Neotropical Hairstreak Butterflies: Genera of the "Calycopis/Calystryma Grade" of Eumaeini (Lepidoptera, Lycaenidae, Theclinae) and their Diagnostics

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IN MEMORIUM

Alvin M. Johnson, Department of Geography and Museum of Natural History, University of Wisconsin, Stevens Point, 1965-1977.

Dr. Kurt Johnson was a graduate, Woodrow Wilson Fellow and James H. Albertson Award recipient at the University of Wisconsin, Stevens Point, 1968-1969.

Prefatory Note to Curators and Collectors

Lepidopterists interested mostly in the butterflies are accustomed to making ready identifications from salient wing pattern characters. This fact makes the study of butterflies one of the most enjoyable among entomological subjects.

Although one could note examples from each of the butterfly families where such methods of identification pose problems, certainly the large Calycopis/Calystryma grade of the Eumaeini has been largely ignored by workers because of uncertainty about wing pattern characters. After studying thousands of specimens from this grade, I have found that some wing characters are generally useful-- particularly patterns of sexual dimorphism and certain extralimital wing characters that identify particular genera or species. However, as is customary in groups of Lepidoptera with confusingly similar wing patterns, the utility of pattern characters tends to increase with the worker's expertise and the truly trustworthy diagnostic characters are structural.

In my presentation of results concerning the large Calycopis/Calystryma grade, it has not been my intention to create a taxonomy based on complex or "miniscule" morphological characters. To the contrary, readers will note that structural groupings in the grade are quite outstanding.

The general intent of this study is to allow workers to determine the generic identities of their local populations by a few dissections. Given the species diversities in the few well-studied groups of the grade, and the propensity of undescribed entities, it is likely that many workers will discover new species in their regions. It will be important for them to call these discoveries to the attention of the general lepidopterological community. Hitherto, lack of knowledge has made local recognition of taxa in this grade largely impossible. Also, it has caused some of the more spectacular taxa to be poorly represented in collections.

Readers will note that I have also devoted numerous pages to elucidating the outgroups. Hitherto, many of these have been poorly known and almost unidentifiable. Since the type specimens of these had been examined and dissected in the course of this study, there appeared little reason not to present a formal nomenclature.

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ABSTRACT

The large and hitherto mostly undescribed "Calycopis/Calystryma grade" of the Eumaeini (including members from 12 "*Thecla*" species groups of Draudt, 1919, and 68 other taxa historically clustered by superficial wing pattern similarities) is divided into 20 monophyletic genera based on dissection of some 1500 specimens emphasizing multiple male/female pairs with duplicate field data. Keys and illustrations concerning adult wing pattern and male and female morphology are provided.

Genera treated include *Calycopis* Scudder, *Iaspis* Kaye, *Calystryma* Field, *Tergissima* Johnson and *Femniterga* Johnson along with fifteen new genera (in order of treatment) *Serratofalca*, *Klaufera*, *Gigantofalca*, *Distissima*,*Serratoterga*,*Terminospinissima*,*Cyanodivida*, *Furcovalva*, *Morphissima*, *Fieldia*, *Kroenleina*, *Antrissima*, *Reversustus*, *Mercedes*, and *Argentostriatus*. The genera are widely sympatric and mostly pan-Neotropical; a few have distributions limited to particular neotropical subregions. The average species number per genus is nine (range three to thirty). Four major structural groups (or clades) are noted among the genera. Two of these contain seventeen of the genera and appear to be sister groups. Members of the other two appear more structurally related to hairsteaks of dissimilar wing pattern not traditionally associated with the grade.

Based on examination of type specimens, taxa originally described in eumaeine grades "*Thecla*", "*Tmolus*" and "*Bithys*" are transferred to new genera as appropriate and lectotypes designated for eleven taxa. In order of treatment, generic combinations (listing **new combinations** and **new species**), are as follows. New **lectotypes** are parenthetically noted as (L); species numbers as (n1 [total species], n2 [species documented but currently undescribed]).

Clade I.

Calycopis (30,5). *cecrops* (Fabricius), *bactra* (Hewitson), *nicolayi* Field, *caulonia* (Hewitson), *jeneirica* (Felder), *chacona* (Jorgensen), *lerbela* Field, *torqueror* (Druce), *isobeon* (Butler and Druce), *susanna* Field, *drusilla* Field, *vibulena* (Hewitson), *vitruvia* (Hewitson), *bellera* (Hewitson), *partunda* (Hewitson), *amplia* (Hewitson), *anfracta* (Druce), *anastasia* Field, *fractunda* Field, *gigantea* Johnson, Eisele and MacPherson ["Johnson et al."], *crena* Johnson et al., *dragones* Johnson et al., *argenopuncta* Johnson et al., *nancea* Johnson et al., *valparaiso* Johnson et al. Five other species were documented but are currently

undescribed (hereafter in the Abstract noted simply as "undescribed").

Calystryma (16,4). *keta* Field, *blora* Field, *malta* (Schaus), *gentilla* (Schaus), *barza* Field, *trebula* (Hewitson), *phryne* Johnson et al., *nototrebula* Johnson et al., **new combinations** (from *Thecla*) *orcilla* (Hewitson) (L), *vesulus* (Stoll), **new species** *quintana* (Yucatan peninsula, Mexico/Belize) and four undescribed.

Serratofalca (5,3): **new combinations** (from *Thecla*) *cerata* (Hewitson) (L), *palumbes* (Druce) and three undescribed.

Klaufera (10,4): **new combinations** (from *Calystryma*) *pisis* (Godman and Salvin) (L), *meleager* (Druce), *anapa* Field, (from *Thecla*) *anthora* (Hewitson) (L), *pisidula* (Druce) (L), *atrox* (Butler) and four undescribed.

Gigantofalca (3,1): **new species** *stacya* (Amazon Basin, Brazil), *duida* (Mt. Duida, Venezuela), one undescribed.

Distissima (7,4): **new species** *spenceri* (Amazon Basin, Brazil), *srandrea* (SW Brazil), **new combination** (from *Thecla*) *instita* (Hewitson) and four undescribed.

Serratoterga (5,2): **new species** *larsoni* (Ecuador), *saopauloensis* (SE Brazil), **new combination** (from *Calystryma*) *naka* (Field) and two undescribed.

Terminospinissima (10,6): **new species** *serratissima* (Amazon Basin), **new combinations** (from *Thecla*) *orcillula* (Strand), *gizela* (Hewitson) (L), *vidulus* (Druce) and six undescribed.

Furcovalva (5,3): **new species** *extensa* (SE Brazil), **new combination** (from *Calystryma*) *tifla* (Field) and three undescribed.

Cyanodivida (7,5): **new species** *fornoi* (Bolivian yungas), *neorcillata* (Guyana Shield) and five undescribed.

Morphissima (10,3): **new species** *scalpera* (Guyana Shield), **new combinations** (from *Thecla*) *thama* (Hewitson) (L), *centoripa* (Hewitson) (L), *netesca* (Draudt), (from *Calycopis*) *xeneta* (Hewitson), *devia* (Moeschler), *indigo* (Druce) and three undescribed.

Fieldia (5,2): **new species** *yungas* (Bolivian yungas), **new combinations** (from *Thecla*) *nisaee* (Godman and Salvin), *vesper* (Draudt) and two undescribed.

Clade II.

Tergissima (4,0): *mosconiensis* Johnson, *macphersoni* Johnson, *shargeli* Johnson, *montanensis* Johnson.

Femniterga (11,0): *notacastanea* Johnson, *judae* Johnson, *cissusa* (Hewitson), *cinniana* (Hewitson), *plumans* (Druce), *megana* Johnson, *strobilata* Johnson, *itaituba* Johnson, *splendida* Johnson, *auria* Johnson; **new species** *boliviensis* (Bolivia).

Kroenleina (9,7): **new species** *panornata* (Bolivian, NW Argentine yungas), *escuintla* (Chiapas, Mexico) and seven undescribed.

Antrissima (7,5): **new species** *varicolor* (Guyana Shield, Trinidad), *misionensis* (NE Argentina, SW Brazil) and five undescribed.

Reversustus (5,3): **new combination** (from *Thecla*) *puppius* Godman and Salvin, **new species** *assuensis* (SW Brazil) and three undescribed.

Clade III.

Mercedes (10,2): **new combinations** (from *Thecla*) *demonassa* (Hewitson) (L), *cos* (Druce) (L), *calor* (Druce) (L), *petauristor* (Druce), *buphonia* (Hewitson), *mimas* (Godman and Salvin), *atrius* (Herrich-Schaeffer), (from *Tmolus*) *clitumnus* (Butler) and two undescribed.

Argentostriatus (7,2): **new combinations** (from *Thecla*) *tamos* (Godman and Salvin), *matho* (Godman and Salvin), *clarina* (Hewitson) (L), *calus* (Godart), *clarissa* (Draudt) and two undescribed.

Clade IV.

Iaspis (8,2): *temesa* (Hewitson) (L), **new species** *diffusus* (Colombia), **new combinations** (from *Thecla*) *thabena* (Hewitson) (L), *talayra* (Hewitson) (L), *castitas* (Druce), *beera* (Hewitson) and two undescribed.

A section on "Outgroup Diagnostics" characterizes superficially similar and widely sympatric outgroups of the sister "Electrostrymon Grade". To distinguish *Electrostrymon* Clench from another mostly undescribed and widely sympatric group, a new genus *Angulopis* is described including **new combinations** (from *Thecla*) *autoclea* (Hewitson) (L), *sangala* (Hewitson), *politus* (Druce), (from *Bithys*) *hesperitis* (Butler and Druce). A second section treats some groups of superficially similar eumaeines which have been characterized in recent cladistic studies but for which no formal nomenclature has existed. These new groups are distingished from the Calycopis/Calystryma grade and include the following **new combinations** from *Thecla*: ***Uzzia***, new genus [*U. uzza* (Hewitson); *U. splendor*, *U. cotera*, representative new species]; ***Dicya***, new genus [*D. dicaea* (Hewitson); *D. cyanoundulata*, representative new species]; ***Celmia***, new genus [*C. celmus* (Cramer); *C. stigmata*, representative new species]; ***Caerofethra***, new genus [*C. emendatus* (Druce), *C. seudiga* (Hewitson), *C. iambe* (Godman and Salvin), *C. carnica* (Hewitson), *C. hesychia* (Godman and Salvin), *C. asa* (Hewitson)]; ***Aubergina***, new genus [*A. alda* (Hewitson), *A. paetus* (Godman and Salvin), *A. hicetus* (Godman and Salvin); ***Sipaea***, new genus [*S. hyccara* (Hewitson); *S. sepeina*, representative new species]. Since these genera have large numbers of undescribed taxa;

representative new species have been included for illustration purposes.

It is noted that the species diversities in South American taxa often occur in multiples of five, indicating general geographic regions of endemism common to all the groups: Guyana Shield, Amazon Basin, Andes, SE Brazil, temperate South America. In addition, certain groups show assemblages distributed from Mexico to the Panamanian isthmus. Higher species numbers in certain genera result from taxa sympatric in particular regions (most often the Guyana Shield and SE Brazil) or the occurrence of some highly insular taxa (most often in the Andes). Groups for which polyphagy and detritus feeding are well known (*Calycopis*, *Calystryma*) are particularly species rich. No ingroup genus has any known Antillean elements.

INTRODUCTION

The "Calycopis/Calystryma grade" refers to a large and mostly undescribed assemblage of Neotropical hairstreak butterflies, brown or blue on the wing upper surfaces with brown under surfaces crossed by a simple orange or reddish band shaped like a "W" in the hindwing anal area (Fig. 1). Contrasting some other hairsteaks with a "W"-shaped element in the anal area (Appendix 1), the "W" in the Calycopis/Calystryma grade is not contiguous with the rest of the band. Rather, the cell M3 element breaks the plane of the band, forming a variously prominent "M3 crossbar" (*sensu* Field 1967a,b) which sets the "W" apart from other elements in the band (Fig. 1). Most Calycopis/Calystryma grade taxa also lack the forewing androconial "brands" (*sensu* Eliot 1973) which typify many other Eumaeini. This generalized description of the Calycopis/Calystryma grade characterizes an extremely large, but structurally heterogeneous group (a "grade" *sensu* Nelson and Platnick 1981), from which few monophyletic groups have been previously defined.

In 1919, Draudt listed some fifty taxa in twelve "species groups" fitting the general description of the Calycopis/Calystryma grade. Later, Field (1967a) published a taxonomic study of the mostly blue group *Calycopis* Scudder in which he included twenty-one Neotropical species. Field (1967b) also described a new genus *Calystryma* (Field 1967b) including thirteen, mostly brownish, Neotropical species. Field differentiated these groups by a number of structural characters.

Recently, I distinguished *Calycopis* and *Calystryma* from two other genera, *Tergissima* and *Femniterga* (Johnson 1988, 1989a; Johnson et al. 1988). To complete these studies, most of the extant type material for *Calycopis*, *Calystryma* and the groups of Draudt, was examined. This large sample included an astonishing number of structural assemblages among many taxa previously assigned to "*Thecla*" and numerous undescribed entities. Geographic distributions of these entities encompassed wide, and often overlapping, areas. It was apparent that *Calycopis*, *Calystryma*, *Tergissima* and *Femniterga* comprised only a fraction of the generic-level assemblages making up this large group. It was also obvious lepidopterists could make little progress recognizing or classifying these butterflies until this large assemblage was divided into generic groups.

In studies of the Polyommatinae (Lycaenidae) and Nacophorini and Lithinini (Geometridae), respectively, Nabokov (1945) and Rindge (1983, 1986) approached large grades by initially describing various monophyletic groups as genera. In a similar fashion, I here delineate twenty genera from the large Calycopis/ Calystryma grade, of which fifteen are described as new. Based on these initial definitions, subsequent work will treat each group over the Neotropical Realm with particular attention to the many undescribed species. Herein, from examination of type specimens, I associate with each of the genera appropriate species originally described in the eumaeine grades "*Thecla*", "*Tmolus*" and "*Bithys*" (see Bridges 1988). As noted below under "Methods" all of the genera delineated in this study are geographically wide-ranging and most often sympatric. To date, four of the genera treated here have been formally revised– *Calycopis*, *Calystryma* (Field 1967a,b) *Tergissima*, *Femniterga* (Johnson 1989a). These studies document the wide geographic ranges of species in these groups which I find typical of all the genera described herein. Thus, it can be confidently stated that each genus recognized here constitutes a major lineage in the Eumaeini worthy of generic recognition and eventual elaboration of its species-level entities.

MATERIALS

Study Group. Material examined included all New World Hairsteaks (the Eumaeini *sensu* Eliot 1973) characterized by a "W"-shaped element in the anal area of the hindwing under surface band. In this large group, disjunction of the "W", either at cell M3 or CuA1 has traditionally differentiated taxa clustered with the Calycopis/ Calystryma grade or various species groups of Draudt (1919) (Field 1967a,b; Johnson 1988, 1989a). Groups with "W"-shaped elements contiguous with hindwing band include a large number of taxa also readily distinguished by the presence of forewing androconial brands in males (see Outgroups). There are also several contiguously banded groups which lack brands (see Outgroups). In this study, specimens with disjunct "W"-shaped elements were considered as part of the potential ingroup and dissected; specimens with contiguous bands were also dissected and these results

condensed in the "Outgroups" section. Throughout, emphasis was placed on locating multiple male/female pairs with duplicate collection data. To prevent material from being accidentally excluded from the study group, specimens were assembled with little attention to previously published formal and informal groupings, and type material consulted subsequent to developing an overall view of these grades' taxonomies.

Collections. Specimens were studied from the the Allyn Museum of Entomology (AME), American Museum of Natural History (AMNH), British Museum (Natural History) (BMNH), Carnegie Museum of Natural History (CMNH), Central Entomology Collection University of Santiago (Chile) (CECUC), David Matusik Collection [Bolivian material] (DMC), Field Museum of Natural History (FMNH), Hope Entomological Collection, Oxford University (HEC), Instituto Miguel Lillo (Tucumán) (IML), Los Angeles County Museum (LACM), Museum National d'Histoire Naturelle (Paris) (MNHN), Milwaukee Public Museum (MPM), Museo Zoologia Universidade Federal do Paraná (Curitiba) (MPZN) and the John A. Shuey Collection [Belize material] (JSC). Because of the numerous undescribed entities, I examined all of the incorporated holdings, and as much of the unincorporated mounted material as presently accessible, at the AMNH, BMNH, CMNH and MNHN.

Methods

Systematics. Taxa are grouped into twenty genera, of which fifteen are new. For purposes of this initial study of the Calycopis/Calystryma grade, each genus meets five criteria: (1) no genus is monotypic; (2) each has members sharing a number of major structural characters not present in other genera; (3) males and females of each are apparent through dissection of numerous male/female pairs with duplicate collection data; (4) each genus has been assessed for species diversity by study of relevant type specimens and a survey of undescribed entities; and (5) each has a geographic distribution of major biogeographic significance (e.g. New World, Neotropical, South American, Central American, Austral, Antillean etc.). When genera are comprised entirely of new taxa, I here describe two species in this initial study. These usually represent geographic or character extremes for the genus. For remaining genera, the large numbers of undescribed species will be described in subsequent studies of each genus of the grade. Among genera described, four larger monophyletic groups are recognized and used to organize the genera as Clades I-IV. Morphological and species diversity within each of these is too great to restrict generic use to these groups. For example, the diverse and species rich genera *Calycopis* and *Calystryma* both occur in Clade I.

Presentation. Many taxa and characters described herein are new to the literature. For clarity and brevity, I use a standardized format for all entries which includes certain abbreviations and descriptive phrases defined hereafter and illustrated in the accompanying figures.

Diagnostic Format.

After the generic name and appropriate figure references:

1 "Synopsis". This introductory statement summarizes previous "common usage", since some new genera were previously known to Lepidopterists as certain "*Thecla*" groups of Draudt (1919) or other authors;

2 "Diagnosis". Style is partially telegraphic with diagnostic characters numbered sequencially, corresponding to numbered elements in the accompanying figures (Diagnosis characters 1-5 etc., Fig. "n" elements 1-5 etc.). Although each genus is distinctive in a constellation of wing and structural characters, for diagnostic purposes one or two characters are chosen as the "*Primary trait(s)*" of the genus and numbered "1" (or "1", "2"). Additional numbered characters follow, introduced after the appropriate words *wings*, *tergal morphology*, *male genitalia*, *female genitalia*, etc.;

3 "Description". Full descriptions are provided for new taxa; references are provided for previously described taxa.

4 "Type Species". 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.

5 "Diversity". Based on examination of type specimens a checklist of species is provided (beginning with the type species), with full data on type specimens provided and lectotypes designated as appropriate. New combinations since original descriptions or Field (1967a,b) are annotated. A numerical estimate of the undescribed entities is provided based on research to date. For groups not formally revised to date, the checklist is not meant to be fully definitive regarding taxonomic rank. Changes in rank may occur in future revisionary works which fully evaluate the many apparent undescribed entities.

6 "Interspecific Variation". Kinds of character differences generally apparent between species level taxa of the genus are summarized.

7 **"Distribution"**. Based on "Diversity", the geographic range of the genus is summarized.

8 **"Remarks"**. Appropriate additional comments are provided, including historical notes and issues concerning identification or nomenclature.

9 **"Etymology"**. Etymologies are annotated for new names and also names without previous etymological comment.

Based on literature cited, and compatible with elements figured and captioned in Figs. 1-3, certain abbreviations and descriptive phrases are employed in the text and Keys.

Abbreviations.

For wing pattern: DFW, DHW (upper [dorsal] surface forewing, hindwing), VFW, VHW (under [ventral] surface forewing, hindwing), W-element (referring to the aforementioned "W"-shaped element variously occurring in the hindwing band from cells CuA1 to 3A); *For morphology*: *sipc* ("subcordate incised posterior cavity" of the eighth tergite [following Field 1967a,b; Johnson 1988, 1989a,b]); *Other*: OD (original description), TL (type locality), N etc. (north, etc.) C (central), GP(s) (genitalic preparation[s]), LD (locality description), ID (identified by). In entries under Diversity some abbreviations are quoted verbatim from label data, the most common being WDF (William D. Field) and NHB (Natural History, Britain =BMNH).

Descriptive Phrases.

For wing pattern: pattern and venation terms follow Clench (1964, 1975) except to add the CuA (cubitus anterior) notation for phylogenetic consistency; the words "above" and "below" [or "beneath"] are used for respective upper and lower surfaces of the wing, "tripartite band" for the VFW postmedian and VHW medial bands along with other terms as illustrated and captioned in Fig. 1, and "bright metallic" and "dull metallic" for respective blue structural colors that are brilliantly iridescent ["morpho blue" of common lepidopterological usage] or of non-iridescent sheen ["flat blue" of common usage]; the term "brand" is used for the androconial scent patch of males (*sensu* Eliot, 1973, herein Fig. 76); the term "brush organ" is used consistent with Eliot (1973) to refer to bundles of elongate microtrichia which cleave to the vinculum dorsum when genitalia are removed by dissection (Figs. 4-23) (see Remarks under *Cyanodivida* for further clarification regarding this term).

For morphology: specialized tergal sclerotization (e.g. the *sipc*, Fig. 2I-O) is termed (i) "simple", when not sclerotized laterad of the spiracles or cephalad of the seventh tergite in males (Fig. 2I-J) or when occurring only on the terminal tergite in females (Fig. 2N), (ii) "elaborate" in either sex when exceeding the above limits and/or exhibiting additional sclerotized components (Fig. 2K-L [males], 2O [females]); genitalic terms follow Klots (1956) and additional designations employed by Johnson (1988, 1989a,b,c, 1990); certain general ventral shapes in the male genitalia are termed "triangular", "parabolic" or "bell-shaped" as respectively figured and captioned in Fig. 2C,E and G; for female genitalia, for descriptive value and consistent with Johnson (1989a) and Fig. 3, the terms "superior" and "inferior" "genital plates" are used for the respective lamella postvaginalis and antevaginalis (3A-C,N-P); "ventral scutes" for prominent sclerotized pads or plates on the ventrum of the inferior genital plate (3A,C-M); "paired central", "-distal" and "-lateral" "prongs" for outstanding projections on the genital plates (3B,D-T); "ventral struts" for the prominent termino-lateral extensions of the ductus bursae which support the superior genital plate (3B-T); and "dendritic signa" for the shieldlike signa which occur in all species of the grade (3a). Similarly, for all sclerotized structures the term(s) "sculptured- [or "sclerotized-] specializations" refer to any uniquely occurring sclerotized elements with complex shapes, particularly in this study referring to structures at the cervix bursae, the point of attachment for the ductus seminalis in all species herein treated. Generally, diacriticals are not employed for political states or provinces.

Illustrations. Figures are provided for all characters, first in schematic form the major clades (Figs. 1-3, 80) and then for the type species and other taxa in each genus (Figs. 4-23, 81-82).

Keys. Generic keys are provided for characters of the wing and male and female morphology. Because wing patterns are most salient to collectors and curators, a scheme for generalized wing pattern identification is provided. However, since there is extreme sexual dimorphism in some taxa, workers should "sex" specimens in advance by forelegs or abdomen. Since sexing will often require examination of the abdomen, genitalic dissection is emphasized as the most reliable means of identification, particularly for initial placement at the generic level. Although keys are a standard taxonomic tool for general entomology, they are often judged less useful than the method of "browsing" photographs and descriptions when attempting to identify some Lepidoptera by wing pattern alone (Garth and Tilden 1987). In the Calycopis/Calystryma grade, because of numerous undescribed entities, wing pattern parallelism and sexual dimorphism, the browsing method (combined with subsequent dissection and reference to the literature cited for individual groups) appears the most reliable method of identification.

KEYS TO GENERA

Wing Pattern

Note. The key uses terms defined in the Methods section and Figs. 1-3 (particularly, the general VHW wing pattern terms "typical [Calycopis, Calystryma or Mercedes] pattern"). Taxa of the "Outgroups" are excluded from the Key based on the continuity of their VHW bands. Discordant sexual dimorphism and varying interspecific occurrence of iridescent color limit some Key couplets to clusters of genera. Taxa in these clusters are readily distinguished by structural characters and subtleties in the wing pattern. However, to avoid initial confusion in the key, I limit reference to subtle wing characters to certain parenthetical comments and treat such characters in more detail in the text.

Male

1.a. DFW,DHW ground color completely brown or black (exclusive of variously colored, thin, DHW marginal lines and/or variously colored anal lobes) 2

b. DFW,DHW ground color with various degrees of iridescent color (usually blue or purple occurring as "bright metallic" or "dull metallic" over entire wing, in iridescent patches, as slight sheens of "steel-blue" or as flecks of iridescent color) 3

2.a. VHW with typical Calystryma pattern (Fig. 1D) 9

b. VHW with any other pattern (typical Calycopis pattern, Fig. 1C, a lesser degree of W-element breaking plane of tripartite band, Fig. 1E, additional angled element in cells 2A-3A, Fig. 1F, or Mercedes pattern, Fig. 1G). 10

3.a. VHW bright yellow in limbal area cells (Figs. 72,73) ..... *Iaspis*

b. VHW orange, red-orange or red in limbal area cells 4

4.a. DFW,DHW iridescent color in various patches on either FW or HW 5

b. DFW,DHW iridescent color continuous over entire wing (except for apices and margins) and occurring either as bright metallic, dull metallic, or as a dull sheen or as iridescent flecks) .. 6

5.a. VHW with typical Calystryma pattern (Fig. 1D) ..... *Calystryma* (in part, e.g. "blue" *Calystryma*); *Morphissima* (in part, e.g. species with limited blue).

b. VHW with typical Calycopis pattern (Fig. 1C), or lesser degree of W-element breaking plane of tripartite band 7

6.a. DFW,DHW iridescent color occurring only as sheen or flecks (Fig. 31) .. *Klaufera* (in part).

b. DFW,DHW iridescent color either bright metallic or dull metallic 8

7.a. VHW with well-defined typical Calycopis pattern (Fig. 1C) .... *Calycopis*, *Femniterga* (in part, e.g. blue taxa).

b. VHW with W-element less defined than in typical Calycopis pattern (Figs. 1E,54) ... *Fieldia*

8.a. DFW,DHW iridescent color bright metallic (Fig. 52) ..... *Morphissima*

b. DFW,DHW iridescent color dull metallic (Fig. 29) ..... *Serratofalca*

9.a. DFW,DHW ground color more black than brown (VHW with SC+R1 element of medial band outstandingly larger than rest of pattern elements and lined with white; DHW with prominent orange anal lobe) (Fig. 31) ... *Klaufera*

b. DFW,DHW ground color more brown than black (VHW with SC+R1 element of tripartite medial band only slightly enlarged, if at all; DHW with anal lobe only slightly colored, if at all) 11

10.a. VHW with Mercedes pattern (Fig. 1GH) . 14

b. VHW with typical Calycopis pattern (Fig. 1C) or lesser degree of W-element breaking plane of tripartite band (Fig. 1E) 12

11.a. DFW large (13.5 -15 mm.) and DHW with notable white slash across base of anal lobe .. 15

b. DFW small (less than 13.5 mm., generally 10-12.5 mm. and DHW without notable white slash across base of anal lobe (respectively Figs. 26,27; 40,42; 44; 46,48; 50; 68,70) ..... *Calystryma*, *Serratoterga*, *Terminospinissima*, *Cyanodivida*, *Furcovalva*, *Reversustus* (see morphology)

12.a. DHW with prominent white marginal line, cells M1 or M2 to at least CuA1 or CuA2 13

b. DHW margin generally brown, white marginal markings, if occurring at all, limited to base of anal lobe (Fig. 56) ..... *Tergissima*, *Femniterga* (in part, e.g. brown taxa)

13.a. VHW with typical Calycopis pattern (Fig. 1C) modified only by slightly more diminutive W-element (Figs. 1E, 60,62) ..... *Kroenleina*

b. VHW with tripartite band elements caudal of the W-element also strongly angled producing a double "W" appearance (Figs. 1F,64,66) .... *Antrissima*

14.a. VHW Mercedes pattern comprised of wide white or silver-white band, continuing through W-element (Fig. 74) ..... *Argentostriatus*

b. VHW Mercedes pattern comprised of thin, lineal or broken band, sometimes bordered distally with brown or orange (Fig. 72) .... *Mercedes*

15.a. VHW with limbal area lavishly colored compared to rest of grade (Figs. 33,35) ..... *Gigantofalca*

b. VHW with limbal no more lavishly colored than other members of grade (Figs. 36,38) ..... *Distissima*

Female

1.a. DFW,DHW ground color completely brown or black (exclusive of variously colored, thin, DHW marginal lines and/or variously colored anal lobes) 2

b. DFW,DHW ground color with various degrees of iridescent color (usually blue or purple occurring as bright metallic or dull metallic over entire wing, in iridescent patches, as slight sheens of steel-blue or as flecks of iridescent color) 3

2.a. VHW with typical Calystryma wing pattern (Fig. 1D) 11

b. VHW with any other pattern (typical Calycopis pattern, Fig. 1C, a lesser degree of W-element breaking plane of tripartite band, Fig. 1E, additional angled element in cells 2A-3A, Fig. 1F, or Mercedes pattern, Fig. 1G) 12

3.a. VHW bright yellow in limbal area cells (Fig. 77) ..... *Iaspis*

b. VHW colored orange, red-orange or red in limbal area cells 4

4.a. DFW,DHW iridescent color in various patches, or variously fading gradually into dark, non-iridescent distal grounds 5

b. DFW,DHW iridescent color continuous and generally of same intensity over entire wing (except for apices and margins and occurring either as bright metallic or dull metallic, or as a dull sheen or iridescent flecks) 6

5.a. VHW with typical Calystryma pattern (Fig. 1D, and respectively 28; 41,43; 45; 47,49) ..... *Calystryma* (in part, e.g. blue species), *Serratoterga*, *Terminospinissima*, *Cyanodivida* (see morphology)

b. VHW with typical Calycopis pattern (Fig. 1C) or lesser degree of W-element breaking plane of tripartite band, (Fig. 1E) 7

6.a. DFW,DHW iridescent color occurring only as sheen or flecks (Fig. 32) ..... *Klaufera* (in part)

b. DFW,DHW iridescent color either bright metallic or dull metallic 10

7.a. VHW with well-defined typical Calycopis pattern (not obscured by reduction of W-element or suffusion of ground (Figs. 1C,25,59) *Calycopis*, *Femniterga* (see morphology)

b. VHW with W-element less defined than in typical Calycopis pattern (Fig. 1E) 8

8.a. DHW with prominent white marginal line, cells M1 or M2 to at least CuA1 or CuA2 9

b. DHW margin generally brown, white marginal markings, if occurring at all, limited to base of anal lobe (Fig. 55) ..... *Fieldia*

9.a. VHW with typical Calycopis pattern (Fig. 1C) modified only by slightly more diminutive W-element (Figs. 1E,61,63) ..... *Kroenleina*

b. VHW with tripartite band elements caudad of the W-element also strongly angled producing a double "W" appearance (Figs. 1F,65,67) .... *Antrissima*

10.a. DFW,DHW iridescent color brilliant metallic blue or lustrous but non-metallic silvery blue (Fig. 53) ..... *Morphissima*

b. DFW,DHW iridescent color dull metallic (Fig. 30) ..... *Serratofalca*

11.a. DFW,DHW ground color more black than brown (VHW with element of medial band outstandingly larger than rest of pattern elements and lined with white; DHW with prominent orange anal lobe (Fig. 32) ..... *Klaufera*

b. DFW,DHW ground color more brown than black (VHW with SC+R1 element of tripartite medial band only slightly enlarged, if at all; DHW with anal lobe only slightly colored, if at all) 14

12.a. VHW with Mercedes pattern (Fig. 1GH) . 13

b. VHW with Calycopis pattern or lesser degree of W-element breaking plane of tripartite band (Figs. 1C,1E,57) ..... *Tergissima*

13.a. VHW Mercedes pattern comprised of wide white or silver-white band, continuing through W-element (Fig. 75) ..... *Argentostriatus*

b. VHW Mercedes pattern comprised of thin, lineal or broken band, sometimes bordered distally with brown or orange (Fig. 73) .... *Mercedes*

14.a. DFW large (13.5 -15 mm.) and DHW with notable white slash across base of anal lobe 15

b. DFW small (less than 13.5 mm., generally 10-12.5 mm.) and DHW without notable white slash across base of anal lobe (respectively Figs. 26,27; 40,42; 44; 46,48; 50; 68,70) ..... *Calystryma* (in part, e.g. brown species), *Furcovalva*, *Reversustus* (see morphology)

15.a. VHW with the limbal area lavishly colored compared to rest of grade (Figs. 34) .... *Gigantofalca*

b. VHW with limbal no more lavishly colored than other members of grade (Figs. 37,39) .... *Distissima*

Morphology

Male

Note. Regarding couplets where identifications rely on characters of the labides (10,13,15,15), such taxa have salient characters of the wing or female morphology; in these cases male genitalia, though reliable, are not the best diagnostic tool.

1.a. Vinculum with lateral surfaces generally in same plane or mildly curvate (dorsal and cephalic elements forming an obtuse angle with cephalic element more diminutive and curvate toward prominent saccus) (Figs. 2ABDH) 2

b. Vinculum with lateral surface strongly declined in the cephalic one-half with angle formed by dorsal and cephalic elements equalling circa 90° or sometimes less; saccus usually diminutive (Fig. 2F) 3

2.a. Vinculum lateral surface (labides base to saccus base) uniformly wide and generally in same plane (Fig. 2H) 4

b. Vinculum lateral surface (labides base to saccus base) of varying widths and variously curvate (Fig. 2ABD) 5

3.a. Valvae terminus dorsally inclined (Fig. 2F1) 6

b. Valvae terminus ventrally declined (Fig. 2F2) ..... *Reversustus*

4.a. Labides terminal margin flat or weakly convex (Figs. 2H2, 23A) ..... *Iaspis*

b. Labides terminal margin dorsally produced (Figs. 2H1, 21A,22A) 18

5.a. Valvae terminus tapered (e.g. not with salient bifurcation) (Fig. 2D3,4) 9

b. Valvae terminus bifurcate (Figs. 2D5,21A) ..... *Furcovalva*

6.a. Valvae paired lobes robust, in ventral and lateral view generally triangular (Figs. 2F5,19A) ..... *Antrissima*

b. Valvae paired lobes sculptured (bilobed areas and caudal extensions well defined and variously angled) (Figs. 2F1) 7

7.a. Vinculum with ventrally declined margin extremely produced (Fig. 18A) ... *Kroenleina*

b. Vinculum with margin of ventral declination not produced (width of conjoining dorsal and cephalic vinculum elements about the same) (Fig. 2F) 8

8.a. Labides dorsally produced (Figs. 2F3,16A) .. .. *Tergissima*

b. Labides ventrally produced (Figs. 2F4,17A) . ..... *Femniterga*

9.a. Falces terminus (caudad of elbow) tapered to point or slightly hooked (not strongly bifurcate at terminus or serrate along inner margin) (Figs. 2AB) 10

b. Falces terminus (caudad of elbow) either strongly bifurcate at terminus or serrate along inner margin (Fig. 2D1,2) 11

10.a. Labides strongly produced centrally to a steep lobe or or ventrally to a prominent prong (Figs. 2B1,2) (slight curvate, ventral production, Fig. 5A, not included here) 12

b. Labides terminus flat (Figs. 2A,H2), strongly concave (Fig. 15A), hemispherical (Figs. 6AC, 7A,13A), slightly lobate ventrally (Fig. 9A) or strongly produced dorsally (Fig. 14A) 13

12.a. *Sipc* with sclerotized lobe laterad of spiracular opening (Fig. 2K) 14

b. *Sipc* without lateral lobe, with lateral margin of *sipc* curving around vicinity of spiracular opening (Figs. 2J,5) ..... *Calystryma*

13.a. Labides terminus produced to dorsal hump or prong (Fig. 14A) ..... *Morphissima*

b. Labides terminus flat (Figs. 2A,H2), strongly concave (Fig. 15A), hemispherical (Figs. 6AC, 7A,13A), slightly lobate ventrally (Fig. 9A) or strongly produced dorsally (Fig. 14A) 15

14.a. *Sipc* terminal margin flat (Fig. 9A) .... *Distissima*

b. *Sipc* terminal margin bilobate (Fig. 12A) ... . *Cyanodivida*

15.a. Labides terminus strongly concave with respective dorsal and ventral ends steeply produced (Fig. 15A) ..... : *Fieldia*

b. Labides terminus flat (Figs. 2A,H2), hemispherical (Figs. 6AC,7A,13A), slightly lobate ventrally (Fig. 9A) or strongly produced dorsally (Fig. 14A) 16

16.a. Labides terminus flat or slightly hemispherical (Figs. 2A,4A) ..... *Calycopis*

b. Labides terminus slightly lobate ventrally (Figs. 7A, 10A) 17

17.a. *Sipc* simple (Fig. 7A) ..... *Klaufera*

b. *Sipc* elaborate (Fig. 10A) ..... *Serratoterga*

18.a. Saccus length not exceeding lateral width of adjoining vinculum by more than two times (Figs. 2D,21A) ..... *Mercedes*

b. Saccus prominent, length much exceeding two times lateral width of adjoining vinculum ... . *Argentostriatus*

Female

1.a. *Sipc* present (Note: *sipc* here includes elaborately sclerotized eighth tergite, Fig. 2O, or simple bilobate dorso-terminal sclerotization of the tergite terminus, Fig. 2N) 2
b. *Sipc* absent (eighth tergite normal, Fig. 2M) 3
2.a. *Sipc* limited to bilobate dorso-terminal sclerotization of the terminal tergite (Fig. 2N) 4
b. *Sipc* elaborate with extensive sclerotization of dorsal,lateral and/or ventral elements of the eighth tergite (Figs. 2O,8B,10B,17B) 7
3.a. Ductus bursae cephalad of the the lamellae corrugated (Figs. 3X2,21B) ..... *Mercedes*
b. Ductus bursae beneath lamellae smooth (e.g., not corrugated) (Fig. 3X1) 9
4.a. Ductus bursae short with length less than or equal to width of inferior genital plate (Fig. 6B) ..... *Serratofalca*
b. Ductus bursae long, with length exceeding, usually greatly, width of inferior genital plate (Figs.9B,19B,18BD) 5
5.a. Superior plate with elongate paired lateral prongs (Figs. 3I,9B) ..... *Distissima*
b. Superior plate with terminal margin entire, with short paired central knobs, or with short paired distal knobs (Figs. 18B,19B) 6
6.a. Ductus bursae with prominent antrum (Fig. 19BD) and distended superior plate (Figs. 3M,19BD) with terminal paired central or distal knobs (Figs. 3M,19BD); inferior plate with scutes obtusely triangular (Fig. 19BD) ..... *Antrissima*
b. Ductus bursae without prominent antrum, superior plate lobate and with paired central or distal knobs diminutive or lacking; inferior plate scutes not strongly angled but equilateral to ovate (Figs. 3L,18BD) ..... *Kroenleina*
7.a. Ductus bursae elongate (length exceeding, usually greatly, width of inferior genital plate) and consistently sclerotized (does not become transparent cephalically toward cervix bursae) (Fig. 10BD) 8
b. Ductus bursae short, with length less than or equal to width of inferior genital plate, and with cephalic one-third or one-fourth often thinly sclerotized, appearing transparent (Fig. 17B) ..... *Femniterga*
8.a. Superior and inferior genital plates terminally rounded and without terminal knobs or prongs (Figs. 3J,10BD) ..... *Serratoterga*
b. Superior genital plate with strongly elongate, often asymmetrical, distal prongs (Figs. 3A,8B) ..... *Gigantofalca*
9.a. Ductus bursae terminating with prominent superior and inferior genital plates (Figs. 4B,5B,6B, 7B,8B,11B,12BD,13B, 14B,20B) 12
b. Ductus bursae terminating with prominent superior genital plate only or sclerotized flaps in place of the plate; the inferior genital plate hardly distinguishable from caudal end ductus bursae (Fig. 3UVYZ) 10
10.a. Superior genital plate produced and thickly sclerotized, terminus with or without paired central and distal serrations (Figs. 3YZ,22B, 23B) 18
b. Superior genital plate occurring only as slightly sclerotized diminutive flap or flaps (Figs. 3UV, 15B,16B) 11
11.a. Ductus terminally fluted and genital plates expansive distad from plane of ductal tube (Figs. 3U,15B) ..... *Fieldia*
b. Ductus less terminally fluted than like a staight tube with superior plate present only as slight terminal flaps (Figs. 3V,16B) .... *Tergissima*
12.a. Superior genital plate with produced, sometimes greatly elongate, paired central prongs, often associated with similarly prominent paired distal or lateral prongs (Figs. 3K,11B) ..... *Terminospinissima*
b. Superior genital plate without paired central prongs, plate terminal margin either serrate (Figs. 3S,14B), widely bilobate with short distal prongs (Fig. 3G) or with prominent paired distal and/or lateral prongs (Fig. 3DEQRST) ... 13
13.a. Superior genital plate with paired distal and lateral prongs of comparable prominence, giving a four-pronged terminal appearance (Figs. 3E,5B) (here not including a serrate terminal margin with four angular projections, Figs. 3S,14B) ..... *Calystryma*
b. Superior genital plate terminus without four comparably prominent paired distal and lateral prongs (Figs. 3E,5B), rather having (a) terminal margin with short paired distal prongs only (Fig. 3D,4B), (b) terminal margin serrate with four angular projections (Figs. 3S,14B), (c) lateral margins strongly extended and with a prominent, terminally directed, distal serration (Figs. 3R, 13B), (d) terminal margin widely bilobate with short distal prongs (Figs. 3G,7B) or (e) terminal margin bilobate with short lateral prongs or sclerotized curls (Figs. 3QT,12BD,20BD) 14
14.a. Superior genital plate with short paired distal prongs; intervening terminal margin rounded or slightly to strongly bilobate (Figs. 3DG,4B,7B) 15

b. Superior genital plate exhibiting any other configuration listed in 13b (above, e.g. 13b (b)-(d)) 16

15.a. Superior genital plate narrow, with width not exceeding the distance between the ductal struts (Fig. 3D), with short paired distal prongs separated by a generally convex or only slightly bilobate terminal margin (Figs. 3D,4B) ..... *Calycopis*

b. Superior genital plate widely bilobate, with width greatly exceeding the distance between the ductal struts (Fig. 3G); paired distal prongs, if occurring at all, only slightly apparent along the distal margin of the widely separated lobes (Figs. 3G,7B) ..... *Klaufera*

16.a. Superior genital plate terminal margin serrate with four contiguous angular projections occurring in the regions of the paired distal and lateral prongs (Figs. 3S,14B) ... *Morphissima*

b. Superior genital plate with terminal margin not serrate but with any configuration listed in 13b not previously keyed [i.e., 13b (c)-(e)] 17

17.a. Superior genital plate strongly extended laterally and with prominent, terminally-directed, lateral projections (Figs. 3R,13B) ..... *Furcovalva*

b. Superior genital plate terminal margin generally parabolic or slightly bilobate and with short paired lateral prongs or sclerotized curls (Figs. 3TQ,12BD, 20BD) 19

18.a. Superior genital plate with paired central and/or distal serrations (Figs. 3Z,23B) ..... *Iaspis*

b. Superior genital plate without paired central and/or distal serrations (Fig. 3Y,22B) ..... *Argentostriatus*

19.a. Superior genital plate slightly bilobate and with short paired lateral prongs or quite contiguous with adjoining margin of inferior genital plate (Figs. 3T,20BD) ..... *Reversustus*

b. Superior genital plate generally parabolic with distolateral margin with thickly sclerotized edge variously produced to paired disto-lateral prongs of short to moderate length (Figs. 3Q,12BD) ..... *Cyanodivida*

TAXONOMIC DESCRIPTIONS

Clade I (The "*Calycopis* Group")

Male genitalia with dorsal and cephalic elements of lateral vincular surface forming an obtuse angle; dorsal element robust, cephalic element more diminutive and curvate toward prominent saccus (Fig. 1,ABD); consequent ventral vincular form triangular (Fig. 2C) or parabolic (Fig. 2E).

CALYCOPIS Scudder

Figs. 4,21,25

Calycopis Scudder 1876: 108.

Synopsis– includes most taxa treated by Field (1967a) and Johnson, et al. (1988), with three taxa included by Field transfered to *Morphissima*, new genus (see Remarks).

DIAGNOSIS. ***Primary trait.*** (1) *Female genitalia*–superior plate with short paired distal prongs (Fig. 3D); inferior plate with prominent paired ventral scutes (Figs. 3A-C,4). ***Additional diagnostic traits.*** (2) *Wings*– iridescent blue usually limited to brilliant or dull patches on DHW; VHW tripartite band in typical Calycopis pattern (Figs. 24,25). (3) *Tergal morphology*–*sipc* occurring in males only; simple (Fig. 2I,I1), extending cephalically to seventh tergite, dorsal plate ovate or oblong and without produced lateral or terminal lobes or pronounced microtrichia (Fig. 4A). (4) *Male genitalia*– ventral vincular shape generally triangular (Fig. 2C); labides with smooth, ventro-cephalic slope; falces arched and with tapered termini; saccus prominent; valvae robust, usually triangular (isoceles) in each lobe and not often with elongate, narrow or sculptured termini (Fig. 4A).

DESCRIPTION. See Field 1967a, pp. 1-2, Johnson et al. 1988, p.6, fig. 8; Johnson 1988, p. 28-29, fig. 3, 1989a, p. 198, fig. 3.

TYPE SPECIES. *Thecla poeas* Hübner 1806-1838 [1811] by original designation ["poesus" of Johnson 1989a, misspelling] (junior subjective synonym of *Hesperia cecrops* Fabricius 1792-1799 [1793]); *T. poeas* TL unknown, type not extant (Field 1967a), *H. cecrops*, TL "in Indiis", type not extant (Field 1967a), synonymic ID by common usage (Field 1967a); type species Figs. 4AB,24,25.

DIVERSITY. Twenty-five species have been described. In addition there are five undescribed species presently known to me.

Species: (1) ***Calycopis cecrops*** (Fabricius) (see above); (2) ***C. bactra*** (*Thecla bactra* Hewitson 1863-1878 [1877]) TL Nicaragua, holotype female, BMNH type no. 915, GP R. 1848-14 (NHB); (3) ***C. nicolayi*** Field 1967a, TL Joao Pessoa, Paraiba, Brazil, holotype male, NMNH type no. 34897, GP WDF 5291, 1953; (4) ***C. caulonia*** (*Thecla caulonia* Hewitson 1863-1878 [1877]) TL Rio de Janeiro, Brazil, holotype female, BMNH type no. 916, GP by topotype, Johnson et. al. 1988b; (5) ***C. jeneirica*** (*Thecla jeneirica* C. Felder 1862)

TL Rio de Janeiro, Brazil, holotype female, location unknown, see Johnson et al. 1988, ID and GP by common usage *sensu* Field 1967a, Johnson et al. 1988b; (6) ***C. chacona*** (*Thecla chacona* Jorgensen 1932) TL Formosa, Argentina, syntypes reputedly extant Museo Argentino de Ciencias Naturales, Buenos Aires, see Johnson et al. 1988a, ID and GP from K. J. Hayward labelled specimens, BMNH, IML, Hayward had seen type; (7) ***C. lerbela*** Field 1967a, TL Obidos, Amazonas, Brazil, holotype male, NMNH type no. 34898, GP WDF 2725, allotype female (same data as holotype but Oct.-Nov. M. de Mathan, Rothschild Bequest) BMNH no. unassigned, GP WDF 3468, 1951; (8) ***C. torqueor*** (*Thecla torqueor* Druce 1907) TL Carimang River, Guyana, holotype male, BMNH type no. 903, GP 1951-489; (9) ***C. isobeon*** (*Tmolus isobeon* Butler and Druce 1872) TL Cartago, Costa Rica, lectotype male by Field 1967a, BMNH type no. 913, lectotype, abdomen missing GPs by compared specimens, Field 1967a, syntype female not congeneric (not located by me, BMNH 1989); (10) ***C. susanna*** Field 1967a, TL Territory of Guyane, Cayenne, French Guiana, holotype male, NMNH type no. 34899, GP WDF 2712/1948, allotype female, same data, GP WDF 2707/1948; (11) ***C. drusilla*** Field 1967a, TL La Florida, Limon Prov., Costa Rica, holotype male, NMNH type no. 34900, GP WDF 2731/1948, allotype female Cabima, Panama, NMNH no. not assigned, GP WDF 2820/1948; (12) ***C. vibulena*** (*Thecla vibulena* Hewitson 1863-1878 [1877]), TL Belem, Para State, Brazil, lectotype male by Field 1967a, BMNH type no. 912, remaining syntypes not congeneric Field 1967a, gen. by topotype Field 1967a; (13) ***C. vitruvia*** (*Thecla vitruvia* Hewitson 1863-1878 [1877]) TL Belem, Para State, Brazil, holotype male, BMNH type no. 900, GP NHB 1951 484 (= *Thecla fortuna* Druce 1907, TL Yurimaguas, Peru, lectotype male by Field 1967a, BMNH type no. 902, paralectotype BMNH, Topajos, Amazona; (14) ***C. bellera*** (*Thecla bellera* Hewitson 1863-1878 [1877]) TL "the Amazon", lectotype female by Field 1967a, BMNH type no. 914 (= *Thecla origo* Godman and Salvin 1879-1901 [1887], TL "Amazon, Para", lectotype male by Field 1967a, BMNH type no. 909, of two additional syntypes, one not congeneric); (15) ***C. partunda*** (*Thecla partunda* Hewitson 1863-1878 [1877]) TL "Amazon", lectotype male by Field 1967a, BMNH type no. 910, gen. by topotype of Fletcher, Field 1967a; (16) ***C. amplia*** (*Thecla amplia* Hewitson 1863-1878 [1877]) TL Chontales, Nicaragua, holotype female, BMNH type no. 917, gen. by topotype of Fletcher, Field 1967a; (17) ***C. anfracta*** (*Thecla anfracta* Druce 1907) TL Chanchamayo, Peru, holotype male, BMNH type no. 908, GP NHB 1949 150; (18) ***C. anastasia*** Field 1967a, TL Chapare, Dept. Beni, Bolivia, holotype male NMNH type no. 34901, GP WDF 3432, 1951; (19) ***C. fractunda*** Field 1967a, TL Achinamiza, Dept. Loreto, Peru, holotype male AMNH, GP WDF 2443, 1951, allotype female, Iquitos, Loreto, Peru, October, AMNH, GP WDF 5069, 1951; (20) ***C. gigantea*** Johnson et al. 1988, TL San Ramon, Dept. Famailla, Tucuman Prov., Argentina, holotype male, allotype female IML with GPs K. Johnson; (21) ***C. crena*** Johnson et al. 1988, TL 1 km. NE Pichanal, Dept. Oran, Salta Prov., Argentina (LD 27B), holotype male, allotype female, AMNH with GPs K. Johnson; (22) ***C. dragones*** Johnson et al. 1988, TL Dragones, Dept. San Martin, Salta Prov., Argentina (LD 20A), holotype male, allotype female, AME with GPs K. Johnson; (23) ***C. argenopuncta*** Johnson et al. 1988, TL Pichanal, Dept. Oran, Salta Prov., Argentina (LD 27), holotype male, allotype female, AME with GPs K. Johnson; (24) ***C. nancea*** Johnson et al. 1988, TL Cucho, Dept. Capital, Jujuy Prov., Argentina (LD 5), holotype male, allotype female, AMNH with GPs K. Johnson; (25) ***C. valparaiso*** Johnson et al. 1988, TL Valparaiso, Chile, holotype female, MNHN with GP K. Johnson.

INTERSPECIFIC VARIATION. Major differences occur in *wings*– expanse of DFW,DHW iridescent blue; *male genitalia*–size and shape of valvae, saccus, aedeagus and brush organs; *female genitalia*–ratios of ductus bursae length to genital plate width and form of terminal prongs on superior plate.

DISTRIBUTION. New World from southern Nearctic south to central Argentina and Chile.

REMARKS. Field (1967a) noted that the females of *Thecla xeneta* and *Thecla devia* were unknown. Females of these were located in the present study; their characters, along with the male traits illustrated by Field, indicate these two taxa belong in *Morphissima*, new genus described herein. Also transferred to *Morphissima* is *Thecla indigo*, both sexes of which were illustrated by Field (female showing characteristic lack of ventral lamellal scutes). Ancientness, ecological adaptability and generalized biological strategies (polyphagy, detritus feeding, etc.) appear to have contributed to the diversity and wide geographic range of this genus.

The name *Thecla beon* Stoll (1775-1790 [1780]) has been historically used for many populations of *Calycopis*-like butterflies (Draudt 1919, Field 1967a). Since there is no type of *T. beon* (Field 1967a, Bridges 1988) it is impossible to ascertain the status of this name. Given the complexity of structural assemblages in the Calycopis/ Calystryma grade, it may be prudent to petition the International Commission on Zoological Nomenclature (ICZN) for the suppression of this name.

CALYSTRYMA Field
Figs. 5,26-28

Calystryma Field 1967b: 1-2.

Synopsis– includes some, but not all, taxa listed by Field (1967b), taxa described by Johnson et al. (1988) and, herein described, the first species known from Mexico.

DIAGNOSIS. ***Primary trait.*** (1) *Female genitalia*–superior plate with moderately elongate paired distal and lateral prongs, giving the appearance of four terminal prongs of about equal size; inferior plate with prominent ventral scutes (Figs. 3E,5BD). ***Additional diagnostic traits.*** (2) *Wings* above and beneath generally brown, VHW and tripartite band in typical Calystryma pattern (Figs. 1D,26-28); (3) *Tergal morphology– sipc* occurring in males only, generally simple with cephalic length sometimes extending through seventh tergite; with diminutive lateral or terminal lobes, sclerotin enclosing spiracle of eighth tergite (see Johnson 1988, 1989a) (Fig. 2J,5AC); dorsum usually with central indentation marked with prominent microtrichia (Fig. 2J1); (4) *Male genitalia*– ventral vincular shape generally triangular (Fig. 2C); labides usually with central or ventrocentrally produced prong; falces arched with tapered (or occasionally slightly bulbous) termini; saccus prominent; valvae usually robust and not often with thinly elongate or sculptured termini (Fig. 5AC).

DESCRIPTION. See Field 1967b, pp. 1-2; Johnson et al. 1988, p. 4, fig. 8; Johnson 1988, p. 28-29, fig. 3, 1989a, p. 198, fig. 3.

TYPE SPECIES. *Calystryma keta* Field by original designation (see Remarks); TL Limon, Prov. of Limon, Costa Rica, holotype, NMNH type no. 34904, GP WDF 3168; type species Figs. 5AC, 26.

DIVERSITY. Here restricted to ten previously described species (six species included by Field 1967b, two described by Johnson et al. 1988, two new combinations from "*Thecla*"), and one new species described below. In addition, there are also four undescribed species currently known to me.

Species: (1) ***Calystryma keta*** Field (see above); (2) ***C. blora*** Field 1967b, TL St. Jean, Maroni River, French Guiana, holotype male, NMNH type no. 24905, GP WDF 3166; (3) ***C. malta*** (*Thecla malta* Schaus 1902) TL Peru, lectotype male, NMNH type no. 5929, GP WDF 2706 (some remaining syntypes are *C. barza* Field 1967b); (4) ***C. gentilla*** (*Thecla gentilla* Schaus 1902) TL Petropolis, Brazil, holotype male, NMNH type no. 5951, GP WDF 3987; (5) ***C. barza*** Field 1967b, TL Upper Rio Maranon, Dept. Amazonas, Peru, holotype male, AMNH, GP WDF 5004; (6) ***C. trebula*** (*Thecla trebula* Hewitson 1868) TL Ega, Amazon, Brazil, holotye male, BMNH type no. 955; (7) ***C. phryne*** Johnson et al. 1988, TL Yariguarenda, Dept. San Martin, Salta Prov., Argentina (LD 15A), holotype male, AMNH with GPs K. Johnson; (8) ***C. nototrebula*** Johnson et al. 1988, TL Tartagal, Dept. San Martin, Salta Prov., Argentina (LD 16A) holotype male AMNH with GP K. Johnson, allotype female, BMNH with GP K. Johnson; (9) ***C. orcilla*** (Hewitson) NEW COMBINATION (*Thecla orcilla* Hewitson 1863-1878 [1874]) TL Ecuador, lectotype male hereby designated, labelled "Ecuador, Hewitson Coll. 79-69, *Thecla orcilla* 2 Thecla orcilla", paralectotype female hereby designated, labelled "Ecuador, Hewitson Coll. 79-69, Thecla orcilla 3" and both "designated (x)type by K. Johnson 1990"; (10) ***C. vesulus*** (Stoll) NEW COMBINATION (*Thecla vesulus* Stoll [in Cramer] 1775-1790 [1781], type of uncertain location, ID here based on specimen from Hewitson Collection, BMNH, labelled "T. vesulus 1, Amazon, Hewitson Coll. 79-69", "vesulus Cramer 340', if not the type probably the most objective specimen for evaluating the name and (11) *C. quintana*, new species described below.

INTERSPECIFIC VARIATION. Major differences occur in *wings*– occasional occurrence of DFW,DHW iridescent blue (male of *C. trebula*, *C. nototrebula*, females *C. blora* etc.); *male genitalia*– size and shape of valve, aedeagus and brush organs, degree of prong production in labides and production of falces terminus; *tergal morphology*– in male *sipc*, degree of terminal or lateral lobe development; *female genitalia*- relative length of ductus bursae and genital plates, various degrees of production in the four apparent genital plate prongs.

DISTRIBUTION. Mexico and Central America; South America S to NW Argentina (first brown species known from Mexico described below; see Remarks).

REMARKS. The genus contains a large number of species exhibiting considerable structural divergence. Unfortunately, the type species chosen by Field (1967b) is highly autapomorphic. Nevertheless, I do not further split *Calystryma*. This results in some divergence of characters in male genitalia (labides and falces) but basic unity is maintained by the simple, four-pronged, female genital terminus (herein Fig. 3E; Johnson 1988, Fig. 3, 1989a, Fig. 3; Johnson et al. 1988, Fig. 8; Field 1967b, Figs. 14,15,18). It is uncertain how many females associated with certain species by Field 1967b are inaccurate but, along with those transferred herein to other genera, those figured in Field's Figs. 16,17 require eventual correction. Given the divergence within the group, and the facies of the type species, a

non-conservative approach might split the group into three subgroups– (i) *C. trebula*, *C. nototrebula* and undescribed relatives (the "blue Calystryma"), (ii) & (iii) "brown Calystryma" including (ii) *C. keta* and undescribed relatives with strongly produced labides (herein Fig. 2B1, and Johnson and Field fig. loc. cits., above); (iii) the remaining species. I remove from *Calystryma* only those taxa clearly belonging to new genera defined in this study. I previously transferred *Thecla cinniana* from *Calystryma* to genus *Femniterga* (Johnson 1989a) and noted that Field's placement of divergent taxa in *Calystryma* resulted from his small sample size. Field's 1967b figure of the female genitalia of *C. keta* was drawn without the ventral membrane removed from the inferior genital plate. Consequently, it did not show the ventral scutes on this plate. Hitherto, for consistency with Field's (1967b) illustrations of his types species, I have followed his drawing closely (Johnson 1988, 1989a; Johnson et al. 1988). However, in the present study I draw the female with the ventral membrane removed, clearly indicating the ventral scutes (Fig. 5B).

Description of Congener.

***Calystryma quintana*,**
new species
Figs. 5CD,27,28

Diagnosis. Known only from the Yucatan Peninsula in Mexico and adjacent Belize and the only brown *Calystyma* currently described north of Costa Rica; distinctive in the region by the brown upper and under surfaces, typical Calystryma pattern in both sexes and small size (FW 9-11.5 mm.). In region similar only to *C. keta* (unmistakable by sipc terminal prong, Field 1967b, Fig. 1) and an undescribed species of *Klaufera* (marked with orbicular SC+R1 hindwing element and large size, FW to 13.0 mm., typical of genus). Genitalia of males are distinctively diminutive in the labides, elongate in the aedeagus and with a terminally lobate *sipc* (Fig. 5C); females have diminutive lateral prongs (Fig. 5D).

Description. *Male.* DFW,DHW ground deep brown hued very slightly metallic blue-green; VFW, VHW beige with typical *Calystryma* pattern. FW length: 9-11.5 mm. (11.0 holotype). *Female.* DFW, DHW brown; VFW,VHW similar to males. FW length: 11.0 mm. (allotype). *Sipc.* Typical of genus but with termino-lateral lobes relatively prominent (Fig. 5C); *Male Genitalia* (Fig. 5C): Labides less-produced than in most species, vinculum latero-centrally robust, valvae thin in the caudal extensions and aedeagus elongate (length exceeding rest of genitalia by nearly x2); *Female Genitalia* (Fig. 5D) typical of genus but lateral prongs relatively reduced and inferior genital plate rather dimunitive.

Types. Holotype male (Fig. 27), allotype female (Fig. 28), Consejo, Corozal Dist., Belize, scrub forest, 17 July 1988 (holotype), 18 July 1988 (allotype) leg. J. Shuey, deposited AMNH. Paratypes (because of data duplication in specimens leg. J. Shuey, usual format is amended below to "AMNH" or "JSC" for each entry, as appropriate). Same data as primary types but 10 July 1988 (one male JSC), 14 July 1988 (one male AMNH); 20 km. S. of Tulua, Quintana Roo, Mexico, 13 vii 1987, leg. J. Shuey (one male AMNH, one male JSC); Grutas Balancancha, Yucatan, Mexico, 10 September 1986 (one male JSC), same data but "road to caves, scrub", 1 August 1989 (one male JSC); Ruinas Becan, Campeche, Mexico, 19 July 1987 (one male JSC); Ruinas Chicana, Campeche, Mexico, young forest, 8 August 1989 (one male JSC, one male AMNH); Ruinas Labna, Campeche, Mexico, 30 August 1987 (one male AMNH), 14 September 1986 (one male JSC); Ruinas Chunyasche, Quintana Roo, Mexico, 18 September 1986 (one male AMNH, one male JSC), 15 September 1986 (one male AMNH); Ruinas Uuxmal, Yucatan, Mexico, 31 August 1987 (one male JSC); 5 km. N Bacalar, Quintana Roo, Mexico, mature forest, 7 August 1987 (one male JSC); Sayil, Yucatan, Mexico, 13 September 1986 (one male JSC, one male AMNH). Additional paratypes (not leg. J. Shuey). AME: Xcan, Quintana Roo, Mexico, 1959, leg. T. C. Emmel (one male). AMNH: Uxmal, Yucatan, 25 July 1952, leg. J. C. Pallister (one male).

Remarks. Circumstances regarding the collection of the type series appear typical of many taxa described in this study and are worthy of remark. Originally the species was known only from the last above-listed AME and AMNH specimens and appeared rare. However, when a long-term Quintana Roo/Belize collector was contacted, a large series was obtained along with notes that the species is locally common. Further, the long series of males occurred with only a single female and locally sympatric males and females of other members of the grade included various *Calycopis* species. Thus, it appears that (as noted by Johnson et al. 1988 for *Calycopis*) there is some local microhabitat segregation of males and females in *Calystryma* and most likely in other members of the *Calycopis/Calystryma* grade.

Etymology. Refers to Quintana Roo, one region of occurrence on the Yucatan Peninsula.

SERRATOFALCA,
NEW GENUS
Figs. 6,29,30

Synopsis–includes taxa of the *Thecla cerata* Group of Draudt (1919) and undescribed relatives

DIAGNOSIS. ***Primary trait.*** (1) *Male genitalia*– falces serrate along entire inner margin (Figs. 2D2,6A). ***Additional diagnostic traits.*** (2) *Wings*– both sexes, above, concolorous dull metallic azure blue (with single known brown exception); beneath light gray with VHW and tripartite band (generally more red than orange) in typical Calystryma pattern (Figs. 1D,29,30); (3) *Tergal morphology*–*sipc* elaborate in males, simple in females; male with terminal margin usually entire and convex, terminal edge lined evenly with short microtrichia (Fig. 2I,I2) (one species with terminus more cleft) (Fig. 6A1,2); (4) *Male genitalia*– in addition to serrate falces, vinculum lacking brush organs and ventral shape generally parabolic (Fig. 2E); labides steeply sloped ventrocephalically and cleft dorsally (Fig. 6A); (5) *Female genitalia*– inferior plates extremely large, width often equalling or exceeding length of ductus bursae with prominent ventral scutes; superior plate with short paired lateral prongs (Figs. 3F,6B).

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,29,30). DFW,DHW of both sexes, except for thin black marginal line, concolorous dull metallic azure blue (one undescribed species completely brown); VFW, VHW of both sexes gray to occasionally beige, VHW and tripartite band typical Calystryma pattern, band and limbal areas with markings in cells M3 to CuA2 generally more red than orange. *Tergal Morphology.* Male *sipc* elaborate, terminal margin usually entire and convex (one species with terminus more cleft), terminal edge lined evenly with short microtrichia (Figs. 2I1,6A1,2); female *sipc* simple (Fig. 2N), with bilobate sclerotization of terminal tergite varying slightly in extent and shape with species (Fig. 6B). *Genitalia.* Male (Fig. 2D2,6A). Vinculum typical of Clade I but lacking brush organs, ventral vincular shape generally parabolic; labides with regular, steep, ventrocephalic taper; valvae robust, particularly in the bilobed area, with caudal extensions of various length; saccus generally short and parabolic; aedeagus usually exceeding length of rest of genitalia by about one-third, caecum often pronounced comprising up to one-half aedeagal length, terminus with single cornutus (Fig. 6A, below). Female (Fig. 3F,6B). Genital plates extremely large relative to ductus bursae (plate breath equalling or exceeding ductus length); caudal end of ductus bursae usually with enlarged antrum at juncture with plates, cephalic end with ductal tube straight, curvate or spiral; superior plate with paired lateral prongs, length varying with the species; corpus bursae with two dendritic signa.

TYPE SPECIES. *Thecla cerata* Hewitson (1863-1878 [1877]), TL Para, Brazil lectotype male here designated from BMNH syntype labelled "Thecla cerata, Para, Hewitson Coll. 79-69, Thecla cerata 4"; paralectotypes, one male labelled "Thecla cerata, Para, Hewitson Coll. 79-69, Thecla cerata 1" [abdomen missing]; one male labelled "Thecla cerata, Para, Hewitson Coll. 79-69, Thecla cerata 2" [abdomen missing]. Note: Another syntype male, labelled as above but "Thecla cerata 3" represents an undescribed species which will be treated in a subsequent publication on this genus; type species Figs. 6,29,30.

DIVERSITY. Two species are previously described and there are three undescribed species currently known to me.

Species: (1) ***Serratofalca cerata*** (Hewitson) NEW COMBINATION (see above); (2) ***S. palumbes*** (Druce) NEW COMBINATION (*Thecla palumbes* Druce 1907) TL Cayenne, French Guiana, holotype male, BMNH type #960, GP K. Johnson.

INTERSPECIFIC VARIATION. Major differences occur in *wings*– difference in size, hue and intensity of DFW,VFW iridescence and additional DHW,VHW pattern components in limbal area; *tergal morphology*– *sipc*, both sexes, shape of terminal and lateral margins; *male genitalia*– shape of valvae and aedeagus; *female genitalia*–shape of ductus bursae and genital plates.

DISTRIBUTION. Central America S through the Amazon region and adjacent Andes to at least SE Brazil and S Peru. Note: In this entry, and hereafter, I make the distinction "at least" because recent work has shown numerous insular tropical endemics occur in the seldom-studied tropical and subtropical biomes isolated along the northern edge of temperate South America in NW Argentina and adjacent Bolivia and Chile (Johnson 1988, 1989a; Johnson et al. 1988, 1990). Samples from such areas have only recently become more widely available for study.

ETYMOLOGY. The name, considered feminine, refers to the serrate inner margin of the falces.

KLAUFERA,
NEW GENUS
Figs. 7,31,32

Synopsis–includes a number of *Thecla* taxa (some of which were included by Field 1967b in *Calystryma*) and numerous undescribed relatives.

DIAGNOSIS. ***Primary traits.*** (1) *Wings*– VHW,VFW black or black-brown with dull iridescent

steel blue or blue-green sheen and outstanding orange anal lobe; VHW tripartite band with SC+R1 element variously produced (lunular to rectangular and widely outlined with white) and displaced distally (Fig. 32); (2) *Male genitalia*– vinculum lacking brush organs and generally parabolic in ventral shape (Fig. 2E), valvae robust with widely ovate to bulbous bases (Fig. 7A); (3) *Female genitalia*– genital plates widely bilobate with superior plate generally lacking prongs and inferior plate with prominent ventral scutes (Fig. 3G,7B). ***Additional diagnostic traits.*** (4) *Wings*– expanse relatively large (FW to 13 or 14 mm., exceeded generally only by members of *Distissima* and *Gigantofalca* (see below); (5) *Male genitalia*– labides usually with a moderately produced central hump (Fig. 7A); (6) *Tergal morphology– sipc* occurring in males only; simple, resembling *Calystryma* with dorsum centrally cleft and minimal occurrence of lateral or terminal lobes (Figs. 2J,J1,7A).

DESCRIPTION. *Wings*. Wing shape not strongly angled (Fig. 1A,31,32). DFW,DHW, both sexes, blackish with dull steel blue or blue-green metallic sheen and thin black marginal bands; DHW with prominent orange anal lobe. Both sexes VFW, VHW gray to occasionally beige, VFW postmedian line prominent, VHW hindwing with SC+R1 element outstanding; tripartite band in typical Calystryma pattern. *Tergal Morphology*. Male *sipc* similar to *Calystryma*, not elaborate along lateral and terminal margins, and with microtrichia clustered in the dorso-central cleft (Fig. 2J1). *Genitalia*. Male (Fig. 7A). Brush organs not present in known species; vinculum typical of Clade I, usually with wide lateral surface abutting saccus and ventral shape generally parabolic; saccus parabolic to funnel-shaped depending on species; valvae robust and, depending on the species, ovate to bulbously based with diminutive caudal extensions; labides usually with moderately produced central hump; falces arched and tapered terminally. Female (Fig. 3G,7B). Genital plates widely bilobate; superior plate, if pronged at all, exhibiting only slight projections along the disto-lateral plate margins; inferior plate with prominent ventral scutes. Cervix bursae showing variously modified sculptured sclerotizations at point of attachment of ductus bursae; corpus bursae with two dendritic signa.

TYPE SPECIES. *Thecla pisis* Godman and Salvin 1879-1901 [1887]; TL Teffe, Ega, State of Amazonas, Brazil, lectotype male designated here, coll. of H.W. Bates, BMNH type no. 955, along with paralectotype male, no abdomen, Bugaba, Panama, leg. Champion, Godman and Salvin Coll., BMNH type no. 950 (Champion material also contains a topotypical male and female, both from Godman and Salvin Coll., BMNH) (see Remarks); type species Figs. 7,31,32.

DIVERSITY. Contains six previously described species (four were placed in *Calystryma* by Field 1967b and two are transfered from *Thecla* here). In addition there are four undescribed species currently known to me.

Species: (1) ***Klaufera pisis*** (Godman and Salvin) NEW COMBINATION (*Calystryma pisis* (Godman and Salvin), Field 1967b) (see above); (2) ***K. meleager*** (Druce) NEW COMBINATION (*Thecla meleager* Druce, 1907 [*Calystryma meleager* (Field 1967b)]), TL Surinam, of seven original syntypes, lectotype male, BMNH type no. Rh 962 by Field 1967b, genitalia prep. no. R. 1951 NHB 495; here designated, paralectotype male labelled "Thecla meleager 2", "Cayenne, Guyana", "type H. H. Druce", paralectotype female labelled "Thecla meleager", "Surinam, ex. Coll. Fruhstorfer", "type H.H. Druce" "J.J. Joicey Coll. BM 1929-435", paralectotype male labelled "Rio Grande, Brazil ex. Coll. Fruhstorfer", "type H. H. Druce", "J .J. Joicey Coll., BM 1929-435"; (3) ***K. anapa*** (Field) NEW COMBINATION (*Calystryma anapa* Field 1967b, USNM type no. 24907), TL Teffe Amazonas, Brazil, holotype male, AMNH, GP WDF no. 3178, allotype, AMNH, Middle Rio Ucayali, Loreto, Peru, 24 Aug. 1928 H. Bassler Collection, GP WDF no. 5089; (4) ***K. anthora*** (Hewitson) NEW COMBINATION (*Thecla anthora* Hewitson 1863-1878 [1877]) TL Para, Brazil, of five original syntypes, BMNH, here designated lectotype male labelled "Para, Hewitson Coll. 79-69", "Thecla anthora 3." with GPs K. Johnson, paralectotype male labelled "Cayenne, Hewitson Coll. 79-69", "Thecla anthora 5." [lacking abdomen]; (5) ***K. pisidula*** (Druce) NEW COMBINATION (*Thecla pisidula* Druce 1907), TL Rio Grande, Brazil, here designated lectotype male, BMNH, labelled "Thecla pisidula 5.", "type H. H. Druce", "BM Type Lep. Rh. no. 952" with GPs K. Johnson (see *Kroenleina* for proper placement of female syntype); (6) ***K. atrax*** (Butler) NEW COMBINATION (*Tmolus atrax* Butler 1877) TL Pedrosa, Rio Purus, Brazil, holotype male, BMNH type no. 911, GP 1951 NHB 493.

INTERSPECIFIC VARIATION. Major differences occur in *wings*– combinations of DFW,DHW/VFW,VHW ground colors, degrees of expression of tripartite band and location and form of the SC+R1 element of the band; *male genitalia*–particularly shape of the valvae; *female genitalia*– shape of the genital plates and specializations at cervix bursae.

DISTRIBUTION. Central America (undescribed) S through the Amazon region to at least SE Brazil and S Peru.

REMARKS. Field (1967a) mentioned a single type of *Thecla pisis*; I designate this specimen as the

lectotype. Field also clearly illustrated the distinctive traits of taxa transferred here from *Calystryma*, showing particularly the condition of the female genitalia (Field 1967b, Figs. 13,21,23). He did not list specimens of these taxa from outside South America. I have found Central American specimens referable to this genus and will determine the status of these in future taxonomic study of the group. Survey of taxa included in this genus leaves little doubt that the variously produced and detached character of the SC+R1 element of the VHW tripartite band most often aids in superficial recognition of the group. However, the character varies somewhat in intensity (extreme in *K. meleager* to small in some males of *K. pisis*) and genitalic dissection should accompany any serious attempt to identify members of the group.

ETYMOLOGY. The name is a patronym for Katherine E. Laufer and considered feminine.

GIGANTOFALCA,
NEW GENUS
Figs. 8,33-35

Synopsis– includes previously undescribed species.

DIAGNOSIS. *Primary trait.* (1) *Male genitalia*– falces gigantic, equal to or exceeding size of valvae (Fig. 8AC). *Additional diagnostic traits.* (2) *Wings*– expanse extremely large (FW 14.0-15.0 mm. or more), brown in both sexes with VHW limbal area markings more lavish than in other genera (Figs. 33-35); (3) *Tergal morphology*– *sipc* elaborate in both sexes; male with outstanding paired terminolateral lobes (Fig. 8AC), female with *sipc* enclosing entire terminolateral abdominal surface cephalad to at least the seventh tergite and, dorsally, enclosing the papillae anales (Fig. 8B); (4) *Male genitalia*– along with gigantic falces, labides with two to three terminally directed prongs; valvae complexly sculptured with prongs, serrate edges and/or bulbous lobes (Fig. 8AC); ventral vincular shape generally parabolic (Fig. 2E); (5) *Female genitalia*– superior plate with elongate, often asymmetrical, paired lateral prongs and with sculpturing or serration of the ventral struts; inferior plates widely hemispherical (Fig. 3H,8B).

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,33,35) but expansive (FW to 15 mm. or more). DFW,DHW of both sexes brown, DHW anal lobe moderately orange, white slash at base of lobe; VFW, VHW of both sexes gray to beige with postmedian line on forewing, tripartite medial band on hindwings in typical Calystryma pattern but with white edging particularly vivid, expansive limbal areas marked lavishly with orange and blue suffusions between veins M2 -2A (Figs. 33,35). *Tergal Morphology.* Male *sipc* with dorsum strongly concave (and often serrate) contrasting emphatically produced termino-lateral lobes (sometime protruding from end of abdomen) (Fig. 8AC), concave terminal margin lined with elongate microtrichia; female *sipc* extending cephalically to at least seventh tergite, enclosing entire terminolateral surface of eighth tergite and dorso-terminally enclosing robust papillae anales (Fig. 8B). *Genitalia.* Male (Fig. 8AC). Brush organs not apparent in known species, though abutting concave surface of *sipc* lined with elongate microtrichia. Genitalic parts with all aspects extremely sculptured; vinculum typical of Clade I with adjoining saccus extremely wide at base, ventral shape generally parabolic; labides with two to three prominent, terminally directed prongs; falces gigantic; valvae with sculptured features including lobate edges, prongs and/or serrations; aedeagus sometimes curvate in terminal one-third to one-half, caecum comprising about one-fourth aedeagal length, terminus with single cornutus. Female (Figs. 3H,8B). Superior plate with elongate, often asymetrical, paired distal prongs and ventral struts sculptured or serrate; inferior plate with lightly sclerotized hemispherical lobes lacking prominent ventral scutes; cervix bursae not structurally specialized in known species; corpus bursae with two, heavily sclerotized, dendritic signa.

TYPE SPECIES. *Gigantofalca stacya*, new species (Figs. 8AB,33,34).

DIVERSITY. Contains the type species and additional congener described below along with one undescribed species currently known to me (see Remarks).

Species: (1) ***Gigantofalca stacya*** (see below); (2) ***G. duida*** (see below).

INTERSPECIFIC VARIATION. Major differences occur in the *tergal morphology*– sculptured specializations of the *sipc* of both sexes; *male genitalia*– sculptured specializations of the labides, falces and valvae; *female genitalia*– sculptured specializations of the genital plates.

DISTRIBUTION. Currently known only from areas in the Amazon basin (see Remarks).

REMARKS. Although only three species are currently known, I suspect this genus is significantly more diverse. Each species has been located among large samples representing significant periods of collecting in areas known for local endemism. As with other "rare" Theclinae, members of *Gigantofalca* appear simply to have been seldom collected. Jenkins (1985) demonstrated the existence of significant, species rich lineages (genera) of little-known Nymphalidae with distributions generally limited to the Amazon basin.

ETYMOLOGY. The name, considered feminine, refers to the gigantic falces distinguishing the genus.

Description of Type Species.

Gigantofalca stacya,
new species
Figs. 8AB,33,34

Diagnosis. Wings typical of genus. Male with falces exceeding length and breath of valvae and lobate in shape (*G. duida*, below, strongly arched); valvae bilobes ovate with shorter, lobate caudal extensions (*G. duida* elongate with sclerotized prongs and serrations); *sipc* with short distoterminal lobes, length not exceeding centrocephalic lobe (*G. duida* strongly elongate with lobes terminally invaginated).

Description. *Male.* DFW,DHW brown; VFW, VHW beige with all markings characteristic of genus emphatic. FW length: 15.0 mm. (holotype). Female. Similar to male. FW length: 14.5 mm. (allotype). *Sipc.* Male (Fig. 8A) with terminal edge strongly concave and serrate, distoterminal prongs short, blunt-ended; female (Fig. 8B) heavily sclerotized over entire lateral surface of eighth tergite and, terminally, dorsally enclosing the papillae anales. *Male Genitalia* (Fig. 8A). Sculptured elements distinctive as noted in diagnosis; vinculum with additional lateral sculptured sclerotin, aedeagus length exceeding rest of genitalia by about one third and strongly curvate at terminus, caecum comprising about one-fourth aedeagal length. *Female Genitalia* (Fig. 8B). Superior plate with asymmetrically lateral prongs (one strongly elongate) and serrate struts; inferior plate with widely hemispherical bilobes.

Types. Holotype male (Fig. 33), allotype female (Fig. 34), Trans-Amazonica Highway, 15 km. S Itaituba, Para State, Brazil, 23 July 1978, leg. C. Callaghan, deposited AME.

Distribution. Presently known only from type locality.

Etymology. Patronym for Stacy Lyons.

Description of Congener.

Gigantofalca duida,
new species
Figs. 8C,35

Diagnosis. Male with falces robust and arched, valvae elongate (falces length consequently shorter than valvae by about one-eighth); elongate valvae basally lobate with pronged terminus and serrate lateral edge on caudal extension; *sipc* with strongly elongate termino-distal lobes (length exceeding that of *sipc* dorsal plate).

Description. *Male.* DFW,DHW brown; VFW, VHW beige with all markings characteristic of genus emphatic. FW length: 13.5 mm. (holotype). *Female.* Unknown. *Male Genitalia* (Fig. 8C). Distinctive as noted in Diagnosis and relevant figure.

Types. Holotype male (Fig. 35), Mt. Duida, Venezuela, 5 March 1929, ex. Frank Johnson Collection, deposited AMNH.

Distribution. Presently known only from type locality.

Remarks. The Mt. Duida, Mt. Roraima area is a long-acknowledged local area of endemism (Huntington 1933, Brown and Heineman 1972).

Etymology. Named for the type locality.

DISTISSIMA,
NEW GENUS
Figs. 9,36-39

Synopsis– includes *Thecla instita* Hewitson and numerous previously undescribed species.

DIAGNOSIS. ***Primary trait.*** (1) *Female genitalia*– superior plate with strongly elongate paired lateral prongs dominating salient appearance of the genital terminus (Figs. 3I,9BD). ***Additional diagnostic traits.*** (2) *Male genitalia*–labides strongly produced to a tapered central prong (Figs. 2B2,9AC), falces often robust and variously sculptured (Fig. 9AC), valvae with caudal extensions of irregular shape (Fig. 9AC); (3) *Tergal morphology– sipc* elaborate in males, simple in females (Fig. 9BD); male with elongate, flat to slightly convex, terminal margin lined with microtrichia and with bilobate lateral extensions (Fig. 9AC); (4) *Wings*– usually brown above with expanse (FW 13-14 mm.) usually larger than most *Klaufera* and only exceeded by *Gigantofalca*; like the latter taxon, with a notable white slash at base of VHW anal lobe.

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,36-39), FW expanse relatively large (13.5-14 mm.). DFW,DHW, both sexes brown, DHW anal lobe only slightly orange, if at all, but with white slash at base; VFW,VHW of both sexes beige to yellowish with prominent FW postmedial line, HW tripartite band in typical Calystryma pattern with W-element pronounced (Figs. 33-34) but not as lavishly edged or boldly suffused as in *Gigantofalca* (Figs. 33-35). *Tergal Morphology.* Male *sipc* with terminal margin elongate, flat to slightly convex, terminally edged with microtrichia and with bilobate lateral extensions; female *sipc* with bilobate sclerotizations of the terminal tergite varying with the species. *Genitalia.* Male (Fig. 9AC). Brush organs not apparent in known species but abutting clefts of dorsal margin of the vinculum and *sipc* with densely clustered microtrichia

(see Remarks); vinculum typical of Clade I but, in ventral shape, departing from triangular shape (Fig. 2C) by being generally ovate and with cephalic surface thin and adjacent saccus small and parabolic; labides strongly produced in terminally tapering prong; falces often robust and variously sculptured; valvae with relatively small bilobes terminating in elongate, often irregularly shaped caudal extensions; aedeagus straight to slightly curvate terminally, length exceeding rest of genitalia by about one-fourth, caecum comprising between one-third and one-fourth aedeagal length, terminus with single cornutus. Female (Fig. 9BD). Superior plate with strongly produced, sometimes asymmetrical, paired distal prongs; inferior plate prominent but not heavily sclerotized with scutes; ductus bursae length exceeding plate breath by one-forth or more; cervix bursae usually without sclerotized specializations; corpus bursae with two dendritic signa.

TYPE SPECIES. *Distissima spenceri*, new species (Figs. 9AB,36,37).

DIVERSITY. Contains the two congeners described here, along with one new combination from *Thecla*. In addition, there are four undescribed species currently known to me.

Species: (1) ***Distissima spenceri*** (see below); ***D. srandrea*** (see below) along with (3) ***D. instita*** (Druce) NEW COMBINATION (*Thecla instita* Druce 1907) TL Chapada, Mato Grosso, Brazil, holotype male, BMNH type no. 953, GP K. Johnson.

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– occasional occurrence of DFW,DHW iridescent blue; *male genitalia*– size and shape of labides, falces, valvae, saccus, aedeagus and brush organs; *female genitalia*–condition of superior and inferior genital plates, ratios of ductus bursae length to genital plate width.

DISTRIBUTION. Currently known from South America, from Colombia S through the Amazon basin and adjacent Andes at least to SE Brazil.

REMARKS. The assignment of *D. instita* is based solely on the facies of the male with females currently unknown. Eventual studies will need to further define the status of "brush organs" in taxa of this genus. As noted above, dense microtrichia line the abuttment of the clefts of the vinculum dorsum and *sipc*. However, these do not closely cleave to the vincular surface when the genitalic apparatus is removed but appear more attached to the cleft of the *sipc*. It may be that the broadly used term "brush organ" (Eliot 1973) has been too loosely defined as any bundle of elongate microtrichia cleaving to dissected genitalia. Since such bundles actually are attached to nearby membranes and not the genitalia or *sipc per se* (Johnson 1989c) there appears need for further morphological elaboration concerning this frequently used term.

ETYMOLOGY. The name refers to the prominent distal prongs of the female genitalia and is considered feminine.

Description of Type Species.

Distissima spenceri,
new species
Figs. 9AB,36,37

Diagnosis. Wings typical of genus. Female genitalia with base of genital plates curving caudally into elongate lateral prongs strongly disjunct from rest of superior plate; male genitalia with lobes of valvae curving irregularly in the caudal extension and serrate along the latero-terminal one-third.

Description. *Male.* DFW,DHW brown; VFW, VHW beige with all marking characteristic of genus emphatic. FW length: 14.0 mm. (holotype). *Female.* Similar to male. FW length: 14.0 mm. (allotype). Tergal Morphology. *Sipc.* Male with terminal margin flat, slightly indented centrodorsally, microtrichia prominent along entire margin (Figs. 2I1,9A) and triangular lateral extensions; female with simple bilobate sclerotizations (Fig. 2N,9B). *Male Genitalia* (Fig. 9A). Valval caudal extension with distinctive irregular curvature and laterotermínal one-third serrate (see Remarks). *Female Genitalia* (Fig. 9B). Base of genital plates curving terminally into elongate lateral prongs strongly disjunct from superior plate; inferior plate prominent but not sclerotized with pronounced scutes; ductus bursae tapering from terminal one-third to genital plate, cervix bursae without sculptureal specialization.

Types. Holotype female (Fig. 37), allotype male (Fig. 36), Para State, Brazil, Cuiba, Santarem, Brazil, 18 July 1978, leg. C. Callaghan, deposited AME. Paratypes. AMNH: same locale as primary types, one male, one female; HEC: Amazon, Bates, one male, one female; BMNH: Santarem, Amazons, one male; Para, leg. A. Miles Moss, one female.

Distribution. Currently known the type locality and old material labelled "Amazon".

Etymology. Patronym for Fr. Bonnell Spencer O.H.C. (Episcopal)

Description of Congener.

Distissima srandrea,
new species
Figs. 9CD,38,39

Diagnosis. Male wings typical of genus, female with overcast of dull blue (base DFW, entire DHW). Female genitalia with base of genital plates flat, inferior genital plate with prominent paired hemispherical lobes, superior plate with elongate lateral prongs connected along terminal margin by undulate margin marked with smaller paired disto-central knobs. Male genitalia with central prong of labides diminutive, valvae tapered from shouldered base, saccus elongate and terminally.

Description. *Male.* DFW,DHW brown; VFW, VHW ground beige, marked typically of genus. FW length: 13.5 mm. (allotype). *Female.* DFW brown, base suffused dull blue; DHW suffused dark bluish throughout, margin with white line from anal lobes to cell M2. VFW,VHW ground beige, marked typical of genus. FW length: 13.5 mm. (holotype). *Sipc.* Male with hemirectangular lateral lobes, dorsum centrally incised and marked with elongate, densely packed, microtrichia (Fig. 9C); female typical of genus (Fig. 9D). *Male Genitalia* (Fig. 9C). Labides with central prong diminutive; valvae with bilobes shouldered, caudal extension gradually tapered; saccus elongate (length equally one-half valval length); aedeagus elongate (length twice that of rest of genitalia). *Female Genitalia* (Fig. 9D). Genitalia plates with bases and terminal margins generally flat, latter with elongate paired lateral prongs connected by undulate terminal margin marked with short paired central knobs.

Types. Holotype female (Fig. 39), allotype male (Fig. 38), Igarapi-Assũ, Paraná State Brazil, Dec. 1911, leg. Parrish, deposited AMNH. Paratypes. AMNH: same data as primary types, two males, one female; highlands above Massaranduba-Blumenau, Santa Catarina State Brazil, one male; BMNH: Guarani, Paraná State, Brazil, 14 January 1954, one male, one female.

Distribution. Presently known only from SE and SW Brazil in Paraná and Santa Catarina States.

Etymology. Patronym for Sr. Andrea O.S.H. (Episcopal).

SERRATOTERGA,
NEW GENUS
Figs. 10,41-43
Synopsis– includes *Calystryma naka* Field and previously undescribed species.

DIAGNOSIS. *Primary traits.* (1,2) *Tergal morphology–sipc* elaborate in both sexes; (1) male *sipc* with serrate lateral lobe (Fig. 10AC), (2) female *sipc* with sclerotized juncture of genital plates expanded laterally to conjoin with a serrate cephalic margin on the eighth tergite (Fig. 10BD). ***Additional diagnostic traits.*** (3) *Wings*– upper surface concolorous dull metallic blue in males, brown with dull blue metallic sheen in females (Figs. 41-43); (4) *Male genitalia*–vinculum lacking brush organs but with lateral surface robust and ventral shape generally parabolic (Fig. 2E), valvae basally robust with abruptly thinner, elongate, caudal extensions (Figs. 2D5,10AC); (5) *Female genitalia*– genital plates expansive but not pronged; inferior plate with prominent ventral scutes and with expansive lateral connection to *sipc* as noted in (2, above) (Figs. 3J,10BD).

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,29,30), expanse moderate (11-12 mm., occasionally to 13 mm. in females). Male DFW,DHW dull iridescent blue, female brown with a dull blue sheen (similar to males of generally larger *Klaufera*, females of generally smaller *Kroenleina*). Both sexes VFW, VHW gray to beige, postmedian tripartite band on forewing, medial tripartite band on hindwing typical Calystryma pattern. *Tergal Morphology.* Male *sipc* with incised terminocentral margin marked with prominent microtrichia; lateral margin with prominent terminally serrate lobe (Fig. 10AC); female *sipc* with heavily sclerotized eighth and terminal tergites, former with serrate cephalic margin, latter enclosing papillae anales (Fig. 10BD). *Genitalia.* Male (Fig. 10AC). Brush organs absent in known species; vinculum with lateral surface wide and saccus diminutive, their length about equal to maximal vincular length along the ventral angle, ventral vincular shape generally parabolic; labides only slightly produced centrally; falces arched and terminally tapered; valvae basally robust, usually with variously thinner and elongate valvae; aedeagus generally straight to slightly curvate near the terminus, caecum comprising about one third aedeagal length, terminus with single cornutus. Female (Figs. 3J,10BD). Superior and inferior plates both prominent, former lacking terminal prongs (if terminal produced at all, only with slight knobs at distal margin), latter heavily sclerotized as triangular scutes; lateral margin of inferior plate extending to elongate juncture with margin of eighth tergite; ductus bursae varying strongly in length; cervix bursae with various structural specializations; structures of cervix bursae moderately specialized in some species; corpus bursae with two dendritic signa.

TYPE SPECIES. *Serratoterga larsoni*, new species (Figs. 10AB,40,41).

DIVERSITY. Thus far known from the type species, one congener here described, one species transfered from *Calystryma* and two other, undescribed species currently known to me.

Species: (1) ***Serratoterga larsoni*** (see below); (2) ***S. saopauloensis*** (see below); (3) ***S. naka*** (Field) NEW COMBINATION (*Calystryma naka* Field 1967b), TL Upper Rio Maranon, Dept. Amazonas, Peru, holotype male AMNH, GP WDF 5003, allotype, same data, AMNH, GP WDF 5085.

INTERSPECIFIC VARIATION. Diagnostic differences occur in the *wings*– divergent pattern elements in some species; *tergal morphology*– marked differences in specializations of the *sipc* in both sexes; *female genitalia*– marked differences in structural specialization of the genital plates, particularly the lateral extension connecting the the eighth tergite; *male genitalia*– lateral vincular configuration and valvae and labides shape.

DISTRIBUTION. Currently known only from the upper Amazon basin, Ecuadorian Andes and SE Brazil (see Remarks).

REMARKS. As with *Gigantofalca* and *Distissima*, the species of *Serratoterga* tend to occur in samples representing long term collecting in areas known for high endemism. Consequently, I suspect numerous additional species will be discovered as larger samples of the grade are assembled and dissected. Considering the structural specializations, *Serratoterga* is apparently an apomorphic sister group of *Klaufera*. Field (1967b, Fig. 13) illustrated the genital plate/ *sipc* contiguity of *S. naka* but since his figure was ventral, lateral and dorsal *sipc* serration (apparent in original dissection, AMNH) was not illustrated. Field's figure (the only one showing genitalia *with sipc*) suggests he was aware of the unique morphology of *S. naka*.

ETYMOLOGY. The name, considered feminine, is a euphonious Latin combination referring to the serrate margins of the *sipc* in both sexes.

Description of Type Species.

Serratoterga larsoni,
new species
Figs. 10AB,40,41

Diagnosis. DFW,DHW brown in males, sheened light metallic blue females; both sexes with DHW white line in cell CuA2 and darker, spot-like marks in cells CuA1 to M2. Female genital plates notably large (width almost equalling length of ductus bursae) and triangular in shape; lateral extension from plates thin, not as prominent as in congener described below and cervix bursae without structural specialization; male genitalia with robust centrolateral vincular surface and valval termini.

Description. *Male.* DFW,DHW brown with HW marginal white slash in cell CuA2 and dark spot-like marks, cells CuA1 to M2; VFW, VHW beige with pattern typical of genus. FW length: 12.5 mm. (allotype). *Female.* DFW,DHW marked similar to male but sheened entirely dull metallic blue; VFW, VHW similar to male. FW length: 12.5 mm. (holotype). *Sipc.* Males deeply incised along dorsoterminal margin and with prominent microtrichia; lateral lobe prominent, nearly equal in size to the terminal lobes and serrate along terminal edge (Fig. 10A); female with eighth and terminal tergites heavily sclerotized, former with prominently serrate cephalic margin, latter enclosing papillae anales (Fig. 10B). *Male Genitalia* (Fig. 10A). Differing from congener below by robust centrolateral vincular surface and valval termini, along with bulbous-ended falces. *Female Genitalia* (Fig. 10B). Distinctive with large, triangular genital plates and relatively thin lateral connection to the *sipc*, ductus bursae length only slightly more than genital plate width, cervix bursae without structural specializations.

Types. Holotype female (Fig. 41), allotype male (Fig. 40), Santo Domingo de los Colorados, Pichincha, Ecuador, submacrothermic rain forest, 24 December 1969, leg. H. Descimon, deposited AMNH. Paratypes. AMNH: Santo Domingo, Ecuador, 25 January 1941, leg. Laddey, one male, one male.

Distribution. Thus far known only from specimens collected in various years at the type locality.

Etymology. Named for the humorist Gary Larson.

Description of Congener.

Serratoterga saopauloensis,
new species
Figs. 10CD,42,43

Diagnosis. Large (FW to 13 mm.) with both sexes blue above, dull sheen in male, generally dull metallic blue in female. Female genitalia with genital plates small relative to ductus, having width of former only one-fourth length of latter, with lateral extension prominent and thickly connecting to cephalic margin of eighth tergite. Male genitalia with lateral vincular surface relatively sculptured, valvae with elongate, thick, caudal extensions and *sipc* with relatively diminutive serrate lateral lobe.

Description. *Male.* DFW,DHW dark blackish brown sheened dully steel blue; VFW, VHW dark

beige, pattern typical of genus. FW length: 12.5 mm. (allotype). *Female*. DFW,DHW dull metallic blue throughout; VFW, VHW as on males, though lighter beige. FW length: 13.0 mm. (holotype). *Sipc*. Males deeply incised along centroterminal margin and with prominent microtrichia (Fig. 10C); serrate lateral lobe about one-half length of terminal margin and blunt-ended; female with eighth and terminal tergites heavily sclerotized, eighth tergite with serrate cephalic margin extending laterally to sclerotized juncture with plates of female genitalia, terminal tergite enclosing papillae anales (Fig. 10D). *Male Genitalia* (Fig. 10C). Distinguished by more sculptured lateral vincular surface, elongate and thin valval caudal extensions and terminally tapered falces. *Female Genitalia* (Fig. 10D). Breadth of genital plates only about one-fourth ductal length. Superior plate with slight distal knobs; inferior plate with prominent scutes, thickly extended laterally to juncture with cephalic margin of eighth tergite; ductus bursae strongly elongate, cervix bursae with heavily sclerotized T-shaped structure at point of attachment of ductus seminalis.

Types. Holotype female (Fig. 43), Alto de Sara, São Paulo State, Brazil, Dec. 1925, leg. R. Spitz, allotype male (Fig. 42), São Paulo State, Brazil, 2300 ft., leg. Jones, both deposited BMNH.

Distribution. Thus far known only from specimens collected in various years at the type locality.

Etymology. Named for the type locality.

***TERMINOSPINISSIMA*,**
NEW GENUS
Figs. 11,44,45

Synopsis– includes a number of previously poorly known *Thecla* species and undescribed relatives.

DIAGNOSIS. ***Primary traits.*** **(1,2)** ***Genitalia***– both sexes exhibiting prominent additional spined components– (1) ***female genitalia*** with superior plate exhibiting strongly elongate paired distal and lateral prongs (Figs. 3K,11B), (2) ***male genitalia*** with terminus of falces strongly bifurcate (Figs. 2D1,11A). ***Additional diagnostic traits.*** (3) *Wings*– VFW,VHW with additional orange and red pattern elements in many species (see *Wings* in Description below), forewing expanse comparatively short (usually 10-11 mm.) (Figs. 44,45); (4) *Tergal morphology– sipc* occurring in males only; terminal bilateral lobes bulbous and comprising most of expanse of *sipc* dorsum (Fig. 11A); (5) *Male genitalia*– valvae basally robust with bilobes bulbous, ovate or widely parabolic contrasting thin, elongate, sometime recurvate caudal extensions (Fig. 2D5,11A); ventral vincular shape generally parabolic (Fig. 2E).

DESCRIPTION. *Wings*. Wing shape not strongly angled (Figs. 1A,44,45); wing expanse generally small for grade, usually 10-11 mm. DFW,DHW of males brown, DHW with anal lobe diminutive and only slightly orange (if at all) with occasional white basal mark; DFW,DHW females dull to bright blue at FW base and across HW except for blackish margins and, sometimes with white marginal line from anal lobe to cell M2 similar to that prevalent in *Kroenleina*. VFW,VHW, both sexes, gray to beige with typical Calystryma pattern but with a suite of species (see below) exhibiting broad additional red or orange pattern elements along the medial band and/or in the limbal areas (Fig. 1D). *Tergal Morphology. Sipc* present in males only, strongly incised centroterminally with prominent microtrichia and strongly produced bilobate terminal lobes (Fig. 11A). *Genitalia*. Male (Fig. 11A). Brush organs lacking in all known species (except one provisionally placed, see below); vinculum generally typical of Clade I but laterally thin with more radical angle along cephalic margin and saccus diminutive, length usually not exceeding width of cephalic vincular surface, ventral shape generally parabolic; labides slightly produced ventrally; falces terminating in widely bifurcate spines; valvae robust with bilobed area strongly produced and generally ovate, caudal extensions various elongate, thin or recurvate; aedeagus with length exceeding rest of genitalia by at least one-third, shaft elongate and often terminally recurved, caecum diminutive comprising less than one-forth to one-fifth aedeagal length, terminus with single cornutus. Female (Figs 3K,11B). Genital plates expansive, superior plate with two strongly elongate paired central prongs and two elongate but shorter paired distal prongs, or bifurcating to an additional prong; inferior plate with prominent ventral scutes; cervix bursae usually diminutive; corpus bursae with two dendritic signa.

TYPE SPECIES. *Terminospinissima serratissima*, new species (Figs. 11,44,45).

DIVERSITY. Currently contains the type species and three species transferred here from *Thecla*. In addition there are six undescribed species currently known to me.

Species with normal VHW surfaces: (1) ***Terminospinissima serratissima*** (see below): Species with lavishly red or orange medial and/or limbal areas: (2) ***T. orcillula*** (Strand) **NEW COMBINATION** (*Thecla orcillula* Strand 1914-1916 [1916]) TL Costa Rica, holotype female, BMNH labelled "Thecla orcillula Strand", "Costa Rica", "type orcillula Strand", "J. J. Joicey Coll. BM Type No. 1074", "Thecla Strand det. (type) orcillula, J. J. Joicey BM 1929-435", with GP K. Johnson (see Diversity under *Cyanodivida*, below); (3) ***T. gizela*** (Hewitson) **NEW COMBINATION** (*Thecla gizela* Hewitson 1863-1878 [1877]) TL Bolivia, lectotype

male, BMNH, designated here labelled "Thecla gizela", "Bolivia, Hewitson Coll. 79-69, gizela 2." with GP K. Johnson (for position of additional syntype see *Femniterga*); (4) ***T. vidulus*** (Druce) **NEW COMBINATION** (*Thecla vidulus* Druce 1907) TL Ecuador, holotype male, BMNH labelled "Thecla vidulus", "TYPE H. H. Druce", "Ecuador, Hewitson Coll. 79-69, Thecla vidulus 1.", "BM Type Lep. Rh. no. 958", with GP K. Johnson.

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– major pattern specialization in degrees of VHW,VFW red and orange pattern elements; *female genitalia*– length and relative placement of paired prongs of superior genital plate; *male genitalia*– configuration of falces termini and shape of valvae; *tergal morphology*– shape of *sipc* dorsum.

DISTRIBUTION. South America from Colombia S through the Amazon basin and adjacent Andes to SE Brazil and NW Argentina (undescribed).

REMARKS. This is a species rich group that has previously gone unrecognized. The occurrence of an undescribed congener in tropical NW Argentina may prove typical of many of the genera treated herein once that fauna is more well known. Because most species of *Terminospinissima* are poorly known, a new species is designated as the type. Significantly, additional wing pattern components of the VHW tripartite band and limbal areas typifying some *Terminospinissima* taxa appear to have independently evolved in two other genera of the grade: in Clade I, *Terminospinnisima* and *Calystryma* (an undescribed species) and in Clade II, *Femniterga* (see *F. splendida* Johnson 1989a and herein *F. boliviensis*) and *Reversustus*. Thus, *T. serratissima* appears to be the best choice for type species among species included here. It should also be noted that one species is included in the genus which lacks brush organs. As I have previously stated (Johnson 1989a) is appears that internal secondary sexual characters "come and go" in certain genera of the Eumaeini and it is therefore possible that some genera will consistently have or lack these while others will display a variety of occurrence. It is thus inadvisable to characterize the occurrence of such characters in genera by singular reference to the type species (Eliot 1973).

ETYMOLOGY. The name, considered feminine, refers to the salient terminal spines occurring on the males' falces and females' superior genital plate.

Description of Type Species.

Terminospinissima serratissima,
new species
Figs. 11,44,45

Diagnosis. Males with the DFW,DHW brown; females DFW base dull blue, DHW lighter blue throughout. Female genitalia with superior plate terminating in extremely incised, paired distal and lateral prongs, dominating entire terminal genital shape. Male genitalia with termini of falces prominently bifurcate and valvae basally ovate with contrasting short, tapered, caudal extensions.

Description. *Male.* DFW,DHW brown; VFW, VHW beige with the typical Calystryma pattern, lacking additional pattern elements present in some congeners (see generic entry). FW length: 10.5 mm. (allotype). *Female.* Similar to male but DFW base dull blue, DHW lighter blue throughout. FW length: 10.0 mm. (holotype). *Sipc.* Male (Figs. 11A) with terminal edge strongly incised at centroterminal margin and with prominent microtrichia, terminal lobes produced and bulbous. *Male Genitalia* (Fig. 11A). Vinculum typical of Clade I, appearing very thin in ventral view; labides slightly produced along vsentroterminal margin, falces elbowed, termini strongly bifurcate; valvae with strongly ovate bilobes, short thin caudal extensions, saccus short, pointed; aedeagus straight, length exceeding rest of genitalia by about one-third, caecum comprising about one-fifth aedeagal length. *Female Genitalia* (Fig. 11B). Superior genital plate strongly incised with prominent, elongate distal and lateral prongs making up nearly the entire configuration; inferior plate triangular (isoceles) and moderately sclerotized; ductus bursae short, length exceeding plate breadth by one-eighth, cephalically tapered and recurvate without specialization at the cervix bursae.

Types. Holotype female (Fig. 45), allotype male (Fig. 44), Rio Calary, Uaupes, Amazonas State, Brazil, 11 September 1906 deposited AMNH. Paratypes. AME: Cuiba, Santarem, Para State, Brazil, 18 vii 1978, leg. C. Callaghan.

Distribution. Currently known from Para and Amazonas states, Brazil.

Etymology. The name is a Latinization referring to the extreme spined features of the genus.

FURCOVALVA,
NEW GENUS
Figs. 12,46,47
Synopsis–includes *Calystryma tifla* Field (1967b) and undescribed relatives.

DIAGNOSIS. ***Primary trait.*** (1) *Male genitalia*– valval terminus bifurcate (Figs. 2D5,12A). ***Additional diagnostic traits.*** (2) *Male Genitalia*– lateral surfaces of vinculum generally wide from base of labides to diminutive saccus and appearing generally in same plane (Fig. 12A), ventral vincular shape generally parabolic (Fig. 2E); (3) *Female genitalia*– genital plates distinctly rectangular, superior plate laterally expansive and terminating laterally with a prominent caudally directed projection (Figs. 3R,12B); (4) *Tergal morphology– sipc* elaborate in males, simple in female; male with terminolateral lobes distad of the eighth tergite spiracle generally with concave outer margin (Fig. 12A); (5) *Wings*– in both sexes vivid blackish brown above and gray beneath with sharply marked, predominantly red, typical Calystryma pattern (Figs. 46,47).

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,46,47). Male DFW, DHW blackish to brown, DHW without notable white marginal line or orange-color on anal lobe; female DFW, DHW blackish to slightly sheened or suffused with dull blue and with slight white DHW marginal band. Both sexes VFW, VHW bright gray, tripartite bands on both wings prominently lined with red or orange. *Tergal Morphology.* Male *sipc* dorsocentrally incised and with prominent microtrichia, terminolateral lobes incised or concave (Fig. 12A); female *sipc* simple but laterally expansive (Fig. 12B). *Genitalia.* Male (Fig. 12A). Vinculum generally typical of Clade I, ventral shape generally parabolic, brush organs lacking in known species. Genitalia with valvae bifurcate at terminus, bifurcation forming a salient ventrally or laterally directed prong; vinculum laterally wide from base of labides to saccus and with surfaces generally in same plane; labides flat to slightly convex centrally; falces arched, termini tapered; saccus parabolic to funnel-shaped and not strongly prominent, usually much smaller than valval bilobes; aedeagus robust, length exceeding rest of genitalia by up to one-third, caecum comprising one-fourth to two-fifths aedeagal length, terminus with single cornutus. Female (Fig. 12B). Genital plates laterally expansive from ductus bursae in a rectangular shape, each lobe of superior plate with prominent lateral projection or prong; base of superior plate abutting ductus bursae with prominent struts; ductus bursae length variable with species; cervix bursae generally without sculptured specialization; corpus bursae with two dendritic signa.

TYPE SPECIES. *Furcovalva extensa*, new species (Figs. 12,46,47).

DIVERSITY. Includes the type species described herein, one species transferred from *Calystryma* and three undescribed species currently known to me.

Species: (1) ***Furcovalva extensa*** (see below); (2) ***F. tifla*** (Field) **NEW COMBINATION** (*Calystryma tifla* Field (1967b) TL Achinamiza, Dept. Loreto, Peru, holotype male, allotype female, AMNH, both figured, 6001 ft., Oct. 30, 1927, H. Bassler Collection, GP WDF 5005, allotype, same data, Jan. 3, 1936, WDF, no. 5084 (allotype misidentified, see *Cyanodivida*).

INTERSPECIFIC VARIATION. Diagnostic differences occur in *male genitalia*– location and specializations of additional valval lobe, saccus, aedeagus and brush organs; *female genitalia*– condition of superior plate and ratios of ductus bursae length to genital plate width.

DISTRIBUTION. South America, currently known from Venezuela and Guyana Shield, uplands along western margin of Amazon basin and SE Brazil (see Remarks).

REMARKS. As noted under *Gigantofalca*, *Distissima* and *Serratoterga*, representatives of this structurally distinctive group will probably continue to be found and the geographic range thus amplified. Field (1967b, Fig. 12) illustrated the male of *F. tifla*. His allotype, which among other pattern differences from the male is very small, is a species of *Cyanodivida*.

ETYMOLOGY. The name, considered feminine, refers the the pronged furcation at the valval terminus.

Description of Type Species.

Furcovalva extensa,
new species
Figs. 12AB,46,47

Diagnosis. Differs from *F. tifla* chiefly by conical valvae with short ventrally-directed dorsoterminal bifurcation (*F. tifla*, Field 1967b, Fig. 12, has basally robust ovate valvae with an extremely wide, laterally-directed terminal bifurcation, with length of lateral tooth equalling one-half ventral valval width).

Description. *Male.* DFW,DHW brown; VFW, VHW beige with all markings emphatic. FW length: 11.0 mm. (holotype). *Female.* Similar to male. FW length: 11.0 (allotype). *Sipc.* Male with lateral lobes deeply concave (Fig. 12A); female with sclerotized areas of terminal tergite laterally expansive (Fig. 12B). *Male Genitalia* (Fig. 12A). Valval lobes elongately parabolic at base, terminating in thinly tapered caudal extensions terminating with small, ventrally-directed dorsoterminal bifurcation. *Female Genitalia* (Fig. 12B). Ductal length and lateral expanse of genital plates both elongate, former terminating in undulation caudad of the cervix bursae and latter with prominent, terminally-directed lateral prongs.

Types. Holotype male (Fig. 46), allotype female (Fig. 47), Igarapi-Assũ, Parana State, Brazil, Dec. 1911, leg. Parrish, deposited AMNH. Paratypes. AMNH: same data as primary types, one male, two females.

Distribution. Currently known only from series at type locality.

Etymology. The name refers to the small, extremely terminal bifurcation at the caudal tip of the valvae.

***CYANODIVIDA*,**
NEW GENUS
Figs. 13,48-51

Synopsis– includes several undescribed species of the *Thecla* grade commonly misidentified in collections as "Thecla orcillula", "T. orcillata" or "Calystryma tifla", and numerous previously undescribed relatives.

DIAGNOSIS. Primary traits. (1) *Wings*– sexual dimorphism typified by brown males and bright blue females, latter with DFW,DHW exhibiting brilliant patches of metallic blue and silver, usually extending from DHW base to a well defined black marginal band (Figs. 48-51); (2) *Female genitalia*–superior plate with steeply tapered terminus at the central and distal margins of the plate, bordered distally by a heavily sclerotized serrate projection along the lateral margin of the plate (Figs. 3Q,13BD). ***Additional diagnostic traits.*** (3) *Male genitalia*– labides with produced ventroterminal lobe, valvae basally conical to lobate contrasting elongate and thin caudal extensions usually serrate along the outer margin (Figs. 13AC), ventral vincular shape generally triangular (Fig. 2C); (4) *Tergal morphology*– *sipc* in both sexes not elaborate, though modified along terminal margins; male dorsum laterally expansive with a central indention covered with prominent microtrichia and bordered laterally by strongly produced terminal lobes (Fig. 13AC); female with terminal and lateral edges variously sculptured to accomodate adjoining thick terminal prongs of superior genital plate (Fig. 13BD).

DESCRIPTION. *Wings*. Wing shape not strongly angular (Figs. 1A,46-49). Males DFW,DHW brown, DHW with anal lobe only slightly orange, if at all; females DFW, DHW with various dull to brilliant blue patches, in most cases dominating ground color from wing base distad to dark marginal band and often with veins overlaid with black, expanse of iridescent blue and degree of metallic brilliance positively correlated with prominent white DHW marginal line. Both sexes VFW,VHW gray to beige with VHW tripartite band in typical Calystryma pattern. *Tergal Morphology*. Male *sipc* distally expansive compared to groups with generally simple *sipc*– dorsum centroterminally incised, covered with prominent elongate microtrichia and bordered laterally by strongly produced terminal lobes; female with *sipc* margins variously sculptured to accomodate adjacent prongs of superior genital plate. *Genitalia*. Male (Figs. 13AC). Vinculum with ventral shape generally triangular, brush organs densely packed along dorsal surface, cephalic vincular margin usually strongly curvate with adjacent saccus prominent; labides with terminoventral margin produced to prominent lobe or prong; falces arched with termini tapered to slightly bulbous; valvae with bilobed areas lobate to conical, contrasting thin and often elongate caudal extensions which vary in length and shape; aedeagus usually straight but with area immediately adjacent terminus sharply curvate, aedeagus length usually exceeding rest of genitalia by one-fourth to one-third, caecum comprising about one-fourth aedeagus length, terminus with single cornutus. Female (Figs. 13BD). Superior plate usually with steeply tapered terminus at central and distal margins of plate, bordered distally by heavily sclerotized serrate projection along lateral margin of plate; ductus bursae of varying length and cephalic configuration, cervix bursae generally without sculptured specialization; corpus bursae with two dendritic signa.

TYPE SPECIES. *Cyanodivida fornoi*, new species (Figs. 13AB,48,49).

DIVERSITY. Along with the types species and congener described here, this genus contains five undescribed species currently known to me, a number of which have been widely misidentified as various "*Thecla*" species in many collections. Series at BMNH placed with *T. orcillula* Strand (but not the type; see *Terminospinissima*) include *Cyanodivida* species as does a series labelled "Thecla orcillata Strand" (for which I can find no OD either in the BMNH collection card catalog or Bridges 1988). In addition, the allotype female of *Calystryma tifla* Field (1967b) (which has no standing under the ICZN Code except as a paratype) is a female of *Cyanodivida*. Thus, although species of *Cyanodivida* have been widely collected, examination of type specimens leaves no *Thecla* species assignable to the genus at this time.

Species: (1) ***Cyanodivida fornoi*** (see below); (2) ***C. neorcillata*** (see below and Remarks).

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– sexual dimorphism in male and female iridescent coloration patterns; *male genitalia*– terminal shape of labides and configuration of the valvae; *female genitalia*–configuration of the genital plates; *tergal morphology*–shape of the *sipc* dorsum.

DISTRIBUTION. South America from Colombia S through the Amazon basin and adjacent Andes to at least SE Brazil and S Peru.

REMARKS. BMNH series identified as "T. orcillula" and "T. orcillata" are comprised of specimens with various patches of a distinctive brilliant metallic "powder blue" color. That this sample is taxonomically heterogeneous is testified to not only by the comments above (under Diversity) but by the presence in these samples of a species of *Kroenleina*, structurally a member of Clade II. This suggests that both (i) additional under surface pattern elements and (ii) various brilliant structural colors have evolved independently in several genera of the Calycopis/Calystryma grade. Since the type species designated here for *Cyanodivida* is from Bolivia, further comment is relevant concerning three species described from Bolivia by Draudt (1919)– *Thecla suda*, *T. cyanus*, and *T. geminata*. Since the location of types of these species is unknown and since the present paper documents the varieties of sexual dimorphism and structural characters typifying the entire Calycopis/Calystryma grade, there is no way to objectively evaluate these names. To complicate matters, Draudt did not mention gender in the OD's of any of these taxa. From wing pattern, it appears that *T. geminata* most likely is a species of *Angulopis* (Outgroups). The other two species could belong to *Calystryma* or *Cyanodivida* of Clade I or *Kroenleina* of Clade II. Other taxa of Draudt's "cecrops-Group", attributed to Hewitson or Godman and Salvin (types BMNH), but not included by me in the present study, are not members of either the Calycopis/Calystryma or Electrostrymon grades. As noted under Outgroups, the genus *Symbiopsis* Nicolay includes a number of blue and brown taxa somewhat superficially similar to genera treated in the present study. An outgroup entry distinguishes *Symbiopsis* from *Cyanodivida* and other prominently blue members of the Calycopis/Calystryma grade.

ETYMOLOGY. The name combines Latin roots meaning "blue" and "divided" and refers to the marked sexual dimorphism characterizing species of this genus.

Description of Type Species.

Cyanodivida fornoi,
new species
Figs. 13AB,48,49

Diagnosis. Wing coloration with iridescent color of females very reduced, comprising only a sheen of bright metallic blue over DHW up to a black marginal band. Both sexes beneath with typical Calystryma pattern. Male genitalia with valvae having bases lobate contrasting extremely thin and elongate caudal extensions. Female genitalia with superior plate parabolic, distolateral edges thickly sclerotized, culminating in widely-based terminally directed distolateral prongs.

Description. *Male.* DFW,DHW blackish brown; VFW,VHW beige with crisply marked Calystryma pattern. FW length: 10.0 (holotype) - 11.0 mm (paratypes). *Female.* DFW brownish black, DHW base to black marginal band bright, but not intense metallic azure blue, black spotlike marks in margins of cells M2-CuA2 bordered by white marginal line. VFW,VHW similar to male. FW length: 10.0 (allotype) - 11.0 mm. (paratypes). *Sipc.* Male (Fig. 13A) with dorsoterminal lobes prominent and expansive, dominating *sipc* shape; female (Fig. 13B) dorsoterminal margins strongly sculptured; dorsum with raised cephalocentral ridge. *Male Genitalia* (Fig. 13A). Valvae basally wide and ovate terminating in very thin, elongate caudal extensions; saccus widely parabolic and short, length less than one-half that of valval bilobes; both shaft and caecum of aedeagus recurvate. *Female Genitalia* (Fig. 13B). Superior plate prominently parabolic with latter edges strongly thickened to terminally directed distolateral prongs (see Remarks).

Types. Holotype male (Fig. 48), allotype female (Fig. 49), Hotel Tamampaya area (Estancia Anacu), 4300 m., Province Sud Yungas, Dept. La Paz, Bolivia, leg. D. and K. Matusik, 20-27 May 1989, deposited AMNH. Paratypes. AMNH: same data as primary types, three males, two females. DMC: same data as primary types, two males, two females.

Remarks. Females within the type series differ somewhat in the degree of differentiation of the prongs along the terminal margin of the superior plate. This kind of minor individual variation appears in a number of species in the genus and probably results from the generic ground plan of the superior plate. The prong producing areas of the distal and lateral margins are more closely proximate than in other genera.

Distribution. Currently known from Bolivian "yungas" localities; considering this, distribution should extend southward in this ecological zone to northern Salta and Jujuy provinces, Argentina.

Etymology. At the request of the collectors of the type series, D. and K. Matusik, this species is named for Dr. Edwardo Forno of La Paz, Bolivia who was their host in 1989. Dr. Thomas Emmel and Fred Werner are also thanked for their participation in that collecting expedition.

Description of Congener.

Cyanodivida neorcillata,
new species
Figs. 13CD,50,51

Diagnosis. Wing coloration with female iridescence extremely bright metallic powder blue at DFW base and over DHW from base to prominent black marginal band. Both sexes beneath with ground light buff complemented by typical Calystryma pattern particularly marked with bold red along the tripartite band. Male genitalia with valvae conical at base, tapering to thin caudal extension slightly serrate along lateral margin. Female genitalia with superior plate uniquely produced along the disto-terminal margin.

Description. *Male.* DFW,DHW brown; VFW, VHW light buff and with all markings vivid and red of tripartite band particularly bright. FW length: 11.0 mm. (holotype), 10.5 -11.0 mm. (paratypes). *Female.* DFW brownish black except base and adjacent cell CuA2 brilliant metallic powder blue, DHW base to black marginal band bright, but not intense, metallic azure blue. VFW,VHW similar to male. FW length: 10.5 mm. (allotype), 10.0 - 10.5 mm. (paratypes). *Sipc.* Male dorsum widely expansive laterally with widely lobate terminal margins directly proxad the centrodorsal incision (Fig. 13C); female with simple bilobate sclerotization of terminal tergite (Fig. 13D). *Male Genitalia* (Fig. 13C). Valvae basally parabolic and with elongate, every thinly tapered caudal extensions slightly serrate along their outer margins. *Female Genitalia* (Fig. 13D). With additional short, paired, distal prongs contiguously joined along a heavily sclerotized rim with the paired lateral prongs.

Types. Holotype male (Fig. 50), allotype female (Fig. 51), St. Jean de Maroni, Guyane Francaise, deposited MNHN. Paratypes. MNHN: same data as primary types, one male, one female; River de Maroni, Guyane Francaise, two males, one female. BMNH: St. Laurent, Guiana, one male, two females. AMNH: same data as primary types, one male, one female.

Distribution. Currently known from numerous localities on the Guyana Shield.

Remarks. I describe this species here since, from BMNH curations, it is apparent that a significant common usage has developed concerning the identification of such females as *taxa T. orcillula* or "T. orcillata". Location of significant series of this species from early MNHN French Guiana expeditions suggests more specimens may eventually be located among the MNHN unsorted materials. *T. orcillula* has been placed herein according to the characters of its holotype female (see *Terminospinissima*).

Etymology. The name refers to an incorrect common usage "T. orcillata" to which is added the Latin prefix for "new".

MORPHISSIMA,
NEW GENUS
Figs. 14,52,53

Synopsis– includes various *Thecla* taxa misassociated by Draudt (1919) with his *T. "hesperitis"* group, some placed by Field (1967a) in *Calycopis*, along with undescribed relatives.

DIAGNOSIS. ***Primary traits.*** (1) *Wings*– DFW,DHW in both sexes uncharacteristically brilliant blue for the grade, males dazzling metallic "morpho" blue except for a thin dark marginal line; females brilliant silver or silvery blue from FW discal cell caudad and across entire HW except for black margin; VFW,VHW very dark brown, often suffused with blackish scales obscuring the tripartite band; (2) *Male genitalia*– Labides dorsoterminally produced (Fig. 14AC); valvae usually of compact, triangular, ventral shape (Fig. 14AC); ventral vincular shape triangular (Fig. 2C). ***Additional diagnostic traits.*** (3) *Tergal morphology– sipc*, males and females, simple; outer margin in males widely concave (Fig. 14AC); (4) *Female genitalia*– Superior genital plate with terminal edge serrate into four rather equally sized projections located at the distal and lateral margins of the plate (Figs. 3S,14BD); inferior plate diminutive and without ventral scutes.

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,52,53). DFW,DHW males brilliant iridescent blue except for thin black marginal borders; females brilliantly blue, often distinctly silver, basad of FW discal cell and on entire HW except for black marginal band. VFW,VHW ground, both sexes, very dark brown with tripartite band consequently not outstanding, W-element very small, adjacent Thecla-spot red, cell CuA1 basally red and distally bright blue. *Tergal Morphology.* Male *sipc* with terminal margin widely concave and edged uniformly with short microtrichia (Fig. 14AC). *Genitalia.* Male (Fig. 14AC). Vinculum ventral shape triangular; brush organs elongate, extending from base of vincular arc to labides base; labides strongly produced dorsally, steeply sloping ventrally; ventral angle of vinculum arched with saccus incised; valvae very robust, usually with cephaloventral margin produced forming, in ventral view, a rather triangular shape, aedeagus length exceeding rest of genitalia by one to two-fifths and usually slightly curvate caudad caecum; caecum comprising about one-fourth aedeagal length, terminus with single cornutus. Female (Fig. 14BD). Superior plate

with terminal margin incised to four prominent excised projections in distal and lateral areas, not thinly prong-like as in *Calystryma*; inferior plate diminutive and without ventral scutes; ductus bursae length variable; cervix bursae generally without sculptured specializations; corpus bursae with two dendritic signa.

TYPE SPECIES. *Morphissima scalpera* new species (Figs. 14BC,52,53).

DIVERSITY. Along with the type species and six species transferred from *Thecla* there are three undescribed species currently known to me.

Species: (1) ***Morphissima scalpera*** (see below); (2) ***M. thama*** (Hewitson) **NEW COMBINATION** (*Thecla thama* Hewitson 1863-1878 [1877]) TL Santa Martha, northern Colombia, lectotype male designated here, BMNH, labelled "Thecla thama", "Santa Martha, N. Colombia, Hewitson Coll. 79-69, thama 1." "B.M. Lep. Rh. type no. 904"; (3) ***M. xeneta*** (Hewitson) **NEW COMBINATION** (*Thecla xeneta* Hewitson 1863-1878 [1877] [*Calycopis xeneta* (Field) 1967a]) TL Chonatles, Nicaragua, lectotype male by Field 1967a, BMNH type no. 899, GP BM 1951-491; (4) ***M. devia*** (Moeschler) **NEW COMBINATION** (*Thecla devia* Moeschler 1883 [*Calycopis xeneta devia* Field 1967a]) TL Surinam, holotype male, Stuttgart Museum, Field 1967a; (5) ***M. centoripa*** (Hewitson) **NEW COMBINATION** (*Thecla centoripa* Hewitson 1868) TL "Amazon", lectotype male designated here, BMNH, labelled "Thecla centoripa, "Amazon, Hewitson Coll. 79-69, centoripa 1" [= *T. hahneli* Staudinger 1884-1888 [1888], TL Upper Amazon, Iquitos, Peru, holotype male, ZMH); (6) ***M. netesca*** (Draudt) **NEW COMBINATION** (*Thecla netesca* Draudt 1917-1924 [1920]) TL "Guiana to south Peru", type deposition unknown, placed here by commn usage identification and GPs K. Johnson, AMNH; (7) ***M. indigo*** (Druce) **NEW COMBINATION** (*Thecla indigo* Druce 1907 [*Calycopis indigo* Field 1967b]) TL Chapada Campo, Brazil, holotype male, BMNH type no. 901, GP NHB 1951-485.

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– expanse and color of DFW,DHW iridescent blue in both sexes; *male genitalia*– size and shape of valvae, saccus, aedeagus and brush organs; *female genitalia*– shape of superior and inferior genital plates, ratios of ductus bursae length to genital plate width.

DISTRIBUTION. Central America; South America from Colombia to Guyana Shield, in uplands bordering Amazon basin and in adjacent tributaries, and S to at least SE Brazil and S Peru.

REMARKS. Although numerous *Thecla* species are assignable to this genus, I describe a new type species since its males and females are the most reliably associated from MNHN samples. However, since the expanse of DFW,DHW brilliant blue varies within the genus, I also figure the genitalia of the type of *M. thama*, a species with an entirely brilliant upper surface (Fig. 14A).

ETYMOLOGY. The Latinized name refers to the brilliant upper surface blue displayed by most species.

Description of Type Species.

Morphissima scalpera,
new species
14BC,52,53

Diagnosis. Male DHW with brilliant blue limited to hemispherical patch from base to medial area; female dull silver-gray flushed with blue (DFW base, entire DHW); male with valvae having lobate caudal extensions heavily fringed on the lateral margins with elongate microtrichia; female genitalia with superior plate incised into four serrate projections of generally equal length.

Description. *Male.* DFW black, DHW black except for brilliant blue from base to medial area, submargins and margins blackish (see Remarks); VFW,VHW beige overcast with blackish suffusion, tripartite band (Fig. 1E). FW length: 12.0 mm. (holotype and paratypes). *Female.* DFW black distally, lustrous silvery blue basally; DHW generally lustrous silvery blue, darker blue toward margin; margin with anal lobe prominent and black, then alternating black and silver blue from cells CuA2 to M2 lined distally with thin white marginal line. FW length: 12.0 (allotype). *Sipc.* Male with terminal margin strongly concave with lateral margins appearing more like paired lobes (Figs. 14B). *Male Genitalia* (Fig. 14B). Valvae with ovate bilobes and cuadal extension lobates and fringed along the lateral margins with microtrichia much more elongate and densely clustered than typical of the grade. *Female Genitalia* (Fig. 14C). Superior plate with four incised serrate projections of about equal length; ductus bursae length about one and one-half of genital plate width; cervix bursae without structural specialization.

Types. Holotype male (Fig. 52), allotype female (Fig. 53), Guyane Francaise, River de Maroni, deposited AMNH. Paratypes. MNHN: same data as primary types, three males; St. Jean de Maroni, two males, one female. AMNH: Santa Barbara, Surinam, 15 April 1927, one male.

Distribution. Currently known from the Guyana Shield.

Remarks. This species should not be confused with *Calycopis anastasia* Field (Bolivia), which is also

prominently blue medially on HW; *C. anastasia* differs in generic structural characters and in having the typical DHW submarginal and marginal markings of *Calycopis*.

Etymology. The Latin name means "half" referring to the restricted DHW blue on the male.

***FIELDIA*,**
NEW GENUS
Figs. 15,54,55

Synopsis– includes a number of species transferred from the *Thecla galliena* and *hesperitis* groups of Draudt (1919), several undescribed species examined by Field (1967a, 1967b) but not associated by him with either *Calycopis* or *Calystryma* and undescribed relatives.

DIAGNOSIS. ***Primary traits.*** **(1,2)** ***Genitalia,*** both sexes–(1) male with terminodorsal and lateral surfaces extremely produced relative to area adjoining saccus with labides consequently large and also terminally concave (Fig. 15AB); (2) female ductus bursae a simple, fluted, tube terminating in a spatulate superior genitalia plate, inferior plate diminutive but often with heavily sclerotized margins (Fig. 3U,15C). ***Additional diagnostic traits.*** (3) *Wings*– VHW tripartite band with W-element very small (Fig. 1E), resembling *Morphissima*, and with band often obscured relative to ground color and with limbal coloration limited to immediate area of Thecla-spot and anal lobe; DFW, DHW, contrasting *Morphissima* always with blue iridescent color reduced (appearing as vague sheen) or absent (Figs. 54,55); (4) *Male genitalia*– valvae with bilobes basally robust and sculptured, contrasting elongate and often very thin caudal extensions (Fig. 15AB); ventral vincular shape generally parabolic, though with saccus prominent (Fig. 2E).

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,54,55). DFW brown, both sexes, occasionally with very dull basal iridescent blue, DHW males either dull iridescent blue except for thin black margins and/or submargins, or completely brown; females as above but always with less iridescent blue; VFW,VHW ground, both sexes, beige to darker brown with tripartite band not prominent, W-element very small, limbal areas with markings restricted to the immediate area of Thecla-spot and anal lobe. *Tergal Morphology.* No *sipc* occurs in either sex of known species. *Genitalia.* Male (Fig. 15AB). Brush organs not apparent in known species; microtrichia prominent along caudal edge of terminal tergite, usually about same length as labides; labides terminus deeply concave and sometimes serrate; lateral surface of vinculum extremely robust with saccus consequently diminutive; valvae with bilobes robust and basally sculptured, contrasting generally thin, variously elongate caudal extensions; aedeagus generally elongate, length exceeding rest of genitalia by at least one-third, with shaft curvate to bowed and caecum comprising one-third to one-fourth aedeagal length, terminus with single cornutus. Female (Fig. 15C). Generally characterized by a variously elongate, fluted, tube terminating in spatulate superior plate of varying size and sculpturing, inferior plate comparatively diminutive but often with heavily sclerotized or sculptured margins, cervix bursae generally without sculptured specializations; corpus bursae with two dendritic signa.

TYPES SPECIES. *Fieldia yungas*, new species (Fig. 15BC, 54,55).

DIVERSITY. The genus is still poorly known relative to the others; includes type species, two species transferred from *Thecla* and two undescribed species currently known to me.

Species: (1) ***Fieldia yungas*** (see below); (2) ***F. nisaee*** (Godman and Salvin) **NEW COMBINATION** (*Thecla nisaee* Godman and Salvin 1879-1901 [1887]) TL Bugaba, Panama, holotype male, BMNH labelled "Type, sp. figured., Godman-Salvin Coll. 1911.–93, B.C.A. Lep. Rhop. Thecla nisaee, G. &. S., Bugaba, Panama, Champion, type, BM Type No. Rh. 870", GP K. Johnson; (3) ***F. vesper*** (Druce) **NEW COMBINATION** (*Thecla vesper* Druce 1909) TL Peru, Chanchamayo, [holo]type male noted as in BMNH [Bridges 1988] but not located there by me) ID by BMNH topotyical male, GP K. Johnson.

DISTRIBUTION. Currently indicated as S Central America (Panamanian region) S to South America in regions along margin of Amazon basin and perhaps southward.

ETYMOLOGY. Named for William D. Field, who first recognized these taxa as generically distinct.

Description of Type Species.

***Fieldia yungas*,**
new species
Figs. 15BC,54,55

Diagnosis. Both sexes DFW,DHW completely brown; male with HW limbal area slightly suffued with dull metallic azure blue. Males structrually differing from congeners by extremely robust, nearly ovate, centrolateral vincular surface with extremely short cephalic extension to the saccus; valvae bulbously shouldered in the bilobed area; female with ductus bursae a simple elongate tube terminating in spatulate superior genital plate.

Description. *Male.* DFW,DHW ground blackish brown with limbal area of HW suffused very dull azure blue. VFW,VHW ground dirty brown, tripartite band

reduced. FW length: 13.5 mm. (holotype, paratype). *Female.* DFW,DHW ground color brown; VFW,VHW similar to male. FW length: 13.5 mm. (allotype). *Genitalia.* Male (Fig. 15B). Labides terminus concave, typical of genus; lateral vincular surface extremely robust, nearly ovate, with cephalic extension so short as to be no longer than the diminutive saccus; falces consequently appear elongate and strongly arched; valvae with bilobed areas bulbous, contrasting narrowly tapered caudal extensions; aedeagus elongate, length two and one-half times that of rest of genitalia, with shaft bowed in terminal two-thirds and caecum prominent. Female (Fig. 15C). Ductus bursae a simple tube terminating in a spatulate superior genital plate.

Types. Holotype male (Fig. 54), allotype female (Fig. 55), Hotel Tamampaya area (Estancia Anacu), 4300 m., Province Sud Yungas, Dept. La Paz, Bolivia, leg. D. and K. Matusik, 20-27 May 1989, deposited AMNH. Paratypes. AMNH: same data as primary types, three males, two females. DMC: same data as primary types, two males, two females.

Distribution. Known only from the types series.

Etymology. Named for the general area of occurence.

Clade II (The "*Tergissima* Group")

Male genitalia with lateral surface of vinculum strongly declined in the cephalic one-half with angle formed by dorsal and cephalic elements equalling circa 90 or sometimes less; saccus usually diminutive (Fig. 2F); consequent ventral vincular form "bell"-shaped (Fig. 2G).

TERGISSIMA Johnson
Figs. 16,56,57
Tergissima Johnson 1988: 30.
Synopsis– includes taxa treated by Johnson (1988, 1989a) and Johnson et al. (1988).

DIAGNOSIS. ***Primary traits.*** (1) *Female genitalia*– terminus lacking genital plates; instead with various sclerotized flaps caudad of simple ductal tube (Figs. 3V,16B); (2) *Tergal morphology– sipc* occurring in male only; elaborate, extending cephalically to sixth tergite and with sculptured, or sometimes pronged or ventrally invaginated, terminal lobes (Fig. 2L,16A); (3) *Wings*– both sexes brown above and with typical Calycopis pattern beneath. ***Additional diagnostic traits.*** (4) *Tergal morphology*– male *sipc*, contrasting *Kroenleina*, having dorsocentral incision and prominent microtrichia but not evidencing prominent inwardly directed prong (Fig. 16A); (5) *Female genitalia*– corpus bursae either lacking or with diminutive signa; (6) *Male genitalia*–contrasting *Femniterga* and *Kroenleina*, labides generally produced dorsally (Fig. 2F3,16B).

DESCRIPTION. See Johnson 1988, p. 30, figs. 3-5, 1989a, p. 197-198, figs. 2-3; Johnson et al. 1988, p. 18, figs. 8-9.

TYPE SPECIES. *Tergissima mosconiensis* Johnson by original designation (Figs. 16,56,57).

DIVERSITY. Recently revised by Johnson (1989a) to include the species below.

Species: (1) ***Tergissima mosconiensis*** Johnson 1988, TL Mosconi, Dept. San Martin, Salta Prov., Argentina (LD no. 17), holotype male, allotype female, AMNH with GPs K. Johnson; (2) ***T. macphersoni*** Johnson 1988, TL Tartagal, Dept. San Martin, Salta Prov., Argentina (LD no. 16), holotype male, allotype female, AMNH with GPs K. Johnson; (3) ***T. shargeli*** Johnson 1989a, TL Santiago, Chile, holotype female, MNHN with GP K. Johnson; (4) ***T. montanensis*** Johnson 1989a, TL Mt. Ollantaitamba, Peru, holotype male, allotype female, AMNH with GPs K. Johnson.

INTERSPECIFIC VARIATION. Major differences occur in *tergal morphology*– male *sipc*, shape and/or additional components; *male genitalia*– size and shape of valvae, labides, saccus, aedeagus and brush organs along with lateral configuration of the vinculum; *female genitalia*– ratios of ductus bursae length to genital plate width and form of dimunitive genital plates.

DISTRIBUTION. Primarily austral, from NW and C Argentina and NC Chile northward to C Peru.

REMARKS. Original descriptions of *Tergissima* and *Femniterga* mentioned male forewings marks resembling "brands" which initially attracted attention to these genera. Subsequent morphological examination clarifed the structural distinctions between the groups. After further study (Johnson, 1989a), it appears doubtful that these forewing marks are indeed androconial (=pheromonal). It is more likely they represent darkened discal scales which appear in some males and females in various Eumaeini and which become more salient with wear. As noted herein under *Iaspis*, salience of male androconial markings varies among species in certain genera. Some androconia are boldly concentrated as "brands"; others appear as diffuse modified scales. Similar interspecific differences have also been noted recently in *Strymon* (Johnson et al., 1990).

FEMNITERGA Johnson
Figs. 17,58,59
Femniterga Johnson 1988: 36.
Synopsis– includes the taxa treated by Johnson (1988, 1989a) and by Johnson et al. (1988) with additional notation of a first known male in one species.

DIAGNOSIS. *Primary traits.* (1,2) *Tergal morphology and female genitalia*– (1) *sipc* elaborate in both sexes; female typified by full dorsal and lateral sclerotization of eighth and terminal tergites (Figs. 2O,17B); male highly sculptured as in other members of Clade II (Figs. 2L,17A); (2) female genitalia with superior plate prominent, closely abutting *sipc* and contrasting diminutive ductus bursae (Figs. 3W,17B). ***Additional diagnostic traits.*** (3) *Wings*– DFW,DHW (particularly in females) with various, often cone-shaped to strobile, bright iridescent blue patches, DHW typical Calycopis pattern (Figs. 58,59); (4) *Tergal morphology*– male *sipc* elaborate, extending cephalically to sixth or seventh tergite and with bilobate termini (Fig. 2L,17A) and contrasting *Kroenleina* by lacking dorsocentral inwardly directed prong (Figs. 17A,18A); (5) *Female genitalia*– corpus bursae with signa "cross"-shaped (see Johnson 1988, Fig. 4); (6) *Male genitalia*– labides generally centrally or ventrally produced but not pronged as in *Calystryma* (Figs. 2F,2F4,17A).

DESCRIPTION. See Johnson 1988, p. 36, figs. 3-5, 1989a, p. 198, 202, figs. 4-10; Johnson et al. 1988, p. 20, figs. 8-9.

TYPE SPECIES. *Femniterga notacastanea* Johnson by original designation (Fig. 58 herein; Figs. cited above in Johnson 1988, 1989a; Johnson et al. 1988; see Remarks).

DIVERSITY. Recently revised by Johnson (1989a).

Species: (1) ***Femniterga notacastanea*** Johnson 1988, TL Piquirenda to Acambuco at Laguna Las Catas, Dept. San Martin, Salta Prov., Argentina (LD no. 11), holotype female, allotype male, AMNH with GPs K. Johnson; (2) ***F. judae*** Johnson 1988, TL Mosconi, Dept. San Martin, Salta Prov., Argentina (LD no. 17), holotype female, allotype male, AMNH with GPs K. Johnson; (3) ***F. cissusa*** (Hewitson) (*Thecla cissusa* Hewitson 1863-1878 [1877]) TL Para, L[ower] Amazons, lectotype female, BMNH type no. 1072, paralectotype female, BMNH unnumbered both 1989 by K. Johnson, BMNH, GPs K. Johnson; (4) ***F. cinniana*** (Hewitson) (*Thecla cinniana* Hewitson 1863-1878 [1877] [printer error as "1817" Johnson 1989] [*Calystryma cinniana* (Field 1967b)]) TL "Amazon", holotype female, BMNH type no. 1073, GP K. Johnson; (5) ***F. plumans*** (Druce) (*Thecla plumans* Druce 1907) TL Chapada, Mato Grosso, Brazil, holotype male, BMNH type no. 1004 [no abdomen], GP by topotype with duplicate data K. Johnson BMNH; (6) ***F. megana*** Johnson 1989a, TL Mendoza, Argentina, holotype female, allotype male, MNHN with GPs K. Johnson; (7) ***F. strobilata*** Johnson 1989a, TL Maroni, French Guiana, holotype female, allotype male, MNHN with GPs K. Johnson; (8) ***F. itaituba*** Johnson 1989a, TL Itaituba, Rio Pastaza, Brazil, holotype female, allotype male, AMNH with GPs K. Johnson; (9) ***F. splendida*** Johnson 1989a, TL Uruhuasi, S Peru, holotype female, allotype male, BMNH with GPs K. Johnson; (10) ***F. aurea*** Johnson 1989a, TL Iquitos, Peru, holotype female, AMMN with GP K. Johnson (Figs. 17B,59, see Remarks); (11). ***F. boliviensis*** (see below).

INTERSPECIFIC VARIATION. Diagnostic differences occur in the *wings*– sexual dimorphism and expanse of DFW,DHW iridescent blue; *tergal morphology*– shape and occasional additional components of female and male *sipc*; *male genitalia*– shape of valvae, configuration of cephalically declined vinculum and adjacent saccus; *female genitalia*– shape of genital plates.

DISTRIBUTION. E South America from montane C. Argentina N to Guyana Shield; W South America from from NE and C Peru S to Bolivia.

REMARKS. In the illustrations for *Femniterga* I include an adult of *F. aurea* and its female genitalia since this species was briefly described in an Addendum added in proof to Johnson (1989a) but not figured. Also, as noted previously, a syntype of *Thecla gizela* not designated lectotype (for lectotype see *Terminospinissima*) represents an undescribed species of *Femniterga*. Since *Femniterga* has been recently revised, I describe this new species below to make the treatment of the group as complete as possible.

Description of Congener.

Femniterga boliviensis,
new species
Fig. 17A

Diagnosis. DFW,DHW lighter brown than congeners; VFW,VHW ground beige, profuse red-orange widely bordering the base of entire medial band and occurring distad of the band in the limbal area and surrounding the Thecla-spot (differing from *F. splendida* by being larger, more profusely marked beneath and not brownish black above). Male genitalia resembling *F. megana* of central Argentina most but *sipc* with terminally tapered lobes and genital valvae widely expansive between their ventro- and dorsocephalic articulations to the vinculum (as often seen in *Reversutus*).

Description. *Male.* DFW,DHW warm brown; VFW,VHW beige with all markings emphatic and with profuse red-orange widely bordering base of entire medial band and occurring distad of the band in the limbal area and surrounding the Thecla-spot. FW

length: 13.0 mm. (holotype). *Female.* Unknown. Tergal Morphology. Male *sipc* with broad cephalic lobe and bilateral terminal lobes, each tapered to a lobate margin (Fig. 17A). *Male Genitalia* (Fig. 17A). Similar to *F. megana* but with shouldered lateral vincular surface continuing cephalad toward the vincular declination and with adjacent articulation of valvae widely expansive; aedeagus short and robust.

Types. Holotype male labelled "Bolivia, Hewitson Coll. 79-69, gizela 1., Thecla gizela, type" deposited BMNH.

Distribution. Presently known only from data on the type specimen.

Remarks. This specimen illustrates the problems of dealing with old, isolated material. The single specimen cannot be identified either as *F. splendida* or *F. megana* and yet obviously belongs within this group of western Andean *Femniterga*. Since species of *Femniterga* represented by much larger samples show frequent regional sympatry both in the Amazon Basin and on the Guyana Shield it is prudent to describe this species as distinct.

Etymology. Named for the region of occurrence.

KROENLEINA,
NEW GENUS
Figs. 18,60-63

Synopsis– includes a number of undescribed taxa studied by Field but not included by him in *Calycopis* or *Calystryma* (Field 1967a, 1967b).

DIAGNOSIS. ***Primary traits.*** (1) *Wings*– Though occurring in occasional species of other genera, one wing character is extremely helpful in superficially recognizing *Kroenleina*: a thin, but bright, DHW,VHW white marginal line enclosing the hindwing, regardless of ground color (Figs. 60-63) (see Remarks); (2) *Female genitalia*– superior genital plate as generally prongless central lobe (Fig. 3L), inferior plates as widely disjunct, ovate to triangular, lobes marked with prominent ventral scutes (Fig. 18BD). ***Additional diagnostic traits.*** (3) *Tergal morphology*– male *sipc* elaborate, female simple; male with dorsocentral margin incised, with prominent microtrichia and two prominent, inwardly directed prongs (Fig. 18AC); (4) *Male genitalia*– dorsocephalic juncture of vincular elements produced; labides centrally produced in a conical fashion (Fig. 18AC).

DESCRIPTION. *Wings.* Wing shape not strongly angled (Fig. 1A,60-63). DFW,DHW in males blackish brown, females with iridescent blue over most of HW and basal area of FW, dull in some species, brilliant in others, but both sexes always with thin, bright, white marginal line enclosing hindwing. VFW,VHW with tripartite band rather arc-shaped, usually with pronounced distal white forming band, and with small W-element (Fig. 1E). *Tergal Morphology.* Male *sipc* elaborate as in *Tergissima* and *Femniterga* (Figs. 2L,18AC) but inner dorso-terminal margin with two prominent inwardly directed prongs; female *sipc* simple. *Genitalia.* Male (Fig. 18AC). Similar to *Tergissima* and *Femniterga* but ventrally declined element of vinculum extremely robust, "wrapping around" to dorsum and exhibiting no saccus at ventrum; labides centrally produced to steep point; falces with base robust but terminus sharply recurved at central "elbow"; valves elongate and thin, often inclined dorsally toward falces. Brush organs denser than in *Tergissima* and *Femniterga*, abutting entire dorsum of vinculum. Female (Fig. 18BD). Ductus bursae elongate and fully sclerotized but terminating with centrally lobate superior genital plate without disto-terminal spines and inferior genital plates widely bilobate, centrally disjunct and with prominent ventral scutes; cervix bursae often with ductus seminalis extending from a detached sclerotized plate located between cephalic terminus of ductus and distal end of corpus bursae.

TYPE SPECIES. *Kroenleina panornata*, new species (Fig. 18AB,60,61).

DIVERSITY. Hitherto wholely undescribed except that a syntype female of *T. pisidula* Druce (1907) belongs herein. Since the lectotype of *T. pisidula* belongs in *Klaufera* (see *Klaufera*) no further action is taken here on the assignment of this syntype. I also know of seven undescribed species in *Kroenleina.*

Species: (1) ***Kroenleina panornata*** and (2) ***K. escuintla***, described below.

DISTRIBUTION. The genus is pan-Neotropical. Two species are described here, one each from north and south of the Panamanian isthmus.

REMARKS. Johnson (1989a, Fig. 11) illustrated the genitalia of the type species to differentiate this group from the often sympatric *Tergissima* and *Femniterga*.

ETYMOLOGY. The name has a double meaning. It is a patronym for David F. Kroenlein but the etymology of "kroenlein" ("little crown") also refers to the white marginal band of the hindwing which distinguishes species of the group.

Description of Type Species.

Kroenleina panornata,
new species
Figs. 18AB,60,61

Diagnosis. Males brown above and beneath like sympatric *Tergissima* or *Calystryma* species but differing in generic structural characters and, superficially, readily recognized by the comparatively arc-shaped VHW tripartite band with small W-element and DHW white marginal line. Among congeners, *F. panornata* with females particularly dull blue.

Description. *Male.* DFW,DHW ground color blackish brown. VFW,VHW ground light beige; tripartite band in typical Calycopis pattern but more arc-shaped with W-element very small and with white lining of band more prominent. FW length: 10.5-12.5 mm. (12.0 mm, allotype) *Female.* DFW,DHW ground blackish, overlaid with outstanding flush of iridescent azure blue, most pronounced distally on HW, basally on FW. Hindwing with thin, bright, white marginal line. Under surface of wings: as on males. FW length: 10.5-12.5 mm. (12.0 mm., holotype) *Sipc.* Male with terminus rather bulbous; female with lateral sclerotization prominently angled. *Male Genitalia* (Fig. 18A). Valvae moderately shouldered at base, caudally tapered to thin terminus dorsally inclined toward falces; vinculum with lateral area robust, not bulging dorsally as in *F. escuintla*. *Female Genitalia* (Fig. 18B). Differing from *F. escuintla* in generally straight, elongate ductus bursae and compact genital plates.

Types. Holotype female (Fig. 61), allotype male (Fig. 60), Rio Surutu, E. Bolivia, 450 m., Nov. 1913, Steinbach Collection, deposited CMNH. Paratypes. AMNH: Hotel Tamampaya area (Estancia Anacu), 4300 m., Province Sud Yungas, Dept. La Paz, Bolivia, leg. D. and K. Matusik, 20-27 May 1989, one male, two females. BMNH: Buena Vista, Bolivia, leg. Steinbach, October, one male, two females; Prov. del Sara, E. Bolivia, leg. Steinbach, one male, one female. CMNH: same data as primary types, two males, two females; Buena Vista, Prov. del Sara, Bolivia, Steinbach Collection, one male, one female; Prov. del Sara, E. Bolivia, 450 m., June, Steinbach Collection, one male, one female; Lower Mamore River, Bolivia, Steinbach Collection, one female; IML: Santa Cruz, Bolivia, leg. Goldbach, two males, one female.

Distribution. Presently known only from large samples from the eastern Bolivian region.

Etymology. The name is a euphonious Latin combination referring to the ornate blue coloration of the female.

Description of Congener.

Kroenleina escuintla,
new species
Figs. 18CD,62,63

Diagnosis. Mexican; brown DFW,DHW of male resembling only *Calystryma quintana* which, aside from generic structural characters, is readily distinguished by blackish upper side and a VHW Calystryma pattern. Female with basal DFW and entire DHW brilliant iridescent sky blue. Structurally distinct from other congeners in robust female genitalia, with short ductus bursae and widely bilobate genital plates, and male genitalic valvae, with caudal extensions elongate and steeply inclined dorsally.

Description. *Male.* DFW,DHW ground blackish brown, VFW,VHW typical of genus. FW length: 10.5 (allotype)-11.0 mm (paratype). *Female.* DFW,DHW ground color brilliant iridescent sky blue over most of hindwing and along base and inner margin of forewing (blue fading to slightly more azure in worn specimens). VFW,VHW typical of genus. FW length: 10.5 (holotype)-11.0 mm. (paratype). *Sipc.* Male typical of genus differing from *F. panornata* by more sculptured terminolateral lobes and more pointed cephalic extension; female less densely sclerotized and angled than in *F. panornata*. *Male Genitalia* (Fig. 18C). Distinctive in lateral surface of vinculum being extremely robust, bulging dorsally before declining ventrally; valvae shorter and more distally shouldered than in *F. panornata*, labides less steeply produced. Brush organs dense, abutting entire dorsal surface of vinculum. *Female Genitalia* (Fig. 18D). Distinctive in very short, cephalically curved ductus bursae and broad, widely disjunct elements of the genital plates.

Types. Holotype female (Fig. 63), allotype male (Fig. 62), mountains above Escuintla, 700 m., sta. #14, Chiapas State, Mexico, 5 September 1974, leg. R. Wind, deposited CMNH. Paratypes. CMNH: same data as primary types, one male, two females.

Distribution. Known only from the Chiapas, Mexico types series.

Remarks. Clench (CMNH) segregated these specimens, along with a number of others from Mexico which he determined as undescribed. Resemblance of the female to the facies of *Calycopis fractunda* (type AMNH) appear homoplasious since structural characters of this later typify Clade I (Field 1967a, Figs. 19,34).

Etymology. The species is named from the general region of occurrence.

ANTRISSIMA,
NEW GENUS
Figs. 19,64-67

Synopsis– includes a number of undescribed species, some of which were original studied by Field but not included by him in *Calycopis* (Field 1967a).

DIAGNOSIS. ***Primary traits.*** (1) *Female genitalia*–ductus bursae with pronounced antrum terminally distending the genital plates; inferior plate consequently with widely separated ventral scutes, superior plate with very short central prongs (Figs. 3M,19BD); (2) *Wings*– VHW tripartite band angled marginad in cells 2A and 3A causing a more "double W" (rather than "W"-shaped) element in the limbal area (Figs. 1F,.64-67). ***Additional diagnostic traits.*** (3) *Male genitalia*– contrasting other Clade II members: (i) dorso-lateral surface of vinculum robust, with diminutive and/or ventrally declined cephalic surface terminating in a diminutive saccus; (ii) aedeagus robust and terminally curvate; (iii) valvae diminutive and basally robust (Fig. 2F2,19AC).

DESCRIPTION. *Wings*. Wing shape not greatly angled (Figs. 1A,64-67). DFW,DHW in males generally blackish brown, occasionally HW, caudad of discal cell, with brilliant iridescent blue patch; females with dull iridescent blue over most of HW and sometimes basal area of FW. VFW,VHW, both sexes with tripartite band also angled in cells 2A and 3A as noted in Diagnosis (2) above. *Tergal Morphology*. Male *sipc* elaborate, wide cephalic lobe sometimes more resembling taxa of Clade I (Figs. 2E,19AC) (see Remarks); female *sipc* simple (Fig. 2N). *Genitalia*. Male (Figs. 19AC). Vinculum generally typical of Clade II, laterally robust along dorsum, cephalic surface contrastingly declined and terminating in short saccus; robust dorsum of vinculum with thick, closely clustered, brush organs; labides produced either centro- or ventroterminally; falces arched, termini tapered; valvae diminutive length generally not much exceeding base of falces; aedeagus terminally curvate, length exceeding rest of genitalia by only about one-fourth, caecum comprising about one-fourth aedeagal length, terminus with single cornutus. Female (Figs. 19BD). Ductus bursae terminating in prominent antrum causing (i) terminal distension of lobate superior plate marked with paired central knobs and (ii) lateral distension of prominently scuted inferior plates. Length and shape of ductus bursae, along with sculpturing of cervix bursae, varying strongly between species; corpus bursae with two dendritic signa.

TYPE SPECIES. *Antrissima varicolor*, new species (Figs. 19AB,64,65).

DIVERSITY. Includes the two species described herein, along with five undescribed species currently known to me.

Species: (1) ***Antrissima varicolor*** (see below); (2) ***A. misionensis*** (see below).

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– presence, absence and location of DFW, DHW iridescent blue in either sex; *male genitalia*– degree of robustness and relative angles in dorsal and cephalic elements of vinculum, size and shape of valvae, labibes, saccus and aedeagus; *female genitalia*– size, shape and relative position of elements of superior and inferior plates, ratios of ductus bursae length to genital plate width and relative specializations of the cervix bursae.

DISTRIBUTION. South America (to date excluding the nuclear Amazon Basin), Trinidad-Tobago and N into Southern Central America.

REMARKS. Specimens of this genus were among material which Field examined but did not include in *Calycopis* or *Calystryma*.

ETYMOLOGY. The generic name refers to the prominent antrum on the female genitalia and is considered feminine.

Description of Type Species.

Antrissima varicolor,
new species
Figs. 19AB,64,65

Diagnosis. Male DFW,DHW blackish brown broken by brilliant iridescent silvery blue on HW caudad of discal cell and vein M3; female similarly marked but with much duller iridescent blue. Male genitalia with vinculum robust dorsally and cephalically, lateral element declined and with saccus length not exceeding vincular width. Female genitalia with ductus bursae strongly elongate and undulate.

Description. *Male*. DFW,DHW ground color blackish broken by brilliant silvery blue caudad of discal cell and vein M3. VFW,VHW ground light beige; tripartite band with additional angled elements caudad of W, in cells 2A and 3A typical of genus. FW length: 10.5-12.5 mm. (11.5 mm. allotype). *Female*. DFW,DHW similar to male but with HW iridescent markings duller and with less concise margin along discal cell and vein M3. VFW, VHW as on males. FW length: 10.5-12.5 mm (12.0 mm. holotype). *Sipc*. Male typical of genus but terminal lobes each with inwardly directed serrate margin; female concave along margin with genital superior plate. *Male Genitalia* (Fig. 19A). Lateral vincular surface robust dorsally and cephalically; latter surface strongly declined, terminated in short saccus; valvae extremely robust and triangular

in both ventral and lateral views; aedeagus with terminal one-third curvate and produced. *Female Genitalia* (Fig. 19B). Ductus bursae strongly elongate and undulate, ductus length exceeding superior plate breadth by x3.5.

Types. Holotype female (Fig. 65), Georgetown, Guyana, deposited AMNH, allotype male (Fig. 64), Guyane Francaise, leg. C. Bar, deposited BMNH. Paratypes. BMNH: data as allotype, one male; Amazons, Bates, one male. MNHN: Cayenne, Guyana, one female. AMNH: Wismar, British Guiana, 10 March 1938, leg. A. S. Pinkus, one female.

Distribution. Presently known only from localities on the Guyana Shield.

Remarks. The distinctive DHW coloration resembles that in males of *Femniterga cissusa* but, along with generic structural differences, the latter species is much smaller (FW 8.0-10.0 mm.), iridescent color much lighter silvery-blue and generally lacking a prominent black spot marginal in HW cell CuA1.

Etymology. The name is a euphonious Latin combination referring to brilliant iridescent blue marking caudal areas of the hindwing.

Description of Congener.

Antrissima misionensis,
new species
Figs. 19CD,66,67

Diagnosis. Male DFW brownish black, DHW same but flecked with dull azure blue in medial and limbal areas; female DFW,DHW dusted dull blue throughout, both sexes with white marginal line from anal lobe to cell M3. Both sexes VFW,VHW ground yellowish beige; VHW with angled elements of tripartite band prominent. Males structrually differing from congener by diminutive cephalic vincular surface, more prominent saccus and widely shouldered triangular valvae nearly filling space of vincular arc; female superior genital plate with prominent paired central knobs, elongate ductus bursae flared widely to antrum in caudal one third, cervix bursae highly sclerotized, including base of ductus seminalis.

Description. *Male.* DFW,DHW ground blackish brown flecked with azure medially and limbally on HW. HW margin having white line from anal lobe to cell M3. VFW,VHW ground yellowish beige; tripartite band with intense white and prominent angled elements. FW length: 9.5 holotype - 10.5 paratype mm. *Female.* DFW,DHW ground color blackish dusted over with dull blue. HW margin with white line from anal lobe to cell M3 more prominent than on male. VFW,VHW typical of genus. FW length: 9.0 allotype - 10.5 paratype mm. *Sipc.* Male typical of genus but with lateral and cephalic lobes extremely robust. *Genitalia.* Male (Fig. 19C). Lateral vincular surface robust dorsally but cephalic surface more tapered than in congener and not as strongly declined; saccus relatively prominent, length nearly equalling width of cephalic vincular surface); valvae widely triangular in ventral view, nearly filling space of vincular arc; aedeagus only slightly curvate in terminal one third. Female (Fig. 19D). Superior plate with salient paired central knobs; ventral scutes of inferior genital plates relative small; antrum prominent in caudal one third of ductus bursae; cervix bursae highly sculptured, including base of ductus seminalis.

Types. Holotype female (Fig. 67), allotype male (Fig. 66), Iguazu, Misiones Province, Argentina, 30 January - 13 March 1945, leg. Hayward, Willink and Golbach, deposited AMMH. Paratypes. IML: Same data as primary types, three males, two females.

Distribution. Known only from the types series.

Etymology. Named for the general area of occurence.

***REVERSUSTUS*,**
NEW GENUS
Figs. 20,68-71

Synopsis– includes *Thecla puppius* Godman and Salvin and undescribed relatives.

DIAGNOSIS. ***Primary trait.*** (1) *Male genitalia*– terminus of male valvae ventrally declined (e.g. directed opposite to that of all other members of the grade) (Figs. 2F5,20AC) and saccus prominent (Figs. 2F6,20AC). ***Additional diagnostic traits.*** (2) *Female genitalia*– superior plate bilobate with lateral margin terminating in paired, curvate, prongs most often contiguous with ventrolateral margin of inferior plate; superior plate occasionally with additional small, paired distal knobs (Figs. 3T,20BD); (3) *Wings*– VFW,VHW both sexes with notable yellowish cast (see Remarks), with tripartite band in typical Calystryma pattern (Figs. 68-71); (4) *Tergal morphology– sipc* occurring in males only; *sipc* simple (Fig. 2J,J1), cephalically not exceeding seventh tergite and with lateral lobes only slightly developed, if at all (Fig. 20AC); (5) *Male genitalia*– caudal extensions of valvae often ventrally asymetrical, falces diminutive and angular (Fig. 20AC).

DESCRIPTION. *Wings.* Wing shape not strongly angled (Figs. 1A,68-71). DFW,DHW both sexes brown to brownish black with overcast of blue or steel blue; variously prominent margins with white lines; VFW, VHW ground generally beige but often with distinctive yellowish cast (see Remarks); tripartite band in typical Calystryma pattern, limbal areas

sometimes with expansive red and markings basal and distal of tripartite band in cells M2 to CuA2. *Tergal Morphology.* Male *sipc* simple, cephalically barely exceeding seventh tergite and with terminal lobes not strongly expansive (Fig. 20AC). *Genitalia.* Male (Fig. 20AC). Brush organs prominent over dorsal surface of vinculum; genitalia with prominent saccus and terminus of valvae ventroterminally directed (as in no other group) and sometimes terminally asymmetrical. Otherwise marked by dorsoterminal production of labides, falces strongly arched and/or angled; aedeagus robust and short, length hardly exceedly rest of genitalia or, if so, not by more than one-fourth, caecum comprising up to one-third aedeagal length, terminus with single cornutus. Female (Fig. 20BD). Superior plate bilobate and marked along lateral edge with paired, curvate prongs most often contiguous with ventrolateral margin of inferior plate; superior plate occasionally with additional small, paired distal knobs; ductus bursae length variable with species; cervix bursae generally without sculptured specializations; corpus bursae with two dendritic signa.

TYPE SPECIES. *Thecla puppius* Godman and Salvin (1879-1901 [1887], TL Carimang River, British Guiana, holotype male, BMNH, labelled "Thecla puppius type male, Carimang River, British Guiana, Godman - Salvin Coll. 1912-23, B.C.A. Lep. Rhop. Thecla puppius Godman and Salvin, B. M. Type no. 961". Representative adults, Figs. 68,69 (see Remarks); type species Figs. 20AB,68,69).

DIVERSITY. Included the type species, a congener herein described and three undescribed species currently known to me.

Species: (1) ***Reversustus puppius*** (Godman and Salvin) **NEW COMBINATION** (see above) and (2) ***R. assuensis*** (see below).

REMARKS. Godman and Salvin were undoubtedly not aware that structural characters of their undissected holotype of *Thecla puppius* were unusual. Superficially the specimen resembles other "brown above, brown beneath" members of the Calystryma grade. Typifying the consequence of morphological studies of the Calycopis/Calystryma grade, various *Thecla* types take their places among the structural groups of the grade quite at "random" with numerous syntype series proving to have been generically mixed. Due to the facies of the *T. puppius* type, many specimens traditionally identified as this taxon (usually by yellowish under surface) now prove to be misidentified. Female facies of *T. puppius* (Figs. 20AB,69) have been determined from the long MNHN series of males and females sharing the data Guyana Francaise or same plus River de Maroni or St. Jean de Maroni and AME series sharing the data Berbice, Guyana, along with various and often duplicate dates from November 1980, leg. S. Steinhauser. Since *R. puppius* has been widely misidentified and the radical morphology in *Reversustus* is so extreme, I depart from general format and figure additional representatives of the type species (Figs. 68,69).

DISTRIBUTION. South America from Guyana Shield through the Amazon basin and adjacent Andes S to at least SE and SW Brazil.

ETYMOLOGY. The name, considered masculine, is an arbitrary euphonious combination referring to the "reversed" direction of the valval terminus which characterizes the genus.

Description of Congener.

Reversustus assuensis,
new species
Figs. 20CD,70,71

Diagnosis. Compared to type species, DFW, DHW blue, male blue-black, female lighter blue, with prominent white HW marginal line; VFW,VHW yellowish. Male genitalia with valvae laterally robust and triangular in shape except for ventrally declined terminus; female genitalia with lobes of superior plate marked by short paired distal knobs and by lateral prongs being extremely curled in conjunction with the margin of the inferior genital plate.

Description. *Male.* DFW,DHW brownish black overcast with dull steel blue, margin with light white line, anal lobe to cell M3; VFW,VHW yellow beige with typical Calystryma pattern. FW length: 10.5 mm. (holotype, paratypes). *Female.* DFW,DHW dusted light azure blue, DHW base to black marginal band somewhat bright, but not intense, metallic azure blue, margin with prominent white line from anal lobe to cell M3. VFW,VHW similar to male. FW length: 10.5 mm. (allotype, paratypes). *Sipc.* Male (Fig. 20C) more typical of Clade II than type species with elongate cephalic lobe and sculptured lateral lobes. *Male Genitalia* (Fig. 20C). Cephalically declined element of vinculum robust with preominently produced saccus; brush organs densely packed along entire vinculum dorsum; valvae laterally robust and very triangular (isoceles) with ventrally declined terminus thin, lobate and with slightly concave sculpturing at juncture with remaining surface of lobe; caudal extensions robust, terminally lobate asymetrical. *Female Genitalia* (Fig. 20D). Superior plate with short paired distal knobs, juncture of superior and inferior plates with extremely curled sclerotized lateral prongs; ductus bursae length exceeding genital plate width by about X2; cervix bursae without sclerotized specialization; corpus bursae with two dendritic signa.

Types. Holotype male (Fig. 70), allotype female (Fig. 71), Igarapi-Assũ, Paraná State Brazil, Dec. 1911-Febr. 1914, leg. Parrish, deposited AMNH. Paratypes. AMNH: same data as primary types, one male, two females.

Distribution. Presently known only from type locality.

Etymology. Named for the type locality.

Clade III (The "*Mercedes* Group")

Male genitalia with lateral surface of vinculum generally wide and in same plane from base of labides to saccus (Fig. 2D); wing shape highly angled at FW apex and HW anal margin, under surface tripartite band angled to a "W"-shape from cells CuA2 to 3A (Fig. 1BGH), not cells CuA1 to 2A as in rest of grade.

***MERCEDES*,**
NEW GENUS
Figs. 21,72,73

Synopsis-- includes taxa of Draudt's (1919) *Thecla demonassa* and *atrius* groups along with undescribed relatives.

DIAGNOSIS. ***Primary traits.*** (1) *Wings*– margins sharply angled (Fig. 1BGH,72,73) and tripartite band with W-element between cells CuA2 and 3A, not CuA1 and 2A as in rest of grade (Fig. 1GH); (2) *Female genitalia*– ductus bursae simple, variously elongate, tube "corrugated" prior to terminus (Fig. 3X2). ***Additional diagnostic traits.*** (3) *Male genitalia*– entire lateral surface of vinculum, including most of saccus, wide and generally in same plane (Figs. 2D,21A); valvae diminutive, length not exceeding base of falces, and with constricted caudal extension; aedeagus strongly recurvate at terminus, caecum diminutive (Fig. 21A); (4) *Tergal morphology*– *sipc* occurring in males only, simple (Fig. 2I,I1), shaped ovate to octagonal (Fig. 21A) as in sister genus below.

DESCRIPTION. *Wings*. Wing shape with apex of forewing and anal angle of hindwing angular (Figs. 1BGH,72,73). Upper surface of males with medial patch of brilliant blue on both wings surrounded by black, females medially dull silvery-blue. Under surface of both sexes with ground color yellowish to buff, postmedian line across forewing, medial band on hindwings oriented rather straight across wing from costa to cell CuA1, then with compact W-element from cells CuA2 to 3A. Coloration of band bi- or tripartite– prominently black centrally with white or silverish distal border, red or orange, if occurring at all, located along basal margin of prominent black central band. Some taxa with additional color components bordering medial band or in limbal area. *Tergal Morphology*. Male *sipc* dorsum generally ovate without strongly produced lateral or terminal lobes. *Genitalia*. Male (Fig. 21A). Vinculum lateral surface wide and generally in same plane from base of labides to saccus, ventral vincular shape generally parabolic with saccus also parabolic; brush organs in tightly clustered bundles along base of labides; falces arched and tapering to pointed termini; valvae diminutive, caudal extensions generally not exceeding base of falces, and with variously short caudal extensions angled laterally from parabolic bilobes, aedeagus variously recurvate in the terminal one-third or one-half, caecum comprising one-fourth to one-fifth aedeagal length, terminus with single cornutus. Female (Fig. 21B). Ductus bursae a variously elongate tube, corregated in the terminal one-third to one fourth and with termini varying from simple, parabolic lamellae to variously sculptured lamellal lobes; cervix bursae generally lacking sculptured specializations; corpus bursae with two dendritic signa (Figs. 3X2,21B).

TYPE SPECIES. *Thecla demonassa* Hewitson 1868; TL Amazons ["Para"], lectotype male, BMNH, designated here, labelled "Para, Hewitson Coll. 79-69, Thecla demonassa 3, BM. Type No. Rh. 933", GP K. Johnson. Note: there is also a female specimen labelled "Amazons, H. W. Bates, Godman-Salvin Coll. 1912–23. B.C.A. Lep. Rhop. Thecla demonassa Hew. Type, demonassa B". This specimen may not be a type, since it is not one of the sequentially numbered specimens from the Hewitson collection (see Johnson 1989c). Since the lectotype is numbered "3" it is definitely a syntype; the additional syntypes "1" - "2" have not been located by me at the BMNH; type species Figs. 21,72,73.

DIVERSITY. Includes eight species transferred here from *Thecla* or *Tmolus*, along with two undescribed species currently known to me.

Species: (1) ***Mercedes demonassa*** (Hewitson) NEW COMBINATION (see above); (2) ***M. cos*** (Druce) NEW COMBINATION (*Thecla cos* Druce 1907) TL, Bartica [sometimes mispelled Bartien (Bridges 1988)], British Guiana, lectotype male, BMNH, designated here, labelled "Bartica, B. Guiana, H. S. Parish, Godman-Salvin Coll. 1912.–23. Thecla cos, H. H. Druce, Thecla cos, TYPE H. H. Druce, Type male", GP K. Johnson; (3) ***M. calor*** (Druce) NEW COMBINATION (*Thecla calor* Druce 1907), TL Brazil, Chapada, Matto [sic] Grosso, lectotype male, BMNH, designated here, labelled "Chapada, Matto [sic] Grosso, H. H. Smith, Dec., Godman-Salvin Coll. 1912.–23. Thecla calor, H. H. Druce, type, Thecla calor TYPE male, H. H. Druce, B.M. Type No. Rh. 937" GP K.

Johnson, and paralectotype female with duplicate labels except "Nov.", female designation and not designated by B.M. Type number; (4) ***M. petauristor*** (Druce) NEW COMBINATION (*Thecla petauristor* Druce 1907) TL Guonga, British Guiana, holotype male, BMNH, labelled "Guonga, Brit. Guiana, H. Whitely, Godman-Salvin Coll. 1912.–23. Thecla petauristor, H. H. Druce, type, Thecla petauristor male type, H. H. Druce, B.M. Type No. Rh. 938", GP K. Johnson; (5) ***M. clitumnus*** (Butler) NEW COMBINATION (*Tmolus clitumnus* Butler 1877) TL Prainha [Parana?], Brazil, holotype male, BMNH labelled, "Amazons, Prainha, shady woods, 6 xii [18]73, Trail Coll. [illegible], Tmolus/type/clitumnus, B.M. Type No. Rh. 935", GP K. Johnson; (6) ***M. buphonia*** (Hewitson) NEW COMBINATION (*Thecla buphonia* Hewitson 1868) TL Amazon, [holo?]type male, BMNH, labelled "Amazon, Hewitson Coll. 79-69. Thecla buphonia -1. B.M. Type No. Rh. 934", GP K. Johnson. There is also a female specimen labelled "Obidos, Amazons, H. W. Bates, Godman-Salvin Coll. 1912-23, Thecla buphonia Hew., type, buphonia B". This may not be a type since it is not one of the sequencially numbered specimens from the Hewitson Collection. Note: the number "1" on the single located specimen from the Hewitson Collection may be a unique, since there is no evidence in the BMNH of additionally numbered specimen; without such evidence I do not considered the Hewitson specimen first listed above as a lectotype (Johnson 1989c); (7) ***M. mimas*** (Godman and Salvin) NEW COMBINATION (*Thecla mimas* Godman and Salvin 1879-1902 [1887]) TL Calobre and Veraguas Panama; type should be at the BMNH but has not been located there by me; ID here by topotypical BMNH specimens; (8) ***M. atrius*** (Herrich-Schaeffer) NEW COMBINATION (*Thecla atrius* Herrich-Schaeffer 1850-1869 [1853]) TL Surinam, location of type unknown (see Bridges 1988), taxon generally considered unambiguous, ID here from topotypical specimens BMNH, MNHN.

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– expanse of DFW, DHW iridescent blue, pattern and/or additional pattern elements in VHW tripartites band; *male genitalia*– size and shape of lateral vincular surface, valvae, saccus, aedeagus and brush organs; *female genitalia*–ratios of ductus bursae length to genital plate width, form and/or additional components on superior genital plate.

DISTRIBUTION. Central America; South America from Trinidad-Tobago S through Amazon basin to SE Brazil, NW Argentina and S Peru.

REMARKS. Included in this study because members have historically been widely confused with *Calycopis* (see Bridges 1988). Workers appear to have not noticed that the VHW W-element in the tripartite band (i) occurs in different cells than in the Calycopis/Calystryma grade and (ii) is generally not disjunct. Since *Mercedes* is treated here, to further elucidate Clade III, the sister group is included below as the new genus *Argentostriatus*.

ETYMOLOGY. Patronym for the late Alice Mercedes Lyons Dawe and Winifred Mercedes Dawe Hitz; considered feminine.

ARGENTOSTRIATUS,
NEW GENUS
Figs. 22,74,75

Synopsis-- includes taxa of Draudt's (1919) *Thecla clarina* and *calus* groups along with undescribed relatives.

DIAGNOSIS. ***Primary trait.*** (1) *Wings*– FW apices, HW anal margins sharply angled (Figs. 1BH,74,75) and tripartite band (with W-element between cells CuA2 and 3A, not CuA1 and 2A as other clades) wide and marked by solid white to silverish coloration throughout (Figs. 1H,74,75). ***Additional diagnostic traits.*** (2) *Female genitalia*– ductus bursae a robust tube terminating in widely bilobate inferior genital plate curving contiguously into spatulate superior plate; cervix bursae often flat and spatulate (Figs. 3Y, 22B); (3) *Male genitalia*– lateral surface of vinculum with components more angled than in *Mercedes* and saccus prominently protruding from vincular plane; brush organs prominent on dorsal vincular surface; valvae with robust base extending prominently from ventrocephalic to dorsocephalic margin of vinculum and variously elongate caudal extensions; aedeagus straight to bowed (Fig. 22A); (4) *Tergal morphology* (*sipc* occurring in males only)– male *sipc* ovate to octagonal as in sister genus above (Fig. 22A).

DESCRIPTION. *Wings*. Wing shape with apex of FW and anal angle of HW strongly angled (Fig. 1B). DFW generally black or brown, DHW brilliant iridescent silvery-blue, azure or violet, depending on the species. VFW,VHW in both sexes brown to yellow-brown with postmedian line on FW and medial band on HW wide and crisply white, cream or silverish; on HW with pronounced "W" between cells CuA2 and 3A. *Tergal Morphology*. Male *sipc* with dorsal plate generally ovate to pent- or octagonal and without strongly produced lateral or terminal lobes. *Genitalia*. Male (Fig. 22A). Vinculum with lateral surface more angled than in *Mercedes* and with saccus prominently outstanding from plane of lateral vincular surface; brush organs in known species in dense bundles from dorsal surface of vinculum to labides base; labides terminally flat to slightly produced centrally; falces generally arched and terminally tapered but some

autapomorphic with extremely modified lobate or spatulate termini (see *A. matho*); valvae with robust base extending from ventrocephalic to dorsocephalic margins of vinculum with caudal extension various, elongate; aedeagus straight, bowed or mildly curvate, depending on the species, caecum comprising one-fourth to two-fifth aedeagal length; terminus with single cornutus. Female (Fig. 22B). Ductus bursae an elongate tube (length varying strongly between species) with terminal one-third to one-fourth tapering to bilobate, spatulate lamellae; cervix bursae often modified to flat or spatulate component; corpus bursae with two dendritic signa.

TYPE SPECIES. *Thecla tamos* Godman and Salvin 1879-1901 [1887]; TL Rio Sucio, Costa Rica, holotype male, BMNH labelled "R. Sucio, Costa Rica, H. Rogers, Godman-Salvin Coll. 1912.–23. B.C.A. Lep. Rhop. Thecla tamos G. & S., Type. Sp. figured., type, B.M. Type No. Rh. 931" GP K. Johnson; type species Figs. 22,74,85.

DIVERSITY. Includes five species transferred from *Thecla*, along with two undescribed species currently known to me.

Species: (1) ***Argentostriatus tamos*** (Godman and Salvin) **NEW COMBINATION** (see above); (2) ***A. matho*** (Godman and Salvin) **NEW COMBINATION** (*Thecla matho* Godman and Salvin 1879-1901 [1887]), TL Carimang River, Guyana, holotype male BMNH labelled "Carimang R., B. Guiana, H. Whitely, Godman-Salvin Coll. 1912.–23. B.C.A. Lepd. Rhop. Thecla matho G. & S., type, B.M. Type No. Rh. 932" GP K. Johnson; (3) ***M. clarina*** (Hewitson) **NEW COMBINATION** (*Thecla clarina* Hewitson 1863-1878 [1874]) TL Mexico, lectotype male, BMNH designated here, labelled type labelled "Mexico, Hewitson Coll. 79-69, Thecla clarina. 2., Thecla/type/clarina, B.M. Type No. Rh. 930", GP K. Johnson; the additional syntypes have not been located but the sequential number "2" indicates there were originally more than one (Johnson 1989c); (4) ***M. calus*** (Godart) **NEW COMBINATION** (*Thecla calus* Godart 1819-1824 [1824]) TL America; type apparently not extant (Johnson 1990b) but outstanding wing facies unambiguous, ID here by common usage and representative material AMMH; (5) ***M. clarissa*** (Draudt) **NEW COMBINATION** (*Thecla clarissa* Draudt 1917-1924 [1920]) TL Sao Paulo, Brazil; type location unknown, ID here by topotypical material MNHN.

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– expanse and hue of DHW iridescent blue; *male genitalia*– size and shape of valvae, saccus, aedeagus and brush organs; *female genitalia*– configuration of genitali plates, ratios of ductus bursae length to genital plate width.

DISTRIBUTION. Mexico through Central America; South America from Colombia S in regions marginal to Amazon Basin to at least SE Brazil.

ETYMOLOGY. The Latin name refers to the prominent silver-white stripe characterizing the genus and is considered feminine.

Clade IV

Note: "Clade IV" is not characterzied here as in Clades I-III since, as noted in Remarks, it is of uncertain relationship and included here only because of historical confusion with members of the Calycopis/Calystryma grade by virtue of superficial wing pattern similarity. Hemming (1955) described the circumstances under the ICZN Code by which Kaye's unelaborated name, *Iaspis* (Kaye 1904), applies to members of this clade. Because of historical ambiguity about this name, and in order to clearly differentiate it from taxa applying to members of the Calycopis/Calstryma grade, I elaborate *Iaspis* below for the first time, making four new combinations and describing one new species.

IASPIS Kaye

Figs. 23,76,77

Iaspis Kaye 1904, p. 196.

Synopsis– includes taxa of the *Thecla thabena* group of Draudt (1919) and relatives of Kaye's type species [*Thecla*] (see Hemming 1955) *temesa*.

DIAGNOSIS. ***Primary traits.*** (1) *Wings*– DFW, DHW varying from iridescent blue to brown, VHW always with a black medial band accented by large detached spot in cell SC + R1 and respendant *yellow* in cells of the limbal area (Figs. 76,77). ***Additional diagnostic traits.*** (2) *External secondary sexual characters*-- differing from other grade members by male scent brand in distal area of discal cell, varying from compact iridescent blue to diffuse black (Fig. 76) (see Remarks); (3) *Male genitalia*– lateral surface of vinculum wide, and generally in same plane, from labides base to saccus; valvae diminutive, with length seldom exceeding base of falces (Figs. 2H2,23A); (4) *Female genitalia*–tending toward configuration of "Electrostrymon Grade" and the related outgroups (Outgroups) with superior plate thick and terminally dentate, inferior plate diminutive to lacking (Fig. 23B).

DESCRIPTION. Original description by Kaye (1904) to be inferred only from type (see Hemming 1955) thus redescribed here. *Wings*. Wing shape not

strongly angled (Fig. 1A) but expansive (FW to 15.0 mm.). DFW,DHW of males variously iridescent blue, from dull navy-blue sheen to brilliant iridescent blue depending on species; females generally brown; VFW,VHW of both sexes light gray to gray-white, bands on both wings dominated by black coloration; HW tripartite band exhibiting typical Calystryma pattern but spot in cell SC + R1 detached from band and very large; limbal area cells resplendant yellow, expanse and presence of additional accenting colors (orange, red) depending on the species. *Tergal Morphology.* No *sipc* in either sex though terminus of terminal tergite in males is lined with prominent microtrichia. *Genitalia.* Male (Fig. 22A). Lateral surface of vinculum similar to taxa of Clade III but with saccus more apparent (as in *Argentostriatus*) and dorsum of vinculum robust to produced; labides generally flat; falces elongate and arched; valvae basally robust with diminutive caudal extensions generally not exceeding base of falces' arch; aedeagus robust and short, with length rarely exceeding rest of genitalia by one-third, and with caecum comprising up to one-third to two-fifths aedeagal length, terminus with single cornutus. Female (Fig. 22B). Ductus robust, length varying strongly; superior plate prominently, often thickly, sclerotized and terminally sculptured in various projections or lobes; inferior plate comparatively diminutive, usually comprising only a ventroterminal margin or lip on ductal tube; cervix bursae generally without sculptured specializations; corpus bursae with two dendritic signa.

TYPE SPECIES. *Thecla temesa* Hewitson (1868) by original designation (see Hemming 1955, p. 229 and Remarks below) TL Amazon, lectotype male, BMNH, designated here labelled "Thecla temesa, Amazon, Hewitson Coll. 79-69, Thecla temesa 4., B. M. Type, No. Rhop. 626, GP K. Johnson (see Remarks).

DIVERSITY. Includes five previously described species, the congener described herein and two species currently known to me.

Species: (1) ***Iaspis temesa*** (Hewitson) (see above); (2) ***I. diffusus*** (see below); (3) ***I. thabena*** (Hewitson) **NEW COMBINATION** (*Thecla thabena* Hewitson 1868) TL Amazon, lectotype male, BMNH, designated here labelled "Amazon, Hewitson Coll. 79-69. Thecla thabena 2, B. M. Type No. Rh. 625, Thecla type thabena, male", GP K. Johnson; (4) ***I. talayra*** (Hewitson) **NEW COMBINATION** (*Thecla talayra* Hewitson 1868) TL Rio de Janeiro, Brazil, lectotype male, BMNH, designated here labelled, "Thecla talayra, Rio R., Hewitson Coll, 79-69, Thecla talayra Hew. 4, B. M. type. No. Rh. 627, Type" GP K. Johnson; (5) ***I. castitas*** (Druce) **NEW COMBINATION** (*Thecla castitas* Druce 1907) TL Para, Brazil, holotype male, BMNH, labelled "Para, T. talayra Hew. var. castitas TYPE plus [undecipherable] B. M. Type No. Rh. 628, type" GP K. Johnson; (6) ***I. beera*** (Hewitson) **NEW COMBINATION** (*Thecla beera* Hewitson 1869-1877 [1870]) TL Ecuador, holotype male, BMNH, labelled "Thecla beera, Ecuador, Hewitson Coll. 79-69., Thecla beera 1., B. M. Type No. Rh. 629, Thecla beera, type male Hew., Beera" GP K. Johnson.

INTERSPECIFIC VARIATION. Major differences occur in *wings*– expanse and color of DFW, DHW iridescent blue, VHW limbal pattern; *male genitalia*– size and shape of valvae, saccus, aedeagus and brush organs; *female genitalia*–configurations of genital plates, ratios of ductus bursae length to genital plate width particularly extremely reduced ductus in some taxa.

DISTRIBUTION. Mexico S through Central America; South America from Trinidad-Tobago S through Amazon basin and adjacent Andes to at least SE Brazil and Peru.

REMARKS. Treated here because of superficial similarity of DHW W-element to taxa of Calycopis/Calystryma grade. Hemming (1955) noted the rationale for application of Kaye's name to the designated type species. Aside from the validity of the type species designation vis-a-vis the ICZN Code, the genus was never further revised or its species diversity enumerated. Thus, to assure reliable male/female character combinations I establish these from a new species added as an additional congener.

Iaspis particularly differs from taxa of the Calycopis/Calystryma grade by the presence of androconial scent brands in males.

ETYMOLOGY. Not previously stated; construed by me as masculine.

Description of Congener.

Iaspis diffusus,
new species
Figs. 23,76,77

Diagnosis. Male DFW,DHW brilliant iridescent blue, DFW with large diffuse black scent brand in discal area of discal cell; female brown. VFW,VHW, both sexes typical of genus. Female genitalia with superior plate terminally distended and laterally dentate; male genitalia with dorsal edge of vinculum produced, saccus broadly parabolic and valvae basally robust with diminutive, blunt, caudal extensions.

Description. *Male.* DFW,DHW brilliant iridescent sky blue; distal area of discal cell with expansive diffuse black scent brand; VFW,VHW gray-white with markings typical of genus. FW length: 14.5 mm. (holotype). Female. DFW,DHW brown,

VFW,VHW similar to male. FW length: 15.0 mm. (allotype). *Male Genitalia* (Fig. 23A). Lateral vincular surface typical of genus except dorsal margin prominently produced; labides flat, falces arched and terminally tapered; saccus widely parabolic; valvae basally robust with diminutive, blunt-ended caudal extensions. *Female Genitalia* (Fig. 23B). Ductus bursae robust and about same length as distended superior genital plate; latter heavily sclerotized and symmetrically dentate along terminal margin; inferior plate diminutive, comprising only a slight ventro-terminal lip on the ductus bursae; cervix bursae lacking sclerotized specialization; corpus bursae with two dentritic signa.

Types. Holotype male (Fig. 76), allotype female (Fig. 77), Guayabetal, Cundinamarca Dept., Colombia 4° 15' 1350 m., coll. Frank Johnson, deposited AMNH.

Distribution. Known only from the type locality.

Etymology. Refers to the diffuse male scent brand.

PHYLOGENETIC RELATIONS

Emphasizing shared structural characters, the primary purpose of this paper has been to delineate clearly monophyletic groups (genera) from the broad Calycopis/Calystryma grade. Traditionally, members of the grade have been defined and grouped by certain superficial similarities of wing pattern. For eventual analysis of parsimonious distributions of shared unique characters, character data for each genus has been included in a data matrix for numerical cladistic analysis. As a basis for outgroup (or outstate) character comparison, further elucication of the Electrostrymon grade is still required for this process. Nonetheless, some sister group relations are apparent in results currenty presented and these are summarized in Figure 87. Figure 87 illustrates genera of the Calycopis/Calystryma grade as lineages and comments on certain unifying characters.

As noted in Introduction, members of clades I and II appear to be sister groups and, together, form part of the larger sister group of the Electrostymon grade. A number of genera within clades I and II suggest very clear sister group relations. *Mercedes* and *Argentostriatus* appear to be sister groups but their overall relationship with the other taxa is less clear. Similarly, the relationship of *Iaspis* to members of the two grades requires further clarification.

Within the Electrostrymon grade, *Electrostrymon* and *Angulopis* comprise two species rich sister groups. However, as noted in Appendix I, there are undoubtedly still a number of apomorphic lineages in the Electrostrymon grade requiring elucidation as genera. What is astonishing about the groups studied herein is their individual diversity and widely overlapping ranges. As one reviewer noted, the sheer number and structural diversity of these butterflies is "bewildering". Certainly, it behooves biologists to learn as much as possible about these insects before their diverse tropical habitats are more permanently altered and destroyed. Hopefully, this basic taxonomy will aid in such an effort.

OUTGROUP DIAGNOSTICS: The "Electrostrymon Grade"

Introduction

Complicating identification of taxa in the Calycopis/Calystryma grade is the wide co-occurrence of superficially similar assemblages of hairstreak butterflies which (i) lack forewing androconia in males; (ii) are often "brown (or brown and blue) above and brown beneath", and (iii) have tripartite under surface bands distinctive only by contiguity of the W-element with the rest of the hindwing tripartite band. In nearly every regional sample of the Calycopis/Calystryma grade examined in this study, representatives of these other assemblages (often undescribed) were present. For purposes of this paper, I refer to hairsteaks typified by the three criteria listed just above as the "Electrostrymon grade" since only one group of this widely co-occurring assemblage has a generic name: *Electrostrymon* Clench 1961, type species *Papilio endymion* Fabricius.

Since Clench did not fully delineate the species diversity of *Electrostrymon* in his original description, the name has been widely applied to many hairstreak butterflies superficially resembling his type species. Within the Electrostrymon grade, *Electrostrymon* properly applies only to the monophyletic group with structural characters like the types species (Johnson 1988, Johnson and Matusik 1988). There is another assemblage in the Electrostrymon grade which is extremely species rich and outstandingly different in structural character from *Electrostrymon*.

To clarify the Electrostrymon grade for purposes of distinction from members of the Calycopis/Calystryma grade, I therefore characterize below both *Electrostrymon* and its widespread and generally sympatric sister group, the new genus *Angulopis*.

Clade V (The "*Electrostrymon* Group")

ELECTROSTRYMON Clench
Figs. 78,80AB
Electrostrymon Clench 1961: 218.
Synopsis– Includes the type and relatives, which are a large assemblage in much need of revision.

DIAGNOSIS. **Primary traits.** (1) *Female genitalia*–ductus bursae a simple tube terminating in a variously prominent, bilobate, superior plate; inferior plate diminutive to lacking (Fig. 80B) having juncture of ductus bursae and lamellae without prominent incised struts or widely angled superior plate typifying new genus *Angulopis* described below(, Fig. 80D); (2) *Male genitalia*– Valvae with bilobed areas generally parabolic and dominating most of ventral valval shape; caudal extensions contrastingly small and shaped as variously small lobes or short, thin, projections usually terminating in elongate microtrichia (Fig. 80A), [not with valval bilobes radically angled along the lateral edges and with generally elongate and robust caudal extensions as in new genus *Angulopis* described below, Fig. 80C]. ***Additional diagnostic traits.*** (3) *Wings*– DFW,DHW of both sexes generally brown or brown with orange-suffused medial patches, FW often appearing larger and more triangulate than hindwing; VFW, VHW with medial bands generally black basally and white distally, orange or red-orange components, if any, usually appearing only as occasional additional edging; W-element in cells M3-CuA2 contiguous with rest of band, not breaking band in cell M3; (4) *Male genitalia*– in species studied to date typified by juncture of saccus and vinculum appearing ventrocephalically distended (Fig. 80A); (5) *Tergal morphology*– both sexes lacking *sipc*.

DESCRIPTION. See Clench 1961, p. 218 f.

TYPE SPECIES. *Papilio endymion* Fabricius 1775 by original designation (though a common species, see comments in Johnson and Matusik 1988 concerning the nomenclatural problems with this name *endymion*); identified here by the generalized common usage (Draudt 1919, Clench 1961, Hayward 1973), particularly from long series of northwestern Argentine male and female pairs leg. R. Eisele (AMNH); TL Brazil; type species Figs. 78,80AB).

DIVERSITY. Using the strict assessment of characters in the type species (Figs. 78,80AB), the genus includes at least the species listed by Bridges (1988: II.33) with the exception that the Antillean representatives listed may be at least paraphyletic (see Remarks in Johnson and Matusik 1988). For recordation purposes, listed below are various types examined by Johnson and Matusik (1988): *Thecla angelia pantoni* Comstock and Huntington 1943 (holotype male, allotype female AMNH); *T. a. boyeri* Comstock and Huntington 1943 (holotype male, allotype female AMNH); *T. a. dowei* Clench 1941 (holotype male, allotype female CMNH); *T. dominicana* Lathy 1904 (holotype male, BMNH); *Electrostrymon minikyanos* Johnson and Matusik 1988 (holotype male AMNH) (see Remarks).

DISTRIBUTION. Pan-Neotropical, including the Antilles.

REMARKS. I characterize *Electrostrymon* here based on its type species and it has not been my purpose in this study to critically enumerate its species diversity. As noted in Johnson and Matusik (1988), there is uncertainty about the monophyly of Antillean elements long associated with the name *Electrostrymon* (Riley 1975, Schwartz 1989) and elements on the mainland. Resolution of these relationships must be the focus of future research. A major contribution to this differentiation is the characterization below of the mainland assemblage *Angulopis*, a large group containing hairstreaks long confused with *Electrostrymon*.

ANGULOPIS,
NEW GENUS
Figs. 79,80CD
Synopsis– Contains the widespread species *Thecla autoclea* Hewitson and its many relatives, including some taxa of Draudt's (1919) *Thecla badaca* and *T. hesperitis* groups.

DIAGNOSIS. **Primary traits.** (1) *Female genitalia*–Ductus bursae comprised of simple tube terminating in prominently forked struts (Fig. 80D) and complemented by laterally expansive, generally rhomboid-shaped, genital plates (Fig. 80D); (2) *Male genitalia*– valvae with lateral edges of bilobed area markedly angled (Fig. 80C) and caudal extensions prominent; compared to Calycopis/Calystryma grade taxa, ventrum of vinculum and saccus junction tapered, not crennate or incised (Fig. 80C). ***Additional diagnostic traits.*** (3) *Wings*– under surface medial band tripartite, red-orange, brown-black, white, but W-element in cells M3 to CuA2 contiguous, not breaking band in cell M3 (Figs. 1I,79); (4) *Tergal morphology*–both sexes lacking *sipc* in species currently included, but some species with terminal female tergite slightly more sclerotized along rim abutting superior plate (see below).

DESCRIPTION. *Wings*. Wing shape not strongly angled (Figs. 1A,79), FW expanse generally 12.5 mm. - 15 mm. (occasionally larger species, see *A. hesperitis* below). DFW,DHW, both sexes brown, occasionally with limbal iridescent blue as in *A. hesperitis*, see below], DFW lacking androconial brands in males; DHW anal lobe prominent, distally black and

often heavily fringed, basally variously orange to red-orange, depending on the species, and often with prominent white slash at base. VFW,VHW of both sexes variously brown, occasionally yellowish to cream with prominent FW postmedial line; HW tripartite band jagged but contiguous, M3 element not breaking plane of rest of band (Figs. 1I,79), limbal area usually with prominent Thecla-spot in cell CuA1 and additional limbal coloration depending on the species. *Tergal Morphology*. Males lacking *sipc*, females without prominent sclerotization of terminal tergite but occasionally with sclerotized lateral rim where tergite abutts superior genital plate, depending on the species (Fig. 80C). *Genitalia*. Male (Fig. 80C). Vinculum (Figs. 80C,82A) compared to *Electrostrymon* (Figs. 80C,82A), robust along dorsal vincular surface and then sweeping directly ventrad to prominent saccus; brush organs in species studied to date apparent only as compact bundles of microtrichia bordering abuttment of labides base and terminal margin of caudal tergite; labides flat to slightly produced centrally; falces prominently arched to angled, usually with tapered termini; valvae with bilobed area prominently angled along and caudal extensions variously tapered (length and additional components depending on the species); aedeagus straight to slightly curvate at terminus, aedeagus length exceeding rest of genitalia by about one-fourth, caecum comprising between one-third and one-fourth aedeagal length, terminus with single cornutus. Female (Fig. 80D). Ductus bursae terminating caudally with prominently sclerotized ventral struts and superior genital plate typifyied by widely angled lateral margins; inferior plate diminutive, often limited to slight ventro-terminal lip on ductus bursae; cervix bursae usually without sclerotized specializations; corpus bursae with two dendritic signa, though often with inwardly directed cross-bar heavily sclerotized to a more spiny configuration, depending on the species.

TYPES SPECIES. *Thecla autoclea* Hewitson 1863-1878 [1877], TL Nicaragua, lectotype male, BMNH, designated here, labelled "Nicaragua. Hewitson Coll. 79-69, Thecla autoclea .1., Thecla/type/autoclea, B.M. Type No. Rh. 1014", GP R. 1951 N.H.B 549; additional syntypes are in the general collection, GP K. Johnson; type species Figs. 79,80AB,82.

DIVERSITY. It has not been my primary purpose in this paper to fully enumerate this genus from type specimens. However, study of type specimens to date indicates the following widespread taxa belong: ***Angulopis autoclea*** (Hewitson) **NEW COMBINATION** (see above); ***A. sangala*** (Hewitson) **NEW COMBINATION** (*Thecla sangala* Hewitson 1868) TL Venezuela, **lectotype** male, BMNH, designated here labelled "Venezuela, Hewitson Coll. 79-69, Thecla sangala .1., B.M. Type Rh. No. 1016", GP K. Johnson; ***A. politus*** (Druce) **NEW COMBINATION** (*Thecla politus* Druce 1907) TL Santarem, Brazil, lectotype type male, BMNH, designated here, labelled "Santarem, Amazons, H. W. Bates, Godman-Salvin Coll. 1912–23. Thecla politus H. H. Druce, male Santarem Amas [sic], Thecla politus TYPE H. H. Druce, male type, B.M. Type No. Rh. 1017" GP R. 1951, N.H.B. 557; paralectotype female, BMNH, with duplicate labels except H. H. Smith collector, GP R. 1951. N.H.B. 551; ***A. hesperitis*** (Butler and Druce) **NEW COMBINATION** (*Bithys hesperitis* Butler and Druce 1872) TL Costa Rica, 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".

INTERSPECIFIC VARIATION. Diagnostic differences occur in *wings*– differential occurrence of DFW, DHW iridescent blue, VHW pattern elements associates with the tripartite band and limbal markings; *male genitalia*– size and shape of vinculum, valvae, saccus, aedeagus and brush organs; *female genitalia*–form of genital plates, ratios of ductus bursae length to genital plate width, structural specialization at the cervix bursae.

DISTRIBUTION. Pan-Neotropical.

REMARKS. As with *Calycopis* and *Calystryma* in the Calycopis/Calystryma grade, *Electrostrymon* and *Angulopis* account for a large number of the widespread taxa in the Electrostrymon grade. Preliminary work on the Electrostrymon grade indicates that, similar to results presented herein for the Calycopis/Calystryma grade, various highly apomorphic assemblages occur in the Electrostrymon grade which are wide-ranging and also worthy of eventual generic recognition.

ETYMOLOGY. The name, considered masculine, is a an arbitrary euphonious combination taken from the Latin *angulus* (angled) and referring to the angled shapes of the female genitalia plates and male claspers in taxa of this genus.

Additional Outgroups Superficially Resembling the Calycopis/Calystryma Grade

1. *Symbiopsis* Nicolay 1971, type species *Thecla strenua* Hewitson 1873-1878 [1877].

This genus is the most likely candidate for confusion with taxa treated herein and in Appendix 1 because males lack forewing androconial brands and

both sexes are often colored brown or brown and blue. However, the under surface band is contiguous (though, because the W-element is typically without a salient central angle, the band in cell M3 can sometimes appear nearly detached from the rest of the band). Male genitalia show a slight resemblance to the strongly declined vincular shape and rubust, curvate, aedeagii characterizing Clade II herein; the female has an *sipc*, but a biramous, terminally dentate ductus bursae easily distinguished from any other Eumaeini. The phylogenetic relationship of *Symbiopsis* to taxa treated in this study warrants further study and there appear to be numerous species of *Symbiopsis* as yet undescribed.

2. Small taxa in the outgroups of *Nesiostrymon* Clench and *Terra* Johnson and Matusik.

Johnson and Matusik (1988) and Johnson (in press) characterized certain Eumaeini as outgroups in their numerical cladistic analyses of *Nesiostrymon* and *Terra*. However, these outgroups have lacked a formal nomenclature outside their original descriptions in *Thecla*. Two groups of taxa included by Johnson and Matusik as the outgroup "Celmus complex" contain numerous species iridescent blue above with an undersurface hindwing band bent severely in the anal areas at cells CuA1 and/or CuA2. Two others included by them as the outgroup "Uzza complex", along with taxa of their "Thecla" outgroups, exhibit either anally incised under surface hindwing bands or pointed struts on the terminus of the female genitalia possibly confusable with members of the Calycopis/Calystryma or Electrostrymon grades.

Since the type work on these groups has been completed and member taxa characterized in two separate cladistic analyses, a formal nomenclature is appropriate. I enumerate the following based on the methods criteria of this paper. For rapid reference, primary character(s) in each Diagnosis are italicized. As noted, these genera have numerous undescribed taxa and, for illustration purposes, represented here by selected species.

UZZIA, NEW GENUS (Figs. 81,86), including certain taxa of Draudt's (1919) *Thecla celmus* Group not included by Johnson and Matusik in *Nesiostrymon* or *Terra*, along with undescribed relatives.

Diagnosis. Male DFW,DHW iridescent blue, often brilliant; female DFW,DHW brown or blue. Males with prominent parabolic scent brands in distal forewing area. Sexes lacking *sipc*. Male genitalia with *valvae length reaching or exceeding curvature of falces and marked with incised, laterally-directed lobes on each valve*; female with *fluted ductus bursae terminating in spatulate lamellae and joined to cervix bursae with prominent sclerotizations, sometimes including a ventrally directed basal bulb*.

Description. FW 11.5-13.0 mm. VFW,VHW generally with beige to gray grounds; VFW with postmedial dark gray to orange-brown band extending from costa to cells M3 or CuA1/2. Hindwing with wavy, disjunct or continuous, dark gray to orange-brown medial band complemented by one to two dark gray to orange-brown postbasal spots or slashes. *Male Genitalia*. Fig. 81. *Female Genitalia*. Fig. 81.

Type Species. *Thecla uzza* Hewitson 1863-1878 [1873], type male BMNH, Fig. 81.

Diversity. Represented here by type species and additional congeners *U. splendor*, *U. cotera*, new species (see below).

Remarks. There are numerous undescribed congeners. Range is South American S through Amazon Basin to at least SE Brazil.

Etymology. Euphonious combination based on type species; considered feminine.

DICYA, NEW GENUS (Figs. 82,86), including certain taxa of Draudt's (1919) *Thecla celmus* Group not included by Johnson and Matusik in *Nesiostrymon* or *Terra*, along with undescribed relatives.

Diagnosis. Male and female DFW,DHW brown to variously iridescent blue. Males with small orbicular scent brands in distal forewing area. Sexes lacking *sipc*. Male genitalia with *valvae length barely reaching curvature of falces, if at all; rather, confined to robust basal bilobes terminating with elongate microtrichia*; female with *simple, irregularly sclerotized, flattened and tubular ductus bursae terminating in prominent paired lateral prongs*.

Description. FW 9.0-12.0 mm. VFW,VHW of wing characterized above generally with beige to gray ground; VFW with disjunct postmedial dark gray to orange-brown band, costa to cell M3 or CuA1/2. Hindwing with wavy to orbicular, disjunct, medial band colored dark gray to dark orange or red-brown, complented by a detached discal slash and sometimes markings in the postbasal area. *Male Genitalia*. Fig. 82. *Female Genitalia*. Fig. 82.

Type Species. *Thecla dicaea* Hewitson 1863-1878 [1874], type male BMNH, Fig. 82.

Diversity. Represented here by the type species, *D. dicina* (Draudt) (ID by topotyical "Colombia" specimens) and *D. cyanoundulata*, new species (see below).

Remarks. There are numerous undescribed congeners. Given the known South American range,

Colombia S to at least SE Brazil, Central America representatives appear possible.

Etymology. Euphonious combination based on the type species; considered feminine.

CELMIA, **NEW GENUS** (Figs. 82,86), including taxa of the species rich grade referred to in common usage as *"Thecla celmus"* (see Remarks) and undescribed relatives.

Diagnosis. Male or female DFW,DHW brown to dull iridescent blue with *VHW of distinctive pattern-- angled to orbicular orange to red-brown elements located medially from cells RS to CuA1/CuA2, with large orbicular elements at RS and variously from M2-CuA1, then angled in cell CuA2 and with a complementary postbasal oribucular in cell SC + R1 costad of the discal cell* (Fig. 86). *Males mostly without scent brands.* Sexes lacking *sipc.* Male genitalia with *elongate saccus (length equalling length of vincular arc) and reduced, ovate to angularly based, valvae (length generally less than curvature of falces)*; female with *ductus tubular, terminating in slightly bulbous aperture lined with thin distal lips, not* (*i*) extremely thin and elongate with spatulate lamellae (as in *Aubergina*, see below) or (*ii*) truncated, with on antrumal area sclerotized and ductus replaced by membranous tube connecting cephalically with the corpus bursae (as in *Caerofethra*, see below).

Description. FW 9.5-13.0 mm. Since the distinctive VFW,VHW pattern has been described above, no further elaboration concerning wing pattern is necessary. *Male Genitalia.* Fig. 82. *Female Genitalia.* Fig. 82.

Type Species. *Thecla celmus* Cramer 1775-1790 [1775], types not extant; ID by numerous topotyical males and females, Surinam, MNHN (Fig. 82).

Diversity. See Remarks below; represented here by the types species and *C. stigmata.*

Remarks. Numerous species have been overlooked in this genus because of the assumption that *"Thecla celmus"* males are brandless and blue and females brown. In fact, I dissected one hundred specimens divided by this criteria and the vast majority, blue or brown, were males with additional work needed to locate companion females. Dissection of a geographic synoptic of this complex indicates that, depending on the species, nearly every combination of sexual dimorphism occurs and these correlate with outstanding morphological differences (for example in *C. stigmata*, below) clearly indicative of species status. Examination of the complex in areas well known for endemism further confirms numerous undescribed species in this group with interspecific differences including shape and color of the under surface markings. The range is Pan-Neotropical, though no Antillean elements are apparent at this time.

Etymology. Euphonious combination based on the type species; considered feminine.

CAEROFETHRA, **NEW GENUS** (Figs. 83,86), including a cluster of taxa in Draudt's (1919) *Thecla celmus* Group and undescribed relatives which share outstanding morphological and wing characters differing categorically from the others.

Diagnosis. *DFW,DHW lush iridescent dark blue, males with obicular, usually black, scent brands* in distal area of forewing. Departing from *Celmia* by *VHW markings lacking the postbasal element in cell SC + R1 and with the medial band more lineal; VFW,VHW often with additional submarginal pattern elements.* Sexes lacking *sipc.* Male genitalia with *vincular shape ovate, saccus occurring only as small lobe or thin rim* with *valvae diminutive, usually only slightly exceeding curvature of falces*; truncate ductus bursae in female genitalia with *ductus sclerotized only caudad of antrum and with long membranous connection to corpus bursae.*

Description. FW 9.0-12.0 mm. Since the distinctive VFW,VHW pattern has been described above, no further elaboration concerning wing pattern is necessary. *Male Genitalia.* Fig. 83. *Female Genitalia.* Fig. 83.

Type Species. *Thecla emendatus* Druce 1907, type male, female, BMNH, respectively Fig. 83.

Diversity. Represented here by the type species and *C. seudiga* (Hewitson) 1863-1878 [1874], type male BMNH, Fig 83; *C. iambe* (Godman and Salvin) 1879-1901 [1887], type female BMNH, Fig. 83; *C. carnica* (Hewitson) 1863-1878 [1873], type male BMNH, Fig. 83; *C. hesychia* (Godman and Salvin) 1879-1901 [1887], type male BMNH, Fig. 83; *C. asa* (Hewitson) 1863-1878 [1873], type male BMNH.

Remarks. This genus is diverse with several species still undescribed. Range is Pan-Neotropical with no Antillean elements currently known.

Etymology. Latinized combination the Latin for "sky blue" with an archaic English usage for "wing"; refers to the salient blue color of the wing upper surfaces and is considered feminine.

AUBERGINA, **NEW GENUS** (Figs. 84,86), including taxa of Draudt's (1919) *Thecla alda* Group and undescribed relatives.

Diagnosis. DFW,DHW of *males distinctive deep purple or violet with prominent black scent brands* in distal forewing area; females brown. VFW,VHW ground dark browns with *various black or brown bands, continuous or broken, medial, postmedial or both.* Sexes lacking *sipc.* Male genitalia with *distended vincular*

shape and elongate valvae (length exceeding, sometimes greatly, curvature of falces); female genitalia with *thin, elongate ductus bursae terminating in spatulate lamellae.*

Description. FW 9.0-12.5 mm. Since the distinctive VFW,VHW pattern has been described above, no further elaboration concerning the wing pattern is necessary. *Male Genitalia.* Fig. 84. *Female Genitalia.* Fig. 84.

Type Species. *Thecla alda* Hewitson 1868, type male, type female, BMNH, Fig. 84.

Diversity. Represented here by the types species and *A. paetus* (Godman and Salvin) 1879-1901 [1887], type male, type female, BMNH, Fig. 84; *A. hicetus* (Godman and Salvin) 1879-1901 [1887], type male, BMNH, Fig. 84.

Remarks. There are a number of undescribed species. The range is Pan-Neotropical with no Antillean elements currently known.

Etymology. Latinization of the English usage (originally from colloquial French) for "deep purple", referring to the upper surface wing color; considered feminine.

SIPAEA, NEW GENUS (Figs. 85,86), including a mostly undescribed assemblage of species superficially like *Terra*, but differing in the thickened under surface band and lack of the structural apomophies typifying that genus.

Diagnosis. DFW generally brown in both sexes, DHW with silvery blue iridescence in some taxa. *Male with large, ovate black-suffused scent brands in forewing distal area. VHW with thickened brown to red-orange medial band, anally incised at cells CuA1 and or CuA2.* Both sexes lacking *sipc.* Males with short brush organs cephaliad of labides. Male genitalia with thin vinculum, widely open vincular arc, elongate saccus and short, flat valvae similar to *Terra.* However, female with *elongate fluted ductus, greatly contricted centrally and lacking ventrally directed sclerotized bulb* typical of *Terra.*

Description. FW: 11.0-13.5 mm. Since the distinctive VFW,VHW pattern has been described above, not further elaboration concerning wing pattern is necessary. *Male Genitalia.* Fig. 85. *Female Genitalia.* Fig. 85.

Type Species. *Thecla hyccara* Hewitson 1868, type male, BMNH, Fig. 85.

Diversity. Represented here by the type species and *S. sepeina* (see below).

Remarks. The type might be included with *Terra* if it were not for the lack of the apomorphic character which unifies this genus, a prominent ventrally directed bulb located midway along the ductus bursae of females. The group is poorly known but appears to be, at least, Pan-South American.

Etymology. A euphonious combination based on the Latin root referring to "sepia", denoting the under surface colors and bands characterizing the genus; considered feminine.

Species Descriptions.

Regarding the above genera, description of new species in *Caerofethra* and *Aubergina* has not been necessary. However, because of the preponderance of undescribed entities in *Uzzia, Dicya, Celmia* and *Sipaea*, the following species descriptions are required.

***Uzzia splendor*, new species**

Figs. 81,86

Diagnosis. DFW,DHW male entirely brilliant iridescent powder blue, female brown; VFW,VFH with continuous lunular orange medial band and no postbasal spots (*U. uzza* pale blue above, FW basad of costal area only, VHW gray-brown with darker gray disjuct medial band only slightly hued orange, if at all). Male genitalia differing from *U. uzza* by valve's elaborate pointed central lobes, angled multi-planar lateral lobes and elongate saccus exceeding twice that of *U. uzza* relative to vincular arc. Female DFW,DHW brown, VFW,VHW as on male. Female genitalia typical of genus, juncture of ductus bursae and cervix bursae less robust than in congener below.

Description. DFW,DHW,VFW,VHW generally summarized by detailed differentiation from *U. uzza* above. VHW, in addition to medial band noted above, marked only with red-orange "Thecla" spot and tails at CuA1 and CuA2. *Male Genitalia.* Fig. 81. *Female Genitalia.* Fig. 81.

Types. Holotype male (Fig. 86A, FW 12.0 mm.), allotype female (Fig 86B FW 12.0 mm.) deposited MPM. Paratypes. MPM: four males, same data as primary type. AMNH: one male, same data as primary type.

Remarks. Currently known only from the type locality; VHW resembles a number of non-congeneric species in "*Thecla*" none of which have the large black scent brand on the DFW.

Etymology. The name refers to the brilliant blue wing color.

***Uzzia cotera*, new species**

Figs. 81,86

Diagnosis. Single known female with bluish-black DFW; DHW marked by oribicular black in area where males of genus show androconial patch. VFW,VHW light beige, wing marked with disjunct dull gray to

slightly orange-edged postmedial band; no post basal markings. Female genitalia with fluted ductus bursae terminating in spatulate lamellae and joined to cervix bursae with prominent, ventrally detached and directed basal bulb (see Remarks).

Description. DFW,DHW as described immediately above; VFW,VHW markings noted above complemented by very slight submarginal whitish dots or dashes in the cells; "Thecla"-spot diminutive and yellow, marked black centrally; tails at CuA1 and CuA2, latter more elongate. *Female Genitalia*. Fig. 81.

Type. Holotype female (Fig. 86C, FW 11.0 mm.), St. Jean de Maroni, Guyana Francaise, MNHN.

Remarks. Based on an analysis of parsimonious character distributions (PAUP, Swofford 1985), I consider the basally located bulb on the ductus bursae in this taxon representative of the primitive condition precursor to the elevated and medial bulb prominent in species of *Terra*. A PAUP analysis supplemental to Johnson and Matusik (1988) was performed with species entities of *Uzzia* separated from other "Uzza complex" taxa as defined in Johnson and Matusik (1988). The cladogram with the highest consistency index (.900) rejected species of *Uzzia* from the ingroup *Nesiostrymon/Terra*. In fact, no rooted tree was possible including species of *Uzzia* with the *Nesiostrymon/Terra* ingroup. As noted below, the same was true for species of *Dicya* scored separately from the outgroups defined in the Johnson and Matusik study. It is worth noting that a black-suffused distal area on the female forewing also occurs prominently in *Caerofethra asa*. These markings appear to be exaggerations of similar, but smaller, marks which occur in this area of the forewing in numerous eumaeine species (see Remarks under *Tergissima*).

Etymology. The name refers to aforementioned bulbed state of the ductus bursae and its apparent affinity to characters of the genus *Terra*.

Dicya cyanoundulata, new species

Figs. 81,86

Diagnosis. In wings differing from *D. dicaea* and *D. dicina* by the blue DFW,DHW (brown in *D. dicaea*, dull violet in *D. dicina*) and VHW undulate gray medial and postbasal bands (medial orbular bands, orange-brown to darker brown in *D. dicaea* and D. *dicina*, respectively). In genitalia distinctive in markedly more elongate central valval lobe and saccus in the male genitalia and the far less severely pronged terminus in the female surrounded by a lobate lamellal flap.

Description. DFW,DHW, male bright iridescent sky blue, distal area with small gray scent brand; female brown. VFW, VHW, both sexes, ground light gray with darker gray undulate medial and postbasal bands as noted in Diagnosis. "Thecla"-spot very diminutive, slightly yellow with black center; tails at termini of veins CuA1 and CuA2. *Male Genitalia*. Fig. 81. *Female Genitalia*. Fig. 81.

Types. Holotype female (Fig. 86F, FW 10.0 mm.), allotype male (Fig. E, FW 10.0 mm.), Umuarama, São Paulo, Brazil, 1800 m, 3-15 February 1932, leg. Gagarin, deposited MPM. Paratypes. MPM: one male, one female, same data as primary types. AMNH: one male, same data as primary types. BMNH: "Amazons", no other data (one male, one female).

Remarks. Typical of the preconceptions that could be based on wing characters in these group, one places specimens of this taxon "easily" with species of *Caerofethra* until noting the odd undersurface pattern. Dissection discloses the clear affinity to *T. dicaea*. There are specimens of this species in the BMNH, one of which bears a label "Type *Thecla 'n'* [so as not to make a nomen nudum]" with no author attribution and for which I can find no OD. The specimens are also located in a drawer which corresponds to no OD card in the BMNH card catalog.

Etymology. The name refers to the blue DFW,DHW and the undulate VHW bands.

Celmia stigmata, new species

Figs. 82,86

Diagnosis. Differing from *C. celmus* and congeners by male DFW suffused black over all but cell CuA2 and with broad black distal mark appearing as a scent brand. Male DHW and female DFW, DHW dull iridescent violet (not as blue as *C. celmus*). VFW,VHW with typical generic pattern comparatively broken and with postbasal orbicular intense black, appearing more intense that distal markings (*C. celmus* with postbasal orbicular more similar to rest of pattern, generally shaded basally orange and of same overall intensity as distal wing markings). Male genitalia with valvae ventrally shouldered and with elongate, thin, caudal extensions; saccus prominently knobbed. Female genitalia with ductus bursae robust and centrally produced and with terminus widely flared.

Description. Wing pattern distinctive among congeners as noted above, obsolescence of certain medial pattern elements more notable in female than male. "Thecla"-spot diminutive, slightly yellow with black center; tails at termini of veins CuA1 and CuA2. *Male Genitalia*. Fig. 82. *Female Genitalia*. Fig. 82.

Types. Holotype female (Fig 86J, FW 10.0 mm.), allotype male (Fig. 86I, FW 10.5 mm.) Hacienda

Garcia, Cauca Valley, Colombia, 29 January 1935, leg. E. I. Huntington, deposited AMMH.

Remarks. This species is one example of the many undescribed entities within the "Thecla celmus" group. Traditionally, curators have identified "T. celmus" simply by assuming its males were blue and females brown. Actually, various dimorphic combinations occur and there are numerous insular species in areas of the Neotropics known for local or regional endemism. It is noteworthy that an undescribed species of *Cyanophrys* was also taken by Huntington at this location.

Etymology. The Latin name refers to the scent brand-like marking apparent on the male forewing.

***Sipaea sepeina*, new species**

Figs. 85,86

Diagnosis. Currently known female differing from *S. hycarra* in blue DFW,DHW deep brown VFW,VHW bands and basal VHW color (Fig. 86) and in robust, abruptly fluted, caudal element in ductus bursae which joins the central part of the ductus in an undulate (rather than straight) fashion (Fig. 85).

Description. Female DFW,DHW dull iridescent silver blue. Female VFW,VHW deep beige with HW basad medial band much darker brown. FW postmedial band, HW medial band thick, dark brown, jagged particularly from cell CuA1 to anal angle. "Thecla"-spot dark brown; tails at terminus of veins CuA1 and CuA2. *Female Genitalia.* Fig. 85.

Type. Holotype female (Fig. 86U, FW 10.5 mm.), St. Jean de Maroni, Guyane Francaise, deposited MNHN.

Remarks. This is a species that would either go unnoticed or be variously identified in a simplified classification of Neotropical Theclinae based solely on wing pattern and traditional names. The VFW,VHW wing pattern is in someways suggestive of the much smaller non-congener *Caerofethra hesychia* but darker; likewise the undersurface is suggestive of congener *S. hycarra* which is brown above and with a much simpler VFW,VHW pattern. It is likely that additional specimens will be found in yet-unsorted MNHN Theclinae from the "Guiana" region. These derive mostly from MNHN "colonial" expeditions of the early 1900's and are of great interest. The species appears typical of an undescribed congener occurring in samples from an area known for endemism and well-collected prior to the post-War "development period". Efforts should be taken to preserve such samples, even if in poor condition or mostly unidentified.

Etymology. Taken from the original root referring to the color sepia and referring to the dark VFW,VHW pattern.

3. Taxa of Draudt's (1919) ***Thecla* "cleon Group"** (*Thecla cleon* Fabricius, *T. ecbatana* Hewitson, *T. picentia* Hewitson, *T. matthewi* Hewitson, *T. socia* Hewitson, *T. sesara* Godman and Salvin, *T. verbenaca* Druce, *T. angusta* Lathy.

These species lack forewing brands in males and are brown or brown and blue on the wing upper surfaces. However, the under surface bands are not as incised as in taxa of the Calycopis/Calystryma grade or *Symbiopsis* and always bordered basally by wide brown or reddish-brown borders on both wings. Also, the submargins between these bands and the wing edges are heavily marked with grizzling and various other small pattern elements.

4. Taxa of Eumaeini with W-shaped elements in the hindwing bands but generally with forewing brands in male.

Other groups evidence a continuous under surface hindwing variously in a W-shape nearly the anal margin. These taxa are readily recognized by forewing brands in the males and include species of *Mitoura*, *Strymon* and *Ministrymon*. For a list of *Ministrymon* based on examination of types, see Johnson and Miller (1990); for *Strymon*, Johnson et al. (1990). For *Mitoura* a general Nearctic list is given in Clench (1961).

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FIGURES

Figures and captions appear on facing pages. Figure numbers corresponding to the figure sequence of the text are underscored. Certain figure details are numbered according to the order of characters listed in **Diagnosis** sections of the text. Numerals for these details refer to the numbered traits in each Diagnosis. Subset letters (A,B, etc.) are arranged according to their order in each Diagnosis.

Example (taken from *Calycopis*): "***Primary trait.*** (1) ***Female genitalia*** – superior plate with short paired distal prongs;" [Note: in the *Calycopis* genitalic figure, 4A, this feature is marked as "**1A**"] "inferior plate with prominent paired ventral scutes" [Note: in the *Calycopis* genitalic figure, 4A, this feature is marked as "**1B**"], **etc.**

Figure 1. Wing Venation and Pattern.

A. Wing shape typifying genera of Clades I,II,IV and outgroups, margins "not strongly angled".

B. Wing shape typifying members of Clade III, margins "angled".

C.-I. Under surface wing patterns and terminology characterizing certain genera.

C. "Typical *Calycopis* Pattern"-- W-element is of moderate size and not necessarily symmetrical; limbal markings are generally limited to Thecla-spot (CuA1) and marginal/submarginal orange or red-orange coloration from anal lobe to cell M3.

D. "Typical *Calystryma* Pattern"-- W-element is large and generally symmetrical; limbal markings extend from anal lobe up to cell M2, including Thecla-spot (CuA1) and/or additional lunule in cell M3.

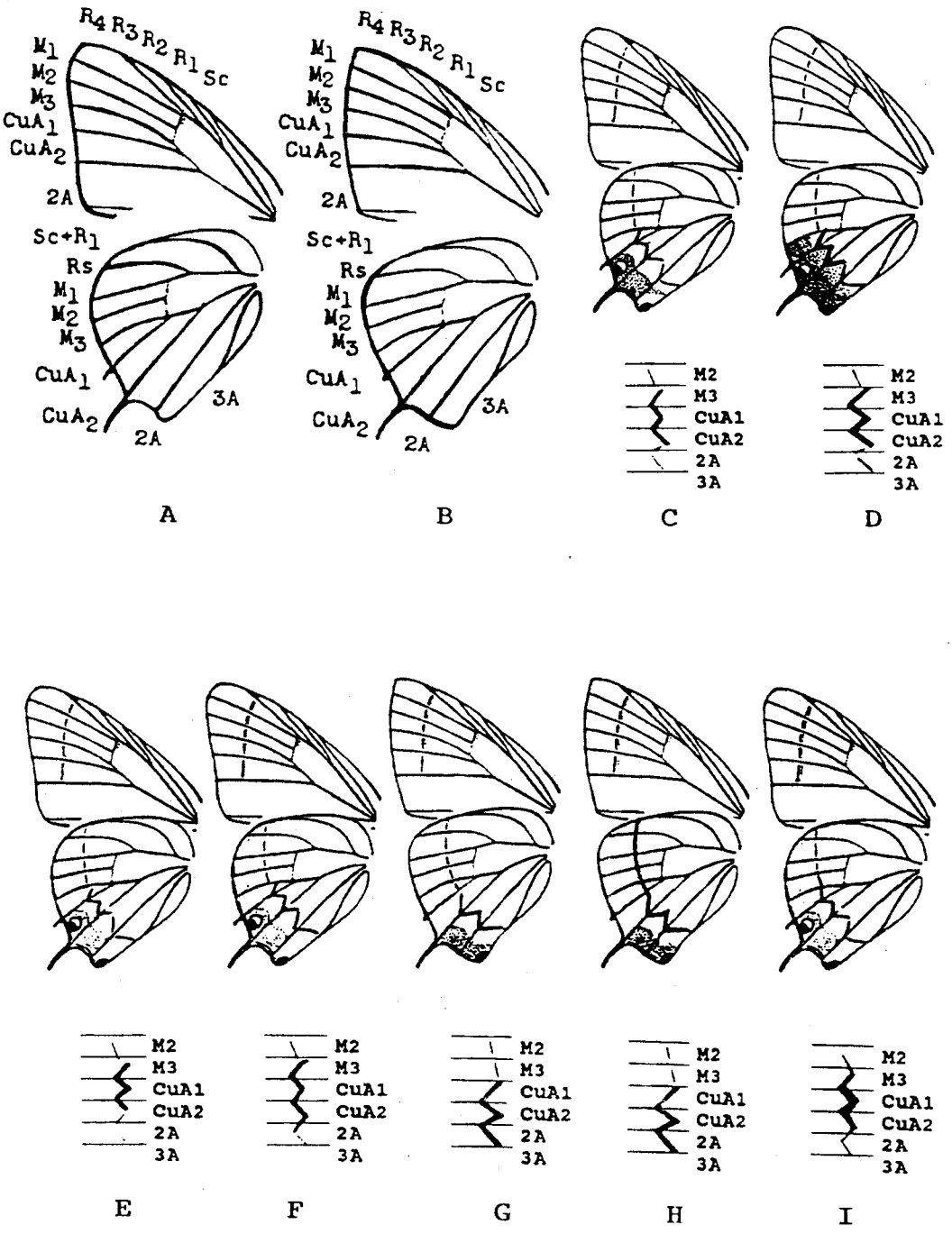
E. "Small W-element Pattern"-- W-element is small and compact, not strongly prominent relative to rest of band; limbal markings are often limited to the cell of the Thecla-spot (CuA1) and anal lobe.

F. "Additionally Angled Pattern"-- band elements in cells CuA2 and 2A are also strongly angled, creating a double "W" pattern; limbal markings are generally as in D, above.

G. "*Mercedes* Pattern" -- W-element is located in cells CuA1 to 2A, not M3 to CuA2; limbal markings are generally limited from anal lobe to cell CuA2 [disjunctive pattern in this entry characterizes genus *Mercedes*, a full band the genus named in entry H, below].

H. "*Mercedes* Pattern" modified to wide white band as in genus *Argentostriatus*.

I. Outgroup Pattern-- contiguous jagged band characterizing taxa of Electrostrymon Grade (See Outgroup Diagnostics).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M2
M3
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CuA2
2A
Sc+R1
Rs
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CuA1
CuA2
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Figure 2. Schematic Male Genitalia and Tergal Morphology

A.-E. Genitalia characteristic of Clade I.

A. Lateral view of male genitalia characterizing *Calycopis* and certain other genera (see text).

B. Lateral view of male genitalia characterizing *Calystryma* and certain other genera (see text). B1,B2 termino-ventral and termino-central production of labides; B3,B4 termini of falces.

C. Ventral view of male genitalia characterized as "triangular".

D. Lateral view of male genitalia characterizing certain genera with highly modified structures. D1,D2 terminal bifurcation and lateral serration of falces; D3, diminutive valve; D4 elongate valve; D5 bifurcate valve.

E. Ventral view of male genitalia characteriaed as "parabolic".

F.-G. Genitalia characteristic of Clade II.

F. Lateral view of male genitalia characterizing genera of Clade II. F1, dorsally directed valve; F2, ventrally directed valve; F3,F4 termino-ventral and termino-dorsal production of labides.

G. Ventral view of male genitalia characterized as "bell-shaped".

H. Lateral view of male genitalia characterizing genera of Clades III and IV. H1,H2 dorsally produced and terminally flat labides.

I.-O. Tergal modifications characterizing certain genera.

I. "Simple" male *sipc* dorsal plate characterizing *Calycopis* and certain other genera (see text) of Clade I. I1, microtrichia along terminal margin.

J. "Simple" male *sipc* dorsal plate characterizing *Calystryma* and certain other genera (see text) of Clade I. J1, microtrichia cluster in dorso-central cleft.

K. "Elaborate" male *sipc* dorsal plate and adjoining lateral surfaces characterizing genera of Clade II.

L. "Elaborate" male *sipc* dorsal plate and adjoining lateral surfaces characterizing highly modified genera of Clade I (arrows indicate general locations of structural modifications or additional components).

M. Schematic lateral views of male or female abdomen; above, with unspecialized terminal tergites; below, showing area encompassed by specialized terminal tergites.

N. "Simple" female *sipc* dorsal plate characterized by bilobate sclerotization of terminal tergite.

O. "Elaborate" female *sipc*; above, lateral view of sclerotized areas of eighth and terminal tergite; below, dorsal view.

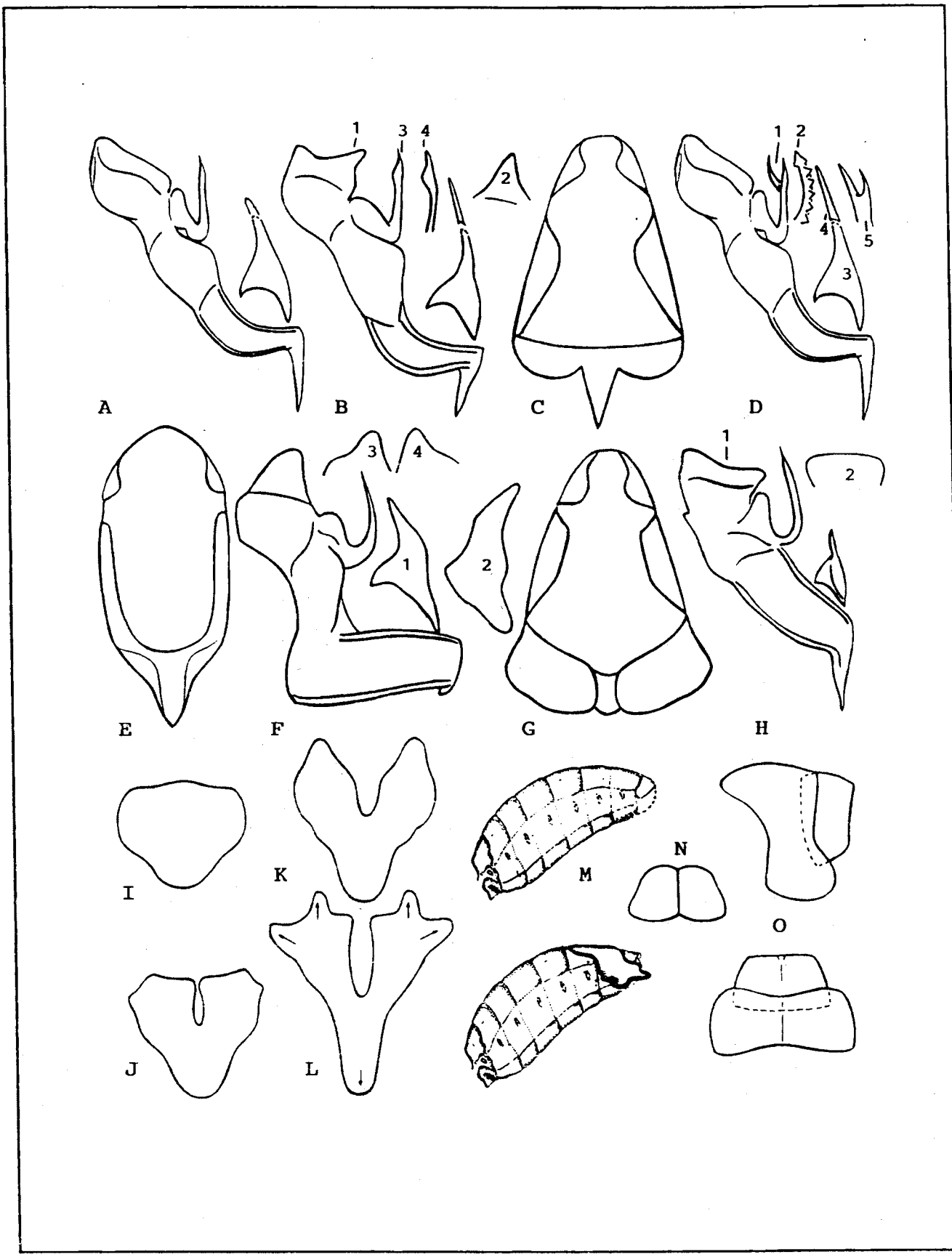
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Fig. 3. Schematic Female Genitalia

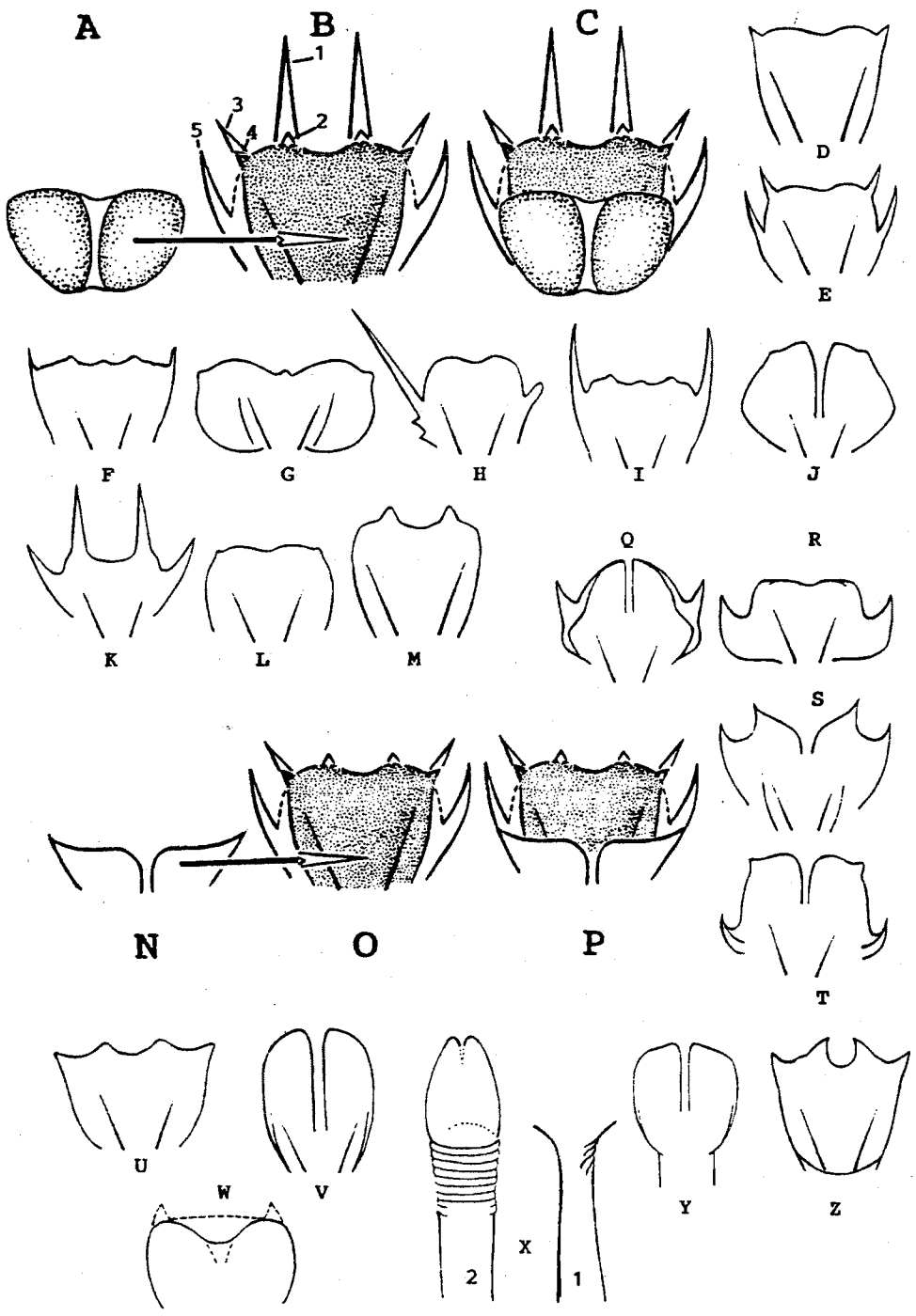
A.-C. Terminal genital plate components characterizing genera which exhibit a prominent inferior plate with sclerotized ventral scutes. **A.** scuted inferior plate; **B.** components of superior plate characterizing certain genera: B1, paired central prongs (or knobs B2); B3, paired distal prongs (or knobs B4); B5, paired lateral prongs. **C.** combined inferior and superior genital plates.

D.-M. Superior plates characterizing genera which have scuted inferior plates: **D.** *Calycopis*; **E.** *Calystryma*; **F.** *Serratofalca*; **G.** *Klaufera*; **H.** *Gigantofalca*; **I.** *Distissima*; **J.** *Serratoterga*; **K.** *Terminospinissima*; **L.** *Kroenleina*; **M.** *Antrissima*.

N.-P. Terminal genital plate components characterizing genera not exhibiting prominently scuted inferior plates. **N.** terminal margin of inferior plate; **O.** components of superior plate characterizing certain genera (same as in A-C but none with paired terminal prongs); **P.** combined inferior and superior genital plates.

Q.-T. Superior plates characterizing genera without scuted inferior plates: **Q.** *Cyanodivida*; **R.** *Furcovalva*; **S.** *Morphissima*; **T.** *Reversustus*.

U.-Z. Terminal genital configuration without prominent plates or with unusual features. **U,V.** Lobate terminus of *Fieldia*, *Tergissima*; **W.** Variable plate terminating diminutive ductus in *Femniterga*; **X.** (1) ductus terminus without "corregation", (2) corregation characterizing *Mercedes*; **Y.** Terminus characterizing *Argentostriatus*; **Z.** Terminus characterizing *Iaspis*; Z1 dendritic signum characterizing most members of grade.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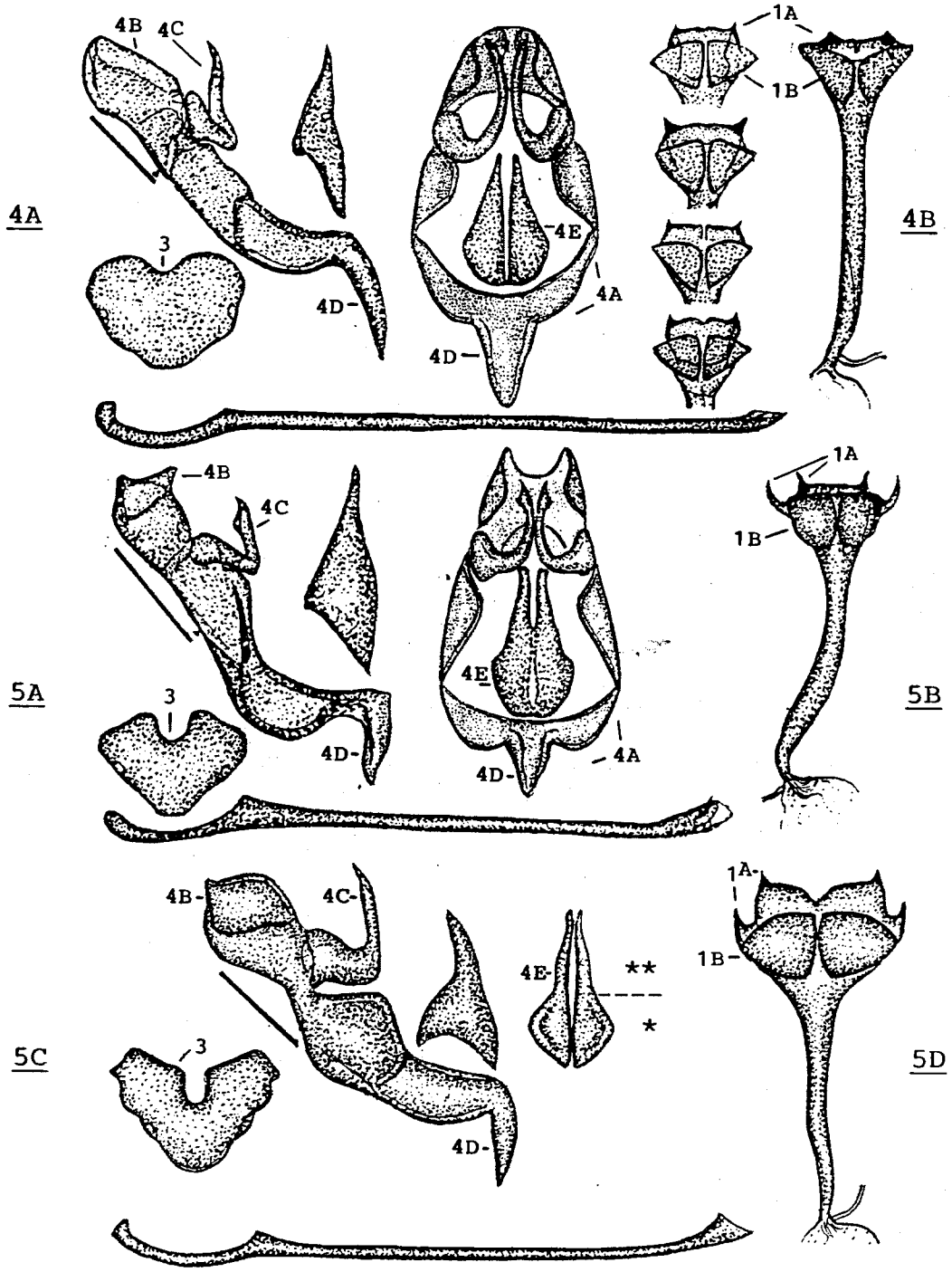
Figures 4-5

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 4. Morphology of *Calycopis*: type species *C. cecrops*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae. Placed immediate left, genital plates in four selected *Calycopis* species (top to bottom, *C. caulonia*, *C. chacona*, *C. bellera*, *C. jeneirica*).

Fig. 5. Morphology of *Calystryma*: type species *C. keta*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae. *C. quintana*. C. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. D. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.



For General Reference:

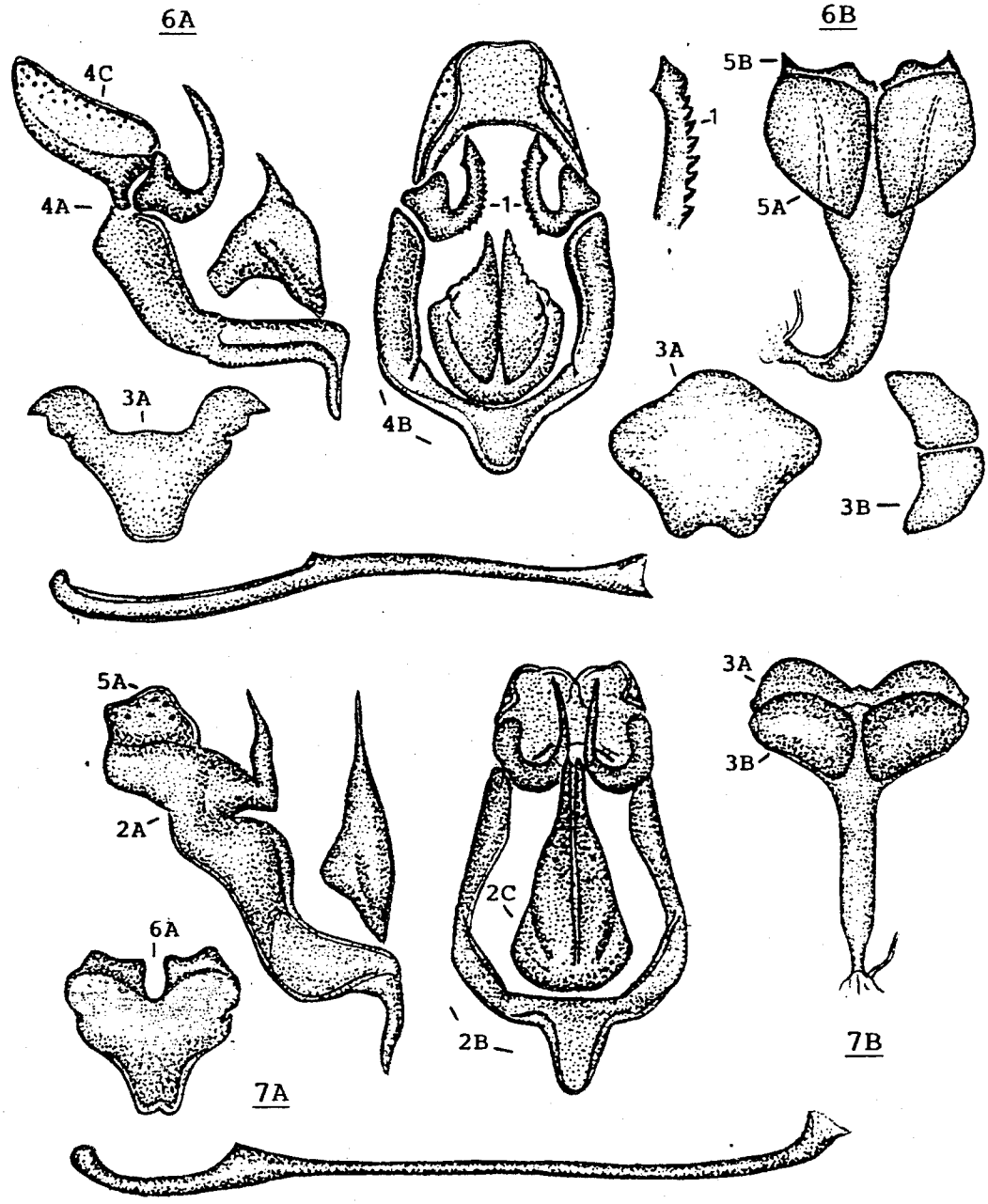
*"bilobed area"
**"caudal extension"

Figures 6-7

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 6. Morphology of *Serratofalca*: type species *S. cerata*. A. Male genitalia-- lateral left, ventral right [placed directly right, inner lateral view, serrate falces]; dorsal view of *sipc* below left [a] [*sipc* placed at right (b) with terminal edge more typical of genus]; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* below, right, in dorsal view.

Fig. 7. Morphology of *Klaufera*: type species *K. pisis*. A. Male genitalia-- lateral left; ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.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3A
1
4B
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5B
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5A
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6A
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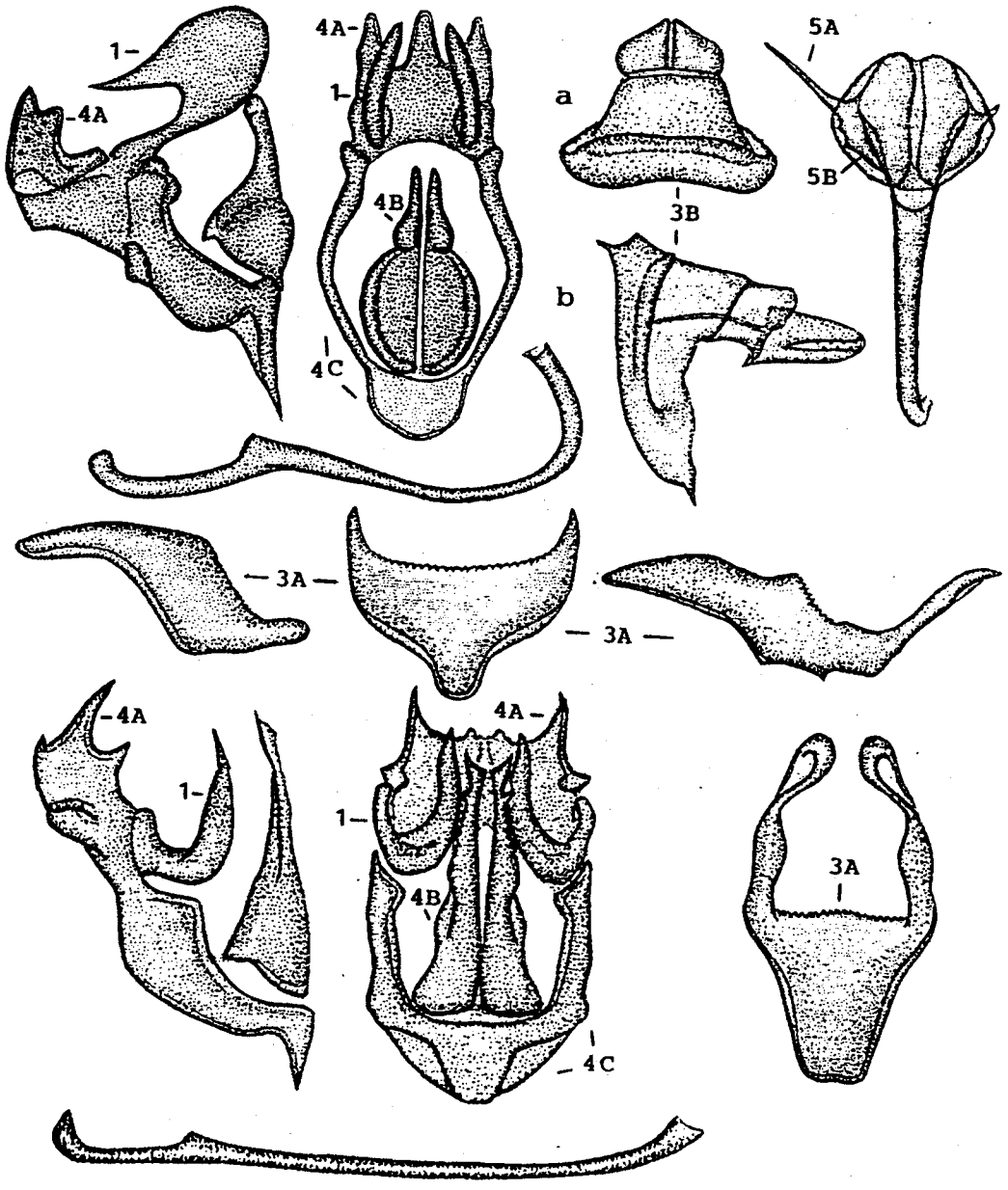
7A
3A
3B
7B

Figure 8

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 8. Morphology of *Gigantofalca*: type species *G. stacya*. A. Male genitalia-- lateral left, ventral right; *sipc* below left-- a. lateral, b. dorsal; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediately left-- a. dorsal, b. lateral (including papillae anales). *G. duida*. C. Male genitalia--lateral left, ventral right; *sipc* above right and immediate right-- a. lateral, b. dorsal; aedeagus below.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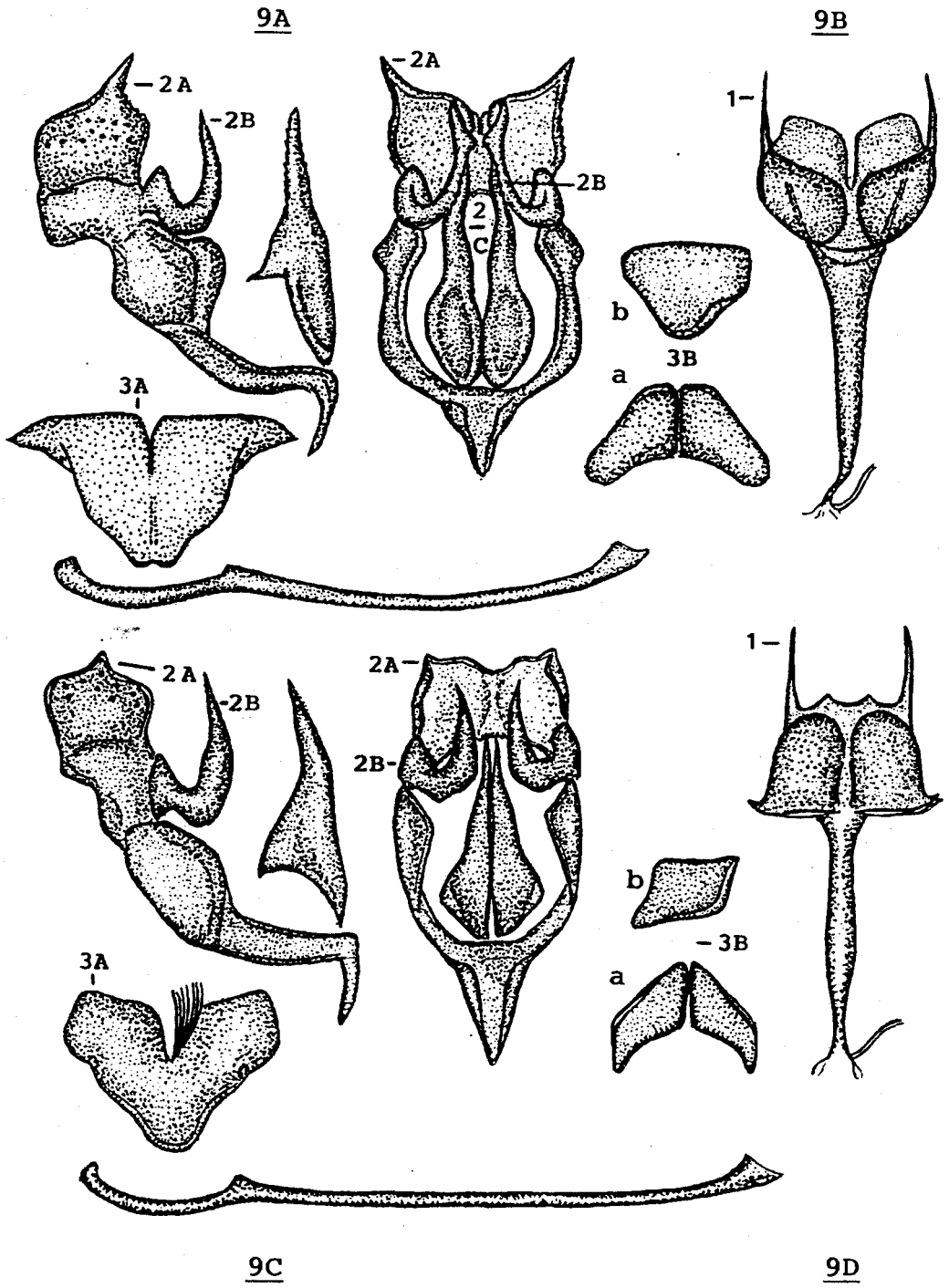
8C

Figure 9

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 9. Morphology of *Distissima*: type species *D. spenceri*. A. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left-- a. lateral, b. dorsal. *D. srandrea*. C. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left-- a. lateral, b. dorsal.


9A
9B
2A
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2C
3A
3B
a
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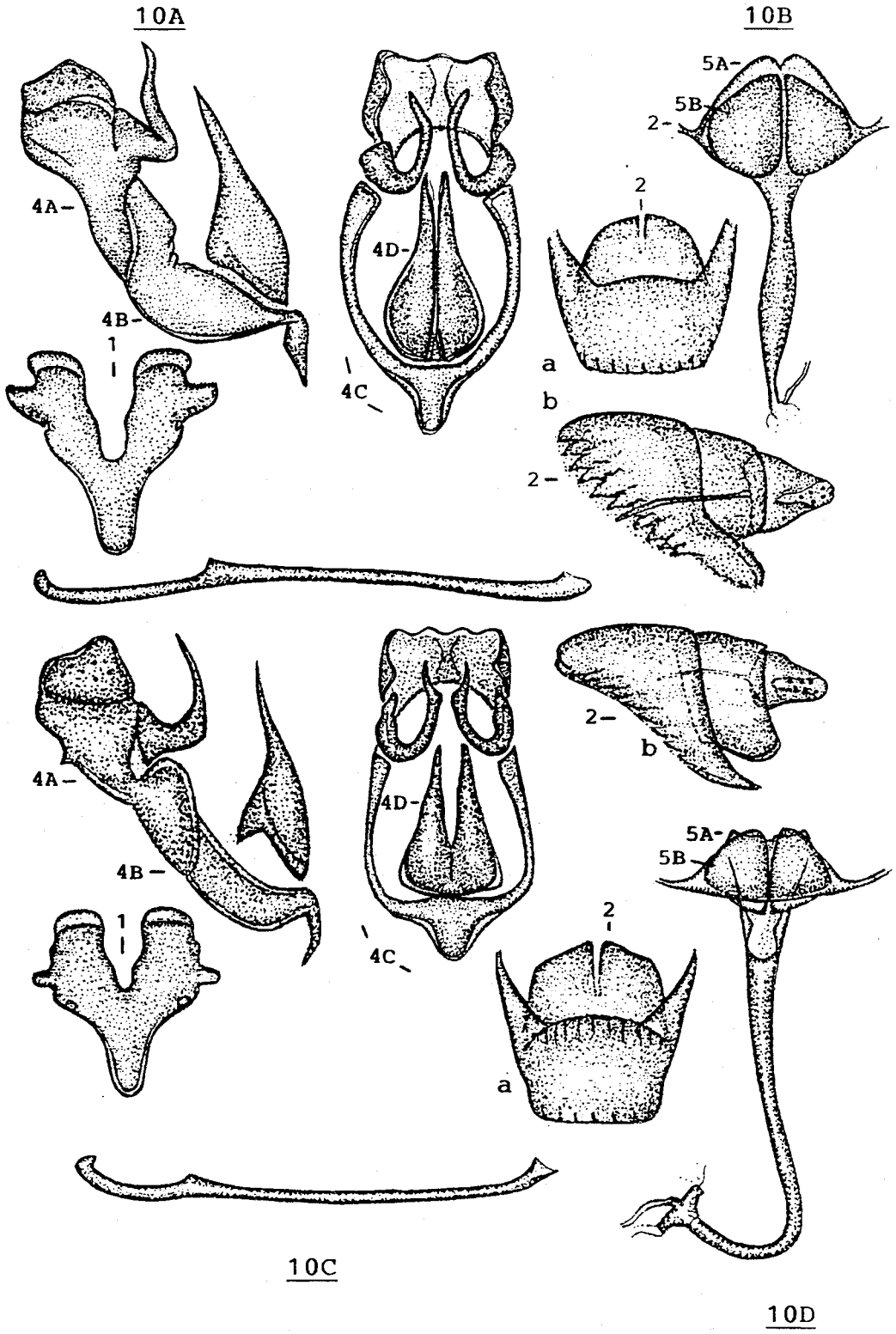
1
9C
9D

Figure 10

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 10. Morphology of *Serratoterga*: type species *S. larsoni*. A. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left and below-- a. dorsal, b. lateral. *S. saopauloensis*. C. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. D. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left and below-- a. dorsal, b. lateral.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Figures 11-12

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 11. Morphology of *Terminospinissima*: type species *T. serratissima*. A. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.

Fig. 12. Morphology of *Furcovalva*: type species *F. extensa*. A. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left and below-- a. dorsal, b. lateral.

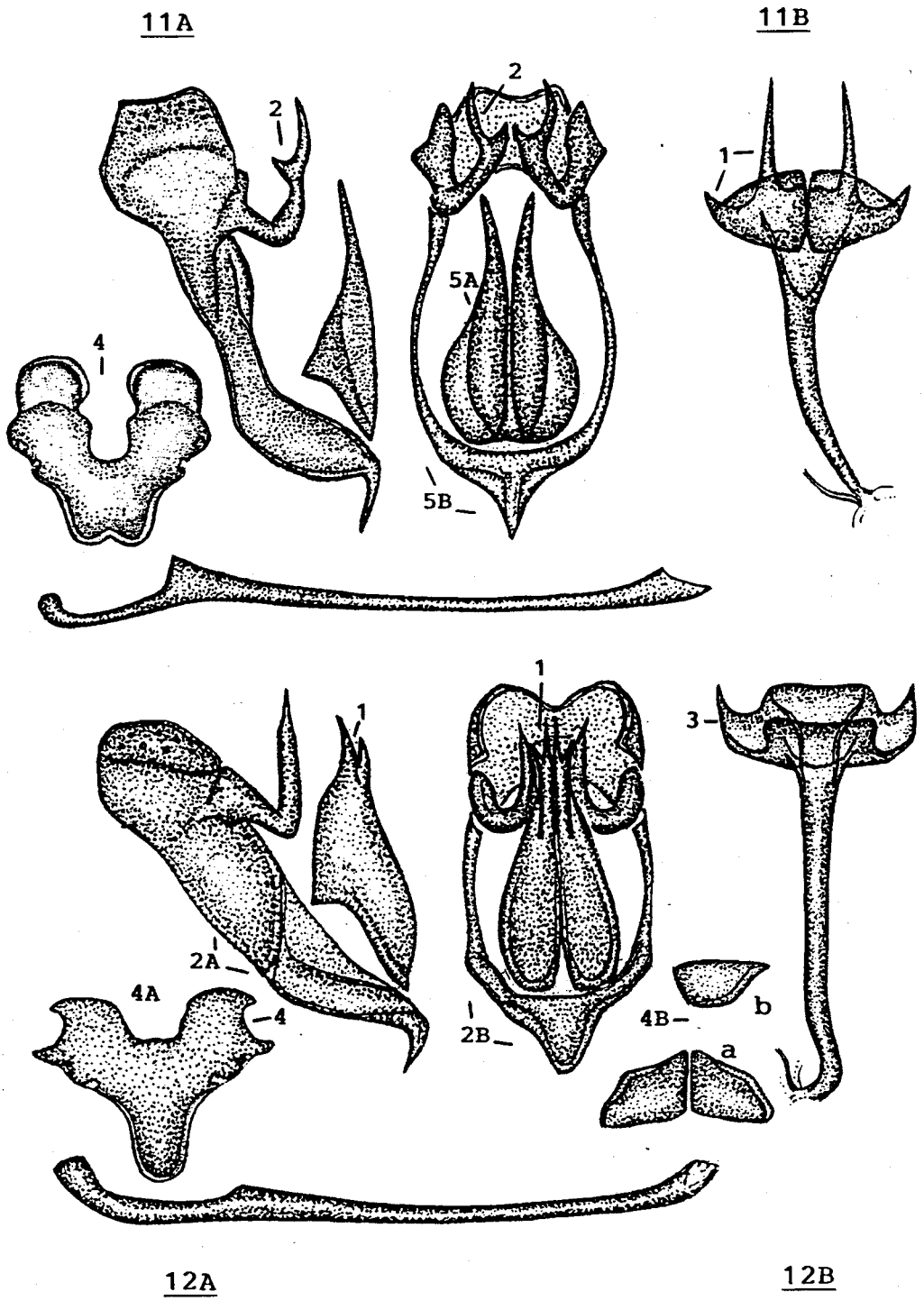

11A
11B
2
2
1
5A
4
5B
12A
12B
1
1
3
2A
4A
4
2B
4B
b
a

Figure 13

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 13. Morphology of *Cyanodivida*: type species *C. fornoi*. A. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left-- a. lateral, b. dorsal. *C. neorcillata*. C. Male genitalia-- lateral left, ventral right; dorsal view of *sipc* below left; aedeagus below. D. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; sipc immediate left-- a. lateral, b. dorsal.

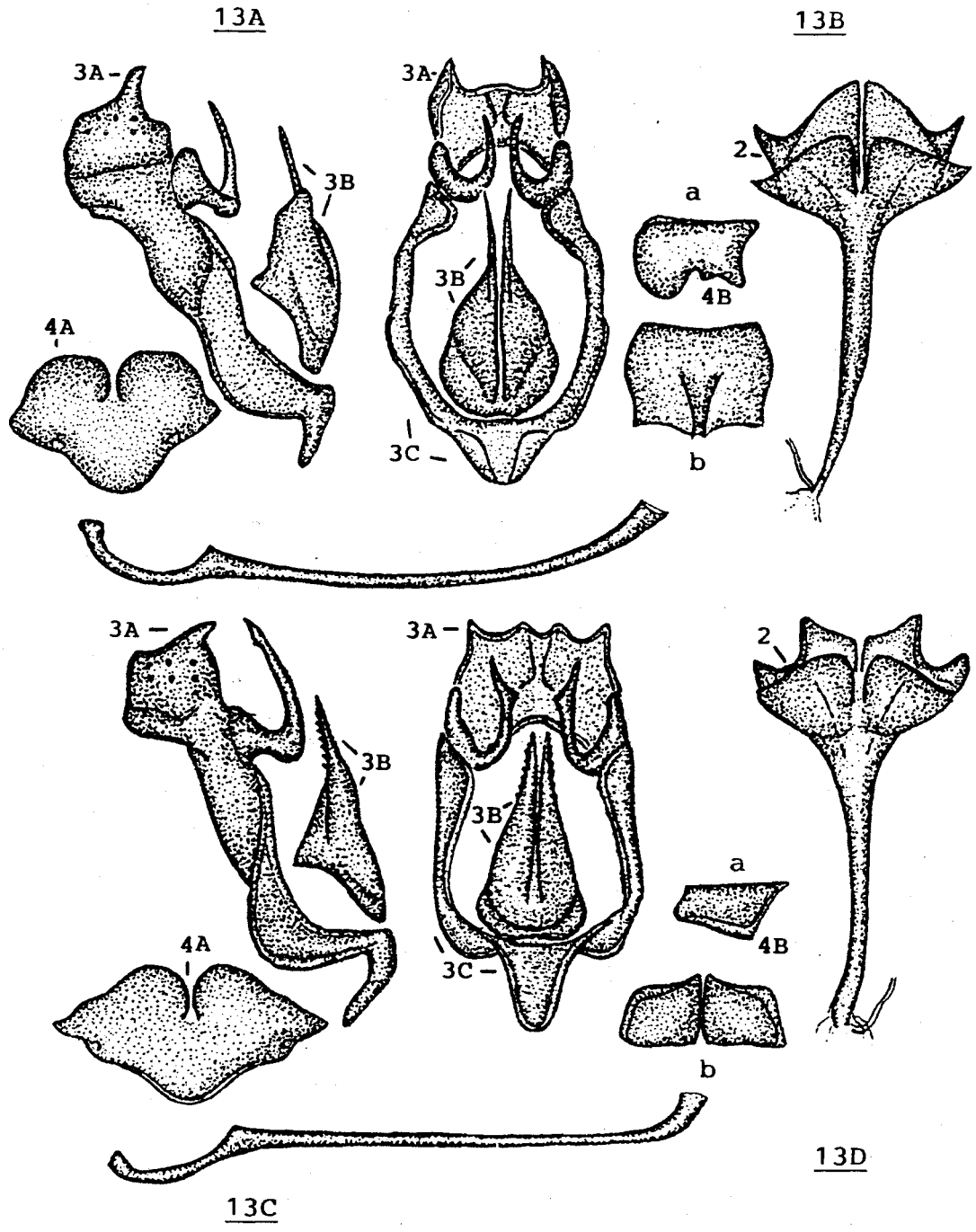

13A
13B
3A
3B
4A
3C
2
a
4B
b
13C
13D

Figure 14

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 14. Morphology of *Morphissima*: representative species *M. thama*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. Type species *M. scalpera*. B. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. C. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.

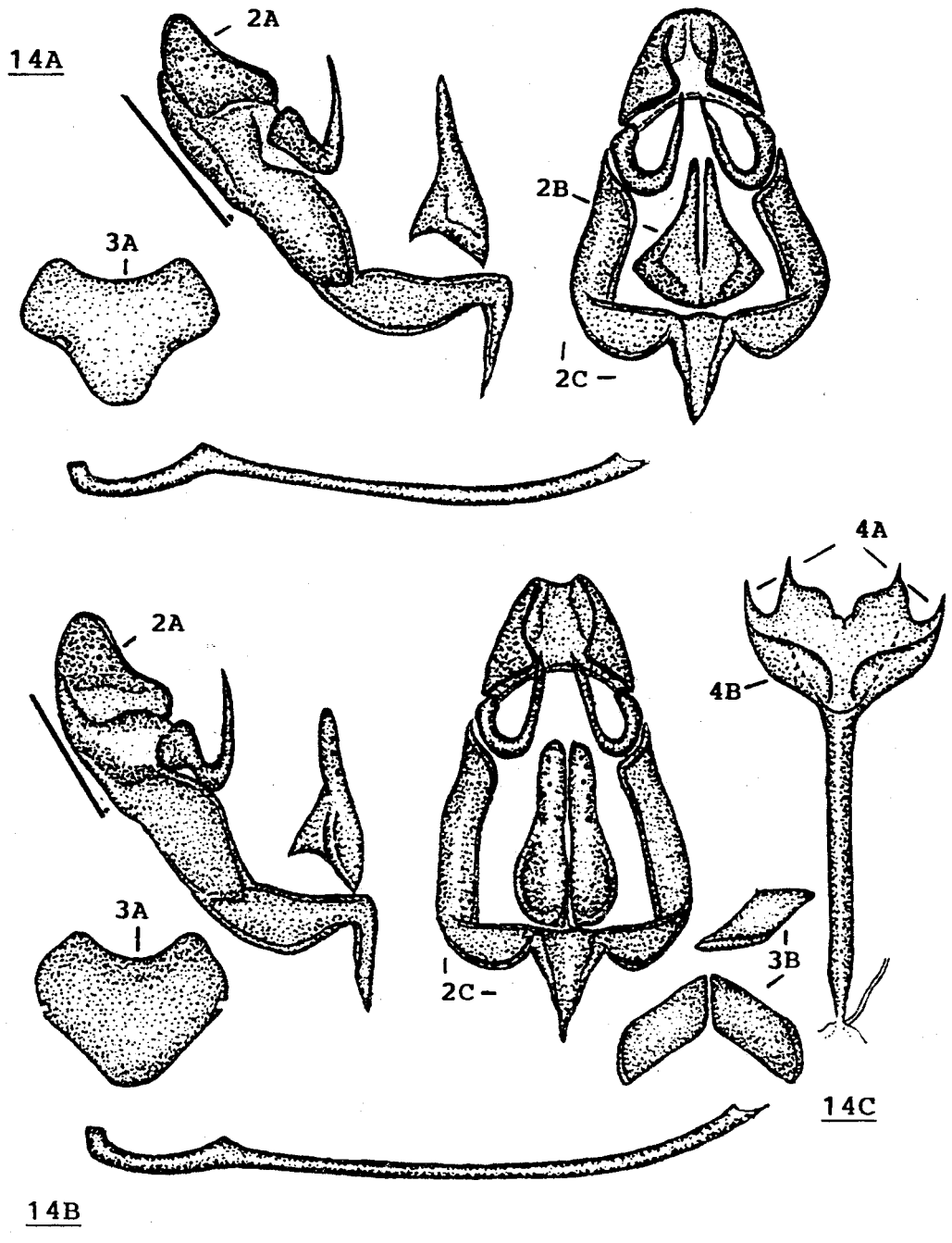
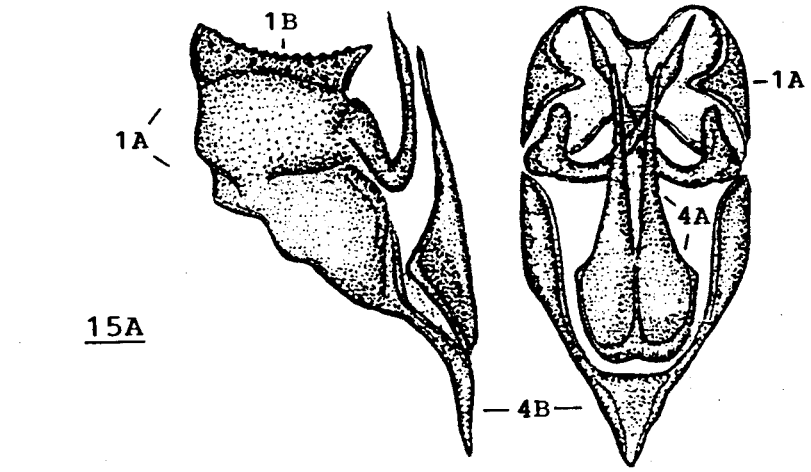

14A
2A
3A
2B
2C
14B
2A
3A
2C
4A
4B
3B
14C

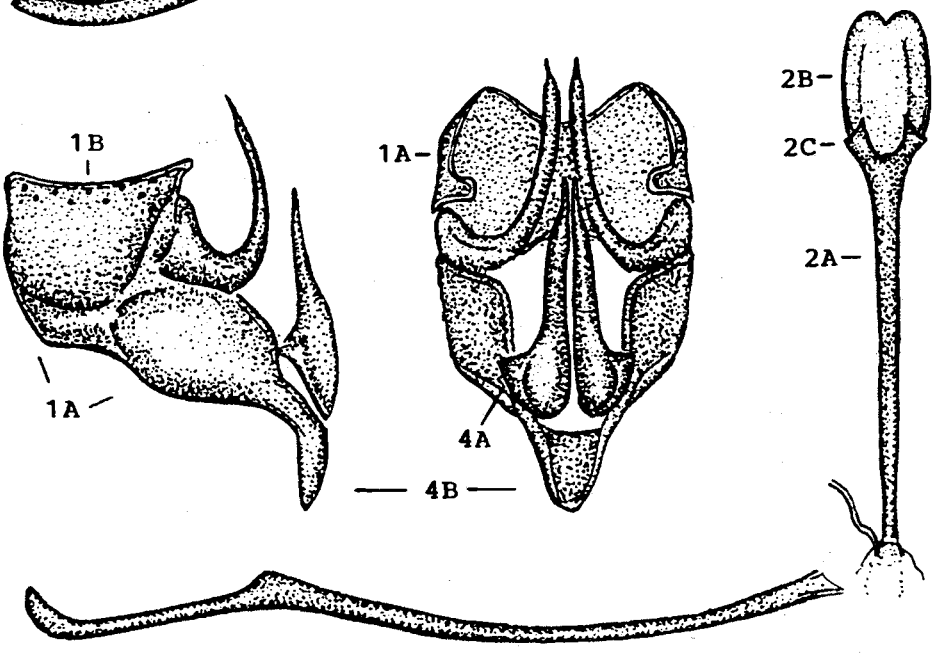
Figure 15

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 15. Morphology of *Fieldia*: representative species *F. nisaee*. A. Male genitalia-- lateral left, ventral right; aedeagus below. Type species *F. yungas*. B. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; aedeagus below. C. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.



15A



15B

15C

Figure 16-17

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 16. Morphology of *Tergissima*: type species *T. mosconiensis*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.

Fig. 17. Morphology of *Femniterga*: representative species *F. splendida* (first recorded male). A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. representative species *F. aurea* (not previously illustrated). B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* at left-- a. dorsal, b. lateral.

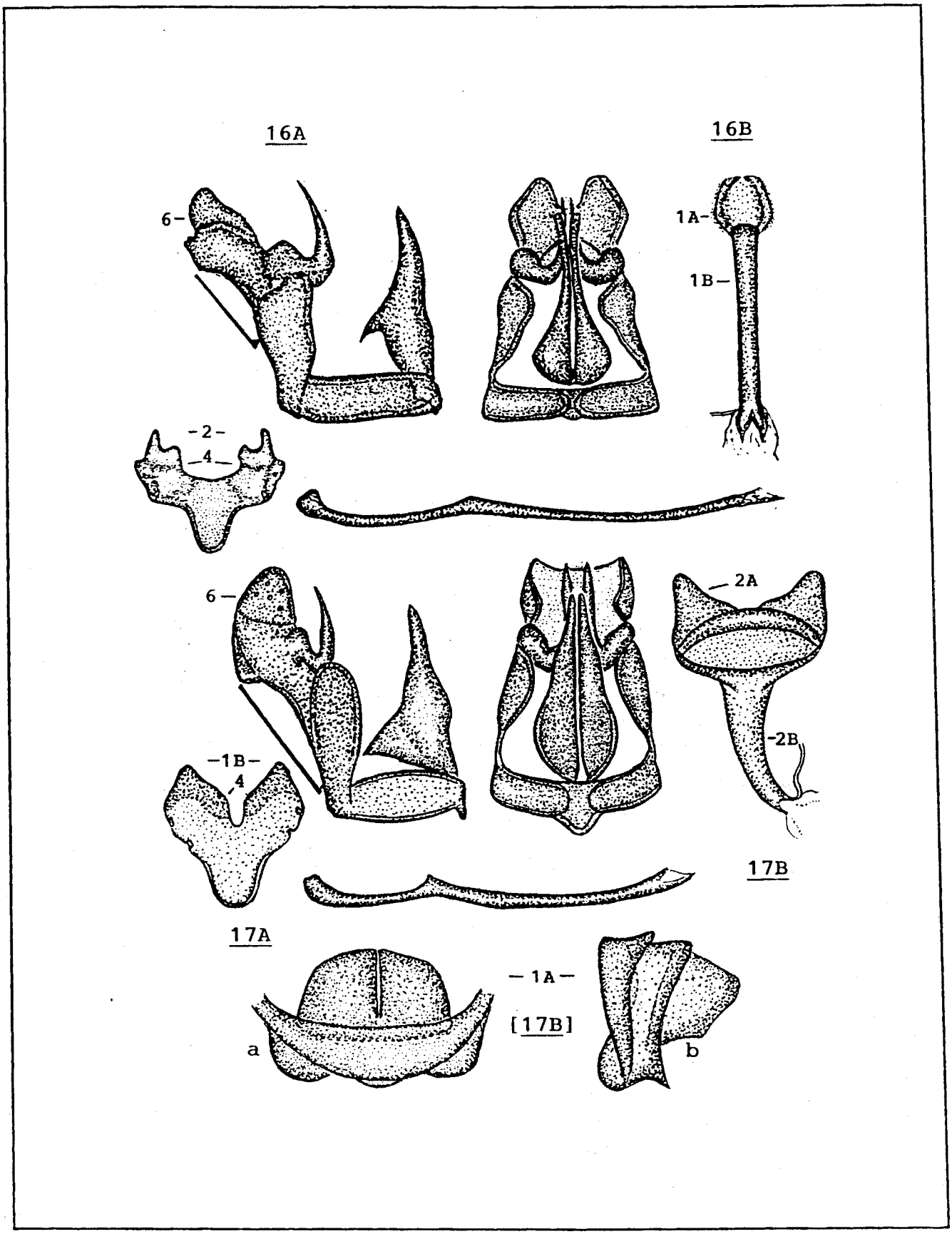

16A
16B
6
1A
1B
2
4
6
2A
2B
1B
4
17B
17A
1A
[17B]
a
b

Figure 18

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 18. Morphology of *Kroenleina*: type species *K. panornata*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left-- a. lateral, b. dorsal. *K. escuintla*. C. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. D. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left-- a. lateral, b. dorsal.

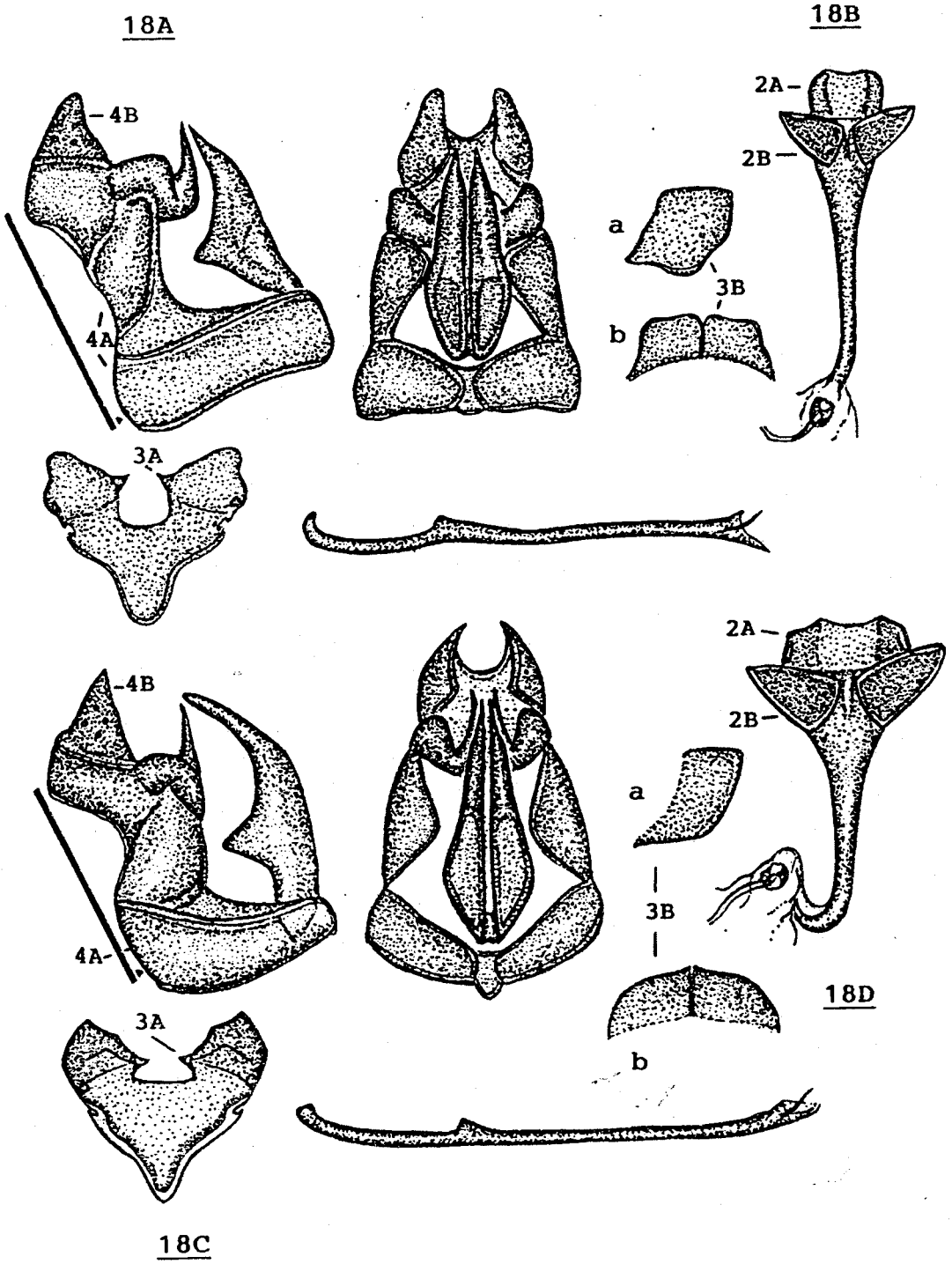

18A
18B
4B
4A
3A
2A
2B
a
3B
b
18C
18D

Figure 19

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 19. Morphology of *Antrissima*: type species *A. varicolor*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left-- a. lateral, b. dorsal. *A. misionensis*. C. Male genitalia--lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. D. Female Genitalia-- ventral view, genital plate terminus to cervix bursae; *sipc* immediate left-- a. lateral, b. dorsal.

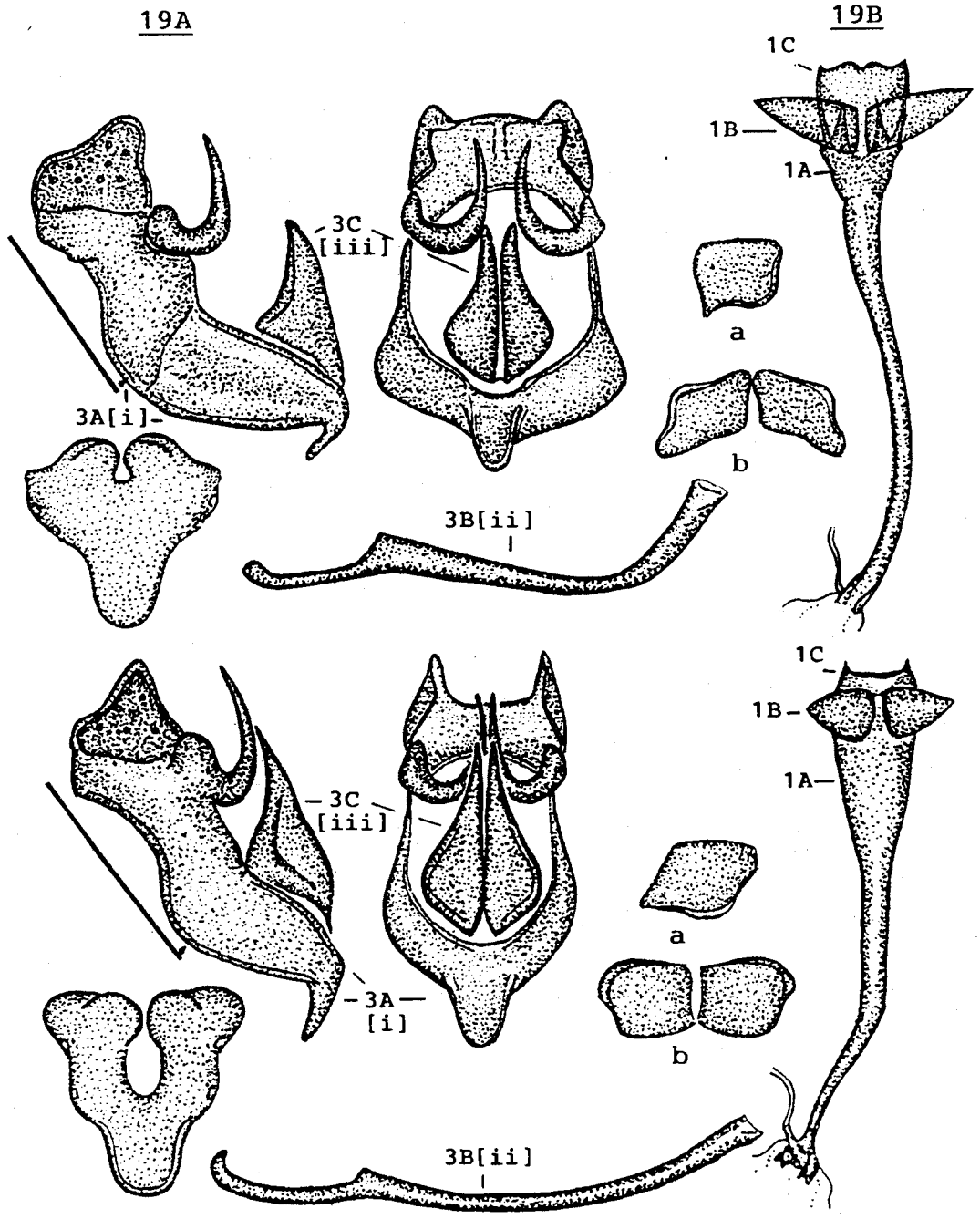

19A
19B
1C
1B
1A
3C
[iii]
3A[i]
a
b
3B[ii]
1C
1B
1A
3C
[iii]
3A
[i]
a
b
3B[ii]
[bracketed letters as in text]
19C
19D

Figure 20

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 20. Morphology of *Reversustus*: type species *R. puppius*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae. *R. assuensis*. C. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. D. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.

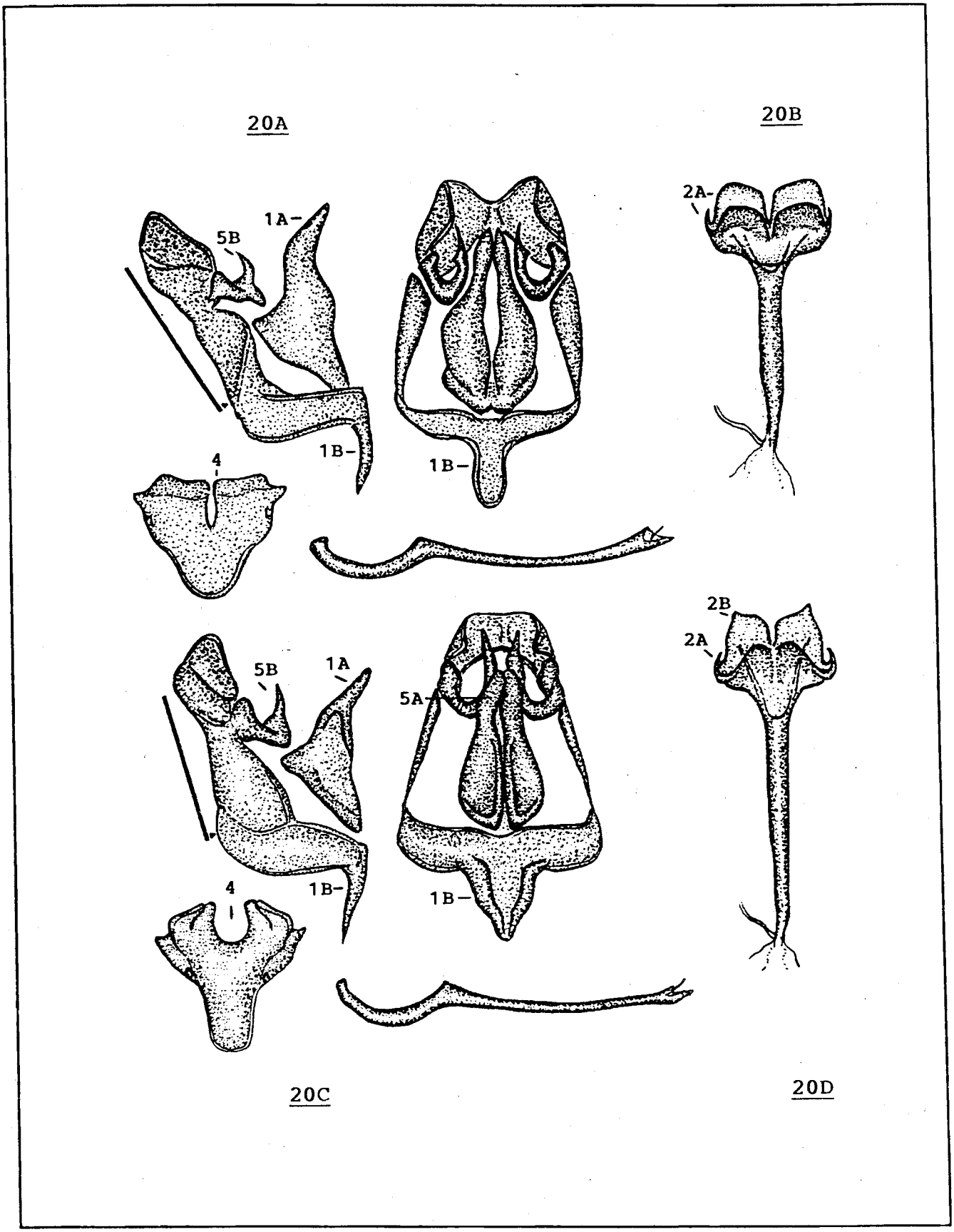

20A
20B
5B
1A
1B
4
2A
20C
20D
5A
2B

Figure 21-22

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 21. Morphology of *Mercedes*: type species *M. demonassa*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.

Fig. 22. Morphology of *Argentostriatus*: type species *A. tamos*. A. Male genitalia-- lateral left [black line and carot, respectively, expanse and locus of abuttment of brush organs], ventral right; dorsal view of *sipc* below left; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.

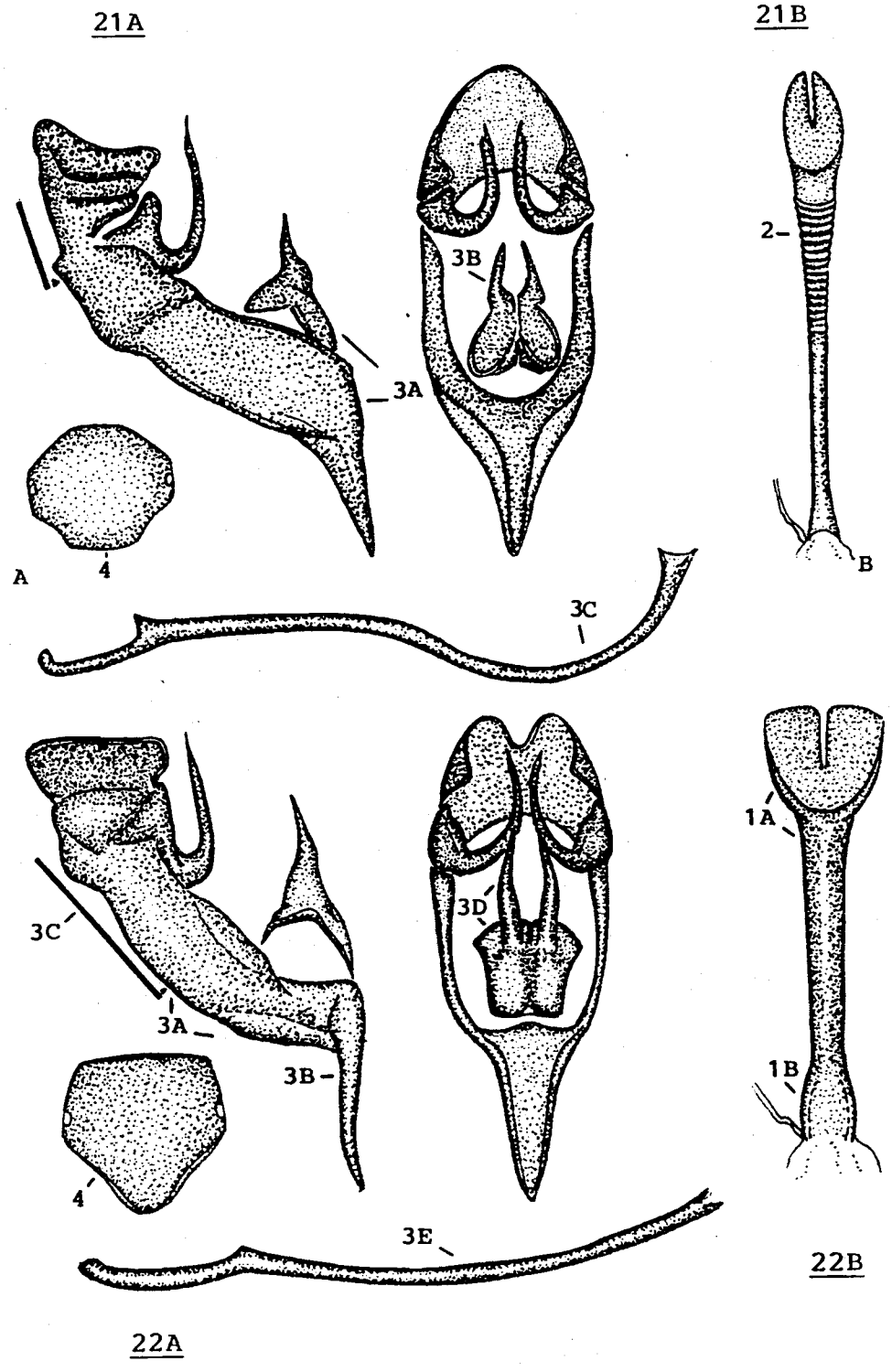
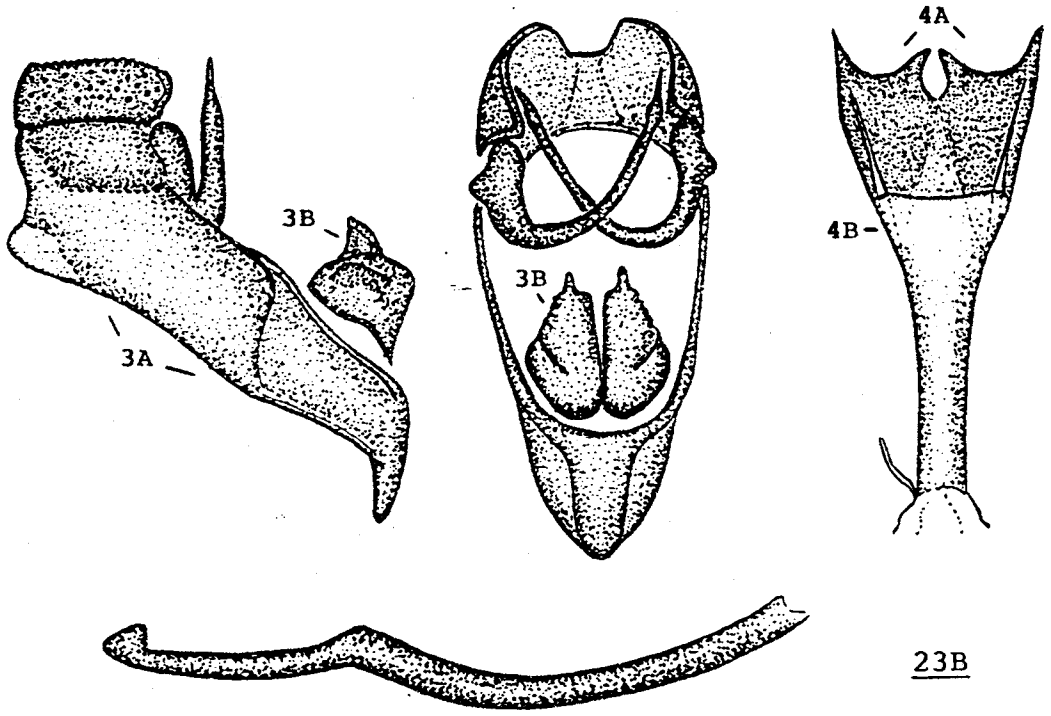

21A
21B
3B
3A
2
A
4
B
3C
3C
3D
3A
1A
3B
1B
4
3E
22B
22A

Figure 23

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B etc.) appear in the order of the text's listings (see FIGURES introduction).

Fig. 23. Morphology of *Iaspis*: representative species *I. diffusus*. A. Male genitalia-- lateral left, ventral right; aedeagus below. B. Female Genitalia-- ventral view, genital plate terminus to cervix bursae.



23A

23B

Figures 24-29

Adults of Selected Species of Genera of the Calycopis/Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 24. *Calycopis cecrops*, male (Clinton, Mississippi, USA, AMNH).

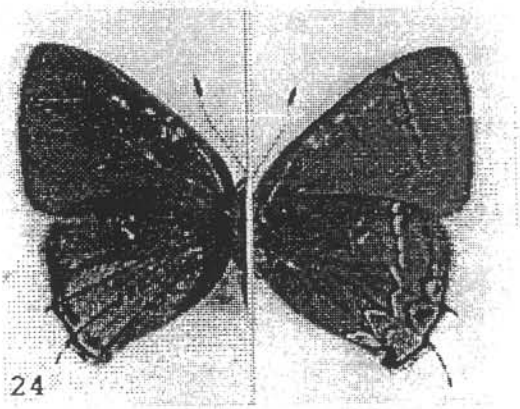
Fig. 25. *Calycopis cecrops*, female (Jackson, Mississippi, USA, AMNH).

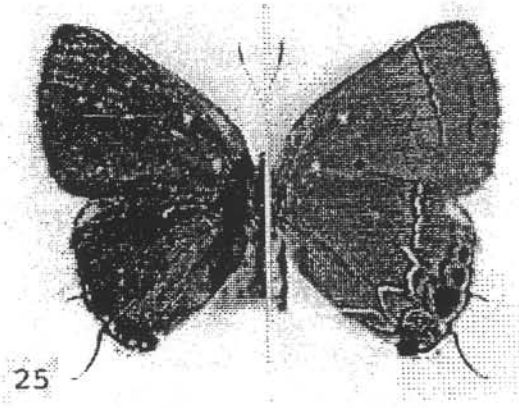
Fig. 26. *Calystryma keta*, male ([ID W. D. Field], Guapiles, Costa Rica, AMNH).

Fig. 27. *Calystryma quintana*, holotype male.

Fig. 28. *Calystryma quintana*, allotype female.

Fig. 29. *Serratofalca cerata*, male (Para, Brazil, AMNH).


24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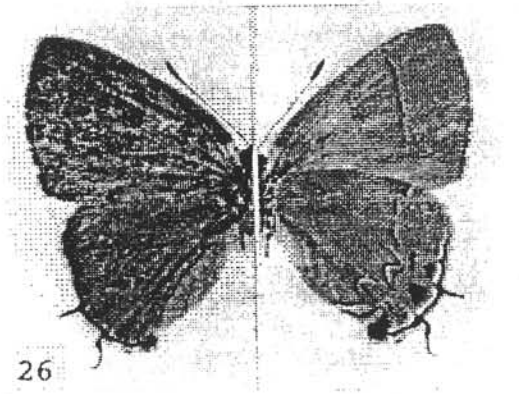
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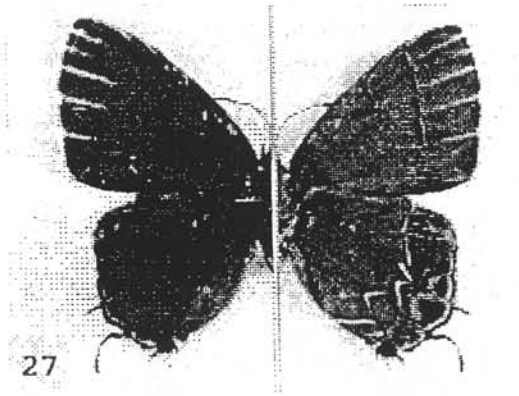
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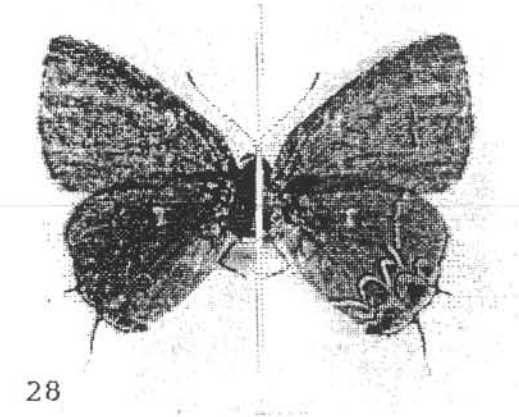
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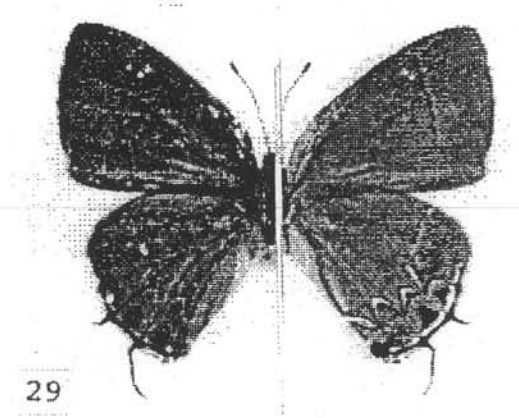

29

Figures 30-35

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 30. *Serratofalca cerata*, female (Para, Brazil, AMNH).

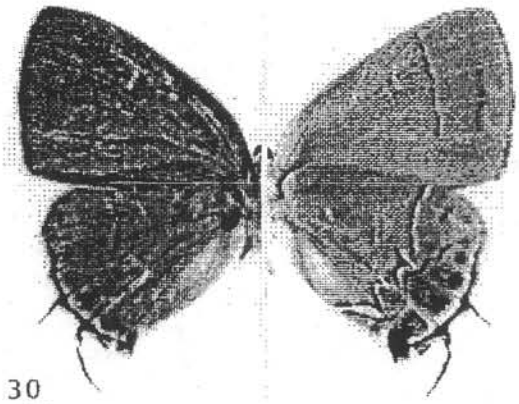
Fig. 31. *Klaufera pisis*, male (Tonantins, Brazil, BMNH).

Fig. 32. *Klaufera pisis*, female (Tonantins, Brazil, BMNH).

Fig. 33. *Gigantofalca stacya*, holotype male.

Fig. 34. *Gigantofalca stacya*, allotype female.

Fig. 35. *Gigantofalca duida*, holotype male.



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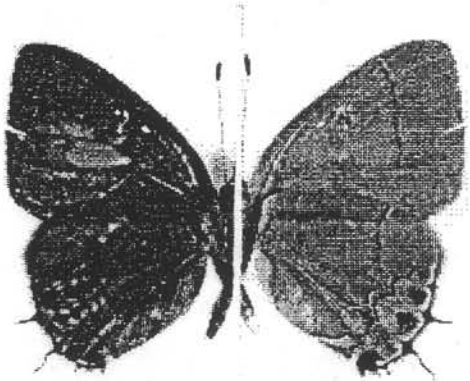

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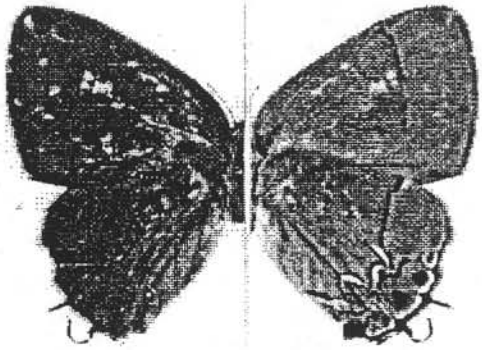

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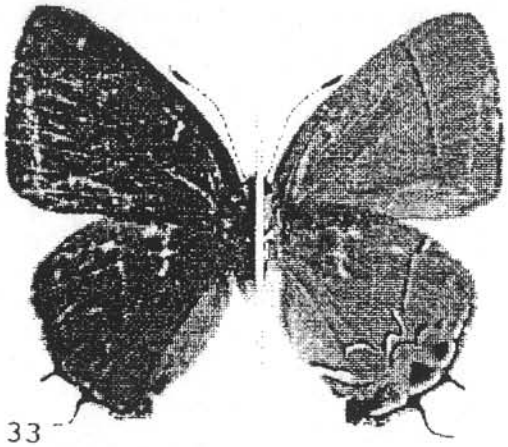

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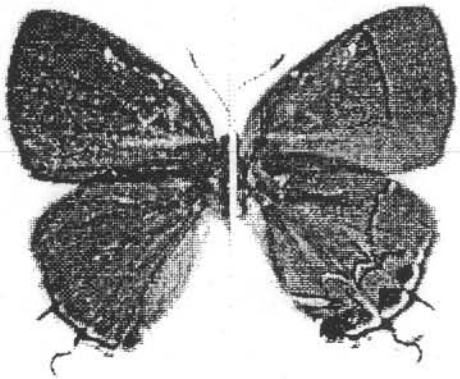

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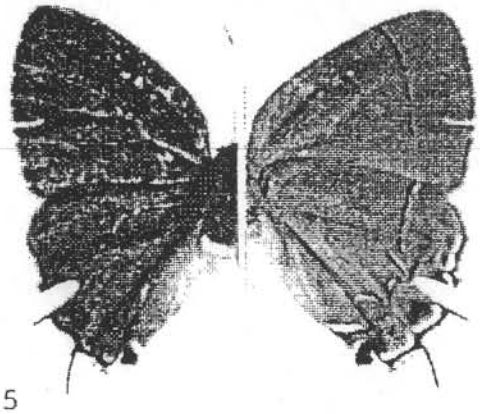


35

Figures 36-41

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 36. *Distissima spenceri*, allotype male.

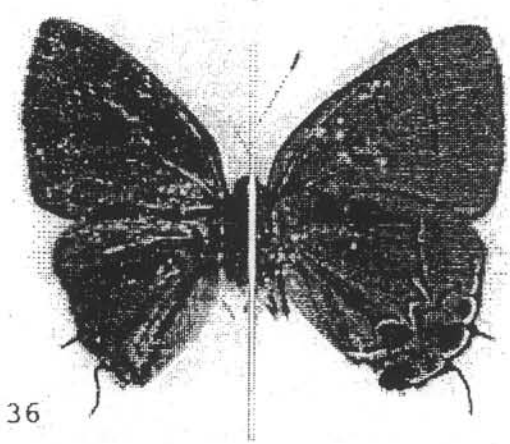
Fig. 37. *Distissima spenceri*, holotype female.

Fig. 38. *Distissima srandrea*, allotype male.

Fig. 39. *Distissima srandrea*, holotype female.

Fig. 40. *Serratoterga larsoni*, allotype male.

Fig. 41. *Serratoterga larsoni*, holotype female.



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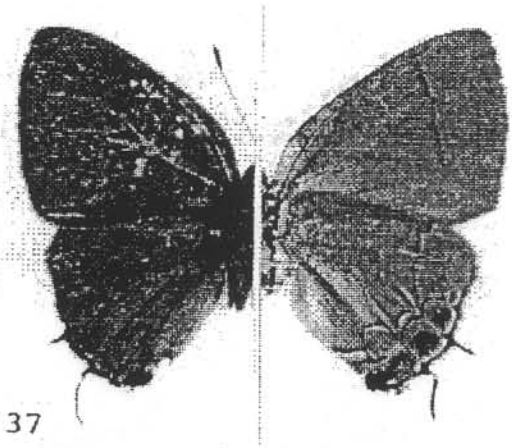

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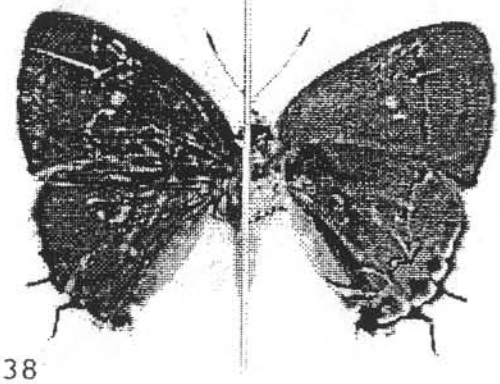

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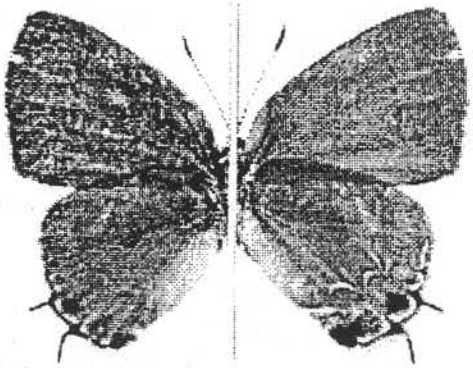

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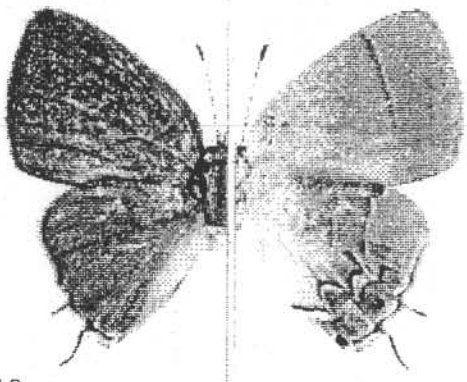

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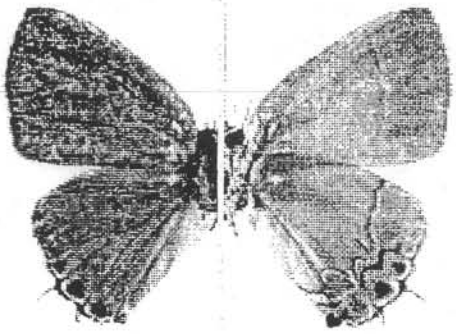


41

Figures 42-47

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 42. *Serratoterga saopauloensis*, allotype male.

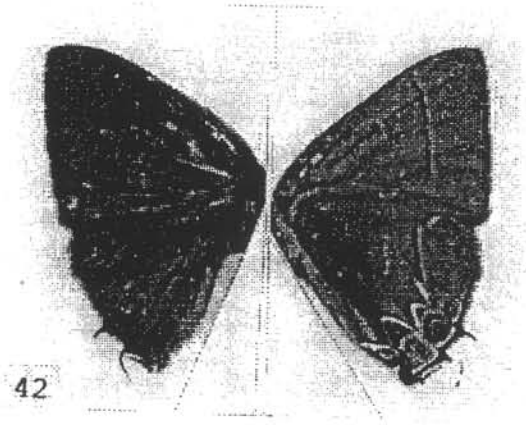
Fig. 43. *Serratoterga saopauloensis*, holotype female.

Fig. 44. *Terminospinissima serratissima*, allotype male.

Fig. 45. *Terminospinissima serratissima*, holotype female.

Fig. 46. *Furcovalva extensa*, holotype male.

Fig. 47. *Furcovalva extensa*, allotype female.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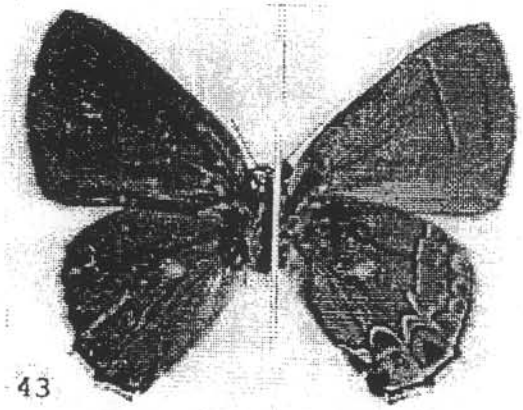
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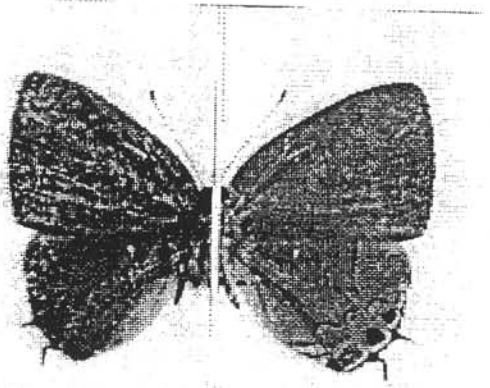
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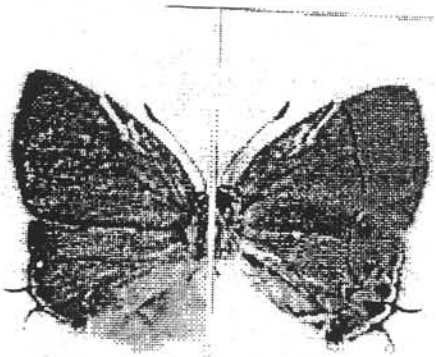
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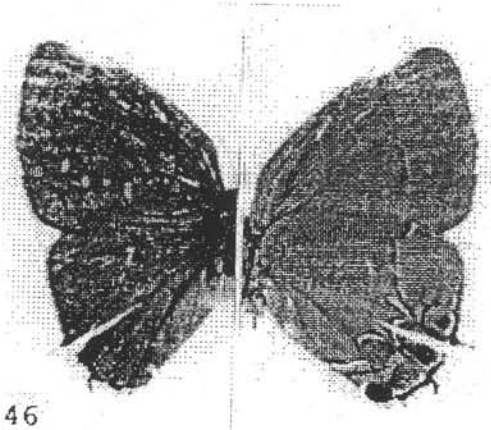
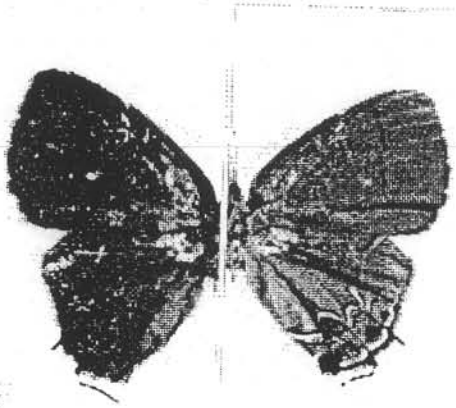

46


47

Figures 48-53

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 48. *Cyanodivida fornoi*, holotype male.

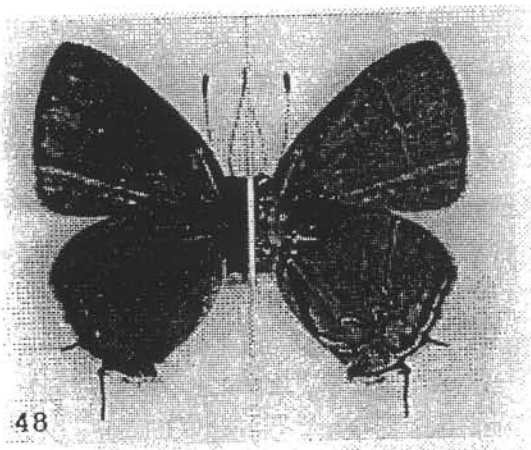
Fig. 49. *Cyanodivida fornoi*, allotype female.

Fig. 50. *Cyanodivida neorcillata*, holotype male.

Fig. 51. *Cyanodivida neorcillata*, allotype female.

Fig. 52. *Morphissima scalpera*, holotype male.

Fig. 53. *Morphissima scalpera*, allotype female.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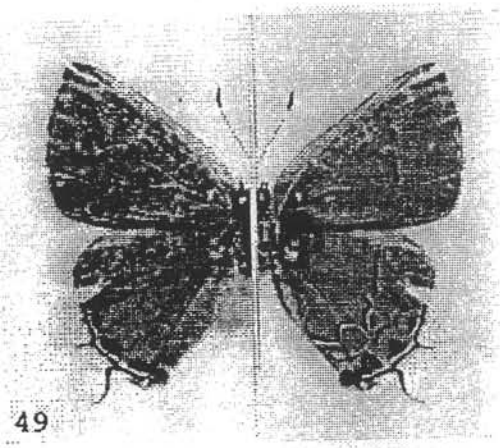
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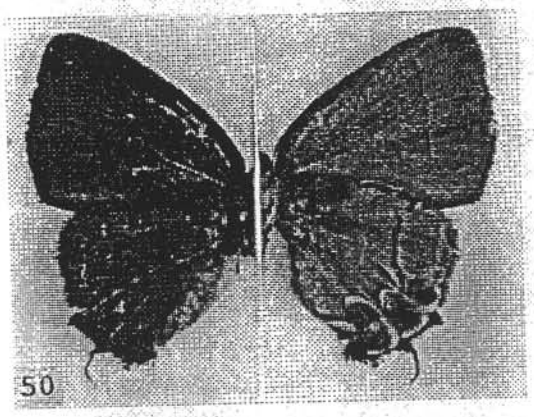
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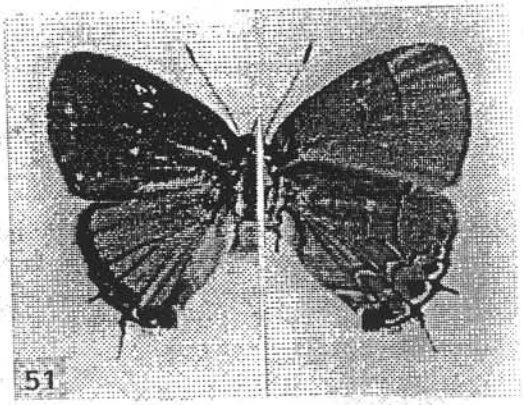
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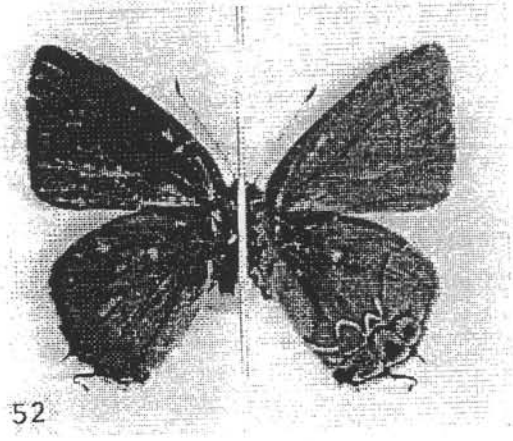
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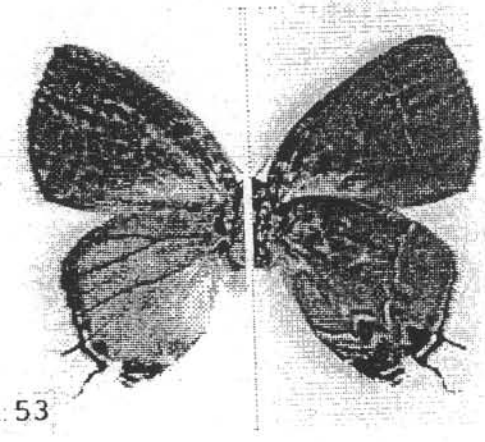

53

Figures 54-59

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 54. *Fieldia yungas*, holotype male.

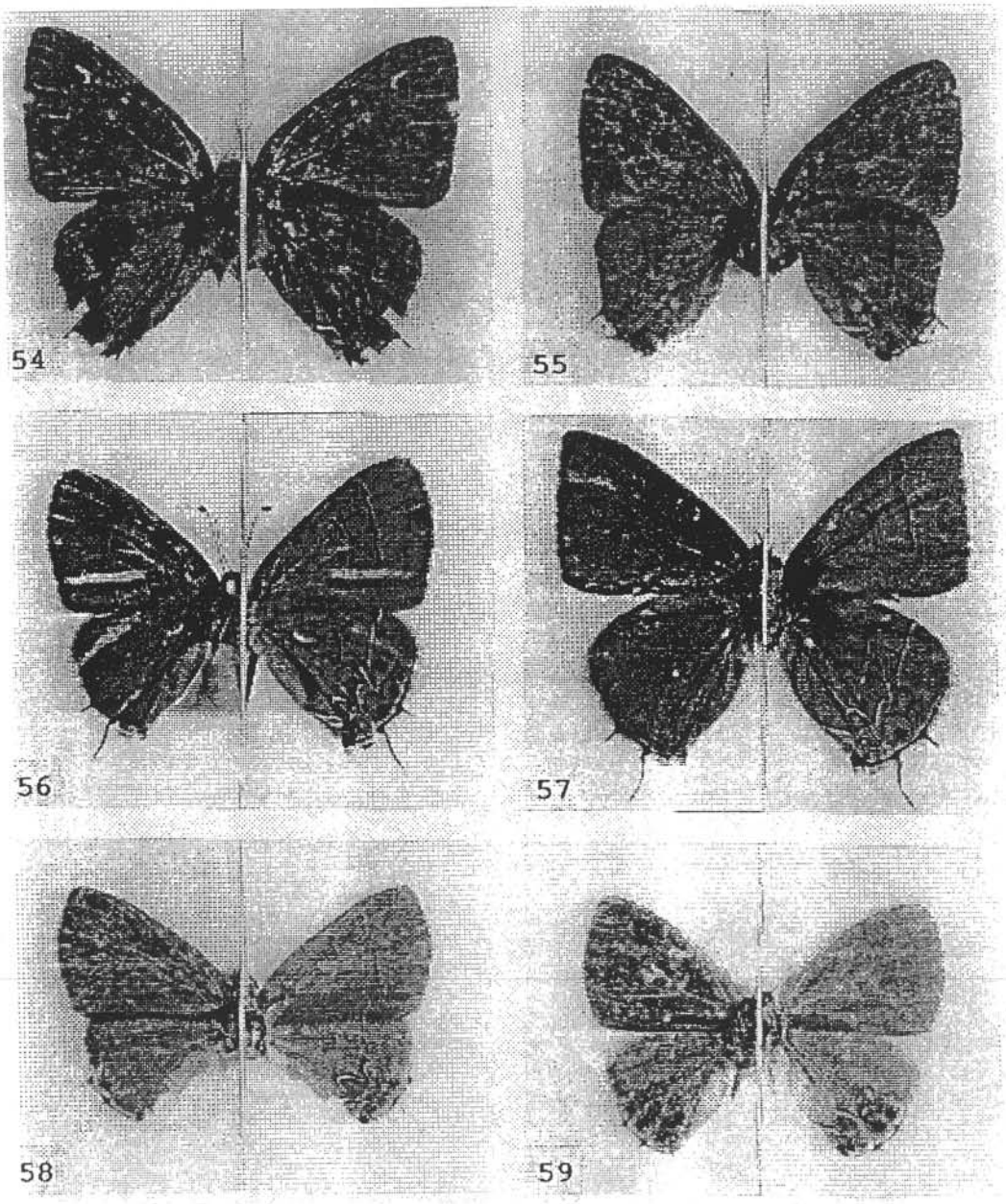
Fig. 55. *Fieldia yungas*, allotype female.

Fig. 56. *Tergissima mosconiensis*, holotype male.

Fig. 57. *Tergissima mosconiensis*, allotype female.

Fig. 58. *Femniterga notacastanea*, allotype male.

Fig. 59. *Femniterga aurea*, holotype female.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Figures 60-65

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 60. *Kroenleina panornata*, allotype male.

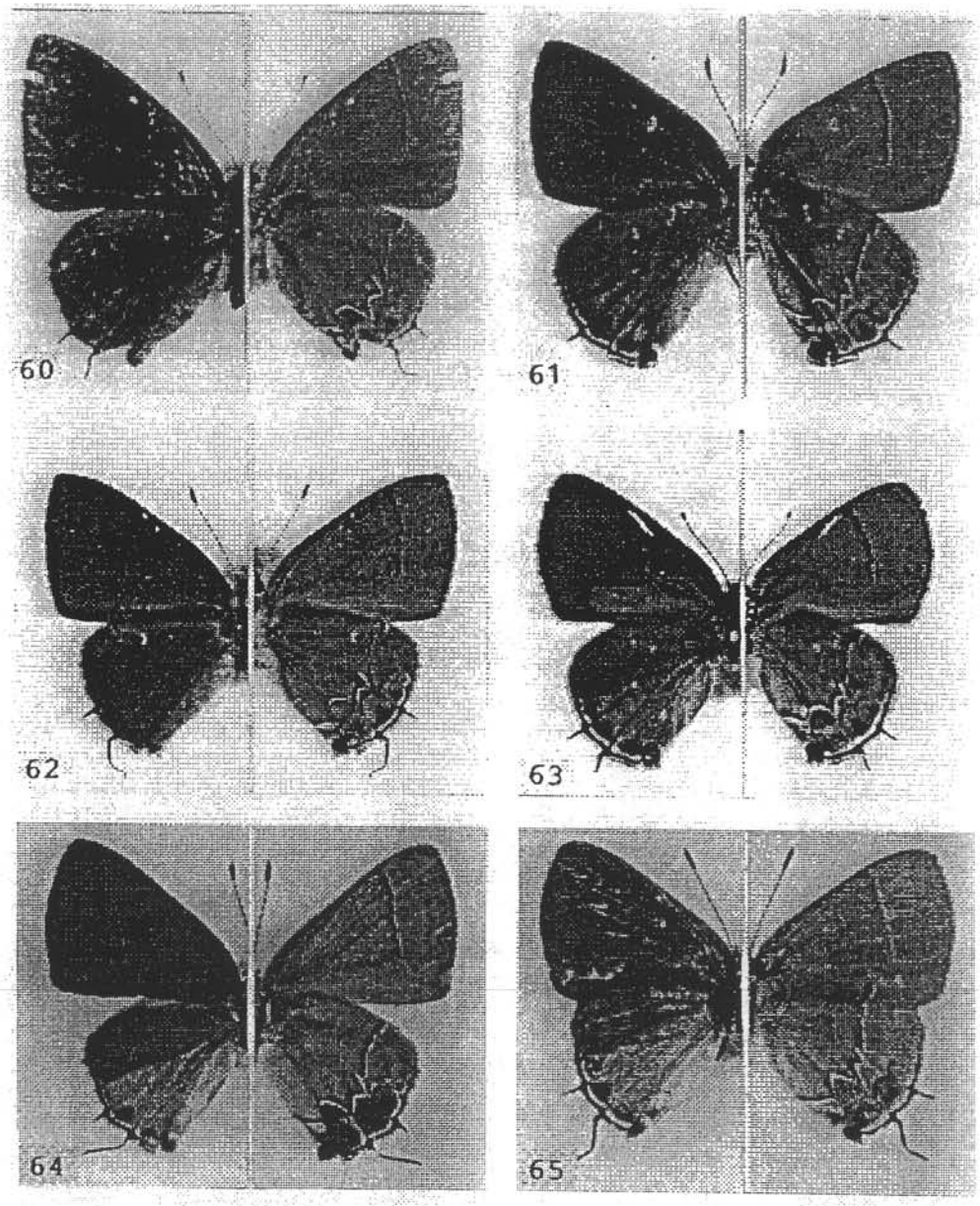
Fig. 61. *Kroenleina panornata*, holotype female.

Fig. 62. *Kroenleina escuintla*, allotype male.

Fig. 63. *Kroenleina escuintla*, holotype female.

Fig. 64. *Antrissima varicolor*, allotype male.

Fig. 65. *Antrissima varicolor*, holotype female.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Figures 66-71

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 66. *Antrissima misionensis*, allotype male.

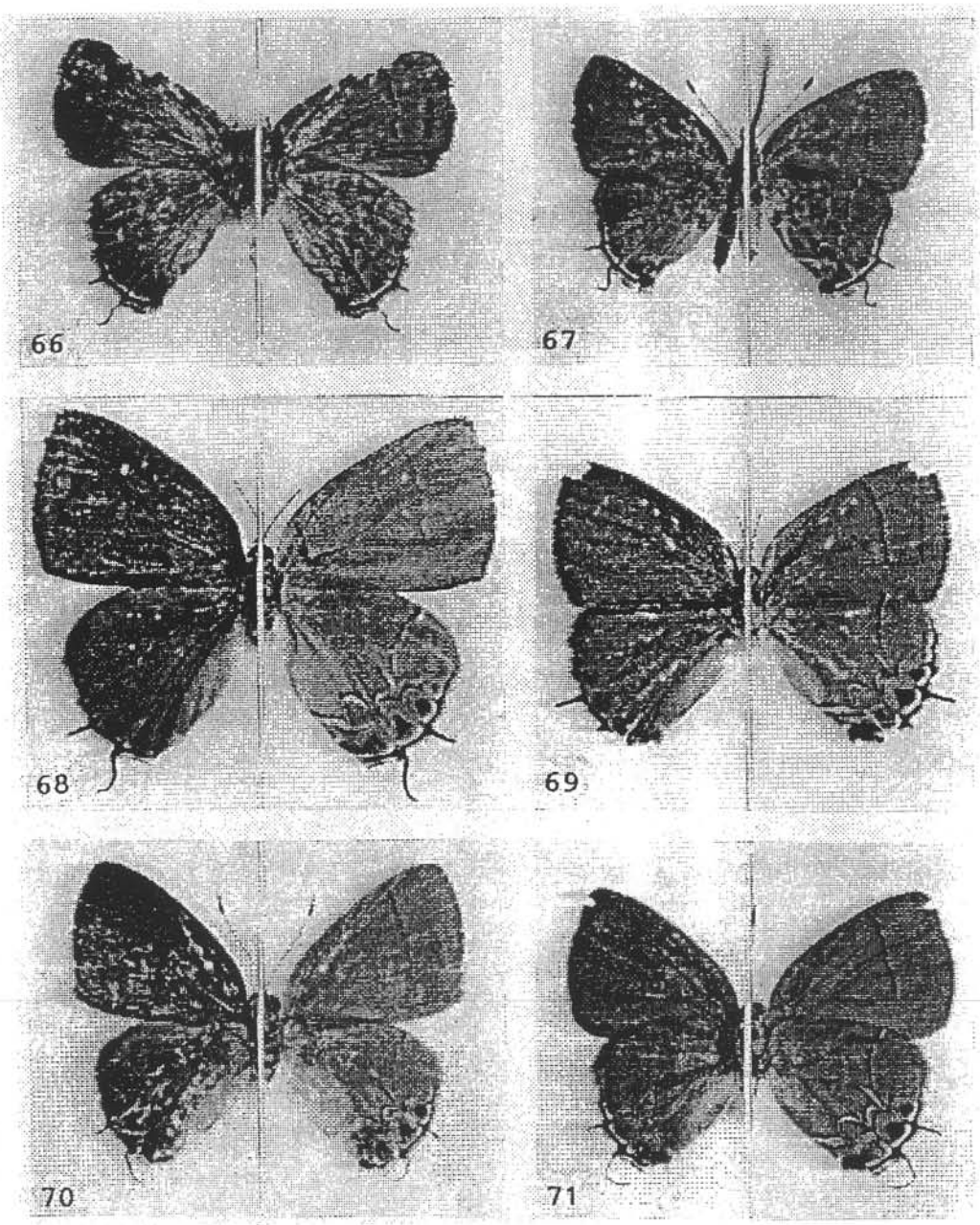
Fig. 67. *Antrissima misionensis*, holotype female.

Fig. 68. *Reversustus puppius* male (Carimang River, Guyana, AMNH).

Fig. 69. *Reversustus puppius*, female (Carimang River, Guyana, AMNH).

Fig. 70. *Reversustus assuensis*, holotype male.

Fig. 71. *Reversustus assuensis*, allotype female.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Figures 72-77

Adults of Selected Species of Genera of the Calycopis/Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 72. *Mercedes demonassa* male (Presidio, Mexico, AMNH).

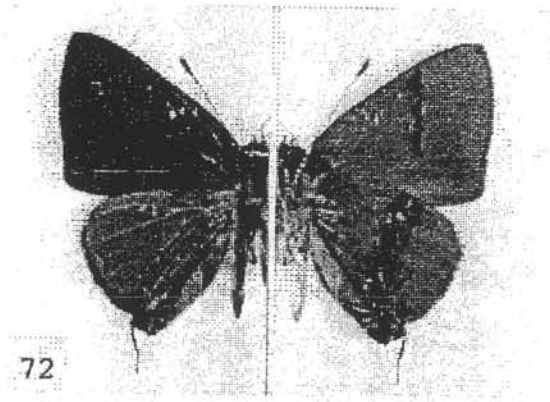
Fig. 73. *Mercedes demonassa*, female (Presidio, Mexico, AMNH).

Fig. 74. *Argentostriatus tamos* male (El Volcan, Chiriqui, Panama, AMNH).

Fig. 75. *Argentostriatus tamos*, female (El Volcan, Chiriqui, Panama, AMNH).

Fig. 76. *Iaspis diffusus*, holotype male.

Fig. 77. *Iaspis diffusus*, allotype female.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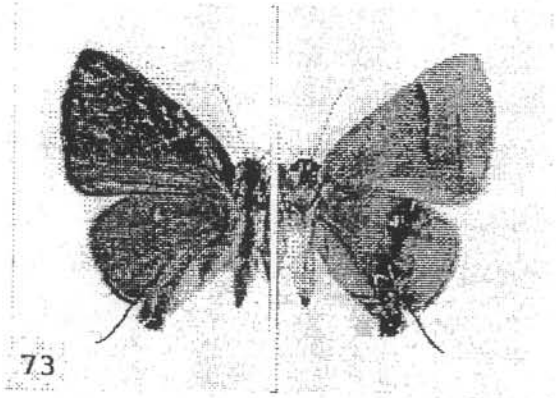
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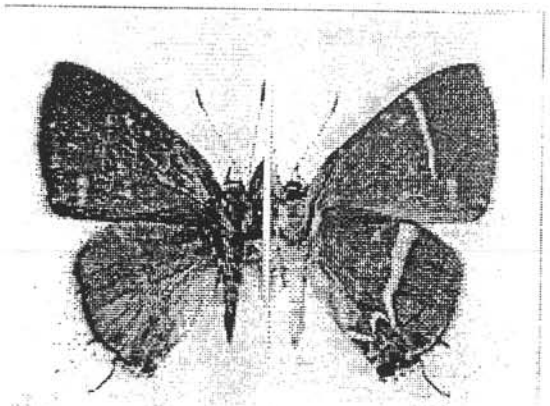
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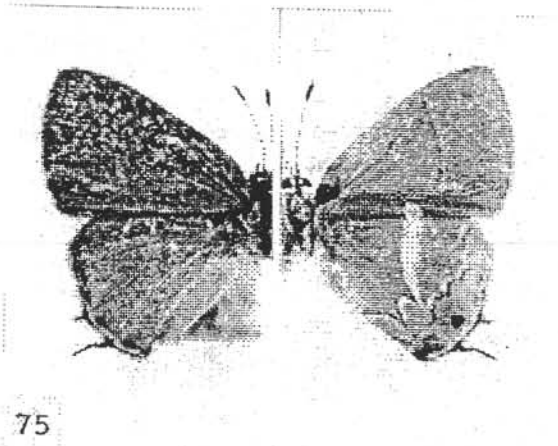
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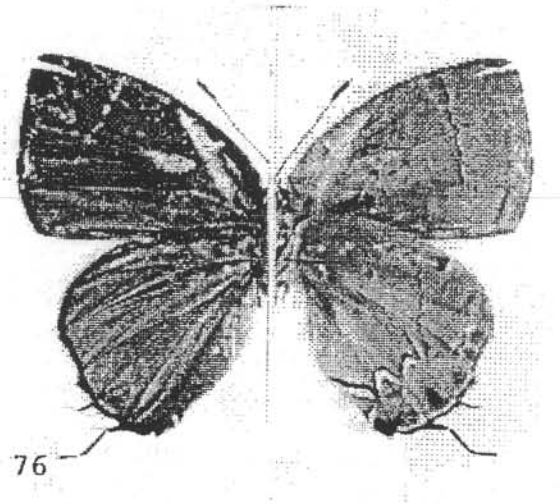
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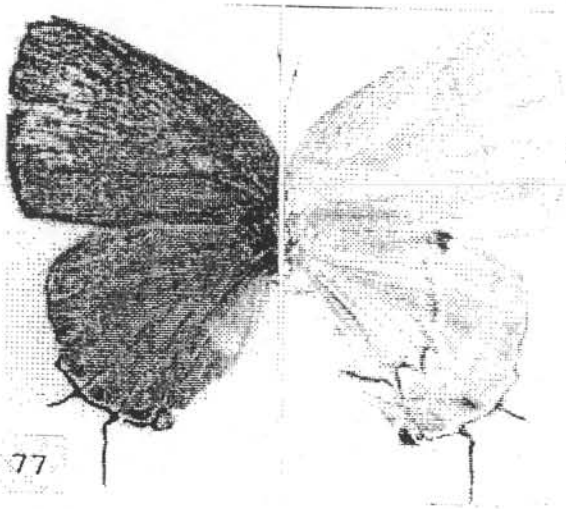

77

Figures 78-79

Adults of Selected Species of Genera of the Calycopis/ Calystryma Grade and Outgroups

Upper surface, left; Under surface, right

Fig. 78A. *Electrostrymon endymion* male (Pelotas, Brazil, AMNH).

Fig. 78B. *Electrostrymon endymion* female (Pelotas, Brazil, AMNH).

Fig. 79A. *Angulopis autoclea* male (Pichanal, Argentina, AMNH).

Fig. 79B. *Angulopis autoclea* male (Pichanal, Argentina, AMNH).

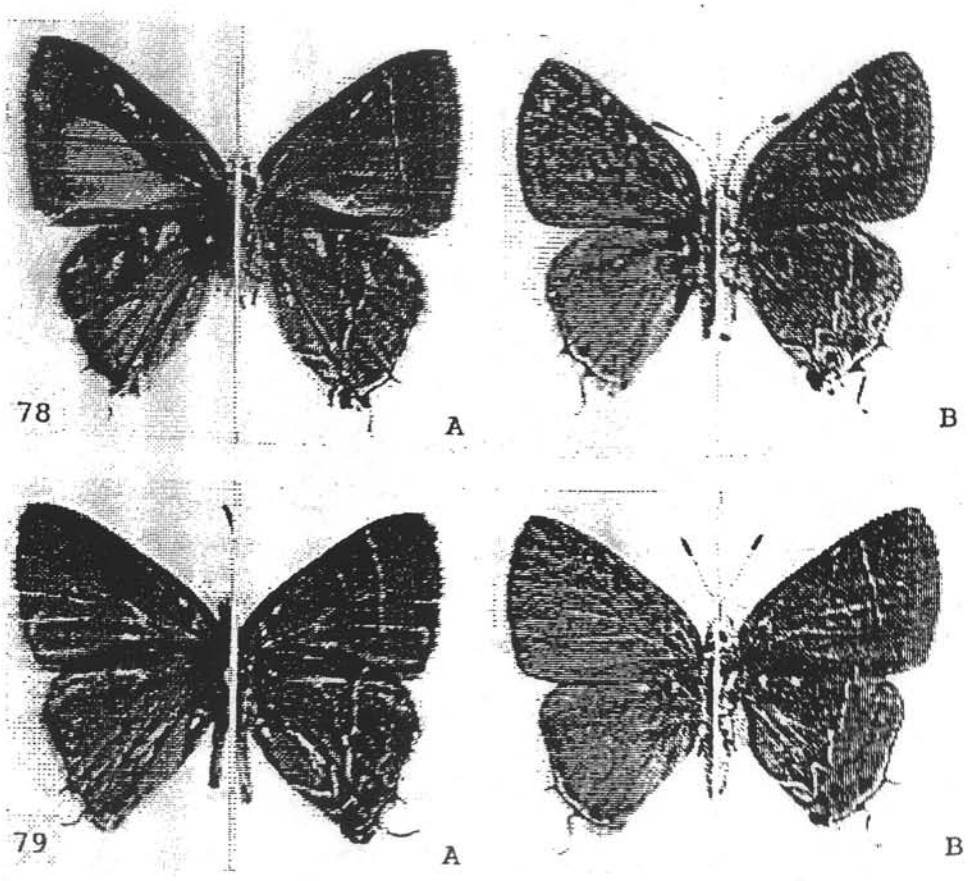

78
A
B
79
A
B

Figure 80

Schematic Structural Characters of Electrostrymon Grade

Major figure numbers are underscored. Location numerals (1-5 etc.) mark characters enumerated in Diagnosis sections of text. Where a character is listed more than once, accompanying letters (A,B yetc.) appear in the order of the text's listings (see FIGURES introduction).

A. *Electrostrymon*, type species *endymion*; left to right--male genitalia: lateral view & ventral view (aedeagus placed below); female genitalia: ventral view (left, type species; right, schematic extreme, as in some Antillean congeners).

B. *Angulopis*, type species *autoclea*; left to right--male genitalia: lateral view, ventral view (aedeagus placed below); female genitalia: ventral view (left, types species; right, schematic extreme of other congeners).

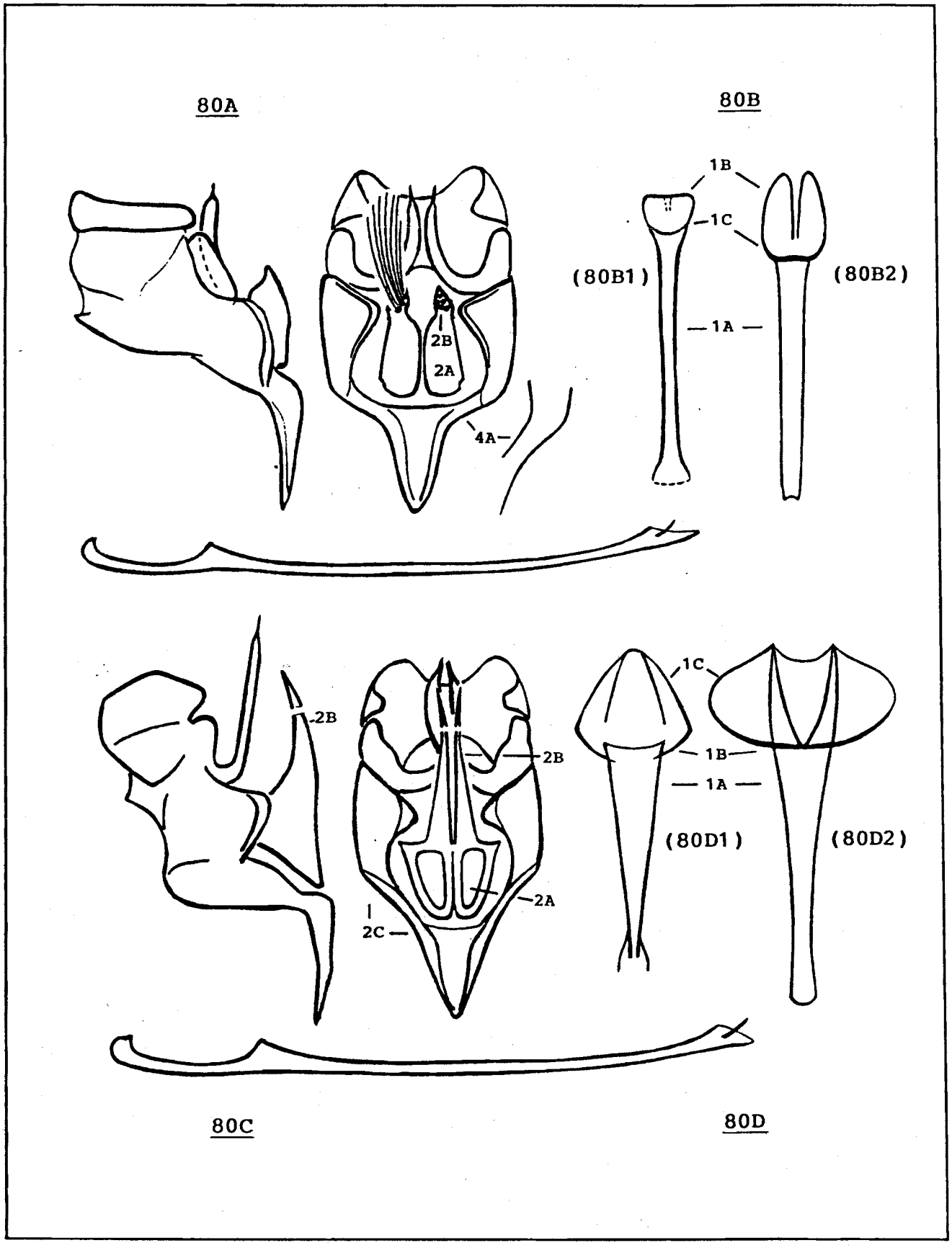

80A
80B
1B
1C
(80B1)
(80B2)
1A
2B
2A
4A
2B
2B
2A
2C
1C
1B
1A
(80D1)
(80D2)
80C
80D

Figure 81

Morphology of Additional Outgroups

Fig. 81. Morphology of *Uzzia*: line drawings, ventral view of male genitalia (aedeagus and valvae shown laterally along side) and female genitalia. A. *U. uzza*, type male. B. *U. splendor*, holotype male. C. *U. splendor*, allotype female. D. *U. cotera*, holotype female.

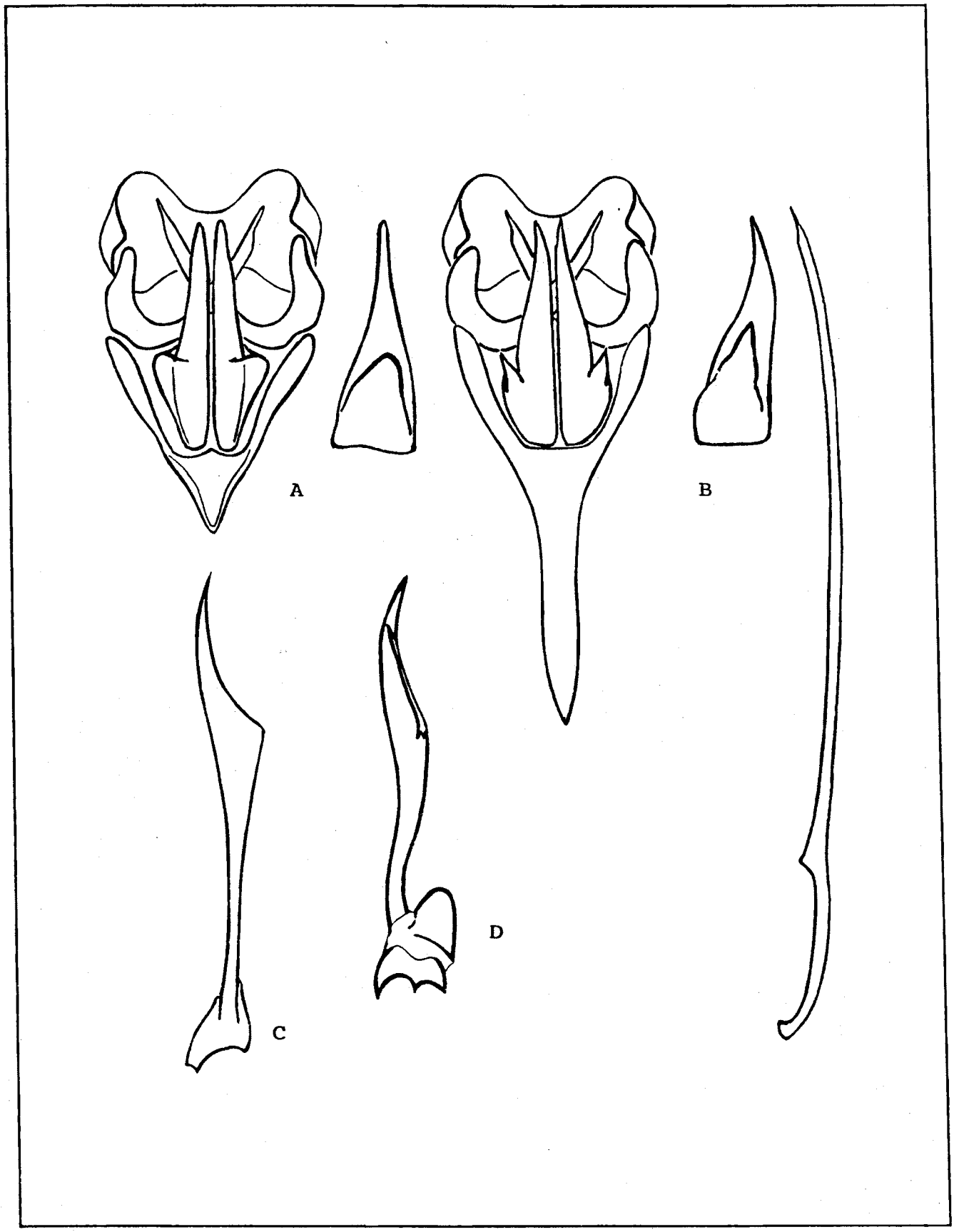

A
B
C
D

Figure 82

Morphology of Additional Outgroups

Fig. 82. Morphology of *Dicya* and *Celmia*: line drawings, ventral view of male genitalia and female genitalia. A. *Dicya dicaea*, type male. B. *D. dicaea*, female (Rio de Janeiro, Brazil MPM). C. *D. cyanoundulata*, holotype male. D. *D. cyanoundulata*, allotype female. E. *Celmia celmus*, male, (Presidio, Vera Cruz, Mexico AMNH). F. *C. celmus*, female, (same data AMNH). G. *C. stigmata*, holotype female. H. *C. stigmata*, allotype male.

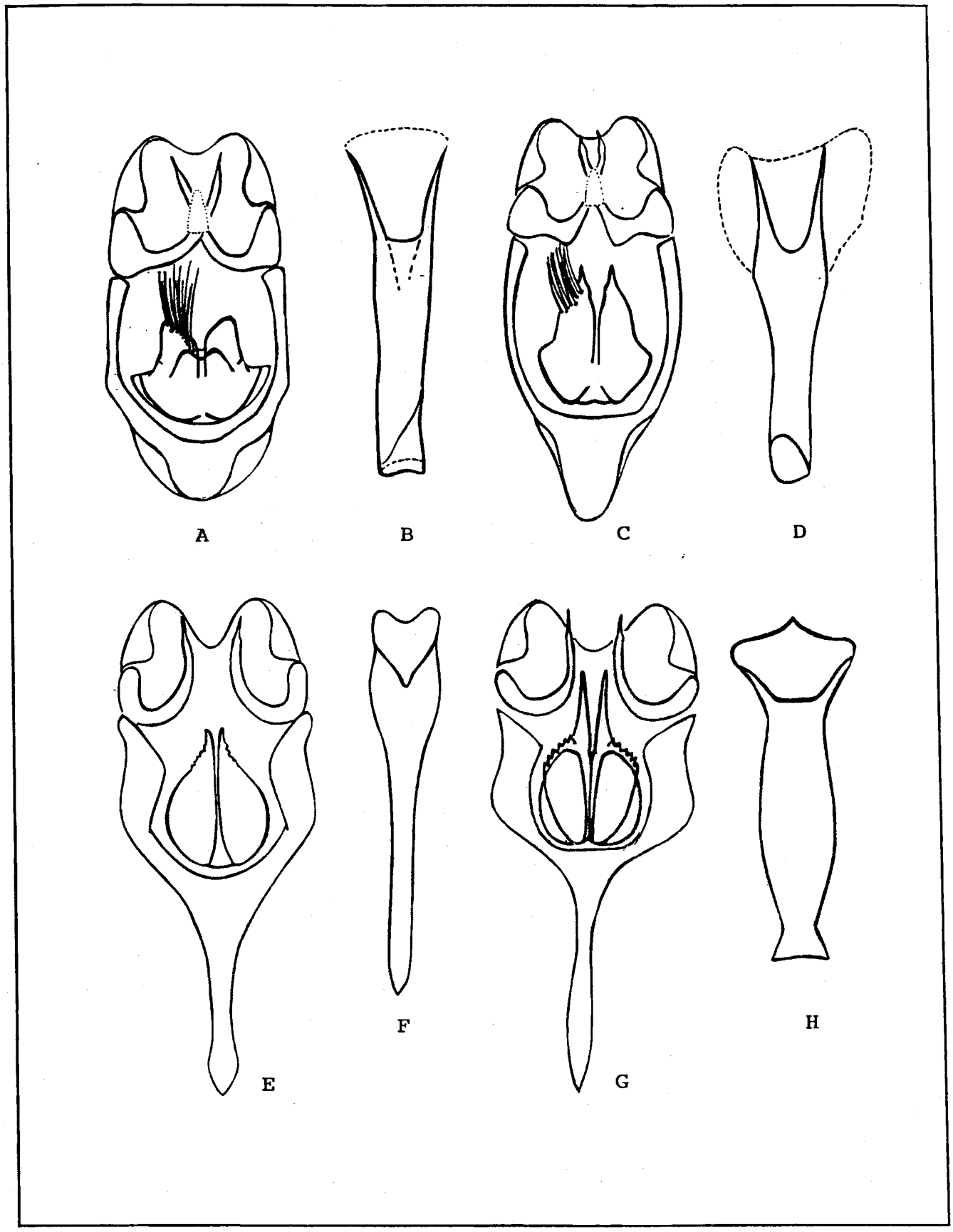

A
B
C
D
E
F
G
H

Figure 83

Morphology of Additional Outgroups

Fig. 83. Morphology of *Caerofethra*: line drawings, ventral view of male genitalia and female genitalia. A. *C. emendatus*, type male. B. *C. emendatus*, type female. C. *C. seudiga*, type male. D. *C. seudiga*, female (Bolivia, BMNH). E. *C. iambe*, type female. F. *C. carnica*, type male. G. *C. hesychia*, type male. H. *C. hesychia*, female (Costa Rica, BMNH).

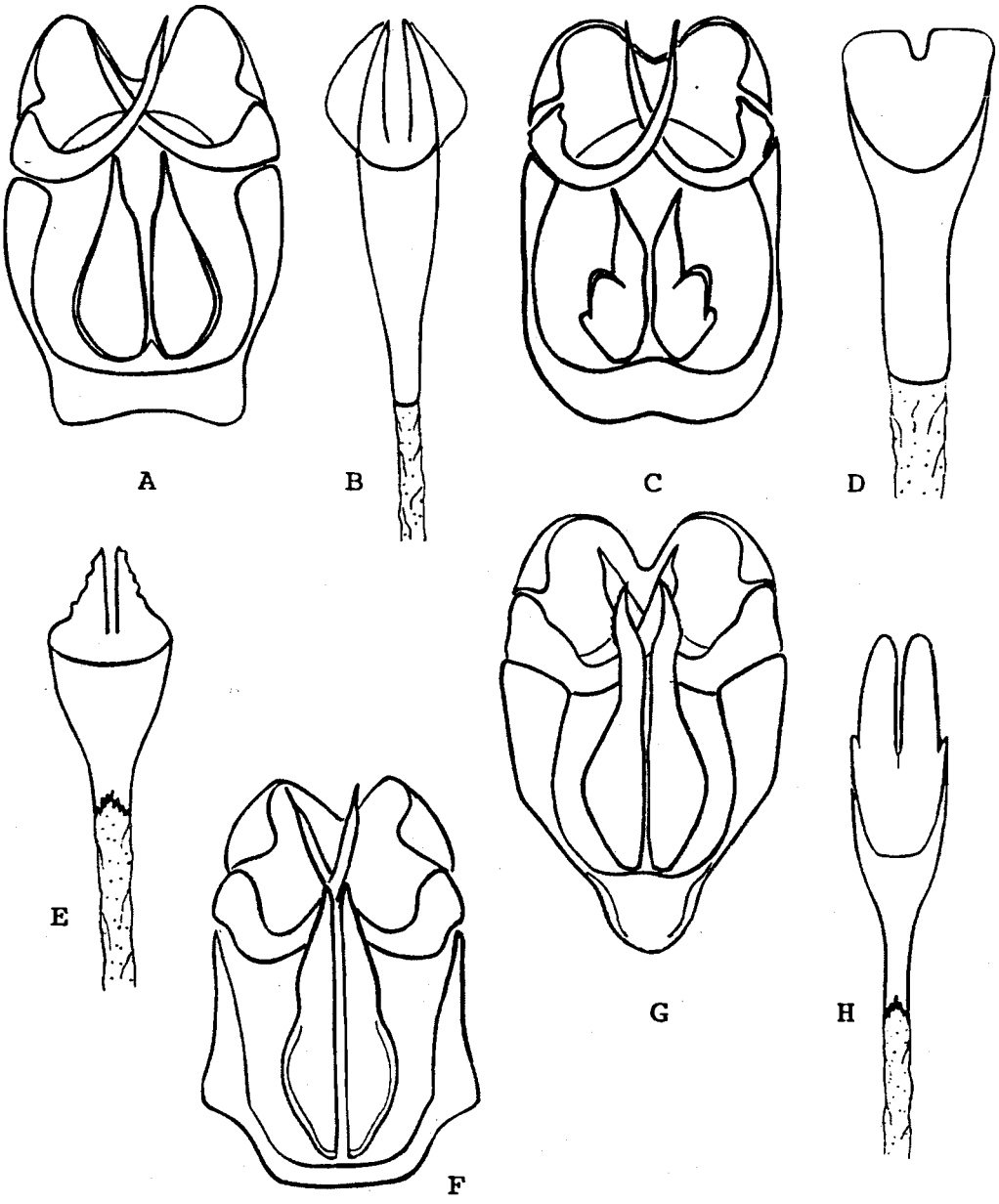

A
B
C
D
E
F
G
H

Figure 84

Morphology of Additional Outgroups

Fig. 84. Morphology of *Aubergina*: line drawings, ventral view of male genitalia (aedeagus removed and placed along side) and female genitalia. A. *A. alda*, type male. B. *A. alda*, type female. C. *C. paetus*, type male. D. *C. paetus*, type female. E. *C. hicetus*, type male.

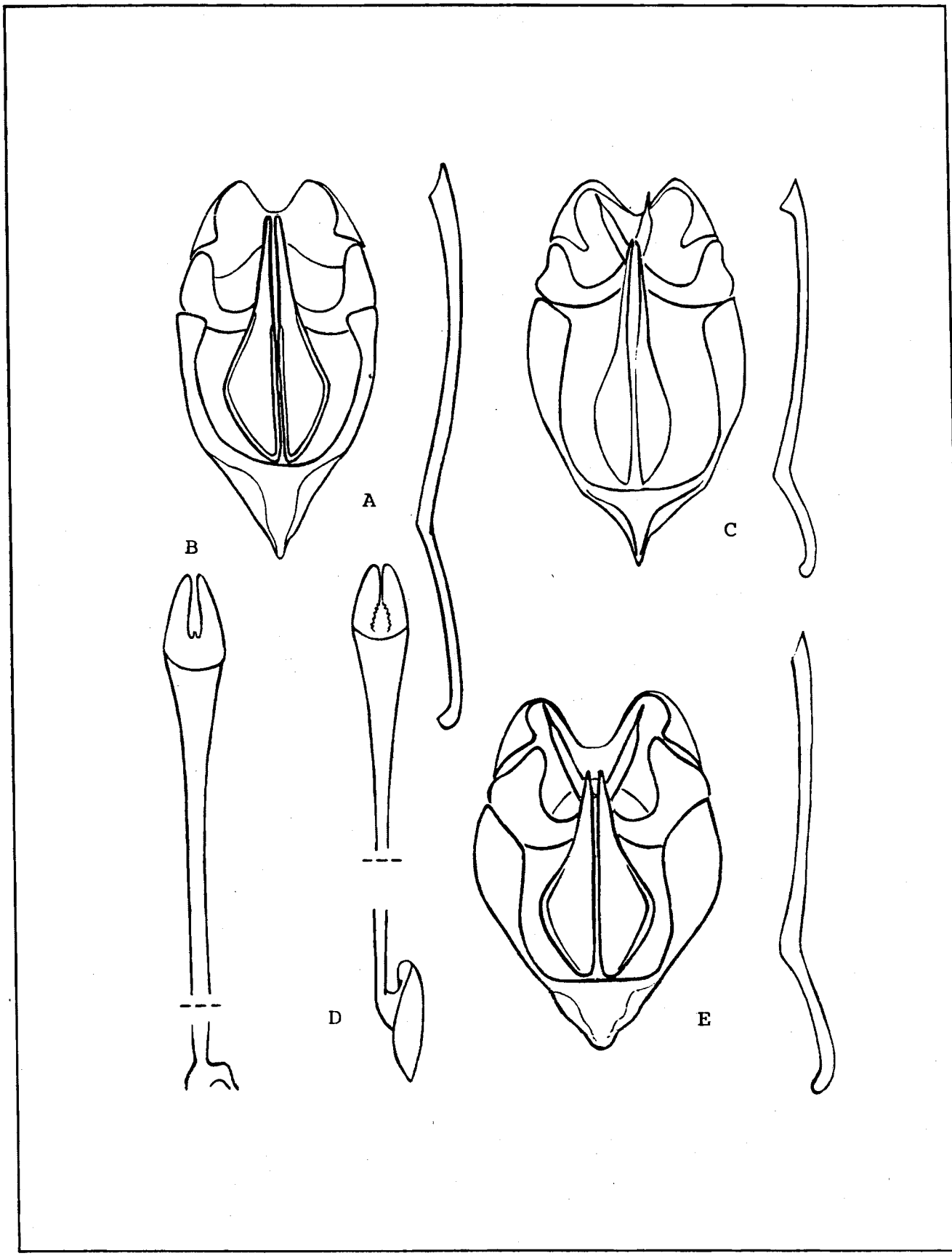

A
B
C
D
E

Figure 85

Morphology of Additional Outgroups

Fig. 85. Morphology of *Sipaea*: line drawings, ventral view of male genitalia (aedeagus and valvae shown laterally alongside) and female genitalia. A. *S. hyccara*, type male. B. *S. hyccara*, female ("Amazon", BMNH). C. *S. sepeina*, holotype female.

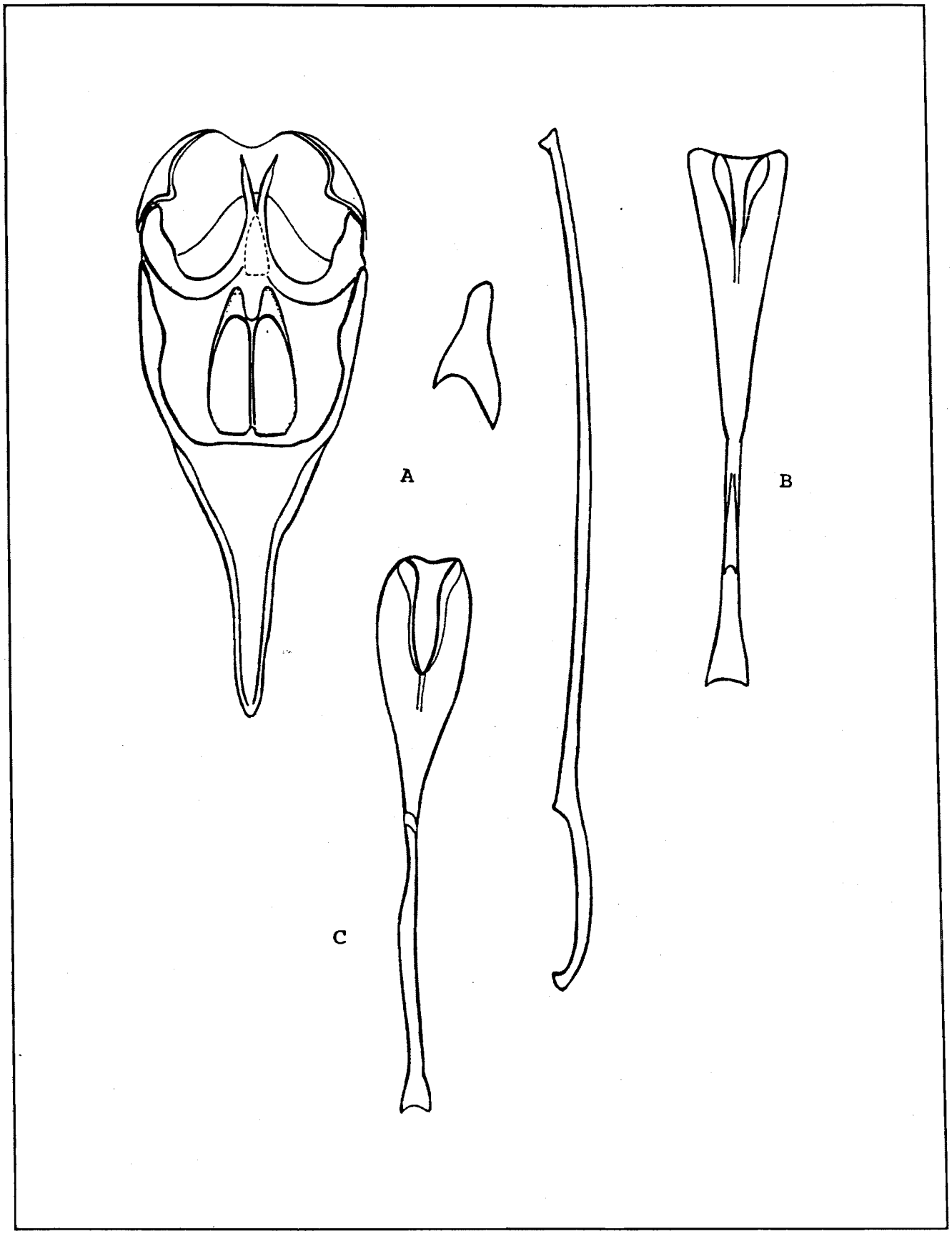

A
B
C

Figure 86

Adults of Additional Outgroups

Fig. 86. Upper surface (left) and under surface (right) of selected adults. A. *Uzzia splendor*, holotype male. B. *U. splendor*, allotype female. C. *U. cotera*, holotype female. D. *Dicya dicaea*, male (Rio de Janeiro, Brazil MPM). E. *D. cyanoundulata*, allotype male. F. *D. cyanoundulata*, holotype female. G. *Celmia celmus*, male of Fig. 82. H. *C. celmus*, female of Fig. 82. I. *C. stigmata*, allotype male. J. *C. stigmata*, holotype female. K. *C. carnica*, male ("Amazon", HEC). L. *Caerofethra emendatus*, male (Bolivia, BMNH).

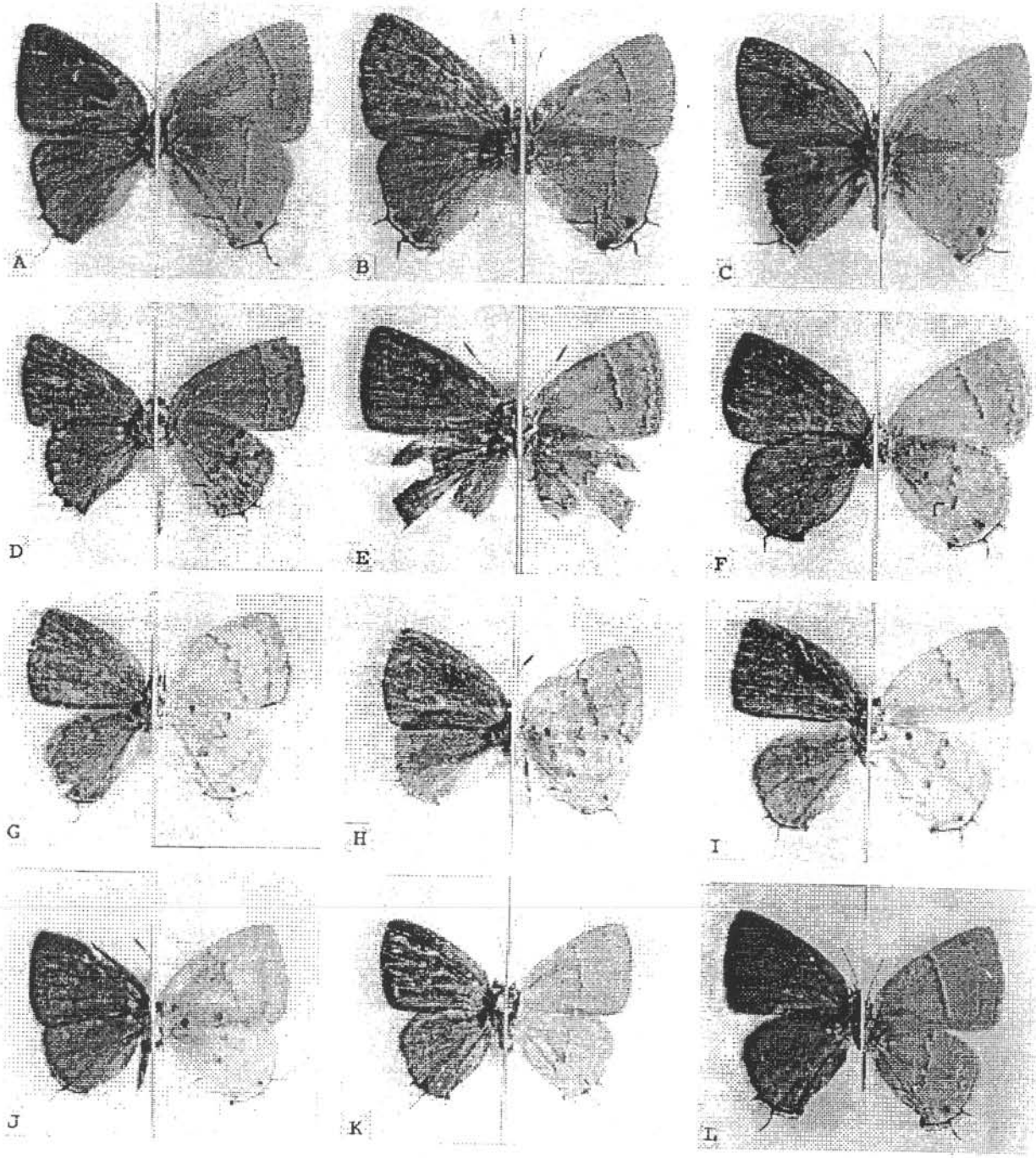

A
B
C
D
E
F
G
H
I
J
K
L

Figure 86, continued

Adults of Additional Outgroups

Fig. 86, continued. M. *C. emendatus*, female (Bolivia, BMNH). N. *Auburgina hicetus*, (Cordova, Mexico, AMNH). O. *A. alda*, male (Para, Brazil AMNH). P. *A. alda* female (Para, Brazil AMNH). R. *C. asa*, male (Para, Brazil, AMNH). S. *C. asa*, female (Para, Brazil, AMNH). T. *Sipaea hyccara* male (Para, Brazil, AMNH). U. *S. sepeina*, holotype female.

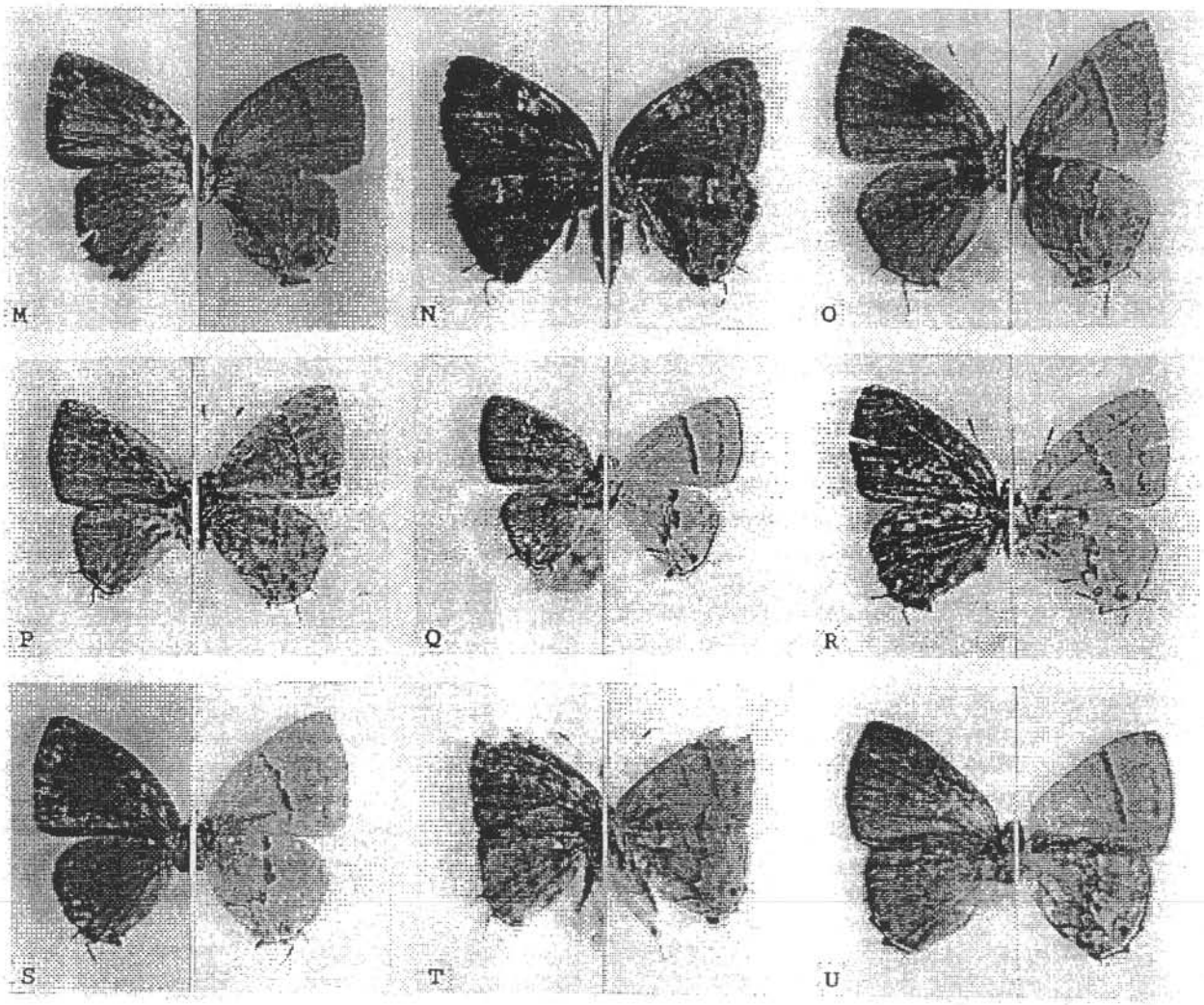

M
N
O
P
Q
R
S
T
U

Figure 87

Notes on Apparent Sister Group Relations

Cladistic analysis of the Eumaeini is hampered by sample error because of the numerous undescribed species and assemblages. Taxa included in this study were examined because they (1) were either grouped as a grade by earlier workers based on superficial wing pattern similarities, or (2) exhibited certain wing pattern characters resembling taxa previously grouped with this grade. Accordingly, the study group had some initial heterogeneity.

Cladistic relations are best inferred from the parsimonious distributions of shared derived characters. The purpose of this paper has been to describe monophyletic elements (genera) which can eventually be part of such an analysis. I have defined genera around a number of shared characters scoreable in a matrix with little contradiction and without requiring *a priori* choices (weightings) based on one or two characters. Accordingly, when characters of a large or widespread group of species-level taxa required "opening up" a new set of shared characters in the matrix, this group was a likely candidate for generic status. This procedure made it less probable that a potential lineage would be omitted or that a sister group would not be locatable. Certain sister group relations are apparent in the data as now recorded. Figure 87, is therefore, not a cladogram or tree but an illustration noting (1) apparent terminal sister groups and (2) index numbers for comments below. Since taxa are not in themselves primitive or derived [only characters], in notes below I use the term "apotypic" for taxa with numerous derived characters and "plesiotypic" for taxa with numerous primitive characters. Elements in Fig. 87 can be rooted once the Electrostrymon grade is fully elucidated.

(1) *Calystryma* and *Cyanodivida* are apparent sister groups, generally similar in their somewhat elaborated *sipc* (see 2, below), genital labides and valval ventrum in males and innovations of the genital plates in females. *Cyanodivida* has some unique characters, including the female *sipc* and its extreme sexual dimorphism. Germane to the generic distinction of *Cyanodivida* are three distinctive subgroups within *Calystryma*, each which score well as *Calystryma* but do not share the apparent autapomorphies of *Cyanodivida*.

(2) Members of (1), above, and *Klaufera* and *Serratoterga* probably are a clade. They share the somewhat elaborated male *sipc*, slightly bulbous falces termini, typical Calystryma wing pattern and, except for the innovations noted below in *Klaufera* and *Serratoterga*, similar lateral vincular shape.

(3) *Klaufera* and *Serratoterga* are apparent sister groups. In males they share robust lateral vincular shape, and somewhat centrally-produced labides; in females they share prominently bilobate genital plates with diminutive terminal prongs. The enlarged orbicular VHW spot in the SC + R1 cell of *Klaufera* appears autapomorphic. *Serratoterga* exhibits apparent autapomorphy in (i) the female *sipc* and its sclerotized juncture to the genital plates and (ii) the expanded lateral lobe of the male *sipc*.

(4) All taxa included in notes (1)-(6) form an apparent clade, traditionally recognized as "*Calycopis*" and "*Calystryma*". These taxa share the generally triangular ventral vincular shape in males and a genital plate configuration in females dominated by ventral scutes and moderate innovation of prongs on the superior plate.

(5) *Morphissima* and *Calycopis* are apparent sister groups. Some taxa of *Morphissima* have formerly been included in *Calycopis*. These genera share a dorsally produced labides, reduced (often generally triangular) valvae and a simple *sipc* in males. However, the genera differ significantly in innovation of the female superior plate and prominence of structural wing color. The latter probably accounts for the number of species in *Morphissima* not previously associated with *Calycopis* or any other genus aside from "*Thecla*".

(6) The probable monophyly of *Calycopis* and *Morphissima* with other taxa listed above was noted in entry 4.

(7) Characters of Clade I were reviewed in the text. Clade I apparently includes all taxa of Fig. 87 from *Calystryma* (1) through *Fieldia* (13) and differs from Clade II in major configural features of the male genitalia (ventral and lateral) and *sipc*. Some derived characters, like the female *sipc*, innovation of the female genital plates and additional VFW,VHW wing pattern elements appear to have evolved independently in each of the Clades I and II. The second major monophyletic assemblage in Clade I appears to be taxa treated below in entries (10)-(13).

(8) Though clearly a part of Clade I, *Serratofalca* has a number of characters which appear relatively

primitive (male vinculum, female genital plates) along with some which are unique (spiral ductus in females of undescribed species, male *sipc* shape, serrate falces and large caecum size). This variety of characters, distinctive in general wing pattern appearance and widespread distribution, suggest the assemblage is quite old. Future cladistic analysis may indicate *Serratofalca* is more closely related to the taxa listed in entries (1)-(6) than those below.

(9) Taxa listed in entries (8)-(13) apparently compose the second major monophyletic group in Clade I (characters that are generally shared by the four genera of the entries (10)-(12) are summarized thereunder). All these taxa share a parabolicly shaped vincular configuration in males. As noted above, although *Serratofalca* is similar to the others in vincular shape, additional characters may eventually place it closer to taxa of entries (1)-(6).

(10) Though very different in the kinds of highly modified morphological features exhibited, taxa of *Furcovalva* and *Terminospinissima* both exhibit extreme innovations of various terminal genital components--valval caudal extensions and falces termini in males and terminal plate prongs in females. The genera are probably highly apotypic sister groups. Accordingly, many taxa of *Terminospinissma* show additional and lavish VFW,VHW wing pattern elements.

(11) This cluster of taxa (entries 10,12) exhibit numerous highly derived features. In males, taxa show numerous innovations of the labides, falces, valvae and *sipc*; females show various innovations of the genital plates and, in some cases, an elaborate *sipc*.

(12) *Distissima* and *Gigantofalca* are apparently highly apotypic sister taxa with the latter the most apotypic of all Clade I members. Taxa of both groups share a common sexual dimorphic pattern and large size, along with innovations of the *sipc* in both sexes, genital plates in females and labides, falces, and valvae in males.

(13) *Fieldia* is of uncertain placement. Its simple female genitalia (remininscent of diverse taxa like *Tergissima*, *Electrostrymon* and [in some other ways] *Aubergina*) may be primitive. It is difficult to speculate at present about the polarity of certain peculiar features in the male genitalia of *Fieldia*.

(14) *Reversustus* clearly has the bell-shaped vincular shape of Clade II but uniquely shows a prominent saccus and ventrally declined valval termini. These latter are probably apomorphic. The genus may represent a lineage of Clade II long isolated from the others.

(15) Taxa in entries (14)-(20) share the unique bell-shaped ventral configuration and declined cephalic vincular shape in the male genitalia. Only one of the members (*Reversustus*, 14) exhibits a prominent saccus. The relative polarity of the bell-shaped, ventrally declined male genitalia will be important to clarify in future cladistic studies. Currently, it appears Clade I (1-13) and Clade II (14-20) are sister groups of a large monophyletic assemblage.

(16) *Femniterga* is highly apotypic with elaborate female *sipc* and highly modified female genital plates. There are also additional VHW,VHW wing pattern elements and complex patterns in the DFW,DHW structural color.

(17) *Femniterga*, *Antrissima* and *Kroenleina* form an apparent clade based on their shared innovative structural features. These contrast probable plesiotypy in *Tergissima* and peculiar features already noted in *Reversustus* (14). As summarized under entry 16, *Femniterga* is the most apotypic of the triad with *Antrissima* and *Kroenleina* sharing several general structural features, particularly in the female.

(18) *Antrissima* and *Kroenleina* show a generally similar female genital ground plan. However, the genera are distinctive in apparent apomorphic features of the VHW wing pattern and characters of the male genitalia and *sipc*.

(19) Taxa in entries (16)-(20) all share the characters common to Clade II (see entry 15) but not the peculiar characters apparently autapomorphic in *Reversutus*.

(20) Like *Reversustus*, *Tergissima* taxa exhibit characters suggesting it is a basal stem in Clade II. The female genitalia appear primitive (somewhat resembling *Fieldia*, *Electrostrymon* or, very generally, *Mercedes*) and there is no female *sipc*. However, some male features appear highly derived, particular the *sipc*.

(21) *Mercedes* and *Argentostriatus* are apparent sister groups (see below, 22) but each has some very distinctive autapomorphies-- the bright silver-white VFW,VHW band and sculptured male valvae and female lamellae in *Argentostriatus* and the corrugated female ductus and sculptured valvae and aedeagus in *Mercedes*.

(22) Along with the W-element occurring distinctly in anal cells CuA1-2A of the VHW, *Mercedes* and *Argentostriatus* share a distinctive lateral vincular configuration and simple *sipc* in males; in females there is no *sipc* and the genital ground plan is simple, somewhat resembling that in *Tergissima*, *Fieldia* and *Electrostrymon*. The overall placement of these two genera in the Eumaeini requires further study.

(23) *Iaspis* is distinctive, its reduced valvae and broad lateral vincular shape in males resembling *Mercedes* and *Argentostriatus* but its female genitalia more suggestive of characters in the Electrostrymon

grade. This, along with distinctive wing pattern and presence of forewing androconia, suggests *Iaspis* has long been a distinctive lineage. Its placement in the Eumaeini requires further study.

(24) *Electrostrymon* requires further elucidation, although description of species rich *Angulopis* (see entries 25-26) accomplishes much in distinquishing two major assemblages in this ill-studied group.

(25) *Electrostrymon* and *Angulopis* are apparent sister groups and probably the largest assemblages in a grade that still requires further elaboration of numerous undescribed entities. The shared and distinctive characters of these two genera have been summarized under Outgroups.

(26) *Angulopis* is asterisked because, if its general description is considered as a "grade", there are undoubtedly further, apotypic, assemblages within it requiring elucidation as genera. The situation parallels that of "Calycopis" and "Calystryma" prior to the present study--there are numerous undescribed species. When subgroups are further clarified, *Angulopis* will apply to the clade sharing the suite of characters typifying its type species.

(27) The line signifies a probable "break" in the homogeneity of taxa included in the Figure. Taxa enumerated from (28)-(34) were included because (i) study of type material had been completed and the groups characterized in recent cladistic analyses (Johnson and Matusik, 1988; Johnson, in press) but without a formal nomenclature; (ii) some wing and structural characters of these additional small Eumaeini were possibly confusing with taxa of the Calycopis/ Calystryma and Electrostrymon grades.

(28) *Aubergina* and *Caerofethra* are probably sister groups. Genitalia of the latter differ in apparent autapomorphies including occurrence of a wholely membranous condition in the ductus bursae in females (see similar innovation in *Chlorostrymon* in Johnson 1989c) and limited expanse of the saccus and other cephalic elements of the vinculum in males.

(29) Probable cladistic relations in taxa (28)-(36) have been elucidated in Johnson and Matusik (1988) and Johnson (in press) [hereafter, "Johnson et al., op. cits."].

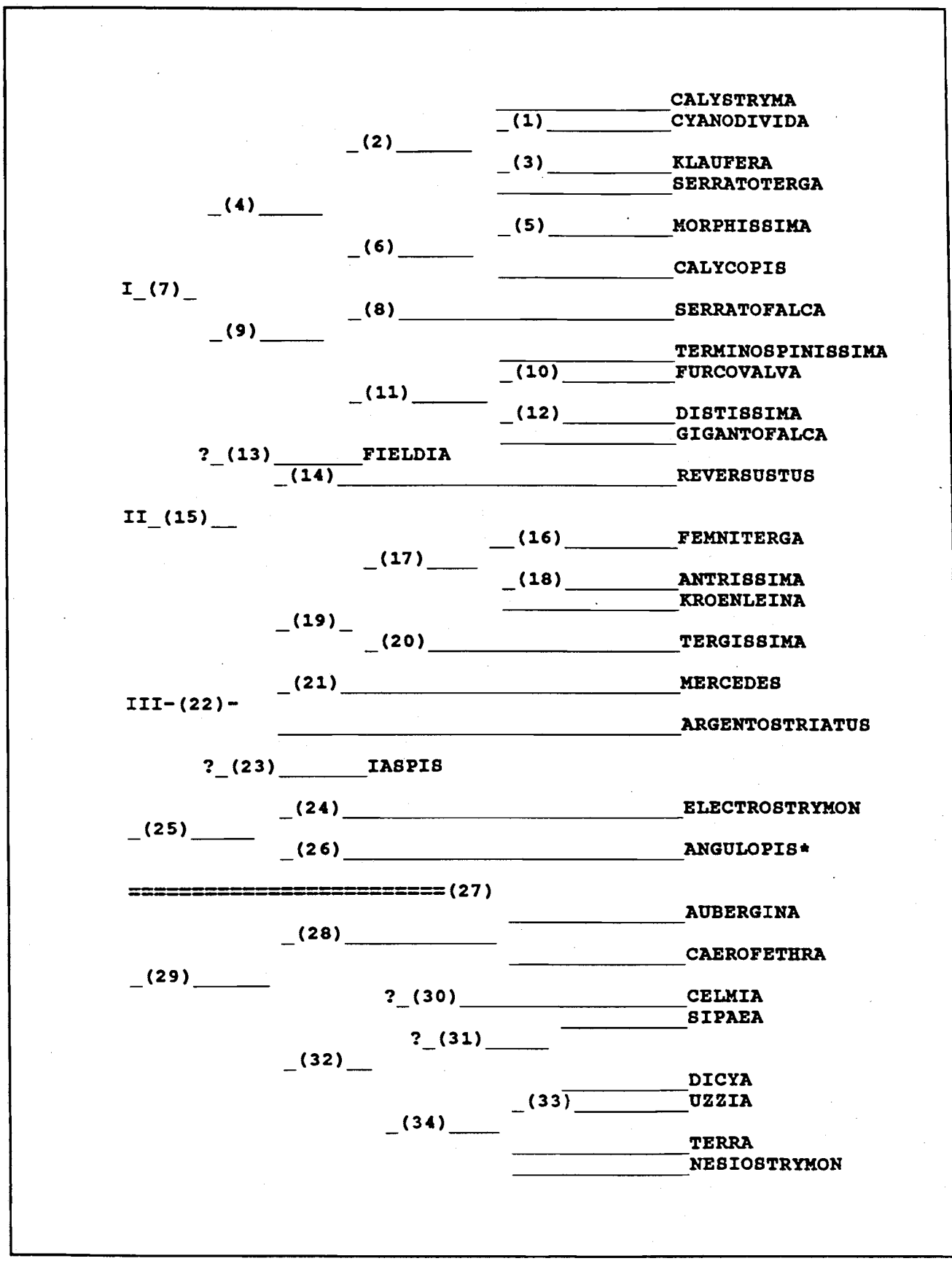
(30) Full elucidation of many undescribed entities in this group will help clarify its cladistic position. As noted in Johnson et al., op. cits., cladistic results varied with use of an outgroup or Lundberg rooting in the PAUP numerical cladistic program.

(31) *Sipaea* and *Dicya* are poorly known but exhibit characters which are likely primitive precursors of those observed in the more well-known *Terra* and *Nesiostrymon* groups. Further elucidation of species limits in *Sipaea* and *Dicya* should clarify their cladistic position relative to *Celmia* and *Uzzia*. Since the latter were indicated as the most probable sister groups of *Terra/Nesiostrymon* (see entry 33), it appears *Sipaea* and *Dicya* may be basal stems of this lineage displaying long term, quite independent, canalization of their structural characters.

(32) Compared to the taxa of *Aubergina* and *Caerofethra*, taxa in entries (30)-(35) are characterized by elaborately modified vincular and valval conditions in males and variously complex ground plans in the ductus bursae and terminal lamellae of females. These innovations have been shown to be apomorphic (Johnson et al., op. cits.) and, in the most apotypic cases, include an independently evolved *sipc* (*Nesiostrymon*).

(33) As noted in Johnson et al., op. cits., further elaboration of species limits in this genus should clarify its relation to other sister groups of *Terra* and *Nesiostrymon* which also show highly sculptured innovations in the sclerotized structures of both sexes. PAUP analysis in Johnson et al., op. cits., rooted by outgroup suggested *Uzzia* as the immediate sister group of *Terra/Nesiostrymon*.

(34) See PAUP analysis in Johnson et al., op. cits.


CALYSTRYMA
(1)
CYANODIVIDA
(2)
(3)
KLAUFERA
SERRATOTERGA
(4)
(5)
MORPHISSIMA
(6)
CALYCOPIS
I (7)
(8)
SERRATOFALCA
(9)
TERMINOSPINISSIMA
(10)
FURCOVALVA
(11)
(12)
DISTISSIMA
GIGANTOFALCA
?(13)
FIELDIA
(14)
REVERSUSTUS
II (15)
(16)
FEMNITERGA
(17)
(18)
ANTRISSIMA
KROENLEINA
(19)
(20)
TERGISSIMA
(21)
MERCEDES
III-(22)-
ARGENTOSTRIATUS
?(23)
IASPIS
(24)
ELECTROSTRYMON
(25)
(26)
ANGULOPIS*
==========(27)
AUBERGINA
(28)
CAEROFETHRA
(29)
?(30)
CELMIA
SIPAEA
?(31)
(32)
DICYA
(33)
UZZIA
(34)
TERRA
NESIOSTRYMON

ERRATA

Page 8. Male morphology key-- entry 11 is missing. It would include a. *Terminospinissima* (falces terminus strongly bifurcate), b. *Serratofalca* (falces terminus serrate along inner margin).

Page 11. Under REMARKS, it is clearer if the first paragraph is read with its last word being "*Calycopis*" instead of "this genus".

Page 45. Under *Uzzia splendor*, in the Types section, the type locality data was ommited. It is "Morro d' Martha, Rio de Janeiro", Brazil, consistent with comments in Johnson 1989b, 1990.

Pages 76,77 (Fig. 17). Fig. 17A is the holotype male of *F. boliviensis* as stated in the text. *F. splendida* was figured in Johnson 1989a.