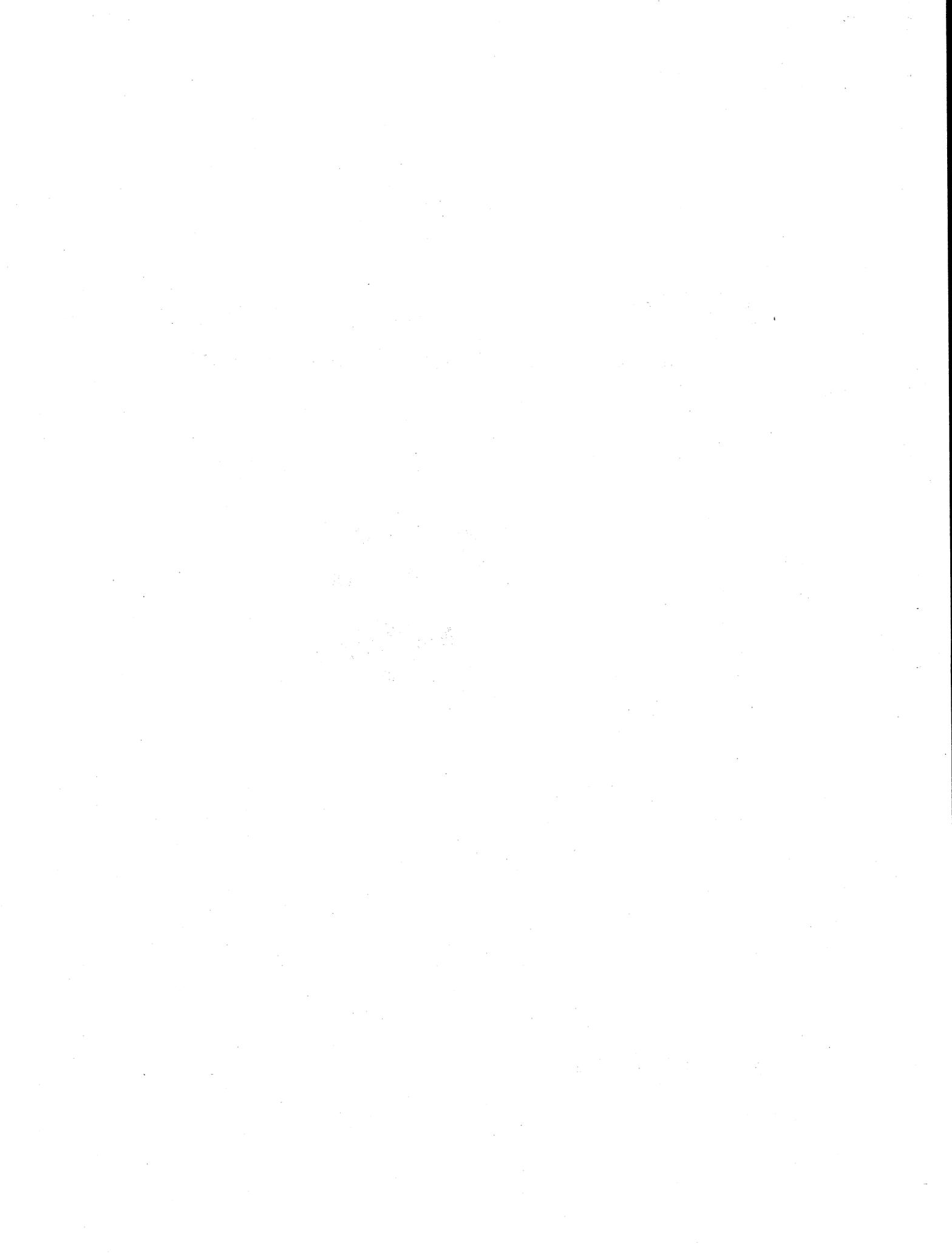


Reports of the Museum of Natural History
University of Wisconsin (Stevens Point)



REPORTS 32-34



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REPORTS 32-34 (in part)

Mailed December 13, 1993



A MESSAGE FROM THE MUSEUM

After publication of *Report #31*, "Phenology in Wisconsin" (K. Lettau and H. Lettau, eds.), we are pleased to return to a series of papers treating butterflies of the New World tropics. In November 1993 the UWSP Museum of Natural History received an "Award of Appreciation" (signified by a large plaque now in the Museum) from an association of Colombian lepidopterists, museums and institutions in gratitude for the many new generic names for butterflies recently made available by the museum *Reports*.

Butterflies are among the best "indicators" of ecologies, and ecological health, among the various organisms studied by tropical biologists. Not only are contemporary species readily sampled by scientists, students and other collectors, a wealth of historical material exists because of the long term interest in these colorful insects. Thus, butterflies are one of the major study groups in the effort to understand "hot spots", or priority areas, in the efforts to preserve biodiversity worldwide (see New York Times, Science Times, 9/28/93, p. 4).

Over the last years, to create a basic resource for designating "target faunas" in the biodiversity conservation effort, major work been ongoing to prepare modern lists of butterflies inhabiting the New World tropics. The UWSP Museum of Natural History is pleased to be a major source of descriptive work in this direction. The current *Reports* continue this effort.

Frank Bowers, Ph.D.
Director

REPORTS of the
Museum of Natural History, University of Wisconsin
Stevens Point

NO. 32

ABSTRACT

Four new genera are described, comprising four of twelve monophyletic assemblages in the large "Electrostrymon grade" of Neotropical Eumaeini. The new genera include *Gigantorubra*, *Crimsinota*, *Ziegleria* and *Nicolaea*, presented in fully revised format and contrasted to eight other genera being treated concurrently elsewhere. The newly described genera include (most generally) clusters from the historical grade "Thecla" (New World Eumaeini) previously referred to in common usage as the *T. zurkvitzi* (Schaus), *T. socia* (Hewitson), *T. hesperitis* (Druce) and *T. volumen*-related assemblages.

Genera and species treated include the following (L indicating lectotype designation):

Gigantorubra: *zurkvitzi* (Schaus), *picientia* (Hewitson), *collucia* (Hewitson) (L), *nubilum* (Druce), *fernanda* (Jones), *orcidia* Hewitson, new combinations (from *Thecla*); new species *adamsi*, *argenomontana*, *bahia*, *clintoni*, *exotissima*, *melanorubra*, *mininota*, *nebadaca*, *ornamentata*, *shueyi*, *simplica*, *solitaria*, and *tafiensis*. *G. orcidia*, *shueyi* and *tafiensis* are mentioned as representing a generic subgroup of multistriated members doubtlessly containing numerous other species, both undescribed and in *Thecla*.

Crimsinota: *rubifer* (Druce) *socia* (Hewitson) (L), new combinations (from *Thecla*); new species *argentina*, *cyanoruba*, *giganta*, *perplexissima*.

Ziegleria: *hesperitis* (Druce), new combination (from *Angulopsis*), new species *bernardi*, *cyanissima*, *mexicana*, *hoffmani*. A divergent "isolated" new species is also tentatively described here as *Z. compendina* but likely represents an undescribed sister clade.

Nicolaea: *volumen* (Druce), *cauter* (Druce) new combinations (from *Thecla*), new species *gagarini*, *honduriana*, *macroma*, *micronota*, *pertaineda*. *N. cauter* requires careful differentiation from a complex of poorly-known and often misidentified taxa in *Thecla* including *obelus* Druce and *begrada* Hewitson.

Modern revisionary work, based on wing and morphological characters, continues to redefine old common usage "Groups" in *Thecla*. Contrasting some modern eumaeine genera generally corresponding to historical "Groups" of *Thecla* (e.g. "loxurina Group" Draudt, 1919 \cong *Thecloxurina* Johnson, 1992, etc.), structural characters in the four genera included here indicate farflung affinities and show their original associations with titular taxa of old *Thecla* "Groups" long since removed to other modern genera (e.g. *T. volumen* in Draudt's 1919 *T. azia* "Group" but *azia* Hewitson to *Ministrymon* Clench 1961; *T. zurkvitzi* in

Draudt's *T. hesperitis* "Group" but most of this "Group" to *Calystryma* Field, 1967, etc.). Numerous members of such "Groups", alike only in very superficial characters of the wing, can be found in a variety of newly named genera cross-referenced here.

Gigantorubra, *Crimsinota*, *Ziegleria* and *Nicolaea* are each pan-Neotropical (excluding the Antilles). However, *Gigantorubra* is one of several new genera including mainland members with ancient phylogenetic affinities to the still unrevised Antillean "Electrostrymon" assemblage, the latter clearly a nonmonophyletic group of multiple historical origins.

INTRODUCTION

In 1991 I published a taxonomy for various genera of the "Calycopis/ Calystryma grade" of Eumaeini (*sensu* Eliot 1973) (Johnson 1991a) and, in appended sections, separated *Electrostrymon* Clench (1961) from a new genus *Angulopsis*. These descriptions distinguished two major structural groupings in a larger group of Theclinae often referred to as the "Electrostrymon grade" of *Thecla* or (in nonmonophyletic nomenclatures like Riley's 1975 usages for the Antilles) simply "Electrostrymon". I contrasted the very different morphological structures of *Angulopsis* and *Electrostrymon* (the latter *sensu stricto* from type species *Papilio endymion* Fabricius) and stated that numerous monophyletic groups (e.g. genera) remained to be delineated from the large "Electrostrymon grade".

In 1992 study was completed concerning morphological characters in type specimens and other samples representing the "Electrostrymon grade". This study included historical material housed at the Natural History Museum (London)(BMNH¹) and other institutions. Based on these studies, I and a colleague completed revision of *Angulopsis* (*sensu stricto*) (Johnson and Kroenlein, in press a). The number of remaining groups requiring definition within the overall assemblage was massive. Part of this was because *Electrostrymon sens. strict.* included so few species (Johnson and Kroenlein, in press b). In addition, the "red-banded" groups of *Thecla*, long a "hodge-podge" of taxa included in such grades as Draudt's (1919) "hesperitis", "orcidia", "cecrops", "endymion", "azia" and "badaca" Groups included a myriad of described taxa along with many long-ignored undescribed species. The present paper provides a taxonomy for four of the twelve groups making up the larger "Electrostrymon grade" and presents a fully elucidated nomenclature for the pan-Neotropical genera *Gigantorubra*, *Crimsinota*, *Ziegleria* and *Nicolaea*.

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¹ I use this abbreviation consistent with the United Kingdom ("UK") statutory name "British Museum (Natural History)" which, for legal purposes in the UK, has remained unchanged.

MATERIALS AND METHODS

Collections. Specimens were studied at the Allyn Museum of Entomology, Florida Museum of Natural History (AME); American Museum of Natural History (AMNH); the Natural History Museum (London) (BMNH) (including recently available material from the Adams/Bernard Expeditions to Colombia and Venezuela), Carnegie Museum of Natural History (CMNH); Instituto Zoología, Fundación Miguel Lillo (IML); Milwaukee Public Museum (MPM); and Muséum National d'Histoire Naturelle (Paris) (MNNH). Specimens from private collections of David Matusik (Skokie, Illinois), Henri Descimon (Marseille, France) and Robert C. Eisele and Bruce MacPherson (Jujuy, Argentina) were also found relevant with some representative specimens deposited at AMNH.

Methods: Five criteria were used for determining genera: (1) none is monotypic; (2) each is comprised of species sharing a number of major structural characters not present in other genera; (3) congener males and female are apparent from dissection of as many male/female pairs with duplicate collection data as possible; (4) each genus has been assessed for species diversity by study of relevant type material and a survey of undescribed entities; and (5) each genus has a geographic distribution of major biogeographic significance (e.g. Neotropical, South American, Central American, Austral, Antillean etc.). Species criteria were derived from standard taxonomic procedures involving consistent differences in characters of the wings and genitalic and tergal morphology.

Presentation. For clarity and brevity, a standardized format is used for all entries. This includes, for generic entries (i) "Synopsis", summarizing previous "common usage", since some new genera were formerly known to Lepidopterists as various "*Thecla*" groups of Draudt (1919) or other authors; (ii) Standard revisionary format including **Diagnosis** and **Description**. Regarding the **Type Species** and **Types**, generic type species are designated from previously described taxa when examination of types could be supplemented by enough additional material to allow verification of gender combinations by study of male/female series with duplicate collection data. When this could not be done, a well-documented new species is used as the type. For species, types have been consulted whenever available at the major museum collections examined and lectotypes designated as appropriate; if types were not available, diagnosis was relegated to topotypes wherever possible. Treatments close with statements concerning **Distribution** (spatial and temporal distri-

bution as noted from collection data), **Remarks** and **Etymology** (provided for all new taxa and for taxa without previous commentary in the literature).

Terminology. Terminology follows Johnson (19-91a) using for brevity DFW, DHW (upper [dorsal] surface FW, hindwing) and VFW, VHW (under [ventral] surface forewing, hindwing). Otherwise terms for venation follow Clench (1964, 1975) (including "Thecla-spot" for the VHW marginal spot in cell CuA1). It should be noted that most genera lack the DFW clusters of androconial (=pheremonal) scales which Eliot (1973) (and many other authors) refer to as "brands". However, one genus treated herein shows this feature so it is mentioned here. In the morphology, some genera show specializations of the terminal tergites. I adopt the terminology for these used widely by Field (1967a,b) and Johnson (1988; 1989a,b; 1990a & in press) "subcordate incised posterior cavity" [abbreviated *sipc*]. I use the term "brush organ" consistent with Eliot (1973) to refer to bundles of elongate microtrichia which clear to the vinculum dorsum when genitalia are removed by dissection. Some general abbreviations used in the text include OD (original description), TL (type locality), N etc. (north, etc.), C (central), GP(s) (genitalic preparation [s]), LD (locality description), ID (identified by).

TAXONOMIC DESCRIPTIONS

GIGANTORUBRA, NEW GENUS

Photoplate I; Figs. 2-5.

Synopsis-- Contains *Thecla zurkvizi* Schaus, *picentia* Hewitson, *collucia* Hewitson, *nubilum* Druce, *fernanda* Jones, *orcidia* Hewitson and a number of rather spectacular previously undescribed species.

DIAGNOSIS. *Wings* expansive (FW lengths commonly 14.5-17.0 mm.) and greatly angulate, particularly in male HW. VFW, VHW unmistakable because of lavish (often wide) stripes of brown to brilliant red stretching across HW from produced "W"-shaped element near anal angle to a large distally offset orb at cell SC+R1. FW with similarly thick postmedial band often much suffused basally. FW lacking scent brands. Females showing similar ventral pattern but with more expansive bands.

Male morphology lacking *sipc*, genitalia marked by greatly serrate inner margin on the falces and by robust sculptured valvae compared to *Angulopsis* Johnson 1991 or *Rubroserrata* Johnson and Kroenlein 1993 (in press b).

Female morphology showing *sipc* limited to bilobate terminal tergite, habitus of genitalia similar to ground

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plan in *Angulopsis* but with more elaborate terminally sclerotized components, including sclerotized ventral at ductus terminus and sculpturing of the superior plate.

Wings distinguished schematically from *Angulopsis* in Figure 1 (opposite).

DESCRIPTION. Adult. Male. Head with frons fuscous, eye lining white, antennae finely striped white, tagmata fuscous. *Wings.* FW alar expanse [hereafter "FW length:"] large, generally 14.5 to 17.0 mm. Wing shape showing FW,HW (especially HW) very angulate at anal angle. DFW,DHW colors generally unicolorous including dark brown, black or (occasionally) deep blue. VFW,VHW with generally brown grounds contrasting brilliant red, red-brown or black bands characterized as follows and in Figure 1. FW with thick reddish to brown postmedial extending from costa to at least cell CuA2 and often much suffused basally; HW with thick, lavish, stripes of brown to brilliant red (comprised of a centrally black, distally white line, marked widely basally with red to orange) across wing between a thickened "W"-shaped element near the anal angle and a large distally offset orb at cell SC+R1 (latter differing dramatically depending on the species). Limbal areas showing various lavish patterns including dark mottling or suffusion with red, orange or yellow, particularly around a prominent CuA1 Thecla-spot. **Female.** Head with frons fuscous, eye lining white, antennae finely striped white, tagmata fuscous. *Wings.* More rounded and broad than in males; dorsal color similar to males on FW, on HW often with light blue across basal or distal areas depending on the species; ventral pattern similar to males but with bands (particularly on HW) generally much broader. **Male Tergal Morphology and Genitalia.** Figs. 2-4. *Sipc* not present; short thick bundles of brush organs abutting dorsum of genital vinculum. Genitalia typified by laterally robust and angulate vinculum, robust triangulate or funnel-shaped saccus; robust valvae with stout, rounded to shouldered bilobes adjoining thickly tapered caudal extensions. Falces, contrasting all members of "Electrostrymon grade", showing robust teeth along ventral and/or lateral contour. **Female Tergal Morphology and Genitalia.** Fig. 5. Terminal tergite with "simple" *sipc* (*sensu* Johnson 1991a) comprised of bilobate terminal elements, lateral edges of which with stout membranous attachment to genital plate. Genitalia typified by elongate ductus bursae terminating in paired struts (*sensu* Johnson 1991a) supporting an elaborate superior plate, including sclerotized lip on the ductus ventrum and various sculpturing of the superior plate. Cervix

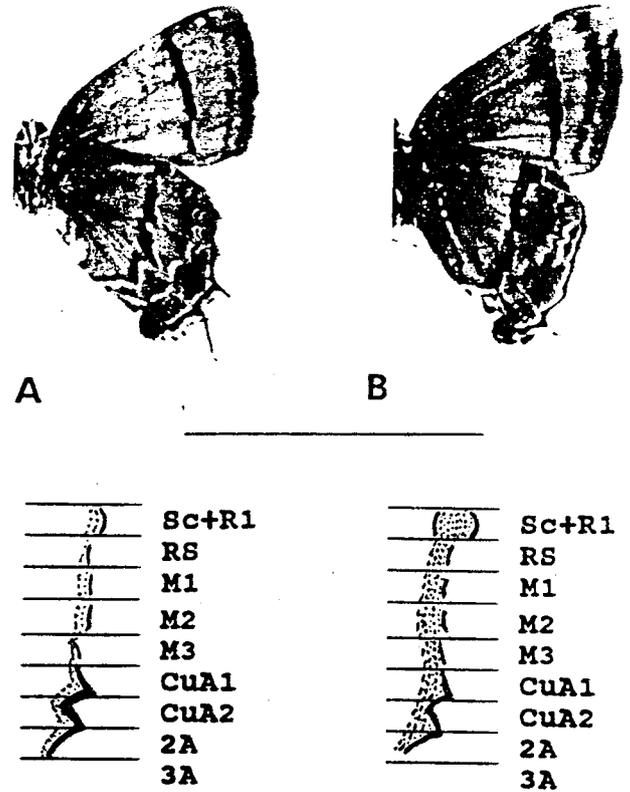


Figure 1. Major wing pattern differences between *Gigantorubra* Johnson of this revision and *Angulopsis* Johnson (1991). For differences between these taxa (with continuous "W" on wing) and members of the *Calycopis/Calystryma* grade ("W" breaks plane of band in cell M3) see Johnson 1991a, fig. 1.

A. *Angulopsis*: "W" is emphatic, with basal orange or reddish shading generally following the jagged shape of the band; SC+R1 element is not greatly produced or displaced distally from rest of band. Males differ little from females except for overall rounder HW shape in latter.

B. *Gigantorubra*: "W" is not emphatic and intense basal orange, brown or reddish shading is wide, generally forming an "entire" basal margin to the HW band. Females, in addition to showing rounder HW, show more width and contiguity to HW band.

Other genera described herein are more straightforward and have been confused with these taxa simply because all have orange or reddish bands.

Structurally, among other characters, male genitalia of *Angulopsis* show falces of even contour; males of *Gigantorubra* show serrate falces. *Rubroserrata* Johnson and Kroenlein 1993 shows finely serrate falces (probably synapomorphic) but, diagnostically, differs from the above genera in numerous salient characters of the wings and genitalia of both sexes.

bursae without elaborate sculpturing; corpus bursae with two signa, each comprised of a thick sclerotized plate traversed by a central ridge (often furcate on inner corpus bursae surface) and fine, dendritic sclerotization surrounding the anterior plate margin.

TYPE SPECIES. *Thecla collucia* Hewitson 1863-1878 [1877] as defined herein by lectotype designation (see Remarks).

DIVERSITY. Includes a large number of species previously described in *Thecla*; also includes a large number of new species, a number of which are spectacularly marked. In addition, one large subgroup centered on *Thecla orcidia* Hewitson still requires complete elucidation (see Remarks).

DISTRIBUTION. Fig. 9. Pan-Neotropical, including species from Mexico south to northern Argentina (excluding Antilles, see Remarks).

REMARKS. Characters and Affinities. This group is an outstanding one and it is surprising that so few of the large, spectacularly marked, members had formerly been described. The wing markings stand out from every other "Electrostrymon grade" genus except *Angulopsis*, from which *Gigantorubra* differs in the remarkable width and lavishness of its bands. Any question about identity can be solved by referring the falces of the male genitalia, where taxa of *Gigantorubra* show a toothed or serrate inner margin. Discovery that *Thecla orcidia* and its relatives also belonged in *Gigantorubra* came late in the initial revisionary study and this means a large subgroup still requires full elucidation (*G. orcidia*, *shueyi* and *tafiensis* representing only the seminal number).

A group of smaller "*Thecla*" species also shows serrate falces (*Rubroserrata*, being described concurrently by Johnson and Kroenlein, in press b) but may not comprise a sister group. Johnson and Sourakov (1993) have already indicated that serrate falces are a parallelism in the Calycopina genus *Serratofalca*. More likely, by numerous structural characters, *Gigantorubra*, *Angulopsis* and *Ziegleria* (of subsequent entry) form a clade. Taxa of the latter genus are smaller but show a similar ground plan in the ventral wing pattern and female genitalia.

Type Species. The types of *Thecla collucia* were the first specimens examined by me showing the males' toothed falces and female's spatulate superior plate separating the group from the more diminutive *Rubroserrata* species. *Thecla collucia* is compelling as a type because it is particularly common in the central Neotropical Realm with males and females both being amply available in collections. It should be pointed

out, however, that *collucia* should be identified from its lectotype and not from the common usage, which appears to vary, *collucia* having often been confused with *Thecla ceromia* Hewitson (much thinner ventral bands and genitalia typical of *Angulopsis*). Some specimens of *Angulopsis opacitas* (Hewitson), *Angulopsis badaca* (Hewitson) and some of the larger undescribed species of *Gigantorubra* have also been identified as "*collucia*". Regarding this, it should be noted that the male genitalia of *collucia* are perhaps among the least robust of *Gigantorubra*. If one wanted to represent the "large" congeners in the type species, one might have chosen *Thecla zurkvitzi* Schaus. However, the female of this species is very poorly known and the species much limited by destruction of the Brazilian coastal forests.

Distribution. *Gigantorubra* species are pan-Neotropical with no known species from the Caribbean region. Informed readers will immediately note the resemblance of *Gigantorubra*'s ventral wing markings, and some structural characters, to certain large Antillean "*Electrostrymon*" (*sensu* Riley 1975). To date I have found no Caribbean region hairstreak with the entire array of structural characters represented in *Gigantorubra*. However, a puzzle is emerging. Just as there is clear resemblance between some Caribbean "*Electrostrymon*" and *Gigantorubra*, characters of some other Caribbean hairstreaks clearly resemble the new genus *Pendantus* Johnson and Kroenlein (in press b) (a group structurally very different than *Gigantorubra*). Consistent with comments first put forward by Johnson and Matusik (1988), in light of mainland groups now elucidated it appears more probable that the so-called Caribbean "*Electrostrymon*" will actually turn out to be a heterogeneous group representing diverse (and early) mainland origins. Eventual cladistic analyses will probably confirm that each of the various Caribbean "*Electrostrymon*" subgroups actually represents a basal stem of some more speciose mainland group. Of these, only one will actually comprise true *Electrostrymon* (*vis-à-vis* its type species, mainland *endymion* Fabricius). It is already clear that the structural characters of the large-sized Antillean "*Electrostrymon*" are closer to *Gigantorubra* or the *politus* assemblage of *Angulopsis* than to *Electrostrymon sensu stricto* (e.g. of *endymion*). As pointed out by Johnson and Kroenlein (in press b), it is *Thecla syllis* Godman and Salvin (a mainland species) that is most similar to the type species of *Electrostrymon*. Thus, in retrospect, Clench (1961) might have been better advised to chose Antillean *Thecla angerona* Godman and Salvin or *T. angelia* Hewitson as type of *Electrostrymon* if his goal was to illustrate Caribbean endemism. The facies of *Papilio endymion* severely limit the phylogenetic

FIGURES 2-5, MORPHOLOGY of *GIGANTORUBRA*OVERLEAF: Fig. 2. Male Genitalia of *Gigantorubra*

Format: male genitalia in ventral view, aedeagus removed, showing left bilateral side of vincular arc (except in A, see below) and entire saccus enclosing left valve. For comparative purposes, valve and aedeagus shown in lateral view for entry A; in entry A, ventral view shows *right* side of vincular arc and left valve to allow illustration of serrate arch of falces typifying the genus; in entries B and E, details of falces obscured by valvae (arrows indicating location of particular features).

- A. *Gigantorubra collucia*, paralectotype male (BMNH).
- B. *Gigantorubra fernanda*, holotype male (BMNH).
- C. *Gigantorubra nubillum*, holotype male (BMNH).
- D. *Gigantorubra mininota*, holotype male (AMNH).
- E. *Gigantorubra adamsi*, holotype male (BMNH).

FACING PAGE: Fig. 3. Male Genitalia of *Gigantorubra*

Format: male genitalia in ventral view, aedeagus removed, showing left bilateral side of vincular arc and entire saccus enclosing the left valve. For comparative purposes, aedeagus shown in lateral view for entry A.

- A. *Gigantorubra ornamentata*, holotype male (BMNH).
- B. *Gigantorubra melanorubra*, holotype male (BMNH).
- C. *Gigantorubra exotissima*, holotype male (BMNH).
- D. *Gigantorubra nebadaca*, holotype male (AMNH).
- E. *Gigantorubra solitaria*, holotype male (BMNH).
- F. *Gigantorubra tafiensis*, holotype male (AMNH).

meaning, and distributional generality, of *Electrostrymon*.

Species Groups. The genus is divided into four distinctive species groups. I review these briefly below because so few of the species have been elaborated hitherto.

simplica Group— DFW,DHW ground brown; VFW,VHW simply marked: VHW without pattern elements additional to the HW band typical of genus, VHW band thin. Genitalia non-robust, little sculptured.

collucia Group— DFW,DHW ground brown; VFW,VHW bands very wide (sometimes with element lunulate), VHW otherwise without pattern elements additional to the HW band typical of genus. Genitalia more robust and sculptured.

exotissima Group— DFW,DFW ground brown or black; VFW,VHW showing "exotic" innovations to the pattern elements typical of the genus as well as additional components. Genitalia very robust and highly sculptured.

orcidia Group— DFW,DHW ground dark blue; VFW,VHW banded elements typical of genus but also dividing the wing into greatly contrasted ground colors (usually appearing as broad brown or yellow-brown stripes in the cell areas enclosed by the bands). Genitalia varied but particularly with innovations along the serrations of the falces. This group is very diverse and was associated with the genus only late in the study. As a result it is not fully elaborated. However, a preliminary list of its "*Thecla*" species is added.

ETYMOLOGY. An arbitrary euphonious combination referring to the large size and red-banded wing under surfaces of these butterflies; considered feminine.

SPECIES

simplica Species Group

The most conservatively marked species of the genus. Aside from their genitalic characters, they appear more like overly lavish species of *Angulopsis*. FW postmedian band not greatly suffused basally, if at all in some taxa. HW band thin and less distinctive than in other Species Groups and, aside from showing the basic pattern elements typical of the genus (this more boldly in females), lacking the greatly embellished basal or distal pattern elements seen in other Species Groups. Genitalia differing from overall habitus of genus only in being more diminutive and less

sculptured than in other Species Groups; falces of males clearly serrate, remedying any questions about status of individual specimens as *Angulopsis* or *Gigantorubra*.

Subgroup 1. Orange-banded Species

Gigantorubra simplica,

NEW SPECIES

Photoplate IA, Figs. 4E,5D.

DIAGNOSIS. *Wings.* VFW,VHW with thin red-orange bands and simple pattern— departing from "*Angulopsis*-look" only by wider costal HW typical of genus and produced SC+R1 element (in this species only about twice band width and only slightly displaced distally from the band). VHW wider in female (as typical of genus) and meandering in a "criss-cross" fashion. Male DFW,DHW suffusive warm brown; HW with suffusive black spots submarginal in cell CuA1 and CuA2 on many specimens. Male must be separated from *G. mininota* (of subsequent entry), a species with DFW,DHW blackish and with redder, wider, and more lunulate markings along the VHW costa.

Morphology. Male genitalia with valvae showing angulate ventrum, marked by sharply angled base, sharp but thin shoulder and caudal extensions of rather even length terminating in robust ends. Female genitalia with superior plate flared widely, caudal margins of paired lamellae greatly exceeding terminus of ductus bursae.

DESCRIPTION. *Male.* DFW brown, DHW same but with bluish hue; HW with suffusive black spots submarginad in cell CuA1 and CuA2, margin of these cells and M2 with white band. HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe orange. VFW,VHW ground beige; bands thin, red-orange, and simply patterned, having an overall "*Angulopsis*-look" except for costal area of band being wider as typical of *Gigantorubra*. SC+R1 element only about two-times band width and slightly displaced distally from the band; angled elements veins M3 to 2A forming wide "W"-shaped element; limbal area suffusive red Theclaspot, black at anal lobe and intervening area lightly suffused with blue and white. Length of FW: 14.0 mm. (holotype), 13.5-14.5 mm. (paratypes). *Female.* DFW ground brown, VHW ground suffused with light gray-blue. VFW,VHW ground beige; FW with red-orange postmedian band wider than male and marked distally with more black and white edging, elements offset in a "criss-cross" pattern. VHW medial band red-orange marked more tripartite than in male with distal black and white edging; SC+R1 element offset distally slightly more than in

male; limbal area more lavishly colored than in male, marked with suffusive red Thecla-spot, black at anal lobe, and intervening area suffusive blue and white. FW length: 14.0 mm. (allotype); 13.5-14.5 mm. (paratypes). **Male Genitalia.** Fig. 4E. Vincular dorsum with stout brush organs extending to base of labides. Genitalia with vincular ventrum angulate and less robust than congeners with prominent "funnel"-shaped saccus reminiscent of *G. collucia*. Falces robustly serrate. Valvae with ventrum of bilobes showing very angulate outline, bilobes with sharply angled base, sharp but thin shouldered, caudal extensions of rather even length to robust termini. Aedeagus less robust than congeners and more elongate, length exceeding rest of genitalia by about almost two-fifths, habitus with caecum and shaft both bowed; aedeagus terminus with prominent pronglike cornutus. **Female Genitalia and Tergal Morphology.** Fig. 5D. *Sipc* typical of genus. Genitalia with terminal superior plate flared terminally, caudal margins of paired lamellae greatly exceeding terminus of ductus bursae; ductus bursae elongate (length twice that of lamellae) and without an antrum; corpus bursae signa platelike with dendritic margins as typical of genus.

TYPES. Holotype male, allotype female, BRAZIL, Santarém, 27 January 1968, B. Heineman, deposited AMNH. **Paratypes.** BRAZIL. Canavieiras, Rio Grande do Sul, nod ["no other data"] 1♂ (BMNH); Santa Cruz, nod, 1♂ (BMNH); Canquieras [sic], nod, 1♂ (BMNH); Pelotas, Rio Grande do Sul, 12 March 1954, leg. C. Biezanko, 1♂ (BMNH); Pelotas, Rio Grande do Sul, 8 February 1954, leg. C. Biezanko, 1♂, 1♀ (AMNH). ARGENTINA. Jujuy Prov., Villa de Ago, 3 September 1960, leg. R. Eisele, 1♀ (AMNH). BOLIVIA. Buena Vista, March 1958, leg. R. Golbach, 1♂ (IML); 5 km. NW Montero at Rio Paray, in wood, 300 m., Prov. San Esteban, Dept. Santa Cruz, 13 January 1973, leg. R. Eisele, 1♂ (Eisele Coll.).

DISTRIBUTION. *Spatial:* Fig. 9. Wide-spread in tropical South America, known from the eastern Amazon Basin southward along Brazilian coast and west to the "yungas" region of Bolivia and adjacent northern Argentina. *Temporal:* dated specimens range from September to March.

REMARKS. *G. simplica* is one of two species showing a typical *Gigantorubra* genitalia but orange VHW stripes barely betraying the identity of the genus in the costal wing area. The phenomenon is paralleled by a companion "brown-banded" subgroup whose members show a more lineal and jagged VHW

band than would be anticipated in the genus but typical genitalia. To create a ready "tag-word" for this entire group, I name the titular species "*simplica*" to refer to the simple VHW bands characterizing all the members. With such a name available for common usage, lepidopterists should become more immediately familiar with the species of this group and their forming a part of what is otherwise a rather spectacularly-marked genus. The two orange-banded members of the group have been previously undescribed and brown-banded members widely confused with non-congeners. The entire Species Group is conservatively marked and members *fernanda* Jones and *nubilum* Druce often confused with taxa of the "*sethon*" Group of *Thecla*. The latter group different completely in morphological character and is treated as a new genus in Johnson and Kroenlein (in press b).

ETYMOLOGY. Arbitrary euphonious combination referring to the simple wing pattern of this species.

Gigantorubra mininota,
NEW SPECIES

Photoplate IB, Fig. 2D.

DIAGNOSIS. *Wings.* Known only from the male which differs from *G. simplica* by being blackish on DFW, DHW (without DHW limbal black spots) and with deep red VHW wing bands lunulate along the costa and produced at SC+R1. This habitus does not approach the great basal suffusion and costal production of elements seen in other Species Groups but *G. mininota* is less apt to be superficially mistaken for an *Angulopsis* than other members of the *simplica* Group.

Morphology. Possibility of diagnosis as an *Angulopsis* belied by robust serrations along the inner margin of the falces; compared to congeners, male valve habitus robust and elongate with diminutive, thin-lipped and rounded bilobes and long, gradually tapering, caudal extensions of relatively even contour.

DESCRIPTION. *Male.* DFW, DHW ground blackish, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe orange. VFW, VHW ground beige; VFW postmedian band thinly tripartite (red basally, distally black and then white); VHW medial band red, thinner toward parterior, in costal area wider tripartite (red basally, distally black and then white) with SC+R1 element produced (tripartite as band and rather square-shaped); angled elements veins M3 to 2A forming concise "W"-shape; limbal area with red-suffused Thecla-spot, black at anal lobe, and intervening area light suffusive blue and white. Length of FW: 14.5 mm. (holotype). **Male Genitalia.** Fig. 2D Vincular dorsum with

short brush organs extending along articulation of falces. Genitalia with vincular ventrum non-robust and quite elliptic in overall shape of vincular arc, saccus elongate and pointed. Falces typically serrate for genus. Valvae ventrally with elongate habitus somewhat reminiscent of *G. fernanda* but with rounded bilobes, and evenly contoured elongate tapered caudal extensions. Aedeagus elongate as typical of Species Group, exceeding rest of genitalia by about one-fourth and with each of shaft and caecum vaguely bowed; terminus of aedeagus with pronglike cornutus typical of genus.

TYPES. Holotype male, BOLIVIA, Prov. Sud Yungas, Dept. La Paz, junction of two rivers, 21 km. E. Chulumani, 4050', 27 May 1980, leg. D. and K. Matusik.

DISTRIBUTION. *Spatial:* Fig. 9. Currently known only from the type locality in the "yungas" region of Bolivia. *Temporal:* currently known only from the type locality.

REMARKS. As noted under *A. simplicia*, of all members of the *simplicia* Group, the former is most easily confused with *Angulopsis* because of the simplicity and orange color of the VHW bands. *A. mininota* is more obviously a *Gigantorubra*, its wider bands more readily associable with the genus because of the more prominent black and white edging and lunulate production of elements along the costa and at SC+R1. In fact, if not for *A. simplicia* being rather frequent in collections, one might not have to stress the possibility of mistaking *A. mininota* for members of *Angulopsis*. It is a fact, however, that I did not discover the remaining members of the *simplicia* Group until dissecting to determine the range of *Gigantorubra* characters in the "Thecla Grade" and thus the whole matter deserves mention. After becoming educated on the genitalia I was able to locate additional members of the group that looked even less like *Gigantorubra* than *G. simplicia*. As noted in subsequent entries, Species Group members *G. fernanda* and *G. nubilum* offer a different problem because of their blood-red to dark brown VHW bands. They resemble the "sethon" Group of *Thecla*. It is unfortunate for taxonomic simplicity that structural characters so readily recognizable as those in *Gigantorubra* embrace such a variety of wing pattern elements. It will be noted that the terminal

ETYMOLOGY. The name combines Latin roots for "small" and "marks" referring to the typical generic wing pattern of this species represented by relatively small pattern elements.

Subgroup 2. Brown-banded Species

Gigantorubra fernanda (Jones)

NEW COMBINATION

Photoplate IC, Fig. 2B.

Thecla fernanda Jones 1912: p. 899, pl. 97, f. 7.

Draudt 1919: 797; Comstock and Huntington 1958-1964 [1960]: 108; Zikán and Zikán 1968: 56; Bridges 1988, I.133, II.106, III.75.

DIAGNOSIS. *Wings.* Small (13.0-13.5 mm.) plain dark brown above and, even for the group, conservatively marked beneath-- VHW band thin and brown to blackish (hint of red in freshest specimens only) and greatly meandering from cell M3 to the anal "W"-like element (thus resembling, along with the species *nubilum* immediately below, taxa of *Pendantus* ["*Thecla sethon*", etc., see Remarks]). Distinctive in the genitalia, however, not only readily placing the species in *Gigantorubra* but distinguishing it from regional sympatric congener *nubilum* (see Remarks).

Male Genitalia with falces showing very finely spiked serrations; valvae with elongate habitus showing diminutive, rather conical, basal shape and gradually thickly tapered caudal extensions with an extremely uneven lateral margin.

DESCRIPTION. *Male.* DFW, DHW ground dark brown, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe brown. VFW, VHW ground dark brown; bands brown to blackish, appearing more unipartite than tripartite (see Remarks); FW with thin postmedial band from costa to cell CuA2; HW medial band also thin, blood-red to brownish black, greatly meandering from cell M3 to anal "W"-like element (latter not greatly produced), limbal area with bright yellow-orange Thecla-spot submarginal in cell CuA1. FW length: 13.0-13.5 mm. (AMNH). *Female.* Unknown to me; probably marked similar to male except DFW, DHW broader and more roundly margined and VHW with more pronounced medial band. *Male Genitalia.* Fig. 2B. Vincular dorsum with short brush organs extending along articulation of falces. Genitalia with vincular ventrum robust and rather rounded toward a parabolic saccus of moderate width. Falces showing very finely spiked serrations (left facing arrow, Fig. 2B). Valvae ventrally showing elongate habitus based on diminutive parabolic bilobes or rather conical basal shape and gradually tapering caudal extensions with an extremely uneven lateral margin (right facing arrow, Fig. 2B). Aedeagus rather elongate, length

exceeding rest of genitalia by about one-fourth and with each of shaft and caecum vaguely bowed; terminus of aedeagus with pronglike cornutus typical of genus.

TYPES. Holotype male, BMNH, labelled [from my notes, see Remarks] "Fernandes Pinheiro, Parana, Brazil", "type", "*Thecla fernanda* Jones" (fig. 2B) (see Remarks).

DISTRIBUTION. *Spatial:* Fig. 9. Apparently restricted to southeastern Brazil and perhaps a coastal forest endemic; however, reported as recently as 1968 (Zikán and Zikán). *Temporal:* the only dated specimen known to me is from March.

REMARKS. I have worked on the types and related specimens of *Thecla fernanda* probably the least of any other member in this Species Group. This results because I had originally "staked out" this species from other BMNH material as a new species. Even at the time of this writing, this putative new species is still so-marked in the BMNH collection and will need to be corrected. On the last day of my 1992 BMNH visit I completed dissections of some additional eumacine type material. I was surprised to find that the type of *Thecla fernanda* matched exactly the genitalia of my putative new entity. This leads me to suspect that the blackish-brown band of the type specimen results somewhat from age, since the newer material, clearly showing the genital habitus of this species, shows a deep blood-red band. Such blackish-colored VHW band has also led to confusion of *fernanda* with the "*sethon* Group" of *Thecla* as noted below. However, I was unable to search the BMNH collection for the additional material and, given the overall problems with identifying this group, it has been unrealistic to ask anyone else to do it. A coauthor and I have revised the "*sethon*" assemblage elsewhere (Johnson and Kroenlein in press b) and neither *fernanda* or the species of subsequent entry belong therein. It is a hopeful sign that Zikán and Zikán report the species as late as 1968, although the specimens may be old. The most hopeful place for finding specimens in the United States is in the Gargarin collection at the MPM. However, since I did not suspect the taxon to be part of this assemblage when I began this study, I did not borrow relevant MPM series to search for additional specimens. Perhaps the information provided herein will facilitate additional identifications of *G. fernanda* at numerous institutions.

MATERIAL EXAMINED [diacriticals employed only as on labels]. BRAZIL. See type above;

Parana, Castro, 2900 ft., leg. E. D. Jones, 2 ♂♂ (BMNH); Pelotas, Rio Grande do Sul, 3 March 1954, leg. C. Biezanko, 1 ♂ (AMNH).

Gigantorubra nubilum H. H. Druce

NEW COMBINATION

Photoplate ID, Figs. 2C.

Thecla nubilum H. H. Druce 1907: 612. Draudt 1919: 797. Comstock and Huntington 1958-1964 [1961]: 199; Zikán and Zikán 1968: 56; Bridges 1988, I.133,II.33,III.30.

Electrostrymon nubilum: Bridges 1988: I.249 (combination in error, see Remarks).

DIAGNOSIS. *Wings.* DFW,DHW dark brown, VHW band very dark (deep red to brownish) giving unipartite appearance against dark brown ground color; SC+R1 element only slightly more produced and distended distally from rest of band; angled pattern from vein M3 to 2A in rather compact "W"; limbal area conservatively marked with dark *Thecla*-spot and adjacent brown-suffused scallops in the cell ends (see Remarks regarding confusion with "*Electrostrymon*").

Morphology. Male genitalia very non-robust with narrow elliptic ventral habitus; valvae ventrally showing widely shouldered bilobes contrasting narrow, thinly tapered caudal extensions.

DESCRIPTION. *Male.* DFW,DHW ground dark brown, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe orange-brown. VFW,VHW ground dark brown; FW with thin, deep red-brown, postmedian band from costa to cell CuA2; VHW medial band thin, compactly tripartite, basally deep red-brown, distally black and white (latter very vague); SC+R1 element SC+R1 element slightly more produced and distended distally from rest of band; angled pattern from vein M3 to 2A in rather compact "W"; limbal area conservatively marked, with dark *Thecla*-spot and adjacent brown-suffused scallops in the cell ends. FW length: 13.5-14.0 mm. (AMNH material examined). *Female.* Not known to me; probably marked similar to male except for broader and more rounded wings and with VHW showing broader medial band habitus. **Male Genitalia.** Fig. 2C Vincular dorsum with short brush organs extending along articulation of falces. Genitalia with vincular ventrum not particularly robust and rather angulate, saccus "funnel"-shaped to a steep point. Falces typically serrate for genus. Valvae ventrally showing widely shouldered bilobes contrasting narrow, thinly tapered caudal extensions. Aedeagus elongate, exceeding rest of genitalia by about one-

FIGURE 6. MORPHOLOGY of *CRIMSINOTA*

Format: (a) male genitalia in ventral view, aedeagus removed and shown in lateral view (d), showing left bilateral side of vincular arc and entire saccus (a) enclosing the left valve (bilobed configuration, b, caudal extension, c), black line and carot, location and point of abutment of brush organs; (e) female genitalia, ventral view from terminal lamellae (above) to cervix bursae (below), (f) corpus bursae signum, lateral view.

- A. *Crimsinota socia*, lectotype male, paralectotype female (BMNH).
- B. *Crimsinota rubifer*, male, Tarapoto, Peru, holotype female (BMNH).
- C. *Crimsinota giganta*, holotype male (MPM).
- D. *Crimsinota perplexissima*, holotype male, allotype female (BMNH).
- E. *Crimsinota argentina*, holotype female (AMNH).

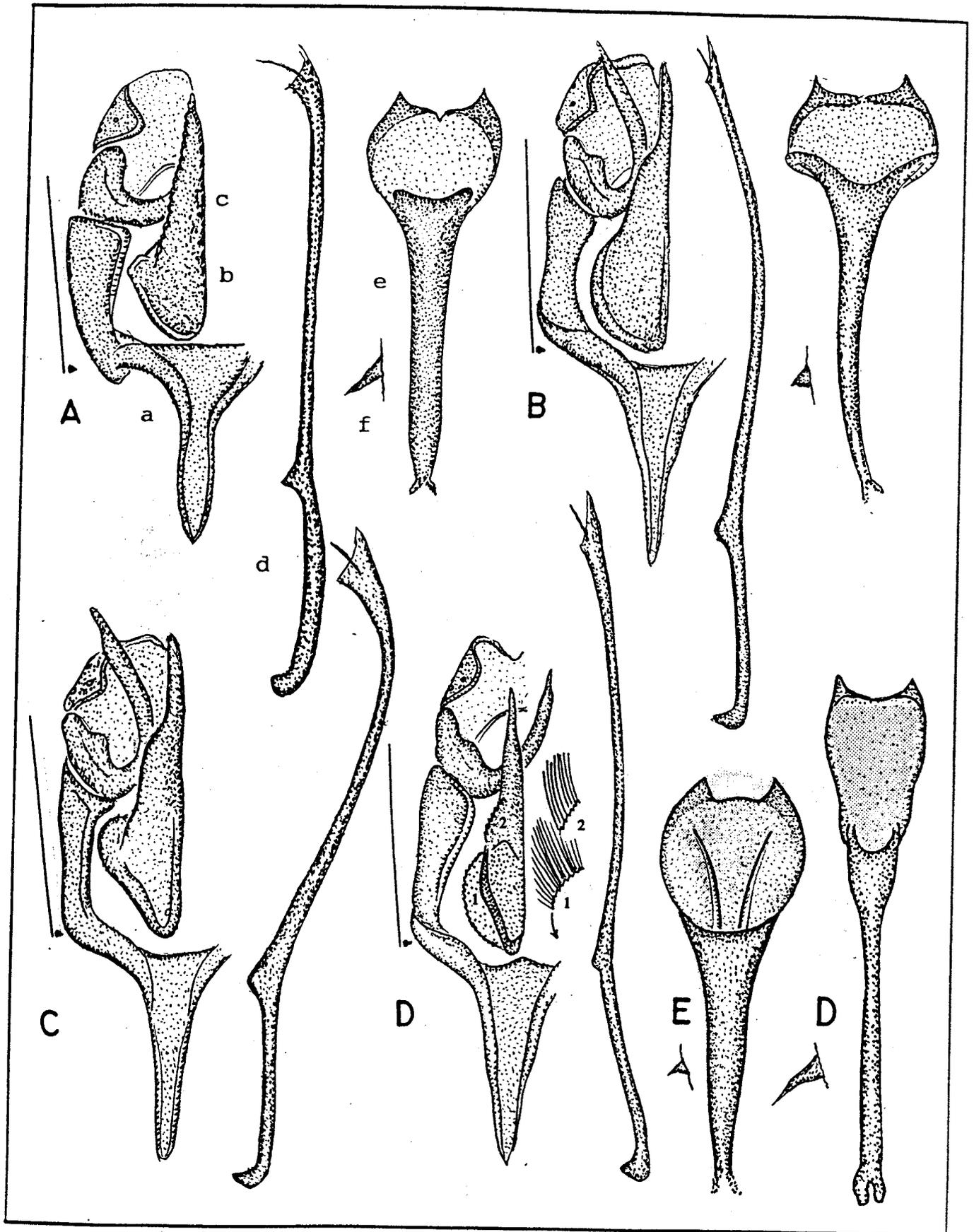


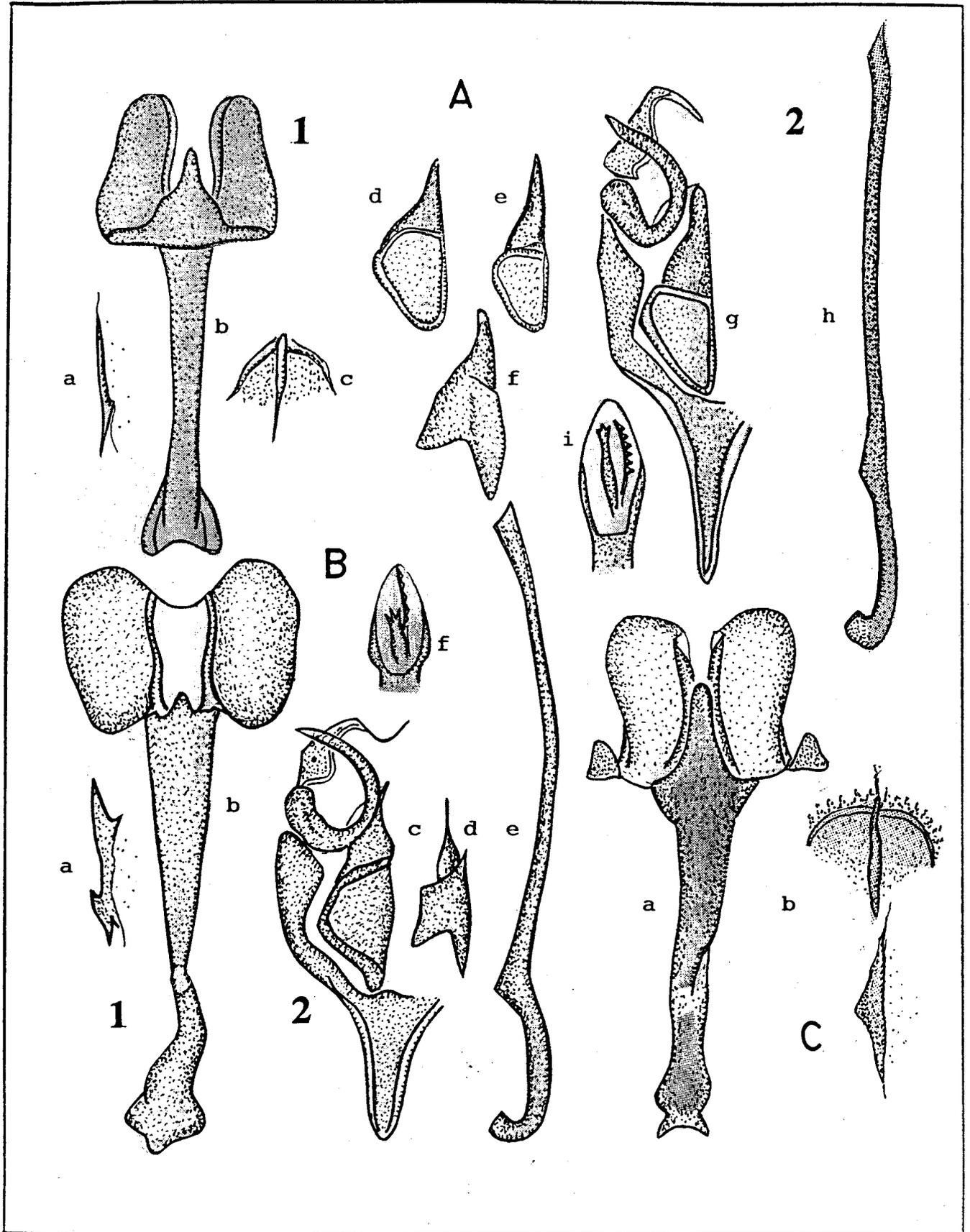
FIGURE 7, MORPHOLOGY of ZIEGLERIA

Format: female genitalia (1) and male genitalia (2) as follows:

A. *Ziegleria hesperitis*, topotype male and female, Cartago, Costa Rica (BMNH); 1, genitalia, b, ventral view from paired lamellae to cervix bursae with a, corpus bursae signum in lateral view, c, in view from outer bursae wall; 2, male genitalia, g, ventral view showing left bilateral side of vincular arc (except for entry A, see below) and entire saccus enclosing the left valve [in lateral view, f] with aedeagus removed and placed at right, h (with sculptured terminus and paired cornuti, i). For comparative purposes, variation in valvae from South America: d, Sierra Nevada de Santa Marta (BMNH, sympatric with *Z. bernardi*) and e, Arima Valley, Trinidad (BMNH).

B. *Ziegleria bernardi*, holotype female, allotype male (BMNH), 1, same features as in 1A; 2, genitalia, ventral view (c), valve, lateral view (d), aedeagus, lateral view (e), aedeagus terminus (f).

C. *Ziegleria cyanissima*, holotype female (AMNH), genitalia, ventral view (a), corpus bursae signa, outer wall view (above), lateral (below).



let across HW limbal area. Typical of the genus, the male shows a thinner band but it is still outstanding in overall width compared to congeners.

Morphology. Female unmistakable, with prominent laterally angled antrum which, along with the terminal lamellae, comprise some one-half of entire genitalic length (see below). Male genitalia less robust than congeners and (although larger overall) reminiscent of the more delicate structures in genus *Rubroserrata* (see Johnson and Kroenlein, in press a and Remarks)—valvae with shouldered bilobes and thickly tapered caudal extensions, saccus slightly knob-ended.

DESCRIPTION. Male. DFW, DHW ground brown, HW with short tail, vein CuA1 terminus, longer tail, CuA2 terminus; HW anal lobe orange. VFW, VHW ground from light buff (dry season) to darker brown (wet season); bands tripartite with red-orange central color dominating width and intensity; FW postmedial band, costa to cell CuA1 or CuA2; VHW medial band maintaining significant width between SC+R1 element and "W"-shaped element at M3 to 2A compared to congeners; limbal area with red-orange CuA1 *Thecla*-spot and often with prominent brown-suffused scallops around this and the adjacent cells. FW length: 13.0 - 14.5 mm. (N=5, AMNH, BMNH Material Examined). **Female.** Marked similar to male except DFW, DHW with flush of violet across medial to limbal area of DHW; VFW, VHW similar to male but VHW with extreme maintenance of width in medial band, with entire band about same width as SC+R1 and "W"-shaped elements. FW length: 13.0 - 15.0 mm. (N=10, AMNH, BMNH Material Examined). **Male Genitalia.** Fig. 2A. Vincular dorsum with short brush organs extending along articulation of falces. Genitalia with vincular ventrum angulate and sloping to somewhat funnel-shaped saccus with slightly knobbed terminus. Falces with robust serrations typical of genus (right facing arrow, Fig. 2A) Valvae ventrally triangulate in shape, comprised of laterally shouldered bilobed area and robustly sloped caudal extension. Aedeagus moderate in length, exceeding rest of genitalia by about one-fourth and with each of shaft and caecum vaguely bowed. **Female Genitalia and Tergal Morphology.** Fig. 5A. *Sipc* with lateral edges produced and slightly undulate. Genitalia with prominent laterally angulate antrum, it and terminal lamellae comprising some one-half of entire genitalic length. Terminal lobes of lamellae tapered caudally (not flared as in some congeners or as common in *Angulopsis* taxa); antrum with prominent sclerotol convolutions along the lateral margins, strongly

connected outward to the tergite with membranous material when dissected; cervix bursae ventrum knob-like, signa shieldlike with some anterior dendritic sclerotizations as typical of the genus.

TYPES. Lectotype, designated here, from *Thecla collucia* syntype 1, labelled as follows "Esp. Santo, Hew. Coll. 79.69.-- *Thecla collucia* .1." These are part of a mixed, noncongeneric syntype series which I and a co-author (Johnson and Kroenlein in press a) have previously elaborated to fix the lectotype female of *Thecla badaca* Hewitson (see *Angulopsis badaca* entry in cited paper, lectotype B.M. Rhop. type #1009, labelled "Brazil, Hewitson Coll. 79-69., *Thecla collucia* 4.", "B.M. Lep. Rh. type 1009". This resolution is consistent with the original BMNH labelling of this and additional syntypes, of which syntypes "1", "2", "3" and "4" are all labelled as "*Thecla collucia*" but "2"- "4" area also labelled "*Thecla badaca*". The latter three syntypes show wing and genitalic characters typical of *Angulopsis*. The wing and genitalic characters of "*collucia* 1." are consistent with the generic diagnosis of *Gigantorubra*. I thus followed the original BMNH labelling, making B.M. Rhop. type #1009 ["*collucia* 2/ *badaca*"], the lectotype of *Thecla badaca* with co-author Kroenlein and here fix B.M. Rhop. type #1010 as the lectotype of *Thecla collucia*, clearly a species of *Gigantorubra*.

DISTRIBUTION. Spatial: Fig. 9. Widely distributed (and probably more than indicated due to the previous problems of identification). Specimens identified in the current study include Mexico south into Colombia, Venezuela and Trinidad-Tobago. The species is particularly common in Trinidad-Tobago samples. **Temporal:**

REMARKS. Comments in entries concerning *Angulopsis* (Johnson and Kroenlein in press a) require review here. Each of *A. ceromia* (Hewitson), *badaca* (Hewitson) and *opacitas* (Druce) have simple thin red VHW bands, *badaca* showing dark distal dark suffusions as well in the limbal area. *G. collucia* can always be recognized by its wide bands, in which the tripartite orange, black and white is outstanding and maintains outstanding with between the anal "W" and the wing costa. This makes the anal "W"-element appear less pronounced in *G. collucia* (introductory schematic Fig. 1). Also, brown suffusion in the VHW limbal area in *G. collucia* appears as scallops around the intercellular areas, not full-blown dark suffusion as seen in *A. badaca*. It should be noted here that some large (16.0 mm. +) species of *Gigantorubra* show lavish developments of distal brown and black patches (Fig. 1). When familiar with these spectacular species, there will be little confusion of these with the simply marked taxa *A. badaca* or *G. collucia*.

Any problems can be easily solved by dissection.

MATERIAL EXAMINED. COLOMBIA. Sierra Nevada de Santa Marta, N. Colombia, leg. G. Bernard, 1 male, 1 ♀ (BMNH); Cauca, leg. de Mathan, 1 ♀, (BM-NH); Makasaka, Sierra Nevada de Santa Marta, leg. Bernard, 1 ♀ (BMNH); North Colombia, Sierra Nevada de Santa Marta, M. J. Adams and G. I. Bernard, #2191, 1 ♂, #2190, 1 ♂ (BMNH). MEXICO. Durango, Durango, August 1932, leg. Hoffman, 1 ♂ (AMNH); Vera Cruz, Presidio, nod, leg. Hoffman, 1 ♀ (AMNH); Valparaiso, 4500 ft., 1 ♀ (AMNH); Presidio, 1 ♀ (AMNH); Durango, Durango, Macias Coll., 1 ♂ (AMNH); Vera Cruz, Presidio, leg. Hoffman, 1 ♀ (AMNH). TRINIDAD-TOBAGO. Tabaquite, 9 April 1922, leg. F. W. Jackson, 1 ♀ (BMNH); "S.S. Estate", Songue Grande, 1 ♀ (AMNH); Arima, 5 November 1969, 1 ♂ (AMNH); Arima, 5 November 1969, 1 ♀ (MPM); Arima Valley, 29 March 1952, leg. Heine-man, 1 ♀; "Trinidad", nod, Rothschild Bequest, 1 ♀ (BMNH); Arima, 30 January 1963, 1 ♀ (AMNH). VENEZUELA. San Estevan, leg. Hahnel, 1 ♀ (BM-NH), Venezuela, Merida, 1 ♂, 1 ♀, (BMNH); Puerto Cabello, 1 ♂ (BMNH).

Gigantorubra picentia (Hewitson)

NEW COMBINATION

Photoplate IF, Figs. 4B, 5E.

Thecla picentia Hewitson 1868: 23. Draudt 1919: 804, pl. 159, f.e. Comstock and Huntington 1958-1964 [1962]: 89; Bridges 1988: II. 108, III. 69.

Thecla rubifer [nec *rubifer* H. H. Druce 1907: 621]: Bridges 1988: II. 108 (treats as synonym of *picentia* in error, see Remarks and genus *Crimsinota* of subsequent entry).

DIAGNOSIS. *Wings.* The consummate "wide-banded" species, this taxon has formerly been known only from the female (mostly from renderings of the BMNH type specimen) and widely confused with *Thecla rubifer*, a much smaller species which resembles it only in having dark blood-red VHW bands (see *Crimsinota rubifer*, subsequent entry). Both sexes of *G. picentia* show a blood-red, extremely wide and costally lunulate; VHW medial band making the species readily recognized. Both sexes are larger than *C. rubifer* but smaller than some *Gigantorubra* (FW alar 13.5-14.5 mm.) and could also be confused with species of the smaller, widely red-banded, genus *Rubroserrata* Johnson and Kroenlein (in press b) if one fails to note the wide "W"-shaped element in the anal area which com-

plements the wide costal banding. Amongst *Gigantorubra G. picentia* shows the most lunulate band elements, surrounded by bold black and white edging, so thick as to make the SC+R1 element appear not laterally displaced from the rest of the band.

Morphology. Male genitalia in known specimen showing single distinctive posterior tooth near base of falces and valvae with ventrum of bilobes roundly shouldered (divided by sculpturing into a dorsal and ventral plane), bilobes then tapering to short but somewhat bulbous caudal extensions. Female genitalia with superior plate widely undulate, protruding terminally from a widely concave opening that terminates the ductus antrum.

DESCRIPTION. *Male.* Small amongst congeners (FW alar 13.5-14.5 mm.). DFW, DHW ground light brown, HW with orange mark at anal lobe but lobe not produced; short tail at vein CuA1 terminus, longer tail at CuA2 terminus. VFW ground light brown, postmedian band black and extending from costa to cell CuA1; VHW ground brown, medial band scarlet bordered contiguously by thick black; SC+R1 element about twice width of band and colored distally black but well enclosed by distal and basal edging of band caudad; band extending in archlike fashion across the wing, scarlet color contiguous (widest costad) and entire, distal black and white edging more jagged but not forming an obvious "W"-shaped element between veins M3 to 2A; limbal area mottled with arched and chevron-like markings formed from contrasting dark and light brown ground colors; Thecla-spot scarlet, anal lobe black, intervening cell submarginally brown but postmedially with a unique black spot. FW length: 15.0 mm. (AMNH example). *Female.* DFW, DHW ground brown, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe marked orange and flanked by a white slash costad in adjoining cell. VFW ground brown; postmedian band wide and orange, narrowing from costa to cell CuA2. VHW ground brown; medial band very wide (1 mm.+), widely red-orange to more scarlet within, but bordered extensively with black, SC+R1 element exaggerated and surrounded widely with black (width of medial band further enhanced by distal dark brown patch in costal HW cells alongside the SC+R1 element). Angled elements from veins M3 to 2A very produced in size but much reduced in width compared to costal element; limbal area much lighter brown, marked with a blackish patch adjoining the anal lobe. FW length: 13.5 mm. (BMNH examples). *Male Genitalia.* Fig. 4B. Vincular dorsum with stout brush organs extending to base of labides. Genitalia with vincular ventrum robust, angled toward posterior but with anterior quite rounded to juncture with broad parabolic saccus. Falces in known

specimen showing single distinctive posterior tooth near falces base. Valvae with ventrum of bilobes showing rounded shoulder, divided by sculpturing into a dorsal and ventral plane (latter tapered thickly to a rather abrupt juncture with caudal extensions); caudal extensions short (only about same length as bilobes) and somewhat bulbous before their terminus. Aedeagus robust, length exceeding rest of genitalia by about one-fourth; caecum and shaft both moderately bowed, terminus with prominent pronglike cornutus. *Female Genitalia and Tergal Morphology*. Fig. 5E. *Sipc* typical of genus. Female genitalia with ductus bursae marked by widely spatulate terminus in which the usual winglike lobes laterad of the ductal struts are quadrangulate and fit into the rest of the ductus much like a sheath. Ductus bursae elongate (length nearly three times that of superior plate) and swollen to a gaping antrum before the lamellae; corpus bursae signa platelike with dendritic margins as typical of genus.

TYPES. Holotype female, BMNH, labelled "Tapajos, Amazons", "H. W. Bates" "picentia" "Godman—Salvin Coll. 1912-23, B.C.A. Lep. Rhop. *Thecla picentia* Hew.", "B.M. Type no. #997".

DISTRIBUTION. *Spatial*: Fig. 9. Currently known only from the Amazon River in Brazil and adjacent areas of eastern Peru. *Temporal*: the only dated specimen known to me is from October.

REMARKS. This species is extremely distinctive but, because it is poorly known, has been historically confused with a smaller noncongener *Thecla rubifer*. When both species are examined they are not much alike and *G. picentia* actually more easily confused with several members of *Rubroserrata* Johnson and Kroenlein (in press b) until the habitus of the HW band in cells M3 to 2A is noted. It is quite probable that knowledge of the geographic distribution of *G. picentia* will rapidly increase once the photographs herein are used to properly identify it.

MATERIAL EXAMINED. BRAZIL. See type above. "Amazon", nod, leg. H. W. Bates, 1♀ (BMNH). PERU. Yumbatos, 25 October 1932, ex. E. I. Huntington Collection, 1♂ (AMNH).

Subgroup 2. Narrower-banded Species

Note: species of this group do not approach the narrow bands typifying the *simplicia* Group. However, compared to the two species just above, members of the group show some area of the VHW band either reduced or deleted. These make them stand out in

comparison to all congeners.

Gigantorubra zurkvitzi (Schaus)

NEW COMBINATION

Photoplate IG, Figs. 4A,5F.

Thecla zurkvitzi Schaus 1902: p. 42. Draudt 1919: 795.

Comstock and Huntington 1958-1964 [1964]: 192; Zikán and Zikán 1968: 56 Bridges 1988: I.133, II.109,III.104.

DIAGNOSIS. *Wings*. The species (an apparent SE Brazil endemic) has been formerly known only from the male. It is readily recognized by an abrupt reduction of the VHW red-brown band after the coastal area (SC+R1 to M3), the intervening band between M3 and the "W"-shaped anal element occurring only as a thin black and white lineal element. Males show a slight blue overcast on DFW,DHW and bright orange HW anal lobe. The female (discovered in the present study) is outstandingly dark blue on DFW,DHW and bright orange HW anal lobe and great wing expanse (alar to 17.0 mm.).

Morphology. Male genitalia with extremely robust valvae, ventrum of bilobes with wide angulate shoulder, caudal extensions very long and thick, terminating in rounded ends. Female genitalia with huge terminal superior plate (comprising nearly one-half genital length) and with a protruding inferior plate unknown in any congener.

DESCRIPTION. *Male*. DFW,DHW ground brown suffused over with a bluish cast, HW with brilliant orange anal lobe and short tail at vein CuA1 terminus, longer tail at CuA2 terminus. VFW ground light tan; postmedian band brown and not very succinct, extending from costa to cell CuA1. VHW ground light tan; medial band beginning with somewhat pronounced orange-brown and black SC+R1 element and orange-brown extending then to vein M3 but, thereafter, angled elements from veins M3 to 2A thin and simply black and white; limbal area with light cream costal suffusion becoming darker at posterior; *Thecla*-spot small and orange, anal lobe black with basal white slash extending into the intervening cell. FW length: 15.0 - 15.5 mm. (AMNH material examined). *Female*. DFW,DHW ground dark dull blue, HW with an orange-brown anal lobe, short tail at vein CuA1 terminus, longer tail at CuA2 terminus. VFW ground chocolate, postmedian band orange, marked quadrapartite by basal black and distal black and white from costa to cell CuA2, thereafter angled thinly black to posterior margin. VHW ground chocolate; medial band bright orange marked pentapartite with basal and distal black and white; area from costa to cell M2 quite checkered in appearance, SC+ R1 element not exaggerated compared to other elements;

angled elements of veins M3 to 2A forming a wide, but not deep, "W"-shape; limbal area greatly mottled with crisp suffusions forming chevronlike marks (white-edged along the submargin and extending to large orange Thecla-spot at cell CuA1), anal lobe fringed black with intervening areas suffused orange, blue and white. FW length: 17.0 mm. (MPM example). **Male Genitalia.** Fig. 4A. Vincular dorsum with short brush organs extending to base of labides. Genitalia with vincular ventrum robust posteriorly and at stout triangulate saccus but with intervening area quite thin. Falces robustly serrate. Valvae extremely robust, ventrum of bilobes with wide angulate shoulder, caudal extensions very long and thick, terminating in rather rounded ends. Aedeagus robust with length exceeding rest of genitalia by only about caecum length; caecum and shaft both moderately bowed, terminus with prominent pronglike cornutus. **Female Genitalia and Tergal Morphology.** Fig. 5F. *Sipc* typical of genus. Genitalia with terminal superior plate comprising nearly one-half of entire genital length and showing widely flared, terminally undulate, margin and a protruding inferior plate unknown in any congener; ductus bursae consequently short (length about same as lamellae) and showing no appreciable antrum; corpus bursae signa platelike with dendritic margins as typical of genus.

TYPES. Holotype male, NMNH, type no. 5932. TL: BRAZIL, São Paulo, "southeast Brazil".

DISTRIBUTION. *Spatial:* Fig. 9. Currently known only from southern eastern Brazil and perhaps a coastal forest endemic. *Temporal.* The only dated specimen known to me is from June.

REMARKS. I associate the large MPM female here with *G. zurkivtzi* based on a "best fit" of wing pattern characters that are consistent with sexual dimorphism in the genus overall. The only alternative to this conservative approach would be to describe the MPM specimen as a new species. However, I believe most lepidopterists will agree that this association is probably correct. It is possible that specimens cited by Zikán and Zikán (1968) include females. Perhaps these can be checked subsequently by South American workers and compared with the MPM female. It is also possible that the MPM has further examples.

MATERIAL EXAMINED [diacriticals employed as on labels]. BRAZIL. Massaranduba-Blumenau, Parana State, E. I. Huntington Coll., 3♂♂ (AMNH); Minaes [sic] Gerais, nod, 1♂ (BMNH); Independencia, Petropolis E. to Rio, 900 m., 8 June 1938, leg. Gagarin; 1♀ (MPM).

Gigantorubra clintoni,
NEW SPECIES

Photoplate IH, Fig. 4C.

DIAGNOSIS. *Wings.* A small species (FW alar 13.5 mm.) light brown on DFW,DHW with VFW,VHW brown bands reminiscent of *G. zurkivtzi*. However, where deletion of the VHW band width occurs in males of *G. zurkivtzi* (cell M3 to the "W"-shaped anal element) band width is maintained in *G. clintoni* as a broad taper (giving the overall appearance of a straight and caudally tapered brown band from the costa to the "W"-shaped anal element).

Morphology. Male genitalia with falces showing very fine knoblike serrations scattered across the inner margins. Valvae with ventrum of bilobes showing a rounded and thinly rimmed shoulder and caudal extensions tapering in a "two-step" fashion to elongate fingerlike termini.

DESCRIPTION. *Male.* DFW,DHW ground warm light brown, HW with more brilliant auburn anal lobe and short tail at vein CuA1 terminus, longer tail at CuA2 terminus. VFW ground light tan; postmedian band brown and succinct, extending in tapered fashion from costa to cell CuA1; VHW ground light tan, medial band beginning with somewhat more pronounced brown SC+R1 element (blackened distally) and then extending in a gradual taper to the angled elements of veins M3 to 2A, there forming a distinctive "W"-shaped element in the anal area; limbal region generally unicolorous tan, broken only by an oranger Thecla-spot and slight chevron-like darker brown suffusions in the surrounding limbal cells. Anal lobe blackish brown with slight basal white slash extending into the intervening cell. FW length: 13.5 mm. (holotype). *Female.* Unknown. **Male Genitalia.** Fig. 4C. Vincular dorsum with short brush organs extending to base of labides. Genitalia with vincular ventrum robust but rather rounded, still very thick along juncture to short triangulate saccus. Falces with very fine knoblike serrations scattered across the inner margins. Valvae with ventrum of bilobes showing rounded, laterally rimmed, shoulder and caudal extensions tapering in a "two-step" fashion to elongate fingerlike termini. Aedeagus less robust than congeners and more elongate, length exceeding rest of genitalia by about almost two-fifths; habitus with caecum and shaft both bowed, terminus with prominent pronglike cornutus.

TYPES. Holotype male, COLOMBIA, Choachi, March 1915, CM Acct. 5337, deposited CMNH.

DISTRIBUTION. *Spatial:* Fig. 9. Currently known only from the type locality. *Temporal:* known only from the March type data.

REMARKS. It will be of great interest to see if more specimens of this species can be located by Colombian lepidopterists. It would be of particular interest to compare females to those of *G. zurkvitzi*. It is possible the two are ancient vicariates.

ETYMOLOGY. A patronym for the late Clinton Hitz.

Gigantorubra solitaria,
NEW SPECIES

Photoplate II [I,I], Figs. 3E,5G.

DIAGNOSIS. *Wings.* VHW band distinctive by solitary appearance of large red lunulate SC+R1 element isolated at the "end" of an otherwise rather lineal HW band (latter thinly red-orange basally with thin white and black distal edging).

Morphology. Male genitalia showing base of falces highly sculptured as well as terminally serrate; valvae with ventrum of bilobes widely parabolic with an angled shoulder and thick caudal extensions inwardly curvate toward their termini. Female genitalia with superior plate showing uniquely serrate terminus with four distal teeth terminating the respectively paired lamellae and ductal struts.

DESCRIPTION. *Male.* DFW,DHW ground light bright brown, HW strewn with lighter beige and marked with vague brown submarginal blotch at cell CuA1 and a white and black marginal line; short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe fringed white. VFW ground darker brown, crossed by very thin red-orange band from costa to cell CuA1; VHW ground brown; postmedian band red orange with an outstanding large and distally displaced SC+R1 element, remaining posterior elements of band appearing comparatively diminutive, mostly through brisk white and black distal edging; limbal area marked with concise alternating beige, brown and white lunulate marks surrounding large orange Thecla-spot at cell CuA1; anal lobe black with basal white slash and intervening areas suffused white and bluish. FW length: 14.0 mm. (holotype). *Female.* Marked similar to male except with DFW,DHW broader and more roundly margined; VFW,VHW showing some thickening of the VHW band compared to the detached SC+R1 element. FW length: 14.0 mm. (allotype). *Male Genitalia.* Fig. 3E. Vincular dorsum with short brush organs extending to base of labides. Genitalia with vincular ventrum very robust and angulate along both inner and outer margins, thickly tapered to abruptly pointed saccus. Falces robustly

serrate. Valvae with ventrum of bilobes widely parabolic with an angled shoulder along margin with caudal extensions; caudal extensions rather thick with termini inwardly curvate in a gradual fashion to sharply pointed ends. Aedeagus robust, length exceeding rest of genitalia by about caecum length; caecum and shaft both moderately bowed, terminus with prominent pronglike cornutus. *Female Genitalia and Tergal Morphology.* Fig. 5G. *Sipc* typical of genus. Genitalia with terminal superior plate showing unique serrate terminus caused by formation of four distal teeth which terminate the respective paired lamellae and ductal struts; ductus bursae length about two-times that of terminal lamellae but with another one-fourth length added by a widely flared terminal antrum; corpus bursae signa platelike with dendritic margins as typical of genus.

TYPES. Holotype male, allotype female, BRAZIL, Cuyabe [sic], Matto [sic] Grosso, no other data, deposited BMNH. *Paratypes.* BOLIVIA, Santa Cruz, nod, 1♂ (BMNH); Hotel Tamampaya area (Estancia Anacu), 4300 m, Prov. Sud Yungas, Dept. La Paz, 20-27 May 1989, leg. D. and K. Matusik 1♂ (AMNH). ARGENTINA. Villa 23 de Augs. 1 December 1966, 1500 m. leg. R. Eisele, 1♂ (AMNH).

DISTRIBUTION. *Spatial:* Fig. 9. Currently known from the "yungas" region of Bolivia and adjacent northern Argentina and southwestern Brazil. *Temporal:* dated specimens range from December to May.

REMARKS. This species is a good example of the kind of diversity indicated in *Gigantorubra*. The species is distinctive and known from old and recent specimens. The fact that the recent specimens have been taken both by long term resident collectors and on short collecting trips, suggests the species will ultimately be known from additional series. I did not use the recent specimens as types since a male/female pair was not represented.

ETYMOLOGY. From the Latin *solitarius* meaning alone (e.g. solitary) and referring to the appearance of the SC+R1 VHW element in this species.

Gigantorubra bahia,
NEW SPECIES

Photoplate II, Figs. 4D,5B.

DIAGNOSIS. *Wings.* The consummate "typical" *Gigantorubra*, showing all features of the wing pattern elements typifying the genus but none with extremes or additional pattern components. Large (FW alar 15.0 - 16.5 m.) with brown DFW,DHW and HW distinctly angled at anal area; VFW,VHW with scarlet bands showing crisp scarlet base on FW band and, on HW, a crisp band

of scarlet proceeding solidly and straight beneath the produced SC+R1 element to "W"-shaped element in the anal area. VHW pattern of males and females the most similar of the genus, VHW band on female only slightly wider than on male. All scarlet elements crisply bordered by succinct white and black edging—compared to other large *Gigantorubra* (e.g., the *exotissima* Group below), lacking further widening or embellishment to the VHW band and any additional limbal or costal elements; compared to species of the *collucia* Group, bands scarlet (not orange or red-brown) and maintaining a consistent width across HW M-cells (not thin or broken as in *G. zurkvitzi* or wider and lunulate as in *G. collucia* or, to the extreme, *G. picientia*).

Morphology. Male genitalia with conservative habitus, showing valvae with thinly rimmed, moderately shouldered bilobes and evenly tapered caudal extensions about two-times expanse of bilobes; female with habitus rather "hammer"-like, formed by expansive hemispherical lamellae flanking a robust ductus bursae about twice the lamellae length.

DESCRIPTION. *Male.* DFW, DHW warm auburn brown, HW quite angled toward anal area and with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe black-rimmed over orange. VFW, VHW medium beige, FW with scarlet-based postmedial line of consistent (circa 1 mm.) width from costa to cell CuA2; HW with crisp scarlet band edged with succinct white and black, starting with a produced SC+R1 element (about twice width of remaining band) and then proceeding straight, scarlet and of homogeneous (circa 1 mm.) width through the M-cells to a succinct "W"-shaped element in the anal area. HW costa, submargins and limbals areas lacking any outstanding pattern components other than bold scarlet Thecla-spot at CuA1 (approximating the simple habitus as in *G. collucia*). FW length: 15.5 mm. (holotype), 16.0 mm. (paratype). *Female.* DFW, DHW showing a dark blue hue not apparent in male; VFW, VHW marked very similar to male, not showing the extremely wide variance in the VHW band as in other congeners; instead, HW band elements only slightly wider (+.5mm.) and appearing only slightly more "blocked" (that is, disjunctive and offset) compared to the male. FW length: 16.0 mm. (allotype). **Male Genitalia.** Fig. 4D. Vincular dorsum with short brush organs extending to base of labides. Genitalia with vincular ventrum rounded and slightly flared distally before a pointed saccus. Falces robustly serrate. Valvae with ventrum of bilobes thin-rimmed and with

moderate shoulder; caudal extensions evenly tapered to a length about twice that of expanse of bilobes. Aedeagus robust, length exceeding rest of genitalia by about about one-fourth, habitus with caecum and shaft both bowed; terminus with prominent pronglike cornutus. **Female Genitalia and Tergal Morphology.** Fig. 5B. *Sipc* typical of genus. Genitalia with "hammer"-like shape formed by widely hemispherical lamellae flanking a robust ductus bursae with length about twice that of expanse of lamellae; corpus bursae signa platelike with dendritic margins as typical of genus.

TYPES. Holotype male, allotype female, BRAZIL, Bahia, Itaparica, 11 January 1905, Meade-Waldo Expedition, both deposited BMNH. **Paratypes.** Same data as primary types, 1♂ (BMNH).

DISTRIBUTION. *Spatial:* Fig. 9. Known only from eastern Brazil and perhaps a coastal forest endemic. *Temporal:* known only from the January dates of the types.

REMARKS. This species is interesting because its characters are so conservative and "regular" compared to congeners and show little difference on the VFW, VHW between the available males and females. Also, the known specimens are disjunct from most of the rest of congeners and represent what is perhaps an old coastal forest habitat. Both *Angulopsis* (see Johnson and Kroenlein in press a) and *Gigantorubra* appear to show a relative paucity of taxa from eastern Brazil but I think this represents short term sampling error. Once the genus is more well-known from this publication it is probable that substantial records from eastern Brazil will become available. It might be interesting to point out that I anticipated "lumping" the three specimens of the types series with another *Gigantorubra* during the course of revisionary study as more material was elaborated. However, this does not appear possible, particularly when both sexes are considered. If far fewer entities of this genus were known (e.g. if one used the old "consult only Seitz" method for identifying "*Thecla*") one might say *G. bahia* is *G. zurkvitzi*. However, this is totally untenable given the characters of the latter species and the diversity of the genus as a whole.

ETYMOLOGY. Named for the Brazilian State from which the primary types originate.

exotissima Species Group

A group of spectacularly marked species, all of which have been formerly undescribed. Generally very large (alar 16.0+ mm.) with VFW, VHW showing exotic patterns including (i) striking tapered VHW bands formed

with broadly rounded ends. Aedeagus extremely robust, caecum and shaft both bowed, length exceeding rest of genitalia by about one-fourth; terminus with prominent pronglike cornutus.

TYPES. Holotype male, SURINAM, "Ornoribe, Museum Paris", no other data, deposited MNHN.

DISTRIBUTION. *Spatial:* Fig. 9. Currently known from only generalized Surinam data. *Temporal.* The type specimen is not dated.

REMARKS. The three species of *Gigantorubra* described above are among the prettiest Theclines known to the me. Interestingly, the specimens are few and mostly very old. This suggests that the habitats of these taxa may be primary rain forest, particularly areas of high rainfall less often visited by collectors, and that the few specimens represent fortuitous collections. I find it curious that none of these three specimens, except that noted as collected by C. Bar, is attributable to a major early long term collector. Most often, uniques trace to long term resident collectors or specialized collecting areas tied to a major research institution. The fact that one specimen is traceable to Le Moutt suggests that specimens have been collected in relatively more recent times.

ETYMOLOGY. Combines Latin roots for "black" and "red" referring to the very pretty VFW, VFW contrasts of blackish ground and red pattern elements in this species.

Gigantorubra adamsi,
NEW SPECIES

Photoplate IN [I,N], Figs. 2E.

DIAGNOSIS. *Wings.* Marked by boldly contrasted yellow-brown and darker brown ground colors in the areas set apart by the generic wing markings—a trait occurring throughout the blue "orchidia Group" of *Gigantorubra* but seen only amongst the brown taxa in this species. Of the other members of the *exotissima* Group, *G. adamsi* (thus far known only from the isolated Sierra Nevada de Santa Marta of Colombia) is smaller and departs from the richness of their wing markings in having fewer odd additional pattern elements.

Morphology. Male genitalia showing serrations of falces limited to the falces arch; genitalia otherwise robust (as typical of species group) but with ventrum of both vinculum and valvae slightly less so than other groups members (see Figs. 3A-C). Valvae ventrum with angulate shoulder at bilobes followed by caudal extensions sloping in a "two-step" fashion.

DESCRIPTION. *Male.* DFW,DHW ground blackish-brown, single elongate tail at vein CuA2 terminus; HW anal lobe warmer brown. VFW,VHW grounds dark beige-yellow basad of bands, darker (to blackish) distad. FW with postmedial band extending from costa to cell CuA2 deep blood-red but heavily suffused over distally with black. VHW with medial band very deep blood-red with distal areas deeply suffused blackish until somewhat lighter brown at the submargins. SC+R1 element produced and marked black over its distal one-half, M-elements deep blood-red suffused around by black and maintaining about 1 mm. width to until the adjoining markings at veins M3 to 2A which form the "W"-shaped anal element, in this species of moderate size and with quite regular components. Distal areas of wing strongly suffused black and brown, obscuring the limbal Theclaspot to a small blood-red blotch. FW length: 15.5 mm. (holotype). *Female.* Unknown. *Male Genitalia.* Fig. 2E. Vincular dorsum with short brush organs extending along articulation of falces to labides base. Genitalia with vincular ventrum robust (but less so than other group members) and angulate, saccus widely parabolic. Falces with even contour, showing spiked serrations only at the arch (upward facing arrows, Fig. 2E). Valvae ventrally showing elongate habitus but with angulate shouldered bilobes and caudal extensions tapering in an uneven fashion to fingerlike termini. Aedeagus rather elongate, exceeding rest of genitalia by about one-fourth and with each of shaft and caecum vaguely bowed; terminus of aedeagus with pronglike cornutus typical of genus.

TYPES. Holotype male, COLOMBIA, Rio Guachaca, N. Sierra Nevada de Santa Marta, 50-100 m., 9 July 1971, leg. G. I. Bernard #299 (see Remarks), deposited BMNH.

DISTRIBUTION. *Spatial:* Fig. 9. Currently known from the type locality in the Sierra Nevada de Santa Marta of Colombia (see Remarks). *Temporal.* Known only from the type data.

REMARKS. Dr. Michael Adams (Blandford, United Kingdom) informs me that on early Bernard specimens individual notebook citations were not recorded. Thus, compared to other Adams/Bernard Expedition specimens cited in various literature with field notes, such are not possible on the specimen used above as the type. The holotype is of particular interest because it unique characters, both in falces and in the contrasting wing grounds, may reflect the relative isolation of the region of occurrence. Low altitude reflects the climes of congeners and, also notable, the contrasting grounds but reduced markings otherwise typifying the *exotissima* Group may suggest an ancient link between this and the widespread *orchidia* Group.

ETYMOLOGY. Named for Dr. Michael Adams (Bryanston School, Blandford, UK) whose Adams/Bernard Expeditions 1971-1986 to Colombia and Venezuela (see itineraries in Johnson and Adams 1993, Appendix I) have produced a major resource for studying the montane faunas of those regions.

Subgroup 2. Red-banded Species

Gigantorubra necbadaca,

NEW SPECIES

Photoplate IO [I,O], Figs. 3D,5H.

DIAGNOSIS. *Wings.* To many collectors this large species will be the "*Thecla badaca*" of common usage. This results because of confusion about the types of this latter species (see *Angulopsis badaca*, Johnson and Kroenlein, in press a, and *Gigantorubra collucia* above). Another species, obviously a *Gigantorubra* by genitalia, has been identified by many museums and collectors as "*Thecla*" *badaca* because it showed dark brown VFW, VHW patches distal of the red-orange bands. In *G. necbadaca* ("not badaca") the dark distal patches comprise the lavish distal marks typical of *Gigantorubra* species of the *exotissima* Group. In "true" *Angulopsis badaca*, a smaller species (13.0 mm.- 14. mm.), the distal markings are comparatively lighter and more diffuse suffusions as typical of the lectotype of *badaca*. Side by side the two non-congeners are readily separated; any questions can be solved by dissecting the males which show the generic characters of the falces and other elements.

Morphology. Male genitalia showing valvae with ventrum of bilobes widely shouldered in a conical fashion, caudal extension very thick and elongate, tapering gradually to pointed termini. Female genitalia with terminal superior plate widely rhomboid in shape and dominating nearly one-half of genital length.

DESCRIPTION. *Male.* DFW,DHW ground dark brown to blackish, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe brown to more orangish but often encompassed with suffusive black. VFW ground brown to charcoal; triangulate postmedian band of deep blood-red tapering from costa to cell CuA2 marked tripartite with black and white edging, formerly not easily distinguished from ground, extending from costa to cell CuA2; VHW ground dark brown to charcoal; medial band (.3-.5 mm.) deep blood-red marked tripartite by white and black edging particularly offsetting the

SC+R1 element but in no way as large as in species of the *collucia* Group. Angled elements at veins M3 to 2A forming a wide and quite regular "W"-shape; limbal area marked by arc to chevron-shaped marks of contrasting light and dark ground, CuA1 with blood-red Thecla-spot centered and surrounded with black, anal lobe black, intervening cell suffused black and white. Distal areas of wings with "marquese"-like blackish patch on FW, wider more elliptic blackish-brown patch on HW. FW length: 15.5 mm. (holotype), 14.0 - 15.5 mm. (paratypes). *Female.* Marked similar to male except DFW,DHW broader and with more rounded margins, VFW,VHW showing more produced bands and more suffusively edged distal patches. FW length: 15.5 mm. (allotype), 14.5- 15.5 mm. (paratypes). *Male Genitalia.* Fig. 3D. Vincular dorsum with short brush organs extending to base of labides. Genitalia with vincular ventrum less robust than Species Group members and rounded toward pointed saccus of moderate length. Falces robustly serrate. Valvae with ventrum of bilobes widely shouldered in a conical fashion, caudal extension very thick and elongate, tapering gradually to pointed termini. Aedeagus less robust than Group Members, length exceeding rest of genitalia by about about one-fourth to one-fifth, habitus with caecum and shaft both bowed; terminus with prominent pronglike cornutus. *Female Genitalia and Tergal Morphology.* Fig. 5H. *Sipc* typical of genus. Genitalia with terminal superior plate widely rhomboid in shape and dominating nearly one-half of genital length; ductus bursae short, widely open area of terminus extending beneath the entire elongate terminal plate; corpus bursae signa platelike with dendritic margins as typical of genus.

TYPES. Holotype male, allotype female ARGENTINA, Salta Prov., Pichinal, 15 June 1964 leg. R. C. Eisele, deposited AMNH; allotype female, Jujuy Prov., San Pedro, 5 June 1972, leg. B. MacPherson, deposited AMNH. *Paratypes.* ARGENTINA. Jujuy Prov., Dept. San Pedro, La Esperanza, 4 km. S. on floodplain of Rio Grande, 550 mt., 1 April 1980, leg. R. Eisele, 1♀ (AMNH). BRAZIL. Minaes [sic] Gerais, ex. Boisduval Coll., 1♂ (BMNH); Santa Catharina [sic], Saltobach [sic], 14 April 1938, leg. F. Hoffman, 1♂ (BMNH). PARAGUAY. "Paraguay", Crowley Bequest, 1♂ (BMNH); Villarrica, March 1933, F. Schade, ex. J. J. Joicey Coll., 1♂ (BMNH); Rolandia, Mato Grosso State, 1 February 1954, leg. A. Maller, 1♀ (AMNH).

DISTRIBUTION. *Spatial:* Fig. 9. Currently known from south and western Brazil, Paraguay and adjacent northern Argentina. *Temporal.* Specimens are dated from February to mid-June.

REMARKS. This is the "*Thecla badaca*" of common usage to many workers but not the *Angulopsis bacaca* of the *Thecla badaca* types. This has resulted because both *Angulopsis badaca* and *Gigantorubra necbadaca* show brown suffusion in the limbocostal area of the VHW, in *A. badaca* as indistinctly defined suffusion, in *G. necbadaca* as a crisp patch of brown similar to that occurring in other species of the *exotissima* Group. However, since *G. necbadaca* lacks other additional VHW pattern components typifying the lavishly marked *exotissima* Group, the brown costal VHW patch attracts more attention. It is unfortunate that this parallelism in wing pattern occurs; however, if there are any questions, dissection of males will easily solve the problem by reference to the serrate falces typical of *Gigantorubra*. In addition, most specimens of *G. necbadaca* are larger than *A. badaca* and the red band in the former typifies the thick and costally straight habitus of *Gigantorubra* contrasting the thinner and more jagged bands of *Angulopsis*. As heretofore noted under *Gigantorubra collucia*, the syntype series of *Thecla collucia* and *Thecla badaca* required resolution because they were a congeneric mix. The syntypes, however, did not include any specimens of *G. necbadaca*. It is notable from the distributions indicated by *G. collucia* specimens (established by dissection in this revisionary study) may suggest that "Brazil" specimens among the *collucia* types are mislabelled. No specimens of *G. collucia* from SE Brazil have been located in this study and it appears that the distributions of *G. necbadaca* and *A. badaca* extend well southward in South America while that of *G. collucia* may be principally north of the Amazon. However, as noted under *Angulopsis badaca* (Johnson and Kroenlein in press a) sampling error is still a problem in construing the distributions of *Angulopsis* and *Gigantorubra* species because these groups have been so poorly known and widely misidentified hitherto.

ETYMOLOGY. An arbitrary combination adding the Latin prefix *nec* ("not") to the name *badaca*, indicating the historical confusion of this species with "*Thecla badaca*" of common usage.

Gigantorubra argenomontana,
NEW SPECIES

Photoplate IP, Fig. 51.

DIAGNOSIS. *Wings.* A small species (12.5 - 13.0 mm.) with dark brown DFW, DHW, VFW, VHW ground on which the VHW medial band shows a "dele-

tion" in cell M3, breaking the wide red band into a straight costal portion above, and the "W"-shaped element beneath. This break is due to blunting of the M3 base of the costa band-element (as also seen in *Angulopsis suarezensis*, a gray-banded noncongener showing the same innovation at M3) not by the CuA1 element crossing perpendicular through the band as in the large "W" of calycopines (Field 1967a,b; Johnson 1991a). Otherwise, the species is marked by its crisp brown VFW, VHW ground, over which the white-lined red band appears very bold, and the elongate tails compared to small wing size.

Morphology. Female genitalia showing elongate ductus bursae terminating in spatulate lamellae, each lobe of which shows a distal-terminal knob unknown in any congener.

DESCRIPTION. *Male.* Unknown. *Female.* DFW, DHW ground crisp dark brown; HW with tail appearing of moderate length at vein CuA1 terminus, longer tail at CuA2 terminus, both tipped white; HW anal lobe brown to more orangish and encompassed with suffusive black. VFW, VHW ground crisp dark brown, FW with lineal and straight .5 mm.-wide postmedian red band from costa to CuA2; HW with lineal and straight .75 mm.-wide red band (slightly outlined with white and black) from costa to cell M2, then blunted at invasion of cell M3 affectively breaking the band before the appearance of a robust "W"-shaped element extending from cell CuA1 posteriorly. Limbal area dark brown with some lighter intercellular suffusion and prominent red *Thecla*-spot at CuA1. FW length: 13.5 (holotype), 12.5 (paratype). *Female Genitalia and Tergal Morphology.* Fig. 51. *Sipc* typical of genus. Genitalia with terminal superior plate widely spatulate and with each lobes showing a prominent disto-terminal knob; corpus bursae signa platelike with dendritic margins as typical of genus.

TYPES. Holotype female, ARGENTINA, Prov. Tucumán, Dept. Yerba Buena, Yerba Buena to Anta Marta, Rt. 338, 1 km. S. of Summit Hotel, Cumbres de San Javier, 1250 m., 9 February 1991, unspecified AMNH Expedition Collector, deposited AMNH. *Paratype.* ARGENTINA, Prov. Tucumán, Quebrada de Lules, January 1929, 1♀ (IML).

DISTRIBUTION. *Spatial:* Fig. 9. Currently known only from Tucumán Province in northern Argentina. *Temporal.* Specimens are dated from January to February.

REMARKS. The IML specimen is fresher than the type but because this species is poorly known I have made the AMNH specimen the holotype for easier reference. As will be shown in a much longer study of small *Theclinae* from northern Argentina (Johnson, Eisele and

MacPherson, in press) the disjunctive upland and lowland tropical and subtropical forests of this region appear to host southernmost populations of nearly every South American Theclinae lineage. *G. argenomontana* is typical of these—distinctive in the wings, small compared to congeners (for some unknown reason), and with unique structural characters. Because of its small size and the deletion of the VHW band between the costal and anal elements, *G. argenomontana* is one of the easiest *Gigantorubra* species to recognize. It will be interesting to see if it is eventually found north and eastward like so many of its Argentine congeners.

ETYMOLOGY. Maintaining the original name coined for the species while in preparation, combining the Latin for "silver" referring to the bright white lining of the VHW band and "montaña" from the "la selva subtropical de montaña" habitat of the species.

orcidia Species Group

DFW,DHW ground dark blue; VFW,VHW banded elements typical of genus but also dividing the wing into greatly contrasted ground colors (usually appearing as broad brown or yellow-brown stripes in the cell areas enclosed by the bands). Genitalia varied but particularly with innovations along the serrations of the falces.

Note: This species group was added to the genus late in the study and still requires full elucidation. Even the titular species poses taxonomic problems until wide ranging specimens attributed to it can be studied in detail and compared to type specimens. However, the subsequent entries demarcate the group within *Gigantorubra* and a list of tentative "Thecla" taxa possibly belonging follows thereafter. Instead of omitting the group, I judged it better that some common usage evolve concerning the group as part of *Gigantorubra* prior to working out all of its problems.

Gigantorubra orcidia (Hewitson) [*sens. lat.*], (see Remarks).

NEW COMBINATION

Photoplate IQ, Fig. 4G.

Thecla orcidia Hewitson 1863-1878 [1874] (1): 182, (2): pl. 73, 73, f. 560,560; Godman and Salvin 1879-1901 [1887] (2): 67, (3), pl. 73, f. 560,561; Draudt 1919: 791, pl. 157f;

Hoffman 1940: 714; Comstock and Huntington 1958-1964 [1962]: 41; Bridges, 1988: I.258, II.107. III.68.

DIAGNOSIS. *Wings.* DFW,DHW dull dark azure over entire wing surface with suffusive black margins and apices; VFW,VHW typical *Gigantorubra* bands "masked" somewhat by contrasted ground colors—light brown to tawny before and after each ventral band.

G. orcidia is generally discreet and easily recognized over its northern Neotropical range but must be separated from *G. shueyi* of the Belize region which shows a brighter DFW,DHW iridescence, discreet black margins and apices and a more lavish *Gigantorubra* patterning below. Genitalic features separate these northern sister taxa readily.

In South America the distribution and identity of *G. orcidia* still requires full elaboration because of the scattered South America records using the name, the "Amazon" data on the type(s) and the occurrence of a distinctive population in Argentina. The latter, *G. tafiensis*, stands out by its small size, lack of lighter brown in the basal VHW ground color and by its genitalic features. The latter are very different from Central American *G. orcidia* but it must be determined if specimens from intermediate geographic regions show an intermediate state or are themselves also different from northern Neotropical *G. orcidia* (see Remarks).

Morphology. Male genitalia with valvae of distinctive elongate habitus, ventrum of bilobes with diminutive angulate shoulder, caudal extensions exceeding length of bilobes at shoulder some three times. Falces teeth are robust and normal for genus. By contrast, male genitalia of *G. shueyi* show a single elongate tooth at the base of the falces, along with other features; *G. tafiensis* of Argentina shows reduced and narrow valvae caudal extensions which greatly contrast shouldered and sculptured bilobes (difficult to rationalize as congeneric with *G. orcidia*) (see Remarks).

DESCRIPTION. *Male.* DFW,DHW dull azure; HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe blackish suffused, surrounding orange to brown. VFW grounds greatly contrasted on each side of the blood-red bands otherwise typifying the genus. FW with blood-red to brown-suffused postmedian band from costa to cell CuA1 (neither as long or lavish as on Belizian *G. shueyi*), ground immediately distal brighter beige to golden beige, immediately basal darker suffusive brown, then beige to golden beige after the medial area. HW with blood-red, white and black-edged, medial band typical of *Gigantorubra*, with grounds distal and immediately basal darker suffusive brown, then

brighter beige or golden beige from medial area. Limbal area dark with some lighter brown crescent suffusions and a blood-red Thecla-spot at cell CuA1. FW length: 13.5-14.0 mm. (AMNH Material Examined).

Female. Unknown to me at present but with structural characters important to understanding the geographic spread of specimens for which the name is applicable (see Remarks). **Male Genitalia.** Fig. 4G. Vincular dorsum with stout brush organs extending to base of labides. Genitalia with vincular ventrum robust and rounded, saccus small and parabolic. Valvae with distinctive elongate habitus, ventrum of bilobes with diminutive angulate shoulder compared to congeners and elongate caudal extensions (length exceeding three-times that of bilobes at the shoulder). Aedeagus elongate, length exceeding rest of genitalia by one-fourth; caecum and shaft both moderately bowed, terminus with prominent pronglike cornutus.

TYPES. Type material is at the BMNH but I have not dissected it because the particular relation to *Gigantorubra* was not known on my last visit. Study of this type material will be most important because of the "Amazon" TL data (see Distribution and Remarks).

DISTRIBUTION. Spatial: Fig. 9. Based here on the assumption that the name is applicable from Mexico southward and figured here based on specimens compared to Mexican material available to me. It is possible that *G. orcidia* has a distribution from Mexico southward into South America. This is not uncommon in Theclinae which are ecological generalists or which are of particularly high population density. However, I do not get the impression that *G. orcidia* is particularly common. It is uncommon in the Hoffman Mexican material and not reported by Ross (1976) or in various recent studies by J. Llorente and his colleagues. Genitalic study of the single "orcidia"-like specimen from Argentina showed a habitus completely different than Mexican specimens and the Belize taxon described below has many unique features. **Temporal:** dates on Material Examined range from March to June.

REMARKS. Many of the comments above pertain because of the elaborated condition of this taxon and the unclear relation of many specimens to the type material. As noted above, I felt it was more important to mark a seminal relationship of the entire *orcidia*-like assemblage and group (see list subsequent to two following taxon entries). Factors making me suspect that the *orcidia*-like assemblage has several species include those noted above under Distribution, the distinctions of the taxa described immediately

below and the fact that the ways in which the following two taxa differ from Mexican *G. orcidia* parallel those that separate the distinctive species in South America. For instance, as below noted, *G. shueyi* shows a far more lavish *Gigantorubra* VFW, VHW pattern than that of *G. orcidia*. In fact, I associated *G. shueyi* immediately with the genus and considered it an odd "blue" member. However, later it was apparent that other "Thecla" taxa with similar but more reduced patterns also belonged in the genus, much as the diminutively marked species of the *simplica* Group also do. However, care is warranted concerning a broad generalization because superficially similar taxa like *Thecla canacha* Hewitson (see subsequent *Ziegleria compendina*) do not belong to *Gigantorubra* but clearly suggest a sister group of the *Ziegleria* (the *Thecla hesperitis* Group) and include such unique characters as an *sipc* in the male tergal morphology. Thus, as opposed to simply "dunking" all these taxa into *Gigantorubra* based on superficial resemblance to *Thecla orcidia*, it appears the only way to resolve the issue will be to revise the entire complex (Draudt's 1919 *orcidia*-Group) with reference to the type material.

MATERIAL EXAMINED. MEXICO. San Luis Potosi, Laurel Canyon, 4 June 1977, leg. W. H. Howe, 1 ♂ (AMNH); Vera Cruz, Presidio, leg. Hoffman, 4♂♂ (AMNH); Chiapas, Puente, 23-26 1977, leg. R. Rozycki, 1♂ (AMNH); Guerrero, Zihuatanejo, 5 April 1929, 1♂ (AMNH); Vera Cruz, leg. Hoffman, 1♂ (AMNH). **TRINIDAD-TOBAGO.** Arima Valley, 24 May 1952, coll. New York Zoological Society, 2♂♂ (AMNH); Arima Valley, 30 March 1953, New York Zool. Soc. Coll., 1♂ (AMNH).

Gigantorubra shueyi,

NEW SPECIES

Photoplate IR, Fig. 4G.

DIAGNOSIS. Wings. DFW, DHW lush dark iridescent azure over entire wing surface except for crisp black apices and submargins. VFW, VHW typical of genus and *orcidia* Group but less contrasting and more suffusive brown grounds and with VFW, VHW bands more enlarged and lavishly edged and colored as in the South American groups.

Morphology. Male genitalia, contrasting *G. orcidia*, showing single posterior tooth near base of falces' arch, valvae with robust ventrum, bilobes sharply shouldered and caudal extensions thickly tapering to pointed termini.

DESCRIPTION. Male. DFW, DHW ground dark iridescent azure, shiny and not as darkly suffusive as in *G. orcidia*, with crisp black marginal and apical edges. HW

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with short tail at vein CuA1 terminus, longer tail at CuA2 terminus, HW anal lobe orange. VFW, VHW grounds somewhat contrasted dark brown and dark beige on either side of the wide, black and white-edged, blood-red bands typical of the genus. FW with blood-red, white and black-edged, postmedian band from costa to cell CuA2, ground immediately distad lighter beige-brown, immediately basal darker brown and then beige-brown after the medial area. HW with blood-red, white and black-edged, medial band typical of *Gigantorubra*, with grounds distal and immediately basal darker suffusive brown, then lighter beige-brown from postmedial area. Limbal area dark brown marked by some intercellular lighter brown suffusions and a blood-red Thecla-spot at cell CuA1. FW length: 13.5 mm. (holotype); 14.0 (paratype). **Male Genitalia.** Fig. 4F. Vincular dorsum with stout brush organs extending to base of labides. Genitalia with vincular ventrum angulate and less robust than congeners but with prominent widely parabolic saccus. Falces distinctive and differing from *G. orcidia* by the occurrence of a singular prominent ventral tooth at the base of the falces' arch. Valvae with ventrum showing robust habitus, bilobes sharply shouldered and caudal extensions thickly tapering to pointed termini. Aedeagus less robust than congeners (but more than in *G. orcidia*), length exceeding rest of genitalia by about caecum length, habitus with caecum and shaft both bowed; terminus with prominent pronglike cornutus.

TYPES. Holotype male, BELIZE, Cayo District, Zunantunich Ruins, approx. 17 degrees 5 minutes x 89 degrees 10 minutes, 23 June 1988, leg. J. Shuey, deposited AMNH. **Paratype.** Yucatan, Hoffman Coll., 1♂ (AMNH) (see Remarks).

DISTRIBUTION. *Spatial:* Fig. 9. Currently known from the Yucatan Peninsula and Belize in Central America (see Remarks). *Temporal:* currently known only from the type data.

REMARKS. Readers familiar with "Thecla" will immediately notice the parallel of the distribution of this species and the "subspecies" of *Radissima umbratus* Geyer (Johnson 1992). The Yucatan/Belize specimens of that species have long been known to differ somewhat in external facies. However, the structural characters are extremely close. It is possible that such a placement for elements of the *orcidia*-assemblage may be preferred after a full revisionary study of Draudt's *orcidia* Group. However, at present I am leaving the distinctively marked and structured Belize/Yucatan specimens as a separate specific taxon. This judgement is based on an overview of the kinds of

characters that separate clearly specific taxa in South America. Particularly, I commented under *Gigantorubra adamsi* about the possible relation of this diminutively marked species of the *exotissima* Group and species of the *orcidia* Group. The lavish markings of *G. shueyi* particularly remind of this similarity and further mark the distinction of *G. shueyi*.

ETYMOLOGY. Named for Dr. John Shuey (Traverse City, Michigan) who collected the initial specimen of this species.

Gigantorubra tafiensis,
NEW SPECIES

Photoplate IS; Fig. 3F.

DIAGNOSIS. *Wings.* Differing from northern *orcidia*-assemblage by smaller size (alar 13.0 mm.) and lack of striped appearance in the VHW ground colors basad of the blood-red medial band.

Morphology. Male genitalia showing thinly angulate vincular ventrum and valvae with bilobes widely parabolic then abruptly tapered elongate and narrow caudal extensions.

DESCRIPTION. *Male.* DFW, DHW ground dull azure blue, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe orange-brown. VFW, VFW ground dark brown; FW with deep red postmedian band bordered with white and black suffusion extending from costa to cell CuA2, ground basad slightly lighter but still darkly suffused; HW with medial red band typical of genus but basad this ground concolorous suffusive brown, distal slightly lighter before the submargin. Limbal area suffusive brown to beige with some lighter brown highlights adjacent dark red Thecla-spot at cell CuA2. *Female.* Unknown. *Male Genitalia.* Fig. 3F. Vincular dorsum with stout brush organs extending to base of labides. Genitalia with vincular ventrum non-robust and thinly angulate along both inner and outer margins, narrowly tapered to abruptly to stout pointed saccus. Valvae with ventrum of bilobes widely parabolic with a central angled shoulder, then rounded and abruptly tapered to elongate and narrow caudal extensions with gradually hooked inward over their long terminus. Aedeagus elongate compared to congeners, length exceeding rest of genitalia by more than one-fourth; caecum more diminutive compared to congeners; both caecum and shaft bowed, terminus with prominent pronglike cornutus.

TYPE. Holotype male, ARGENTINA. Tucumán Prov., Dept. Tafi, "Arroyo Azucena" [road marker], below Tafi del Valle, Rt. 307 (El Mollar to Acherál), 6800', 6 February 1991, leg. Kurt Johnson, in distinctive

"mountain meadow"-like habitat with a mix of deciduous (birchlike) and coniferous trees by a stream strewn with boulders and peppered with blooming flowers. This area comprised a small ecotone along the arroyo between xeric savannah above (stretching upland to Tafi del Valle) and steep slopes that drop into rain forest below (first from the Rio de los Sossos, then down to "El Nogalar" and finally "Piedras Colorados" in the lowland rain forest, along the winding road known locally as "The Refrigerator" (see Remarks).

DISTRIBUTION. *Spatial:* Fig. 9. Currently known only from the type locality (see above and Remarks). *Temporal:* currently known only from the type data.

REMARKS. Southeast of the broad mountain "bowl" or "park" comprising Tafi del Valle, extends steep and winding Rt. 307 which descends some 15 km. through deepening rain forest down into the lowlands toward Tucumán. Because it is narrow and winding, the road has taken the local nickname "The Refrigerator" [from the winding tubes lining the back thereof]. However, this narrow road has also afforded access to varied and little-disturbed surroundings through much of the valley. The road passes through radically stratified ecologies (see Shapiro, 1991) and the lower areas are often cloud-covered. Collecting in the area for some three days, on February 6 (1991) the AMNH group made a dash southward along the road when midday offered a short sunny period. On our ascent the day before, the entire road had been cloud-covered and could be collected only by "beating". About eight collectors walked swiftly down Rt. 307, spot collecting along the way and hoping to reach denser rain forest before cloud cover again set in. At a road marker "Ao. Azucena" there is a unique habitat described briefly under TYPE which encompasses less than half a football field. Here, a wide stream comes out of the trees into a meadow, before it moves steeply down into the forest below. For lack of a better way to describe the meadow surrounding this stream, it is very reminiscent of the Front Range of Colorado (probably because of the mix of flora mentioned above), granite-like boulders, clear water, and a profusion of wildflowers aesthetically reminiscent of temperate North America. Large numbers of otherwise rarely reported Satyridae were found mudpuddling here, along with many Theclinae on the flowers. Although compared to other *orcidia* Group members, the striped ventral ground of *G. tafiensis* appears diminished, R. Eisele commented at the time that he had never seen

anything like this species before. He noted, however, that the area was one of a few known in Argentina for collecting certain satyrid species. The 1992 AMNH Expedition returned to this area but to very poor weather. This entire area is one that should be collected seriously. Spot checks of localities often noted on IML labels show some trips to this area, but far fewer than those noted for Tafi del Valle itself or the paramo areas upland from it. This may be because of the frequent cloud cover in the forested valleys. However, it should be easy for collectors to locate "Ao. Azucena" if the metal marker there is maintained.

ETYMOLOGY. Named for the region of Tafi del Valle, Argentina.

Summary Note on orcidia Species Group.

A List of "Thecla" Species with VFW, VHW Ground Color Striping Suggestive of the *orcidia* Group.

As before noted, it would be helpful if every "Thecla" taxon showing striping of the VFW, VHW ground colors that surround the wing bands could reliably be placed in the *orcidia* Group of *Gigantorubra*. However, this does not appear to be the case, since other similar species clearly show the structural features of the *hesperitis* Group of *Thecla*, e.g. genus *Ziegleria* of subsequent entries. It is therefore possible that these striped grounds may be widely homoplesious in the Eumaeini and independently evolved in several genera (clades). A list "Thecla" taxa showing such striped grounds, and whose generic combinations must be investigated from their type material, follows.

- Thecla myrsina* Hewitson (BMNH type)
- Thecla tabena* Godman and Salvin (BMNH type)
- Thecla arza* Hewitson (BMNH type)
- Thecla paralus* Godman and Salvin (BMNH type)
- Thecla calatia* Hewitson (BMNH type)
- Thecla aunus* Cramer (type unknown)

It is clear from the study of the new genus *Ziegleria* (subsequent section) that *Thecla canacha* Hewitson (BMNH type) probably belongs in that genus. As noted, species of this assemblage, tentatively placed in *Ziegleria* herein, and which show elongate valvae and a male *sipc*, may actually be of generic worth if a number of undescribed species also exist. Thus, as with the distinction of *Gigantorubra* from *Angulopsis*, it does not appear there will be an easy way to lump the ventrally "striped" "Thecla" into clades based on superficial wing pattern alone.

FIGURE 8. MORPHOLOGY of ZIEGLERIA (continued)
and NICOLAEA

Overleaf p. 38—

C. *Ziegleria mexicana*, holotype male, allotype female (AMNH). 1, same features as in 1A; 2, genitalia, ventral view (c), valve, lateral view (d), aedeagus, lateral view (e), aedeagus terminus (f).

D. *Ziegleria hoffmani*, holotype female (AMNH). Genitalia, ventral view (a), corpus bursae signa, outer wall view (above), lateral (below).

E. *Ziegleria compendina*, holotype male (AMNH). Same features as in 1A except adding j, *sipc* of tergite eight, dorsal view (terminomarginal microtrichia shown on left lobe only).

Format for *Nicolaea*: Male genitalia (F; A,C,E) in ventral view (a), aedeagus removed and shown in lateral view (b), genitalia including left bilateral side of vincular arc (a) and entire saccus (c) enclosing the left valve (d). Female genitalia (F; B,D,F-H) in ventral view from terminal lamellae (above) of ductus bursae (e) to cervix bursae (below) with corpus bursae signum (when occurring) figured at immediate left (f). Note differences in habitus of species with complete ductus (F; D,F-H) and those with reduction of anterior sections to membranous state (B) also known in eumaeine genera *Chlorostrymon* and *Arases*.

F. *Nicolaea volumen*, holotype male (BMNH), female, Blumenau, Brazil (AMNH).

Overleaf Facing Page p. 39— *Nicolaea*, continued...

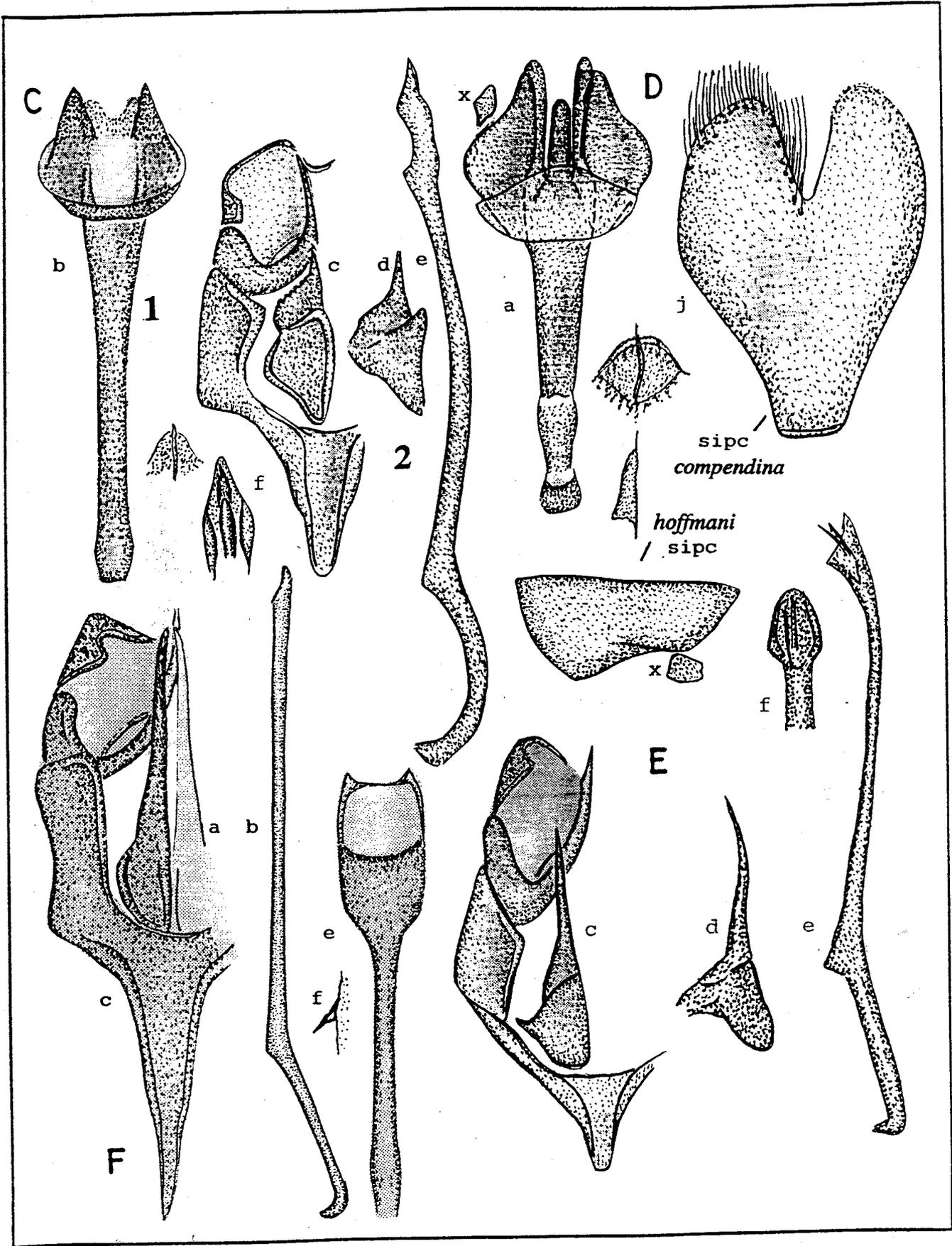
A,B. *Nicolaea gagarini*, allotype male, holotype female (MPM).

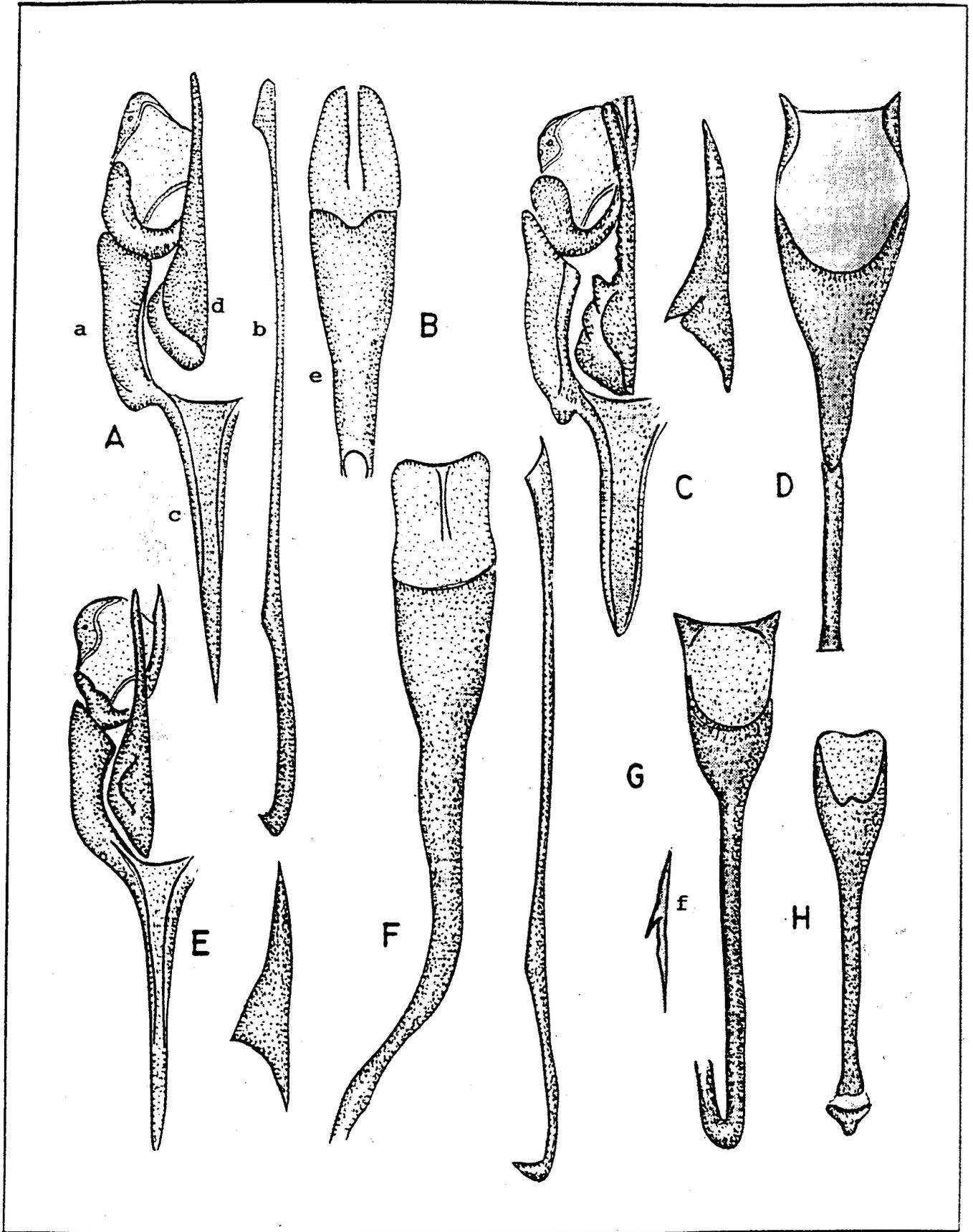
C,D. *Nicolaea macroma*, allotype male, holotype female (AMNH).

E,F. *Nicolaea cauter*, male, Viannopolis, Brazil, female, Goyas Campinas, Brazil (MPM).

G. *Nicolaea micronota*, holotype female (MPM).

H. *Nicolaea pertainea*, holotype female (AMNH).





CRIM SINOTA, NEW GENUS

Photoplate II, Fig. 6

Synopsis-- Contains red-banded *Thecla socia* Hewitson, *Thecla rubifer* H. H. Druce and previously undescribed relatives.

DIAGNOSIS. *Wings* not greatly angulate (angulate in *Gigantorubra* of previous entries, particularly in males) and marked by brilliant red VFW and VHW bands, recognizable as two general habitae typical of the Species Groups— wide lunulate bands of crimson in *socia* Species Group, blood-red in *rubifer* group, both contrasting light gray to beige grounds and often with profuse white or blue-white limbal suffusions. DFW, DHW with FW 9.0-15.0 mm., often strewn with silver-white or blue-white in *socia* Group, brown to blackish in *rubifer* Group. All sharing characteristic structural habitus.

Male morphology showing less concilience than females (constellation of shared traits but each Species Group with distinctive valvae). Morphology generally with no *sipc* but brush organs on known species; genitalia with vinculum angulate, saccus elliptic and relatively long; aedeagus narrow, exceeding rest of genitalia by at least caecum length, both shaft and caecum usually bowed, single terminal cornutus; *valvae* robust and thickly tapered terminad— *socia* Group readily recognized by simple, thickly tapered *valvae* termini, *rubifer* Group by two to three-step more complexly sculptured termini.

Female morphology showing all species with a pair of stout triangulate teeth protruding terminally from rounded [ovate to elliptic] superior plate. Otherwise with *sipc* simple (limited to slight lateral sclerotization, if any, flanking genital lamellae); ductus bursae of genitalia varying from elongate tube beneath superior plate to vestigial condition (latter as has been shown to occur in certain species of several eumacine genera).

DESCRIPTION. *Adult. Male.* Head with frons fuscous, eye lining white, antennae finely striped white, tagmata fuscous or showing suffusive iridescence from the structural color of DFW, DHW. *Wings.* FW alar expanse [hereafter "FW length:"] small to moderate, generally 11.5-15.0 mm. in *socia* Group, 9.0-12.5 mm. in *rubifer* Group. Wing shape generally rounded in both sexes with long tail at CuA2 terminus, shorter tail at CuA1 terminus; anal angle colored but usually not with greatly produced lobe. DFW, DHW colors generally with basal to medial iridescent blue over brown ground in *socia* Group, duller blue to

completely brown in *rubifer* Group. VFW, VHW with brown to gray grounds contrasting brilliantly striped, red to crimson in *socia* Group, blood-red to brownish-black in *rubifer* Group; bands characteristically comprised of stripe on FW, archlike band on HW made up of lunulate elements, mostly continuous but occasionally disjunctive in a distinctive fashion. SC+R1 element of HW band not greatly detached from band so as to dominate habitus; "W"-shaped element in anal area also relatively diminutive so as not to dominate. Rather, elements of band at discal cell usually showing distinction, either swollen or protruding (as in *socia* Group) or with central deletion (as in *rubifer*) Group. Limbal areas showing various lavish patterns including dark mottling or suffusion with red, orange or yellow, particularly around a prominent CuA1 Theclaspot. **Female.** Head with frons fuscous, eye lining white, antennae finely striped white, tagmata fuscous or with suffusion of iridescence from DFW, DHW. *Wings.* More rounded and broad than in males; dorsal color similar to males on unicolorous taxa (usually *rubifer* Group) or HW showing lighter blue across medial or distal in species with brightly blue males. **Male Tergal Morphology and Genitalia.** Fig. 6. Eighth tergite normal, showing no notable innovation toward *sipc*; brush organs abutting vincular dorsum to base of labides. Genitalia showing moderately robust vinculum with generally elongate, elliptic to pointed saccus (length of latter usually about equal to breadth of vincular arc), falces arched and of even contour until terminating in "nipple"-like ends; *valvae* elongate to fill area from vincular arc to tip of labides, each valve robust and showing variously shouldered bilobed habitae and tapered or "stair-stepped" caudal extensions (depending on species group, see below). Aedeagus generally elongate, exceeding rest of genitalia by one fourth to two-fifths, with caecum and shaft both bowed, former sometimes displaced from plane of latter, terminus with single pronglike cornutus. **Female Tergal Morphology and Genitalia.** Fig. 6. Eighth tergite generally normal, showing no notable innovation to *sipc* other than simple sclerotization of distal edges abutting the genital plate. Genitalia characterized variously elliptic to ovate superior genital plate marked with sclerotized distal rims and two stout triangulate distoterminal teeth; ductus bursae generally thin and elongate but vestigial in one species; cervix bursae simple, not showing significant sclerotinal innovation; corpus bursae with paired spikelike signa. Interspecific variation usually involves overall shape and dominance of specific components and, in some species, occurrence of a prominent antrum.

TYPE SPECIES. *Thecla socia* Hewitson 1868 based on lectotype designation herein.

DIVERSITY. Includes two species previously described in *Thecla* along with four new species, all of which are spectacularly marked but some of which are poorly known. Additional species are likely.

DISTRIBUTION. Fig. 10. South American, some species showing classic "generalist" distributions, other reflecting regional patterns of endemism.

REMARKS. Characters and Affinities. As noted here and under the new genus *Nicolaea* (of subsequent entry) there appears to be a close phylogenetic relation between these two assemblages. This contrasts placement of the entire group with others of the present paper because of the simple convention that all "red-banded" groups of "*Thecla*" required studied in relation to the overall "Electostrymon/ Angulopsis grade". Comparison of Fig. 6 *Crimsinota* features with those of *Nicolaea* in Fig. 8 shows this the overall resemblance and shared general features in both sexes. However, an additional strong argument for this relationship is the existence of the Central American species *N. honduriana* (of subsequent entry), a species with a VHW band much like *C. socia* but (if one operates mostly by morphology) a more clear generic relation to *Nicolaea*. Taking this into account, it is probable that both genera are more diverse with additional species still undescribed. This prediction is supported not only by the small current sample sizes for species representing known areas of local and regional endemism but by the hiatus between members of *Nicolaea* and the divergent species *N. cauter* (see Remarks under *Nicolaea*). The current treatment of *Crimsinota*, although it diversity may surprise some workers, must still be considered preliminary since everywhere one looked at samples from areas known for local endemism, distinctive taxa were found. In addition, in areas where samples were good (like from SE Brazil in the Gagarin Collection, MPM) sympatric sister taxa were also discovered. It is worthy of noting here that androconial scent "brands" have not been showcased in the above Description, although some were lacking in the genus *Gigantorubra* described immediately above. At present, occurrence of scent "brands" appears differential in *Crimsinota* (as has been shown in numerous other Eumaeini genera [Strymon, Johnson, Eisele and MacPherson 1990; *Rhamma* Johnson 1992, etc.]). More study needs to be made among *Crimsinota* congeners regarding the occurrence of diffuse androconia as opposed to concentrated "brands" before any generalization can be made.

Species Groups. Most workers would not suspect the relation of *Thecla socia* and its relatives and

Thecla rubifer and its relatives. Thus, the shared characters of both sexes in these groups came as a surprise. However, once the connection is made consideration of the wing patterns also shows the common ground plan of the VHW lunulate band, in which the former group shows more outstandingly lunulate elements in red or crimson and the latter a more contiguous band often with a partial deletion at the discal cell. Accordingly, the genus is divided into two Species Groups:

socia Species Group (four species)

rubifer Species Group (three species).

socia Species Group

VFW, VHW bands bright red or crimson with VHW medial band elements lunulate, distinctive cell to cell, bordered variously basally and or distally with white and black and showing interspecific distinctions by various exaggeration of different areas of the band; limbal areas sometimes lavish. Genitalia with males showing robust thickly tapered valvae, females showing prominence in the generic features along the terminal superior plate.

Crimsinota socia (Hewitson)

NEW COMBINATION

Photoplate IIA, Fig. 6A.

Thecla socia Hewitson 1868: p. 29; 1869: (1) 136, (2), pl. 54, f. 320,321. Kirby 1871: 394; Draudt 1919: 804, fig. 159e; Comstock and Huntington 1958-1964 [1963]: 191; Bridges 1988: I.324, II.108, III.69.

DIAGNOSIS. Wings. One of the most beautiful red-banded South American theclines-- compared to congeners readily recognized as the species with the brilliant continuous red VHW band (edged with crisp white and/or blue-white), alternate cellular elements of which protrude distally from the rest of the band (particularly at the discal cell).

Morphology. Male genitalia very robust, with valvae thickly tapered to terminus, vinculum indented proxad elongate, slightly tear-drop shaped, saccus; female genitalia showing ovate superior plate with wide distal rims terminating in paired terminal triangulate prongs following a robust ductus bursae with length about two-times that of superior plate diameter.

DESCRIPTION. Male. DFW, DHW ground black distally suffused with blue and blue white basally, distal area of FW discal cell with dark scent brand. HW with very short tail at vein CuA1 terminus, long tail at CuA2 terminus; HW anal lobe indistinct. VFW, VHW

ground gray-white with suffusive white overscaling; FW with postmedian red to crimson band from costa to cell CuA2, VHW with red to crimson medial band comprised of tightly aligned lunulate markings appearing more "bubble"-like than congeners and with elements at SC+R1, the discal cell, and through the "W"-like anal element particularly produced and extending distad of red band. Limbal area lavishly suffused with blue and white overscaling; CuA1 Thecla-spot crimson. FW length: 13.0-13.5 mm. (Material Examined). *Female*. Marked similar to male but with more extensive suffusive blue-white on FW base and medial to marginal on HW. FW length: 12.5 mm. (paralectotype). *Male Genitalia*. Fig. 6A, left. Brush organs along vincular dorsum to base of labides. Genitalia with vinculum more robust than congeners and with marked indentation at juncture with "tear-drop"-shaped saccus. Valvae more robust than congeners, showing widely shouldered bilobes and thickly tapered caudal extensions (lateral margins with a finely "ridged" contour). Aedeagus showing straight shaft, curvate only at terminus and bowed caecum, latter comprising about one-third aedeagal length. *Female Genitalia*. 6A, right. Ductus bursae robust and straight, slightly fluted toward terminus; terminus with ovate superior plate showing wide sclerotized rims and paired distoterminal prongs at "10:30" and "1:30"; inferior plate apparent as slight ventral rim around base of ovate superior plate (see Remarks).

TYPES. Lectotype male, from *socia* syntype 2, labelled "Type" "Brazil" "socius B. Br" "ex Oberthur coll." "Thecla Type *socia* Hew.", "Brazil, Hewitson Coll. 79-69, *Thecla socia*. 2." "male", BMNH Rhopalocera type #999; paralectotype female similarly labelled except "Amazon, *socia* 1" plus two paralectotype males labelled as the lectotype except for "3." and "4." and without designation of BMNH type number.

DISTRIBUTION. *Spatial*: Fig. 10. From detailed data known principally from SE Brazil. Apparently rarely collected (see Remarks). *Temporal*: dated specimens range from May to June.

REMARKS. The overall similarity of the female genitalia between *C. socia* and divergently marked *C. rubifer* are notable along with a similar resemblance between the male of *C. rubifer* and *C. gigantea* (subsequent entry in *socia* Group). These divergent wing patterns coupled with conciliance of the genitalic characters attest the overall phylogenetic unity of the genus. The species *socia* is evidently seldom collected. Zikán and Zikán (1968) do not mention the species, although all specimens known to me come

from the general region of their collections. The substantial holdings of the Gagarin Collection (MPM) contained only a few specimens and also showed a unique sister species (also known from just a few specimens). Samples identified by Miles Moss as *socia* in the BMNH old accessions from Pará (Belém), Brazil, proved to be yet another distinctive congener. These instill some doubt as to the authenticity or meaning of the "Amazon" data in some of the *socia* paralectotypes and perhaps suggest that, in this case, "Amazon" refers more to eastern Brazil. In the above description I use terms like "10:30" etc. to refer to the relative location (as on a clock) of terminal spines on the ovate superior plate of female genitalia. I also introduce below the term "deletion" for a distinctive part of the generic wing band habitus that is characteristically missing in a particular species.

MATERIAL EXAMINED. BRAZIL. See types above listed. Goyas, Campinas, 14 May, leg. S. Lopez, 1♂ (MPM); Vinnanopolis, Goyas, 7 June 1935, leg. Gagarin, 1♂ (MPM).

Crimsinota gigantea,

NEW SPECIES

Photoplate IIB, Fig. 6C,F.

DIAGNOSIS. *Wings*. Larger than congeners (♂FW alar 15.5 mm.), DHW brightly suffused blue-white, abdomen white, DFW suffused blue-white along entire caudal margin (lighter to medial area); VHW band angulate and disjunctive, complete only from anal angle to cell CuA1, thereafter costally invaded by blue and white suffusion so as to be thin and meandering, SC+R1 laterally elongate in "hour-glass" shape.

Marking of band at discal cell similar to that of *rubifer* Group, that is, with band element at cell invaded by ground color so as to be bipartite—marked thinly distally in the band and then again basally in the discal cell. I here use the term "deletion" for this loss (or severe reduction) of one of the major band elements. Such deletions are also typical of certain distinctive species in *Gigantorubra* and *Angulopsis* (of subsequent article).

Morphology. Male genitalia with much narrower vinculum and with valvae terminating in broad "three-step" fashion and of even surface contour; aedeagus with shaft terminally curvate. Female genitalia very robust, with terminal lamellae spatulate and sclerotically disjunct, lamellae fitting caudally into robust ductus terminus along juncture of swollen membranous material; ductus bursae inclined nearly 90 degrees at anterior.

DESCRIPTION. *Male*. DFW, DHW ground fuscous only distally, FW with basal and caudal suffusions of

Figure 9. Distributions of *Gigantorubra* Species

Overleaf, pg. 44—

- *Gigantorubra simplicia*
- ◻ *Gigantorubra nubilum*
- ⊕ *Gigantorubra fernanda*
- *Gigantorubra mininota*
- ◻ *Gigantorubra ornamentata*
- △ *Gigantorubra melanorubra*
- ▼ *Gigantorubra exotissima*
- ⊙ *Gigantorubra nebadaca*
- *Gigantorubra adamsi*

Overleaf, Facing Page, pg. 45—

- *Gigantorubra collucia*
- ◻ *Gigantorubra bahia*
- ⊕ *Gigantorubra zurkvitzi*
- ◆ *Gigantorubra clintoni*
- ⊙ *Gigantorubra picentia*
- ▲ *Gigantorubra solitaria*
- ⊙ *Gigantorubra orcidia**
- ◻ *Gigantorubra shueyi**
- *Gigantorubra tafiensis**

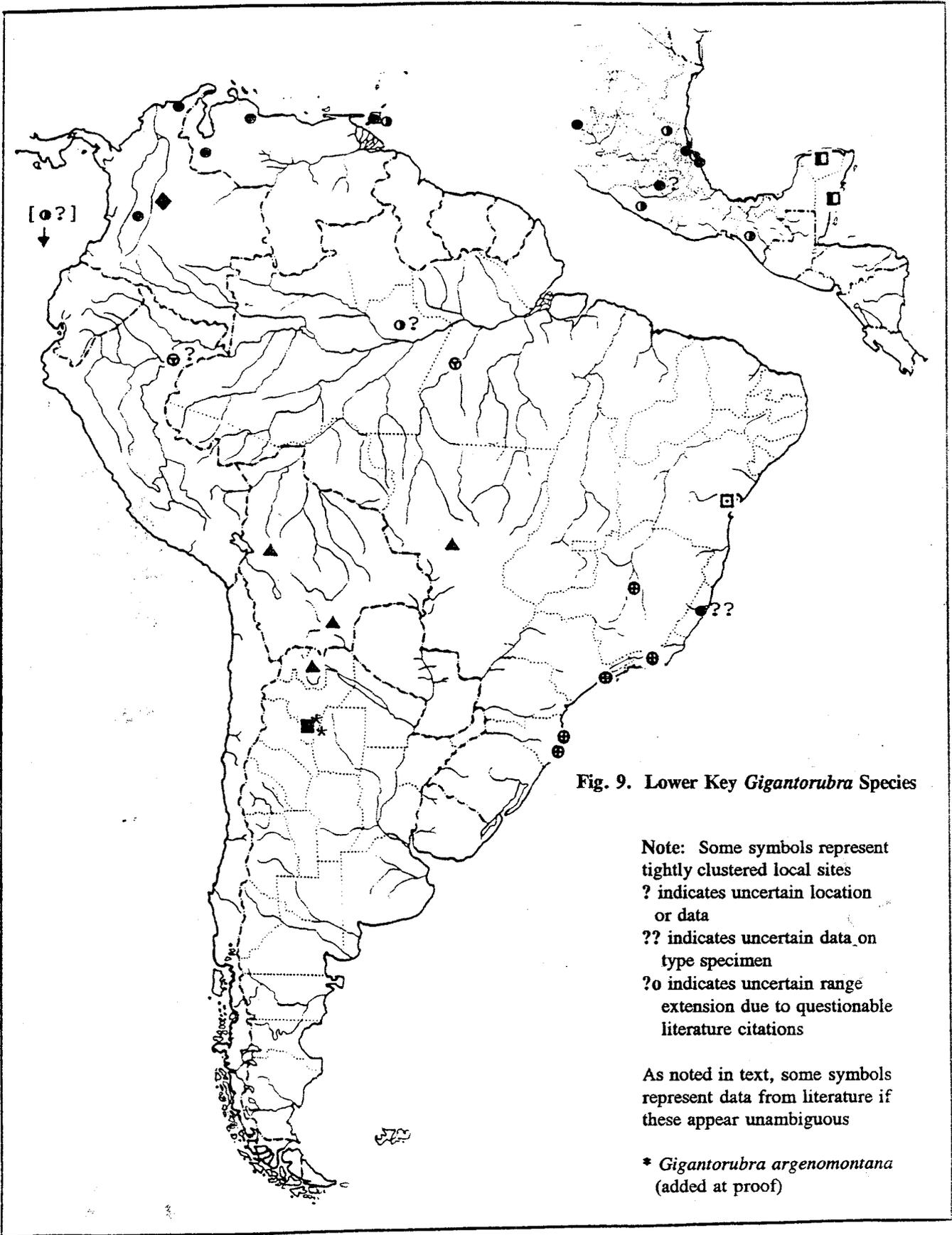
* Represent individual congeners of yet unelucidated species group



Fig. 9. Upper Key *Gigantorubra* Species

Note: Some symbols represent tightly clustered local sites

As noted in text, some symbols represent data from literature if these appear unambiguous



of blue-white, HW with broad blue-white suffusion from base to margins except along very apex. FW with broad fuscous band distal from discal cell; HW with very short tail at vein CuA1 terminus, long tail at CuA2 terminus; HW anal lobe not protruding. VFW ground beige, somewhat overscaled with white; FW with red to crimson postmedian band from costa to cell CuA2; HW with medial band angulate and disjunctive, complete only from anal angle to cell CuA1, thereafter invaded costally by blue and white suffusion so as to be thin and meandering, SC+R1 laterally elongate in an "hour-glass" shape. Marking of band showing deletion of band element otherwise typical of discal cell; rather, band element invaded by ground color so as to be bipartite—marked thinly distally in the band and then again basally in the discal cell. Limbal area with darker brown ground compared to other members of Species Group; Thecla-spot darkly suffusive crimson. FW length: 15.5 mm. (holotype). *Female*. Marked similar to male except DFW, DHW with more expansive but darker hued blue-white suffusion; VFW, VHW on known specimen with clearer rendering of band elements than male, FW with postmedian band extending across wing and HW clearly showing deletion in the band at the discal cell and other markings of the male. FW length: 14.5 mm. (allotype). *Male Genitalia*. Fig. 6C. Genitalia with vinculum robust but not particularly angulate, saccus elongate and terminating with a dull point. Valvae ventrum angulate, with widely shouldered bilobes and broad "two-step" caudal extension, first in rounded shoulder and then fingerlike termini. Aedeagus very elongate and obtusely shaped, caecum (comprising about one-fifth aedeagal) length displaced out of plane of shaft some 60 degrees, shaft greatly hooked in terminal one-fourth. *Female Genitalia*. Fig. 6F. Ductus bursae thin anteriorly and then greatly fluted to prominent antrum; antrum appearing disjunctive from terminal superior plate along juncture of membranous material "anchoring" a robust, elongate, and spatulate superior plate distally rimmed with thick sclerotin, divided into lobes by a central fissure and with each lobe showing a robust distal triangulate tooth. Anterior of ductus bursae greatly inclined (some 90 degrees) (Fig. 6F, bottom).

TYPES. Holotype male, BRAZIL, Umua-rama, 1800 m., "Est. de S. Paulo", 3-15 [day], 2-4 [month] 1937, São Paulo State, leg. Gagarin, deposited MPM; allotype female, Rolandia, Paraná State, 1947, leg. A. Maller, deposited (AMNH).

DISTRIBUTION. *Spatial*: Fig. 10. Currently known from western SE Brazil (compared to *C.*

socia of previous entry). *Temporal*: known from February-April data of holotype.

REMARKS. It is fortunate that two specimens of this taxon are known to allow sufficient comparison to *C. socia*. The graphic differences in both sexes' structural characters corroborate the wing pattern differences that are consistent between the genders of each species. There appear to be numerous examples of sympatric species in SE Brazil once enough historical material is examined to discover them (see *Argentostriatatus*, Johnson, in press a). I remember observing some "*socia*" material in BMNH old accessions before revisionary work was initiated concerning this group. As these specimens appeared have labels indicating old "Amazon" data, these should be located and checked regarding the specific characters herein noted. It should also be pointed out that SE Brazil appears to show a "ring" (perhaps of Muellierian mimicry) wherein a number of noncongeners express vivid VHW red bands (see Johnson and Kroenlein, in press c, and *Nicolaea cauter* of subsequent entry). This diversity in SE Brazilian "red-beneath" species parallels the apparent regional sympatry of *C. socia* and *C. gigantea*. It should also be noted that the type locality has produced a number of distinctive and perhaps locally endemic species (Johnson in press b).

ETYMOLOGY. The Latin names refers to the large size of this species.

Crimsinota perplexissima,
NEW SPECIES

Photoplate IIC, Fig. 6D.

DIAGNOSIS. *Wings*. Thus far known only from the mouth of the Amazon River, about the size of *C. socia* (FW alar 13.5 mm.) but VHW band comprised squarish red elements (without dark discal mark) and paralleled distally by white chevron-like marks across the postmedian area.

Morphology rather spectacularly different, in male with sculptured bilobes and base of caudal extensions showing densely protruding microtrichia not seen in other congeners; female showing some basic overall resemblance to habitus in *C. gigantea* but with elements of both ductus and superior plate far more elongate and without any comparable inclination at the ductus anterior.

DESCRIPTION. *Male*. DFW, DHW ground fuscous only distally, FW with basal suffusions of dull blue-white, HW with broad dull blue-white suffusion from base to submargins but not along wing apex. FW with broad fuscous band distal of discal cell; HW with very short tail at vein CuA1 terminus, long tail at CuA2 terminus; HW

anal lobe not protruding. VFW ground beige-grey, somewhat overscaled with white; FW with red post-medial band from costa to cell CuA₂; HW with medial band VHW band comprised of square-shaped elements spaced rather "criss-cross" to each other, proceeding from the SC+R₁ element to the anal element, latter which appears less "W"-shaped probably due to the overall shape of the elements in the band; postmedial area of wing with white chevron-like elements; limbal area rather dull except for orange-red Thecla-spot. FW length: 14.0 mm. (holotype). *Female*. Marked similar to male except DFW, DHW with more expansive blue-white suffusion; VFW, VHW similar to male. FW length: 14.0 mm. (allotype) [not figured due to tattered distal wing areas]. *Male Genitalia and Tergal Morphology*. Fig. 6D, left. Genitalia with vinculum not robust and angulate only by the juncture with the saccus showing a slight lateral flare; saccus elongate and pointed. Valvae ventrum with extreme sculpturing and additional components. Bilobed nearly ovate with a thin, keel-like rim covered with prominent elongate microtrichia, caudal extensions in a "three-step" fashion, first a rounded shoulder covered with prominent elongate microtrichia, and then two successive finger-like extensions. Aedeagus elongate, caecum (comprising about two-fifths aedeagal length) displaced out of plane of shaft some 60 degrees, shaft elongate and centrally bowed. *Female Genitalia*. 6D, far right. Ductus bursae narrow and elongate until swelling to prominent antrum at base of superior plate; superior plate elongate and spatulate, outlined with thickened sclerotized rims and terminating with a two triangulate distoterminal teeth at "10:30" and "1:30".

TYPES. Holotype male, allotype female, BRAZIL, Pará (=Belém), leg. Miles Moss, no other data except note of "rare" on holotype specimen, both deposited BMNH (see Remarks).

DISTRIBUTION. *Spatial*: Fig. 10. Currently known only from type locality at mouth of Amazon River. *Temporal*: Unknown.

REMARKS. As noted elsewhere herein and in Johnson and Kroenlein (in press a) the extensive Miles Moss material at the BMNH includes numerous unusual specimens due mostly to the long term residence of the collector in his area in comparatively early times. Unfortunately, some of the data is scanty which suggests that, of the many butterflies collected by Moss (and with his enchantment for painting the early stages) he may have devoted less time to the copious quantities of lycaenids which also came his way. I was surprised when dissection of the above

specimens indicated such an unusual morphology. At the time, I had not yet located the female of *C. gigantea* so was less sure of the great interspecific differences apparent in species of *Crimsinota*. As noted by Johnson and Sourakov (in press) if not for the collections of Moss far fewer unique Theclinae would be known from the area of the mouth of the Amazon. Particularly notable in *C. perplexissima* is the vague similarity of the female habitus to that shown so extremely in *C. gigantea*. This suggests that the two are sister taxa with typical sister distributions. Johnson and Sourakov showed similar geographic segregations in the much more well-known species of calycopine genus *Serratofalca*. Due to fortuitous pagination a further note could be added here at proof, when the subsequent species was also inserted. It testifies to the fact that additional congeners can be discovered even when dissecting specimens not originally associated with this group. Given comments thereunder it should be mentioned here that the statement above, that the "W"-shaped element in *C. perplexissima* appears ill-defined, refers to the relative size of the "W" compared to the copious red-orange edging. In *C. perplexissima*, compared to congeners, red-orange along the "W" is profuse. However, as to shape, the "W"-shaped element in *C. perplexissima* is truly a "W" while the same element in *socia*, *giganta* and the species of subsequent entry more like a "V".

ETYMOLOGY. The Latin name adds the superlative to roots meaning "perplexing", indicating the surprise introduced into this genus by discovery of such a radical morphology as in the present species.

Crimsinota youngi,

NEW SPECIES

Photoplate IID, Fig. 6I.

DIAGNOSIS. *Wings*. Known from a single female in Gagarin (MPM) Rio de Janeiro material with DFW, DHW fuscous with slight blue hues, VFW, VHW beige, HW with jagged medial band comprised of continuous rectangular red-orange elements (bordered distally with black and white) with M₂ and M₃ elements distally displaced from band and "W"-element with rudiments more widely spaced as two "V"'s (see Remarks).

Morphology in known female showing vestigial condition to ductus bursae wherein, following a short neck beneath the superior plate, usual ductal area is a membranous tube extending to the corpus bursae (see Remarks).

DESCRIPTION. *Male*. Unknown. *Female*. DFW, DHW ground distally, FW with basal suffusions of dull blue, HW with broader dull blue hue over fuscous

ground. HW with very short tail at vein CuA1 terminus, long tail at CuA2 terminus; HW anal lobe not protruding. VFW ground beige; FW with red postmedian band from costa to cell CuA2; HW with medial band comprised of continuous rectangulate red-orange elements bordered distally by black and white, with M2 and M3 elements distally displaced from band and "W"-element with rudiments more widely spaced (nearly as two "V"'s, see Remarks). Postmedial areas of wing with some crisp white suffusive marks; limbal area with well-defined orange Thecla-spot and adjacent crisp white and brown suffusive chevrons. FW length: 13.0 mm. (holotype). *Female Genitalia*. Fig. 6I. Ductus bursae in vestigial condition, with full sclerotization extending only slightly beneath the superior plate; rest of usual ductal area for genus of membranous condition extending to the corpus bursae. Superior plate typical of genus with somewhat rectangulate to apically rounded plate surrounded by narrow distal rims and with two short triangulate distoterminal teeth along margin at "10:30" and "1:30" (see Remarks). Corpus bursae signa spikelike as typical of genus.

TYPE. Holotype female, BRAZIL, "Teatui", Rio de Janeiro, "8/6/39" [August 6 or June 8?], leg. Gagarin, deposited MPM.

DISTRIBUTION. *Spatial:* Fig. 10. Currently known only from type locality. *Temporal:* Currently known only from old material dated June or August.

REMARKS. Female genitalia lacking a full ductus bursae and showing instead a membranous condition have been reported in some species of *Chlorostrymon* (Johnson 1989a) and *Arases* (Johnson and Adams 1992) and most of the genus *Caerofethra* (Johnson 1991a). Thus, the condition seems to appear as an autapomorphy in certain species of genera otherwise with normal ductal conditions as well as a synapomorphy for some clades of species. As noted elsewhere herein and in Johnson and Kroenlein (in press a), the extensive Gagarin material at the MPM includes numerous unusual specimens due mostly to the long term residence of the collector in his area in comparatively early times. With Gagarin material such uniqueness is further enforced by the massive denigration of tropical forest in the region in recent times. It may be that additional material of this and other SE Brazilian "uniques" can be found in samples at Brazilian museums. Due to inadequate taxonomic reference material for the diverse "*Thecla*" grade, much of this material is unsorted and, according to K. Brown (pers. comm.), in many cases unmounted. The present species might

not have been discovered if it were not my practice to dissect every specimen in relatively small series of unusual *Theclinae*. In the present case, at the time of dissection I remarked to AMNH co-worker Calvin Snyder that I was proceeding with the dissection because of the slightly different VHW band in this specimen. Further, I said if it proved yet again different from species I knew of in *Crimsinota* and *Nicolaea* I was going to jump from my sixth story office window. Luckily I did not take this promise seriously.

ETYMOLOGY. Patronym for Dr. Allen M. Young (MPM) who made the Gagarin material available to me for study and has been patient for a generic framework to emerge so much of it could be described.

rubifer Species Group.

VFW, VHW bands brown or deep red-brown, particularly with a "deletion" in the band element at the discal cell, wherein invasion of underlying ground color divides this element into a thin distal component contiguous with, or distally displaced from, the band and a second element (usually black) thinly crossing the apex of the discal cell. Morphology, as heretofore noted, quite similar to *socia* Group but males with more robust graded sculpturing on valvae and females with less sculptured terminal elements (superior plate and antrum) than most *socia* Group members.

Crimsinota rubifer (H. H. Druce)

NEW COMBINATION

Photoplate IIE, Fig. 6B.

Thecla rubifer H. H. Druce 1907: p. 621. Draudt 1919: 804. Comstock and Huntington 1958-1964 [1963]: 53. Bridges 1988: I.305, II.108, III.30.

Thecla picentia [nec *picentia* Hewitson 1868: 23]:

Draudt 1919: 804. Bridges 1988: II.108 (treat as synonym of *picentia* in error, see Remarks and genus *Gigantorubra* of previous generic entry).

DIAGNOSIS. *Wings.* Small species (FW alar 10.0 - 12.5 mm.) DFW, DHW brown to blackish; VHW band deep red-brown to magenta-brown, wide (to 2 mm.) near costa but then with "deletion" at discal cell (showing thin dark distal M2, M3 mark divided basally by invading ground color from a parallel thin black slash basad in discal cell). Anal area of wing with slight, mostly red-black "W".

Historically, this habitus has proved confusing to workers mistaking it for *Gigantorubra picentia* (type specimen of which is actually quite different, larger [alar

13.5-14.5 mm.] with brick to blood-red VHW band of mostly even thickness (2-3 mm., including edging) and comprised as noted in Fig. 1 herein.

As diversity dictates, uniformly dark DFW, DHW *C. rubifer* must also be differentiated from a sister species (possibly sympatric) most obviously recognized by blue DHW surface in its females. This species, *C. cyanoruba* (of subsequent entry and with peculiar genitalia) also shows more uniform width in the VFW, VHW bands with invasion of ground color into the center of the HW band extending from M2 as far as CuA1 (see Remarks and *C. cyanoruba*). Also, both *C. cyanoruba* and *C. argentina* (latter not mentioned above because of apparent temperate South American distribution) show plain limbal/anal areas, a portion of the wing lavishly colored in tropical *C. rubifer* (see notes on type specimen below).

Morphology typified in male by valvae showing robust "three-step" configuration (from rounded bilobed graded in two steps to termini) and, in female a habitus very similar to *C. socia* except for much narrower ductus bursae. By contrast, *C. cyanoruba* shows a robust ductus bursae with a wide antrum and unique ventral scutes on a prominent inferior genital plate (see Remarks).

DESCRIPTION. Male. DFW, DHW ground blackish brown, androconia unapparent on FW (see generic Remarks) HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe slightly protruding. VFW, VHW ground various light to dark brown (depending on regional morphs), FW with narrow blackish-magenta postmedian band from costa to CuA2 or outer angle, HW with deep red-brown to magenta-brown or blackish band, wide (to 2 mm.) near costa but at discal cell showing thin dark distal M2, M3 mark divided basally by invading ground color from a parallel thin black slash basad in discal cell (the "deletion" of this, an other, entries). Anal area of wing with slight, mostly red-black "W"-shaped element. Limbal area more lavish than other group members particularly with dark red to blackish Theclaspot, similar color (sometimes toward orange) along the small anal lobe, and with adjacent cells suffused blue or grayish [type specimen, for instance with white suffusion along cells from VHW anal lobe and along VFW subapex]. FW length: 10.0 - 12.5 mm. (Material Examined). **Female.** Marked similar to male except for somewhat more rounded wing shape and slightly more lavish VHW limbal coloration. FW length: 10.0 - 12.5 mm. (Material Examined). **Male Genitalia.** Fig. 6B, left. Brush organs along dorsum of vinculum to

base of labides. Genitalia with vinculum less robust and more angulate than in *socia* Group; saccus consequently appearing more elongate and pointed. Valvae with a rounded shoulder on bilobes and caudal extensions tapered in a "two-step" fashion, first very rounded, second finger-like. Aedeagus showing curvate shaft, latter comprising about three-fourths aedeagal length; caecum bowed. **Female Genitalia.** Fig. 6B, right. Ductus bursae narrow although slightly fluted toward terminus; terminus with hemispherical superior plate showing wide sclerotized rims and paired distoterminal prongs at "10:00" and "2:00"; inferior plate unapparent, only slight ventral struts continuing from the contour of the ductus bursae.

TYPE. Holotype female, labelled "rubifer" "Type", "Bogota. 89 154", "B.M. Rhop. type #998". Contrary to many Druce type situations, as far as I can surmise, *rubifer* is represented by a single type at the BMNH.

DISTRIBUTION. Spatial: Fig. 10. Needing further elaboration now that sister species are known. From Material Examined listed below currently indicating general tropical South American distribution from Colombia southward in the west to Peru and in the east through Brazil (see Remarks concerning Brazil below). **Temporal:** Current Material Examined suggests year-round occurrence in the tropical zone.

REMARKS. As heretofore noted, the overall similarity of the female genitalia between *C. rubifer* and *C. socia* and male genitalia of *C. rubifer* and *C. gigantea*, when the wing characters in these species differ so greatly, says much for the overall phylogenetic unity of this genus. It is a situation reminiscent of *Strymon* (Johnson, Eisele and MacPherson 1990) and as such, workers should be prepared for the discovery of additional sister taxa, particularly regional endemics. Certainly, the Brazilian fauna needs detailed study and I have not included here a number of populations of possible taxonomic worth, waiting to define this in a forthcoming local study of the entire SE Brazilian fauna of small Theclinae. I should also note that the Material Examined below listed from the BMNH was assembled before I had become convinced of the existence of *C. cyanoruba*. Thus, further elaboration is needed in Peru itself to see if these two taxa coexist. I first ignored *C. cyanoruba* as an oddity within Argentine populations; however, I continued to find it northward through Bolivia and into southern Peru in the material available to me after returning from London.

MATERIAL EXAMINED. See type above. **BRAZIL.** Ega, upper Amazon, leg. Bates, 2 ♀♀ (BMNH) [SE Brazil specimens purposely omitted pending elaboration of regional fauna]. **PERU.** Perou [sic], Tarapoto, 1♂

(BMNH); Juhuty, Amazons, April 1905, leg. de Mathan, 1♂ (BMNH); Tefé, Amazon, 1♂ (BMNH); Tonantins, Amazonas, 1880 de Mathan, 1♂, 1♀ (BMNH). COLOMBIA. Bogotá, 1♂ (BMNH); Novella Grenada [=Colombia], 1♂, 2♀♀ (BMNH); Cundinamarca, 1900, leg. de Methan, 2♂♂ (BMNH). ECUADOR. Cachabe, January 1897, leg. Rosenberg, 1♂ (BMNH). PERU. Rio Tono, 1♂, 2♀♀ (BMNH); Iquitos, leg. Fruhstorfer, 2♂♂, 1♀ (BMNH); Rio Marañón, 2♀♀ (BMNH); Balzapuerto, Parana River, Dept. Loreto, March 1933, leg. E. I. Huntington, 1♂, 1♀ (AMNH).. VENEZUELA, Caripito, 9-20 March 1942, 1♂ (AMNH).

Crimsinota cyanoruba,

NEW SPECIES

Photoplate IIF, Fig. 6GH.

DIAGNOSIS. *Wings.* DHW in female bright suffusive blue in distal two-thirds, not brown as in *C. rubifer*. VHW with black-bordered brick-red to darker magenta medial band of more uniform width (1-2 mm. throughout) with invasion of beige to grayish ground color into the center of band (the "deletion") extending from M2 as far as CuA1 and appearing almost as an additional central element of the wider band.

Morphology. Female genitalia with robust ductus bursae terminating in swollen antrum, genital terminus with reduced superior plate and produced inferior plate, latter showing unique ventral scutes (*sensu* Johnson 1991); male with more robust valvae terminating with a less sculptured lateral shape.

DESCRIPTION. *Male.* DFW, DHW ground dull brown to blackish, FW showing no apparent androconial clusters; HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe slightly produced. VFW, VHW ground warm beige, FW with wide (1 mm.) postmedian band suffusively brick-red to magenta from costa to CuA2 or beyond to outer angle, HW with wide VHW dark brick-red to magenta black-bordered medial band of relatively uniform width (1-2mm. throughout) with invasion of warm beige (sometimes nearly grayish) ground color into the center of band from M2 as far as CuA1 (so as to comprise almost a central element of the wider band). Limbal area comparatively unlavish, mostly covered with light ground of rest of wing but showing slight white suffusive spots adjacent orange Theclaspot. FW length: 10.5 mm. (holotype), 10.0-10.5 mm., paratypes. *Female.* Differing from male markedly by bold suffusive blue distal two-thirds of DHW,

otherwise differing little from male except for tendency of bands to be somewhat wider (see Remarks). FW length: 10.0 mm. (allotype), 10.0-10.5 mm. (paratypes). **Male Genitalia.** Fig. 6G. Brush organs abutting dorsum of vinculum to base of labides. Genitalia with vinculum more robust and angulate than *C. rubifer*; saccus robust and rather "funnel"-shaped. Valvae with rounded shoulder on bilobes and caudal extensions terminating with a robust taper. Aedeagus showing curvate shaft and caecum, former comprising about three-fourths of aedeagal length, terminus with single cornutus typical of genus. **Female Genitalia.** Fig. 6H. Ductus bursae robust and comparatively short (length about one and one-half times maximal width of terminal plates); ductus swelling terminally to robust antrum and terminating with a relatively diminutive superior plate compared to wide companion inferior plate, latter which shows prominent ventral scutes (*sensu* Johnson 1991). Superior plate, as typical of genus, with two short distoterminal prongs (at "10:00" and "2:00"); corpus bursae signa with short inwardly-directed spine as in congeners.

TYPES. Holotype female, ARGENTINA, Prov. Salta, Quebrada de Escoipe, deep wet bottomland bordering marsh, 10 February 1991, unspecified AMNH expedition collector; allotype male, ARGENTINA, Salta Prov., Dept. Caldera, Rt. 9, "Alto de la Sierra/La Cornisa", 1450 m., along highway at border of forest and interspersed farm/grazing land, 9 February 1991, unspecified AMNH expedition collector, both deposited AMNH. **Paratypes.** ARGENTINA. Jujuy Prov., Dept. Ledesma, 5 mi. N. Cucho, 29 December 1986, leg. B. MacPherson, 1♂ (AMNH). BOLIVIA. Prov. Ibanez, Dept. Santa Cruz, 2 km. at Jardin Botanica, woods, 12 January 1973, leg. R. Eisele, 1♀ (Eisele Collection); S. Cruz de la Sierra, Steinbach 1905/1906, 1♀ (CMNH); Prov. Sara, Dept. Santa Cruz, Steinbach, 1♂ (CMNH); Dept. La Paz, Prov. Sud Yungas, Estancia Aracu, Hotel Tamampaya area, 4300', 20-27 May 1989, leg. D. and K. Matusik 1♂, 1♀ (AMNH); Buena Vista, March 1958, leg. R. Golbach, 1♀ (IML); 5 km. NW Montero at Rio Paray, in wood, 300 m., Prov. San Esteban, Dept. Santa Cruz, 13 January 1973, leg. R. Eisele, 1♂ (Eisele Collection).

DISTRIBUTION. *Spatial:* Fig. 10. Needing further elaboration northward in relation to *C. rubifer*. Dominant in Material Examined from Argentina and Bolivia and requiring distinction from SE Brazilian members of *rubifer* Group now under study. *Temporal:* Current Material Examined indicates occurrence from December to May.

REMARKS. I initially was puzzled by this population, particularly from the female genitalia, until it

occurred again and again in material from Argentina and Bolivia. Since I have already studied material from the SE Brazilian area for purposes of a separate regional study of Theclinae, it appears that *C. cyanoruba* will eventually be shown to have a range of sympatry with congeners both eastward and northward. As noted heretofore, my study of BMNH *C. rubifer* took place before I was aware of other sister species and I did not make an effort to canvas unsorted material there to buttress available samples. Also, I have been unable here to integrate data from the MNHN in Paris because I was unaware of sister species when I canvassed *C. rubifer* in their curated collections. The diversity of the Species Group is further buttressed by the occurrence of another distinctive congener in temperate South America which is described below.

ETYMOLOGY. An arbitrary euphonious combination, using "cyano" to refer to the blue coloration and the female DHW combined with "ruba" signifying the red VFW, VHW bands.

MATERIAL EXAMINED. See types above. An additional specimen, not in hand, but most apparently belonging here is ARGENTINA. "Salta, N. Argentina, iv-v 1921", no other data [Steinbach?], 1♀ (BMNH) listed in my BMNH *Thecla rubifer* notes.

Crimsinota argentina,
NEW SPECIES

Photoplate IIG, Fig. 6E.

DIAGNOSIS. *Wings.* A very small species (FW 7 - 8.0 mm.) without a CuA1 tail and known only from temperate Argentina; VFW, VHW bands orange—straight across FW and, on HW, widely orange comprised of orbiculate SC+R1 element, wide orange M-cell elements (orange both in discal cell and distally in band) and then a succinct "W" in the anal area; distal wing area with crisp white postmedian line contrasting orange Thecla-spot and spot beneath anal lobe.

Morphology with known females showing caudally fluted ductus bursae terminating with a large, ovate, superior plate into which protrude stout ductral struts (sensu Johnson 1991) from the ductus bursae.

DESCRIPTION. *Male.* Unknown. *Female.* DFW, DHW ground fuscous brown, HW with no tail at CuA1 terminus, very long tail at CuA2. HW anal lobe slightly pointed. VFW, VHW ground light beige; FW postmedian band orange, straight across wing from costa to outer margin; HW with wide orange bands bordered distally with black, comprised of orbiculate SC+R1 element, wide (1 mm.) orange M-cell elements

(orange both in discal cell and distally in band) and then a succinct "W" in the anal area; distal wing area with crisp white postmedian line contrasting orange Thecla-spot and spot beneath anal lobe. FW length: 7.0 mm. (holotype), 7.0-8.0 mm. (paratypes). *Female Genitalia.* Fig. 6E. Ductus bursae robust and greatly fluted terminally to prominent ovate superior plate, later comprising over two-fifths of genitalic length; superior plate showing wide sclerotized rims and paired distoterminal prongs at "11:00" and "1:00". Ventrums of superior plate widely open, exposing prominent sclerotized struts protruding from the ductus terminus.

TYPES. Holotype female, ARGENTINA, Tucumán Prov., Quebrada de Lules, January 1929 [labels on with paper and ink printing typical of K. J. Hayward specimens, see Remarks], deposited IML. *Paratypes.* two females, same data as primary type (IML); one female, La Rioja Prov, "Gayaba-Patovia" [as read by me from IML Hayward/Willink notes], 30 April 1947 (IML).

DISTRIBUTION. *Spatial:* Fig. 10. Currently known only from temperate Argentina. *Temporal:* Currently known from January and April type data.

REMARKS. As I have noted elsewhere (Johnson 1992 and herein) there is a wealth of material at the IML collected by K. J. Hayward that remained unelaborated. Some of this material is also at the BMNH and, since Hayward passed away while still working toward completion of his Argentine list (published posthumously in 1973), there is some question about the ownership of the BMNH material (Z. D. Ajmat de Toledo, pers. comm.). As was noted by Johnson, Eisele and MacPherson (1990) the BMNH material contained some paratypes, cited in Hayward's work but not individually labelled. At the IML there are numerous specimens, some formerly unmounted, which contain the brief light paper and black printed ink "field" labels referring very generally to localities frequented by Hayward (Villa Nougues, Villa Anna, Quebrada de Lules, etc.) and I believe it was Hayward's intent to eventually elaborate these with fuller labelling. Thus, with the scanty data at hand, there are presently four specimens representing this small and intriguing *Crimsinota* population. I do not know the precise location of the type localities. These matters are usually resolved by a conversation through Roberto Eisele with Rodolfo Golbach at the IML, who accompanied Hayward on many collecting trips. However, this has not been possible during R. Eisele's 1992-1993 absence from Argentina. As noted by Johnson, Eisele and MacPherson (1988, 1990) and in detail elsewhere (Johnson, Eisele and MacPherson, in press) the temperate areas of Argentina and areas interdigitating with, or abutting on, the tropical and subtropical areas in

northern Argentina harbor a complex and diverse fauna of Theclinae.

ETYMOLOGY. Named for the general area of the type localities.

ZIEGLERIA, NEW GENUS

Synopsis-- contains certain members of Draudt's (1919) *hesperitis*-Group and undescribed relatives. Photoplate III, Figs. 7-8.

DIAGNOSIS. A genus required by discovery of a heterogeneity in common usage identifications of "*Thecla hesperitis*" and a number of sister taxa, some of which are quite spectacular. Wing pattern ground plan of genus approximating traditional idea of "*Thecla hesperitis*", i.e. some blue distally on DHW, VHW with thin, meandering, mostly black band comprised of lineal elements "jagging" at near right angles to each other; however, many additional species have previously been set aside as simply "too blue" for *Thecla hesperitis*. Thus, two Species Groups comprise the genus: the *hesperitis* Group with dorsal blue limited to the HW and the *cyanissima* Group with wing dorsums almost completely blue.

Morphological characters show a kinship to *Angulopsis* and *Gigantorubra* but, from this shared ground plan, show extreme structural innovations and additional components.

Female genitalia unmistakable, building from the overall ground plan familiar in *Angulopsis* and *Gigantorubra* (e.g. the wide, hemispherical, laterally-protruding superior plate) but, departing radically by the presence of complexes of additional components, heavily sclerotized and sculptured, occurring (1) along the ductus bursae, (2) at mouth of ductus, (3) across the inferior plate [lacking in former genera] and (4) adjacent the superior plate and the highly modified *sipc*. In addition, the ductus is often curvate and the cervix bursae marked with additional sclerotinal components.

Male Genitalia readily distinguished by compact, highly sculptured, valvae showing a short stout bilobed area terminating with short fingerlike caudal extensions; aedeagus with sculptured hood at terminus.

DESCRIPTION. Adult. Male. Head with frons fuscous, eye lining white, antennae finely striped white, tagmata fuscous or showing suffusive iridescence from the structural color of DFW, DHW in *cyanissima* Group. **Wings.** FW alar expanse [hereafter "FW length:"] moderate to large, generally 13.5-15.5

mm. Wing shape angulate, particularly on HW; FW without appearance of androconial mark. HW with long tail at CuA2 terminus, shorter tail at CuA1 terminus; anal angle colored and sometime lavishly fringed but itself not with greatly produced. DFW, DHW colors brown to blackish in *hesperitis* Group with iridescent blue suffused on in patches in HW distal area; *cyanissima* Group blue over entire surface unless with exception along wing apices and extreme margins. VFW, VHW with yellow-brown to darker grounds crossed by vivid but thin bipartite bands, comprised of lineal, basally black, elements outlined distally by white. These usually progress across the wing as dashes in the cells (SC+R1 element only slightly larger than others) and bend into a "W"-shaped element in the anal area. Distally, limbal area marked by a bright orange or reddish *Thecla*-spot often accompanied in the adjacent cells by contrasting white or dark brown suffusions of chevron or archlike shape. **Female.** Head with frons fuscous, eye lining white, antennae finely striped white, tagmata fuscous or with suffusion of iridescence from DFW, DHW. **Wings.** More rounded and broad than in males; dorsum with more suffusive and light iridescent color, whether occurring distally on DHW (as in *hesperitis* Group) or across the entire dorsum (as in *cyanissima* Group). **Male Tergal Morphology and Genitalia.** Figs. 7-8. *Hesperitis* and *cyanissima* Groups— eighth tergite normal, showing no notable development to *sipc*; short brush organs abutting vincular dorsum to base of labides. Genitalia with generally angulate vinculum enclosing a widely ovate vincular arc (often approximately the same breadth as the length of the rather short valvae) and tapering to a usually elongate saccus. Falces extremely arched. Valvae short and robust with stout, heavily rimmed, bilobes (length usually equalling or exceeding that of caudal extensions); caudal extensions short and abruptly tapered to diminutive fingerlike termini. Aedeagus robust, length exceeding rest of genitalia by caecum length to one-fourth entire length and with caecum and shaft variously bowed; aedeagus terminating in a sclerotized hood enclosing two prominent and sculptured cornuti. Additional group, tentatively placed herein, varies from ground plan principally by presence of male *sipc* and elongate valvae (group will probably prove of separate generic worth when fully elaborated). **Female Tergal Morphology and Genitalia.** Fig. 7-8. Showing modification to a complex *sipc* in one Species Group. Genitalia generally characterized by robust and straight ductus bursae, terminating with a superior plate comprised of paired elliptic lamellae separated by a wide central fissure and with an inferior plate forming a ventral and terminally protruding tooth beneath the terminal ductal opening; cer-

vix bursae with innovative sclerotol development in some species, usually including a slight hood over the distal end of the corpus bursae; corpus bursae showing paired signa, each very robust with a shieldlike basal plate, a central inwardly-directed (and sometimes spined) keel and profuse dendritic sclerotizations along the margins.

TYPE SPECIES. *Ziegleria bernardi*, new species (see Remarks).

DIVERSITY. Two Species Groups comprised, respectively, of three and two species; interestingly, both groups are pan-Neotropical, each with species from Mexico to Argentina. A further group, tentatively added, consists of one seminal species. The latter group may be of generic worth once fully elaborated.

DISTRIBUTION. Fig. 11. Pan-Neotropical, with each of two Species Groups showing species distributed from Mexico to Argentina.

REMARKS. Characters and Affinities. I originally included *Thecla hesperitis* in my seminal description of *Angulopsis* (Johnson 1991). The purpose of *Angulopsis* was to separate the many Neotropical hairstreaks showing a morphology like its type species (*Thecla autoclea* Hewitson) from the very differently structured species of *Electrostrymon* Clench (type species *Papilio endymion* Fabricius). Inclusion of *Thecla hesperitis* with *Angulopsis* was based mostly on the female genitalia (which became relevant during an analysis of type specimens possibly belonging to the new group). The female genitalia of *Thecla hesperitis* do, in fact, share a very basic ground plan with *Angulopsis* (if compared to *Electrostrymon*). However, in the context of fully elaborated *Angulopsis* (and, indeed, *Gigantorubra*) (based on specimens of both sexes), it is now clear that the female habitus in *Thecla hesperitis* is the most conservative of a larger clade of species which depart overall from the characters of these other groups when fully enumerated.

The discovery of distinction in the morphological characters of the clade of species including *Thecla hesperitis* is also compatible with the wing characters. Amongst *Angulopsis* taxa, *Thecla hesperitis* represented a group of species departing from the jagged orange and red-orange bands of *Angulopsis* and showing, instead, lineal blackish bands. As well, elaboration of a separate genus (*Ziegleria*) also circumscribes a genus itself of pan-Neotropical distribution, further meeting the generic criteria consistently used by me for Neotropical Eumaeini (Johnson 1991a, 1992).

Thus, it is apparent that *Thecla hesperitis* is part of a large sister clade of *Angulopsis*. As such, it

must be separated from *Angulopsis* to (1) allow full definition of genera by the widest conciliation of definitive characters (without contradictions) and (2) to recognize a clade of pan-Neotropical biogeographic significance. Anything less would require arbitrary choice of what characters represent the larger cluster of species (*Angulopsis* + *Gigantorubra* + *Ziegleria*) and sorting out the occurrence of three overlapping pan-Neotropical distributions.

Type Species. "*Thecla hesperitis*" itself has a history of confused nomenclature since it has been an available name applied by workers to many populations and arrays of specimens. Thus, I have avoided using it as the type species of *Ziegleria*, opting instead for a species with a clearer breath of characters typifying the clade and male and female specimens both with more current data. I have chosen *Z. bernardi* not only because it meets these criteria (its extreme habitus is more like the *cyanissima* Species Group than other members of the *hesperitis* Group) but because, if anyone was prone to lump species in this group based simply on an *a priori* notion of reducing species numbers, the choice for conspecificity with *Z. bernardi* would not be *Z. hesperitis* but *Z. mexicana*. The latter is a species that has remained undescribed but has been generally known to Mexican workers.

Species Groups. As heretofore noted, I divide the genus into two Species Groups, each pan-Neotropical. The "*hesperitis* Group" includes taxa showing limited dorsal blue and conservative morphological habitus; the "*cyanissima* Group" contains fully blue species with a genital habitus showing various structural innovations and additional components.

Diversity. The group promises an increase in diversity. The genus includes two species whose degree of sympatry must still be worked out (*Z. hesperitis*, *Z. mexicana*). Since Mexican workers have known of the latter sister taxon, it should not be difficult to subsequently elaborate. The reach of the *hesperitis* Group into South America, and the number of sister taxa actually in it, remains an open issue. *Z. bernardi* of the Sierra Nevada de Santa Marta invites study as to whether it is the only distinctive sister in South America. Given the data suggested in rudimentary Material Examined, there are a volume of local populations to be studied. More peculiarly, the two taxa of the *cyanissima* Group are poorly known. Not only must the distributions of these taxa be more widespread, their discovery at all suggests that further entities must represent this group (particularly since the structural characters are so striking). Robert Eisele (the collector of *Z. cyanissima*) has collected in his regions for fifteen years; the appearance of this singleton may indicate low density or habitat restriction. The Mexi-

Figure 10. Distributions of *Crimsinota* and *Nicolaea* Species*Crimsinota*

- *Crimsinota socia*
- ⊕ *Crimsinota gigantea*
- ⊕ *Crimsinota perplexissima*
- *Crimsinota youngi*
- *Crimsinota rubifer*
- ⊙ *Crimsinota cyanoruba*
- *Crimsinota argentina*

Nicolaea

- ▣ *Nicolaea volumen*
- *Nicolaea cauter*
- ⋄ *Nicolaea gagarini*
- ▽ *Nicolaea macroma*
- ▽ *Nicolaea micronota*
- *Nicolaea pertainea*
- ◻ *Nicolaea honduriana*



Note: Due to occurrence of several species at some sites, symbols are occasionally clustered

? indicates generalized data

?t indicates old type data which is vague

can sister species is also from a concerted collecting expedition, not casual work. Accordingly, below *Z. hesperitis* is treated as "*Z. hesperitis* complex" because its distribution *sensu stricto* must still be clarified and it is possible that within the distribution areas cited in Material Examined that additional species of the complex occur but require local elaboration. In addition, not all the type specimens of named "*Thecla*" possibly synonymous (or cited in the literature as synonymous) are extant. This, with the possibility of local endemics, further confused the taxonomy of "*Thecla hesperitis*".

ETYMOLOGY. Named to honor Dr. Benjamin Ziegler (Summit, New Jersey) who, along with his great interest in hairstreak butterflies, published one of the first higher classifications for New World Theclinae.

hesperitis Species Group

DFW,DHW ground black, HW with patch of medial or medial-limbal iridescent blue; morphology showing male with short stout valvae comprised of a shouldered bilobed area and smaller, fingerlike, caudal extensions; female without prominent sclerotinal modification of eighth tergite and with genitalia terminally comprised of simple paired terminal lamellae, often with a central tooth at the lamella postvaginalis but without numerous additional components along around the lamellae as in the subsequent Species Group.

Ziegleria hesperitis (Butler and Druce) complex, NEW COMBINATION

Photoplate IIIA, Fig. 7A.

Bithys hesperitis Butler and Druce 1872: p. 107.

Butler 1873: 159, pl.57, f.14.

Thecla hesperitis: Godman & Salvin 1879-1901 [1887]: 177; Draudt 1919: 794, pl. 175i; Comstock and Huntington 1958-1964 [1960]: 181; Hayward 1973: 156 (as "*hesperites*", misspelling); Huntington 1932: 195. Druce 1909: 431. Zikán and Zikán 1968: 56; Bridges 1988: I.156; II.106,III.14.

Angulopsis hesperitis: Johnson 1991: 42.

Historical Synonyms— (1) type(s) available; synonymy judged valid:

Thecla cabiria Hewitson 1863-1878 [1877] (1): 195, (2) pl. 77, f. 623,624. Draudt 1919: 794; Comstock and Huntington 1958-1964 [1960]: 181; Hayward 1973: 156; Bridges 1988: II.

106,III.68.

(2) type(s) unavailable (see Remarks):

Tmolus perdistincta Kaye 1904: 194, pl. 18, f. 8.; Draudt 1919: 794, pl. 175i. Comstock and Huntington 1958-1964 [1960]: 181 Hayward 1973: 156; Bridges 1988: II.106; III.

Thecla lugubris Moschler 1876, 1876, 301, pl. 3, f. 4. Draudt 1919: 794, pl. 175i; Comstock and Huntington 1958-1964 [1960]: 181; Hayward 1973: 156; Bridges 1988: II.106,III.

DIAGNOSIS. *Wings.* DFW,DHW blackish, lacking androconial brand and with HW showing moderately bold iridescent azure patch suffusively defined within medial to limbal area. In comparison, *cyanissima* Group members are blue over entire DFW,DHW, *Z. mexicana* and *Z. bernardi*'s DHW patch is vivid with clearly defined edges particularly rounded about submargins of cells M2 and M3 distad of discal cell. In *Z. bernardi* males, particularly, patch boldly engulfs M2 and discal cell as well (as in the more expansive blue typical of females of Group).

Morphology. Male genitalia with valvae ventrum showing paired widely triangulate bilobes tapering abruptly to short, fingerlike, caudal extensions (*Z. bernardi* and *Z. mexicana* showing highly sculptured valve ventrum). Female genitalia with ductus bursae straight and unipartite, terminating with superior plate comprised of paired elliptic lamellae separated by a wide central fissure, inferior plate a wide triangulate tooth (*Z. bernardi* with bipartite ductal structure, along with other characters [see Remarks]; *Z. mexicana* with elongate ductus bursae and comparatively diminutive lamellae).

DESCRIPTION. *Male.* DFW,DHW ground dark blackish brown to black in fresh specimens, FW without androconial elements, HW with suffusive azure patch indistinctly defined outside of discal cell from cells M2 and across limbal area; short tail at vein CuA1 terminus, very long tail at CuA2 terminus; HW anal lobe only slightly produced but heavily fringed. VFW,VHW ground brown to dark beige and often suffusive with darker brown; FW with thin, dashed to more continuous, postmedian band (black basally, white distally) from costa to cell CuA2; HW with medial band of same colors, bolder proceeding from slightly enlarged SC+R1 element in rectangulate dashes slightly inset at cell M3, then followed by a "W"-shaped element in the anal area but all these elements, including the "W", when compared to *Angulopsis/Gigantorubra* or to the "W" in calycopines (Johnson 1991), looking "squared-off" against each other (not with the obvious jaggedness of these former groups). Limbal area with bold *Thecla*-spot, orange to brown (southward into South

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America), this and adjacent cells with basal crescents of white nearing the anal lobe, intercellular areas suffused with white, gray or bluish gray and with anal lobe boldly black. FW length: 13.0 mm. - 15.0 mm. (AMNH Material Examined). *Female*. Marked similar to male except DFW, DHW ground duller and more suffusive, DHW patch more suffusive and lighter, silvery to gray-blue; VFW, VHW varying from male only in slightly bolder bolder maculation, though often not as colorful *per se*. FW length: 13.0 - 15.5 mm. (AMNH Material Examined). *Male Genitalia*. 7A,2. Short brush organs abutting vincular dorsum. Genitalia with vincular ventrum angulate, arc about same breadth as elongate pointed saccus; falces extremely arched; valvae with ventrum showing paired widely triangulate bilobes tapering abruptly to short, fingerlike, caudal extensions (about equal or less than terminal length of bilobes). Geographic variation somewhat changing overall allometry of valvae proportions (see Fig. 7A d,e,g) but with same overall shape. Aedeagus robust, exceeding rest of genitalia by about caecum length; caecum bowed, shaft straight, terminus with elliptic hood and cornuti typical of genus. *Female Genitalia*. Fig. 7A,1. Lacking notable *sipc*. Genitalia characterized by robust and straight ductus bursae terminating with superior plate comprised of paired elliptic lamellae separated by a wide central fissure and an inferior plate forming a ventral and terminally protruding tooth beneath the terminal ductal opening; cervix bursae flared to slight hood covering distal end of corpus bursae; corpus bursae showing paired signa typical of genus.

TYPES. Holotype male, BMNH, labelled "Costa Rica, Van Patten" "Godman-Salvin Coll. 1912-23, B.C.A. Lep. Rhop." "Thecla hesperitis Butl. [&] Dr." "B. Hesperitis Butler type" "type" "B.M. Type No. Rh. 892". Further cited TL "Cartago", Costa Rica (sensu Butler and Druce 1872; Bridges 1988).

Thecla cabiria Hewitson 1863-1878 [1877], type male, BMNH, "Brazil, Hew. Coll. 79.69. Thecla cabiria .1.". Appearing as synonymous with *B. hesperitis* unless further syntypes may be located which represent another species. Consequently, no lectotype designated at this time.

Imolus perdincta Kaye 1904, type historically cited in Kaye Collection (Bridges 1988), deposition unknown to me; TL Tabaquite, Trinidad. May require distinction from *Z. bernardi* if located; synonymy thus tentative.

Thecla lugubris Möschler 1876, deposition unknown to me; TL "inner Surinam; Colombia". In re-

gard to "Colombia", discovery of syntypes may require distinction from *Z. bernardi*; synonymy thus tentative.

DISTRIBUTION. *Spatial*: Fig. 11. *Z. hesperitis* sens. strict. throughout central Mexico through Central America and Panama and probably including upper South American coastal areas to Venezuela and Trinidad-Tobago. Area southward ("*hesperitis* complex" Fig. 11) needing further elaboration in relation to possible sister or sibling taxa or overlooked endemics. The *hesperitis* complex appears mostly linked to xeric conditions while members of *cyanissma* Group appear noted as "moist forest". *Temporal*: Current Material Examined suggests probably year-round occurrence in tropical regions.

REMARKS. Various circumstances have suggested the wisdom in provisional treatment of this species as "*hesperitis* complex", in which the more well known Central American component (vis-a-vis the Costa Rican type material) can be referred to as *hesperitis* sens. strict. while caution must be advised in broad use of the name southward into South America without further study. A major factor recommending this approach is the appearance of two sister taxa in sympatric material. Here, where different morphologies (and at least moderately apparent wing traits) can be observed in specimens with duplicate data (*Z. bernardi*, Colombia) or with at least similar regional data (*Z. mexicana*, Mexico) the possibility rears its head that further south additional sister taxa occur where samples are currently more sparse, names variously used in the literature, and some type material which may be relevant not currently available. At present, I am studying the complex from specimens from throughout SE Brazil and will reserve comment on the situation there until this work can be completed. Suffice it to say that numerous specimens with an "easy Seitz i.d." as *hesperitis* are not *hesperitis* and some not even congeneric (for one with bold scent brands see Johnson in press c).

MATERIAL EXAMINED. [diacriticals employed as on labels]. **BOLIVIA.** [*hesperitis* complex] Santa Cruz de la Sierra, nod, 1♂ (AMNH); Prov. Ibanez, Dept. Santa Cruz, 2 km. at Jardin Botanica, woods, 12 January 1973, leg. R. Eisele, 1♀ (Eisele Collection); Buena Vista, S. Bolivia, leg. Steinbach, 1♂, 1♀ (CMNH). **BRAZIL.** [*hesperitis* complex] Parana, Caviuna, May 1945, leg. A. Maller, 2♂♂ (AMNH); Santa Catarina, Annaburg, Coll. Huntington, 2♂, 1♀ (AMNH); [intentionally not enumerated, SE Brazil material MPM] [see Remarks]; Iguacu, Parana, leg. Parish, 3♀♀ (AMNH). **COLOMBIA.** Santander, Rio Suarez, leg. Felipe Ovalle, 3♂♂ (AMNH); [needing subsequent elaboration and clustered with above] Environs Bogotá [may include various Colombian localities warranting comparison to *Z. bernardi*], nod, 12♂♂,

10♀♀ (MNHN); [*hesperitis* sens. strict.] Sierra Nevada de Santa Marta, N. Colombia, leg. G. Bernard, 1 male, 1♂, 1♀ (BMNH); Makasaka, Sierra Nevada de Santa Marta, leg. Bernard, 1♂, 1♀ (BMNH). COSTA RICA. [*hesperitis* sens. strict.] Libano Gunacaste, May 1927, 1♀ (AMNH); La Florida, March 1907, 5♀♀ (AMNH). ECUADOR. [*hesperitis* complex] Santo Domingo, 12-28 December 1940, leg. D. B. Ladday, 1♂, 1♀ (AMNH). GUATEMALA. [*hesperitis* sens. strict.] Rabinal, 12 September 1947, 1♂ (AMNH); Polochic Valley, 1♀ (BMNH); Guazacapan, 1♂ (BMNH); San Geronimo, Verapaz, leg. Champion, 1♂ (BMNH). GUYANA. [*hesperitis* complex] British Guiana, leg. Parish, 1 male (AMNH). HONDURAS. [*hesperitis* sens. strict.] San Pedro Sula, 1896, leg. Erich Wittkugl 2♂♂ (BMNH). MEXICO. [*hesperitis* sens. strict.] Oaxaca, Mpi. Yolox, 18 September 1962, leg. E. C. Welling, 1♂ (CMNH); same data, 1♂, 1♀ (AME); Colima, Colima, February, leg. Hoffman, 1♂ (AMNH); Vera Cruz, Presidio, leg. Hoffman, May 1941, 1♂, August 1940, 2♂♂ (AMNH); Guerrero, Rincon, 1680 m., 4 mi. E. Chilpancingo, dense grassy scrub, 30 August 1967 leg. Miller and Pine, one male, one female (AMNH); San Luis Potosi, 2 mi. N Tamasunchate, in moist forest 90 m., 10 September 1967, leg. R. Pine, one male (AMNH). NICARAGUA. [*hesperitis* sens. strict.] Chontales, 1♀ (BMNH); Nagarote, 1♂, 1♀ (AMNH); "Nicaragua", nod, Comstock Coll., 1 male (AMNH); Vera Cruz, Cordoba, May 1906, leg. Hoffman, 2♂♂ (AMNH); Vera Cruz, Misantla, June 1909, leg. Hoffman, 1♂ (AMNH); Vera Cruz, Presidio, September 1939, leg. Hoffman, 2♂♂ (AMNH); Vera Cruz, Jalapa, leg. Hoffman, 1♀ (AMNH). PANAMA. [*hesperitis* sens. strict.] Barro Colorado Island, 11-19 March 1936, leg. W. J. Gertsch, 2♂, 1♀ (AMNH); Barro Colorado, 16 March 1936, 1♂, 1♀ (AMNH); Balboa, Canal Zone, 26 May 1918, 1♂ (AMNH); Chiriqui, 1 male, nod (MPM). PERU. [*hesperitis* complex] Iquitos, 3 October 1931, nod, 1♂ (AMNH), same data but 6 November 1931, 1♀ (AMNH), same data but 19 July 1930, 1♂ (AMNH). TRINIDAD-TOBAGO. [*hesperitis* sens. strict.] La Gloria Estate, Gran Couva, 1 April 1929, 2 males, five female. VENEZUELA. [*hesperitis* complex] San Esteban, 25 September 1938, 1 male (AMNH); Caripito, New York Zool. Soc. Coll., 9-20 March 1942, 1♂, 2♀♀. [Note: some citations of Material Examined, as 1♂, 1♀, from institutions other than AMNH represent material borrowed on an "example" basis and may not include all the relevant material at that institution.

Ziegleria bernardi,

NEW SPECIES

Photoplate IIIB, Fig. 7B.

DIAGNOSIS. *Wings.* Most similar to *Z. mexicana* (and possibly a southern vicariate of the same ancestral population) showing vivid azure DHW patch with clearly defined edges rounded about submargins of cells M2 and M3 and, in males, patch boldly engulfing M2 and discal cell (as in the more expansive blue typical of females of *hesperitis* complex). VFW, VHW ground in known specimens bright yellowish beige with clearly defined black and white-bordered bands and lavish limbal area compared to duller marked sympatric *Z. hesperitis*.

Morphology. Male genitalia with valvae ventrum highly sculptured; bilobes with rounded shoulder, caudal extensions of uneven contour and with inwardly directed pointed termini; female genitalia uniquely with ductus bursae broken into respective fluted posterior element and undulate anterior element, separated by a transparent neck. Terminal lamellae differing from both *Z. hesperitis* and *Z. mexicana* by widely produced lateral lobes.

DESCRIPTION. *Male.* DFW, DHW ground vivid black, HW with vivid azure DHW patch with clearly defined edges rounded about submargins of cells M2 and M3, boldly engulfing M2 and discal cell. HW with short tail at vein CuA1 terminus, very long tail at CuA2 terminus; HW anal lobe slightly produced and heavily fringed. VFW, VHW ground vivid yellowish beige; FW with well-defined dashed postmedian band (black basally, white distally) from costa to cell CuA2; HW with similarly colored medial band, dashed across wing from somewhat larger SC+R1 element, then with "W"-shaped element in anal area, all markings typical of the "squared-off" habitus (compared to extreme jaggedness of bands in *Angulopsis* and *Gigantorubra*). Limbal area lavishly marked, with blue and grayish suffusion adjacent orange Thecla-spot and with black and white crescents surrounding the intercellular areas of each submargin. FW length: 14.0 mm. (holotype); 13.5-14.0 mm. (paratypes). *Female.* Marked similar to male except for more rounded DFW, DHW and with DHW showing more suffusive, but also more extensive, duller silvery or gray-blue HW patch. FW length: 14.0 mm. (allotype); 13.5-14.5 mm. (paratypes). **Male Genitalia.** Fig. 7B, 1. Short brush organs abutting vincular dorsum. Genitalia with vincular ventrum less angulate than *G. hesperitis* and with saccus short and parabolic; falces extremely arched; valvae with highly sculptured habitus, bilobes widely rounded and caudal extensions, although short, of greatly sculptured contour compared to *G. hesperitis*. Aedeagus elongate, exceeding

rest of genitalia by about one-fourth; caecum short and bowed, shaft elongate and widely bowed; terminus with more triangulate hood enclosing cornuti typical of genus. *Female Genitalia*. Fig. 7B,2. Lacking notable *sipc*. Genitalia with ductus bursae broken into a fluted posterior element and an undulate anterior element separated by a thin transparent neck. Terminus of posterior element with superior plate comprised of wide, "mouse-ear"-shaped, lamellae flanking prominent ductal struts, inferior plate forming only a slight ventral tooth; cervix bursae flared to slight hood covering distal end of corpus bursae; corpus bursae showing paired signa typical of genus although two prongs apparent on each keel.

TYPES. Holotype female, allotype male, labelled "COLOMBIA, North Colombia, Sierra Nevada de Santa Marta, M. J. Adams and G. I. Bernard" specimen numbers #2226 (male, notebook data— below San Pedro de la Sierra, NW Sierra Nevada de Santa Marta, 900 m., 9 September 1972), #298 (female, notebook data— Rio Guachaca, N Sierra Nevada de Santa Marta, 50-100 m., 9 July 1971), both deposited BMNH (see Remarks). *Paratypes*. Two males, two females, with respective duplicate data of primary types except individual specimen numbers (latter not specifically noted, see Remarks).

DISTRIBUTION. *Spatial*: Fig. 11. Currently known from the Sierra Nevada de Santa Marta in Colombia where it is locally sympatric with *Z. hesperitis* sens. strict. (see Remarks). *Temporal*: Currently known from July to September data on type specimens.

REMARKS. *Historical Material*. This species was discovered when dissecting specimens borrowed from the Adams/ Bernard Expeditions material at the BMNH when it was apparent that the specimens could be divided into two wing character groups. These dissections and choice of primary types occurred before clarifying data was sought from Dr. Michael Adams (Blandford, England) concerning particular specimen numbers. Thus, it is interesting that the types turned out to represent two Sierra Nevada de Santa Marta localities paralleling the data on at least locally sympatric specimens of *Z. hesperitis* (as well as other local angulopines, see *G. collucia* and *G. adamsi*). However, a fault in the data to date stems from the fact that since the taxon distinctions of the present revision were unknown to me at the time I borrowed BMNH material, I was forced by circumstance to cull material on an "example" basis, first from the larger Adams/Bernard samples in BMNH "Accessions" and,

later, when smaller samples were gleaned for hand-carrying. As a result, more material of both *Z. bernardi* and *Z. hesperitis* from the Sierra Nevada de Santa Marta is extant at the BMNH (as well as material most likely representing other Colombian localities from the Adams/Bernard expeditions (see list in Johnson and Adams 1993, Appendix 1). This situation indicates the need for further sorting of material from BMNH "Accessions". Michael Adams (in litt.) informs me that, to date, specimens listed by me for *Z. bernardi* are from samples collected by G. Bernard before Adams initiated the practice of keeping detailed field notebooks on individual specimens. This creates some misfortune since, when I chose specimens for loan, I was unaware of precisely what was represented by the individual specimen numbers. Had I known, I would have chosen specimens with the greatest array of label data. In addition, I usually borrowed only a pair (or sometimes a few more examples) from each group of Adams/ Bernard specimens that showed unusual wing markings. As a result, for groups eventually relevant to angulopine revisions, my current results are limited to synoptic material. Another discovery subsequent to selection of specimens for loans was that BMNH printed labels (added to Adams/ Bernard material by various preparators over the years) differed in data content. Some contained full data and specimen numbers, others only regional data and specimen numbers, and others no specimen numbers at all. It may be that these discrepancies resulted from an "evolving" labelling practice at the BMNH. As a result, however, simply by chance specimens described in Johnson and Adams (1993) had full data on the labels (plus specimen numbers corresponding to field data in notebooks) while types of *Z. bernardi* had only regional data and a specimen number referring to a more precise locality. The latter had to be retrieved by Adams (in litt.). Thus, to date, paratypes of *Z. bernardi* are listed only from my notes indicating additional specimens in the BMNH "Accessions" which showed similar wing pattern characters. Since there is an ongoing elaboration of Adams/ Bernard hairstreaks, I will need to return to the BMNH and review the status of specimens in these collections representing various recently described taxa. Happily, with recent initiation of projects with Colombian workers to begin "tracking" the Colombian Theclinae fauna in detail, it should be relatively easy to record future additional records for *Z. bernardi* (just as has been done with Colombian elfins [Johnson and Adams 1993, Le Crom and Johnson, in press]).

Affinities. Readers will note the apparent affinity of *Z. bernardi* and *Z. mexicana* of subsequent entry. The genitalia of *Z. bernardi* are so unique that when I first dis-

sected them, alongside regional sympatric *Z. hesperitis*, I was astonished. They were particularly astonishing in light of the uniform characters within *Z. hesperitis* sens. strict. (see Fig. 7A2,d,e,f,g). However, when I located specimens of *Z. mexicana* (a species often noted in litt. by Mexican workers as "*Thecla* nr. *hesperitis*") its sharing with *Z. bernardi* of the overall habitus of the blue DHW patch clearly suggested the distinction of both entities from the *Z. hesperitis* complex. Recent work on Neotropical hairstreaks has recorded numerous geographic distributions showing either trans-Panamanian pattern (Central America into Colombia and Venezuela) or a disjunction between upland elements in respective regions of Central America and northern South America. Further distributional elucidation is required in many of these cases. However, from the structural characters, it would appear that *Z. bernardi* and *Z. mexicana* are sister vicariates limited to respective northern Central American and northern South American distributions.

ETYMOLOGY. Patronym for George Bernard who initiated the Adams/Bernard Expeditions with Michael Adams.

Ziegleria mexicana,

NEW SPECIES

Photoplate IIIC, Fig. 7C.

DIAGNOSIS. *Wings.* Differing from regionally sympatric *Z. hesperitis* sens. strict. by showing vivid dark azure DHW patch with clearly defined edges rounded about submargins of cells M2 and M3 (similar to Colombian *Z. bernardi*). VFW, VHW ground brown, often suffusively darkened, with clearly defined black and white-bordered bands and lavish limbal area compared to duller marked sympatric *Z. hesperitis* (including black arcs surrounding the submarginal intercellular areas and blackish elements at Thecla-spot, anal lobe and along base of "W"-element).

Morphology. Male genitalia with sculptured lateral outline on valvae (nearly in undulate fashion from curving along the caudal extensions as well as the bilobes) and with extremely robust and sculptured aedeagus; female genitalia with unipartite ductus bursae as in *Z. hesperitis* but more elongate, lacking extreme swelling at cervix bursae and, at terminal lamellae, showing only diminutive and terminally pointed structures (not the widely bilobate structures like former species) and no tooth on inferior plate.

DESCRIPTION. *Male.* DFW, DHW ground vivid black, HW with vivid dark azure DHW patch

showing clearly defined edges rounded about the submargins of cells M2 and M3; HW with short tail at vein CuA1 terminus, very long tail at CuA2 terminus; HW anal lobe quite produced and heavily fringed. VFW, VHW ground dark brown, often suffusive with darker brown; FW with well-defined dashed postmedian band (black basally, white distally) from costa to cell CuA2; HW with similarly colored medial band, dashed across wing from somewhat larger SC+R1 element, then with "W"-shaped element in anal area, all markings typical of the "squared-off" habitus (compared to extreme jaggedness of bands in *Angulopsis* and *Gigantorubra*). Limbal area with lavish markings over dark brown ground, with blue and grayish suffusion adjacent deep red-orange to brownish Thecla-spot and with prominent black arcs surrounding the intercellular areas of each submargin; based of anal lobe, Thecla-spot and "W" element prominently edged with black. FW length: 14.0 mm. (holotype); 14.0-14.5 mm. (paratypes). *Female.* Marked similar to male except for more rounded DFW, DHW and with DHW showing more suffusive and extensive dull silvery blue to gray-blue color in the HW patch. FW length: 14.0 mm. (allotype); 14.0-14.5 mm. (paratypes). *Male Genitalia.* Fig. 7C, 1. Short brush organs abutting vincular dorsum. Genitalia with vincular ventrum quite angulate compared to *G. hesperitis* and *G. bernardi*, saccus short and "funnel"-shaped; falces extremely arched; valvae with laterally sculptured habitus, appearing rather undulate laterad from curving of both the bilobes and caudal extensions, latter terminating at very short and blunt ends. Aedeagus very robust, with both caecum and shaft very bowed and with terminus sculptured into a hoodlike element, much like in species of the subsequent Species Group. *Female Genitalia.* Fig. 7B, 2. Lacking notable *sip̄c*. Genitalia with ductus bursae unipartite and elongate, with hardly any production at the cervix bursae; terminal plates extremely diminutive for genus, with superior plate comprised of somewhat pointed paired flaps with these rounding laterally into the inferior plate area (as opposed to being widely separated centrally), latter which shows no produced tooth; corpus bursae also showing diminutive structures, signa slight and basally platelike.

TYPES. Holotype male, allotype female MEXICO, Chiapas State, Puente Chamula, 23-24 July 1977, leg. R. Rozycki, both deposited AMNH. *Paratypes.* MEXICO, Chiapas, San Jeronimo, 6000', 18 September 1973, leg. E. C. Welling, one male (AMNH); Chiapas, Ochuc, 28 August 1982, leg. R. Rozycki, 1 male (AMNH), same data but 15 July 1982, 1 male (AMNH).

DISTRIBUTION. *Spatial:* Fig. 11. Currently known from the Chiapas, Mexico, specimens but probably

more widely distributed in the Central American region and Mexico and needing elaboration compared to *Z. hesperitis*. **Temporal:** Currently known from July to September type specimen data.

REMARKS. This species has been called to my attention as "*Thecla* nr. *hesperitis*" by various Mexican collectors and was obvious once specimens were in front of me. Comments under *Z. bernardi* pertain. The distribution still requires fuller elucidation.

ETYMOLOGY. Named for the region of the type locality in deference to the common usage references to this species in correspondence.

cyanissima Species Group

DFW, DHW both broadly iridescent blue, HW with prominent black spots along margin; female genitalia extremely robust and showing complexified superior plate including extra lateral components connecting to a complex *sipc* and, on the inferior plate, a greatly produced central tooth.

Ziegleria cyanissima,

NEW SPECIES

Photoplate IIID, Fig. 7C [p. 37].

DIAGNOSIS. **Wings.** DFW, DHW bright sky blue over entire HW and, on FW, except for costa and apex/subapex which are brownish black; HW with prominent marginal black spot at CuA1 amid blue HW ground. VFW, VHW generally like *G. hesperitis*.

Morphology. Tergite eight showing modification to *sipc*. Genitalia in known females extremely robust; ductus bursae sculptured, terminating in short antrum before genital plates; latter with superior plate robustly bilobate surrounding elongate produced tooth on inferior plate; lateral area of inferior plate with paired triangulate elements strongly abutting the *sipc*.

DESCRIPTION. **Male.** Unknown. **Female.** DFW, DHW ground bright sky blue except for apices/subapices and costa of FW which are brownish black; HW margin with prominent black spot at cell CuA1, slightly less prominent spot at CuA2. HW with short tail at vein CuA1 terminus, very long tail at CuA2 terminus; HW anal lobe quite produced and heavily fringed. VFW, VHW ground beige, FW with dashed postmedian band (black basally, white distally) from costa to cell CuA2; HW with similarly colored medial band, dashed across wing from somewhat larger SC + R1 element, then with "W" -shaped element in anal area, appearing somewhat more prominent than in

congeners of other Species Group. Limbal area lavishly marked with blue and grayish suffusion adjacent prominent orange Thecla-spot, particularly with black arcs surrounding the intercellular areas of each submargin and in patches at base of anal lobe and in adjacent cell. FW length: 14.5 mm. (holotype). **Female Genitalia and Tergal Morphology.** Fig. 7C [p.37]. Eighth tergite showing slight elaboration of terminolateral margin conjoining strongly with triangulate flaps at the base of the lamellae. Genitalia characterized by robust but twisted ductus bursae, twist occurring at the area where *Z. bernardi* shows complete division by the transparent neck. Ductus terminating with superior plate comprised of extremely robust and paired elliptic lobes lined by bulky sclerotized rims and slight central fissure, inferior plate forming prominent ventral tooth just beneath; cervix bursae flared to slight hood covering distal end of corpus bursae; corpus bursae showing very robust paired signa with a rounded, inwardly-directed, keel.

TYPE. Holotype female, ARGENTINA, Salta Prov./Jujuy Prov., "Corniza" road, La Caldera to Jujuy border on Rt. 9 ("Site 1, 1984", see Remarks), "moist forest", 20 September 1984, leg. R. C. Eisele, deposited AMNH.

DISTRIBUTION. **Spatial:** Fig. 11. Currently known only from northern Argentina, but undoubtedly more widely distributed. **Temporal:** Currently known only from September type data.

REMARKS. Robert C. Eisele sent this specimen to me when he knew I was working on the *Angulopsis*-related groups. However, from the "Site" lists he had provided earlier, I have been unable to be exact concerning "Site 1, 1984" and have surmized the location from site numbers assigned in adjacent years. Given Eisele's absence from Argentina (due to health problems) at the time of this writing, I have been unable to confirm the precise site. However, since we are coworking a paper on Argentine forest *Theclinae*, I can report the matter subsequently if the above citation is imprecise. Obviously, the species is poorly known if thirty combined years of collecting in the region by Eisele and Bruce MacPherson have produced only a single specimen. Readers will note that in treating *Gigantorubra* and *Angulopsis*, substantial series were available from the Bolivian, Argentine and western Brazilian regions. Again, no specimen of *Z. cyanissima* appeared in this material. I was unaware of anything like the complex morphology of this species until discovery of the Mexican species of subsequent entry. Since both appear to hail from damp forest, the lack of specimens may reflect a seldom collected habitat. Location of additional material of this group should be a

priority. With such a prominent morphology, surely additional members of this complex are still to be located in the neotropics.

ETYMOLOGY. An arbitrary use of the superlative added to the root referring the blue color of this species.

Ziegleria hoffmani,
NEW SPECIES

Photoplate III, Fig. 7D.

DIAGNOSIS. *Wings.* DHW with bright silvery blue to wing margin below discal and cell M2 contrasting large (1.5 mm.) and black spots marginad in cells M3 to CuA2; FW with bright silvery blue across medial-basal area. VFW, VHW ground light beige, HW medial band very straight toward costa above "W"-element, "W" appearing exaggerated relative to congeners; limbal area comparatively dull.

Morphology. Female showing *sipc* extremely sculptured and with additional termino-lateral component midway between tergite margin and terminus of genital lamellae. Genitalia with ductus sculptured by two nearly transparent junctures in the anterior one-third and, as typical of Species Group, showing robust bilobate superior plate and inferior plate terminating in produced caudally-directed tooth.

DESCRIPTION. *Male.* Unknown. *Female.* DHW bright silvery blue to margin posterior of discal and M2 cells, margin with bold 1.5 mm. black spots contrasting blue ground in cells M3 to CuA2; FW with bright silvery blue across medial-basal area. HW with short tail at vein CuA1 terminus, very long tail at CuA2 terminus; HW anal lobe quite produced and heavily fringed. VFW, VHW light beige, FW with dashed postmedian band (black basally, white distally) from costa to cell CuA2; HW with similarly colored medial band, dashed very straight across wing from only slightly larger SC +R1 element, then with "W"-shaped element in anal area, latter appearing somewhat more prominent than in congeners of other Species Group. Limbal area comparatively dull, with light orange *Thecla*-spot bordered by some gray and blue grizzling, particularly darker toward blackish in cell adjacent anal lobe, latter which is basally with a black chevron. FW length: 14.5 mm. (holotype). *Female Genitalia and Tergal Morphology.* Fig. 7D. *Sipc* with prominently sclerotized dorsum showing angulate lateral anterior and posterior, and along the latter an additional sclerotized component (Fig. 7D,x) between the *sipc* and terminal lobes of superior genital plate.

Genitalia extremely robust with ductus sculptured by two nearly transparent junctures in the anterior one third and a swollen cervix bursae ventrum, then fluted posteriorly to genital plates. Superior plate showing widely bilobate elements terminally pointed and separated by a wide central fissure, latter quite filled by the elongate tooth protruding from the inferior plate. Inferior plate with membranous lip tightly attached. Corpus bursae with signa basally platelike, with a slight inwardly directed keel and denticritic sclerotizations along the margins.

TYPE. Holotype female, MEXICO, Guerrero, 2 mi. W. Colotlipa, 1020 m., moist forest, 27 July 1967, leg. Miller and Pine; Miller and Pine 1967 Specimen #753, deposited AMNH.

DISTRIBUTION. *Spatial:* Fig. 11. Currently known only from Guerrero State, Mexico. *Temporal:* Currently known only from July type data.

REMARKS. This species superficially appears on the DFW, DHW like a gigantic *Calycopis* because of the bright silvery blue and, specifically, because of the black spots in the blue field on the hind wing, compelling like a gigantic *Calycopis argenopuncta* Johnson, Eisele and MacPherson (TL N Argentina). This is completely homoplesious but interesting all the same. Beneath, the species shows the typical markings of *Ziegleria* but with a bit more of a jagged habitus than the other species above. The Miller and Pine material offers an interesting addition to the Hoffman material at the AMNH. Mexican workers should look for additional specimens of this outstanding species.

ETYMOLOGY. A patronym for Dr. C. C. Hoffman, the major contributor to historical knowledge of the Mexican butterfly fauna.

Tentative Placement in *Ziegleria*

Hairstreak butterflies of the "*Thecla canacha*" assemblage.

As noted under the *orcidia* Species Group of *Gigantorubra*, a group of Neotropical hairstreaks is distinguished by striped undersurface ground colors (usually browns and yellow-browns) which further contrast the bold ventral wingbands. Although it might be expected that these would all belong to one monophyletic group, it is apparent that one group belongs with *Gigantorubra* while yet another shows structural characters far more akin to *Ziegleria*. However, these species also show an *sipc* in males. The most familiar of these species is *Thecla canacha* Hewitson, distributed across northern

South America from Ecuador to Venezuela. Consistent with the late insertion of taxa of the *orcidia* Species Group into the genus *Gigantorubra*, treatment of the *canacha* assemblage of "*Thecla*" cannot be completed until there is a morphological analysis of the relevant type specimens. However, I feel strongly that this latter assemblage may prove of generic worth and also show a wider diversity than now apparent among the various "*Thecla*" taxa that might be associated with it based on superficial characters. Accordingly, I think it is relevant to describe here a Central American member of the group that has previously been unknown. Provision description of this taxon within *Ziegleria* serves to point out the similarities, but great distinctions, between the morphology of these species and *Ziegleria* sens. strict.

Ziegleria compendina,
NEW SPECIES

Fig. 7E.

DIAGNOSIS. *Wings.* Most similar to "*Thecla canacha* Hewitson" (see Remarks) of northern South America but VFW, VHW grounds showing contrasting basal ground and gray-brown grounds only from the medial band distally (not also striped basally as in *canacha*) and with VHW medial band dashed gray and at sharp angles (as in *Ziegleria*). May also need to be distinguished from other Colombian members of the group which are still to be elaborated (see Remarks).

Morphology resembling typical *Ziegleria* but with a prominent *sipc*. In the genitalia, valvae base and aedeagus also like *Ziegleria* but differing from all congeners in the presence of an elongate caudal extension on valve (Fig. 7E,c) (see Remarks).

DESCRIPTION. *Male.* Wings angulate; DFW, DHW ground deep brown, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe protruding. VFW, VHW ground grizzled warm brown; FW with dashed postmedial band of gray from costa to cell CuA2, bordered basally with rather continuous black; HW with ground basal of medial band completely grizzled warm brown, medial stripe formed of grayish dashlike elements bordered with more continuous black and forming a moderate but rather equilateral "W" in the anal area. Limbal area lighter brown to buff, slightly marked with blackish submarginal line framing orange and black *Thecla*-spot and some orangish suffusion in the adjacent cells near the black anal lobe. FW length:

14.0 mm. (holotype). *Female.* Unknown. *Male Genitalia and Tergal Morphology.* Fig. 7E. *Sipc* dorsal plate widely bilobate laterally, fringed with heavy microtrichia terminally and extending well beneath tergite seven at anterior. Genitalia with brush organs abutting vincular dorsum. Vincular arc robust and angled anteriorly to a moderate-sized parabolic saccus. Valvae bilobes angulate and shouldered as in most *Ziegleria* but with fully elongate caudal extensions. Aedeagus elongate and with caecum outside of plane of shaft some 45 degrees; caecum comprising about two-fifths aedeagal length, aedeagus terminating with triangulate hood.

TYPES. Holotype male, GUATEMALA, Rabinal, no other data, ex. AMNH backlog, deposited AMNH.

DISTRIBUTION. *Spatial:* Fig. 11. Currently known only from the type locality. *Temporal:* some of the Rabinal material is dated but the present specimen is not.

REMARKS. I have compared this specimen to examples identified as *Thecla canacha* Hewitson at the AMNH and MPM (ECUADOR, Rio Guambo, no other data, AMNH; COLOMBIA, "Colombia", Niedhoffer Coll. (MPM) [misidentified as "*Thecla plusios*"]). *Thecla canacha* appears to be a poorly known species. Unfortunately, interest in these specimens resulted from the blind test dissection of the Rabinal male in regard to *Thecla plusios* (see Johnson and Kroenlein 1993b) which postdated work on types at the BMNH. I can only surmise the exact identification of *T. canacha* from the above specimens but believe that such a different morph from far to the north in Guatemala deserves attention in the present study. Furthermore, as work progressed on other papers in the present *Reports* volume, I became suspicious that additional sister species exist which may make the entire group one of eventual generic worth. It is therefore important to point out the morphology in contrast to other members of *Ziegleria* described here.

Jean Francois Le Crom (Bogota, Colombia) has recently sent me photographs from another population further confusing the identity of *Thecla canacha* and suggesting a clade of species. Le Crom's specimens are nearly black and gray, with the black closing heavily around the basal margins of the VHW medial band and the limbal areas very bright. Work will begin immediately on these and other Colombian examples from this assemblage. Then, when the types of *T. canacha* can be examined and dissected, the matter can be further resolved.

ETYMOLOGY. An arbitrary use from the Latin meaning "summarized" or "abridged" and referring here to use of the species of an example of the facies of apparent sister species.

NICOLAEA, NEW GENUS

Synopsis-- contains *Thecla volumen* Druce, *Thecla cauter* Druce and a number of much more spectacularly marked relatives that have been undescribed.

Photoplate IV, Figs. 6,8.

DIAGNOSIS. *Wings.* Small to moderate size (10-12.5 mm). Males with basal FW/ distal HW blue iridescence against distally brownish-black or black grounds; FW with small (usually tan) ovate to elliptic androconial brand; female brown. VFW, VHW grounds beige to gray marked with postmedial (FW) and medial (HW) bands formed by orbiculate elements (orange, red or red-black) aligned either into a complete band or spot-band depending on the species.

Female genitalia unmistakable, appearing as a simple, elongate or robust, tube terminating with paired hemispherical lamellae separated by a thin central fissure, each lamella often showing a very slight disto-terminal tooth. This terminal habitus appears to support a phylogenetic relationship with *Crimsinota* (see Male Genitalia below).

Male Genitalia belying (as do the wings) congeneric relation with *Crimsinota* and showing a distinct habitus characterized by elongate saccus (length equaling or exceeding that of vincular arc or valvae); valvae elongate, generally tapered from a shouldered (sometimes sculptured) bilobed area; aedeagus elongate with both shaft and caecum general straight to only slightly bowed.

DESCRIPTION. *Adult. Male.* Head with frons fuscous to slightly iridescent blue in bright species, eye lining white, antennae finely striped white, tagmata fuscous or showing suffusive iridescence from the structural color of DFW, DHW. *Wings.* FW alar expanse [hereafter "FW length:"] small to moderate generally 10.0-12.5 mm. Wing shape not greatly angulate, particularly on HW (which has margin generally rounded in both sexes); HW with long tail at CuA2 terminus, short tail at CuA1 terminus (see Remarks); anal lobe not much produced (if at all, pointing inward toward abdomen); FW with discrete but small (usually tan and ovate to elliptic) androconial brand. DFW, DHW distal colors brown to blackish with bright iridescent blue suffused across the FW basal area and HW distal areas (often appearing confined between blackened wing veins). VFW, VHW with beige to gray grounds crossed by a lunulate band or spot-band on both wings; FW with postmedial band, HW with medial band with differences between species involving the shape of these elements (orbiculate,

rectangulate or more lineal) and their color (orange, red, blackish red). SC+R1 element not appearing much different than other elements of the band; anal area with appearance of a "W"-shaped element obviated to great extent either by produced elements of the band or, in some species, the band having already bent distally at the discal cell. Distally, postmedial area most often with white suffusions or chevron-like markings; *Thecla*-spot bright yellow, orange or reddish, and often accompanied in the adjacent cells by contrasting white, grayish or bluish suffusions. *Female.* Head with frons fuscous, eye lining white, antennae finely striped white, tagmata fuscous. *Wings.* Shape very similar to males but lacking FW androconial elements; DFW, DHW lacking structural color, instead brown to blackish. VFW, VHW similar to males but with somewhat more expansive wing pattern elements. *Male Tergal Morphology and Genitalia.* Fig. 8. Eighth tergite normal, showing no tendency toward *sipc*. Small brush organs along vincular dorsum, more robust in some species. Genitalia with generally rounded vincular ventrum tapering to greatly elongate saccus, length of latter equalling that of former and also equalling that of elongate valvae. Habitus of latter generally elongate in the caudal extensions, tapering from shouldered bilobes (which may be highly sculptured in some species). Aedeagus elongate, length exceeding already elongate vinculum and saccus by at least the caecum length; caecum slightly bowed, shaft generally straight, terminating with pencilate cornutus. *Female Tergal Morphology and Genitalia.* Figs. 6,8. Eighth tergite dorsum with some lateral sclerotization along border of genital lamellae resembling a very simple *sipc*. Genitalia typified by tubular ductus, generally elongate (variously fluted at posterior, tapered at anterior) terminating in simple paired hemispherical lamellae separated by a thin central fissure. Ductus bursae "vestigial" in one species (see Remarks); cervix bursae unelaborate, corpus bursae either lacking signa or with signa occurring only as slight inwardly-directed spines.

TYPE SPECIES. *Thecla cauter* H. H. Druce (see Remarks).

DIVERSITY. Six species are known, with a concentration of sympatric taxa evident in SE Brazil and one species outlying in Central America. Diversity in the group appears to have resulted from a "burst" of evolution in primary rain forest habitats. Because species show a penchant for juxtaposing very similar general characters with highly divergent autapomorphies, the genus is not divided into Species Groups (see Remarks).

DISTRIBUTION. Fig. 10. Pan-Neotropical; one species in Central America, five in South America with the majority occurring sympatrically in SE Brazil.

Highly probable that additional species will be discovered elsewhere in South American primary rain forest habitats.

REMARKS. Type Species. This genus presented great difficulty regarding choice of a type species. From wing characters, I would have much rather chosen one of the SE Brazilian new species, *N. macroma*, *N. gagarini* or *N. micronota*. Male *N. cauter* (although similar to congeners in DFW, DHW color and androconial band) differs in its brilliant explosions of red on the VHW. However, the three SE Brazil congeners just mentioned show incredible autapomorphies in the genitalia (*gagarini* in the female, *macroma* in the male) or, in the case of *micronota*, are known only from a single sex. There has been so much misidentification of *Nicolaea volumen* (even confused with non-congener *Gigantorubra picentia*) that this latter species has required redefinition from its type specimens and is, therefore, a poor choice. Although I have chosen *N. cauter* as type species rather by default, it might be feared that this species is so divergent it might be split by someone else from other members of the clade. However, the structural characters seem unified enough to prevent this.

Characters and Affinities. There are elements in both the female genitalia (superior plate habitus) and VHW pattern (see *N. honduriana* in particular) suggesting a sister relationship with the previously described genus *Crimsinota*. The male genitalia obviate any temptation to consider these genera as the same entity. In addition, both clades occur throughout South America and one has a representative in Central America. Interestingly, both genera have one representative with female genitalia showing a vestigial condition in the ductus bursae. In such taxa (also reported in *Chlorostrymon* [Johnson 1989a, 1991c] and *Arases* [Johnson and Adams 1993]), the sclerotized elements of the female genitalia are limited to the terminal plate (lamellae) and immediately adjacent ductus (antrum, if present) with the remaining area of the ductus bursae, usually fully sclerotized in Eumaeni, occurring only in a membranous condition. In my view, such reduced conditions illustrate morphological autapomorphies in isolated taxa of otherwise very ancient clades. No similar structure reported to date has yet appeared to represent the primitive condition relative to outgroups and sister taxa.

It should also be mentioned that Draudt (1919) considered "*Thecla*" *volumen* to show a single HW tail and used this as a character. This is highly subjective when compared to many actual specimens, both of *vo-*

lumen and other congeners. It is notable that some species show a much shorter tail (or stub) at vein terminus CuA1 but this condition also occurs in some species of other eumaene genera.

Geographic Spread. The location of numerous sympatric species in rain forest habitats in SE Brazil suggests that additional insular taxa referable to *Nicolaea* will probably be found elsewhere in South America. The discovery of *N. honduriana* from old Honduran material further reinforces this possibility and suggests that as with numerous groups reported in the "elfin-like" hairstreak butterflies (Johnson 1992), some groups treated in the present revision are old enough to have disjunct entities spanning the trans-Panamanian region. As noted in *Ziegleria* (and elsewhere in the genus *Tigrinota* [Johnson in press b]) unique Central American congeners often exhibit an extreme hiatus in characters compared to their South American counterparts and this sometimes adds a complexity to enumerating truly generic characters.

ETYMOLOGY. A patronym honoring Colonel Stanley S. Nicolay (Virginia Beach, Virginia) who published pioneer work on the Neotropical Eumaeni.

Nicolaea volumen (H. H. Druce)

NEW COMBINATION

Photoplate IV, A; Fig. 8F (p. 38).

Thecla volumen Druce 1907: 623. Draudt 1919: 805.

Comstock and Huntington 1958-1964 [1964]: 185; Bridges 1988: I.369, II.109, III.30.

DIAGNOSIS. Wings. Needs to be carefully identified vis-a-vis the characters of its type— has been confused with both *Gigantorubra picentia* and *Crimsinota rubifer* because of attribution to *Thecla volumen* of a VHW thick reddish band. Actually, the band in *N. volumen* is more orange with the elements rectangulate and surrounded by thin edges of black and white. To anyone familiar with *Strymon valentina* Berg (see Johnson, Eisele and MacPherson 1990), *N. volumen* is to its congeners (and historically confused noncongeners) what *S. valentina* is to *Strymon*— the species with the rectangulate orange medial band elements thinly but brightly surrounded with white and black edges. Also, compared to taxa of first sentence above, *N. volumen* is small (FW alar 10.0 - 12.0 mm.)

Morphology. Female genitalia typical of genus with narrow and elongate ductus bursae tube fluting abruptly to a robust antrum and terminating with elliptic lamellae showing slight distoterminal teeth; male genitalia with robust and elongate saccus, saccus only slightly shorter than elongate valvae, which are narrowly tapered from

diminutive, rather rounded, bilobes.

DESCRIPTION. *Male.* DFW,DHW ground brown, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe colored reddish to red-black. VFW,VHW ground light beige, FW with thick postmedian band of orange elements edged thinly with distal black and white distally, basally with black from costa to cell CuA2; HW with similar band in medial area but with elements more as "blocks" within the cells, each slightly displaced from the other laterally, and showing more prominent edging as noted above and in the initial Diagnosis. Limbal area showing intercellular mottling of the ground with lighter, or even whitish, ground; Thecla-spot orange and of medium size, anal lobe blackish. FW length: 10.0 mm. to 12.0 mm. (Material Examined). *Female.* Pattern similar to male on both DFW, DHW and VFW, VHW; differing only in more expansive and rounded wing shape and in some more expansiveness to the ventral pattern elements. FW length: 10.0 - 12. mm. (Material Examined). *Male Genitalia.* Fig. 8F [left], p. 38). Genitalia with robust vinculum sloping to elongate sacculus, latter with length only slightly less than valvae; valvae with slight basally rounded bilobes comprising about one-fourth valvae length and terminating with elongately, tapered, caudal extensions. Aedeagus also elongate, exceeding rest of genitalia; caecum comprising about two-fifth aedeagal length and displaced about forty-five degrees out of the plane of the aedeagal shaft; latter is generally straight. *Female Genitalia.* Fig. 8 [right], p. 38). Typical of genus, showing narrow and elongate ductus bursae tube; however, with distinctive and abruptly fluted antrum in the posterior one-third and terminating with elliptic lamellae showing only slight distoterminal teeth; cervix bursae swollen but not elaborated along its juncture with corpus bursae; signa of corpus bursae occurring as slight, inwardly-directed, spikes.

TYPE. Holotype male, BMNH, labelled "Type", "Rio. S. Brazil", "Thecla volumen TYPE H. H. Druce" "B.M. Rhop. type #1007", "J. J. Joicey" "ex Coll. H. H. Druce 1919".

DISTRIBUTION. *Spatial:* Fig. 10. Identified herein from SE Brazil, principally from material in the MPM Collection. *Temporal:* material examined by me is from May and June.

REMARKS. Aside from a single AMNH specimen acquired by E. I. Huntington, the material examined in limited below to exemplary material borrowed by me during my first visit to the MPM. Such material is probably more extensive but care is needed

in making identifications because of the confusion of *N. volumen* with *Crimsinota rubifer* (also known from MPM material and differing by larger size and thick blood-red VHW medial band). Also, the relevant BMNH material was not organizable on my visit in 1992 because the generic compositions elaborated in the present revision were not in place at the time. Once the identification of *Nicolaea* taxa has been clarified by the present study, additional geographic records for *N. volumen* should be easily accountable. Fortunately, for nomenclatorial purposes, "true" *N. volumen* has been poorly enough known that a wide synonymic problem (as seen with *C. rubifer* and *G. picentia*) has not followed "*Thecla volumen*" through the historical literature.

MATERIAL EXAMINED. See Type above. BRAZIL. "Teatu", Rio de Janeiro, 17 June 1939, leg. Gagarin, 1♀ (MPM); Goyas, Campinas, 13 May 1939, leg. Gagarin, 1♂ (MPM); Massaranduba-Blumenau, Coll. E. I. Huntington 1♂ (AMNH).

Nicolaea gagarini,

NEW SPECIES

Photoplate IVB; Fig. 8A,B (p. 39).

DIAGNOSIS. *Wings.* At FW 12-13.0 mm., a much larger species than *N. volumen* and, since it is iridescent blue on DFW,DHW, more requiring separation from the following two new species, *N. macroma* and *N. micronota*. Of the three large blue *Nicolaea* of SE Brazil, *N. gagarini* stands out by its bright sky-blue DFW,DHW and orbiculate reddish VFW,VHW band (narrow on FW but expansive on HW). In comparison, *N. macroma* (deep azure on DFW,DHW) has a jagged lineal VHW band and *N. micronota* (known females brown) a VHW band of small and discrete red-black dots.

Such differences might seem less significant if the genitalia of the species were not so greatly disparate (see below). Considering this, it should be noted that *N. gagarini* males show double-sized band elements (appearing nearly paired) in the HW band at M2 and the discal cell and both sexes show profuse white suffusion in HW post-medial area. The latter contrasts lineal borders of the submarginal cells in *N. macroma* and submarginal spots in *N. micronota*.

Morphology. Female with vestigial condition of ductus bursae, sclerotized elements occurring only narrowly beneath the terminal ventrum and, afterwards, entirely membranous to the corpus bursae. This contrasts the greatly elongate, and sometime undulate or curvate, ductus bursae shapes in congeners. Male genitalia with unsculptured elements much more like *N. cauter* and *N.*

volumen (*N. macroma* being greatly sculptured along both vinculum and valvae [see entry below]).

DESCRIPTION. *Male.* DFW,DHW ground bright iridescent sky blue basad of black FW apices and margins on both wing; FW with small, ovate and tan-colored, androconial brand; HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe not greatly produced. VFW,VHW ground grayish-tan, FW with narrow band of rectangulate reddish elements (bordered very thinly on distal edges with black and white) from costa to cell CuA2; HW with similar band of much wider orange elements (with more prominent white and black edging than FW) with those at cell M2 and the discal cell about double the width of others and suffused in a manner as to appear as paired elements (the paratype male shows them nearly discrete). Limbal area showing postmedial white suffusions prominent in the cell interspaces and a yellow-orange *Thecla*-spot. FW length: 12.5 mm. (holotype), 12.0 mm. (paratype). *Female.* Brown on the DFW,DHW and differing from male on VFW, VHW by showing clearly orbiculate elements without the double size near the discal cell and also forming more of a "W"-shape in the anal area. This appearance probably results from the wider wing expanse typical of eumaeine females. FW length: 13.0 mm. (allotype). *Male Genitalia.* Fig. 8A (p. 39). Both valvae and saccus elongate and appearing "spike"-like, each of about equal length and together dominating the overall habitus of the genitalia. Vinculum angulate prior to saccus but nowhere as drastic as in *N. macroma*. Aedeagus elongate, exceeding length of rest of genitalia by about caecum length, caecum very slightly bowed, shaft straight, cornutus pencilate at terminus. *Female Genitalia.* Fig. 8B (p. 39). Genitalia with ductus bursae in "vestigial" condition—robust terminal area sclerotized typically for genus but, anterior of antrum, exhibiting only a membranous condition extending completely to the corpus bursae. Terminal sclerotized area comprising antrum and lamellae normal for genus, lamellae elliptic and separated by a central fissure; area beneath antrum joining membranous ductus bursae at an invaginated notch; corpus bursae lacking signa.

TYPES. Holotype male, allotype female, BRAZIL, Umuarama, 1800 m., "Est. de S. Paulo", 8-15 February 1937, leg. Gagarin, deposited MPM; one paratype male, same data, deposited AMNH.

DISTRIBUTION. *Spatial:* Fig. 10. Currently known from the SE Brazil type locality. *Temporal:* known only from February type material.

REMARKS. There is, hopefully, additional material of this species (and the two following) in the MPM collection or the museum in Curitiba, Brazil. I was extremely surprised to find the differences apparent in the genitalia of these species and find them corroborated by wing pattern differences on both the dorsal and ventral surfaces. Regarding the three new species described here from SE Brazil, it should be mentioned that the regional series containing them also showed other startling undescribed Eumaeini. An extremely relevant example is a *Strymon* species treated elsewhere by Johnson and Kroenlein (in press c). The specimens associated with this species as its putative female were so much like male of this unknown *Strymon* that I did not even question them (dissecting them only as a matter of course for illustration purposes). They proved to be males of an undescribed *Ministrymon* species! I believe that in SE Brazil there must be some selective premium on red and orange wing-bands—witness not only *Crimsinota* and *Nicolaea* but species of the *Thecla tarania/atrana* complex throughout SE Brazil. In *Nicolaea*, the three new red-striped species join *N. cauter* and *N. volumen* as well as the red-striped *Strymon* and *Ministrymon* species and the *atrania/tarania* complex.

ETYMOLOGY. Patronym for N. Gagarin whose magnificent early collections of Theclinae (and other butterflies) in SE Brazil provide an incomparable resource for studying the original Lepidoptera faunas of that region.

Nicolaea macroma,

NEW SPECIES

Photoplate IVC; Fig. 8C,D (p. 39).

DIAGNOSIS. *Wings.* Compared to *N. gagarini*, larger (FW alar 13.5 mm) with DFW,DHW iridescence dark azure blue; VFW,VHW bands lineal and, on HW, jagged, elements comprising bands being limited to light intercellular reddish bordered distally by lineal black and white. Female brown on DFW,DHW, otherwise differing little from male. *N. micronota* cannot be confused with either *N. gagarini* or *N. macroma* because of *N. micronota*'s reddish black spot-band on VHW.

Morphology. Not confusable with any congener. Male with remarkably sculptured vinculum and valvae (latter with spikes and cleats lining their lateral surfaces) and a very robust saccus. Ductus bursae made nearly bipartite by a transparent juncture prior to antrum; antrum gigantic, terminating with large lamellae showing stout distotermial teeth.

DESCRIPTION. *Male.* DFW,DHW ground deep azure blue basad of black apices and submargins.

FW with small, round and tan-colored androconial brand; HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe slightly more prominent than in congeners (except *N. cauter*) and boldly black. VFW, VHW light beige-gray; FW with thin postmedian band of reddish color outlined with white from costa to cell CuA1; HW with jagged lineal medial band comprised of mostly contiguous intercellular red, bordered distally with black and then white, anal area with band forming a "W"-shape. Submargin with gray-black line running jagged along each cell interspace framing a yellow-orange Thecla-spot in the limbal area. FW length: 13.5 mm. (holotype). *Female*. Marked similar to male except DFW, DHW brown. FW length: 13.0 mm. (allotype). *Male Genitalia*. Fig. 8C (p. 39). Vinculum and valvae extremely sculptured, former with a sharp invagination prior to juncture with robust and elongate saccus; valvae robust, with rounded bilobes covered laterally with prominent sculptured prongs and cleats which continue laterally up the basal one-half of elongate caudal extensions. Aedeagus elongate, exceeding the length of rest of genitalia by slightly more than caecum length, caecum slightly bowed, shaft nearly straight, terminating with pencilate cornutus. *Female Genitalia*. Fig. 8,D (p. 39). Genitalia with sclerotized elements appearing bipartite due to separation of a greatly fluted terminal antrum from the rest of the ductus bursae by a thin transparent area. Antrum comprising posterior one-half of genital length and terminating in widely gaping lamellae showing paired distoterminal teeth. Remainder of genitalia comprised by the anterior of the short ductus bursae and an unelaborated cervix bursae; corpus bursae with signa occurring only as paired spots of sclerotin along the bursal sac.

TYPES. Holotype female, allotype male, BRAZIL, Massaranduba-Blumenau, leg. K. Schmith, E. I. Huntington Coll., marked "?" by Comstock and Huntington as to identification; male further marked "highlands near Massaranduba"; both deposited AMNH.

DISTRIBUTION. *Spatial:* Fig. 10. Currently known from the SE Brazil type locality. *Temporal:* specimens are undated.

REMARKS. The two primary types appear to be another example of Huntington limiting his collection acquisitions to male/female pairs. Since the specimens are pristine, it is likely the original collector had more. Like *N. macroma* of previous entry, the genitalia of this species are startling. Remarks under the generic description and *N. macroma* pertain.

ETYMOLOGY. The Latin name refers to the robust and highly sculptured genitalia.

Nicolaea micronota,

NEW SPECIES

Photoplate IVD; Fig. 8G (p. 39).

DIAGNOSIS. *Wings.* VHW band formed of discrete red-black spots, further appearing indented in the band at cells M1, discal and CuA2. Submargin of HW with further pattern of lighter brown intercellular blotches paralleling the elements in the medial band. Known females DFW, DHW brown.

Morphology. Female with genitalia reminiscent of *N. volumen* but with more prominent distoterminal teeth and an elongate ductus bursae with a radical dorsal recurvature in the anterior one-sixth.

DESCRIPTION. *Male.* Unknown. *Female.* DFW, DHW ground brown hued slightly violet-gray toward wing bases; HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe not much produced. VFW, VHW crisp gray-white; FW with post-medial band of blackish orbicular elements from costa to cell CuA2, paralleled in submargin by brownish spots in each cell interspace; HW with medial band formed of discrete red-black spots (blackish with slight reddish flecks where fresh), band with element indented (e.g. displaced basally) from the band at cells M1, discal and CuA2. Submargin with additional pattern of lighter brown intercellular blotches paralleling the elements in the medial band around entire margin; Thecla-spot yellow-orange. FW length: 12.5 mm. (holotype); 12.0 mm. (paratype). *Female Genitalia*. Fig. 8G (p. 39). Genitalia with an abruptly flared terminal antrum similar to *N. volumen*, but with more pronounced terminal lamellae and distoterminal teeth; also with ductus bursae far more elongate and, in the anterior one-sixth, radical dorsal recurvature prior to the corpus bursae; latter with paired signa, each showing a thin elongate base and short, inwardly-directed, prongs (see Remarks).

TYPES. Holotype female, BRAZIL, Santa Catharina [sic], March 1922, leg. E. D. Jones, deposited BMNH. *Paratype.* Same data as primary types, one female (BMNH).

DISTRIBUTION. *Spatial:* Fig. 10. Currently known from the SE Brazil type locality. *Temporal:* currently known only from March 1922.

REMARKS. This is a surprising species, not only given the region of occurrence but the wing and genitalic characters. The spotted HW band differs most notably from congeners and is more like that occurring in

sympatric red-spotted *Strymon* and *Ministrymon* species I have mentioned under *N. gagarini*. The genitalia demonstrate the overall unity of characters in *Nicolaea*— the female terminus is more like *N. volumen* but the elongate anterior more like the meandering and undulate habitus of *N. cauter*. As with the other SE Brazil *Nicolaea* species described herein, it is probable additional specimens will be located in local collections as well as the uncurated materials still at the MPM.

ETYMOLOGY. The Latin names means "small marks" and refers to the dotted HW spot-band in this species.

Nicolaea pertainea,

NEW SPECIES

Photoplate IVE, 8H (p. 39).

DIAGNOSIS. *Wings.* A small Argentine species (FW 10-10.5 mm.) most reminiscent of *N. volumen* but, consistent with its historical confusion with *C. rubifer*, showing a more contiguous and wide band of deep brick-red elements. As noted in Remarks, Hayward (1973) called this species "*Thecla rugatus*" to which species he attributed dark HW bands. Hayward recognized the diagnostic uniqueness of *N. pertainea*, but having done no dissections, misidentified it with one of the "available" *Thecla* names. Thus, belonging in *Nicolaea*, *N. pertainea* is most confusable with *N. volumen* but stands out by the ruddy band and the structural distinctions noted just below.

Morphology. Dissection of this species shows it "pertains" to the *Nicolaea* generic assemblage. It might be considered a candidate for conspecificity with *N. volumen* if not for the less produced female genital terminus and the detached "flap"-like innovation at the cervix bursae. The latter is also seen in congener *N. honduriana* from Central America.

DESCRIPTION. *Male.* Unknown. *Female.* DFW, DHW ground fuscous brown, HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe not emphasized. VFW, VHW ground beige; FW with wide brick red band (bordered distally with black and white) from costa to cell CuA2; HW with wide and rather contiguous brick-red band, with deemphasized SC+R1 element, heavy M cell elements, and wide red color extending basally along the "W"-shaped element of the anal area. Limbal area marked only with slightly lighter suffusive ground and a black *Thecla*-spot at CuA1. FW length: 10.5 mm. (holotype). **Female Genitalia.** Fig. 8H (p. 39). Genitalia

with short ductus bursae compared to congeners— comprising only about three-fifths of total genital length; remainder of genital terminus fluted gradually to a broad antrum opening widely along the ventrum but showing little sclerotinal innovation at the lamellae postvaginalis or superior plate. At ductus bursae anterior, cervix bursae showing a detached "flap"-like sclerotized element similar to one seen in *N. honduriana*, and (among other Eumaeini) most familiar in clades like *Ministrymon* (see Remarks).

TYPES. ARGENTINA, Jujuy Prov., Cucho, (see site description in Johnson, Eisele & MacPherson 1988), 25 km. N. San Salvador de Jujuy, 1000 m., 29 December 1986, leg. B. MacPherson, deposited AMNH. **Paratypes.** ARGENTINA, Tucuman Prov., Villa Nougues, November 1949, leg. Hayward, 1 ♀ (IML); Quebrada de Lules, January 1929, 1 ♀ (IML).

DISTRIBUTION. *Spatial:* Fig. 10. Currently known from the northern Argentina type locality. *Temporal:* dated specimens range from November to January.

REMARKS. This species and noncongener *Crimsinota argentina* illustrate the consistency of ventral wing and morphological characters within clades of Eumaeini once they are fully elaborated. The VHW of *C. argentina* shows the obvious "deletion" at the end of the distal discal cell marking all members of the *rubifer* Group of *Crimsinota*. Dissection corroborates the generic placement. *N. pertainea* might be thought subspecific of *N. volumen* (if it were not for the thicker and more suffusive red-brick VHW band in which the SC+R1 element is diminutive compared to that in *N. volumen*). Dissection shows the genitalia to have a divergent terminus and cervix bursae. Thus, two Argentine entities that might simply be placed with "*Thecla volumen*", "*Thecla rubifer*", or even "*Thecla rugatus*" are shown to belong with neither. In a forthcoming study of SE Brazil *Theclinae*, I will be able to elaborate more on the relationships of respective Argentine and Brazilian populations in various eumaeine complexes.

Hayward took the dark VHW band and blackish *Thecla*-spot of *N. pertainea* to be "*Thecla rugatus*" (a species whose type material he had seen in London but not dissected). Hayward had also seen the types of *T. volumen* and *T. rubifer* but, rightly, did not identify either species from Argentina. In a separate publication, Johnson and Kroenlein (in press b) place *rugatus* in a new genus typified by genitalia and tergite structure totally different from *Crimsinota* and *Nicolaea*. True "*rugatus*" features include, in males, a *short* saccus and valvae with labides forming laterally a near right angle along the falces and, in females, short ductus bursae lacking antrum and terminating with widely bifurcate lamellae. In the present

revisionary study my responsibility was simply to dissect the specimens referred to by Hayward as "*rugatus*" and place them in the appropriate genus.

A final comment is probably worthwhile concerning the detached element along the ventrum of the cervix bursae in this species and *N. honduriana*. Similar structures occur commonly in species of *Ministrymon* and also in various other Eumaeini. It is possible that, as with "hoods" on the distal end of the corpus bursae, such structures have arisen separately in many groups of Eumaeini. It is also possible, however, that the plate along the base of the cervix bursae is a primitive feature. With this in mind it is notable that in *Nicolaea*, the two species showing it are farflung—Central America and, in the case of *N. pertained*, relatively austral.

ETYMOLOGY. As noted heretofore, from Latin (*pertinere*) meaning "belonging here" and referring to the generic placement of this taxon.

Nicolaea cauter (H. H. Druce)

NEW COMBINATION

Photoplate IVF; Fig. 8E,F (p. 39).

Thecla cauter H. H. Druce 1907: 589, pl. 34, f. 15.

Draudt 1919: 776. Comstock and Huntington 1958-1964 [1960]: 185; Bridges 1988: I.74, II.105, III.29.

DIAGNOSIS. *Wings.* VHW band unmistakable—comprised of wide (to 2mm.) brilliant red or red-orange orbs wedged between wide (to 1 mm.) white and black distal and basal edgings. Male DFW brown with basal bright blue, DHW sheened with shiny iridescent blue; female DFW, DHW brown. The DHW pattern appears to be a highly autapomorphic innovation from the red-banded ground plan of the genus (see Remarks).

Morphology. Typical of genus—male with elongate (nearly pencilate) saccus and equally elongate and tapered valvae; female with elongate ductus bursae terminating in a fluted antrum and with paired hemispherical lamellae (however lacking distoterminal teeth). Anterior of ductus bursae in female greatly elongate and undulate before the corpus bursae.

DESCRIPTION. *Male.* DFW, DHW ground brownish black at apices and submargins, contrasting shiny iridescent blue basal on FW and across most of HW. FW with small ovate, tan-colored, androconial brand; HW with short tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe heavily fringed black. VFW, VHW ground brown; FW with

postmedial band comprised of red or red-orange coalescent elements, first in a group from costa through the M cells and then more basal in cells CuA1 and CuA2. HW with remarkable expression of medial band—extremely wide (to 2mm.) with red or red-orange elements bordered thickly (to 1 mm.) with white and black borders. Typical of genus, element at discal cell displaced (specifically very distad of the rest of the band in cell M2); limbal area either brown or suffused with red depending on specimens; Thecla-spot blackish. FW length: 12.5 mm. (Material Examined). *Female.* Marked similar to male except DFW, DHW brown. FW length: 11.5-12.5 mm. (Material Examined). **Male Genitalia.** Fig. 8E (p. 39). Showing a very narrow and elongate habitus; ventrum of vinculum sloped to an elongate, pencilate, saccus (length exceeding that of entire vincular arc). Valvae also elongate, only slightly shorter than saccus and comprised of narrow caudal extensions proceeding from shouldered bilobes. Aedeagus [placed at right of F in Fig.] very elongate—exceeding length of rest of genitalia by only slightly less than caecum length. Caecum slightly bowed; shaft nearly straight, terminating with a pencilate cornutus.

Female Genitalia. Fig. 8F. Female with extremely elongate elements—ductus bursae elongate and undulate in its anterior one-half, terminating to fluted antrum in its posterior one-fourth; antrum extending the length of half the ductus before terminating in paired hemispherical lamellae which show no distolateral teeth. Cervix bursae diminutive, gradually joining corpus bursae after a narrow meandering of the ductus anterior; corpus bursae with signa barely apparent as sclerotized gots on bursae sac.

TYPE(S). Type male, BMNH "Type", "Chapada Campo, Brazil", "*Thecla cauter* TYPE H. H. Druce", "Godman-Salvin Coll. 1912-23. B.C.A. Lepid. Rhop. *Thecla cauter*" (see Remarks).

DISTRIBUTION. *Spatial:* Fig. 10. Known here from MPM and AMNH SE Brazil material. *Temporal:* data on dated specimens is from March.

REMARKS. I did not initially suspect this bright species as relevant to the clades revised here. Therefore, in hindsight, Material Examined does not fully represent the species. For the same reasons, although I saw the type material at the BMNH, I did not make the effort to examine all three locations where syntypes at the BMNH could occur (general collection, type collection, World War II reference collection). I have relied on the MPM specimens for representing the structural facies of the taxon, which is unambiguous. It is relatively easy to understand the composition of the VHW band in *N. cauter* when one knows the congeners. Not only is the large and bright band in *N. cauter* typical of the overall ground plan

of the genus, its displacement at the area of the M and discal cells is typical as well. Druce mentioned that *N. cauter* was like his species *T. obelus* [and it like *T. begradia*]. Unfortunately, for reasons mentioned directly above concerning *N. cauter*, I have not studied these species. Dissection would be necessary to confirm either species in *Crimsinota* or *Nicolaea*.

MATERIAL EXAMINED. BRAZIL. Vianópolis, Goyas, 30 March 1935, leg. Spitz., 1♂ (MPM); Goyas Campinas, March 1933, leg. R. Spitz, 1♀ (MPM); São Paulo, Brazil, E. I. Huntington Coll., 2♀♀ (AMNH).

Nicolaea honduriana,
NEW SPECIES

Photoplate IVG; Fig. 6J.

DIAGNOSIS. *Wings.* HW with meandering lineal medial band, thinly colored red-orange basally, bordered black and white distally, and showing the lateral displacement at cell M2 typical of *N. gagarini*, *N. micronota* and *Crimsinota socia*. Known specimen, a female, brown on DFW, DHW with single elongate tail at CuA2.

Morphology. Female with genitalia reminiscent of terminal shape in *N. gagarini* but, instead of joining elongate membranous ductus, terminating at the anterior abruptly with an oblongate flap as seen in *N. pertainea* (see Remarks).

DESCRIPTION. *Male.* Unknown. *Female.* DFW, DHW ground brown; HW with single tail at vein at CuA2 terminus; HW anal lobe slightly produced and black. VFW, VHW beige; FW with red-brown post-medial band extending across entire wing (although angled basally after cell CuA2); HW with meandering lineal medial band, thinly red-orange basally, bordered by black and white distally and showing a distinct lateral displacement at cell M2; broad concave shape toward anal area of HW obviates all but the second "V" in the normal anal "W"-shape for the group. Limbal area concolorous except for red-orange Theclaspot, white line around margin, black marking beneath anal lobe, and chevron of orange-brown directed to the base of the medial band. FW length: 12.5 mm. (holotype). **Female Genitalia.** Fig. 6J. Genitalia with robust and flared terminal antrum reminiscent of terminal portion in *N. gagarini*, but fully sclerotized to an abrupt juncture with the cervix bursae and corpus bursae; cervix bursae showing a detached and fully sclerotized oblongate flap similar to that in *N. pertainea*.

TYPE. Holotype female, HONDURAS, "Honduras" [in longhand, no other data], from E. I. Huntington Coll., deposited AMNH.

DISTRIBUTION. *Spatial:* Fig. 10. Currently known from the generalized "Honduras" data. *Temporal:* type is undated.

REMARKS. The holotype is, unfortunately, a poorly labelled specimen. It was first dissected by me in a blind test concerning the entire *Calycopsis/ Calystryma* grade. It then languished in a box of "unknowns", and as an outline drawing in my notebooks, until its affinity became apparent as study of *Nicolaea* and *Crimsinota* progressed.

ETYMOLOGY. An arbitrary euphonious combination referring to the general region of the type locality.

SUMMARY and COMMENT

The present paper has elaborated four speciose clades of Neotropical hairstreak butterflies, each poorly known hitherto and requiring the description of many new species. Taxa treated in this study should be considered in concert with those of two papers immediately following (Johnson and Kroenlein 1993a, 1993b). Together, the works enumerate a large segment of the Eumaeini. Combined with taxa included in a recent monograph of the "Calycopsis/ Calystryma grade of Eumaeini" (Johnson 1991a) a very substantial cross-section of the lowland Neotropical hairstreak fauna is now elaborated and can be considered side by side with the pan-Andean "elfin"-like faunas also treated in recent works (Johnson 1992). As much as possible, these studies have based taxonomy on morphological examination of extant type specimens and elaborated distributions from major museum collections according to current gazetteers (herein Rand McNally 1992 and U.S.B.G.N. 1961-1968). Male and female genitalia have been illustrated mostly from the type specimens.

It is apparent from the number of taxa treated in all the above studies that a review is necessary of recent generic names and subsections [infratribes] of the Eumaeini. Johnson (1990: Callophryina, Thecloxurina) and Robbins (1991: Thereus Section) initiated this process. However, so many genera have been described subsequently it is useful to group all these into one list. As a result, Johnson and Kroenlein (1993b), in linear order the last revisionary work of the present *Reports* volume, includes such a list as Appendix II. Some of the groupings are phylogenetically cohesive. Others, because of the heterogeneity of Eumaeini studied by various workers to date,

are based more on convenience. However, the list serves as an updated summary of genera of the Eumaeini elaborated to date.

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**Revision of *Angulopis*
(Lepidoptera, Lycaenidae, Theclinae)**

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ABSTRACT

A revised taxonomy is presented for the large Eumaeini assemblage *Angulopsis* Johnson (1991) and the genus distinguished from several other sister genera concurrently described.

Members of *Angulopsis* form a monophyletic group including three Species Groups comprised as follows: *autoclea* [type species] Group: *autoclea* (Hewitson) [= *sangala* Hewitson, synonym], *politus* (Druce); *suada* (Hewitson) new combination; new species *tucumanensis*, *desjardinas*, *obscurus* and *hernandezi*.

ceromia Group: *ceromia* (Hewitson), *badaca* (Hewitson), *opacitas* (Druce), new combinations; new species *microterminatis*, *saphronotis* and *strymonotis*.

angusta Group: *angusta* (Lathy) new combination; new species *viaangulis*, *rubrolimbacosta*, *ruborbiculis* and *calycopinotis*. All new combinations include species transferred from eumaeine grade *Thecla*.

Lectotypes are designated for *Thecla badaca*, *ceromia* and *suada*. *Angulopsis badaca* and *A. ceromia* show type identities differing from historical common usage; entities formerly misidentified as these species are clarified. *Thecla hesperitis* Druce, previously associated with the genus in the original description, is removed to another monophyletic assemblage comprised by it and several new species.

As revised, *Angulopsis* is pan-Neotropical (excluding the Antilles) with species distributed from Mexico to northern Argentina.

INTRODUCTION

In 1991 the senior author published a taxonomy including various genera of the "Calycopis/ Calystryma" grade of the Eumaeini (Theclinae, Eumaeini *sensu* Eliot 1973) (Johnson 1991a). In appended sections, *Electrostrymon* Clench (1961) was separated from the new genus *Angulopsis* to distinguish two major structural groupings in the larger, mostly undescribed, "Electrostrymon grade" of the Eumaeini. It was stated that numerous monophyletic groups remained to be delineated in this latter group.

In 1992 a study was completed of morphological features of types and other specimens comprising the large "Electrostrymon grade". Particularly important were facies of type specimens at the Natural History Museum (London) (BMNH¹) some of which suggested disagreement with long-entrenched historical "common usage" for the grade *Thecla* (e.g. Draudt 1919, Bridges 1988). Often, historical names had been used to denote very generalized wing patterns when, in actuality, long syntype series corresponding to many of

these names contained specimens of divergent morphological structure and, upon detailed study, wing pattern similarities of only the most superficial nature. Regarding some names, the predicament included syntype series comprised of (1) more than a single entity historically attributed to a name (but at least entities structurally congeneric), (2) individuals belonging to nonmonophyletic groups (different genera) or (3) no individuals corresponding to the historical usage of a name. This created an unfortunate situation but one requiring resolution nonetheless. Compounding the problem, lack of a usable nomenclature in the past had also left large backlogs of unidentified material at many depositories. These included many species, or even entire groups, which had never been described. Among the latter were some spectacular undescribed species whose divergence further attested to the little attention formerly paid these groups. The present paper, worked out by collaboration between the authors since a 1991 collecting expedition to Argentina, includes only the species belonging in *Angulopsis sensu stricto*. Many other taxa from samples studied are treated elsewhere, in studies describing several other new genera (see citations of Johnson and Kroenlein, and Johnson in the Literature Cited).

MATERIALS AND METHODS

Collections. Although primary study involved materials at the the Natural History Museum (London) (BMNH), specimens were eventually integrated from the Allyn Museum of Entomology, Florida Museum of Natural History (AME); American Museum of Natural History (AMNH); Carnegie Museum of Natural History (CMNH); Instituto Zoología, Fundación Miguel Lillo (IML); Milwaukee Public Museum (MPM); and Muséum National d'Histoire Naturelle (Paris) (MNNH). Specimens from private collections of Henri Descimon (Marseille, France) and Robert C. Eisele and Bruce MacPherson (Jujuy, Argentina) were also found relevant with some representative specimens deposited at AMNH.

Terminology. Terminology primarily follows Johnson (1991a) (which inculcated some previous comment on *Angulopsis* or its species by Johnson 1989 and Johnson, Eisele and MacPherson 1988), using for brevity DFW, DHW (upper [dorsal] surface FW, hindwing) and VFW, VHW (under [ventral] surface forewing, hindwing). Otherwise terms for venation follow Clench (1964, 1975) (including "Thecla-spot" for the VHW marginal spot in cell CuA1 occurring in most eumaeines) except to add the

1

We use this abbreviation consistent with the United Kingdom ("UK") statutory name "British Museum (Natural History)" which, for legal purposes in the UK, has remained unchanged.

CuA (cubitus anterior) vein notation for phylogenetic consistency. Regarding morphology, an explanation of terminology and format for tergite and genitalic illustrations is given in the initial entry captions pertaining to the genus. An initial figure (Fig. 1) schematically distinguishes general wing pattern features of *Angulopsis* from sister genera. Some general abbreviated terms used through included OD (original description), TL (type locality), N etc. (north, etc.), C (central), GP(s) (genitalic preparation [s]), LD (locality description), ID (identified by).

Format. Historically "well-known" taxa are treated with an abbreviated Diagnostic format; new species, poorly-known, or historically misidentified species are treated with full descriptive format.

GENUS ANGULOPIS Johnson

Angulopsis Johnson 1991a: 41. Johnson and Llorente Bousquets 1992: 10,11; Schwartz and Johnson 1993: 153.

DIAGNOSIS (abbreviated with selective emphasis from Johnson 1991a: 41). DFW,DHW brown (a very few species with DHW light blue) and lacking DFW scent brands. VFW, VHW each with medial/post-medial orange or red band, on FW without basal suffusion (contrasting *Gigantorubra* Johnson 1993 and some *Rubroserrata* Johnson 1993), on HW with band a jagged "W" in cells CuA1 - 2A (but not greatly broken from rest of band in cell M3 as in *Calycopis*, *Calystryma* etc., see Johnson 1991a), basal orange or reddish elements similarly jagged (Fig. 1). Limbal and distocostal areas occasionally with additional suffusive or orbicular marks, depending on the species.

Morphology marked in males by angulate valvae, particularly contrasting greatly shouldered bilobes (often with additional lateral angles, processes, etc.) and thin elongate and often angled caudal extensions (Figs. 2 forward); in females ductus bursae showing elongate tubular habitus terminating in paired struts which support a curvate superior plate of hemispherical, ovate, elliptic or undulate shape, depending on the species (Figs. 2 forward).

DESCRIPTION. See Johnson 1991a: 41-42.

TYPE SPECIES. *Thecla autoclea* Hewitson 1863-1878 [1877] by original designation.

DISTRIBUTION. Pan-Neotropical (excluding the Antilles), including three taxa cited in the original description and numerous other treated herein. Known species extending from Mexico to northern Argentina.

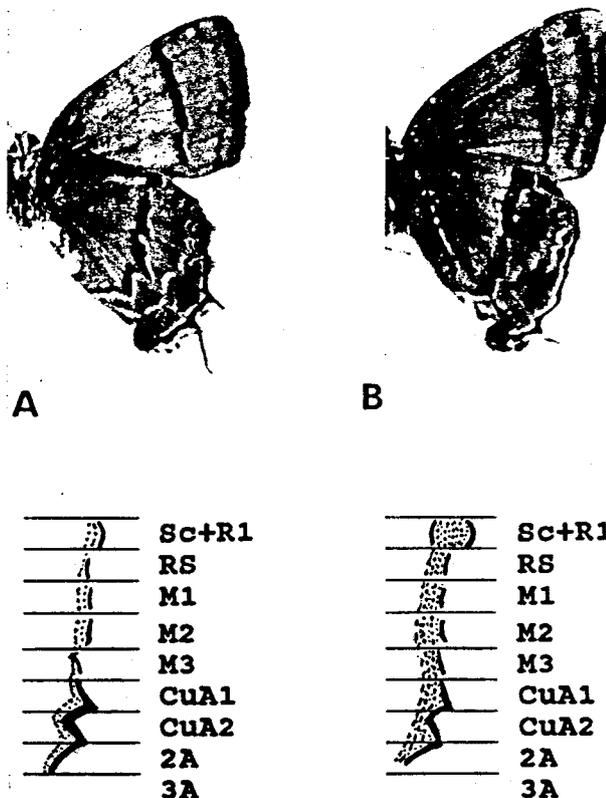


Figure 1. Major wing pattern differences between *Angulopsis* Johnson (1991) and *Gigantorubra* Johnson (1993). For differences between *Angulopsis* (continuous "W" on wing) and members of the *Calycopis*/*Calystryma* grade ("W" breaks plane of band in cell M3) see Johnson 1991a, fig. 1.

A. *Angulopsis*: "W" is emphatic, with basal orange or reddish shading generally following the jagged shape of the band; SC+R1 element is not greatly produced or displaced distally from rest of band. Males differ little from females except for overall rounder HW shape in latter.

B. *Gigantorubra*: "W" is not emphatic and intense basal orange, brown or reddish shading is wide, generally forming an "entire" basal margin to the HW band. Females, in addition to showing rounder HW, show more width and contiguity to HW band.

Other genera referred to herein or described in Johnson (in press) or Johnson and Kroenlein (in press) are far more straightforward and have been confused with these taxa simply because all have red or orangish bands.

Structurally, among other characters, male genitalia of *Angulopsis* show falces of even contour; males of *Gigantorubra* show serrate falces.

Figure 5 illustrates distributions of lesser known or new congeners. For common widespread species, generalized distributions are given in the taxon entry.

SPECIES OF *ANGULOPIS*

Format. Organized by Species Groups of the Abstract, entries keyed to photopages interspersed in volume, morphological features illustrated within number as Morphological Figures 1-4 (M1,2 etc.).

autoclea Species Group

Generally small (13.0-14.5 mm.) tails short and VHW pattern simple—continuous orange (to reddish or black) medial band, bent in generally equilateral "W"-shape between veins M3 and 2A; lacking additional markings along HW bands or adjacent costal or limbal areas. Dorsum warm brown to darker brown (a few taxa with HW basally to medially bright blue).

Angulopis autoclea (Hewitson)

Photoplate V,1; Fig. M1A.

Thecla autoclea Hewitson 1863-1878 [1877]: (1) 194. (2) pl. 77, f. 616,617. Godman and Salvin 1879-1901 [1887]: (2), 76, (3), 57, f. 9,10; Draudt 1919: 806; Druce 1907: 610; Comstock and Huntington 1958-1964 [1959]: 86 (list *callides* Dyar as synonym); Bridges 1988: I.42, II.108, III.68; Johnson 1988: 29, 1989: 197; Vargas Fernandez, Llorente Bousquets and Martinez 1991: 27; Johnson, Eisele and MacPherson 1988: 5.

Thecla sangala Hewitson 1868, p. 35. Kirby 1871: 394; Comstock and Huntington 1958-1964 [1963]: 45; Johnson 1991a, p. 42; Draudt 1919: 806, pl. 159g; Bridges 1988: I.310.

Thecla callides Dyar 1914 [1915]: 151. Schaus 1920: 176 (as synonym of *autoclea*); Comstock and Huntington 1958-1964 [1959]: 173; Bridges 1988: I.67 (as synonym of *sangala*).

Angulopis autoclea: Johnson 1991a: 42. Johnson and Llorente Bousquets 1992: 27; Johnson and Schwartz 1993: 153

DIAGNOSIS. *Wings.* This is the common "brown above, brown beneath" *Angulopis*; it shows homogeneous wing and structural features from Mexico south to northern Argentina. DFW,DHW uniformly brown, VHW tan to beige; ventrum with

moderately wide (.5 mm.) orange or reddish bands (actually tripartite, formed of orange or red basal color bordering thin distal lineal elements of black and white). Band on HW slightly jagged and, in anal area, forming a notable (but not greatly exaggerated) "W"-shape between veins M3 to 2A; Sc+R1 element not much outstanding from the rest of the band (see below and Remarks). **Variation:** The name *sangala* was applied to a northern form showing a whiter VFW, VHW ground color and consequently more contrast with reddish band; the name *callides* (from Panama) differed from *autoclea* even less, being only slightly darker in ground.

Morphology distinctive in male with angulate bilobed area of valvae and diminutive saccus; female terminal superior plate diminutive and angulate compared to congeners.

DESCRIPTION. See Johnson, Eisele and MacPherson 1988, p. 5; 1989 [figs.] and Johnson 1991a, p. figs 79,80CD. *Male* and *Female* marked similarly, latter differing by more rounded wing shape. FW length: 13.0-15.0 mm. (n=15 males, 15 females, AMNH). *Male and Female Genitalia and Tergal Morphology.* Fig. M1A.

TYPES. Lectotype male of *autoclea*, BMNH, designated and described by Johnson 1991a: 42, TL "Nicaragua"; lectotype male of *sangala*, BMNH, designated and described by Johnson 1991a: 42, TL "Venezuela"; type of *callides*, USNM #15760 [I have been unable to examine], TL La Chorrera or Trinidad River, Panama.

DISTRIBUTION. Mexico southward to northern Argentina.

REMARKS. Best identified by rather unremarkable pattern and lack of any outstanding or "odd" marks relative to congeners. Additional brown *Angulopis* of the *autoclea* Group have outstanding wing traits and divergent genitalia. With two such species described herein from Argentina, it is likely other insular endemics occur elsewhere. *Angusta* Group members show very jagged bands and often blue on the DHW, *ceromia* Group members additional markings (particularly limbal or costal on VHW). The species could be confused with *Thecla syllis* Godman and Salvin, a species showing a very different structural habitus (see genus *Kisutam* Johnson and Kroenlein in press). Since *A. autoclea* is extremely common we omit, for brevity, lists of Material Examined.

Angulopis politus (Druce)

Photoplate V,2; Figs. M1D,3B.

Thecla politus Druce 1907: 625, pl. 36, f. 22,23.

Hoffman 1940: 719; Comstock and Huntington 1958-1964 [1962]: 117; Zikán and Zikán 1968:

56 [marked?]; Ross 1976: 199; Vargas Fernandez, Llorente Bousquets and Martinez 1991: 27.

Angulopsis politas: Johnson 1991a: 42; Johnson and Llorente Bousquets 1992: 10.

DIAGNOSIS. *Wings.* This is the common congener with light blue on the DHW (DFW, DHW brownish black, HW usually blue over distal two-thirds of wing). VHW similar to *T. autoclea* but with slightly more emphatic "W"-shape in cells M3 to 2A.

Morphology showing male with parabolic valvular bilobes and short caudal extensions, female with rather robust "mallet"-shaped superior plate.

DESCRIPTION. *Male.* DFW, DHW ground brown-black, HW with short tail, vein CuA1 terminus, longer tail, CuA2 terminus; HW anal lobe notable. VFW ground dark beige to browner; band deep red-orange to reddish; HW with enunciated "W"-shape in band near anal angle, limbal area with dark reddish black Thecla-spot. FW length: 12.5-14.0 mm. (n=10, AMNH). *Female.* Differing from male by rounder wings and lighter DHW blue. *Male and Female Genitalia and Tergal Morphology.* Figs. M1D, 3B.

TYPES. Lectotype male, BMNH, designated and described by Johnson 1991a: 42, TL "Santarem, Amazonas".

DISTRIBUTION. Southern Mexico south through Central American; in South America south at least to Misiones, Argentina (IML though curiously omitted by Hayward 1973).

REMARKS. This species is very straightforward due to the wide patch of "powder" blue on the HW dorsum. It could, however, be confused with HW blue-above noncongeners *Thecla cleon* Fabricius, *Thecla mathewi* Hewitson (Johnson and Kroenlein in press) or *Antrissima varicolor* Johnson (1991a). For brevity we do not list Material Examined herein.

Angulopsis suada (Hewitson)

NEW COMBINATION

Photoplate V,3; Fig. 2B

Thecla suada Hewitson 1863-1878 [1877]: (1) 207, (2) pl. 82, f. 691,692; 1877: 20 (listed as synonym of *ceromia*, in error [see Remarks and Comstock and Huntington 1963: 264]); Druce 1907: 264 (synonymy with *ceromia* following Hewitson, in error); Draudt 1919: 806; Comstock and Huntington 1963: 264; Bridges 1988: I.331, II.105 (synonymy with *ceromia* following Hewitson *et al.*, in error), III.68.

DIAGNOSIS. *Wings.* More the size of *A. autoclea* but standing out by dark DFW, DHW and lack of HW anal lobe. VHW band black (except for slight rust basal suffusion) contrasting colorful limbal area (Thecla-spot light red, surrounding cells blue-suffused to anal margin).

Morphology showing male genitalia distinctive—vincular ventrum rather rectangulate and with elongate, pointed saccus; valvae with bilobes only slightly longer than caudal extensions, former angulate laterally and ventrally, latter thinly tapered and inwardly recurvate.

DESCRIPTION. *Male.* DFW, DHW ground dark brown, HW with short tail, vein CuA1 terminus; HW anal lobe not apparent. VFW ground brown; postmedian band thin and deep red bordered prominently by black. VHW ground brown; medial band mostly black bordered basally by flush of rust suffusion; SC+R1 element contiguous with rest of HW band, vein elements from M3 to 2A more incised than in other brown congeners; limbal area lavishly colored, showing light red Thecla-spot connected by blue suffusion to red and black along the anal margin. FW length: 13.5 mm. (n=1, BMNH). *Female.* Not currently known to us (see Remarks). *Male Genitalia and Tergal Morphology.* Fig. 2B. Vincular dorsum with brush organs extending to base of labides. Genitalia with vincular ventrum rather rectangulate and with elongate, pointed saccus. Valvae with bilobes only slightly longer than caudal extensions, former angulate laterally and ventrally, latter thinly tapered and inwardly recurvate. Aedeagus with caecum comprising less than one-fourth aedeagus length and not displaced out of plane of very slightly bowed but generally straight aedeagal shaft; single bifurcate cornutus. *Female Genitalia and Tergal Morphology.* Not currently known to us (see Remarks).

TYPES. Lectotype male, BMNH, labelled "Thecla Type suada Hew.", "Bolivia, Hewitson Coll. 79-69, Thecla suada. 1." "male". BMNH Rhopalocera type #1011. There has been historical confusion between the types of *Thecla suada* and *Thecla ceromia*. Three specimens are involved which received printed labels subsequent to acquisition of Hewitson material. I follow the original BMNH type labels in which B.M. Rhop. type #1011 is labelled type of *Thecla suada* and "Hewitson suada 1". There are also two other specimens called syntypes "2" and "3" (together alike, but very different in wing pattern from "Hewitson suada 1". These other two specimens also bear the labels "*Thecla ceromia*" with "3" marked B.M. Rhop. type #1012. I thus consider "1" as lectotype of *Thecla suada* and, subsequently make "3" the lectotype of *Thecla ceromia* (see *Angulopsis ceromia*).

DISTRIBUTION. Fig. 5. Currently limited to our knowledge of the type.

REMARKS. The type of *Thecla suada* is very distinctive and appears to have been historically confused with *Thecla ceromia* ever since Hewitson's original 1877 note and the subsequent sorting of the Hewitson Collection. The present usage of the name is consistent with how BMNH staff construed the original specimens. It appears likely the female will eventually be identified from Bolivian material and the distribution of the species may include the "yungas" region south into northern Argentina.

Angulopsis tucumanensis,
NEW SPECIES

Photoplate V,4; Figs. M1E,3C.

DIAGNOSIS. *Wings.* Small (FW 11.0 - 11.5 mm.) wings angulate, particularly in male; DFW, DHW warm brown, VHW differing from *A. autoclea* with band thinner, dull orange-brown and showing contrast between rather straight costal portion and exaggerated "W" in band at anal angle.

Morphology of male distinctive in both saccus and valvae (former elongate and robust, latter hemielliptical in the bilobes and with elongate caudal extensions). Female showing much more robust ductus terminus and greatly hemispherical superior plate.

DESCRIPTION. *Male.* DFW, DHW ground warm brown; short tail, vein CuA1 terminus, longer tail, CuA2 terminus; HW anal lobe angulate. Ventral ground light beige; FW postmedium band thin and straight, colored orange brown; HW band of similar appear similarly colored and showing great contrast between rather straight character from costa through cell M3 and then a much exaggerated and angulate "W" in the anal area. FW length: 11.0 mm. (holotype). *Female.* Marked similar to male except DFW, DHW, VFW, VHW except wings more rounded. FW length: 11.5 mm. (allotype). *Male Genitalia and Tergal Morphology.* Fig. M1E. Brush organs abutting vincular dorsum. Genitalia with vinculum thin ventrally contrasted by elongate and robust saccus; valvae with bilobes hemielliptical and caudal extensions elongate, all contrasting *A. autoclea*. *Female Genitalia and Tergal Morphology.* Fig. 3C. *Sipc* with lateral edges ventrally produced. Genitalia robust terminus and extremely flared paired hemielliptical elements forming the superior plate all contrasting *A. autoclea* and indeed more like *A. politus*.

TYPES. Holotype male "Tucuman, September", with no other data; allotype female "Tucuman, Steinbach", both BMNH (see Remarks).

DISTRIBUTION. Fig. 5. Currently known only from old BMNH specimens generically labelled "Tucuman".

REMARKS. These specimens have been in the senior author's study material for many years and have never been matched by any recent Argentine material either from Eisele, MacPherson or material at the IML. This may result because *A. autoclea* is so common, anything like it is overlooked in the field. The wings and genitalia of this new species are far from those of common *A. autoclea*, the HW appearing more "Calystryma-like".

ETYMOLOGY. Refers to general type locality.

Angulopsis desjardinas,
NEW SPECIES

Photoplate V,5; Fig. 3D.

DIAGNOSIS. *Wings.* From Argentina, a large (FW alar 14.5 mm.) generally brown species reminiscent of Central American *A. opacitas*; differing from congeners by thin, lineal and brown, V bands, lacking any orange basal color common to smaller sympatric *A. autoclea* or regional *A. tucumanensis*. Differing from *A. opacitas* or other large congeners by band color and notable convexity of VHW band through the M-cells.

Morphology of female with habitus showing heavily sclerotized margins at the ductus opening and presence of a prominent ventroterminal tooth.

DESCRIPTION. *Male.* Unknown. *Female.* DFW, DHW ground dark brown, HW with short tail at CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe tufted. VFW ground dark beige; bands narrow dark suffusive brown, HW showing convexity through the M-cells and an emphatic equilateral "W" in the anal area; limbal area with black-centered orange Thecla-spot and black at anal lobe. FW length: 14.5 mm. (holotype). *Female Genitalia and Tergal Morphology.* Fig. 3D. *Sipc* with lateral edges terminobasally angulate. Genitalia with robust, terminally flared and elliptic superior plate flanked by stout heavily sclerotized margins of ductus terminal ductus bursae ventrally enclosing a terminal tooth. Cervix bursae unelaborate; corpus bursae with robust signa typical of genus.

TYPE. Holotype female, ARGENTINA, Prov. Jujuy, Parque Nacional Calilegua, upland park track W Rt. 34 at 11-13 km., hot humid forest break, 14 Febr. 1991, 1200 hr., leg. K. Johnson, deposited AMNH.

DISTRIBUTION. Fig. 5. Currently known only from type locality.

REMARKS. This was immediately identified as an unknown species when collected, as *A. autoclea* is so

MORPHOLOGICAL FIGURES**Figure 1****Male and Female Genitalia of *Angulopsis* Type Species and Male Genitalia of Certain Other Species**

A. *Angulopsis autoclea*, type species, Pichinal, Salta Prov., Argentina (AMNH).

Format: male genitalia, a, lateral view, b, ventral view, d, aedeagus, lateral view (subset in the upper case also to associate with species); female, c, ventral view.

Format for B-D: male genitalia, a, ventral view, b, valve, lateral view; for E, aedeagus, lateral view.

B. *Angulopsis suada*, lectotype male (BMNH).

C. *Angulopsis ceromia*, male, La Paz, Bolivia (AMNH).

D. *Angulopsis politus*, male, San Gabriel, Oaxaca, Mexico (AMNH).

E. *Angulopsis tucumanensis*, allotype male (AMNH).

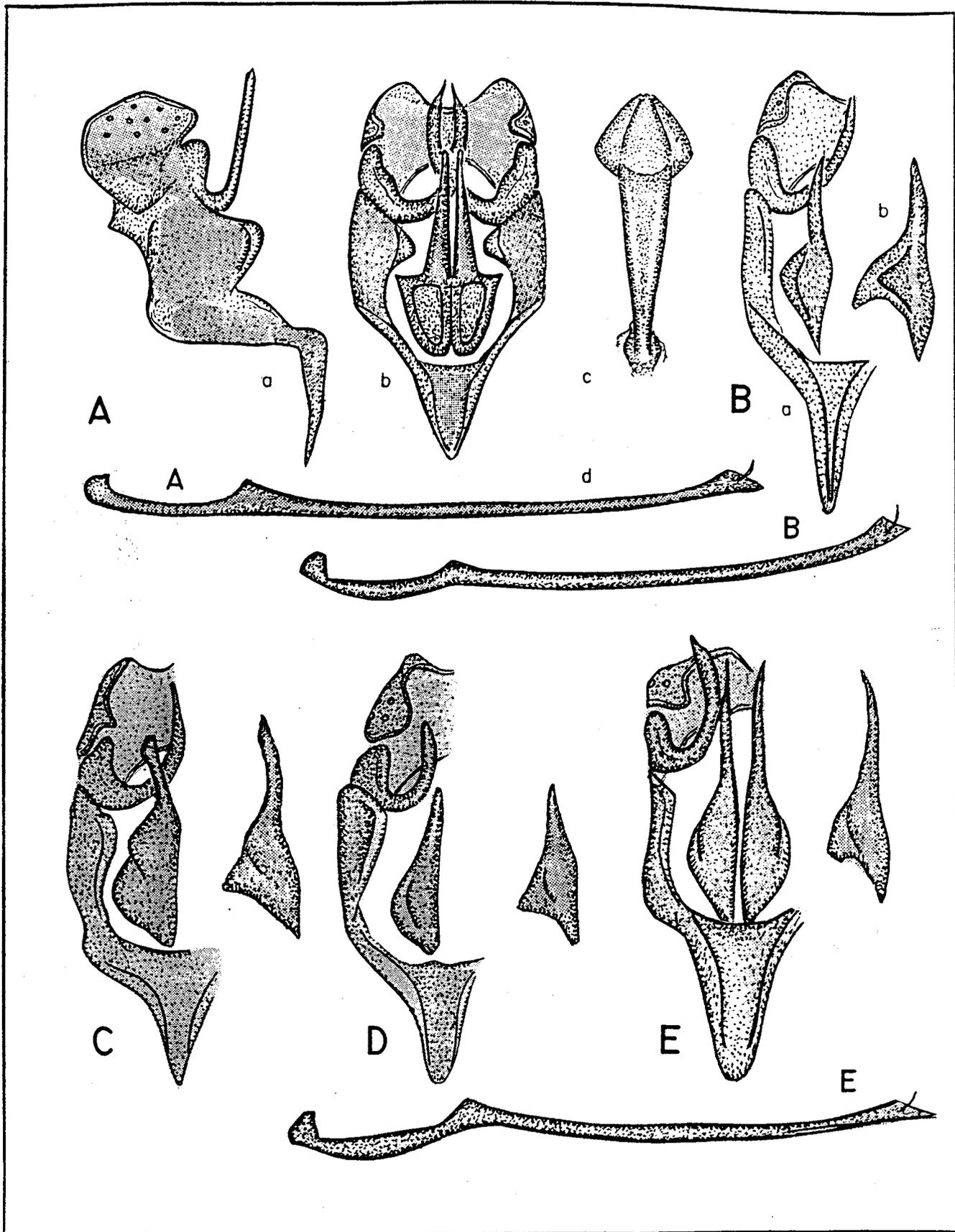


Figure 2**Male Genitalia of *Angulopsis***

Format: male genitalia, a, ventral view (1, valve bilobed configuration, 2, valve caudal extension) enclosed by b, bilateral half of vincular arc and c, saccus.

- A. *Angulopsis opacitas*, holotype male (BMNH).
- B. *Angulopsis angusta*, Santissima-Trinidad, Paraguay (AMNH).
- C. *Angulopsis badaca*, Sierra Nevada de Santa Marta, Colombia (BMNH).
- D. *Angulopsis microterminatis*, allotype male (AMNH).
- E. *Angulopsis rubrolimbacosta*, allotype male (BMNH).
- F. *Angulopsis strymonotis*, holotype male (BMNH).
- G. *Angulopsis obscuris*, holotype male (MPM).

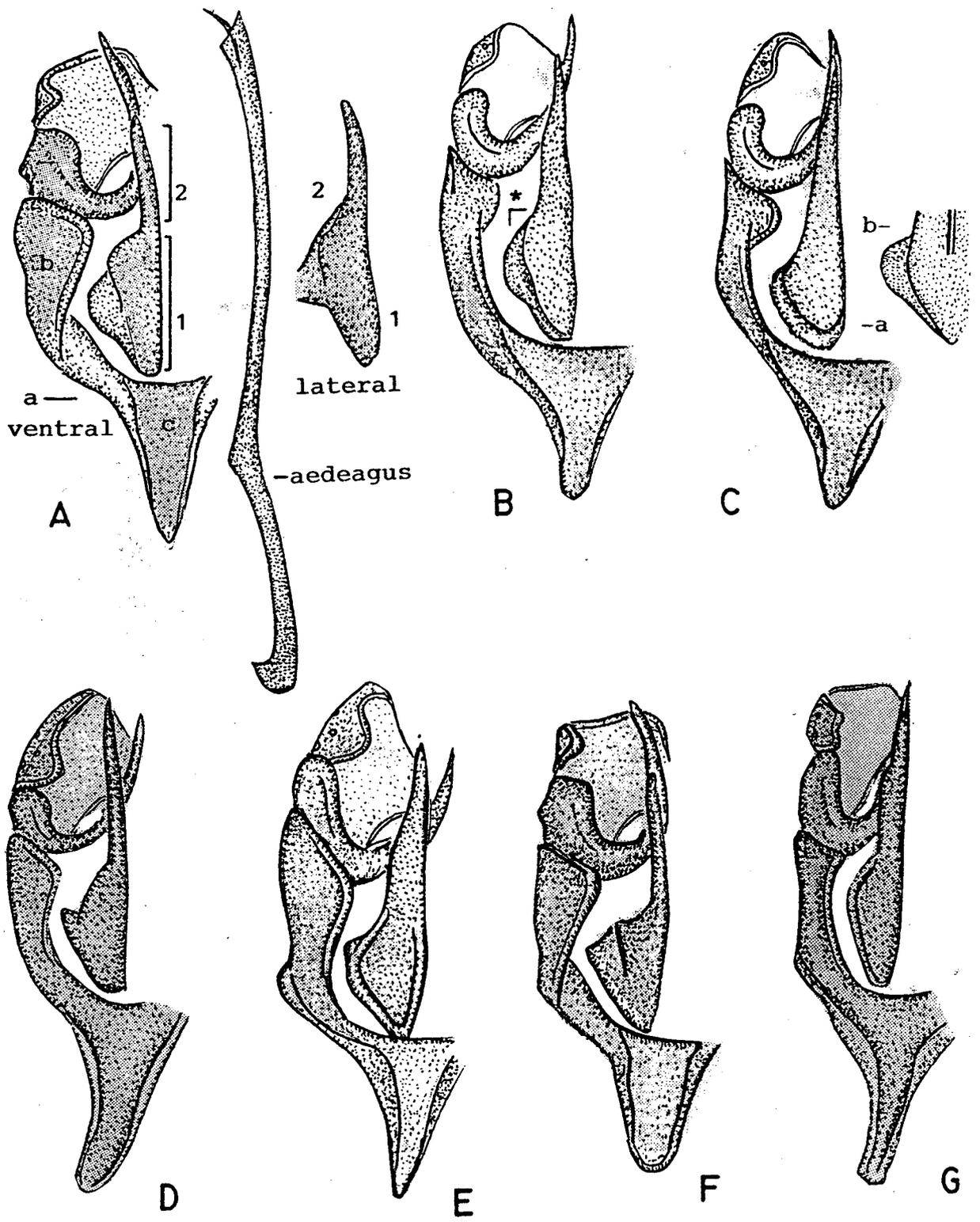


Fig. 3. Female Genitalia of *Angulopsis* "autoclea" and "ceromia" Groups"

Format: females with genitalia shown in ventral view, terminus directed alternately left (A), right (B) etc. **Features:** a, ductus bursae from winglike lamellae to cervix bursae, b, winglike superior lamellal plate, c, ductal struts, d, lateral view, terminal tergite, terminus directed right, e, exemplary signum, outer view.

- A. *Angulopsis sangala*, Caripito, Venezuela (AMNH).
- B. *Angulopsis politus*, San Gabriel, Oaxaca, Mexico (AMNH).
- C. *Angulopsis tucumanensis*, holotype female (AMNH).
- D. *Angulopsis desjardinas*, holotype female (AMNH).
- E. *Angulopsis hernandezii*, holotype female (BMNH).

- F. *Angulopsis angusta*, holotype female (MNHN).
- G. *Angulopsis calycopinotis*, holotype female (BMNH).

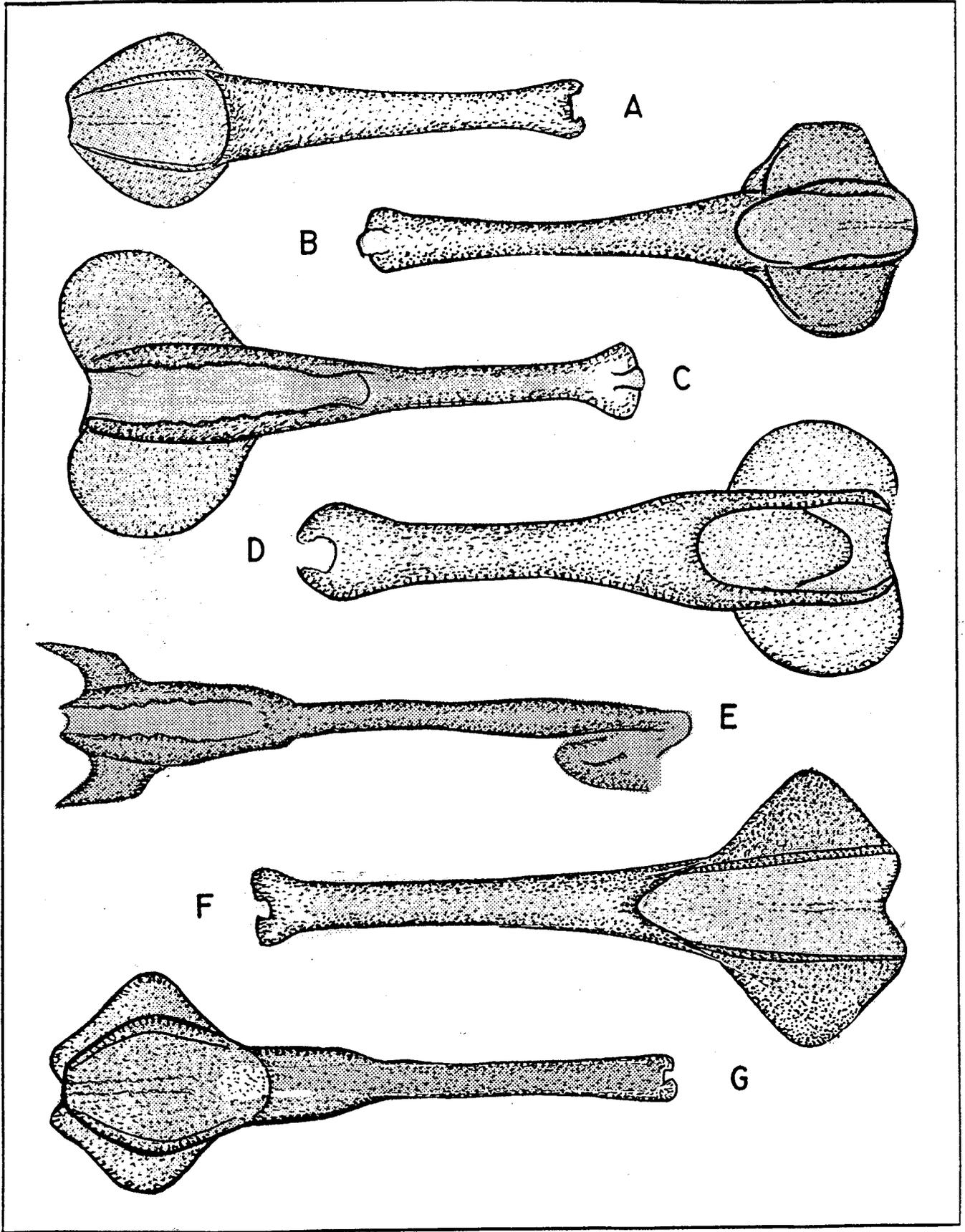
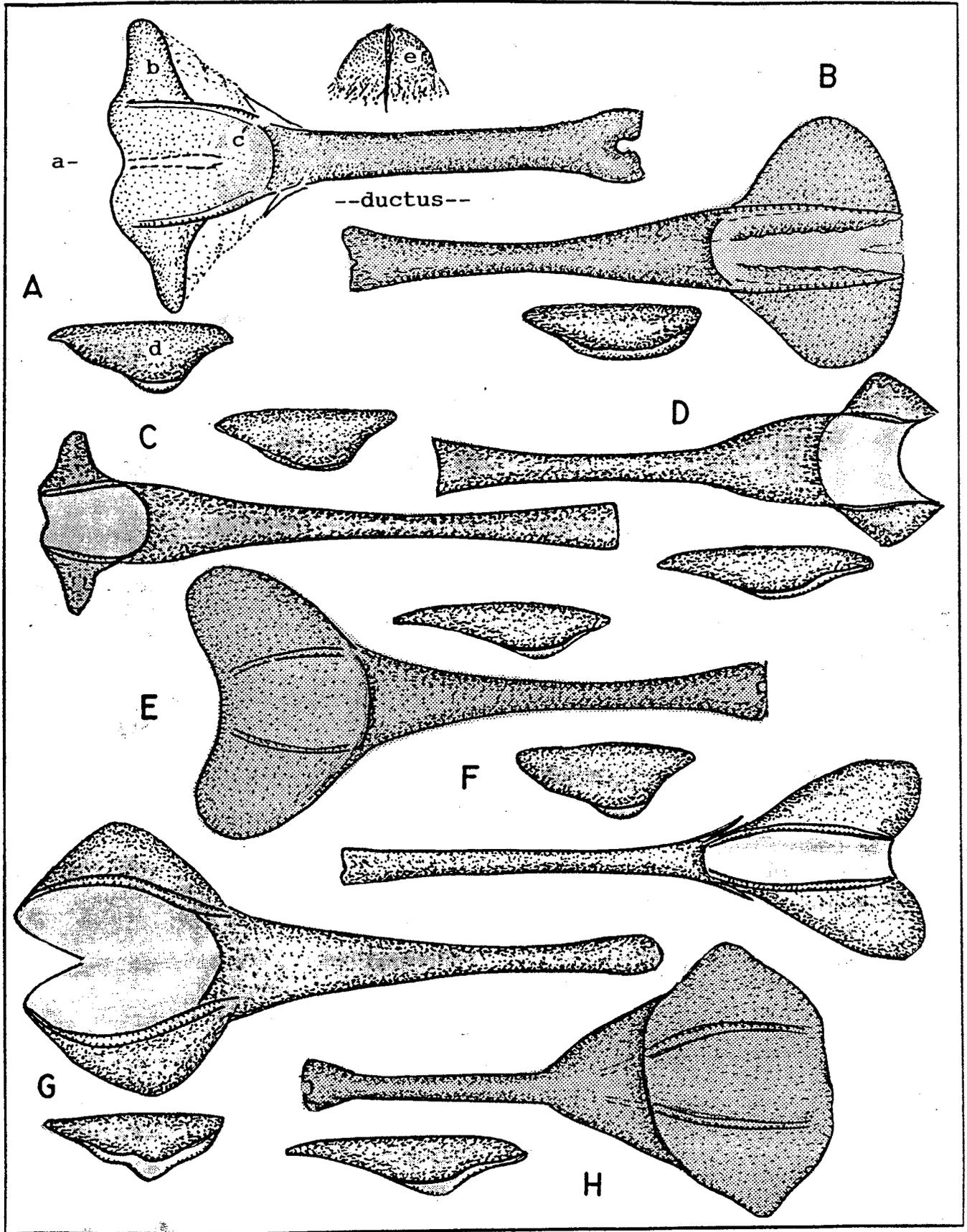


Fig. 4. Female Genitalia of *Angulopsis* "ceromia Group"

Format: females with genitalia shown in ventral view, terminus directed alternately left (A), right (B) etc. Features: a, ductus bursae from winglike lamellae to cervix bursae, b, winglike superior lamellal plate, c, ductal struts, d, lateral view, terminal tergite, terminus directed right, e, exemplary signum, outer view.

- A. *Angulopsis ceromia*, lectotype female (BMNH).
- B. *Angulopsis opacitas*, Presidio, Vera Cruz, Mexico (AMNH).
- C. *Angulopsis badaca*, lectotype female (BMNH).
- D. *Angulopsis microterminatis*, holotype female (AMNH).
- E. *Angulopsis vioangulis*, holotype female (BMNH).
- F. *Angulopsis rubrolimbacosta*, holotype female (BMNH).
- G. *Angulopsis ruborbiculis*, holotype female (BMNH).
- H. *Angulopsis saphronotis*, holotype female (BMNH).



familiar and had been collected in some numbers the same date, at lower altitudes near the river entrance to the Parque Nacional. Flooding required fording the river on foot and the walk upland on February 14 left only two collectors active by noontime, the rest having turned back because of bad weather. However, from about 1200-1300 hrs. the sun broke through in a large canopy break along the upland track, marked by an expansive "S"-shaped upgrade in the trail and further identifiable by expanses of red-rock cliffs in the background. Myriads of butterflies emerged in the sunlight (including many *Morpho*) and collecting was conducted frantically (specimens not even papered until afterward when the collectors returned to piles left along the trail). This seemed the only way to take advantage of the sudden weather change and, even with this consideration, many individuals flying out from the trail over steep gulches could not be netted.

ETYMOLOGY. A double meaning. Actually a patronym for Roberta Desjardins but since the latter means "of the Gardens" apt in referring to the lush habitat in which this species was collected.

Angulopsis obscurus,
NEW SPECIES

Photoplate V,6; Fig. 2G.

DIAGNOSIS. *Wings.* Very dull compared to all congeners (see Remarks); HW very angulate at anal margin marking black Thecla-spot on DHW, VHW. VFW, VHW with bands extremely thin (hardly notable at tripartite) mostly brown. HW band very straight from costa to cell CuA1 then in exaggerated "W"-shape before the anal margin.

Morphology showing male genitalia unique; saccus truncate with knobbed end; valvae tapering in gradual "three-step" terminal shape.

DESCRIPTION. *Male.* DFW, DHW ground brown but with flush of blue; short tail, vein CuA1 terminus, somewhat longer tail, CuA2 terminus; HW anal lobe angulate, black CuA1 spot apparent. Ventral ground dull beige; FW postmedian band straight and thin, colored brown; HW band similarly colored and very straight from costa through cell CuA1 then in much exaggerated "W"-shape across anal area. FW length: 13.0 mm. (holotype). *Female.* Unknown (see Remarks). *Male Genitalia and Tergal Morphology.* Fig. 2G. Brush organs abutting vincular dorsum. Genitalia with vinculum thin ventrally and with truncate, somewhat knob-ended saccus; valvae with bilobes thinly parabolic, caudal extensions elongate and ter-

minating in a rather "three-step" fashion not seen elsewhere in the genus. Aedeagus typical of genus.

TYPE. Holotype male, BRAZIL, Rio Grande du Sul State, Pelotas, 12 March 1954, C. Biezanko, deposited BMNH (see Remarks).

DISTRIBUTION. Fig. 5. To date known only from type locality.

REMARKS. This species was among specimens marked "sp. nov." at the BMNH. It was borrowed on such a basis and dissected simply because it didn't look like anything else (particularly with the dull flush of blue above). Search of Biezanko material at the AMNH (now completely prepared) did not show any other examples; however, I have not been able to check the MPM Gagarin collection for this dull taxon. This species appears to be one of those which has escaped notice simply because it is so uninteresting looking. One can either ignore such specimens or describe them. It is likely more specimens will be located in old Brazilian material.

ETYMOLOGY. An arbitrary combination referring to the "obscure" nature of the type specimen.

Angulopsis hernandezi,
NEW SPECIES

Photoplate V,7; Fig. 3E.

DIAGNOSIS. *Wings.* One of the most distinct members of the genus. DFW, DHW appearing reminiscent of *Strymon* (particularly *S. canitus*) with HW limbal areas framing intercellular patches of vivid silvery blue and with a black CuA1 and CuA2 spots. VFW, VHW belying this identification with habitus typical of *Angulopsis* although with vivid orange band with a more slight "W" in anal area than many congeners (see Remarks).

Morphology showing female extremely odd for genus—central area of ductus bursae and jaw-like ductus terminus typical of genus but with superior plate reduced to only small, extremely angulate, lateral elements unlike any congener.

DESCRIPTION. *Male.* Unknown. *Female.* DFW blackish, DHW same basally, limbal area with vivid intercellular silvery blue between black veins and margins with black spots at CuA1 and CuA2. VFW, VHW ground yellow-beige, FW with vivid orange postmedial band, HW with wide (.5 mm.) jagged orange band quite typical of genus except for more reduced "W"-shaped element in the anal area. Limbal area lush compared to most congeners, with blue-white suffusion framed in the cells around the Thecla-spot. FW length: 13.0 (holotype). *Female Genitalia and Tergal Morphology.* Fig. 3C. *Sipc* with lateral edges ventrally produced. Genitalia with central areas of

ductus bursae robust and jaw-like typical of species group, but terminus completely departing from other species with very short and angulate lateral elements on the superior plate; cervix bursae also divergent—produced near juncture to corpus bursae.

TYPE. Holotype female, TRINIDAD-TOBAGO, Trinidad, Arima Valley, 28 January 1962, leg. Bernard Heineman, deposited AMNH.

DISTRIBUTION. Fig. 5. To date known only from the region of the type locality.

REMARKS. This is another example of an upper surface "look-alike" thecline that when examined on the under surface departs from anything expected. The DFW,DHW is extremely like the female of *Strymon canitus* (H. H. Druce). The VFW,VHW is typical of *Angulopsis*. I suspect that once this is noted, additional specimens of this species may readily be found. In particular, Ronald Hernandez, Simla Research Station, Asa Wright Nature Center, Arima, Trinidad, is working on the Trinidad-Tobago Theclinae fauna. It will be interesting to see if more examples of this species are located.

ETYMOLOGY. Patronym for Ronald Hernandez, honoring and encouraging his work of the complex Trinidadian Eumaeini fauna.

ceromia Species Group

Species are large (usually FW 15+ mm.) and very dark brown or dark burnished blue on DFW, DHW with VFW,VHW ground beige to brown; HW with two prominent tails. VHW pattern more "lavish" than in *autoclea* Group but not showing the additional limbal pattern elements typifying the *angusta* Group. VHW pattern with red-orange band thin and lineal, then bent to a prominent "W" in the anal area and contrasted by prominent dark (red or black) marks marginad in cells CuA1 (Thecla-spot) and along anal margin near the HW anal lobe.

Angulopsis ceromia (Hewitson)

NEW COMBINATION

Photoplate V,8; Figs. 1C,4A.

Thecla ceromia Hewitson 1863-1878 [1877]: (1) 185, (2) pl. 174, f. 573,574; 1877: 20 (*suada* Hewitson 1863-1878 [1877]: (1) 207, (2) pl. 82, f. 691, 692 included as synonym, in error; see Remarks and Comstock and Huntington 1963: 264); Druce 1907: 264 (lists *suada* synonymy following Hewitson, in error); Draudt

919: 806, pl. 159g.; Huntington 1933: 5; Comstock and Huntington 1958-1964 [1959]: 182 (include *suada* as synonym, in error, see *A. suada* above and Types below); Bridges 1988: I.76, II. 105, III.68 (follows Comstock and Huntington *et al.* citing *suada* as synonym, see Types and Remarks).

DIAGNOSIS. A widespread South American species historically much overlooked because of confusion with the name *suada* Hewitson (see Types) and superficial similarity to members of *Gigantorubra* Johnson 1993 as well as *Angulopsis badaca* Hewitson (subsequent entry). Of these, *A. ceromia* is the common large South American *Angulopsis* with simple, thin, red-orange bands and no markings in the limbal area except at the Thecla-spot and at base of anal lobe. Species more lavishly marked with red or orange across limbal areas are of *angusta* Group; a species similarly marked in the bands but with dark brown suffused patches across the limbal area is *A. badaca* Hewitson; species with wide VFW, VHW bands (to 2 mm. and greatly tripartite with white and black) are of the *Gigantorubra collucia* Group. The latter are obvious upon dissection because of serrate falces in the male genitalia.

Morphology hitherto little understood because of misidentification. Male showing widely lobate valvae base contrasting short, rather knob-ended, caudal extensions; female showing short "stubby" lobes on superior plate connected anteriorly to the ductus bursae by less sclerotized, more membranous, material.

DESCRIPTION. *Male.* DFW,DHW ground warm brown, HW with elongate tails both at vein CuA1 and CuA2 terminus; HW anal lobe orange to rust-colored. VFW ground variously beige to darker brown; postmedian band thin (.5 mm.) and bright orange to reddish from costa to cell CuA1; VHW ground as on FW; medial band similarly thin and bright, Sc+R1 element not outstanding, angled elements veins M3 to 2A not greatly produced; limbal area of light ground, with orange or red at Thecla-spot and at base of anal lobe. FW length: 14.5 mm. - 15.5 mm. (n= 4, see below). *Female.* Marked similar to male except lighter brown on DFW,DHW, with more rounded wing shaped and slightly brighter highlights in VFW limbal areas. FW length: 14.5 - 15.5 mm. (n=8, see below). **Male Genitalia and Tergal Morphology.** Fig. 1C. Brush organs abutting vincular dorsum. Genitalia with valvae bilobes widely ovate basally with a secondary "enfolding" ventral production prior to thin caudal extensions terminating in rather knoblike ends; vincular arch angulate, saccus pointed; falces arched and of even contour; aedeagus elongate, exceeding length of rest of genitalia by about two-fifths, shaft and caecum both

bowed, latter comprising about one-fifth of aedeagal length, terminus with single pointed cornutus. *Female Genitalia and Tergal Morphology*. Fig. 4A. *Sipc* robust and laterally extensive, closely abutting lateral edges of genitalic superior plate. Genitalia with ductus robust, contrasting in the terminal one-fifth of its length, short and laterally "stubby" lobes of the superior plate which connect anteriorly to the ductus not with fully sclerotized material but, instead, a ridged, membranous, habitus. Signum broad-based.

TYPES. Nomenclatorial problems stem from a mixed, nonconspecific syntype series. Lectotype female, B.M. Rhop. type #1012, labelled "Thecla Type suada Hew.", "Bolivia, Hewitson Coll. 79-69, Thecla suada. 3.", "Thecla ceromia", "B.M. Rhop. type #1012". One of two "Bolivia"-labelled *suada* syntypes "2" and "3" with subsequent labels indicating them as "Thecla ceromia"; "3" with further designation as "B.M. Rhop. type #1012", latter which I have made lectotype. Both "2" and "3" differ in facies from "1" (hitherto made lectotype of *Thecla suada* Hewitson, see above). Consistent with the above designations and curatorial practice at BMNH, I consider "2" a paralectotype of *Thecla ceromia*. Remarks and Types under *A. suada* pertain.

DISTRIBUTION. Fig. 5. When properly identified, known from a number of specimens principally from Bolivian "yungas" region but extending south into northern Argentina and east into Mato Grosso State, Brazil.

REMARKS. As noted under the *A. suada* Type entry, there has been historical confusion between the types of *Thecla suada* and *Thecla ceromia* ever since the original description and Hewitson 1877: 20. It has apparently not been noted (other than by BMNH staff labels) that of the three syntype specimens, one is divergent (chosen herein, consistent with BMNH staff interpretation, as *suada*). The other two specimens, which typify *ceromia* match a wider array of additional specimens representing numerous localities.

A. ceromia appears to be the South American sister species of Central American *A. opacitas* but there does not appear to be evidence of intervening distribution. The material examined listed below may not include all the existing specimens, since only those diagnosed from series by dissection are included. The most recent material is from the 1989 "Emmel" Expedition to Bolivia. However, numerous species of *Angulopsis* and *Gigantorubra* are represented in such material.

MATERIAL EXAMINED. Along with types noted above, ARGENTINA. Prov. Salta, Dept. La Caldera, Rt. 9, km. 20, km. post 1642, "La Cargadera: 1450 m., 12 February 1991, AMNH Expedition, 1♀ (AMNH); Prov. Jujuy upland at on Park Track at 11-13 km. W. of Rt. 34 in hot humidforest break, 14 Febr. 1991 AMNH Expedition, 1♀ (AMNH). BOLIVIA. Coc[h?]abamba, Bolivie, 1889, 2♂♂, 1♀ (MNHN); "Bolivia" ex. Smith, 1♀ (BMNH); "Bolivia ex. Hewitson, 1♀ (BMNH); San Jacinto, no other data 1♀ (BMNH); "Bolivie", Cochabamba, Yunga del Espiritu Santo, 1888-1889 leg. P. Germain 1♂, 1♀ (BMNH); Dept. La Paz, Prov. Sud Yungas, Estancia Aracu, Hotel Tamampaya area, 4300', 20-27 May 1989, leg. D. and K. Matusik 1♂, 1♀ (AMNH); same data, 2♂♂, 1♀ (David Matusik Collection). BRAZIL. Mato Grosso State, Cuyabe, ex. Joicey Collection, 1♂ (BMNH).

Angulopsis badaca (Hewitson)

NEW COMBINATION

Photoplate V,9; Figs. 4C

Thecla badaca Hewitson 1868: 12; Hewitson 1874: (1), 184, (2), pl. 73, fig. 569, 570 (as synonym of noncongener *collucia* Hewitson 1863-1878 [1877]: (1), 186, (2) pl. 74, f. 577, 578, in error); Kirby 1871: 399. Druce 1907: 264. Draudt 1919: 806, pl. 159f. Comstock and Huntington 1958-1964 [1959]: 89 (following Hewitson, as synonym of noncongener *collucia*, see Remarks); Hayward 1973: 160.

DIAGNOSIS. *Wings.* An even more widespread species than the above, fortunately with good VHW marks for identification, but some historical nomenclatorial confusion. Fortunately, the type of *Thecla badaca* clearly assigns itself to *Angulopsis* by morphological characters; however, other superficially similar taxa must be assigned elsewhere. *A. badaca* is the congener showing bold dark brown suffusive patches parallelling (especially distad) the red VHW band. Other somewhat similar specimens, exhibiting bolder (nearly solid) dark brown patches on both sides of the VHW band, variations in the band (including increased width, additional red components, or enhancement of the SC+R1 element) probably species of *Gigantorubra* Johnson 1993 and can be diagnosed readily by the serrate falces on their male genitalia (Johnson in press a).

Morphology showing male valvae with distinctive "heart"-shaped bilobe rims followed by widely tapering caudal extensions. Female distinctive with prominent "cup"-shaped antrum beneath the superior plate, latter which shows triangulate lateral elements.

DESCRIPTION. *Male.* DFW, DHW ground blackish brown, HW with prominent tails at veins CuA1 and CuA2 termini, latter longer and with more prominent white tip; HW anal lobe flushed orange. VFW ground brown; postmedian band deep red, extending from costa to cell CuA1. VHW ground lighter brown; medial band wide (to .5 mm.), basally deep red bordered lineally by black and white; Sc+R1 produced but not greatly heterogeneous with rest of band, angled elements from veins M3 to 2A in prominent W-shape; distad of red band, ground color suffused over with dark brown to blackish elements (meandering lineally to more patchlike), postmedial to submarginal, particularly heavy toward costa; limbal area generally dark, marked mostly by deep red *Thecla*-spot. FW length: 14.5-16.0 mm. (n=5, see below). *Female.* Marked similar to male except for more rounded wing shape and sometimes, on VHW, bolder contrast between ground and distal suffused patches. FW length: 14.5-16.0 mm. (n=5, see below). *Male Genitalia and Tergal Morphology.* Fig. 2C. Brush organs abutting vincular dorsum. Genitalia with valvae bilobes rather conical (somewhat "heart"-shaped at base) with gradually tapered, rather elongate caudal extensions; vincular arc angulate; saccus broad and pointed; falces arched and of even contour; aedeagus elongate, length exceeding length of rest of genitalia by at least two-fifths, shaft bowed and then somewhat curvate toward terminus, caecum comprising about one-fifth of aedeagal length and also bowed, terminus with a single pointed cornutus. *Female Genitalia and Tergal Morphology.* Fig. 4C. *Sipic* with lateral margins produced near edge of superior genital plate. Genitalia with terminal two-fifths of ductus bursae showing prominent antrum terminating in rather triangulate lateral flaps on superior plate in the posterior one-half. Ductus bursae anterior of antrum robust, somewhat fluted toward the juncture with the corpus bursae. Corpus bursae signa broad-based as typical of genus.

TYPES. Nomenclatorial problems stem from a mixed, noncongeneric syntype series. Lectotype female, B.M. Rhop. type #1009, labelled "Brazil, Hewitson Coll. 79-69., *Thecla collucia* 4.", "B.M. Lep. Rh. type 1009". This is consistent with the original BMNH labelling of this and additional syntypes, of which syntypes "1", "2", "3" and "4" are all labelled as "*Thecla collucia*" but "2"- "4" area also labelled "*Thecla badaca*". The latter three syntypes show wing and genitalic characters typical of *Angulopsis*. The wing and genitalic characters of "collucia 1." are consistent with the generic diagnosis of *Gigantorubra*

Johnson 1993. Thus, I thus follow the original BMNH labelling, making B.M. Rhop. type #1009 the lectotype of *Thecla badaca* and B.M. Rhop. type #1010 subsequently the lectotype of *Thecla collucia*, a species of *Gigantorubra*. The latter is further marked "Esp. Santo" "Brazil".

DISTRIBUTION. Fig. 5. As here diagnosed, occurring from the Guyana Shield of South America (and adjacent Trinidad and Tobago) south to northern Argentina and Paraguay. Material examined to date, however, appears to represent a more "tropical swath" across the Amazon Basin and directly southward rather than also including the Andean foothills or SE Brazil. This remains to be resolved with further material. Considering this, the number of locations where species of *Angulopsis* are indicated as sympatric with certain species of *Gigantorubra* is also presently prone to some sampling bias (e.g. larger samples for dissection were typically available to us only from certain localities).

REMARKS. There is little to be added if the remarks above under "Types" and under *A. suada* and *ceromia* have also been studied. Remarks under *Gigantorubra collucia* (Johnson in press a) also pertain. Each of *A. ceromia*, *badaca* and *opacitas* have simple thin red VHW bands, *badaca* showing the distal dark suffusions. *G. collucia* can always be recognized by its wide bands, in which the tripartite orange, black and white is far more apparent and the anal "W" less pronounced (introductory schematic Fig. 1). Some large (16.0 mm.+) species of *Gigantorubra* show lavish developments of distal brown and black patches (Fig. 1). When familiar with these spectacular species, there will be little confusion with simply marked *A. badaca*. Any problems can be easily solved by dissection, looking for the teeth on the falces.

In case there is any future confusion regarding the numbering of BMNH syntypes (see comments in Johnson 1989 concerning linear numbering system) the citation of B.M. Rhop. #1009 is meant to take precedent over any other criterion and the lectotype label to remain affixed to the specimen of that type number.

Material Examined below illustrates the sample bias above noted (Distribution) and is limited to dissected samples.

MATERIAL EXAMINED. ARGENTINA. Prov. Jujuy, Dept. Capital, Cucho, 1 April 1980, leg. B. MacPherson 1♀ (AMNH), Prov. Salta, Dept. La Caldera, Rt. 9, km. 20, km. post 1642, "La Cargadera: 1450 m., 12 February 1991, AMNH Expedition, 1♀ (AMNH); Prov. Jujuy upland at on Park Track at 11-13 km. W. of Rt. 34 in hot humid forest break, 14 Febr. 1991 AMNH Expedition, 1♀ (AMNH); Prov. Sante Fe, Villa Nougues, leg. Hayward 1♂, 1♀ (IML); Prov. Misiones, Iguassu, leg.

Hayward and Willink, 1♂, 1♀ (IML). BOLIVIA. Prov. Ibanez, Dept. Santa Cruz, 2 km. at Jardin Botanica, woods, 12 January 1973, leg. R. Eisele, 1♀ (Eisele Collection). BRAZIL. Mato Grosso State, Cuyabe, ex. Joicey Coll., 1♂ (BMNH). COLOMBIA. Reg. Bogota, ex. Crowley Bequest, 1♂ (BMNH); Rio Opon, 4 February 1947, 1♀ (AMNH). FRENCH GUIANA. Guyane Francaise, St. Jean de Maroni, leg. Le Mout, 2♂♂, 2♀♀ (MNHN). GUYANA. Bartica, 2 February 1937 1♂ (AMNH). PARAGUAY. Cordillera, Santissima Trinidad, May, B. Podtiaguin, 1♂, 1♀ (AMNH). TRINIDAD-TOBAGO, Arima Valley, leg. 19-21 January 1961, leg. B. Heineman 1♀ (AMNH).

Angulopsis opacitas (Druce)

NEW COMBINATION

Photoplate V, 10; Figs. 2A, 4B.

Thecla opacitas Druce 1907: p. 624. Comstock and Huntington 1958-1964 [1962]: 40; Llorente-Bousquets, Garces and Luis 1986: 30; Bridges 1988: I.257, II.107, III.30 (see Remarks).

DIAGNOSIS. *Wings.* Limited to Central America, poorly known, and most similar to South American *A. ceromia*. Differing from sympatric brown congener *A. autoclea* by large size (FW 15.0+ mm.), darker DFW, DHW color, prominent orange on HW anal lobe and HW with two prominent tails; VHW band thin and very deep red, *Thecla*-spot black, bordered by red along anal lobe (see Remarks).

Morphology showing male genitalia with bilobed area of valvae rather rounded and sculptured along the ventro-lateral margin and with elongate, quite finger-like, caudal extensions; female showing widely hemielliptical superior plate.

DESCRIPTION. *Male.* DFW, DHW ground very dark brown, HW with prominent tails at both vein CuA1 and CuA2 termini; HW anal lobe bright orange. VFW dark brown; postmedian band deep red marked distally by thin black and white edging, extending from costa to cell CuA1; VHW ground dark brown; medial band deep red, thinly tripartite as on FW; Sc+R1 element not greatly outstanding from rest of band, angled elements between M3 to 2A more extremely "W"-shaped than in *A. autoclea*; limbal area marked by black *Thecla*-spot and red blotching along the anal lobe. FW length: 15.5 mm. (n=2, see below). *Female.* Marked similar to male except for more broadly rounded wing shape and DFW, DHW appearing slightly lighter. FW length: 15.0, 15.5 mm. (n=1, AMNH). *Male Genitalia and Tergal Morphology.* Fig. 2A.

Brush organs abutting dorsum of vinculum. Genitalia with vincular arch angulate, saccus parabolic; valval bilobes divided into angulate, ventrally-directed, elements and humped dorsal element adjoining tapered, "fingerlike", caudal extensions. Aedeagus with length exceeding length of rest of genitalia by about two-fifths, shaft bowed and then curvate toward terminus, bowed caecum comprising about one-fifth of aedeagal length, terminus with single pointed cornutus. *Female Genitalia and Tergal Morphology.* Fig. 4B. *Sipc* with terminolateral edges produced along juncture with superior genital plate. Genitalia with widely flared superior plate, quite hemielliptical on each side, ductus bursae robust, length about two-times terminal diameter of superior plate width; cervix bursae indented as typical of genus; corpus bursae signa broad-based.

TYPES. Holotype male, BMNH, labelled "type [male]", "Atoyac, Vera Cruz, May, H. H. S.", "*Thecla opacitas* [male] TYPE H. H. Druce", "Godman-Salvin Coll. 1912.-23. *Thecla opacitas* H. H. Druce", "B.M. Rhop. type #1012".

DISTRIBUTION. Fig. 5. Easily distinguished from other Central American congeners but not well represented in major collections. Specimens known to the authors are all from the region of type locality or from Guatemala.

REMARKS. This insect is very distinct but poorly known in major collections (see Llorente-Bousquets, Garces and Luis, 1986). This may result from the members of this genus being long overlooked by collectors and curators. However, the large AMNH Hoffman collection, concentrated mostly on Vera Cruz material, included only two specimens. Although one can note a possible sister species relationship with *A. ceromia*, the genitalia (particularly in males) argue against conspecificity.

MATERIAL EXAMINED. Along with type noted above. GUATEMALA. Polochic Valley, ex. Godman & Salvin Coll. 1♂ (BMNH). MEXICO. Vera Cruz State, Presidio, June 1939, leg. Hoffman 1♂, ♀ (AMNH).

Angulopsis microterminatis,

NEW SPECIES

Photoplate V, 11; Figs. 2D, 4D.

DIAGNOSIS. *Wings.* VFW, VHW bands very restricted, FW hardly tripartite and appearing mostly brown, HW band with odd distribution of basal orange (more saphron than red-orange). Latter occurring basally along band (costa to M3), again inside anal "W" (thus appearing broken from band) and finally in limbal cells CuA1 (the *Thecla*-spot) and M3.

See Remarks for comments regarding superficial similarity of this species to some taxa of *Calystryma* Field.

Morphology drastic, showing in female extremely long ductus bursae with diminutive superior plate (hardly one-tenth ductus length); male with distinctive valvae, bilobes with angulate lateral process and contrasting elongate caudal extensions.

DESCRIPTION. *Male.* DFW,DHW ground very dark brown, HW with prominent tails at vein CuA1 and CuA2 termini; HW anal lobe brown and unapparent compared to congeners. VFW beige-brown, postmedian band thin and mostly brown, extending from costa to cell CuA1; VHW ground beige-brown; medial band basally more saphron orange than red-orange and distinctively patterned—wide saphron lining basad of band appearing first from costa to M3, and then again within the anal "W", appearing to break the W. In limbal area, saphron at Thecla-spot, also in cell M3 and then at base of anal lobe. FW length: 14.5 mm. - 15.0 mm. (n=5, see below). *Female.* Marked similar to male except for more broadly rounded wing shape and DFW,DHW appearing slightly lighter. FW length: 14.5-15.0 mm. (n=6, see below). **Male Genitalia and Tergal Morphology.** Fig. 2D. Brush organs abutting vincular dorsum. Genitalia with vincular ventrum and arch rather rounded, saccus elongate and slightly assymetrical; valvae bilobes quadraspherical with a pronglike lateral extension, caudal extensions elongate and of rather even contour. Aedeagus not differing much from congeners, length exceeding rest of genitalia by about caecum length, shaft bowed and then curvate toward terminus, bowed caecum comprising about one-fifth of aedeagal length, terminus with single pointed cornutus. **Female Genitalia and Tergal Morphology.** Fig. 4D. *Sipic* with lateral edges much produced and constricted laterally near genital superior plate. Genitalia with greatly elongate ductus bursae contrasting short stubby superior plate lobes comprising less than one-tenth length of genitalia; cervix bursae not outstanding relative to comparatively thin ductus; corpus bursae signa appearing less robust than in congeners.

TYPES. Holotype female, allotype male, BOLIVIA, Dept. La Paz, Prov. Sud Yungas, Estancia Aracu, Hotel Tamampaya area, 4300', 20-27 May 1989, leg. D. and K. Matusik (AMNH). **Paratypes.** ARGENTINA. Prov. Jujuy, Dept. San Pedro, 4 km. S. on flood plain of Rio Grande, 550 m., 1 April 1980, leg. R. Eisele, 1♂ (AMNH); Prov. Salta, Dept. Chicoana, Quebrada de Escoipe, 1600 m., in flood-

plain marsh, 10 February 1991, AMNH Expedition, 1♀ (AMNH). BOLIVIA. Same data as primary types, 2♂♂,1♀ (David Matusik Collection); "Bolivia", ex. Brabant Coll., 1♀ (BMNH). PARAGUAY. "Paraguay", Crowley Bequest, 1♀ (BMNH); Villarica, March 1923, leg. R. Schade, 1♂ (BMNH); Cordillera, Santissima Trinidad, May, B. Podtiaguin, 1♀ (AMNH).

DISTRIBUTION. Fig. 5. Currently known from a cluster of localities in N Argentina, SE Bolivia and adjacent Paraguay (see below).

REMARKS. This species is extremely distinctive. At first, the orange markings on the VHW make the anal "W" appear more disjunct, as in members of *Calystryma*, an impression further enhanced by the limbal orange in cell M3. In the genitalia the species is obviously *Angulopsis* but with extremely distinctive superior plate in the female and valvae in the male. The currently known distribution probably shows some sample bias. We suspect further specimens are among material from the 1989 "Emmel" Bolivian expedition. Given the apparent sympatry and synchrony of several new *Angulopsis* from the collections examined, we suggest these same species may be found sympatric in other areas of South America once more specimens become available. There is a correlation between available specimens and concentrated local collecting.

ETYMOLOGY. Departing from usual practice, this species takes its name from the distinctively small superior plate on the female genitalia.

Angulopsis saphronotis,

NEW SPECIES,

Photoplate V,12; Figs. 4H.

DIAGNOSIS. *Wings.* VFW differing from all congeners by the basal band and limbal colors being yellow, not orange or red-orange. DHW differing from most congeners (except *A. hernandezii* and *A. calycopi-notis*, see Remarks) by showing brilliant intercellular iridescent blue across the limbal areas through the medial area.

Morphology known only from female but showing extremely wide and "gaping" terminus beneath expansive superior plate (expanse of which, along with immediately adjacent antrum, are longer than the ductus bursae).

DESCRIPTION. *Male.* Unknown. *Female.* Large, FW 15.5 mm. DFW,DHW ground dark, nearly blackish brown, base of FW strewn with suffusive blue iridescence, HW with brilliant intercellular blue throughout the limbal areas to the medial area; margin white outline and prominent white-tipped tails at vein CuA1 and

CuA2 termini; HW anal lobe hardly notable. VFW, VHW with grayish-beige ground, FW with postmedian line mostly black, extending from costa to cell CuA1; HW with band thin and bipartite white and black until the limbal area. Limbal area around band and intercellular areas in submargins of cells M3 and CuA1 boldly yellow, CuA2 suffusive white and blue, base of anal angle yellow. FW length: 15.5 mm. (holotype).

Female Genitalia and Tergal Morphology. Fig. 4H. *Sipc* with lateral edges very produced over posterior two-thirds of tergite abutting superior genital plate. Genitalia with short ductus bursae contrasting elongate antrum and adjoining expansive superior plate. Length of antrum and superior plate equalling that of ductus, ductus terminus beneath expansive superior plate wide and "gaping". Cervix bursae with ventrum somewhat knob-like, corpus bursae signa generally less robust than in most congeners.

TYPE. Holotype female, ECUADOR, Palmar, Manabita, 200 m., 21 May 1941, leg. D. B. Ladday (BMNH).

DISTRIBUTION. Fig. 5. Currently known only from type locality.

REMARKS. This species was marked "sp. nov." at the BMNH and is extremely distinctive. On the upper surface it appears much like a large "*Thecla beon*" (e.g. *Calycopis* sp.) but this identification is completely belied on the VFW, VHW. It is interesting that each species group of *Angulopsis* has members with DHW blue iridescent patches. This may indicate that there are numerous of *Angulopsis* species with this trait but that their specimens are perhaps "lost" in unidentified material or perhaps placed in series of *Calycopis* where no one has looked at the VFW, VHW. It appears likely that more specimens of all these species will eventually be located since all occur in areas represented by rather substantial collections.

ETYMOLOGY. An arbitrary euphonious combination denoting the yellow color of the VHW pattern.

Angulopsis strymonotis,

NEW SPECIES

Photoplate V,13; Fig. 2F.

DIAGNOSIS. *Wings.* A bizarre large brown species (FW 16.0 mm.) appearing on the VHW somewhat like *Strymon yojoa* Reakirt or *S. daraba* Hewitson but with HW band basally bordered with red-orange (former have gray and gray-brown bands), Sc+R1 element produced and with emphatic "W" (though

somewhat "domelike") at anal angle differing completely from *Strymon* (*S. yojoa* and *daraba* are known among their congeners for relatively curvate bands in anal region; see Remarks and Johnson and Salazar, in press).

Morphology typical of *Angulopsis*, male differing from congeners by extremely angulate and sculptured valvae base contrasting elongate thin caudal extensions.

DESCRIPTION. *Male.* DFW, DHW ground bright auburn brown, HW with white marginal line along limbal area and a single elongate tail apparent at vein CuA2 terminus. VFW ground tawny brown marked with postmedian band or red-orange edged prominently with distal white and with the basal ground a darker orange-brown than rest of wing; VHW ground tawny brown; medial band thin and lineal, elements more contiguous and curvate than jagged and disjunctive (up to the anal area) and framing darker orange-brown basal ground; Sc+R1 element somewhat produced; elements at veins M3 to 2A forming a "domelike" W-shape; limbal area marked with chevrons of brown and beige; Thecla-spot black, lined suffusively with white and black chevrons; anal angle black with intervening area suffused white and blue. FW length: 16.0 mm. (holotype). *Female.* Unknown. **Male Genitalia and Tergal Morphology.** Fig. 2F. Brush organs abutting vincular dorsum. Genitalia with vincular base and arch angulate, saccus widely parabolic; valvae bilobes very angulate, in two planes— first at shoulder halfway from base to caudal extensions and then again as a more anterior keel. Aedeagus typical of genus though slightly more robust, length exceeding rest of genitalia by caecum length, shaft bowed and then more curvate toward terminus, caecum bowed and comprising about one-fifth of aedeagal length, terminus with single pointed cornutus.

TYPES. Holotype male, ECUADOR, La Chima, Rio de las Junta, Prov. Los Rios, June-July 1893, leg. de Methan (BMNH).

DISTRIBUTION. Fig. 5. Currently known only from the type locality.

REMARKS. Not atypical of surprises at the BMNH, the holotype was placed with a hodge-podge of specimens in the *Strymon yojoa* and *S. daraba* assemblage. The collection, as curated, did not distinguish the *Strymon* species nor the various other material that was mixed in (see Johnson and Salazar, in press, for distinction of these *Strymon* species). These, and several other *Strymon* taxa, have been confused because all share a relatively curvate VHW band comprised of basically brown pattern elements (with some hues of white, yellow and gray). This contrasts more jagged red or orange bands of many other *Strymon* species. In addition, most *Strymon* in these groups have large FW androconial brands on the males (of

course missing in *A. strymonotis* as a generic character; the holotype was misidentified as a female). Material from La Chima, Ecuador, is not uncommon in collections and contains a number of oddities in groups of Eumaeini as yet unrevised.

ETYMOLOGY. Combines the generic name *Strymon* with the Latin suffix *nota* ("marks") and refers to the resemblance of this species to taxa of the former genus.

angusta Species Group

Moderate to large in size (FW 14-15 mm. in duller species, 15 mm. + in colorful members); differing from congeners on VFW, VHW by wider and often more angulate bands, VHW's of colorful species showing additional pattern elements (usually orange or red in limbal and/or costal regions). In addition, DFW, DHW often flushed with blue or violet, differing from all other members of the genus.

Angulopsis angusta Lathy

NEW COMBINATION

Photoplate V, 14; Figs. 2B, 3F.

Thecla angusta Lathy 1936: 232, pl. 32, f. 9. Comstock and Huntington 1958-1964 [1959]: 71; Bridges 1988: I.23, II.105, III.80; Johnson 1991b, p. 144.

DIAGNOSIS. *Wings.* DFW brown, DHW brown to slightly flushed dull violet in male, brighter violet in female with bold black CuA1 spot, orange anal lobe and wide white marginal line. VFW, VHW bands orange-brown, wide (1.5 mm.) and greatly angulate at area of HW anal "W"; distal areas hued with darker brown ground (not suffusive as in *A. badaca*).

DESCRIPTION. *Male.* DFW, DHW ground brown, HW with short tail, vein CuA1 terminus, longer tail, CuA2 terminus; HW anal lobe fuscous to light brown. VFW ground beige; postmedian band costa to cell CuA1 mostly orange to brown-orange and lightly edged with white and black; VHW ground beige basad of medial band, usually strewn darker brown distally; medial band wide (1.5 mm.) and jagged, particularly at the "W" near anal angle; Sc+R1 element slightly more produced than rest of band. FW length: 14.0 mm. - 15.0 mm. (n=3, see below). *Female.* Marked similar to male except DFW, DHW with brighter violet, with black spot at CuA1 and prominent white marginal line. FW length: 14.0 mm. - 15.0 mm. (n=4, see below). *Male Genitalia and Tergal Mor-*

phology. Fig. 2B. Brush organs abutting vincular dorsum. Genitalia with vincular ventrum and arch rather rounded, saccus truncate; falces arched and of even contour; valvae bilobes widely shouldered and of uneven contour (more extreme in the type [Fig. 2B*] than other specimens examined, 2B), caudal extensions unevenly tapered; aedeagus slimmer than in congeners, length exceeding rest of genitalia by about two-fifths, shaft and caecum both bowed, caecum comprising about one-fifth of aedeagal length, terminus with single pointed cornutus *Female Genitalia and Tergal Morphology.* Fig. 3F. *Sipic* with lateral edges produced along juncture with superior genital plate. Genitalia with robust ductus bursae terminating in superior plate with laterally flared triangulate shoulders (not sweeping terminad as in some congeners). Superior plate and ventral ductal opening comprising about two-fifths of genital length; cervix bursae ventrum swollen as typical of genus; corpus bursae with broad-based signa.

TYPES. Holotype female, MNHN (see Johnson 1991b); TL "Paraguay".

DISTRIBUTION. Fig. 5. Currently known from localities in Paraguay, S Brazil and N Argentina, all indicating a more eastern range compared to congeners (see Remarks).

REMARKS. This species is very straightforward although considered poorly known. This probably results because the insect was not included in Draudt (1919) and its type not further elucidated until 1991. Compared to other taxa in this study with similar country distributions, data on specimens indicates a more eastern distribution (Iguassu eastward to S Brazil). I see no specimens in Podtiaguin's extensive material from Cordillera Prov., Paraguay (AMNH) and none from NW Argentina in large samples by Eisele and MacPherson. I could not check MPM Gagarin material from S Brazil for this species at the time I studied that collection. The BMNH Paraguay female listed below was the only specimen in the main BMNH collection identified as *angusta*; the other was found elsewhere. As with numerous other taxa in this study it is likely more material will be located once the present work is available as a guide. There is an apparent sister species in the Sierra Nevada de Santa Marta of northern Colombia described herein. There appear to be no objective criteria at present by which these could be considered conspecific.

MATERIAL EXAMINED. Along with type, ARGENTINA. Misiones Prov., Iguassu, leg. Hayward and Willink, 1♂ (IML). BRAZIL. Pelotas, 15 January 1960, leg. Biezanko, 1♂ (AMNH); Rio Grande, ex. Fruhstorfer Coll., 1♀ (BMNH). PARAGUAY. "Paraguay", 1♂, 1♀ (MNHN); "Paraguay", 1♀ (AMNH).

Figure 5. Distributions of Certain *Angulopsis* Species

Included are species other than those common and widely distributed, particularly the localities of new species described herein from seminal material and needing further elucidation by local workers and curators.

autoclea Group

- *Angulopsis suada*
- △ *Angulopsis tucumanensis*
- ▼ *Angulopsis desjardinas*
- ⊕ *Angulopsis obscurus*
- ◆ *Angulopsis hernandezi*

ceromia Group

- *Angulopsis ceromia*
- ⊙ *Angulopsis badaca*
- ⊙ *Angulopsis opacitas*
- *Angulopsis microterminatis*
- *Angulopsis saphronotis*
- ⊕ *Angulopsis strymonotis*

angusta Group

- *Angulopsis angusta*
- *Angulopsis vioangulis*
- ⊕ *Angulopsis rubrolimbacosta*
- ▼ *Angulopsis ruborbiculis*
- ▼ *Angulopsis calycopinotis*



Angulopsis vioangulis,

NEW SPECIES

Photoplate V,15; Fig. 4E.

DIAGNOSIS. *Wings.* Small (FW 12.0 mm.) and dull brown above. VFW, VHW reminiscent of *A. angusta* but with red-brown VHW extremely jagged, including distally placed Sc+R1 element and very wide "W" at anal area angled inward again at vein M3; angle of band causing postmedial line of suffusive brown to begin only at M3 and proceed costad.

Morphology in known female showing terminally flared superior plate similar only to congener *A. rubrolimbacosta*, a species differing completely in size and VHW coloration.

DESCRIPTION. *Male.* Unknown. *Female.* DFW, DHW ground brown, not otherwise colored, tails short. VFW, VHW ground light tan; FW postmedian band dark red-brown extending across entire wing, slightly tripartite by thin black and white edging; VHW ground similarly light tan; medial band red-brown and extremely angulate throughout, Sc+R1 element displaced distally, angled elements in cells M3 to 2A in extreme "W"-shape, marked more so by further incision of band along vein M3; angle of band causing a suffusive line in the postmedial area to be limited to proceeding costally only from M3 to the costa, not across entire limbal area as in *A. badaca* or as in the red markings of some other *angusta* Group members. FW length: 12.0 mm. (holotype). *Female Genitalia and Tergal Morphology.* Fig. 4E. *Sipic* dorsal plate produced along lateral juncture with superior genital plate. Genitalia with terminally inclined elliptic flaps which jutt prominently caudad of the ductus terminus; ductal struts comprising about one-third of the entire ductal length. Similar only to *A. rubrolimbacosta* but differing in more robust elliptic flaps and more antrum-like juncture of superior plate to ductus bursae. Cervix bursae ventrally swollen; corpus bursae with broad-based signa typical of genus.

TYPES. Holotype female, COLOMBIA, north Colombia, Sierra Nevada de Santa Marta, Adams and Bernard Expedition, #2191 (see Appendix 1) leg. M. Adams and G. Bernard (BMNH)

DISTRIBUTION. Fig. 5. Currently known only from the area of the type locality and perhaps endemic (see Adams 1985).

REMARKS. There were many species from the Adams and Bernard Expeditions that were new to science. Adams and Bernard, in a series of papers, treated numerous new pronophiline Satyridae; Johnson and Adams included several new "elfin"-like Theclinae

(see citations in Johnson and Adams, in press). Having reviewed these extensive samples, it is fair to say there are undescribed species of Theclinae in the Sierra Nevada de Santa Marta from nearly every major eumaeine subgroup.

ETYMOLOGY. An arbitrary combination of Latin roots for "departing" and "angled", referring to the peculiar VHW band that distinguishes this species.

Angulopsis rubrolimbacosta

NEW SPECIES

Photoplate V,16; Fig. 2E,4F.

DIAGNOSIS. *Wings.* Stands out by the extremely jagged orange HW band (causing misidentification as Mexican "*Thecla guzanta* Schaus" in some collections) and in both sexes (particularly the female) bold red elements in submargin of VHW costa. Latter occur only as suffusive marks in some fresh specimens of the orange-banded "Subgroup 1" of the *simplica* Species Group of *Gigantorubra*. Any questions concerning such specimens can be solved by dissection; males of latter genus will show serrate inner margin on falces.

Morphology distinctive in males by robust valvae, with short terminolateral prong along margin of greatly shouldered bilobes, and thickened caudal extensions compared to most congeners; female with terminally flared superior plate similarly only to general habitus of *A. vioangulis* (from which it differs greatly in the wings) but much slimmer.

DESCRIPTION. *Male.* DFW, DHW gray-brown (grayer in fresh specimens), otherwise marked only with thin white HW marginal line; VFW, VHW with bright red-orange, very jagged appearing bands— FW band angled at cell CuA2/3A, HW because of interspersed orange basal suffusion at Sc+R1 element, along M1-M3 elements and finally the very jagged anal "W". Limbal area with *Thecla*-spot bright red-orange, red-orange beneath anal lobe and flush of orange costad where the submargin and HW costa abutt. FW length: 14.5 mm. (holotype), 15.0 mm. (paratype). *Female.* Similar to male but DFW, DHW slightly browner and with more broadly rounded wing shape, VFW, VHW similar to male but with bands appearing even more jagged and with HW costal red much brighter. FW length: 15.0 mm. (allotype), four paratypes 14.5 - 15.0 mm. *Male Genitalia and Tergal Morphology.* Fig. 2E. Brush organs abutting vincular dorsum. Genitalia with vincular ventrum quite rounded compared to congeners with with truncate, rather pointed, saccus. Valvae robust, bilobes greatly shouldered and with short terminolateral prong at the arch shoulder, caudal extensions quite thickened compared to congeners and tapering

in two steps to robust termini; aedeagus robust, length exceeding rest of genitalia by about caecum length, shaft and caecum bowed, caecum comprising about one-fifth of aedeagal length, terminus with single pointed cornutus. *Female Genitalia and Tergal Morphology*. Fig. 4F. *Sipc* centrolaterally rounded as generally typical of genus. Genitalia with wide elliptical terminolateral flaps distending terminal opening of ductus bursae; lamellae flared distinctly terminad and (at juncture with quite thin ductus bursae showing some extra lateral struts and strongly attached membranous material).

TYPES. Holotype female, allotype male, BOLIVIA, Prov. Sud Yungas, Dept. La Paz, junction of two rivers, 21 km. E. of Chulumani, 4050', 27 May 1989, leg. D. and K. Matusik (AMNH). *Paratypes*. BOLIVIA. Same data as primary types, two males (DMC); "Bolivia" [no other data], one male (BMNH); Chulumani, beginning of wet season, S. Cruz de las Sierra, 2000 m. December, leg. Steinbach, one female (BMNH); "Bolivia", [no other data]; "Thecla sp. 15" ex. Coll. Brabant 1926, J. J. Joicey Coll. BM 1929-435 (BMNH).

DISTRIBUTION. Fig. 5. Currently known from several localities in Bolivia (particularly the "yungas" region).

REMARKS. We suspect that it will not be difficult to locate additional specimens of this species because, at least at the BMNH, these were misidentified as *Thecla guzanta* (= *Thecla denarius* Butler and Druce). Specimens identified as these taxa occur in most synoptic Neotropical collections. *T. denarius* is a species with brilliant red on the VHW but which, structurally, belongs in a very different genus (see Johnson and Kroenlein in press). Considering the already described *Angulopsis strymonotis* and subsequent *A. calycopinotis*, it is obvious that *Angulopsis* species figure heavily in the eumaeine "look-alike" phenomenon. Reference should be made to Johnson and Kroenlein (in press a) which treats a multi-generic sequence of look-alike taxa all showing very produced and bright limbal markings but representing several generic assemblages. It is possible that this convergence toward brilliant orbiculate limbal markings is part of the well known eumaeine "false-head" phenomenon. Such species apparently gain some protection by the resemblance of the limbal HW area and adjacent tail to the insect head and antennae. Similar marks are noted in the speceis described immediately below.

ETYMOLOGY. Combining Latin roots referring to the brilliant red VHW band and adjacent red markings across the HW costal submargin.

Angulopsis ruborbiculis,

NEW SPECIES

Photoplate V,17; Fig. 4G.

DIAGNOSIS. *Wings.* VHW marked with huge red orbicular mark across cell CuA1 including adjacent areas of cell M2 (from HW postmedial area to margin); DHW marked with vivid violet blue across wing posterior of discal cell and with a black orb in the area dominated by the red-orb of the VHW.

Morphology. Habitus of female genitalia robust with a rather ovate and "gaping" ductus terminus, latter formed by paired hemispherical lamellae which laterally enclose the terminal ductus opening more than in other species.

DESCRIPTION. *Male.* Unknown. *Female.* DFW ground brownish black, slightly hued light lavender basally, HW with brownish black ground broken by vivid violet blue across wing posterior of top of discal cell (this violet patch broken by a black orb submarginal in cell CuA1); margins with vivid white and black line enclosing HW, HW vein CuA2 terminus with elongate tail, anal lobe not produced but marked very blackish. VFW ground beige, marked with red-orange postmedium band crossing entire wing, displaced basally after cell CuA2 and bordered distally with thin lines of black and white. VHW ground beige; medial band red (made tripartite by black and white distal edging) and with Sc+R1 element displaced distally about as much as the band width; band basal of vein M3 generally straight, then angled along veins M3 to 2A to a rather equilateral "W"-shape. Limbal area with huge red orbicular spot spanning postmedial to submarginal area of cell CuA1 (and adjacent cell M3), with red again abutting black anal lobe, intervening area suffused white and blue. FW length: 14.5 mm. (holotype). *Female Genitalia and Tergal Morphology.* Fig. 4G. *Sipc* with lateral edges undulate. Genitalia robust, fluted terminally to widely hemispherical paired terminal lamellae. Latter laterally robust, enclosing the terminal opening of the ductus bursae in a "mouthlike" fashion.

TYPE. Holotype female BRAZIL, Santa Catarina [no other data], J. J. Joicey Collection, deposited BMNH. ruborbiculus. BRAZIL. Santa Cruz, April 1907, leg. F. Birch, Rothschild Bequest, BM 1938-1.

DISTRIBUTION. Fig. 5. Currently known only from the generalized data of the type locality.

REMARKS. In the case of this distinctive species (and numerous others in the genus), a time period must now pass in which further specimens can be located at other museums and in the "Old Accessions" of the BMNH (see Johnson and Smith 1993). The senior author worked on *Angulopsis* taxa available in the curated BMNH and based on some synoptic material gathered from the "Accessions" on the main floor of BMNH Lepidoptera before the genus has been elaborated. This search by no means covered all the unincorporated BMNH material. Since the eventual holotype was clearly marked at the BMNH as "sp. nov." it is possible (given comments by Johnson and Smith) that this example was culled by some BMNH historical worker from a backlog of similar specimens elsewhere in the museum. Further, it is unclear whether there is also additional material of "red-banded" *Theclinae* species at the MPM. This material was also borrowed on an "example" basis a few years ago. Given the frequency of misidentification in these groups, borrowing on an "example" basis may be misleading and (as has been oft-noted) the Gagarin Collection at the MPM is fertile ground for SE Brazilian material.

ETYMOLOGY. The name combines Latin roots referring to the large red orbicular mark in the VHW limbal area.

Section Added in Proof.

Consistent with the Abstract's listing of species, a taxon below (*A. calycopinotis*) was the terminal entry in this revisionary study at the time of acceptance for publication. A reviewer, however, had suggested we investigate the type of *Thecla capeta* Hewitson and we had a chance to do this in 1992. We thus discovered that this "*Thecla*" species, *A. calycopinotis* and some other undescribed "blue-above" Neotropical species appear to comprise the seminal taxa of another species group in *Angulopsis*. Page proof offered us a chance to divide the text before *A. calycopinotis* and addend all these taxa as a final set of entries.

We do this below, but first add additional paratypes of *Angulopsis hernandezii*, *A. vioangulis* and *A. tucumanensis* also discovered since the completion of the original study.

Additional paratype, *A. vioangulus*. ECUADOR. Laysico, Santiago-Zamora, 1000 m., 21 November 1941, leg. D. L. Ladday, F. M. Brown Collection, 1 female (AMNH). **Remarks.** In 1993 the AMNH incorporated over 6000 new Neotropical Eumaecini specimens to its collections. These had been assembled

by the senior author (including preparation of old AMNH backlog). This specimen was contained therein.

Additional paratype, *A. hernandezii*. COLOMBIA. Rio Dagu, W. Colombia, leg. Rosenberg, 1 male (BMNH). **Remarks.** In 1992 the senior author was able to borrow miscellaneous BMNH material for identification; this specimen was included therein.

Additional paratype, *A. tucumanensis*. ARGENTINA. Tucuman, Sept., Brit. Mus. 1932-12, 1 male (BMNH). **Remarks.** Also discovered in miscellaneous material borrowed from the BMNH in 1992.

capeta Species Group

Species are of moderate size (usually FW 12.5 mm.-14.5 mm.) with vivid iridescent dark blue crossing the medial (or postmedial) to marginal areas of the DHW, otherwise contrasting dark blackish brown DFW, DHW grounds. VFW, VHW ground beige to brown; HW with two prominent tails. VHW pattern with red-orange medial band very thin and lineal, bent to a moderate "W" in the anal area (this reduction reminiscent of *Electrostrymon* like *E. nubes* H. H. Druce, see Johnson and Kroenlein in press, in press a). In some species thin lineal VHW band marked by additional basal suffusive color (yellow to orange) (as seen in VHW of *Electrostrymon* species like *E. endymion* Fabricius); limbal area with various development of orbicular marks, ranging from conservative red-orange CuA1 *Thecla*-spot to additional orbs in surrounding cells.

Angulopsis capeta (Hewitson)

NEW COMBINATION

Photoplate V, 18; Figs. 6A.

Thecla capeta Hewitson 1863-1878 [1877]: (1) 193; (2) pl. 77, fig. 614, 615; Godman and Salvin 1879-1901 [1887]: (2): 75 (see Remarks); Draudt, 1919: 795, pl. 158a; Comstock and Huntington 1958-1964 [1959]: 175; Bridges 1988: I.70; II.105, III.68.

DIAGNOSIS. *Wings.* Smaller than other "blue-above" *Angulopsis* of this group (12.5 mm.+) and, contrasting *A. politus* (smaller "blue-above" member of *autoclea* Group) with dark iridescent azure blue on VHW typical of *capeta* Group (*A. politus* DHW powder blue). Compared to group members, VFW, VHW pattern elements diminutive (thin, lineal, unsuffusive), concisely defined over light beige ground (reminiscent of the *Electrostrymon* habitus mentioned above under *capeta* Group).

Morphology showing female genitalia with robust terminal habitus, formed by relative short and thin ductus bursae dominated by expansive terminally flared lamellae (length of each distal lobe some two-thirds that of ductus length).

DESCRIPTION. *Male.* DFW,DHW ground blackish brown, DHW with patch of deep azure iridescent color across medial and limbal areas; HW with prominent tails at veins CuA1 and CuA2 termini, latter longer and with more prominent white tip; HW anal lobe orangish. VFW ground light beige; postmedian band thinly red-orange, extending from costa to cell CuA1; VHW ground light beige, medial band thin and concise, bordered only minimally with lineal black and white; Sc+Rl slightly produced but not greatly heterogeneous with rest of band; angled elements from veins M3 to 2A forming moderate "W"-shape. Submarginal ground generally concolorous beige; limbal area marked mostly by a red-orange Thecla-spot, adjacent cells only slightly suffused, if at all. FW length: 12.5-14.0 mm. *Female.* Marked similar to male except for more rounded wing shape and, on the DHW, widened blue patch of slightly lighter and less shiny blue than on male. FW length: 12.5-14.0 mm. **Male Genitalia and Tergal Morphology.** Brush organs abutting vincular dorsum. Genitalia with vincular arc more rounded than many congeners, saccus broad and parabolic. Valvae with bilobes robust (valval base in ventral view thus quite rounded) caudal extensions rather thickly tapered; aedeagus of moderate length, length exceeding length of rest of genitalia by about one-fourth, shaft and caecum bowed, caecum comprising about one-fifth of aedeagal length, terminus with a single pointed cornutus. **Female Genitalia and Tergal Morphology.** Fig. 6A. Typical of *Angulopsis* and seminal to inclusion of the species herein. *Sipc* with lateral margins produced near edge of superior genital plate. Genitalia with terminal two-fifths of habitus dominated by greatly expansive lamellae flaps, latter quite expansive compared to ductus bursae length (each lamellae lobe equally some two-thirds ductal length). Ductus bursae relatively thin and only slightly flared to the anterior to a simple cervix bursae; corpus bursae signa broad-based as typical of genus.

TYPES. Holotype female, BMNH, labelled "Nicaragua, Hewitson Coll. 79-69., *Thecla capeta* 1.", "type".

DISTRIBUTION. Fig. 5 [because of late addition to group, not elaborated beyond type locality]. However, from type data, assumed to have a primarily

Central American distribution with representatives into Colombia (Draudt, 1919).

REMARKS. At the suggestion of a reviewer, this species was examined subsequent to completion of the manuscript, then added in proof after further indication of the existence a species group within *Angulopsis* with dark blue DHW features. In retrospect, adding this species to *Angulopsis* is particularly interesting. Johnson (1991, 1992) in generic characters attributed to Calycopina genera (versus *Angulopina* genera [Johnson 1993]) used the undetached "W"-shaped anal element to generally denote the former and a "W"-element detached at the cell M3 crossbar to denote the latter. Draudt's 1919 figure of *capeta* clearly shows an angulopine wing band but the species is figured to the immediate right of a number of calycopines. Considering this plate, it should also be pointed out that, as noted by Johnson (1991) and Johnson and Kroenlein (in press a), members of the genus *Profieldia* Johnson (Draudt 1919, pl. 158, "*Thecla*" *netesca*, *vesper*) also are accurately portrayed in Draudt with their small, and very finely jagged anal "W". Thus, even though *Thecla capeta* was not immediately noted by us as a possible member of *Angulopsis*, its wing characters in retrospect are compatible with the diagnosis that is obvious from the genital habitus. It should also be noted that Godman and Salvin 1879-1901 [1887] suggested that the type of *capeta* might be a male. This view typifies what has been pointed out by Bálint (1993) and the senior author (in numerous papers cited in Johnson and Kroenlein, in press a). The initial historical misdiagnosis of many females as males has effectively masked the existence of many lycaenid groups. Godman and Salvin undoubtedly thought the type of *capeta* might be a male because of the bright, but dark, blue DHW colors. If it was a male, its characters would make sense for the group they had misplaced it in— *e.g.* calycopines. But, *capeta* is not a calycopine and its VHW band (together with its obvious genitalia) is typically angulopine. Thus, for the overall diagnostic value of this citation it has been worth addending the *capeta* Group here. There may be many more taxa in this group, just as Johnson (1993) has provided a list of taxa possibly belonging to a "blue-above" group of *Gigantorubra*.

Angulopsis calycopinotis,
NEW SPECIES

Photoplate V,19; Fig. 6B.

DIAGNOSIS. *Wings.* DFW,DHW faint light blue throughout; VHW band widely orange-yellow basally but with bright tripartite distal black and white elements so

thin as to make angled pattern from vein M3 to 2A appear "falsely" disjunct from rest of band, much like species of genus *Calycopis*. Limbal area similarly *Calycopis*-like with orbs in cells M3, CuA1 and CuA2 boldly orange.

Morphology. Female genitalia outstanding in the extremely shortened flaplike terminus of the ductus, these comprising only about 1/16 of ductal length and with their overall lateral breadth only about one-half the length of the ductal struts.

DESCRIPTION. *Male.* Unknown. *Female.* DFW,DHW ground dull blue-violet marked darker blackish along FW apex and chevrons of suffusive black in the submargins of HW; HW with short stout tail at vein CuA1 terminus; HW anal lobe unapparent. VFW ground warm brown; postmedium band of yellow orange, tripartite with distal black and white lining extending from costa to cell CuA2, thereafter angled greatly basally; VHW ground warm brown; medial band widely bright yellow-orange along base, distally with thin black and white edging showing little emphasis of Sc+Rl element and superficially appearing as if angled elements veins M3 to 2A are detached in a W-shape from the rest of band; limbal area with orange lunulate marks in all submarginal cells but most prevalent as orbs in M3, CuA1 and CuA2. FW length: 14.0 mm. (holotype). **Female Genitalia and Tergal Morphology.** Fig. 6D. *Sipc* typical of genus but slightly more robust and angulate along lateral margins. Genitalia with terminal lateral flaps extremely diminutive and fingerlike (overall length of flaps only about 1/16 that of ductal length and one-half that of strut length).

TYPES. Holotype female, PERU, Huanca-bamba, Cerro de Pasco, NE Peru, further labelled "Calycopis sp. not, named, BM" (see Remarks), deposited BMNH.

DISTRIBUTION. Fig. 5. Currently known only from the type data.

REMARKS. This species was marked "sp. nov." in the BMNH among *Calycopis* but is clearly a member not of the Calycopina but Angulopina. The senior author was fortunate enough to study this specimen even though it was placed in the "wrong group"—a testimony to the fact there may be other such widely misplaced angulopines but "you can't do everything". Given the location of the specimen in the BMNH, it is possible that there are additional specimens of this species as well as additional species of the species group.

ETYMOLOGY. Adds the Latin suffix denoting "marks" to *Calycopis*, referring to the external similarity of this *Angulopis* species to the taxa of the former group.

Angulopis suarezensis,
NEW SPECIES

Photoplate V,20; Fig. 6C,D.

DIAGNOSIS. *Wings.* DFW,DHW blackish, DHW with broad band of dark iridescent blue reminiscent of *A. capeta* but broader. Differing completely on the VFW,VHW—ground gray-brown with crisp bands of yellow-orange with black edging; VHW band greatly diminished in cell M2 like no other congener, giving the appearance of a clear break in the band before the anal "W"-shaped element. "W"-shaped element appearing as a very broad "W", component angles being much more obtuse than on congeners.

Morphology. Male genitalia outstandingly robust on the valve ventrum, bilobes showing greatly produced shoulders followed by a recurvate taper to thin caudal extensions with fingerlike termini (an overall habitus more like members of the calycopine genus *Klaufera* or some *Calystryma* [see Johnson 1991]); female genitalia showing robust habitus typical of group with terminal lamellae less than in *A. capeta* (e.g. comprising only about one-third of overall genital length).

DESCRIPTION. *Male.* DFW,DHW ground dull blue-violet marked darker blackish along FW apex and chevrons of suffusive black in the submargins of HW; HW with short stout tail at vein CuA1 terminus; HW anal lobe unapparent. VFW ground warm brown; postmedium band of yellow orange, tripartite with distal black and white lining extending from costa to cell CuA2, thereafter angle greatly basally; VHW ground warm brown; medial band widely basally bright yellow-orange, distally with thin black and white edging showing little emphasis of SC+Rl element and superficially appearing as if angled elements veins M3 to 2A are detached in a W-shape from the rest of band; limbal area with orange lunulate marks in all submarginal cells but most prevalent as orbs in M3, CuA1 and CuA2. FW length: 14.0 mm. (holotype). *Female.* Marked similar to male but DFW,DHW both with hue of violet-gray iridescence, DHW with this much more pronounced across medial to limbal area. **Male Genitalia and Tergal Morphology.** Fig. 6C. Vincular dorsum with brush organs extending to base of labides. Genitalia with vincular ventrum angulate, saccus of moderate length and parabolic. Valvae with bilobes widely shouldered, producing a very robust, nearly hemispherical shape over the

anterior one-half of nabitus; caudal extensions steeply tapered in "two-step" fashion to fingerlike termini. Aedeagus robust, caecum comprising some one-fourth aedeagus length and not displaced out of plane of shaft; both shaft and caecum slightly bowed; terminus with single bifurcate cornutus. *Female Genitalia and Tergal Morphology*. Fig. 6D. *Sipc* typical of genus. Genitalia with ductus bursae robust, swollen into broad antrum in caudal one-third and flanked laterally by widely hemispherical terminal lamellae that comprise the superior plate. Otherwise differing little from other members of the group.

TYPES. Holotype male, COLOMBIA, Rio Suarez, Santander, 900-1000 m., 11-28 August 1948, leg. L. Richter, at AMNH; allotype female Soccoro, Santander, nod, J. J. Joicey Coll., at BMNH.

DISTRIBUTION. Fig. 5. Currently known from only two localities in Colombia.

REMARKS. This is perhaps one of the most distinctive species of the genus because of the peculiar facies of VHW band and the gray-hued ground color. In fact, when first viewed, specimens invite question concerning possible membership in the genus and only dissection confirms their typical genitalia. It should not be difficult to locate further specimens of this distinctive entity.

ETYMOLOGY. Named for the locality of the primary type.

Angulopsis suggestis,

NEW SPECIES

Photoplate V,21; Fig. 6E,F.

DIAGNOSIS. *Wings.* DFW,DHW differing from all congeners in being widely and brightly iridescent sky blue, colors not at first associable with the genus; VFW,VHW however typical of genus except for VHW band being thinner, basically gray-brown and with a wider and more anally distended "W"-element (reminiscent of species of the *Thecla coelicolor*-Group of Draudt 1919 or brown *Angulopsis obscurus* of previous entry).

Morphology. Female genitalia robust as typical of other species in group, in this case with ductus bursae length about equal to total lateral expanse of superior plate, latter with terminally flared elliptic lamellae flanking robust ductus slightly flared toward terminus (maximal width about one-fourth that of terminal lamellae).

DESCRIPTION. *Male.* DFW,DHW ground bright sky blue from base to submargins, margins

rimmed by blackish borders slightly more expansive at the apices. HW with short stout tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal blackish-brown and not greatly produced. VFW ground warm brown; thin postmedian band of gray-brown extending from only slightly produced Sc+R1 element to cell CuA2, thereafter angled somewhat basally; VHW ground warm brown crossed by thin medial gray-brown band angled in distended fashion toward anal area where elements in veins M3 to 2A form pronounced "W"-shape. Limbal area generally unicolorous with only marks a orangish Thecla-spot and slight chevron-like marks of brown suffusion in the adjacent cells. FW length: 13.5 mm. (holotype). *Female.* DFW,DHW with darker blue iridescent (but still bright blue) and extending distally only past postmedial area on both wing; VFW,VHW similar to male but with pattern slightly more expansive because of the rounder wings typifying females of genus. *Male Genitalia and Tergal Morphology.* Fig. 6C. Habitus less robust than other group members though still with vincular ventrum less angled than taxa of other groups, saccus parabolic; valvae robust with rather even tapered habitus from parabolic bilobes, caudal extensions exceeding bilobes length by about X2. Aedeagus robust, exceeding rest of genitalia by about caecum length, both caecum and shaft slightly bowed. *Female Genitalia and Tergal Morphology.* Fig. 6A *Sipc* typical of genus but slightly more robust along lateral margins. Genitalia robust as typical of species group with ductus bursae length about equal to total lateral expanse of superior plate, latter with terminally flared elliptic lamellae flanking robust ductus slightly flared toward terminus (maximal width about one-fourth that of terminal lamellae); corpus bursae with platelike signa showing marginal dendritic sclerotizations typical of genus.

TYPES. Holotype male, ECUADOR, Puyo, Napo-Pastazza, 7 December 1932, E. I. Huntington, marked "? sp."; allotype female, PERU, Pampa Hermosa, 1600 m., 5-11 June 1935, leg. F. Woytkowski, F. M. Brown Coll., both deposited AMNH.

DISTRIBUTION. Fig. 5. Currently known from localities in Ecuador and Peru (see Remarks).

REMARKS. This species was marked "? sp." by Comstock and Huntington in the AMNH. The sexes are so close by pattern and so outstanding from congeners that we have not been reluctant to establish types from two distant localities. The blue color of this species suggests that there may be a clade of undescribed taxa still to be attached to *Angulopsis* which show such bright DFW,DHW facies. It is also notable that the VFW,VHW markings of this species are much like those of a brown DFW,DHW

Angulopsis described herein from southeastern Brazil. This may be part of the phenomenon of there being other subgroups within this diverse genus which still need to be associated as congeners and more fully elucidated.

ETYMOLOGY. From the Latin "*suggestus*" referring to the possibility that further very blue species like this one still require addition to this diverse genus.

Summary Comments

Angulopsis is obviously an extremely diverse genus. In this paper we have described all the entities known to us that are referable to this monophyletic group. The elaboration of these species follows on searches of material at many depositories. However, it is apparent from the few specimens representing some of the species that knowledge of the genus suffers from general sampling error and the problems of unsorted backlogs at many museums. Further review of unsorted and unprepared materials at these and other institutions will be needed to buttress the type series of some of these taxa. Such searches nearly always prove fruitful because so much material has been set aside when initial identifications could not be made and this quantity escalates over the years. Also, at many institutions there are backlogs of material from regional expeditions and collectors that are unsorted even to family. As an example of *Angulopsis* material in such samples an addended Appendix 1 describes a new species from the early Miles Moss (Brazil, Pará) collections at the BMNH. This species is also significant because of its "look-alike" status with a noncongener.

Readers of this revision will undoubtedly give some thought to the separation of *Angulopsis* from *Gigantorubra* (Johnson 1993) described immediately before the present paper. We were unaware of this differentiation when we started the work on *Angulopsis*. Discovery of the two groups, separated (among other characters) by the serrate falces in males of *Gigantorubra*, presented itself again and again as we dissected material and compared it to superficial wing pattern differences. What emerged was the consistent wing pattern differences summarized in Fig. 1 of both studies. However, we are aware that if workers do not identify their material properly in the first place, they may be faced with the initial confusion that confronted us. At first we saw no consistency in the mixed series of *Angulopsis* and *Gigantorubra* at all museums. However, once the serrate falces and distinctive VHW pat-

tern of *Gigantorubra* emerged, it was relatively easy to separate the taxa even without dissection. We summarized many clues in Fig. 1 ("clues" because diversity of taxa in both genera, as with many Eumacini, somewhat clouds generality). However, the most useful one to us was the produced Sc+R1 element followed on the wing by wide banded costal elements in *Gigantorubra*. These make the "W"-shaped element in *Gigantorubra* appear less outstanding than in *Angulopsis*, where it dominates the VHW habitus. We are confident that anyone who studies enough material will recognize this same distinction. *Angulopsis* and *Gigantorubra* are sister groups, but distinguishing them (particularly considering the spectacular taxa of the *exotissima* Species Group of *Gigantorubra*) allows recognition of two groups of approximately twenty species each instead of a huge grade. With a huge grade (e.g. all as "*Angulopsis*") there would be no resolution of what characters typify *Angulopsis* in a data matrix (serrate falces or non-serrate falces, etc.).

From our correspondence, we are aware that workers finding the greatest utility to genera such as those mentioned above are South and Central American workers who are active "at the scene", have volumes of material to sort, and are willing to dissect to confirm identifications. North American workers with a general interest in "*Thecla*" and samples usually culled from collections or purchases based on Draudt (1919) (or other early lists) find the matter more confusing. This is generally because of sampling error. For instance, it is doubtful that any of these workers would have specimens of the *exotissima* Group of *Gigantorubra*. Thus, they might want to lump the remaining *Gigantorubra* with the smaller *Angulopsis*. Further, we find that such workers often actually do not read recent revisionary work but simply criticize it at face value based on their expertise on "*Thecla*" drawn from Draudt or other early lists. This kind of activity will probably persist for a long time but should not hamper investigations that elaborate voluminous new material from the backlogs at many worldwide museums. Even more species can be expected to be added in the future. For example, a knowledgeable anonymous reviewer called our attention to *Thecla capeta*, a species even we had overlooked. This opened an entire new group to membership in *Angulopsis* and demands that we go back and "look again" at the backlog material at many institutions. Another worker, reviewing the paper for us prior to submission, send photographs of undescribed *Angulopsis* from his region which he intends to describe based on the present work. We anticipate the same will true for many regions, particularly those known for endemism.

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APPENDIX I

Angulopsis, Thecla echinita Schaus 1920, and a new species from the Miles Moss Collection (BMNH).

We have been aware from AMNH identifications of eumaeine specimens by Comstock and Huntington that *Thecla echinita* Schaus (1920a) most probably belongs in *Angulopsis*. The type of *T. echinita* is at the NMNH (NMNH #5946). Since AMNH requests for NMNH eumaeine material have gone unanswered for several years, we have been unable to check this. However, it is likely that the combination *Angulopsis echinita* (TL Orizaba, Mexico) pertains. It becomes relevant because in the unincorporated Miles Moss material at BMNH there is a somewhat similar entity from eastern Brazil. However, since the Brazilian material differs in wing and genitalic characters from material identified as *echinita* by Comstock and Huntington from as far south as Colombia, it appears that the Moss specimens represent an undescribed species. This would be compatible with the distributions of sister taxa demonstrated by Johnson and Sourakov (1993) in which, amongst a clade of superficially similar taxa different greatly in genital and tergal characters, eastern Amazon basin entities were distinct from (even if sympatric with) entities from the Guyana Shield/Colombia. Thus we describe the new entity immediately below.

Angulopsis mossi,
NEW SPECIES

Photoplate V22, Fig. 6G.

DIAGNOSIS. *Wings.* Closest to *A. echinita* (if known to a lepidopterist) but most often misidentified as *Reversustus puppius* (Godman & Salvin) a brown noncongener. *A. mossi* is warm brown on DFW,DHW and, on VFW-VHW, shows a strong brown ground interspaced between darker brown to blackish veins and crisp basomedially-oriented HW and postmedial FW bands accented by vivid white edging. Whiteness of the bands causes the confusion with *R. puppius* and one must note that the "W"-shaped anal element is contiguous in *A. mossi* to properly place it as an angulopine. On *R. puppius*, the "W"-element is broken from the rest of the band at cell M3 but, as noted by Johnson (1991a), is relatively compact compared to other calycopines (see Remarks).

Morphology. Female genitalia reminiscent of *A. echinita* (in turn reminiscent of *A. ceromia* although totally dissimilar in the wings) but with much longer ductus bursae and with an antrumlike configuration supporting the more membranous convolutions along the anteriobasal margins of the lamellae.

DESCRIPTION. *Male.* Unknown. *Female.* DFW,DHW ground warm auburn brown, margins rimmed by thin blackish borders. HW with short stout tail at vein CuA1 terminus, longer tail at CuA2 terminus; HW anal lobe blackish-brown. VFW,VHW with dark auburn brown ground interspaced between darker to blackish veins; FW with thin postmedian band dominated mostly by black and white edging from costa to cell CuA2; HW with basomedial band of same color but with white appearing bolder, appearing jagged across the wing posterior of Sc+R1 element to anal area where elements of veins M3 to 2A form succinct "W"-shape. Limbal area marked with bolder orangish Thecla-spot and slight chevron-like marks of brown suffusion with distal and/or basal white in the adjacent cells. FW length: 13.5 mm. (holotype). **Female Genitalia and Tergal Morphology.** Fig. 6G *Sipc* typical of genus but quite robust along terminolateral margins. Genitalia elongate, ductus bursae length exceeding width of lamellae by x2 and with terminus swollen caudally to an antrumlike configuration which, along base with the lamellae distad, shows prominently ridged (or convoluted) membranous material as in *A. ceromia*. Specimens identified by Comstock and Huntington as *A. echinita* (Figs. V23; 6G, right) show this ridged terminus base but in a short and robust configuration much like *A. ceromia* (see Remarks); corpus

bursae with platelike signa showing dendritic sclerotization along the margins as typical of genus.

TYPES. Holotype female, BRAZIL, Pará (=Belém), leg. A. Miles Moss, deposited BMNH. **Paratypes.** Same data as primary types, 4♀♀ (BMNH) (see Remarks).

DISTRIBUTION. Fig. 5. Currently known from Miles Moss's historical collecting locality, Pará, Brazil.

REMARKS. This species was marked as a "sp. nov." but with *Thecla puppius* at the BMNH. Attention needs to be drawn to a series of *puppius*-like species which contain members of several genera (Johnson and Kroenlein, in press a). As noted therein, a produced or highly colored Thecla-spot and VHW band of basomedial orientation and whiter band and limbal accents characterizes these several species. The rather phenomenal superficial resemblance of these species, with morphologies hardly alike, may result from selective pressures toward the "false-head" phenomena in Theclinae. Of taxa with such tendencies, *A. mossi* is not particularly striking compared to those noted in Johnson and Kroenlein (in press a) and so was added here. However, the tendency is notable, testified in part by the BMNH's initial identification as *T. puppius* and in part by the differentiation of *A. mossi* from putative *A. echinita* (Fig. V23) by the *A. mossi*'s tendencies toward more extreme limbal characters. Regarding this, the rather similar female genitalic habitus shared by *A. mossi*, *A. ceromia* and putative *A. echinita* deserves mention. If there is a selective pressure operating on Theclinae to push toward more pronounced limbal orbs and colors, such pressure could be responsible in the *ceromia* clade for steering *A. mossi* and *A. echinita* gradistically away from the orange bands typical of the genus and *A. ceromia*. It is interesting because, in a vacuum, the resemblance of female genitalia in the three species would be apparent but not suggest any particular causal factor concerning the differences in the wings. However, when one notes that the pattern differences are emphasized in the limbal area, the association becomes apt.

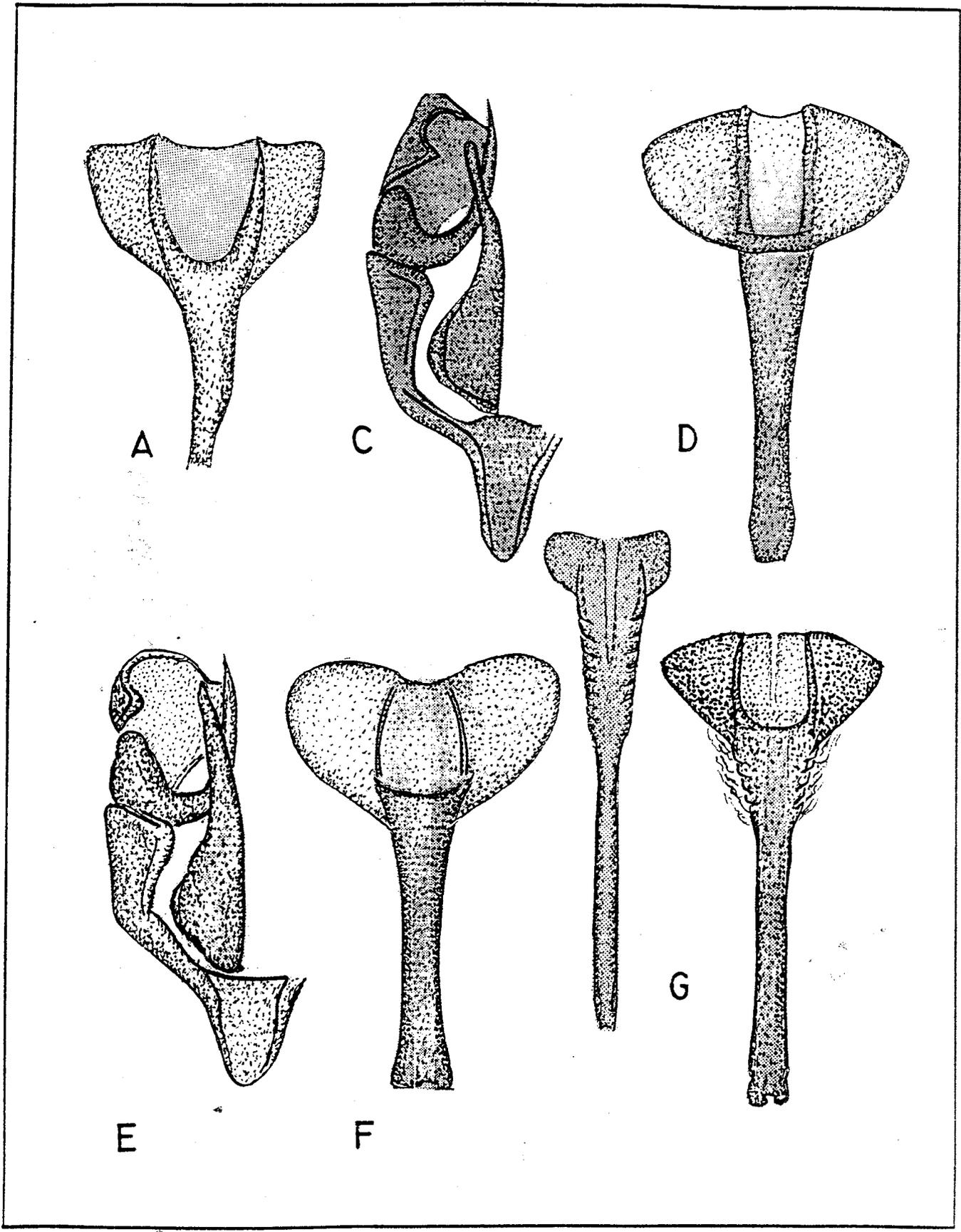
I was unable to locate males of this species but am sure that they must be present in the uncurated specimens of Moss which remain at the BMNH.

ETYMOLOGY. Named for the collector of the types, A. Miles Moss. Moss's longterm residence and collecting in and around Pará, Brazil, produced one of the finest samples of thecline diversity available for study (see additional unique species collected by Moss in Johnson 1993).

Fig. 6. Morphology of Additional *Angulopsis* Species

Format: females with genitalia shown in ventral view, terminus directed alternately left (A), right (B) etc. Features: male— a, genitalia in ventral view (1, valve bilobed configuration, 2, valve caudal extension) enclosed by b, bilateral half of vincular arc and c, saccus; female— a, ductus bursae from winglike lamellae to cervix bursae, b, winglike superior lamellar plate, c, ductal struts, d, lateral view, terminal tergite, terminus directed right.

- A. *Angulopsis capeta*, holotype female (BMNH).
- B. *Angulopsis calycopinotis*, see Fig. 3G (removed to *capeta* Group here).
- C. *Angulopsis suarezensis*, holotype male (AMNH).
- D. *Angulopsis suarezensis*, allotype female (BMNH).
- E. *Angulopsis suggestis*, holotype male (AMNH).
- F. *Angulopsis suggestis*, allotype female (AMNH).
- G. *Angulopsis mossi*, holotype female (BMNH) (left); right, genitalia of AMNH Colombian specimen probably attributable to tentative combination *Angulopsis echinita*.



APPENDIX II

New Species of *Angulopsis* Added at Proof

Dr. Jorge Llorente-Bousquets (Museo de Zoología, Mexico City) has visited the AMNH several times and identified and recorded data on specimens from Mexico. The senior author has made an effort to track such curations and note new additions to the Mexican Lycaenidae at the AMNH. In curating Hoffman material, a series of large *Angulopsis* from Colima represents a new species. These were misidentified by Comstock and Huntington as *A. sangala*, the small BMNH type of which is a synonym of *Thecla autoclea* (as noted in previous entries). The new species is therefore described as follows.

Angulopsis llorentei,
NEW SPECIES

Photoplate V23, Fig. 6H.

DIAGNOSIS. *Wings.* Both sexes large (14.0 - 15.0 mm.) and with HW angulate compared to congeners. VHW with medial red-orange band over very light beige ground, showing a distinctive posterior tapering to a greatly produced "W"-element (making the band appear as a widening "sweep" toward the "W" and the "W" itself very large and greatly extended distally over the anal area of the wing compared to congeners). Male DFW, DHW brown (but lighter than *A. autoclea*), female DHW strewn ill-defined light bluish white (not the crisp powder blue of *A. politus*).

Morphology. Male genitalia showing distinctive short caudal extensions contacting rounded bilobes and terminating with a small hooklike element unknown in any congener. Female genitalia with elongate ductus bursae terminating with club-ended lamellae, latter with expanse very small compared to congeners.

DESCRIPTION. *Male.* DFW, DHW ground light auburn brown rimmed by thin blackish marginal lines. HW angulate at anal area, with short stout tail at vein CuA1 terminus, long tail at CuA2 terminus; HW anal lobe brown edged slightly black. VFW, VHW ground light beige; FW with tapered red-orange postmedian band showing mostly white edging from costa to cell CuA2; HW with distinctive red-orange medial band widening in a tapered fashion to a greatly produced "W"-element in the anal area (making the band appear as a widening "sweep" toward the "W" and the "W" itself very large and greatly extended distally over the anal area of the wing compared to congeners). Limbal area with light gray-blue suffusion through submargin cells, rimmed internally with

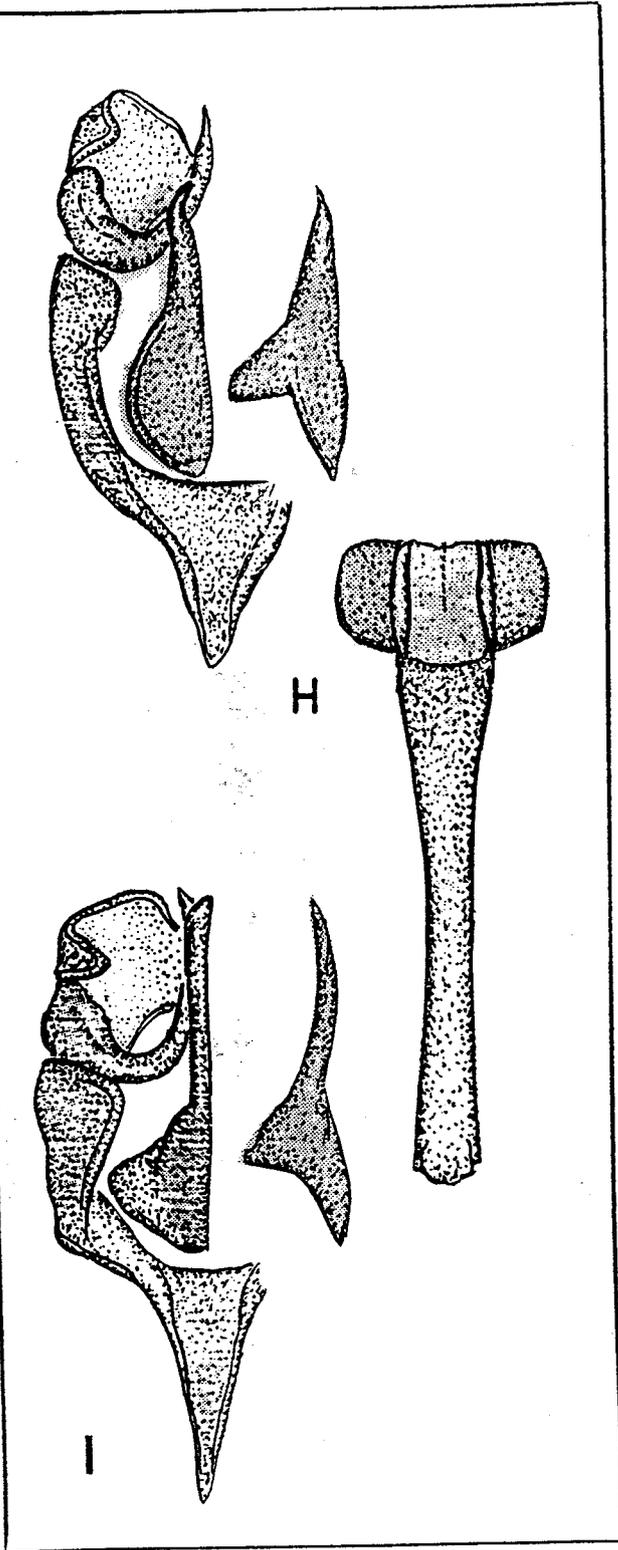


Fig. 6H,I. Morphologies of *Angulopsis llorentei* (H) and *A. constantinoi* (I).

Same features as Fig. 6. H, holotype male, allotype female (AMNH); I, holotype male (MCNB).

chevron-like marks encircling a produced red-orange Thecla-spot at CuA1. FW length: 14.5 mm. (holotype), 13.5-14.5 mm. (paratypes). *Female*. Size, wing shape and VFW, VHW similar to males; DHW with suffusive silvery blue extending from submedial area to indistinctive border with brown marginal suffusion. FW length: 14.5 mm. (allotype), 13.5-15.0 mm. (paratypes). *Male Genitalia and Tergal Morphology*. Fig. 6H. Habitus rather typical of *autoclea* Group and reminiscent of *A. politus* with vincular ventrum less angled than taxa of other groups, saccus parabolic (but quite long) and valvae relatively short and robustly elliptic at base. However, valvae otherwise with caudal extension abruptly tapered from bilobes and terminating in an inwardly directed hook not seen in any congener. Aedeagus robust, exceeding rest of genitalia by caecum length or slightly more, both caecum and shaft slightly bowed. *Female Genitalia and Tergal Morphology*. Fig. 6H. *Sipc* typical of genus but quite robust along terminolateral margins. Genitalia elongate, ductus bursae length exceeding width of lamellae by x2 and with terminus compact and "club"-like, with relatively small hemispherical lamellae flanking a robust ductus terminus with a rather squarish medioventral opening; corpus bursae with platelike signa showing dendritic sclerotization along the margins as typical of genus.

TYPES. Holotype male, allotype female, MEXICO, Colima, April 1918, deposited AMNH. *Paratypes*. Same data as primary types, 6♂♂, 4♀♀ (AMNH).

DISTRIBUTION. *Spatial*: currently known from a Colima, Mexico, series. Certainly more widely distributed. *Temporal*: known only from the April type series.

REMARKS. The lectotype of *Thecla sangala* Hewitson (Venezuela) at the BMNH (Johnson 1991a) is a small specimen with a light VFW, VHW ground otherwise identical with *Thecla autoclea* Hewitson. The light ground probably is what led Comstock and Huntington to label the above series as "*sangala*". Given the size of the type series, the species is obviously represented elsewhere in collections. In reviewing this uncurated material, the following records of *A. ceromia* were also added: NICARAGUA, SE Managua, January 1976, leg. R. A. Anderson, 6♂♂, 6♀♀ (AMNH); COSTA RICA, Hacienda el Rodeo, 900', 2 April 1946, leg. F. M. Brown, 3♀♀ (AMNH).

ETYMOLOGY. Named for Mexican lepidopterist Dr. Jorge Llorente-Bousquets.

In ongoing correspondence with Colombian lepidopterists, Jean Francois LeCrom (Bogotá) informed me of perhaps the most distinctively marked *Angulopsis* species known. Contrasting every other congener, some which show iridescent blue on the DHW, this species is brilliant tawny-orange across the distal two-thirds of the DHW but with typical *Angulopsis* markings beneath. The species is named below to honor the active Colombian lepidopterist Luis Constantino (Bogotá). Mr. Constantino's work on Colombian Satyridae is well-known but he has also actively collected Theclinae in Colombia and secured a number of undescribed species.

Angulopsis constantinoi,
NEW SPECIES

Photoplate V24, Fig. 6I.

DIAGNOSIS. *Wings*. Small (alar 8.0 mm.) with DHW brilliant tawny-orange over distal two-thirds of wing contrasting DFW, DHW blackish ground. VFW, VHW with gray-beige ground and typical *Angulopsis* markings—FW with red-based postmedian band, HW with continuous red-based (white and black edged) jagged medial band forming a "W" in anal area.

Morphology. Male genitalia distinctly angulate shoulder at valve base, narrow caudal extension fluted terminally as in no other congeners; saccus elongate.

DESCRIPTION. *Male*. DFW, DHW blackish brown except for bright tawny-orange over distal two-thirds of HW; HW with short tail at CuA1 terminus, long tail at CuA2 terminus; HW anal lobe unapparent. VFW, VHW ground light beige-gray, FW with thin lineal red-based postmedian band edged with white and black extending from costa through cell CuA2; HW with jagged medial band showing more basal red-orange than FW band, proceeding across wing as typical of genus after slightly displaced Sc+R1 element to moderate "W"-shaped element in anal area. Limbal area conservatively marked with some lighter ground and red-orange Thecla-spot at CuA1. FW length: 8.0 mm. (holotype). *Female*. Unknown. *Male Genitalia and Tergal Morphology*. Fig. 6I. Stout brush organs along vincular dorsum to base of labides. Genital habitus rather typical of *autoclea* Group in vincular features but with saccus pointed and slightly more elongate than congeners. Valvae very unique—bilobes with extreme lateral shoulder, then with abrupt transition to narrow caudal extensions which are fluted caudally to comparatively wider termini. Aedeagus elongate and narrow compared to most congeners, length exceeding rest of genitalia by some one-fourth and terminating with cornuti typical of the genus.

TYPES. Holotype male, COLOMBIA, Remolino, Meta, 400 m., 20 March 1989, leg. J. F. Le Crom, "flying at 3 m. height around an aisled tree in Blancos Savannah at the end of the dry season", deposited Instituto de ciencias Naturales, Museo de ciencias Naturales, Universidad Nacional Bogotá, Colombia (MCNB). *Paratype.* Same data primary type, 1♂ (Le Crom Collection, Bogotá).

DISTRIBUTION. *Spatial:* currently known only from the type locality. *Temporal:* currently known from March type data.

REMARKS. This is a remarkable species about which we can hope to know more in the future. It is extremely small but aside from the brilliant tawny-orange DFW which readily separates it from other taxa

of the genus is otherwise generally typical of congeners in wing pattern and genital habitus. The fluted valvae, however, are unique for *Angulopsis* although autapomorphies of the valve termini are not unusual among congeners (see hooklike terminus of Mexican *A. llorentei* described just above). *Angulopsis constantinoi* is an example of the kind of diversity becoming apparent in many groups of Neotropical Theclinae once the abundance of interesting species in the hands of local collectors becomes available for study.

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