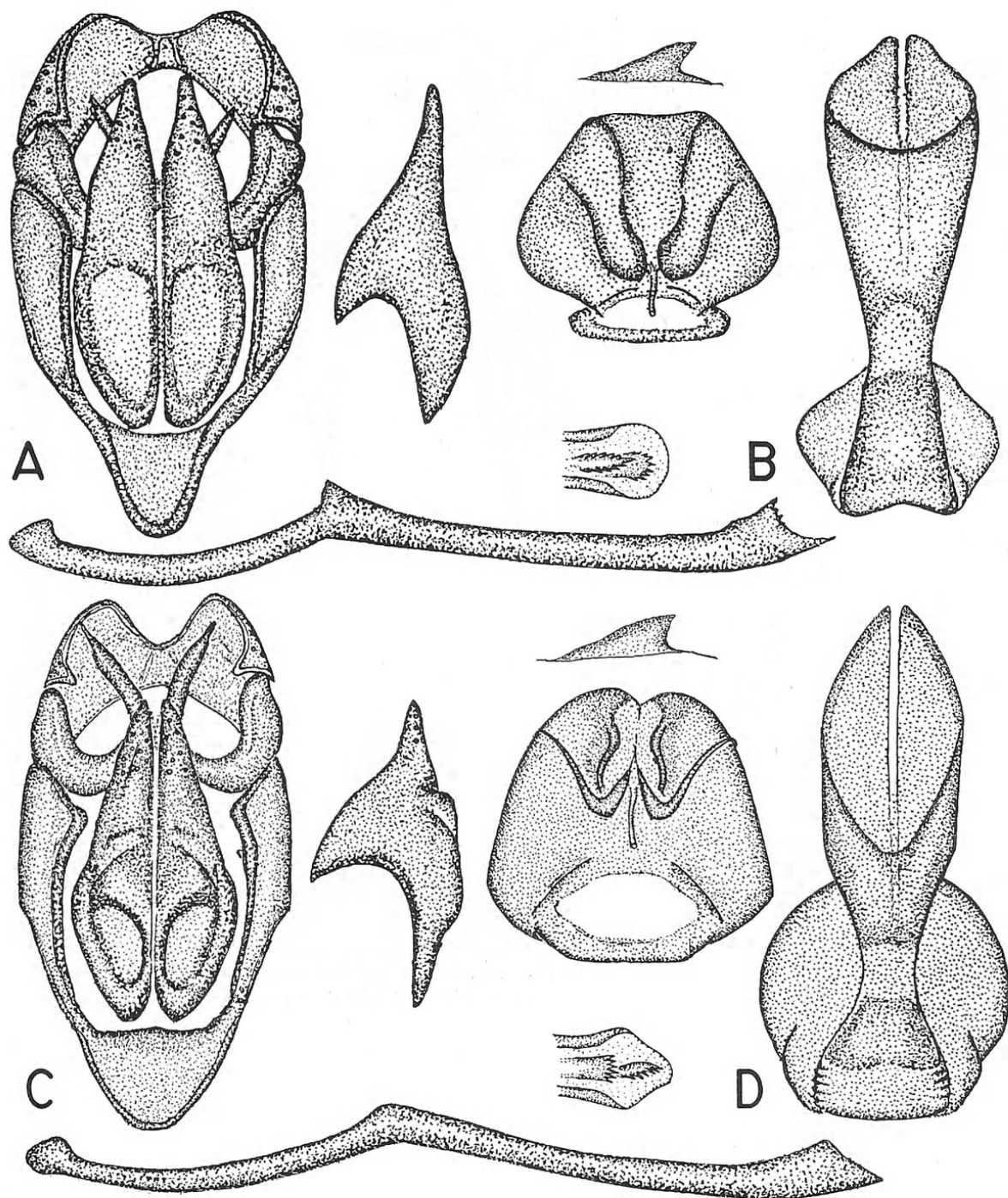


Figure 8. Genitalia of *Penaincisalia*, *penai*-group (format as in Figure 4). A. *P. penai*, holotype male; D. *P. penai*, allotype female; C. *P. candor*, holotype male; D. *P. candor* female of Figure 6.

prefix *Pena-e* (Latin for beside or near) is added to *Incisalia*, denoting the superficial resemblance of Nearctic and Neotropical elfins, and is feminine.

The *Culminicola*-Group

Hindwing anal margin rounded (without prominent anal lobe); upper surface structural colors blue, violet or orange (all species lacking rufous limbal coloration characterizing certain taxa of *penai*-group); mottled lower surface patterns with



Figure 10. Geographic distributions of *Penaincisalia* species in Andean regions of South America (see distribution remarks under generic entry and remarks under *P. culminicola*).

153, fig. g; Comstock & Huntington 1958–1964 [1959]: 65; Lamas 1977: 71 (as “*Thecla*”); Bridges 1988: II.109. NEW SYNONYMY.
 [*Incisalia*] *alatus*: Brown 1942: 1 (included categorically taxa of Draudt’s *culminicola*-group in *Incisalia*); Gillham 1956: 145 (regarded *Incisalia* as Holarctic).

[*Penaincisalia*] *alatus*: Bridges 1988: I.95 (nonbinomial combination in index, genus as *nomen nudum*).

Types.—*Lectotype*, male (Fig. 1), two paralectotype males (ZMH). Lectotype labelled "designated lectotype K. Johnson, Pan-Pac Entomol. 1990" and "syn-type", "origin", "*culminicola* Staud.", "Huallatani, Bolivia., 5000 m [sic, original description says 4–5000 m], 92 Garlepp, culminicula [sic] Stgr." Paralectotypes, same data plus "designated paralectotype". *Thecla alatus*, holotype male (BM[NH]) (Fig. 4A). *Type Localities*: nominate—BOLIVIA. Huallatani, 4–5000 m; *T. alatus*—PERU. Cajamarca Province (northern Peru), 3800 m.

Description.—*Male*. Head, thorax, abdomen, palpi and forewing androconial brands typical of genus. Wings: upper surface ground color bright iridescent lavender blue, narrow area of the margins and wing apices fuscous, edges accented by checkered fringe; lower surface ground colors variegated brown and tawny, mottled and suffused with dark brown and gray; forewing with broken postmedial line, costa to vein CuA2 (ground basad of line heavily suffused brown to gray, distad more immaculate tawny to yellow), apex of margin with dark gray and brown blotches in each cell; hindwing basal disc darkly hoary, surrounded distally by lunular, medial line (basally black, distally tawny to gray), distal wing areas lighter tawny or yellow, submargin with brown blotches in each cell. Forewing length: 10.0–14.5 mm. Genitalia (Figs. 1C, 4A): ventral surface of valvae rhomboid shaped, pronounced bilobed area and terminal caudal extension both evenly tapered; vinculum robust, saccus lobate with rounded margin; aedeagus robust, length exceeding rest of genitalia by one-third to three-fifths, caecum about one-third aedeagal length and displaced laterally from plane of aedeagal shaft. *Female*. Head, thorax, abdomen and palpi typical of genus. Wings: upper surface ground color dull brown, suffused with dull light blue; lower surface of wings similar to males but duller, profuse brown and gray suffusions sometimes obscuring pattern. Forewing length: 11.0–14.5 mm. Genitalia (Figs. 1D, 4B): ductus bursae narrow, central area only slightly constricted, width of cephalic elements often exceeding terminus, terminus with paired, elliptical, lamellae; cervix bursae with hood relatively small (height one-third to two-fifths ductal length), sculptured by lateral ridges, raised central area invaginating near ductus seminalis; each signum elongate basally, with short, inwardly directed, spine.

Diagnosis.—Males iridescent lavender blue over entire wing upper surface, margins fuscous; females dull brown throughout, flushed with blue. Lower surface hoary, distinctly brown to yellow in cast, dark basal disc on hindwing ringed distally with a lunular band of brown or black spots.

Distribution.—*Spatial* (Fig. 10): disjunct high Andean localities in southern Ecuador, Peru and northwest Bolivia. *Temporal*: October to July.

Remarks.—In spite of nearly a century of historical usage distinguishing two divergent and familiar species of this group, *alatus* and *culminicola*, examination of syntypes of *T. culminicola* and the type of *T. alatus* indicates the types are the same species and share the facies historically attributed only to *alatus*. Consequently, hereafter the name *culminicola* subsumes the historical usage of *alatus* and the new name, *penai*, must be applied to the specimens historically called "*culminicola*." Previously, because the types of *culminicola* could not be located (Johnson 1981; Johnson & Matusik 1987a, b), Johnson (1981) contemplated a neotype; this unpublished paper, however, has no status under the ICZN and is not needed. The syntypes were located in 1989 (L. D. Miller, personal communication) and the lectotype forwarded to me for examination (Fig. 1A, C).

Differences in morphology of *P. culminicola* are limited to some specimens being more or less robust than the type and topotypical females (Fig. 1B, D). There is variation in wing ground color hues, including gray, brown or ochre tints, depending on the population. Bolivian specimens of true *culminicola* are duller

blue on the wing upper surfaces and generally more ochre beneath than northern Andean populations (see Draudt 1919) (Figs. 1, 2). This appears to have contributed to confusion about the names. An upper surface hindwing rufous patch distinguishes *P. penai* but this was overlooked previously. *P. culminicola* and *P. penai* (= historical *culminicola*) have been the most frequently collected members of the genus, though the new species *P. aurulenta* also has many recent records. The Ecuadorian distribution (Fig. 10) is construed from Brown's (1941) lists of localities visited by early field workers (see *Material Examined*).

Including types, 35 specimens of *P. culminicola* were examined; the types and all BM(NH) and AMNH specimen genitalia were dissected (AMNH specimens were also dissected for legs and palpi).

Material Examined. — BOLIVIA. Cochabamba, Yunga del Espiritu Santo, 1888–89, P. Germain, 1 female (BM[NH]); Huallatani, 4–5000 m, 1 female (ZMH); Illimani, 5150 m, O. Garlepp, 4 males (BM[NH]). ECUADOR. Andes of Ecuador, E. Whymper, 1 male (BM[NH]). PERU. Callanga, Cuzco, 1500 m, O. Garlepp, 1898, 2 males (ZMH); Abra Malaga, Cuzco, 4200 m, 14 Oct 1983, H. Descimon, 1 male (AMNH); Abra Malaga, Cusco [sic], 3 Jul 1984, S. Courtney and P. Stern, 1 female (UCD); [34 mi] E of La Aroya [sic, = Oroya?] on road to Tarma, 4200 m, 22 Jan 1975, P. Ehrlich, 1 female (AMNH); Oroya [12,178 ft.], 19 Jul 1914, H. Parrish, 3 males (AMNH) (Fig. 2A); Oroya, 28 Jul 1914, H. Parrish, 1 female (AMNH) (Fig. 2B); Sacsayhuaman, Cuzco, 12 Apr 1971, J. Herrera, 6 males, 5 females (AME); Callanga, Cuzco, Paramo, 1500 m, 1899, O. Garlepp, 1 male (BM[NH]); San Mateo, 3600–4000 m, 30 Nov 1898, dry season, Simons, 1 male (BM[NH]); Orongo, 22 Jul 1914, 1 female (BM[NH]); Catamarca [sic, = Cajamarca?], 3485 m, 1 male (BM[NH]); Cordillera Blanca, Cajamarca, 1 male, 1 female (MNHN). See *Types* above.

Penaincisalia aurulenta Johnson, NEW SPECIES

Figs. 2C, 2D, 4C, 4D

Types. — *Holotype*, male; *allotype*, female (Figs. 2C, 2D, 3C, 3D) deposited AMNH, data: PERU. Carhuas, Cordillera Blanca, 4900 m, C. Achohido. *Paratypes*. PERU. Laguna Peron, Cordillera Blanca, nr Caraz, 28 Jul 1980, 1850 m, H. Descimon, 1 female (AMNH); Huancayo, 4 Aug 1973, H. Descimon, 4 males, 2 females (AMNH); Paramo, Corongo, 30 Nov 1899, 1 male (BM[NH]); Quebrada Monda Base Camp, Ancash Province, 9 Jul 1979, Gibby & Barrett, 1 male (BM[NH]); Paramoa [sic], 4 Dec 1899, at snow line, 4200 m, Simons, 1 male (BM[NH]); Paramo, Adams Bequest, 1 male (BM[NH]); Paramo, Coronga Prov., 3600–4000 m, 30 Nov 1898, dry season, Simons, 1 male (BM[NH]).

Description. — *Male*. Head, thorax, abdomen, palpi and forewing androconial brands typical of genus. Wings: upper surface ground color bright iridescent orange, forewing costal, marginal and submarginal borders fuscous, hindwing borders sometimes suffused fuscous to the medial area; lower surface ground color bright buff to yellow, forewing margins and apices widely mottled brown and yellow brown with light spots between the veins along outer margin; forewing postmedial line of six brown spots, costa to cell CuA2, discal cell with distal blackened slash; hindwing basal disc suffused vividly brown or black often broken by light yellow patches in postbasal area, distal ground color yellow, bordered by medial line of distorted yellow to orange crescents sometimes protruding basally into disc, submargin with dark chevrons in each cell, margin darkly suffused. Forewing length: 13.5 mm (holotype), paratypes 11.0–13.5 mm. Genitalia (Fig. 4C): valvae bilobes parabolic, joined to caudal extension with slight central keel, caudal extension gradually tapered to fingerlike termini; vinculum laterally produced, saccus lobate; aedeagus robust, length one-third to three-fifths longer than rest of genitalia, caecum about two-fifths aedeagal length. *Female*. Head, thorax, abdomen and palpi typical of genus. Wings: upper surface of wings marked as male but ground color flat yellow orange; lower surface of wings similar to males but suffused patterns often more reduced. Forewing length: 12.5 mm (allotype), paratypes 11.0–12.5 mm. Genitalia (Fig. 4D): ductus bursae conical, only slight cephalic constriction

caudad of the cervix bursae; cervix bursae hood ovate (height about two-fifths ductal length), sculptured with raised ridges proxad of the midline; each signum elongate basally, with a wide, inwardly directed, spine.

Diagnosis.—Upper surface of wings on both sexes brilliant orange (iridescent in males, flat in females) except for fuscous margins and apices. Lower surface with mottled and hoary patterns much like *P. culminicola* but with suffusions distinctly overcast with yellow and orange and forewing discal area brightly orange.

Distribution.—*Spatial* (Fig. 10): high montane localities in the Cordillera Blanca of Peru. *Temporal*: late November to early August; one specimen is marked "dry season".

Remarks.—Subsequent to the 1985 return of BM(NH) historical material, a dermestid infestation resulted in destruction of much of that material listed above (P. Ackery, J. Huxley, personal communications). Campbell Smith (BM[NH]) has since repaired a number of specimens from remaining parts. Fortunately, the species has been subsequently collected.

Genitalia of all known specimens were dissected and AMNH specimens were dissected for legs and palpi also.

Etymology.—The Latin name means orange or gold colored.

Penaincisalia caudata Johnson, NEW SPECIES

Figs. 2E, 5A

Types.—*Holotype*, male (Figs. 2E, 5A) deposited BM(NH), data: PERU. Cajamarca, 2800 m, Simons Collection. *Paratypes*. PERU. Cajamarca, 3800 m, O. Baron, ex Hamilton Druce Collection, 1 male (in poor condition, tails broken off) (BM[NH]).

Description.—*Male*. Head, thorax, abdomen, palpi and forewing androconial brands typical of genus. Wings: upper surface ground color dull iridescent lilac blue, somewhat orange suffused along hindwing anal margin, both wings with wide fuscous margins; lower surface ground color tan, heavily suffused brown, black basad of forewing postmedian line and hindwing medial band; forewing with checkered fringe, dark marginal border basally, dark submarginal blotches along veins, spot nearest apex along radial veins prominent and larger than others, postmedial band prominent, pronounced spot paralleling submarginal radius, prominent distal black spot at discal cell; hindwing accented by darkly suffused basal disc contiguous with dark suffusion of forewing, medial band wavy, basally black, distally white to tan, black chevrons submarginally or blotches over light tan ground, margin darkly suffused, short tail at vein CuA2 terminally. Forewing length: 10.5 mm (holotype). Genitalia (Fig. 5A): valvae ventrally produced, filling entire vincular area, bilobed areas constricted basally near indentation, caudal extension thickly tapered to blunt termini; saccus diminutive, lobate with rounded margin, robust where adjoining vinculum; aedeagus robust, length one-half to three-fifths longer than rest of genitalia, caecum about two-fifths aedeagal length, displaced laterally from plane of aedeagal shaft in dorsal or ventral view. *Female*. Unknown.

Diagnosis.—Differs from all *Penaincisalia* by having a short tail at terminus of the CuA2 vein of the hindwing (see *Remarks*). If the tails are broken, *P. caudata* can be distinguished by the upper surfaces of wings in males, which are iridescent lilac blue but with much wider fuscous borders than *P. culminicola* and *P. aurulenta*. The lower wing surfaces are most like these species but differ with a dark suffusion over a tan ground color, and a much darker area basad of the forewing postmedial line and the hindwing medial band.

Distribution.—*Spatial* (Fig. 10): known only from type locality. *Temporal*: unknown.

Remarks.—The occurrence of a *Penaincisalia* with short tails is not surprising; such occurrence varies in many eumaeine groups, occasionally within species (see *Strymon eurytulus* Hübner; Johnson et al. in press). Generalized lack of tails, however, is more common in high altitudinal groups (as in *Eiseliana*, Ajmat de Toledo 1978; unpublished data).

Etymology.—The name *caudata* is derived from Latin for tail.

Penaincisalia oribata (Weymer), NEW COMBINATION, STATUS REVISED
Figs. 2F, 5B

Thecla oribata Weymer 1890: 123, pl. 4. Comstock & Huntington 1958–1964 [1962]: 43. Bridges 1988: II.109.

Thecla anosma [not *anosma* Draudt 1919, see *Remarks*]: Draudt 1921: 823; Comstock & Huntington 1958–1964 [1962]: 43, [1959]: 72 (synonymy in error). [*Incisalia*] *oribata*: Brown 1942: 1 (included categorically taxa of Draudt's *culminicola*-group in *Incisalia*); Gillham 1956: 145 (regarded *Incisalia* as Holarctic).

[*Penaincisalia*] *oribata*: Bridges 1988: I.95 (nonbinomial combination in index, genus as *nomen nudum*).

Types.—*Holotype*, female (ZMH) (see *Remarks*). *Type Locality*: CHILE. Tacora, Bolivia [sic, extreme northern Chile, see *Remarks*].

Description.—*Male*. Unknown. *Female*. Head, thorax, abdomen and palpi typical of genus. Wings: edges accented by checkered fringe; upper surface ground color dull brown, base suffused cinnamon; lower surface mottled patterns reduced, ground color drab brown, heavily suffused gray, brown; forewing basad of postmedial area suffused gray brown, submargin with black spots from costa to vein CuA₂, margin suffused brown; hindwing basal disc suffused gray, edged with medial band of irregular black dots (edged distally white), submargin light tawny with small black dots in each cell, margin heavily suffused gray, brown. Forewing length: 11.0 mm (AMNH female). Genitalia (Fig. 5B): ductus bursae robust with little central constriction, cephalic and caudal ductal elements of about equal length, caudal terminus with widely parabolic lamellae; cervix bursae hood ovate (height about one-half ductal length) sculptured with two, centrally directed parallel ridges emanating from the point of attachment of the ductus seminalis; each signum basally broad, with thick, inwardly directed, spine.

Diagnosis.—Somewhat resembles *P. culminicola* but lower surface of wings is grayer with reduced mottled markings and submargins marked with black dots in each cell. The upper surface on the female is brown, not blue hued, and the female genitalia exhibit a robust ductus bursae and ovate cervix bursae hood.

Distribution.—*Spatial* (Fig. 10): known from two localities in extreme northern Chile and west central Bolivia. *Temporal*: unknown.

Remarks.—The type in the Zoologische Museum, Humboldt Universität, is assumed extant but Weymer material was badly damaged during World War II and specimens salvaged from a museum section exposed to the elements for a protracted post-War period have still not been thoroughly sorted and arranged (H. J. Hannemann, L. D. Miller, personal communications).

Draudt (1921: 823) substituted the name *oribata* Weymer for *Thecla anosma*, which he described as new (Draudt 1919: 760). This apparently resulted from the confusion about the facies of *T. anosma* (see *P. anosma*, below) and Comstock & Huntington (1958–1964 [1962]) took this to mean *anosma* was placed in synonymy. No statements of either authors included any discussion. Comparison of Draudt's figure of the *anosma* type (gender uncertain, see *P. anosma Remarks*)

and Weymer's figure of *oribata* suggests *anosma* and *oribata* are very different butterflies, as do the widely disjunct type localities (southern Bolivia and central Colombia). Tacora is a volcano located mostly in northern Chile and southern Peru. Other Theclinae are endemic to this immediate area (Johnson 1989b). Thus, *T. oribata* is likely to be a distinct species. Johnson (1981) contemplated a neotype for *T. oribata* but now this is unwarranted (see *P. culminicola* Remarks); the unpublished designation, along with the relevant restriction of the type locality (Bridges 1988), has no ICZN standing.

Material Examined.—BOLIVIA. Corque [west of Lake Poopo (south of Lake Titicaca) about 175 km SE of type locality], 1 female (AMNH) (Figs. 2F, 5B).

Penaincisalia downeyi Johnson, NEW SPECIES

Figs. 3A, 5C

Types.—*Holotype*, male (Figs. 3A, 5C) deposited MNHN, data: COLOMBIA. Monte Tolima, Central Cordillera, 4200 m, Fassl Collection. *Paratype*. COLOMBIA. Monte Tolima, Central Cordillera, 4500 m, 1920, Brabant Collection, 1 male (MNHN).

Description.—*Male*. Head, thorax, abdomen, palpi and forewing androconial brands typical of genus. Wings: upper surface ground color dark iridescent blue violet with broad fuscous apices and borders completely surrounding forewing androconial brands; lower surface ground color dark brown suffused black; forewing with vague black postmedial line, costa to cell CuA1; hindwing basal disc suffused black, edged with straight black line dividing disc from ochre distal ground, submargin with angled line of black blotches, occasional chevrons (straight from costal margin to limbal area, angled to anal lobe). Forewing length: 12.0 mm (holotype); paratype, 12.5 mm. Genitalia (Fig. 5C): valvae bilobed areas parabolic, caudal extension margin with raised sculptured keel, valvae termini steeply tapered, widely disjunct; saccus rectangular, thinly joining vinculum; aedeagus thin, length two-fifths longer than rest of genitalia, caecum about two-fifths aedeagal length.

Diagnosis.—On the lower surface of the hindwing the basal disc margin and adjacent medial band are nearly straight (perpendicular to inner wing margin and extending from costa to limbal area) and divide dark brown suffused basal ground from lighter ochre distal ground; the upper surface is dark iridescent blue violet with wide fuscous borders completely surrounding the forewing androconial brands. Termini of the male genital valvae are widely disjunct.

Distribution.—*Spatial* (Fig. 10): known only from type locality. *Temporal*: unknown.

Remarks.—Fassl Collection data are reputed as generally reliable (P. J. deVries, personal communication). These MNHN specimens are the only known representatives of *Penaincisalia* from this high mountain in the Colombian Central Cordillera.

Etymology.—Named for lycaenid specialist John C. Downey.

Penaincisalia anosma (Draudt), NEW COMBINATION, STATUS REVISED

Figs. 3B, 5D

Thecla anosma Draudt 1919: 760, pl. 153, fig. h; Comstock & Huntington 1958–1964 [1959]: 72. Bridges 1988: II.109.

Thecla oribata [not *oribata* Weymer 1890]: Draudt 1921: 823; Comstock & Huntington 1958–1964 [1959]: 72, [1962]: 43 (synonymy in error, see *Remarks*).

[*Incisalia*] *anosma*: Brown 1942: 1 (included categorically taxa of Draudt's *culminicola*-group in *Incisalia*); Gillham 1956: 145 (regarded *Incisalia* as Holarctic).

[*Penaincisalia*] *anosma*: Bridges 1988: I.95 (nonbinomial combination in index, genus as *nomen nudum*).

Types.—*Holotype* male, reported deposited at Museum of Natural History, Basel, Switzerland (MNHB) (Comstock & Huntington 1958–1964 [1959]) but not locatable there (H. Weiss, MNHB, personal communication 1980, see *Remarks*). *Type Locality*: COLOMBIA. Bogota, 3000 m.

Description.—*Male*. Known only from original figure; construed therefrom to resemble female described below but darker brown on wing upper surfaces and with androconial brands typical of genus (see *Remarks*). *Female*. Head, thorax, abdomen and palpi typical of genus. Wings: edges accented by checkered fringe; upper surface ground color auburn with wide (2 mm) black margins; lower surface ground color dark brown; forewing postmedial line lunular, black; hindwing basal disc dark chocolate brown edged with lunular black medial band, submargins lighter brown. Forewing bursae narrow in caudal two-fifths, terminus widely fluted to two pointed lamellae; cervix bursae hood ovate (height about one-half ductal length), ventrum with two cephalically directed lobes, dorsum sculptured with prominent fluted central ridge; each signum elongate basally, with short, inwardly directed, spine.

Diagnosis.—Wing upper surfaces on both sexes are warm auburn framed by wide (2 mm) black borders; lower surface basal disc is chocolate brown edged by black medial band and light brown distal ground. Female superficially resembles only *P. pichincha* but latter is distinguished by diminutive genital plate (ductus bursae length nearly equal to height of cervix bursae hood).

Distribution.—*Spatial* (Fig. 10): known only from two disjunct high montane areas of Colombia. *Temporal*: apparently July.

Remarks.—As noted above under *P. oribata*, *T. anosma* was described by Draudt (1919) and apparently placed in synonymy with *T. oribata* by him (Draudt 1921). The original description of *T. anosma* states the type is a male, has a short tail (not apparent in Draudt's figure) and no forewing androconial brands (see *T. oribata* *Remarks*). The description and/or figure discrepancies and often cryptic androconial brands in *Penaincisalia* (see *P. candor* *Remarks*) suggest some of Draudt's statements are inaccurate. A recently caught female (Fig. 3B and *Material Examined*) matches the original figure and is from a similar locality (high montane Colombia). It appears prudent to identify this female as *T. anosma*. I cannot locate the type of *T. anosma*; without a male specimen, creation of a neotype is inadvisable. Similarly, lacking more material, description of a new species from the recent female is unwarranted.

Material Examined.—COLOMBIA. El Tabano, Putumayo, 3300 m, 1 Jul 1981, J. Sullivan, 1 female (AMNH).

Penaincisalia rawlini Johnson, NEW SPECIES

Figs. 3C, 6A, 6B

Types.—*Holotype*, male (Figs. 3C, 6A, 6B), *allotype* female, deposited BM(NH), data: PERU. Pcapampa, Recuay, 3500 m, wet season, 20 Dec 1899, Simons Collection (see *Remarks*). *Paratype*. ECUADOR. Pichincha, Napo Pass, 10 km NW Papallacta, 3980 m, 10 Oct 1987, paramo habitat, Rawlins, Young & Davidson, 1 male (CMNH).

Description. — *Male.* Head, thorax, abdomen, palpi and forewing androconial brands typical of genus; brand near costa pronounced. Wings: upper surface ground color dark iridescent bronze, hued slightly blue, edged by wide (1.5 mm) fuscous border; lower surface ground color light ochre mottled with brown and black; forewing discal cell strewn with brown dots; hindwing basal disc and postbasal area with disordered brown and black patches, submargin strewn with brown dots. Forewing length: 11.0 mm (holotype), 9.5 mm (paratype). Genitalia (Fig. 6A): valve bilobed area basally parabolic, joined to caudal extension with greatly produced keel, caudal extension termini slightly hooked; saccus diminutive, hardly exceeding width of adjoining vinculum; aedeagus shaft extremely short, about equal in length to caecum. *Female.* Head, thorax, abdomen and palpi typical of genus. Wings: upper surface ground color brown; lower surface similar to males. Forewing length: 12.0 mm (allotype, see *Remarks*). Genitalia (Fig. 6B): ductus bursae and terminal bilobate lamellae narrow, ductus bursae slightly constricted at center with larger patch of transparent sclerotin; juncture of ductus bursae and cervix bursae with deeply incised, crescent-shaped, cephalic margin; cervix bursae hood ovate with two parallel central ridges (ductus seminalis emanating at swollen, partially sclerotized, basal aperture); each signum wide basally, with an elongate, inwardly directed, spine.

Diagnosis. — Wing upper surfaces iridescent bronze, slightly hued blue (not bright orange like *P. aurulenta* or lavender blue like *P. culminicola*), with wide (1.5 mm) fuscous borders and pronounced costal androconial brand. Lower surface ground color light ochre, strewn with disordered dark patches and dots in forewing discal cell and hindwing basal disc and submargin.

Distribution. — *Spatial* (Fig. 10): known from two disjunct high montane localities, respectively in Ecuador and Peru. *Temporal*: collection dates are October and December, holotype noted as "wet season"; J. E. Rawlins (personal communication) reports Ecuador locale is swampy grass/sedge biome with cold, damp conditions year round.

Remarks. — The allotype was destroyed by a dermestid infestation in the British Museum sometime after 1985 (J. Huxley, P. Ackery, personal communications); genitalic dissection remains. Lower surface of wings of the CMNH paratype is more boldly marked than holotype (see *P. pichincha* *Remarks*).

Etymology. — Named for John E. Rawlins, whose Carnegie Museum team collected the most recent specimen in 1987.

Penaincisalia pichincha Johnson, NEW SPECIES

Figs. 3D, 6C

Types. — *Holotype*, female (Figs. 3D, 6C) deposited CMNH, data: ECUADOR. Pichincha, Napo Pass, 10 km NW Papallacta, 3980 m, 10 Oct 1987, paramo habitat, Rawlins, Young & Davidson.

Description. — *Male.* Unknown. *Female.* Head, thorax, abdomen and palpi typical of genus. Wings: upper surface ground color uniformly dark brown, no other markings; lower surface ground color dark brown; forewing with chocolate brown postmedial band, costa to vein CuA1, basally blackened, distally suffused white; hindwing basal disc concolorous chocolate brown, crenate along distal margin, submarginal ground slightly lighter brown; margins suffused black, edged with black fringe. Forewing length: 10.0 mm (holotype). Genitalia (Fig. 6C): ductus bursae short (length barely exceeding height of cervix bursae hood), greatly constricted in cephalic one-third with caudal end widely fluted to two, parabolic, bilobed lamellae; cervix bursae with extremely large ovate hood, surface sculptured by produced margin and raised ridges proxad of midline and dorsad of ductus seminalis; each signum broad basally, with a short, inwardly directed, spine.

Diagnosis. — This species and *P. anosma* are dark brown on the wing upper surfaces, *P. pichincha* uniformly dark brown, *P. anosma* with light auburn framed by wide black borders. Both species lack upper surface rufous limbal coloration

typifying dull fuscous females of *P. penai*. *P. anosma* and *P. pichincha* differ radically in genitalia, *P. anosma* with ductus bursae length twice height of ventrally pronged cervix bursae hood, *P. pichincha* with uniquely short ductus bursae, length barely exceeding height of ovate cervix bursae hood.

Distribution.—*Spatial* (Fig. 10): known only from type locality. *Temporal*: known only from October type data and same, nonseasonal, biome as *P. rawlinsi*.

Remarks.—The holotype was taken at the same place and time as CMNH male of *P. rawlinsi*. Simultaneous field collection of specimens of several *Penaincisalia* is not unusual. Brown collected *P. penai*, *P. candor*, *P. bimediana* and *Thecla amatista* Dognin at the same time and place (see *Remarks* for those species), as did Descimon with *P. culminicola* and *P. aurulenta*. *P. caudata* is sympatric with *P. culminicola*, though allochronic. This suggests that *Penaincisalia* shows high diversity and low density. Currently, disjunct distributions suggest sampling error and wide ranges are probable.

Etymology.—Named for the type locality.

Penaincisalia descimoni Johnson, NEW SPECIES

Figs. 3E, 6D

Types.—*Holotype*, male (Figs. 3E, 6D) deposited AMNH, data: PERU. Quebrada Pachaesto, nr Catac, Cordillera Blanca, 4200 m, elfin forest, 16 Jul 1986, H. Descimon.

Description.—*Male*. Head, thorax, abdomen, palpi and forewing androconial brands typical of genus. Wings: upper surface ground color fuscous except for dull iridescent lilac blue at forewing base and across hindwings; lower surface ground color dusty gray; forewing without pattern except slightly suffused postmedial band, costa to cell CuA₂; hindwing with distally incised dark gray basal disc, submargins marked with slightly lighter ground. Forewing length: 11.0 mm (holotype). Genitalia (Fig. 6D): valvae bilobed areas gradually tapered to parabolic margin and junctured to caudal extensions with slight rim, caudal extensions tapered to fingerlike termini; vinculum rather ovate with saccus basally indented; aedeagus length about two-fifths longer than rest of genitalia, terminus of shaft and margins of caecum produced.

Diagnosis.—Upper surface iridescent on the male is limited to dull lilac color across the hindwing and at the forewing base; forewing fuscous encompasses both androconial brands. The lower surface ground color is dusty gray, devoid of pattern except darker gray suffusion of the hindwing basal disc.

Distribution.—*Spatial* (Fig. 10): known only from type locality. *Temporal*: known only from July type data.

Remarks.—Descimon (personal communication) notes the type locality is elfin forest known for highly insular, relict Bromeliaceae (*Puya* sp., *Raimondia* sp.).

Etymology.—Named for Henri Descimon (Université de Provence, France), who collected the type.

Penaincisalia patagonaevaga Johnson, NEW SPECIES

Figs. 3F, 6E

Types.—*Holotype*, male (Fig. 3F, 6E) deposited CECUC, data: ARGENTINA. 40 km N Rio Mayo, Chubut Prov. (Patagonia), 20 Nov 1966, nr 700 m, J. Herrera.

Description.—*Male*. Head, thorax, abdomen, palpi and forewing androconial brands typical of genus. Wings: upper surface ground color iridescent lavender on entire forewing and hindwing cephalad of discal cell, rest of hindwing red brown; lower surface ground color tawny, forewing with postmedial

band from costa to cell CuA1 (basally suffused dark brown, distally cream); hindwing with dark brown basal disc, irregularly edged and extending distally to the postmedial area, submarginal ground color beige, margin with small brown dots in each cell. Forewing length: 11.0 mm (holotype). Genitalia (Fig. 6E): valvae ventrum extremely narrow with bilobed area steeply inclined and caudal extension abruptly and thinly tapered; vinculum ventrally distended with small, rectangular, saccus; aedeagus about two-fifths longer than rest of genitalia, shaft length exceeding caecum length by about one-fourth. *Female*. Unknown.

Diagnosis.—Upper surface iridescence and under surface basal disc unique among *Penaincisalia*: former occurring as bright lavender on entire forewing and cephalad of discal cell on hindwing, latter concolorous brown extending distally to the hindwing postmedial area. Male genitalia with ventrally distended vinculum and narrow valvae steeply inclined basally, with thin termini.

Distribution.—*Spatial* (Fig. 10): known only from type locality. *Temporal*: known only from November type data.

Remarks.—The type locality is some 2000 km disjunct from other *Penaincisalia*, possibly due to paucity of high montane sampling from Argentina southward. Endemism at type locality is suggested by fact that among Theclinae, except for *Strymon eurytulus*, sample was comprised wholly of undescribed taxa (see Johnson et al. in press).

Etymology.—The Latin name adds *vaga* (roamer) to Patagonia.

The *Penai*-group

Hindwing anal lobes pronounced, fringes concolorous red brown; upper surface structural colors violet red to maroon, hindwing with rufous limbal patch in titular species; lower surface ground color generally mottled red brown with lineal pattern elements. Genitalia more robust than in *culminicola*-group, particularly in male valvae and vinculum and female ductus bursae.

Penaincisalia penai Johnson, NEW SPECIES

Figs. 7A, 7B, 8A, 8B

Thecla culminicola [not Staudinger 1894]: 80, pl. 2, fig. 6. Weeks 1905: 28. Draudt 1919: 760, pl. 153, fig. g; Comstock & Huntington 1958–1964 [1959]: 198; Lamas 1977: 71 (as “*Thecla*”); Bridges 1988: II.109.

[*Incisalia*] *culminicola* [not Staudinger 1894]: Brown 1942: 1 (included categorically taxa of Draudt’s *culminicola*-group in *Incisalia*); Gillham 1956: 145 (regarded *Incisalia* as Holarctic).

[*Penaincisalia*] *culminicola* [not Staudinger 1894]: Bridges 1988: I.95 (nonbinomial combination in index, genus as *nomen nudum*).

Types.—*Holotype*, male; *allotype*, female (Figs. 7A, 7B, 8A, 8B) deposited AMNH, data: ECUADOR. Cuicocha, Imbabura, 3100–3500 m, 29 Apr 1939 to 31 May 1939, F. Brown. *Paratypes*. ECUADOR. Cuicocha, Imbabura, 3100–3500 m, 29 Apr 1939 to 31 May 1939, F. Brown, 12 males, 1 female (AMNH); Hda. Talahua, Bolivar, 3100 m, 4 May 1939, F. Brown, 1 male, 1 female (AMNH); Paramo Tinpulla, Cotapaxi, 3500 m, 6 Nov 1938, F. Brown, 1 male, 1 female (AMNH); Hda. San Rafael, Rio San Pedro, 2700 m, 5 Nov 1938, F. Brown, 1 male; Paramo Pasochoa, 3300 m, 12 Nov 1938, F. Brown, 1 male, 1 female (AMNH).

Description. — *Male.* Head, thorax, abdomen, palpi and forewing androconial brands typical of genus. Wings: upper surface ground color dark iridescent purple, narrow margin and wide area of forewing apices fuscous, hindwing limbal area bright rufous, fringe red brown; lower surface ground color rich maroon, sometimes lighter, suffused brown and red; forewing with thin, dark red brown postmedial line, costa to vein CuA2, marginal cells with dark red brown blotches; hindwing basal disc heavily suffused with dark red brown, bordered distally by dark brown medial band edged with white, submarginal ground lighter brown with dark red brown blotches in each cell. Forewing length: 11.0–14.0 mm. Genitalia (Fig. 8A): valvae ventrally robust, bilobed areas widely parabolic, caudal extension thickly tapered (some variation in length and robustness of caudal extension in this widespread species); vinculum laterally more pronounced and saccus more prominent than in most *Penaincisalia*; aedeagus robust, length about one-third longer than rest of genitalia, caecum about two-fifths aedeagal length. *Female.* Head, thorax, abdomen and palpi typical of genus. Wings: upper surface ground color dull brown, hindwing with outstanding limbal rufous patch; lower surface similar to males. Forewing length: 10.5–13.5 mm. Genitalia (Fig. 8B): ductus bursae robust, caudal end longer and more fluted than cephalic end, center constricted and only lightly sclerotized; terminal lamellae short, robust; cervix bursae hood small, trapezoidal (height equalling about one-third length of ductus bursae), hood surface sculptured with two prominent ridges proxad of midline and dorsad of ductus seminalis; each signum short, robust, with an inwardly directed spine.

Diagnosis. — Differs from all other *Penaincisalia* by a rufous limbal patch on the hindwing upper surface; upper surface ground otherwise dark iridescent purple in males, brown in females. Compared to other group members, hindwing anal lobe is less prominent and lower surface basal disc has more irregular distal margin.

Distribution. — *Spatial* (Fig. 10): known from high montane localities in Colombia, Ecuador, Peru and Bolivia. *Temporal*: specimen dates range from October to late May.

Remarks. — As noted, examination of the types of *Thecla culminicola* indicates they are not the familiar purple species historically associated with the name. Confusion probably originated because most workers have identified “culminicola” from areas other than Bolivia. Weeks (1905) misused the name, reporting specimens from Coroica and Cachabamba. The Cachabamba specimens of Germain at the British Museum of Natural History include both true *P. culminicola* and *P. penai* but Weeks may have thought they were “culminicola” and “alatus”. Draudt figured both “alatus” and “culminicola”, saw the type of the latter, and referred to the upper surface of “culminicola” as “deep violet” (Draudt 1919: 760). He cited wing fringe differences (which appear highly variable, particularly with wear) as the most notable distinction among specimens he had viewed. Draudt reported “culminicola” from Colombia (3500–4400 m) and Cuzco, Peru (3–4000 m), the latter a common locality for “true” *culminicola*. Brown (1942) believed that “culminicola” was the common purple species in Ecuador and widely reported it as such. His series from the American Museum of Natural History is designated here as types of *P. penai*. *P. penai* varies little, except for differences in ground color hues and the robustness of the genitalia.

Along with the type, 39 specimens of *P. penai* were examined; AMNH and BM(NH) specimens were dissected for genitalia, and AMNH specimens from the former were dissected also for legs and palpi.

Etymology. — This familiar species is named for Lucho Peña, an Andean lepidopterist.

Material Examined. — BOLIVIA. Bolivie, 2 males, 1 female (MNHN); Bolivie, 1 male (BM[NH]). ECUADOR. Andes of Ecuador, E. Whymper, 1 male, 1 female (BM[NH]); see *Types* above. PERU. Cuzco, 1 male, 1 female (MNHN); Cordillera Occidental, Andes, N Peru, 2 males (MNHN); Cayuma

Puente, Huanuco, 23 Oct 1946, J. Pallister, 1 male (AMNH); Ccapana Hacienda, Ocongate, Cuzco, 3333 m, 6–12 Apr 1947, J. Pallister, 1 male (AMNH).

Penaincisalia candor (Druce), NEW COMBINATION

Figs. 7C, 7D, 8C, 8D

Thecla candor Druce 1907: 578, pl. 33, fig. 1. Comstock & Huntington 1958–1964 [1959]: 174; Bridges 1988: I.69.

Thecla candar [sic]: Dyar 1913: 636 (misspelling).

Thecla amatista [not *amatista* Dognin 1895]: Druce 1909: 433; Bridges 1988: I.69, II.104 (synonymy in error, see *Remarks*).

Type.—*Holotype*, male, BM(NH) (Fig. 8A). *Type Locality*: PERU. Huanca-bamba, 1818–3030 m.

Description.—*Male*. Head, thorax, abdomen, palpi and androconial brands typical of genus. Wings: upper surface ground color deep violet red, apices and margins fuscous, hindwing anal lobes elongate and suffused rufous; lower surface ground color of both wings divided into darker basal and lighter distal shades by bold postdiscal line (often less prominent on forewing); forewing with submarginal line of dark brown dashes, costa to cell CuA₁; hindwing with similar line, costa to anal lobe on hindwing, basal disc mottled and suffused darker brown particularly along distal margin. Forewing length: 13.0–14.5 mm. Genitalia (Fig. 8C): labides, vinculum and saccus rather elliptical, latter very broad for *Penaincisalia*; valvae robust, bilobed area prominently sculptured, caudal extension thickly tapered; aedeagus length two-fifths longer than rest of genitalia, caecum about two-fifths aedeagal length. *Female*. Head, thorax, abdomen and palpi typical of genus. Wings: upper surface similar to males but flat purple with fuscous margins and less angular hindwing; lower surface similar to males. Forewing length: 13.0–14.5 mm. Genitalia (Fig. 8D): ductus bursae emphatically angled (central area greatly constricted between bulbous cephalic end and ellipsoid caudal end), lamellar lobes widely parallel; cervix bursae hood hemispherical (height equalling or slightly exceeding half ductal bursae length), hood complexly sculptured over dorsocaudal surface to point of attachment of ductus seminalis; each signum elongate basally with short, inwardly directed, spine.

Diagnosis.—Compared to all other *Penaincisalia*: hindwing anal lobes markedly elongate, male upper surface darker iridescent violet red. Compared to other group members: both sexes lacking upper surface rufous patch of *P. penai*, females dull iridescent violet (not brown), lower surface of wings with single, elongate, medial band directed straight from inner margin to anal area (not rounded about basal disc as in *P. penai* or with two bands as in *P. bimediana*).

Compared to small taxa of *loxurina*-group with elongate hindwing anal lobes and similar wing pattern (particularly, *Thecla amatista* Dognin [Fig. 7F, 9B, 9C]): males of *loxurina*-group have single androconial brand on each forewing (apex of costal vein of the discal cell), morphology of *loxurina*-group typified by elongate valvae in males and elongate ductus bursae in females with little or no modification of the cervix bursae (Fig. 9B, 9C).

Distribution.—*Spatial* (Fig. 10): known from several high montane localities in Colombia, Ecuador and Peru (see *Remarks*). *Temporal*: specimen dates range from January to July.

Remarks.—Druce (1909) synonymized *T. candor* with *T. amatista* but did not dissect the type and apparently did not examine its forewing androconial brands. Though these species are superficially similar, androconial brands and genitalia indicate the taxa are not congeneric (Figs. 8C, 8D, 9B, 9C). *Thecla amatista* is usually much larger (forewings 14.5–16.0 mm, Figs. 7C, 7D, 7F). There are several undescribed species closely related to *T. amatista* with which *T. candor* can also

be confused. Consequently, *T. candor* may be more widely distributed than previously indicated. The majority of specimens that I examined and identified as *P. candor* prior to this study were either misidentified *T. amatista* or undescribed species closely related to it. Reliable identification of females requires dissection. Female genitalia of *T. amatista* lack the elaborately sclerotized cervix bursae typical of *Penaincisalia* (Fig. 9C). I have identified *T. amatista* from the type (BM[NH], Figs. 7F, 9B) and a series of seven males and one female, collected by F. M. Brown, at Hda. Talahua, Bolivar Prov., Ecuador, 3100 m, 4 May 1939 (where Brown also captured *P. candor*).

In addition to the types of *Thecla candor* and *T. amatista*, all BM(NH) and AMNH specimens of both species (listed above and below) were dissected; the AMNH specimens were also dissected for legs and palpi.

Material Examined.—COLOMBIA. Quasca, 1 male (BM[NH]); Quasca, Cordillera Oriental, 2900–3300 m, 30 Jan 1946, 1 male (AMNH); Cordillera Oriental, 1 male (BM[NH]); El Tabano, Putumayo, 3300 m, 1 Jul 1981, J. Sullivan, 1 female (AMNH) (Fig. 7D). ECUADOR. Cuicocha, Imbabura, 3800 m, 31 May 1939, F. Brown, 1 male (AMNH) (Fig. 7C); West Slope of Andes, E. Whymper, 3 males (BM[NH]); El Monje- pres [= nr] Loja, 1 male (MNHN). PERU. Huancachamba, 1818–3030 m, 2 males (BMNH); Huancabamba [sic], Cerro de Pasco, 1818–3030 m, Bottger, 2 males (BM[NH]); Ccapana Hacienda, Oconogate, Cuzco, 3333 m, 6–12 Apr 1947, J. Pallister, 1 female (AMNH). See *Type* above.

Penaincisalia bimediana Johnson, NEW SPECIES

Figs. 7E, 9A

Types.—*Holotype*, female (Figs. 7E, 9A) deposited AMNH, data: ECUADOR. Cuicocha, Imbabura, 3800 m, 31 May 1939, F. Brown.

Description.—*Male*. Unknown. *Female*. Head, thorax, abdomen and palpi typical of genus. Wings: upper surface ground dark brown, fringes light brown; hindwing with elongate anal lobe slightly suffused rufous at the base [lobe broken on wing surface illustrated in Fig. 7E]; lower surface ground color tawny, suffused red brown; forewing with dark slash in discal cell and two parallel bands, postmedial and submarginal, from costa through cell CuA₂; hindwing basal disc darker red brown, distal margin forming rather straight, darkened medial line paralleled in submargin by line of fused red brown dots. Forewing length: 10.5 mm (holotype). Genitalia (Fig. 9A): ductus bursae robust, central area less constricted than in other *Penaincisalia*, caudal end moderately fluted, terminating in short, lobelike, lamellae; cervix bursae hood ovate (height equalling about one-half ductus bursae length), sculptured with prominent central ridge and radiating proximal folds; corpus bursae with two, steeply pronged, signa.

Diagnosis.—Differs from all other *Penaincisalia* by brown upper surface of wings and elongate hindwing lobes and, on the lower surface, prominence of two stripes, postmedial and submarginal on forewing, medial and submarginal on hindwing (see *Remarks*).

Distribution.—*Spatial* (Fig. 10): known only from type locality. *Temporal*: known only from type data.

Remarks.—In a series of 11 specimens of *P. penai* collected by F. M. Brown on the same day, this female was much darker brown, had a prominent anal lobe, and lacked the limbal rufous patch. Dissection further showed it to be distinct from sympatric and synchronic *P. penai* females. Brown also collected an undescribed species I originally identified as the *P. bimediana* male (Johnson 1981: 180). Subsequent diagnostic recognition of dual androconial brands in *Penain-*

cisalia showed this male to be a member of the brandless *arria*-group, as also indicated by morphology (see *Penaincisalia* Remarks).

Etymology. — The name refers to paired submarginal and postmedian bands on the lower surfaces of both wings.

DISCUSSION

Penaincisalia is a high Andean monophyletic genus of cryptically marked, mostly tailless, Elfin-like butterflies known from the Central Cordillera of Colombia southward through the Cordillera Oriental of Peru and the Cerros de Bala of Bolivia. South of this area there are no records except for a species in central Patagonia. This distributional gap probably results from insufficient collecting. There is a long history of high Andean butterfly collecting from Peru northward (Brown 1941, 1942; Pallister 1956) but many areas from Bolivia southward are poorly sampled (Johnson et al. 1988, in press). Further, two immediate sister-groups of *Penaincisalia* (the *loxurina*- and *arria*- groups of *Thecla*) also occur at high altitudes in the Andes and although they are more common at sub-paramo altitudes, they are often sympatric with *Penaincisalia*. The *loxurina*- and *arria*-groups contain undescribed species that are well represented from Bolivia to montane Argentina and Chile. Two other high Andean groups of Theclinae, *Eiseliana* (Ajmat de Toledo 1978) and the *Thecla wagenknechti*/*T. heodes* assemblage (Johnson et al. in press) also occur from Colombia to central Patagonia. Collecting at altitudes above those for these latter taxa will probably yield undescribed *Penaincisalia* from central Bolivia southward.

Rather sporadic collecting of *Penaincisalia* to date indicates numerous sympatric species (see *P. pichincha* Remarks). Both the *penai* and *culminicola* subgroups of the genus have overlapping distributions from Colombia to Bolivia; each subgroup has species distributions spanning the northern range for the genus. There are also several species whose known distributions suggest substantially wider ranges. Numerous *Penaincisalia* are insular; *P. aurulenta* has only been collected in the Cordillera Blanca of Peru and *P. downeyi* is known only from Monte Tolima in the Colombian Central Cordillera.

The appearance of many sympatric *Penaincisalia* in relatively small samples suggests that many species with low density typify the genus. General character stability in *Penaincisalia* over wide ranges, and numerous sympatric insular taxa, has an important biogeographic implication. If further sampling verifies the disjunctive patterns, it would be significant in assessing the history of the group. Character data indicate that the immediate relatives of *Penaincisalia* are not Nearctic *Incisalia* or Palaearctic *Ahlbergia*, contrary to early speculations (Brown 1942, Gillham 1956). *Penaincisalia* share all major morphological attributes with other often sympatric Neotropical groups and constitute an upland lineage of these.

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APPENDIX 1

Taxa of callophryine butterflies and their relatives.

Callophryine butterflies.—Of the Eumaeini genera listed by Eliot (1973), groups included by Brown (1942), Gillham (1956), Clench (1961), Howe (1975), Johnson (1981), Johnson & Quinter (1982) and Descimon (1986) include: (1) *Ahlbergia* Bryk, (2) *Callophrys* Billberg, (3) *Cyanophrys* Clench, (4) *Incisalia* Scudder, (5) *Mitoura* Scudder, (6) *Sandia* Clench, and (7) *Xamia* Clench. Authors have widely treated the New World members (2–7) as a monophyletic group, including all or most as either subgenera of *Callophrys* (Clench 1961, dos Passos 1970, Howe 1975, Scott 1986) or separate genera (Klots 1951; dos Passos 1964; Miller & Brown 1981, 1983; Pyle 1981; Johnson & Quinter 1982; Opler & Krizek 1986). Separate genera appear preferable because Palaearctic groups are a part of the assemblage and far more diverse than indicated in the current literature (Johnson 1981, Johnson & Quinter 1982).

Sister-group.—Of the Eumaeini species groups listed by Draudt (1919), groups included by Brown (1942), Descimon (1986) and Johnson (1981) include: *Thecla culminicola*-group (herein, *Penaincisalia*), *loxurina*-group, and *arria*-group. The latter two include numerous undescribed taxa.

APPENDIX 2

Characters.—The major shared features of any structure are listed with states for: (A) *Penaincisalia* and the sister-group of “callophryine” butterflies, and (B) true “callophryine” butterflies (Appendix 1).

1. Male genitalia, cephaloventral margins of valval lobes: (A) separated by transparent sclerotin (Fig. 4[1]); (B) fully fused with opaque sclerotin (Gillham 1956; Clench 1964, 1981; Johnson 1976, 1978, 1981, 1987b; Brown 1982 [1983]).
2. Male genitalia, bilobed area of valvae: (A) opaque and ventrally convex (Fig. 4[1]); (B) transparent and flat or concave (Gillham 1956; Clench 1964, 1981; Johnson 1976, 1978, 1981, 1988b; Brown 1982 [1983]).
3. Male genitalia, caecum of aedeagus: (A) comprising at least a third of aedeagus length and often ventrally declined (Fig. 4[3]); (B) comprising a fourth or less of aedeagus length and uniplanar [or contiguously bowed] with shaft (Gillham 1956; Clench 1964, 1981; Johnson 1976, 1981; Brown 1982 [1983]).
4. Female genitalia, ductus bursae and terminal lamellae: (A) as one conjoined tubelike structure, variously constricted in the cephalic one-half to one-third, and with a prominent dorsoterminal fissure (Fig. 4[5]); (B) terminal lamellae flared distally outside plane of ductal tube, unconstricted in the cephalic one-half to one-third, and with dorsoterminal area either fused or with a transparent suture (Johnson 1976, 1978, 1981; Clench 1981; Brown 1982 [1983]).
5. Female genitalia, cervix bursae: (A) variously sclerotized into a major additional genital component (Fig. 4 [5, 7]); (B) diminutive, developed at most to a thin shield covering distal end of corpus bursae (Johnson 1976, 1978, 1981; Clench 1981; Brown 1982 [1983]).

No external wing characters consistently define the major groups, although such characters do pertain to particular genera of callophryines or certain species groups in the callophryine sister-group.

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