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A REVISIONARY STUDY OF THE NEOTROPICAL HAIRSTREAK BUTTERFLY GENUS *NOREENA* AND ITS NEW SISTER GENUS *CONTRAFACIA* (LEPIDOPTERA: LYCAENIDAE)

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Abstract.—Formerly monotypic *Noreena* Johnson, MacPherson & Ingraham (Theclinae, Eumaeini) is revised to comprise a monophyletic group of nine species distributed from east-central Mexico to northwestern Argentina. Four new species are described, *N. guianivaga* (Guyana Shield), *N. luxuriosa* (Marañon area of endemism, Ecuador), *N. pritzkeri* and *N. galactica* (Rio de Janeiro area of endemism, Brazil), and four species are transferred from *Thecla, T. cambes* Godman and Salvin, *T. comana* Hewitson, *T. molena* Jones and *T. lemona* Hewitson. Lectotypes are designated for *T. lemona* and *T. molena.* From ten eumaeine outgroups studied by numerical cladistic analysis (PAUP, Swofford), the sister genus *Contrafacia* is described, including four new species, *C. rindgei* (Sonora, Mexico), *C. mexicana* (montane central Mexico), *C. australis* (Paraguay/eastern Bolivia), and *C. minutaea* (Rio de Janeiro area of endemism, Brazil). The "*orcynia*" and "*orios*" species complexes of thecline grade genus *Thecla* are indicated as the sister group of *Noreena/Contrafacia* and their species composition further defined.

Recently, two colleagues and I described a monotypic genus *Noreena* (Theclinae; Eumaeini) from upland xeric woodland habitats in northwestern Argentina (Johnson, MacPherson, and Ingraham, 1986). This taxon exhibited unusual characters for the tribe. Particularly, the female genitalia were laterally arched and the ductus seminalis disjunct from its usual point of attachment at the distal end of the ductus bursae. Such divergence was clearly suggestive of cladistic significance. However, at the time neither we nor reviewers knowledgeable of the Eumaeini could propose any congeners for the type species of *Noreena, N. maria.*

Subsequently, I initiated a search for *Noreena* congeners amongst unidentified eumaeine samples and the nearly 750 eumaeine species presently placed in broadly polyphyletic "genus" *Thecla* (Bridges, 1988). The study included specimens from the Allyn Museum of Entomology (AME), American Museum of Natural History (AMNH), British Museum (Natural History) (BMNH), Carnegie Museum of Natural History (CMNH), Field Museum of Natural History (FMNH), Institute Miguel Lillo, Tucuman, Argentina (IML), Milwaukee Public Museum (MPM), and Museum National d'Histoire Naturelle, Paris, France (MNHN).

Four *Thecla* taxa were found to share the generic characters of *Noreena.* These species were poorly represented in collections and seldom referenced in the systematic literature: *T. cambes* Godman & Salvin, *T. comana* Hewitson, *T. lemona* Hewitson and *T. molena* Jones. They had been included by Draudt (1919) with *T. cupentus* Cramer and *T. lausus* Cramer in his *Thecla* "*cupentus* Group." Also, four undescribed species of *Noreena* (Guyana Shield, SW Ecuador, and SE Brazil) were discovered.

Species of *Noreena* are apparently seldom collected. The early faunal lists (Weeks, 1905; Köhler, 1923, 1928; Schweizer and Webster-Kay, 1941; Zikán and Zikán, 1968) do not include them and recent detailed faunal lists from Vera Cruz State, Mexico (Ross, 1975–1977; Llorente-Bousquets, Garceś Medina and Martinez, 1986) do not record *T. cambes,* though the species is prevalent in early collections. Recent western Argentine collectors R. Eisele and B. MacPherson have collected only six specimens of *N. maria* in thirty years of concerted sampling. Two southeastern Brazilian species are known only from small samples from the turn of the century and a third from specimens taken exclusively by one collector at one locality. The taxa are apparently extremely habitat restricted in disparate desert, chaparral/chaco, and primary tropical forest biomes. Xeric environs are often poorly sampled by lepidopterists; primary tropical forest appears largely destroyed in the areas where *Noreena* specimens were originally collected (K. S. Brown, Jr., pers. comm.).

To understand the *Noreena* assemblage among the Eumaeini, and explore the cladistic significance of its characters, numerical cladistic analysis (PAUP, Swofford, 1985) was used to study species of *Noreena* and representatives of ten eumaeine outgroups resembling *Noreena.*

PHYLOGENETIC ANALYSIS OF *NOREENA* AND EUMAEINE OUTGROUPS

Ten eumaeine groups were studied in relation to *Noreena* (Table [hereafter, "Tb."] 1). Three included taxa grouped by Draudt (1919) with *T. cambes* (Tb. 1F, G, H). Four included taxa listed by Johnson, MacPherson & Ingraham (1986) as morphologically similar to *N. maria* (Tb. 1B, C, D, J). Others were included which had wing patterns or bipartite male forewing androconia ("brands" *sensu* Eliot, 1973) similar to *N. maria* (Tb. 1E, I). Wing brand occurrence and similarity have been used by certain authors to group eumaeine taxa (Draudt, 1919; Clench, 1961; Field, 1967a, b). In addition, any apparently undescribed taxa resembling *Noreena* were also studied.

Taxa were defined by examination of type specimens and other material (if differences between common usage and types indicated additional diversity). Species criteria were derived from standard taxonomic procedures involving consistent differences in characters of the wing, genitalia and tergal morphology. Taxon/character matrices were prepared and parsimonious distributions of characters constructed using PAUP (Swofford, 1985). Various hypotheses of relationship were tested, rooting trees by different outgroups and by the Lundberg method (Swofford, 1985). From the ten eumaeine groups studied (Tb. 1A–J) a monophyletic study set (Tb. 1, *Noreena* + A–D) was delimited and its apomorphies (Tb. 2) delineated from the final rooted tree (Figs. 8, 9). This ingroup includes five terminal assemblages: *Noreena,* a new genus *Contrafacia* (described herein, including four previously undescribed species), a group of undescribed eumaeine taxa hereafter called "sister group X," and certain taxa of the "*orcynia*" and "*orios*" groups of Draudt (1919) (Tb. 1C, D).

Noreena is indicated as sharing nine synapomorphies with *Contrafacia* (Chs. 1, 2, 5, 8–12, 15). *Noreena* is distinguished by five autapomorphies (Chs. 19, 21, 22, 23, 25) and *Contrafacia* by three autapomorphies (Chs. 18, 20, 24). These include the outstanding modified eighth tergite in males (Chs. 1, 18, 19; Figs. 2, 6) and the laterally arched genitalia in females (Chs. 8–13, 20, 21; Figs. 4, 6) not present in other groups. *Noreena* and *Contrafacia* share three structural synapomorphies with

Table 1. Taxa of ingroup and outgroups.[1]

Ingroup:	*Noreena* (type species *N. maria* plus new species described herein) plus
	A: *Contrafacia* (all new species described herein, Figs. 5, 6, 10B).
	B: sister group X (one undescribed species, Fig. 7B).
	C: "*orcynia* Group" including *Thecla orcynia* (Figs. 7A, 10C), *T. catharina* Draudt, *T. ahola* Hewitson, *T. bassania* Hewitson, *T. marmoris* Druce, *T. aunia* Hewitson, *T. cordelia* Hewitson, *T. anthracia* Hewitson and two undescribed species.
	D: "*orios* Group" including *Thecla orios* (Fig. 7F), and a large number of undescribed species distributed from Mexico S to Argentina.
Outgroups:	
	E: "*spurina* Group" including *T. spurina* Hewitson (Fig. 7C), *T. ericusa* Hewitson (Fig. 7D), *T. thoana* Hewitson, and *T. brescia* Hewitson (Draudt placed these latter two in his "*brescia* Group");
	F: "*thyesta* Group" including *T. lausus* (Fig. 7E) (which Draudt placed with the taxa placed here in *Noreena*), *T. pharus* Druce (Fig. 7G), and *T. radiatio* Druce;
	G: "*brescia* Group" including *T. lyde* Godman & Salvin (Fig. 7H) (which Draudt considered similar to *T. cupentus*), and *T. cupentus* (Fig. 7I) (which Draudt included with the taxa placed here in *Noreena*). *T. cupentus* appears to be one of an assemblage of species, the rest of which are undescribed;
	H: "*avoca* Group" including *T. olbia* (Fig. 7L) (which Draudt compared, in discussion, to the taxa placed here in *Noreena*);
	I: "*echion* Group" including *T. fabulla* Hewitson (Fig. 7K), and *T. philinna* Hewitson.
	J: "*atrana* complex" (one group of taxa placed by Draudt, 1919 in his triphyletic "*americensis* Group") including *T. atrana* (Fig. 7O) (type female, NMNH), *T. tegaea* (Fig. 7N) and *T. tarania* (Fig. 7M).

[1] Outgroups studied have, hitherto, all been placed "*Thecla*" (Draudt, 1919; Bridges, 1988). For historical purposes, this list cites the group names of Draudt (1919) but, since his groups were often nonmonophyletic, limits each group to taxa determined as probably monophyletic in the present study. Type material has been used in all cases except for taxa of Column D, since this group is under study by another worker. For this group representative material identified at AMNH by R. K. Robbins (NMNH) has been used. All types are BMNH unless otherwise indicated. Outgroups are not in any particular order but simply include taxa whose superficial similarity to *Noreena* required study (for instance, taxa in outgroup E are often placed in the genus *Rekoa* Kaye along with numerous taxa varying greatly from their general wing pattern).

sister group X (Chs. 3, 7, 16; Figs. 1G, 2, 6, 7B). Sister group X is presently monotypic, consisting of a morphologically unusual undescribed species with wing pattern similar to *Thecla orios* Godman & Salvin. This wing pattern is indicated as plesiomorphic (Tb. 3, 31). Since it is anticipated that further members of sister group X will be discovered, it is not formally described here.

Noreena, Contrafacia and sister group X share two structural synapomorphies (Chs. 4, 6) with taxa of the "*orcynia* Group" (Tb. 1C). *Noreena* and *Contrafacia* share with the "*orcynia* Group" the distinctive wing pattern which makes them superficially distinctive among the Eumaeini (the "split-stripe" on the hindwing under the surface, Chs. 17, 25; Fig. 10). The primitive wing pattern is maintained in sister group X

Table 2. Ingroup characters. The following describes apomorphic (A) and plesiomorphic (P) states for characters used for constructing cladogram in Figure 8, as listed in the matrix of Figure 9.[1]

A. Characters of Figure 9 (e.g., apomorphic states shared by two or more terminal taxa in Fig. 8).

Tergal morphology

1. Male, condition of eighth tergite: (A) eighth tergite with "incised posterior cavity" (*sensu* Field, 1967a, b; Johnson, 1988; Johnson, Eisele and MacPherson, 1988; Johnson and Matusik, 1988) (Figs. 2, 6). (P) eighth tergite normal (*sensu* Ehrlich, 1958; Johnson and Matusik, 1988).

Genitalia

2. Male, bilobed area of valvae (Fig. 3A): (A) bilobed area robust and strongly angled ventrad the caudal extension (Fig. 3); (P) bilobed area thin to mid-rimmed and generally parabolic (Figs. 6, 7A, B, E, F, I, M).
3. Male, caudal extension of valvae (Fig. 3A): (A) caudal extension greatly thickened caudad bilobed area, tapering caudad with convex ridge defined along ventral inner margin of the lobes (Figs. 3, 6, 7B); (P) caudal extension greatly constricted terminad the bilobed area (Fig. 7A, C, D, E, F, G, H, I, K).
4. Male, saccus: (A) saccus radically elongate, cephalic expanse exceeding that of entire vincular arc (measured from base of saccus to basal juncture of uncus lobes) (Figs. 6, 7A, B); (P) saccus short, cephalic expanse never greater, and usually much shorter, than that of entire vincular arc (measured as above) (Figs. 7C, D, E, F, G, H, I, M, O).
5. Male, terminus of saccus: (A) with emphatic terminal knob (Figs. 3, 6); (P) gradually tapered (Fig. 7A, C, D, E, F, G, H, I, M, O).
6. Male, vinculum: (A) ventro-caudal area of vincular arc with spurs abutting or overlapping the juncture of valve's bilobed area and caudal extension (Figs. 3, 6, 7A, B); (P) ventro-caudal area of vincular arc smooth and entire (Fig. 7C, D, E, F, G, H, I, K, M, O).
7. Male, vinculum: (A) ventrum of vinculum extremely compact, measure of entire edge not exceeding measure of entire edge of bilobed area of valvae (Figs. 3, 6, 7B); (P) ventrum of vinculum expansive, measure of entire edge exceeding (usually greatly) measure of entire edge of bilobed area of valvae (Fig. 7A, C, D, E, F, G, H, I, K, M, O).
8. Female, ductus bursae: (A) cephalic "ductus" (Fig. 3A) strongly arched laterally (Figs. 4, 6); (P) cephalic ductus straight or displaced only slightly from plane of caudal "antrum" (Fig. 3A) (Fig. 7A, B, C, D).
9. Female, point of entry of ductus bursae into corpus bursae: (A) point of entry on centro-lateral surface of corpus bursae (Figs. 4, 6); (P) point of entry at distal end of corpus bursae (Fig. 7A, B, C, D, E, F, H, I, J, K, L, N).
10. Female, condition of juncture of ductus bursae and corpus bursae: (A) ductus bursae joins corpus bursae with variously expansive sclerotized "arms" (Figs. 4, 6); (P) ductus bursae joins corpus bursae in a flush manner, without additional sclerotization of the corpus bursae (Fig. 7A, B, C, D, E, F, H, I, J, K, L, N).
11. Female, condition of corpus bursae and ductus seminalis: (A) ductus seminalis emanating from a sclerotized shield located on the lateral to disto-lateral surface of the corpus bursae (Figs. 4, 6); (P) ductus seminalis emanating from unsclerotized corpus bursae near flush juncture of ductus bursae and corpus bursae (Fig. 7A, B, C, D, E, F, H, I, L, N).
12. Female, condition of juncture between cephalic area of ductus bursae and antrum (Fig. 4A): (A) transparent juncture, viewed from any angle, with marked "hour-glass"-like constriction (Figs. 4, 6); (P) transparent juncture not constricted (simply part of general,

Table 2. Continued.

contiguous, cephalic tapering of ductus) (Fig. 7A, B, C, D). [Note: "transparent" is specified because this condition is indicated as apomorphic to a fully sclerotized condition in cladistic analysis among outgroups of the present study group (Fig. 7E–L), see Tb. 2, 9].

13. Female, condition of sclerotization at juncture between cephalic area of ductus bursae and antrum (Fig. 4A): (A) juncture of cephalic area of ductus and antrum with closely abutting, fully sclerotized, dorsal surfaces; folded transparent region ventrad (Fig. 7A); (P) juncture fully sclerotized throughout (Fig. 7E–L). [Conditions of taxa in Fig. 7B–D have been omitted here from characterization as 13A because, although it is certain that condition 13P is primitive, it is uncertain that the slightly different juncture in taxa of Fig. 7B, C, D is homologous with that of 7A, see Tb. 3, 10].

Internal secondary sexual characteristics

14. Male, vincular brush organ (Fig. 2B): (A) present [see entry 2] (all taxa of Figs. 3, 6); (P) absent.
15. Male, saccal brush organ (Fig. 2B): (A) present (all taxa of Figs. 3, 6); (P) brush organ along vinculum only [Note: to date, in the Eumaeini, saccal brush organs have only been found in taxa also having a vincular brush organ (Johnson, 1989)].

External secondary sexual characteristics

16. Male, dorsal forewing androconial structures ("brands"): (A) androconial on each wing with two sectors ("bipartite"), each occurring on the respective distal and basal sides of the crossvein of the discal cell (Fig. 1H); (P) androconia absent.

Wing pattern

17. Both sexes, pattern of hindwing under surface stripe: (A) stripe with two to three parallel, discal cell-end streaks, breaking stripe into caudal and cephalic elements ("split-stripe" of text) (Figs. 1, 5, 10); (P) stripe uniramous across entire wing.

B. Characters with apomorphic state unique to one terminal taxon in Figure 8.

18. Male, condition of eighth tergite: (A) Dorsal plate of incised posterior cavity ovate, extending terminally from beneath seventh tergite (Fig. 6). (P) A, entry 1.
19. Male, condition of eighth tergite: (A) Dorsal plate of incised posterior cavity elongate cephalad and incised or pronged, extending terminally from at least beneath sixth tergite (Fig. 2). (P) A, entry 1.
20. Female genitalia, condition of corpus bursae and ductus seminalis: (A) Sclerotized distal shield and point of attachment of ductus seminalis on corpus bursae conjoined proxad cephalic ductal terminus (Fig. 6). (P) A, entry 11.
21. Female genitalia, condition of corpus bursae ductus seminalis: (A) Sclerotized distal shield and point of attachment of ductus seminalis on corpus bursae detached from juncture of ductus bursae and corpus bursae (Fig. 4); (P) A, entry 11.
22. Male, internal secondary sexual characteristics: (A) Terminus of saccal brush organ extending beyond proximal edge of vinculum and saccus; (P) A, entry 15.
23. Male genitalia: (A) Terminus of aedeagus recurvate (Fig. 3); (P) terminus of aedeagus straight.
24. Male genitalia, bilobed area of valvae: (A) Bilobed area of valvae constricted caudad saccus (Fig. 6); (P) P, entry 2.
25. Both sexes, under surface of hindwing: (A) Limbal spots postmedial-submarginal, cell CuA1 and at base of anal lobe (Fig. 1, 10A); (P) either or both of above spots reduced or absent (Fig. 5).

[1] Terminology for tergal and genitalic structures follows introductory section, notations in Figures 3–4, and Johnson (1976, 1978, 1988); additional references regarding some structures are provided as appropriate.

Table 3. Outgroup characters.[1]

Tergal morphology

1. Male, eighth tergite unspecialized (outgroups D, E, F, G, H, I): plesiomorphic.
2. Female, eighth tergite unspecialized (outgroups A, B, C, D, E, F, G, H, I): plesiomorphic.

Genitalia

3. Male, caudal extension of valvae greatly constricted (Fig. 7A, B, C, D, E, F, G, H, I, K) (outgroups F, G, H, I): homoplasic.
4. Male, caudal extension smoothly tapered to blunt ends (Fig. 7C, D) (outgroup E): plesiomorphic.
5. Male, bilobed configuration smoothly parabolic without notable sculpturing (Fig. 7C, D) (outgroup E): plesiomorphic.
6. Male, aedeagus caudally straight or only slightly curved (e.g., not radically recurvate caudad) (ougroups B, C, D, E, F, G, H, I): plesiomorphic.
7. Male, saccus reduced, greatly constricted, highly sculptured, cephalic expanse barely exceeding cephalic arc of vinculum [(i) undescribed "*brescia* Group" taxon like *T. cupentus* type in wing pattern but differing greatly in morphology; (ii) one undescribed species of the *orios* complex (outgroups D, G)]: homoplasic.
8. Male, saccus smoothly parabolic and without notable sculptured features (Fig. 7C, D, E, F, G, H, I, M, O) (outgroups E, F, G, H): plesiomorphic.
9. Female, sclerotized genital parts occurring as one uniformly sclerotized tapered tube (e.g., not divided into distinct cephalic ductal and caudal antrumal elements) (Fig. 7E, F, H, I, J, K, L) (outgroups F, G, H, I): plesiomorphic.
10. Female, sclerotized genital parts disjunct, occurring as cephalic ductal and caudal antrumal elements separated by a transparent juncture (Figs. 4, 6, 7A, B, C, D) (outgroups B, C, E): apomorphic to character 9 but homoplasic in several outgroups relative to study set (Fig. 7N, O) (outgroup J).
11. Female, sclerotized genital parts as in 10, but oriented uniplanar or only slightly displaced laterad (Fig. 7A, B) (outgroup E): homoplasic.
12. Female, sclerotized genital parts as in 10, but cephalic area of ductus displaced laterally such that juncture of ductus bursae and corpus bursae is slightly behind distal end of corpus bursae (Fig. 7C, D) (outgroup E): apomorphic to entry 9 but homoplasic relative to Tb. 2, Chs. 8–11). [Note that such homoplasy also includes similar, slightly displaced, junctures of the ductus bursae and corpus bursae in certain taxa without lateral displacement of the ductus bursae itself (Fig. 7H) (outgroup G).
13. Female, cephalic terminus of ductus bursae adjoining distal end of the corpus bursae (Fig. 7A, B, E–L) (outgroups B, C, F, H, I): plesiomorphic.
14. Female, cephalic terminus of ductus bursae adjoining corpus bursae slightly cephalad caudal end of corpus bursae (Fig. 7C, D, H) (outgroups E, G): homoplasic.
15. Female, corpus bursae without extending "arm" from cephalic terminus of ductus bursae (Fig. 7A–N) (outgroups B–I): plesiomorphic.
16. Female, corpus bursae distally unsclerotized (e.g., with no corpus bursae shield, either attached or detached) (Fig. 7C, D) (outgroups D, E, G, H) [Though distinctive of some groups, this condition varies greatly in others; thus it must be studied across the entire species diversity of any group to ascertain its value]: homoplasic.
18. Female, corpus bursae as in Tb. 2, Chs. 8–10 but lacking detached sclerotized shield on corpus bursae (Fig. 7O) (outgroup J): homoplasic.

Internal secondary sexual characteristics

19. Male genitalia without brush organs (outgroups F, G): plesiomorphic.
20. Male genitalia with vincular brush organ component only (Fig. 3B) (outgroups C, D, E,

Table 3. Continued.

F, G, H, I): apomorphic to 19, but plesiomorphic to saccal brush organ (Fig. 3B, *Noreena* and *Contrafacia* only).

21. Male genitalia with small dorsal vincular brush organ (attached beneath dorsa-caudad arch of vinculum and barely extending to base of falces) (outgroup G): homoplasic.

External secondary sexual characteristics

22. Male, forewings, dorsal androconia ("brands") on each wing with two sectors ("bipartite"), each occurring on the respective distal and basal sides of the crossvein of the discal cell (Fig. 1H) (outgroups E, I): homoplasic.
23. Androconial brand as in 22, but with distal sector located more vertically over basal sector (e.g., poised more adjacent radial area of discal cell) (outgroup E): homoplasic.
24. Bipartite androconial brand with sectors non-adjacent and divided widely above and below the costal vein of the apical end of discal cell (outgroup I): homoplasic.
25. Bipartite androconial brand divided into cephalic and caudal sectors but within the discal cell (outlying or edging scales may lie variously on the veins of the cell) (outgroup F): homoplasic.
26. Androconial brand bipartite but as two concentric circles inside the apex of discal cell (outgroup G): homoplasic.
27. Androconial brand of each wing undivided (outgroup H): apomorphic to no androconia; plesiomorphic to divided androconia.

Wing pattern

28. Under surface wing pattern, hindwing medial band with centrally broken or laterally disjunct pattern resembling the "split-stripe" of *Noreena* (Figs. 1, 10A) (outgroups F, G): homoplasic.
29. Upper surface wing pattern, suffused with iridescent coloration fading gradually into distal fuscous (various taxa in outgroups B–I): plesiomorphic relative to distinct patches of iridescent blue.
30. Upper surface iridescent coloration occurring in distinct patches (Figs. 1H, 4C) (outgroups F, G, H): homoplasic.
31. Under surface wing pattern, medial or postmedial band not centrally broken (ingroup sister group X, outgroups D, E, F, G): plesiomorphic to ingroup; homoplasic to condition in 28.

[1] Outstanding characters in outgroups superficially resembling conditions in the ingroup but indicated as relatively plesiomorphic or homoplastic.

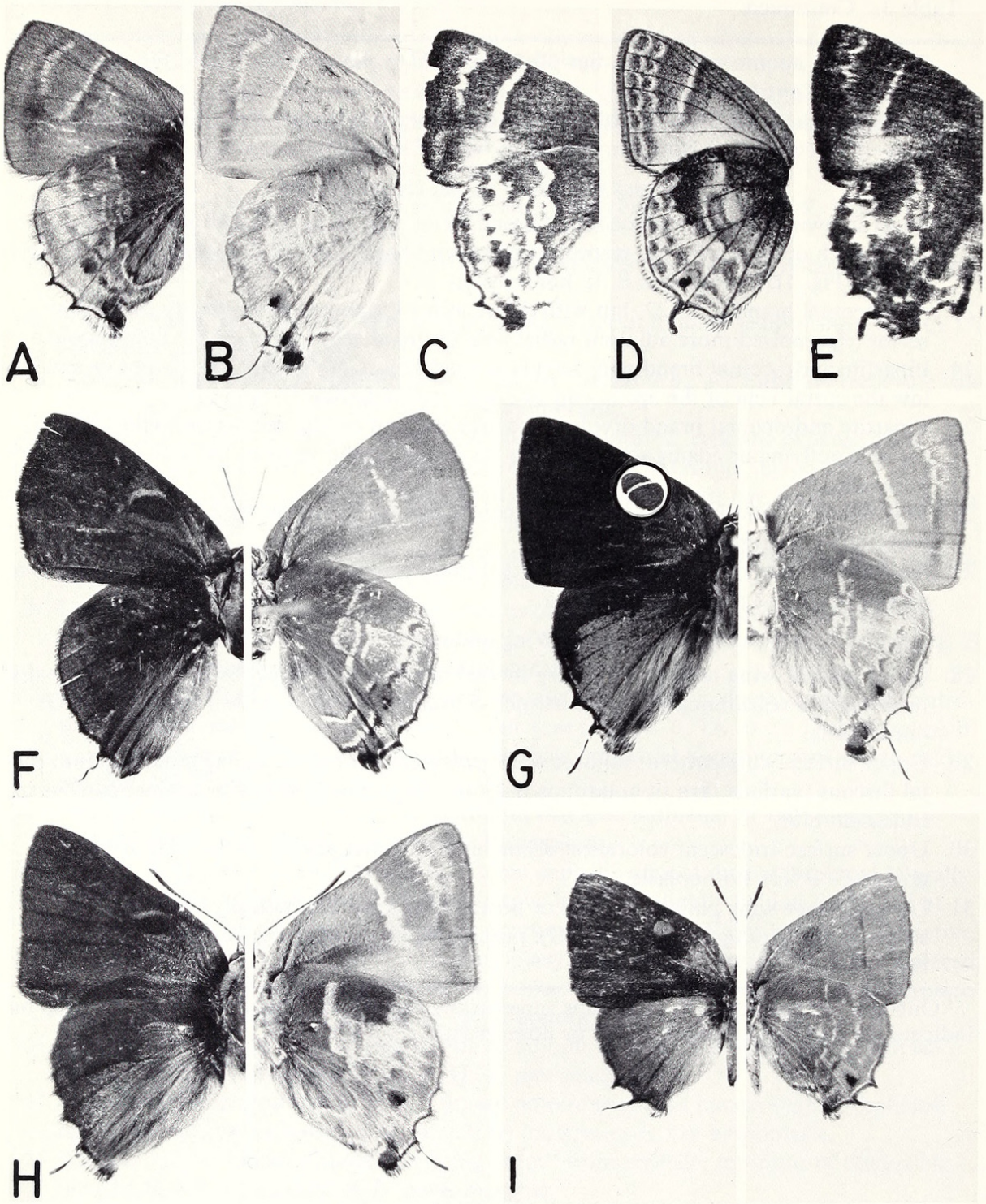

Fig. 1. Species of *Noreena*. *Previously described species,* A–E, wing under surfaces: A. *N. maria* (type species), ♀, Cornejo, Salta, Argentina (AMNH); B. *N. cambes,* ♂, Presidio, Veracruz, Mexico (AMNH); C. *N. comana,* holotype ♂ [B&W reproduction of color photo]; D. *N. molena,* syntype ♂ [B&W reproduction of Jones (1912) color plate]; E. *N. lemona,* lectotype ♀ [B&W reproduction of color photo]. *New species,* F–I, upper surface (left), under surface (right): F. *N. guianivaga,* holotype ♂; G. *N. luxuriosa,* holotype ♂ (bipartite androconial brand illustrated diagrammatically on left forewing); H. *N. pritzkeri*, holotype ♂; I. *N. galactica,* holotype ♂.

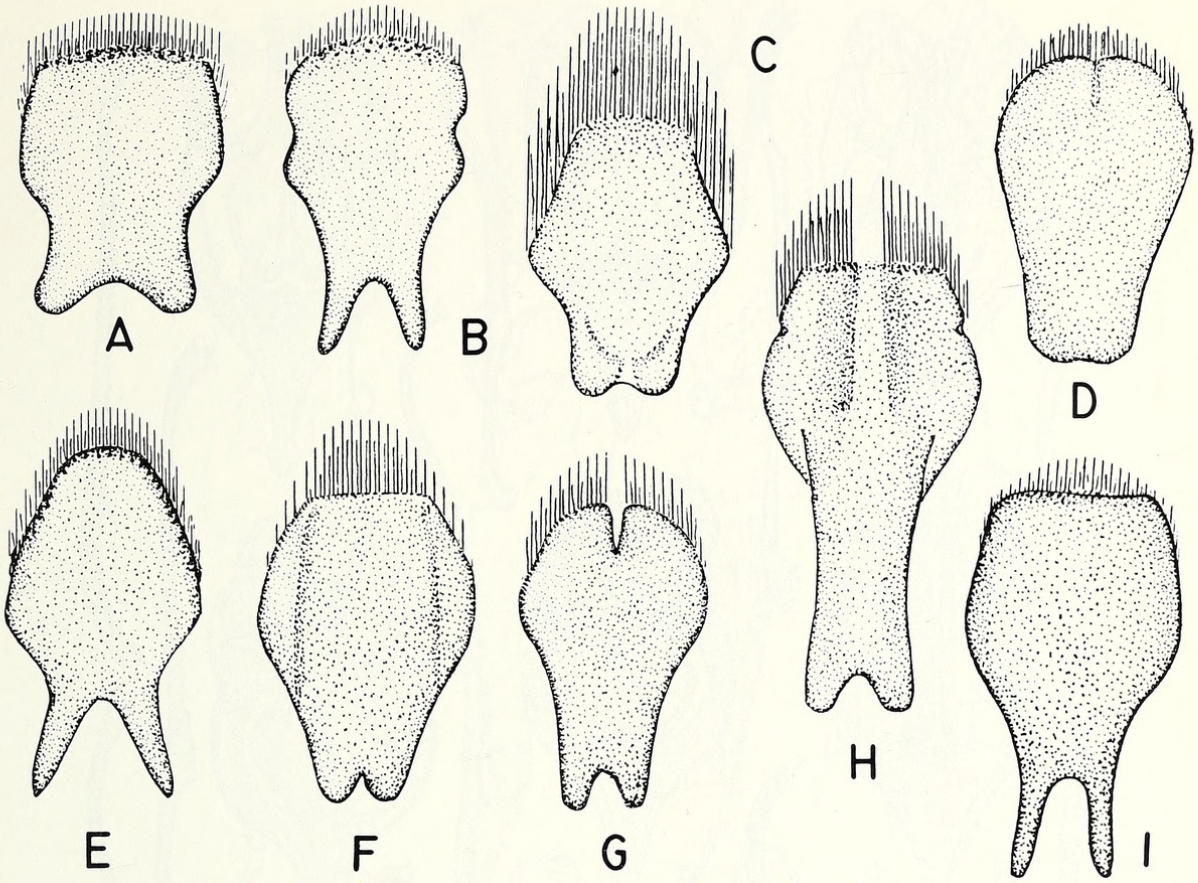

Fig. 2. Specialized eighth tergites of *Noreena*. A. *N. cambes*, holotype; B. *N. comana*, holotype; C. *N. guianivaga*, holotype; D. *N. luxuriosa*, holotype; E. *N. pritzkeri*, holotype (MPM); F. *N. molena*, syntype; G. *N. maria*, paratype, Mosconi, Argentina (AME); H. *N. lemona*, Castro, Paraná, Brazil (BMNH); I. *N. galactica*, holotype (MPM).

(Tb. 3, 31). Thus, the sister group of *Noreena*, *Contrafacia* and sister group X is the "*orcynia* Group," not the branded taxa which had been associated with *T. cambes* by Draudt (1919).

Taxa of the "*orcynia* Group" lack male forewing brands (basal view, Fig. 10C). It is apparent from the present study that, in some groups of Eumaeini, occurrence of such external secondary sexual characters (Figs. 1, 5, 10) is of limited cladistic significance (Ch. 16; Figs. 8, 9; Tb. 3, 22–27). Accordingly, taxa of Draudt's (1919) "*spurina* Group" also do not appear to be closely related to *Noreena*. The laterally arched ductus bursae in *Noreena* and *Contrafacia* (Chs 8–13; Figs. 4, 6) appears to have evolved from the centrally constricted, but uniplanar, ductal structure of the "*orcynia*" and "*orios*" groups (Tb. 3, 10, 12, 15, 16; Fig. 7A, F). As indicated using "*spurina* Group" taxa as an outgroup for rooting in Figures 8–9, the slightly curvate ductus bursae in "*spurina* Group" taxa (Tb. 3, 10, 11, 12, 14, 16; Fig. 7C, D) appears to be homoplasic since these taxa lack all other derived characters of the ingroup. As in sister group X, the simple, postmedial under surface hindwing band occurring in the "*spurina* Group" (and many other Eumaeini) is indicated as plesiomorphic (Tb. 3, 31).

The other member of the ingroup of this study is the "*orios* Group" (Tb. 1D). Taxa

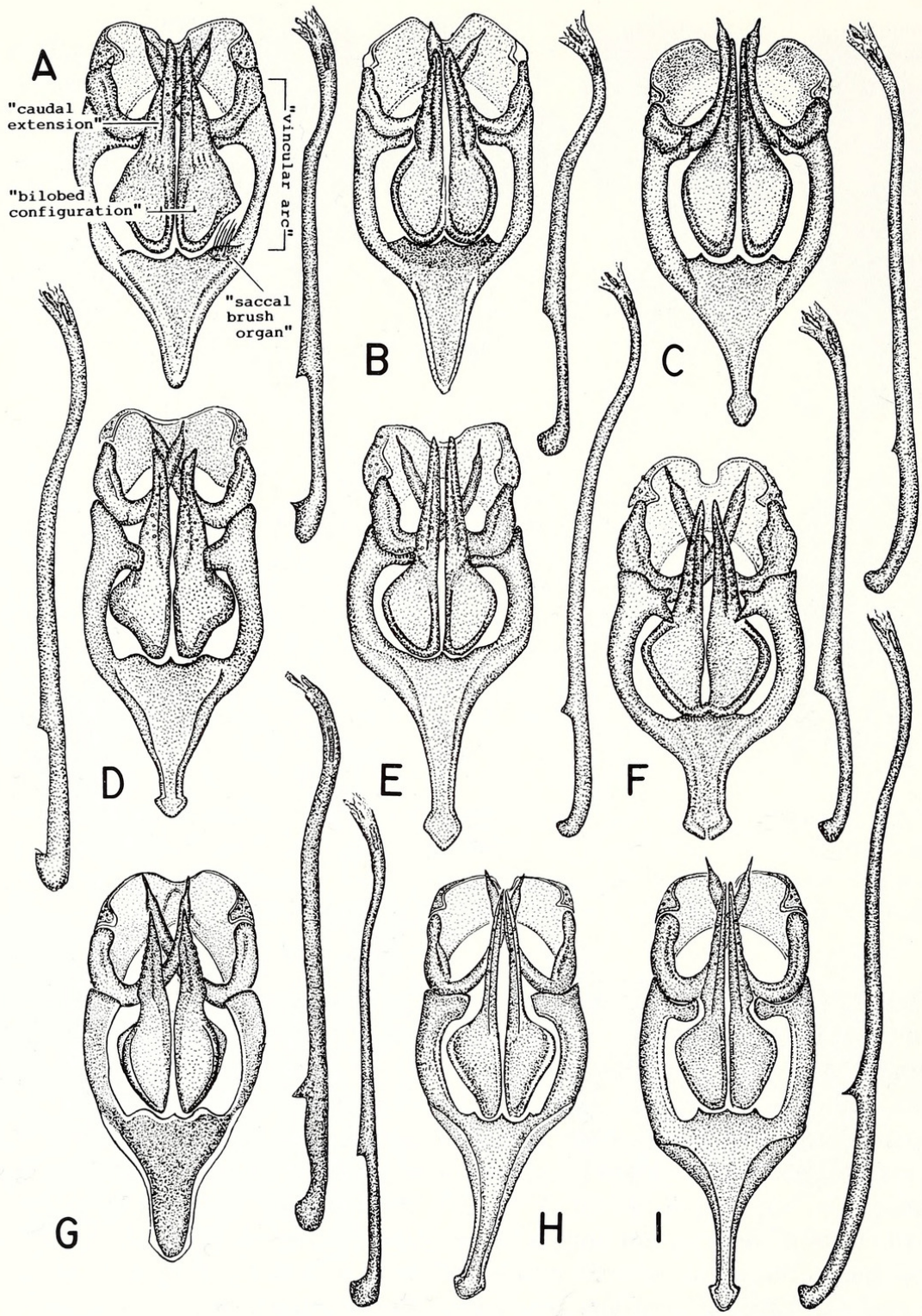

Fig. 3. Male genitalia of *Noreena,* ventral view with aedeagus removed and placed vertically alongside. A. *N. cambes,* holotype; B. *N. comana,* holotype; C. *N. guianivaga,* holotype; D. *N. luxuriosa,* holotype: E. *N. lemona,* Castro, Paraná, Brazil (BMNH); F. *N. molena,* syntype; G. *N. maria,* paratype, Mosconi, Argentina (AME); H. *N. pritzkeri,* holotype; I. *N. galactica,* holotype.

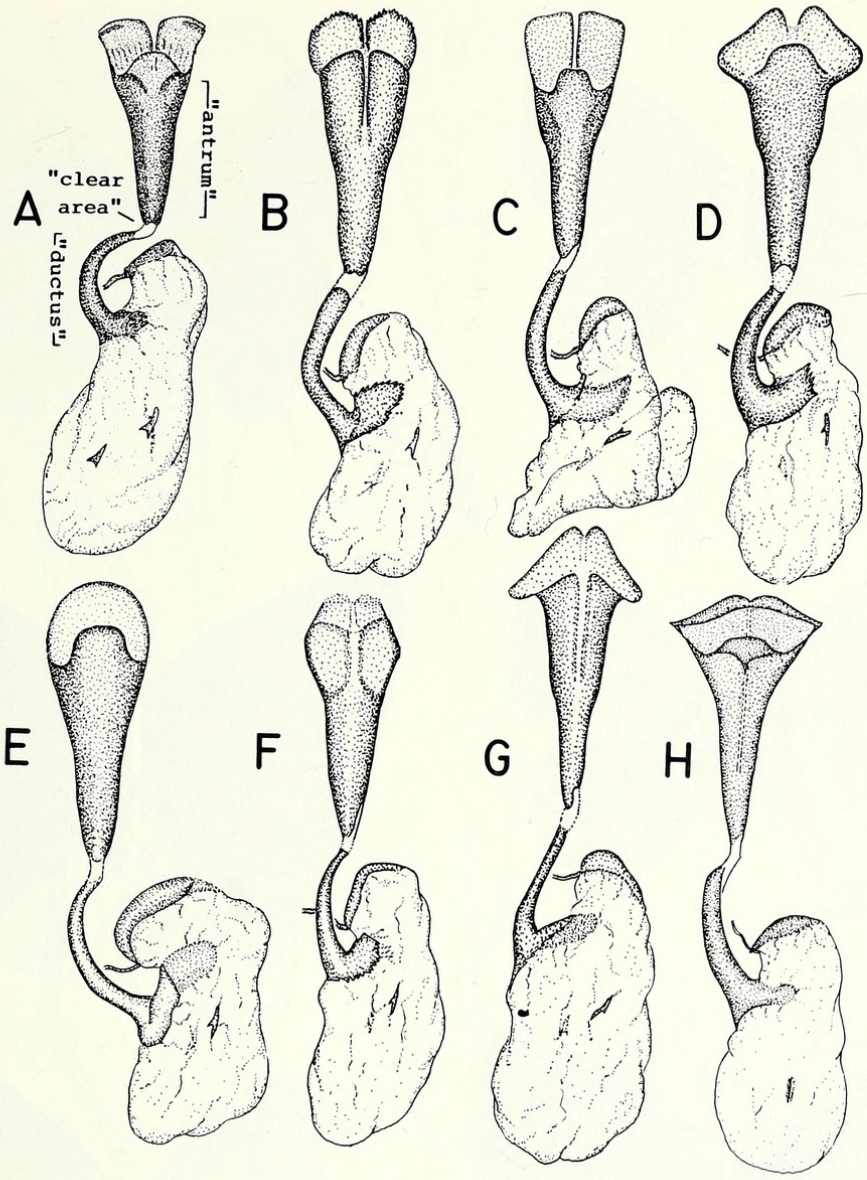

Fig. 4. Female genitalia of *Noreena*. A. *N. maria*, holotype; B. *N. cambes*, Urualoana, Mexico (AMNH); C. *N. comana*, Canal Zone, Panama (MNHN); D. *N. guianivaga*, paratype; E. *N. luxuriosa*, paratype; F. *N. molena*, lectotype; G. *N. lemona*, lectotype; H. *N. pritzkeri*, allotype.

of this group have bipartite male forewing brands and a simple under surface hindwing postmedial band like the "*spurina* Group." Structurally, however, taxa of the "*orios* Group" (Fig. 7F) belong in the clade including *Noreena, Contrafacia,* sister group X and the "*orcynia* Group" (Figs. 8, 9). For purposes of this study, the "*orios* Group" includes *T. orios* (as defined by a type, BMNH, Fig. 7F) and a large number of undescribed taxa. The type locality for *T. orios* is "Guatemala" and the species appears insular. Superficially similar butterflies occur from Honduras to southern Brazil, but vary greatly in morphology. Since cladistic study of these undescribed species will probably result in additional basal branching below the "*orcynia* Group" of Figure 8, the "*orios* Group" as defined here is probably paraphyletic. Resolution of relationships in this largely undescribed group will be an important future project.

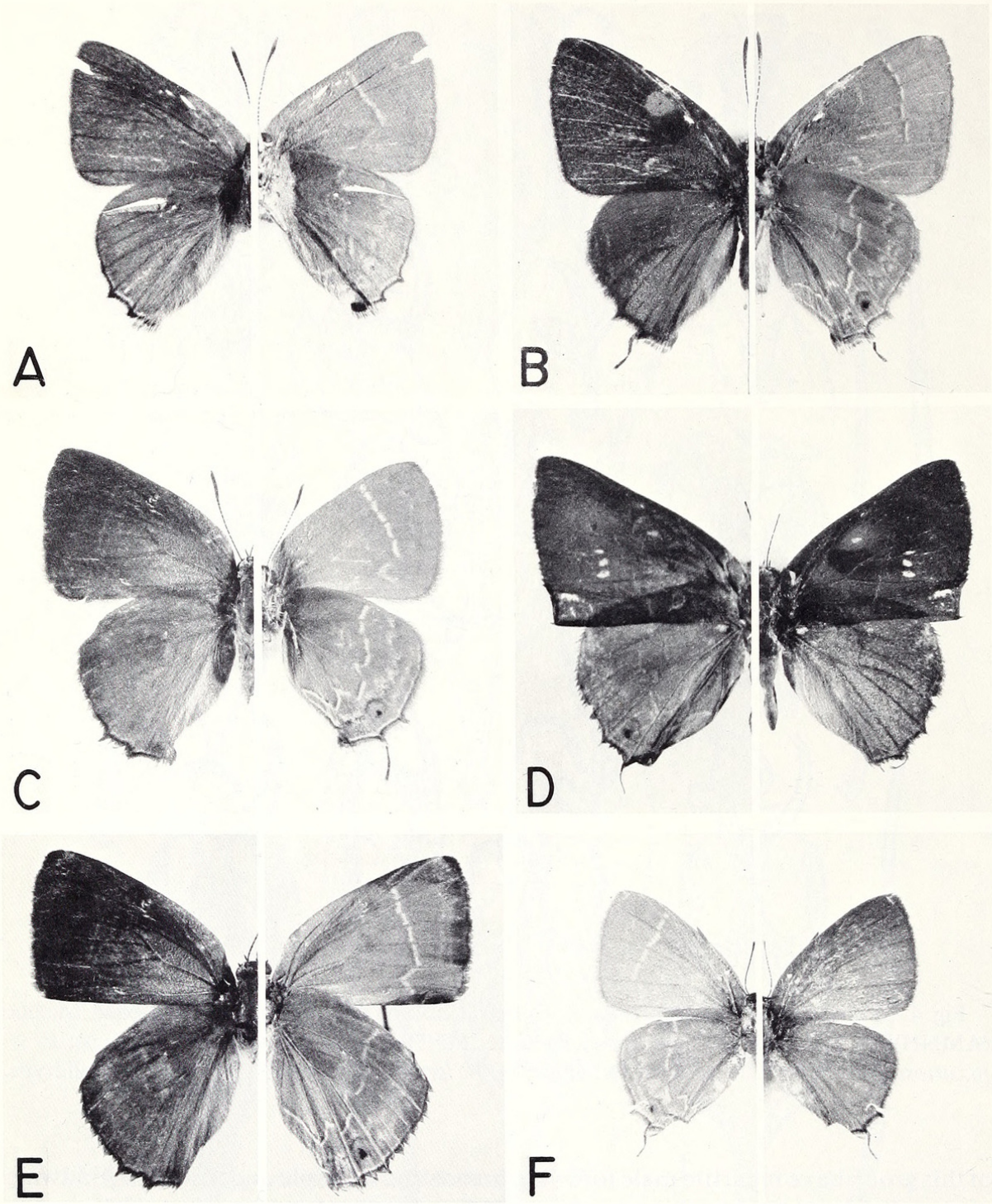

Fig. 5. Species of *Contrafacia,* upper surface (left), under surface (right) (except D, F opposite). A. *C. rindgei,* holotype ♀; B. *C. mexicana,* allotype ♂; C. *C. mexicana,* holotype ♀; D. *C. australis,* allotype ♂; E. *C. australis,* holotype ♀; F. *C. minutaea,* holotype ♀.

Cladistic analysis in this study indicates many characters used by early workers for grouping eumaeine taxa had little cladistic significance. Relative to a particular cladistic ingroup, many such characters are either primitive or, because of homoplasy, useful for clustering only a few taxa. Table III lists, and cross-references to illustrations from type specimens (Fig. 7), many features previously thought significant for group-

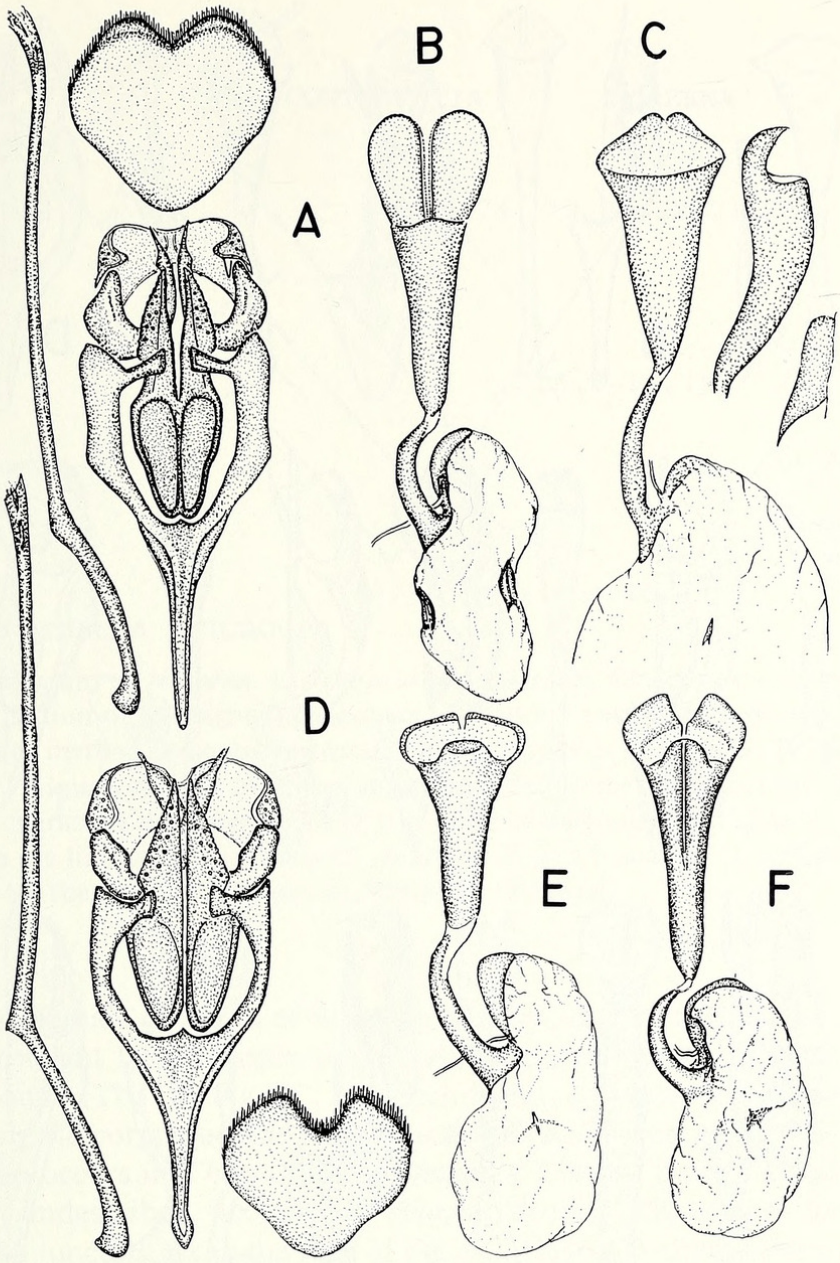

Fig. 6. Tergal morphology and genitalia of *Contrafacia*. A. *C. mexicana*, allotype ♂; B. *C. mexicana*, holotype ♀; C. *C. minutaea*, holotype ♀; D. *C. australis*, allotype ♂; E. *C. australis*, holotype ♀; F. *C. rindgei*, holotype ♀.

ing Neotropical hairsteak butterflies (Draudt, 1919; Clench, 1961; Field, 1967a, b; Bridges, 1988). The table indicates plesiomorphy and/or homoplasy relative to characters defining the ingroup of the present study. Of particular interest, and reviewed briefly below, are several parallelisms in extremely salient structures.

There are other eumaeine taxa with laterally arched female genitalia. Some of these taxa share no other characters with ingroup or outgroup taxa of the present study. Most notable is the *Thecla atrana* complex (Tb. 1J; Tb. 3, 18, Fig. 7N, O). Draudt (1919) used wing pattern similarity to group these taxa in this *Thecla* "*americensis* Group." Johnson, Miller and Herrera (ms.) demonstrate this group is triphyletic; the

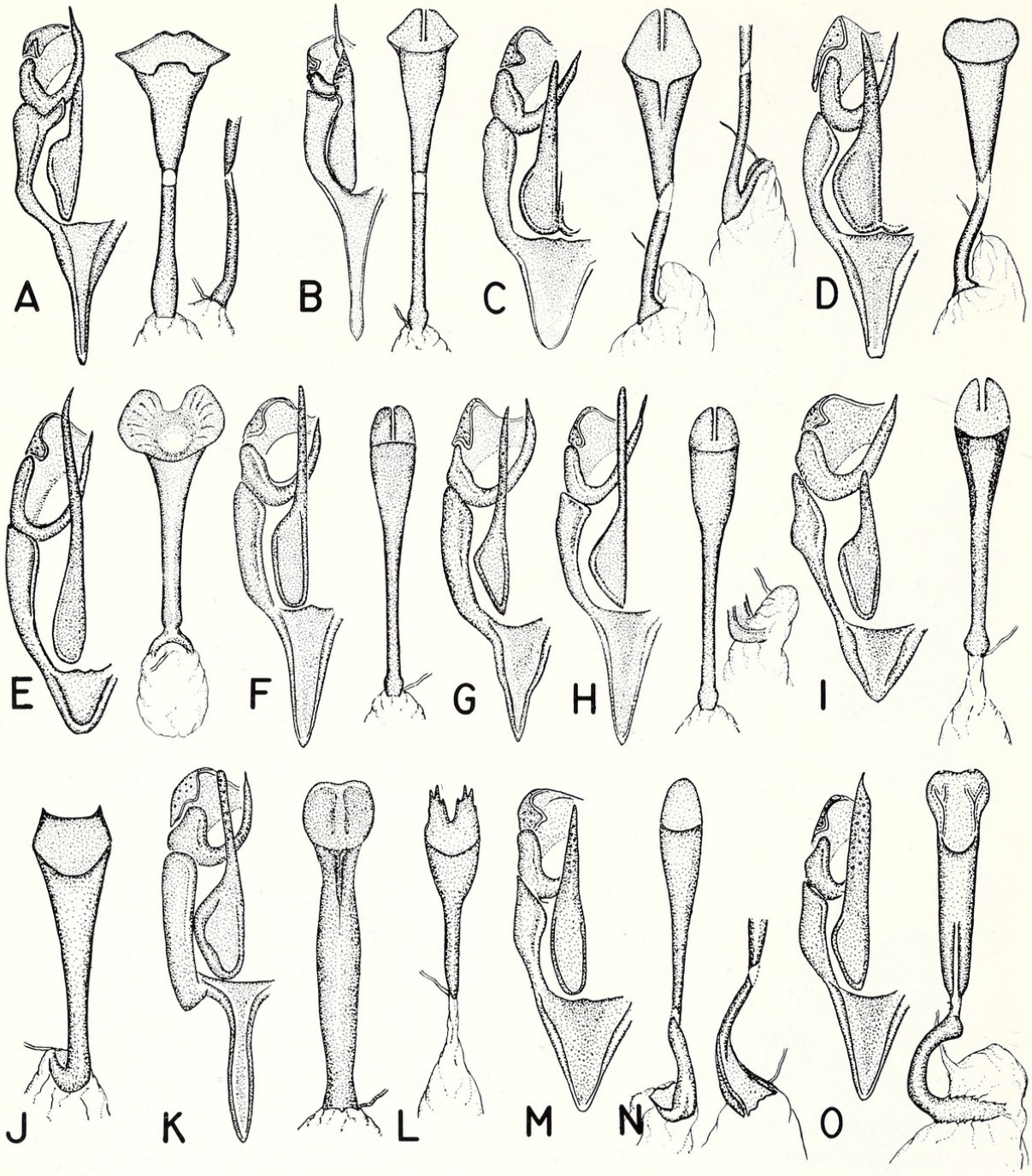

Fig. 7. Morphology of outgroups (males and females both ventral view, unless indicated otherwise). A. *Thecla orcynia,* left: syntype ♂; right: syntype ♀ (BMNH) (lateral view of ductus, far right). B. undescribed species of sister group X: left: ♂, Caripito, Venezuela (AMNH); right: ♀, same data. C. *T. spurina,* left: ♂, Igarapi-Assũ, Brazil (AMNH); center: ♀, same data (AMNH); right: cephalic ductus terminus and fanlike bursal shield in undescribed Andean species of *spurina* Group (see Discussion), Cucho, Argentina (nr. Bolivia) (AMNH). D. *T. ericusa,* left: ♂, Hololo Mt. Road, Trinidad-Tobago (AMNH); right: ♀, Oropoche, Trinidad-Tobago (AMNH). E. *T. lausus,* left: lectotype ♀ (Johnson and Matusik, 1988) (BMNH); right: ♂, Managua, Nicaragua (CMNH) (i.d. and genitalic preparation, H. K. Clench). F. *T. orios,* left: syntype ♂ (BMNH); right: ♀, Tenedores, Guatemala (AMNH). G. *T. pharus,* left: holotype ♂ (BMNH). H. *T. lyde,* left: syntype ♂ (BMNH); right: syntype ♀ (BMNH) (lateral view, cephalic ductus terminus, far right). I. *T. cupentus,* left: syntype ♂ (BMNH); right: syntype ♂ (BMNH). J. *T. thyesta,* syntype

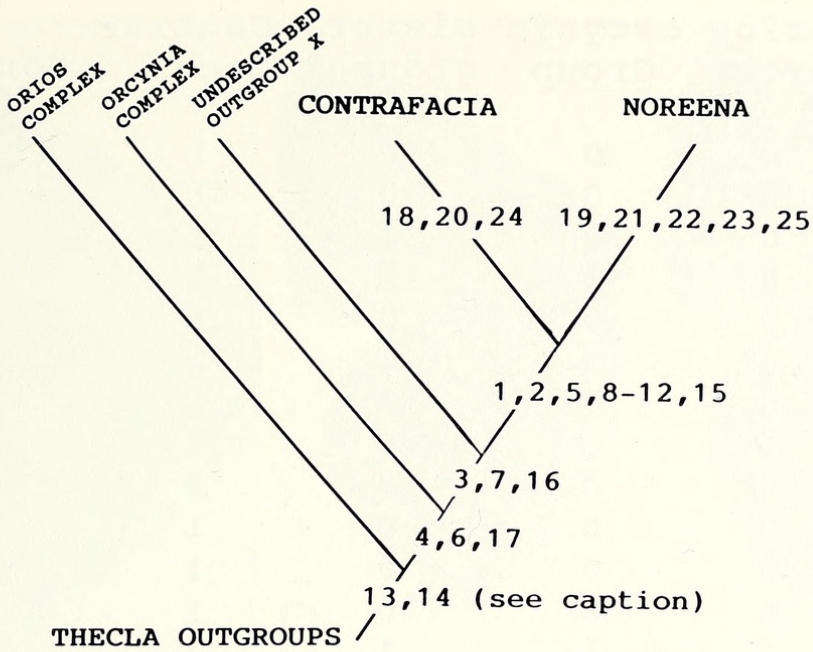

Fig. 8. Cladogram of *Noreena, Contrafacia* and relatives. Cladogram derived from parsimonious distribution of unweighted characters of Figure 9 rooted by concensus between the Lundberg rooting method and outgroup rooting using outgroups E, F and G (Tb. 1) (Consistency Index = .850). Uniquely derived apomorphies are specified by the horizontal bars on internodes, and represent characters described in Tb. 2 and listed in the matrix of Figure 9. Since data for this cladogram are limited to the character matrix of Figure 9 and Tb. 2, autapomorphies are specified only for the two terminal genera revised in this study.

lateral arch in female genitalia of the *atrana* complex is of independent derivation. There is also slight lateral displacement of the ductus bursae in some taxa of the "*spurina* Group" (Tb. 1E; Fig. 7C, D). Such lateral displacement causes the ductus bursae to join the corpus bursae just behind the caudal end of the bursal sac. This condition also occurs in *Thecla lyde* of Draudt's *Thecla* "*brescia* Group" (Fig. 7H) and in other, undescribed, taxa of the "*spurina* Group." These structures vary from a simple, flush juncture (as in the taxa of Fig. 7C, D) to a fanlike sclerotized structure extending caudad along the bursal sac (as in Fig. 7C, right). Significantly, the latter structure, which occurs in an undescribed "*spurina* Group" species from the northwestern Argentine and Bolivian Andes, is also typical of many other Eumaeini—taxa among the seven genera of Callophryina (Johnson, 1981) and certain species of *Strymon* Hübner (Johnson, Eisele & MacPherson, 1989). Neither callophryines, nor *Strymon* taxa, are closely related to the "*spurina* Group" (Johnson, MacPherson and Ingraham, 1986). This assessment of homoplasy in the various, slightly displaced,

←

♀ (BMNH). K. *T. fabulla,* left: syntype ♂ (BMNH); right: syntype ♀ (BMNH). L. *T. olbia,* holotype ♀ (BMNH). M. *T. tarania* Hewitson, holotype ♂ (BMNH). N. *T. tegaea,* syntype ♀ (BMNH). O. *T. atrana,* left: ♂, Castro, Paraná, Brazil (BMNH); right: holotype ♀ (NMNH).

	orios Group	orcynia Group	sister group X	Contra-facia	Noreena
1.	0	0	0	1	1
2.	0	0	0	1	1
3.	0	0	1	1	1
4.	0	1	1	1	1
5.	0	0	0	1	1
6.	0	1	1	1	1
7.	0	0	1	1	1
8.	0	0	0	1	1
9.	0	0	0	1	1
10.	0	0	0	1	1
11.	0	0	0	1	1
12.	0	0	0	1	1
13.	1	1	1	1	1
14.	1	1	1	1	1
15.	0	0	0	1	1
16.	1	0	1	1	1
17.	0	1	0	1	1

Fig. 9. Character state matrix used for cladogram construction (Fig. 8) of *Noreena, Contrafacia,* and relatives (plesiomorphic states of Tb. 2 = 0, apomorphic states of Tb. 2 = 1). Outgroup consists of groups E, F and G (Tb. 1) (from study of their types and other specimens) scored all 0 (characters 1 and 11 could be scored as 1 if based on exceptional taxa in a minority of E, F or G). Characters for Lundberg rooting of parsimonious network scored all 0.

ductal structures in "*spurina* Group" is further supported by the normal eighth tergite, and vincular characters, of "*spurina* Group" males (Fig. 7C, D). The latter structures do not indicate cladistic affinity to the radically modified eighth tergite in *Noreena* or *Contrafacia,* on the constricted vinculum and elongate saccus characteristic of *Contrafacia,* sister group X and the "*orcynia* Group."

From this analysis it is apparent that bipartite androconial brands and laterally arched female genitalia have arisen independently in several groups of the Eumaeini. Bipartite androconial brands vary greatly within small eumaeine assemblages and thus may be of little use as taxonomic characters except within genera or species groups. On the other hand, morphological innovation in disparately evolved laterally arched female genitalia is far more diverse and such structures appear taxonomically useful for differentiating larger assemblages of taxa.

TAXONOMY OF *NOREENA* AND *CONTRAFACIA*

Species criteria and distributions. Nine *Noreena* taxa are accorded species status and represent six allopatric areas of endemism. Four species are regionally sympatric in SE Brazil, two on the Guyana Shield, and it is possible that the Central

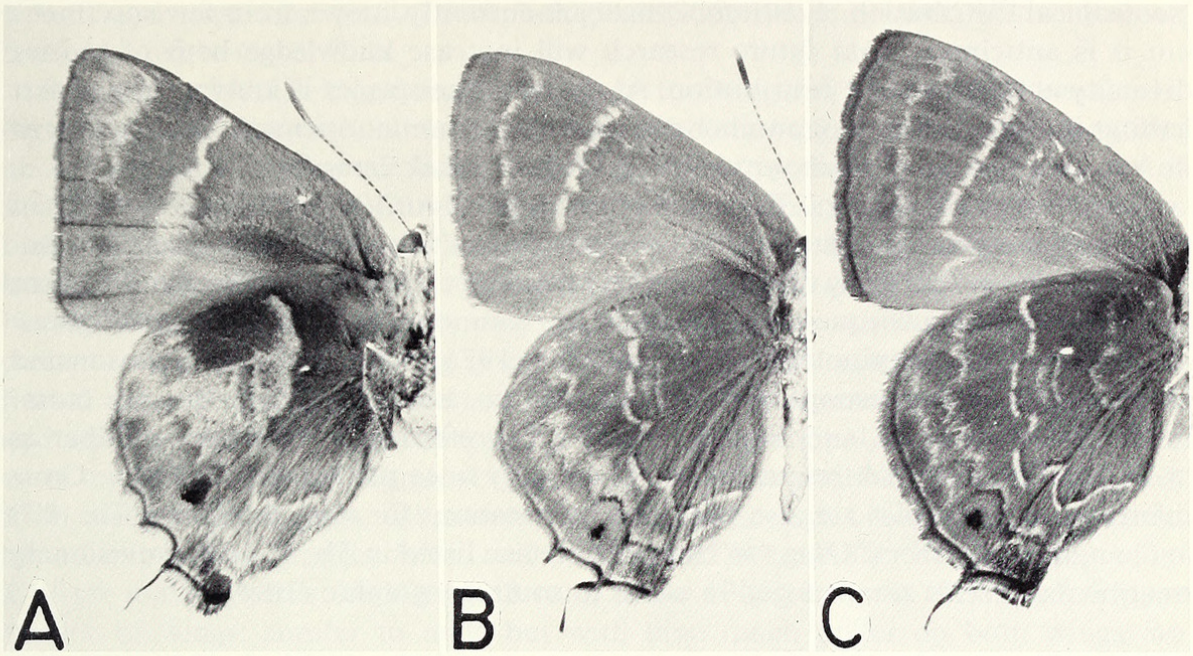

Fig. 10. The "split-stripe" (Ch. 17) and "limbal spots" (Ch. 25) characteristic of *Noreena, Contrafacia* and the *orcynia* Group. A. *Noreena* (*N. pritzkeri* shown here)—costal portion of medial band junctures variously with parallel cell-end streaks: (i) basal in *N. pritzkeri,* (ii) at central cell-end streak in most other *Noreena* taxa, (iii) at distal cell-end streak in *N. molena.* All taxa have two limbal spots, postmedial to submarginal, cell CuA1, and at base of anal lobe. B. *Contrafacia* (*C. australis* shown here)—medial band junctures to distal cell-end streak; CuA1 spot (submarginal) and spot at base of anal lobe often reduced or latter missing. C. *orcynia* complex—medial band junctures to distal cell-end streak; CuA1 spot (submarginal) apparent but base of anal lobe often not emphatically marked (*Thecla ahola,* shown here [Orizaba, Mexico, AMNH], also exhibits postbasal stripes characterizing some species of this complex).

American/northern South American taxa (*N. cambes* and *N. comana*) are sympatric at the Isthmus of Panama. In wing pattern, four species of *Noreena* are disparately marked: *N. molena, N. lemona* and *N. galactica* of SE Brazil and *N. guianivaga* of the Guyana Shield. The other species (*N. maria, N. cambes, N. comana, N. luxuriosa* and *N. pritzkeri*) are part of a more superficially similar complex of allopatric populations. Structurally, members of this latter complex diverge as much from each other as from the disparately patterned species. Such divergence probably results from the extreme habitat restriction typifying all of these taxa. Structural divergence in the group exceeds that of eumaeines whose pan-Neotropical allopatric segregations are usually considered complexes of subspecies (see, for instance, *Chlorostrymon,* Johnson, 1989). Consequently, along with apparent sympatric species, I treat widely distributed allopatric populations of *Noreena* as species, if morphologically distinct. This view could be modified when enough neotropical Eumaeine groups are revised to allow some overall assessment of nomenclatural status and allopatric divergence across many groups.

Contrafacia includes four distinctively marked new species representing three allopatric areas of endemism. These species are included in a new genus because they are distinguished by three autapomorphies and, like *Noreena,* encompass a Pan-

Neotropical distribution. *Contrafacia* taxa are currently known from few specimens but it is anticipated that future research will increase knowledge both of species diversity and geographic distribution. At present, one species is known from desert habitat in Sonora, Mexico; another occurs in xeric montane central Mexico and, as in *Noreena,* two species are sympatric in SE Brazil and Paraguay.

Format and terminology. Taxa of *Noreena* and *Contrafacia* exhibit a number of wing and morphological features not previously characterized in the literature. Accordingly, in the following diagnostic text, I introduce a number of descriptive terms and phrases used subsequently throughout the taxonomic entries, tables and figures. Aside from these, terminology follows Johnson (1976, 1978, 1988) and Johnson and Matusik (1988). In descriptions and discussions, taxonomic characters are cross-referenced with Tb. 2 and Figures 8 and 9 by referring to character number as "Ch.'#,'" etc., and such references are given only once per taxonomic entry. Cross references in the tables are also provided by notations for table number ("Tb. '#'") and outgroup number ("Outg. '#'" referring to taxa listed in Tb. 1). In the revisionary treatments, species are arranged in north to south geographic order.

Noreena Johnson, MacPherson and Ingraham
Figs. 1–4, 10

Noreena K. Johnson, MacPherson and Ingraham, 1986:2 Johnson 1988:34; Bridges 1988:II.78.

Diagnosis. From other Eumaeine, *Noreena* can be superficially recognized by the wings' upper surface "bipartite" scent brands (males, Ch. 16, Fig. 1G) and iridescent blue to silvery blue coloration (both sexes) combined with an under surface hindwing medial band split into costal and anal elements by two to three disjunct stripes in the discal cell (the "split-stripe," Ch. 17, Figs. 1, 10A). In addition, on the hindwing undersurface are bright, red to orange, "limbal spots" in cell CuA1 (postmedian to submarginal) and at the base of the anal lobe (Fig. 10A). Morphologically, the genus is characterized by autapomorphic characters 19, 21–23, and 25 of Tb. 2.

Description. Johnson et al., 1986, p. 2–3, illustrated in the present study in Figures 1 (imago), 2–3 (male morphology), and 4 (female morphology).

Types Species. Noreena maria K. Johnson, MacPherson & Ingraham (Figs. 1A, 2G, 3G, 4A) by original designation.

Distribution. Nine species distributed from east-central Mexico southward to northwestern Argentina.

Noreena cambes (Godman & Salvin), **new combination**
Figs. 1B, 2A, 3A, 4B

Thecla cambes Godman and Salvin 1879–1901 [1887], vol. 2:53, vol. 3: pl. 54, f. 16–18; Draudt 1919:769, pl. 154e; Schaus 1920:176; Comstock and Huntington 1958–1964 [1959]:173, [1964]:64, Bridges 1988:I.68, II.78;

Thecla syvix Dyar 1918:3; Schaus 1920:176; Comstock and Huntington 1958–1964 [1959]:174, [1964]:64; Bridges 1988:I.68, I.338, II.78.

Diagnosis. Above, both sexes silvery blue, female hindwing often uniquely bold blue. Beneath, concolorous, split-stripe and submarginal bands only moderately distinctive, fading in anal area with limbal markings obsolescent. Male androconial

brands and tergal and genital morphologies distinctive as detailed below. Known from Mexico to Costa Rica.

Description. MALE: Upper surface of wings: forewing dull blue on basal two thirds, distally fuscous. Bipartite androconial brand with distal sector equilaterally triangular, about half the size of parabolic basal sector. Tail of medium length at terminus of vein CuA2, shorter tail at CuA1. Hindwing dull gray-blue except for darker fuscous base and costal area. Under surface of wings (Fig. 1B): ground color uniformly brown-hued gray. Forewing with white postmedial line, costa to cell CuA1, angled caudobasad, not gently rounded; submarginal area with vague white intercellular lines, costa to vein CuA2. Hindwing ground concolorous but markedly obsolescent in limbal area. Medial split stripe and cell-end streaks not outstanding, each whitish and equally emphatic with companion whitish submarginal band extending from costa to cell CuA2; black marginal spots parallel submarginal band in cell interspaces from costa to anal margin. All pattern elements increasingly obsolescent toward anal lobe. Limbal spots orange, dull in cell CuA2, vivid at anal lobe. Length of forewing: $\bar{x}$ of six males (AME, AMNH) 13.3 mm, range 13.0–13.5 mm. FEMALE: Upper surface of wings: similar to male but with blue much duller on both wings; no androconial brand. Under surface of wings: as on males. Length of forewing: $\bar{x}$ of three females (AME, AMNH, BMNH) 13.7 mm, range 13.5–14.0 mm. MALE TERGAL MORPHOLOGY AND GENITALIA: Figures 2A, 3A. Incised posterior cavity extending only through the seventh abdominal segment, varying infraspecifically in length of cephalic prongs (*N. cambes* thus sharing shortest incised cavity of the genus with *N. molena* and *N. guianivaga,* these two species having cephalic lobes, not prongs). Genitalia, though otherwise typical of genus, only in *N. cambes* and *N. comana* showing little tripartite sculpturing at margin of saccus and valvae, *N. cambes* with margin of valval bilobed configuration irregular. FEMALE GENITALIA: Figure 4B. Cephalic component strongly angled distad, not arched or inclined as in congeners. Lamellae postvaginalis extremely serrate; apophyses of the papillae analyses shortest of genus.

Types. Holotype, ♂, BMNH, labelled "Type, Sp. figured, Thecla cambes, G & S. B.C.A. Lep. Rhop., Godman-Salvin Coll. 1911–93" "Cordova, Vera Cruz. Rumeli, BM Type Lep. Rh. 693." Holotype, ♂, *T. syvix,* National Museum of Natural History (NMNH), labeled "Presidio, Mexico, December 1913, type no. 19,253."

Distribution. Spatial: from Vera Cruz State, Mexico southward at least to Costa Rica (see below). Temporal: specimens (see below) are known from nearly every month of the year.

Remarks. A label on the holotype indicates it was figured in Draudt (1919). However, this color figure differs significantly from the holotype, particularly in omitting the CuA1 limbal spot and not clearly depicting pattern obsolescence in the limbal area.

I have been unable to study the type of *T. syvix* (NMNH) but its description is unambiguous and it has been listed as a synonym by Comstock and Huntington (1958–1964), Bridges (1988) and correspondence by R. K. Robbins (NMNH) to Bridges (1988, p. IV.76).

Material examined. COSTA RICA, San Jose, 28 April, H. Schmidt, 1♂ (BMNH), "Costa Rica," A.G.M. Gillott, 1929, 1♀, (BMNH); MEXICO, Presidio, Vera Cruz State, June 1939, C. C. Hoffman, 1♂ (AMNH), 12 July 1945 (AME); Urualoana, May, C. C. Hoffman, 1♀ (AMNH); Catemaco, Vera Cruz State, August 1962, T.

Escalante, 1♂ (AME); Santeco Mapan, Vera Cruz State, May 1955, T. Escalante, 1♂, (AME); Rincon, Guerrero State, 2,800 ft, September, H. Druce, 1♂ (BMNH); Colima, S Mexico, one male, 1♀ (CMNH). Specimens in NMNH assumed to be *N. cambes* by distribution (R. Robbins, pers. comm.)—MEXICO, Coatepec, male: Jalapa, 3♂, 1♀ [one labelled February]; Presidio, December 1913 (type of *T. syvix*); Vera Cruz State, Cordoba, 31 July 1955; COSTA RICA, San Jose, 1♀. Godman & Salvin (1879–1901 [1887]) list Cordova, Mexico and Polochic Valley, Guatemala. They question the association of their figured female because it is blue on both wings above; I have seen no completely blue female of *N. cambes,* but since many are fully blue on the hindwing such wider blue coloration may be possible.

Noreena comana (Hewitson), **new combination**
Figs. 1C, 2B, 3B, 4C

Thecla comana Hewitson 1863–1878 [1867], vol. 1:97, vol. 2: pl. 36, f. 87, 88 [or 86, 87]; Kirby 1871:388; Weeks 1911: xiv; Draudt 1919:769, pl. 154e; Comstock and Huntington 1958–1964 [1959]:192, [1962]:107; Bridges 1988:I.68, II.78.

Thecla peraltá Möschler 1883:308, pl. 17, f. 1; Draudt 1919:769; Comstock and Huntington, 1958–1964 [1959]:192, [1962]:107; Bridges 1988:I.272, I.68, II.78.

Diagnosis. Above, both sexes silvery blue, less distinctive in female. Beneath, split-stripe emphatically marked, ground color distad and basad strongly contrasted gray and brown, respectively; all limbal and anal markings emphatic, ground nowhere strongly suffused. Male androconial brands and tergal and genital morphologies distinctive as detailed below. Known from Panama through northern South America (see below).

Description. MALE: Upper surface of wings: forewing dull blue on basal two thirds, distally fuscous; hindwing dull blue at base, silvery blue on distal two-thirds, margins and costal area fuscous. Bipartite male androconial brand with sectors of about equal size, distal sector nearly oval, basal sector as isosceles triangle. Long tail at terminus of vein CuA2; shorter tail at vein CuA1. Under surface of wings: forewing ground color basally deep brown, distally bright light gray; vivid white postmedial line, costa to cell CuA1, patchy white submarginal line, costa to cell CuA2; hindwing basally deep brown contrasting distal bright gray separated by vivid white split-stripe with emphatic cell-end streaks. Limbal area bright gray, emphatic black spots in cells across entire wing, each with white chevron-like markings at the base; limbal spots bright red-orange blotches. Length of forewing: $\bar{x}$ of three males (AME, AMNH, BMNH) 12.7 mm, range 12.0–13.0 mm. FEMALE: Upper surface of wings: marked similarly to male but with hindwing duller blue. Under surface of wings: as of males. Length of forewing: one female, MNHN, 12.5 mm. MALE TERGAL MORPHOLOGY AND GENITALIA: Figures 2B, 3B. Incised posterior cavity generally elongate and extending cephalad beneath sixth and seventh segments; lateral edges with central indentation; cephalad prongs widely bifurcate with rounded ends. Genitalia resemble *N. cambes* most, but bilobed area in *N. comana* is smoothly parabolic, not angled along the distal edge. Aedeagus remarkably short, length less than 1.2 times that of entire genitalia from labides tip to terminus of saccus and with more than one-third of the terminal aedeagal length recurved (*N. cambes* aedeagus length exceeding 1.5 times that of entire genitalia and with less than the terminal one-fourth recurved). *N. comana* lacks the vincular process for abutment of the brush organs prominent

on *N. cambes*. FEMALE GENITALIA: Figure 5C. Caudal component elongate with rectangular, flaplike lamellae; cephalic component broadly arched with lateral attachment to corpus bursae limitedly sclerotized across center of corpus bursae; detached sclerotized shield parabolic, curving slightly proxad cephalic component of ductus. Due to format restriction, corpus bursae of Figure 4C shown folded under.

Types. Holotype ♂ (Fig. 1C), BMNH, labelled "Tapajos, Amazons, H. W. Bates, Coll. Godman-Salvin, B.M. type No. 642." Holotype, ♀, *T. peralta*, type locality, Paramaribo, Surinam, deposition unknown (Comstock and Huntington, 1958–1964 [1962]).

Distribution. Spatial: Widely distributed from Panama across northern South America southward to the Amazon River. Temporal: specimens represent nearly every month of the year.

Remarks. Week's (1911) reference to *N. comana* in a brief list of Venezuelan specimens collected is the only reference to this species in the classic early faunal lists (see Introduction). With the range of *N. cambes* being principally Mexican but extending at least to Costa Rica and that of *N. comana* extending north to Panama, their overall similarity may prove to represent ends of a cline. However, considering the long history of trans-Panamanian disjunctions and the compelling differences in the incised posterior cavities and certain genitalic characters of presently known specimens, it seems more likely the two may prove to be sympatric species in some areas of their respective southward and northward ranges.

The specimen figured by Draudt (1919) does not show the bold split-stripe and drastic basal/distal ground color contrast (though somewhat variable) typical of most *N. comana* and the holotype.

Deposition of the type of *T. peralta* is unknown but its description appears unambiguous. It has been listed as a synonym by Draudt (1919), Comstock and Huntington (1958–1964) and Bridges (1988).

Material examined. BRAZIL, [see type data]; "Vinea, Amazon," 1♂ (BMNH); COLOMBIA, Puerto Atlantico, 11–12 July 1920, dry hills in thick scrub, 1♂ (CMNH); PANAMA, La Boca, Canal Zone, 24 January 1908 (AMNH), 1♂, Canal Zone, 2♂, 1♀ (MNHN). TRINIDAD, Maupartius, November 1923 R. Dick (AME), 1♂; VENEZUELA, Naiguata, Federal District, 29 August 1937, Lichy, (AME), 1♂; Caracas, 1♂ (MNHN); specimens in NMNH presumed to be *N. comana* by distribution but not available for study—PANAMA, Canal Zone, Paraiso, 2 June 1979, 2♂, Panama Province, Cerro Campana, 1♀, 5 August 1977, San Carlos, 1♂, 21 July 1973; COLOMBIA, Meta, Villavicencio, 5♂, 4♀, 4–31 July 1972.

Noreena guianivaga, new species
Figs. 1F, 2C, 3C, 4D

Diagnosis. Above, male deep steel blue with thin black marginal lines, distal sector of androconial brands apparent only along outer edge of basal sector; female brown. Beneath, both sexes deep, concolorous, chocolate brown with a bright white costal suffusion framing a deep brown costal patch ground; split-stripe thin, vividly incised gray-white (black basad), with cell-end streaks, submarginal band, and limbal spots the most emphatic of the genus. Tergal and genital morphologies distinctive as detailed below. Known only from localities on the Guyana Shield.

Description. MALE: Upper surface of wings: ground color dull deep blue iridescent

throughout except for blackish marginal lines. Bipartite and androconial patch parabolicly elongate, light distal component comprising only about one-fourth the length of the remaining dark-colored brand (in *N. luxuriosa* basal sector is large and oval with distal sector only about one quarter its size and both curvate). Long tail at terminus of vein CuA2, shorter tail at vein CuA1. Under surface of wings: ground, both wings, deep chocolate brown. Forewing with white-blotched postmedian line, costa to cell M3, submarginal line obsolescent. Hindwing split-stripe vivid over dark concolorous ground; prominent bright gray-white distal suffusion in cells M1 and M2; three prominent cell-end streaks. Limbal pattern of concise, white-edged submarginal black line, anal area to costa. Limbal spots deep red. Length of forewing: 16.0 mm (holotype). FEMALE: Upper surface or wings: ground color dull brown; lacking androconial brand. Under surface of wings: as on male but undersurface ground color slightly lighter, pattern elements more vivid but costal hindwing suffusion reduced. Length of forewing: 16.0 mm (paratype, BMNH). MALE TERGAL MORPHOLOGY AND GENITALIA: Figures 2C, 3C. Incised posterior cavity smaller than on any congener except *N. cambes* and *N. molena,* extending only through the seventh abdominal segment. Contrasting *N. cambes,* but like *N. molena,* cavity dorsal plate with no cephalad pointing prongs, only two gently rounded lobes. Genitalia distinctive in tear-drop shaped ventral valval configuration and extreme constriction of valval terminus. Vincular brush organs in thick bundle, abutting wide area of dorso-cephalic region of vincular arc; saccal brush organs in thick strip anchored between caudal and distal margins of saccus. FEMALE GENITALIA: Figure 4D. Genital plate distinctly massive, both components quite wide relative to length (length of caudad component below lamellae, 2.2× maximum width; length of cephalad component proxad corpus bursae 3.0× maximum width). Lamellae angled distad; prominent centrad lobe on the lamella antevaginalis.

Types. Holotype ♂ (Fig. 1F, G), labelled "Caripito, Venezuela, 23 August 1942," "collection New York Zoological Society, Tropical Research Department," deposited AMNH. Allotype, ♀, labelled "Guyana Française, C. Bar," deposited BMNH. Paratypes, 2♂, same data as allotype, BMNH; 1♂, Upper Putumayo, S.E. Colombia, MNHN.

Distribution. Spatial: presently known only from the type locality and the generalized data of the paratypes. Temporal: known only from 23 August (holotype).

Remarks. It appears biogeographically significant that the type locality of *N. guianivaga* is the same as that of the recently described *Heraclides matusiki* Johnson and Rozycki (1986) (Papilionidae) which is presently known from a single specimen. The immediate sister species of each of these is western Andean in distribution (see *H. isidorus* (Doubleday), Johnson and Rozycki, 1986 and *N. luxuriosa,* below).

Etymology. The name, using the Latin suffix "*vaga*" means "Guiana roamer."

Noreena luxuriosa, new species
Figs. 1G, 2D, 3D, 4E

Diagnosis. Above, male iridescence brilliant and in distinct baso-medial patches, androconial brands with basal section abnormally large and ovate; female shiny brown; tails very long, costa vivid red from forewing base beyond expanse of discal cell. Beneath, ground concolorous medium brown, split-stripe vivid, with submarginal bands of both wings "exotically" scalloped basad and distad each vein. Male androconial brands and tergal and genital morphologies distinctive as detailed below.

Description. MALE: Upper surface of wings: ground color dominated by patches of brilliant blue—forewing from base to distinct juncture with postmedian fuscous, hindwing from postbasal area to margin; outer margin of wings fuscous, fuscous blotches at margin in cells M1, M2 and M3. Bipartite androconial brand with basal sector large and ovate, distad sector only about one-third this size and oblong in shape. Very long tail at terminus of vein CuA2, somewhat shorter tail at vein CuA1. Under surface of wings: ground, both wings, deep chocolate brown. Forewing postmedium line scalloped basad and distad along each vein, extending from costa to cell CuA1. Hindwing split-stripe vivid, extremely angled along the band (particularly toward anal margin) and with bright postmedian line scalloped basad and distad along each vein. Limbal spots deep red. Length of forewing: 16.0 mm (holotype). FEMALE: Upper surface or wings: ground color shiny brown; faint marginal blue-gray hue; no androconial brand. Under surface of wings: as on male. Length of forewing: 16.0 mm (allotype). MALE TERGAL MORPHOLOGY AND GENITALIA: Figures 2D, 3D. Incised posterior cavity large, extending well beneath sixth abdominal segment, widely tear-drop shaped with short rounded prongs formed by a cephalic indentation. Male genitalia with extremely thick terminally knobbed saccus and a rectangular vincular configuration. Valvae widely angled at base, tapering thickly to broad terminus. Vincular brush organs abutting a long triangular flap protruding from a large dorsal vincular spur. Vincular brush cluster consequently thin compared to bulbous clusters of congeners (latter abutting either an ovate flap or occurring variously along the dorsal edge of the vincular arc). Aedeagus elongate (length nearly one-third more than entire length of the genitalia); terminal third recurvate. FEMALE GENITALIA: Figure 4E. Genital plate massive, similar to *N. guianivaga,* but with central lobe of lamella antevaginalis more prominent. Compared to other congeners, cephalic component very thin, elongately arched so as to significantly displace the corpus bursae laterally. Arched cephalic component adjoining corpus bursae with a fingerlike extension about one-half the lateral expanse of the bursae. Sclerotized shield elongate and bent distinctly around caudal curvature of bursae.

Types. Holotype ♂ (Fig. 1G), Guayquichuma, Dept. el Oro, Ecuador, 1,200 m, August 1980, xeric habitat, leg. Henri Descimon. Allotype, ♀, "Ecuador," leg. Carlos Vela 1986, both deposited AMNH.

Distribution. Spatial: known only from the type locality (see below) and an associated specimen with ambiguous data. Temporal: known only from August (holotype).

Remarks. The type locality is xeric habitat in the Marañon area of endemism (*sensu* Brown, 1982) characterized by a number of highly insular butterfly taxa including *Papilio streckerianus* Honrath (Papilionidae), *Diaethria ceryx* Hewitson, and *Heliconius erato himera* Hewitson (Nymphalidae).

Etymology. The name is taken from the Latin *luxuriosus* referring to the exotic patterning and other distinctive markings of this species.

Noreena pritzkeri, new species
Figs. 1H, 2E, 3H, 4H

Diagnosis. Above, male shiny steel blue fading distally, distal sector of androconial brand extremely large, generally ovate; female dull brown. Beneath, ground concolorous medium brown; split-stripe cephalad discal cell pronounced, displaced basad

and thickly white, white extending basad and also distad through cells M1 and M2 to the margin. Anal area of split-stripe dull, thin and widely angled. Tergal and genital morphologies distinctive as detailed below. Known only from a cluster of localities in southeastern Brazil.

Description. MALE: Upper surface of wings: forewing baso-medially dull shiny iridescent steel blue, apex to subapex, brown; hindwing lighter iridescent blue dusted silverish toward the margin. Bipartite androconial brands with distal sector ovate and two or more times size of triangular basal sector. Hindwing with tail at terminus of vein CuA2. Under surface of wings (Fig. 1H): ground color deep brown; forewing with submarginal and postmedian lines, costa to at least to vein CuA2. Costal portion of hindwing split stripe thickly white, extending to and surrounding the cell-end streaks; adjacent distal and basal areas of cells M1 and M2 highly suffused white; rest of medial stripe thin and sharply angled. Limbal area suffused; limbal spots small, reddish. Length of forewing: 14.0 mm (holotype), $\bar{x}$ of 28 paratypes 13.8 mm, range 13.5–15.0 mm. FEMALE: Upper surface of wings: completely brown; no androconial brand. Under surface of wings: as on males. Length of forewing: 13.0 mm (allotype). MALE ABDOMINAL MORPHOLOGY AND GENITALIA: Figures 2H, 3H. Incised posterior cavity elongate, extending to beneath sixth segment, steeply tapered cephalically, but with elongate, widely bifurcate prongs. Genitalia with bilobed area of valvae basally rounded, caudal extension thin, though recurvate caudad the bilobed extension and then tapering sharply terminad. Saccus elongate, terminally knobbed. Aedeagus longest of genus, with length ×2 remaining genitalic length from tips of labides and saccus. Vincular and saccal brush organs uniquely contiguous. FEMALE GENITALIA: Figure 4H. Antrum elongate, terminal lamellae widely expanded dorsad, sculptured ventrad; ductus with mild lateral arch but widely extended sclerotized arms at juncture with bursae. Detached corpus bursal shield small but sclerotized to flap proxad the ductus.

Types. Holotype ♂, allotype ♀, "Morro Dona Martha, Rio de Janeiro" [Brazil] 27 April 1938, 25 April 1938, respectively, MPM. Paratypes: MPM—same locale as primary types, but 10 June 1938, 14 August 1958, 17 October 1936 (2); "Gavea, Rio de Janeiro," 1 January 1933, 23 June 1936, 1 January 1951; "Rio de Janeiro" 8 May 1961, 11 July 1934; "Teatu, Rio de Janeriro" 28 June 1930 (2), 1 June 1932, 12 May 1935, 29 July 1938, 25 March 1939, 23 May 1939; "Castorina, Rio de Janeiro" 1 May 1936, 20 May 1936(3), 6 May 1936; "Collegio Baptista, Rio de Janeiro" 29 May 1938 (2); "[illegible], Rio de Janeiro" 19 May 1939, 8 June 1934, 26 August 1939; Joinville [Brazil], 12 March 1954 (28♂). AMNH: 2♂, same data as primary types but 3 March 1936; "Gavea, Rio de Janeiro" 24 June 1932; AME—1♂, same data as primary types but 14 August 1958.

Distribution. Spatial: known from several localities in the vicinity of Rio de Janeiro formerly characterized by virgin primary forest (see above and Remarks). Temporal: dates on specimens range from early March to late August.

Remarks. The Gagarin Collection (MPM) contains large samples of SE Brazil theclines otherwise known from very few specimens (sometimes only the types). In addition, this collection contains numerous undescribed taxa, ranging from many singletons (see *N. galactica, C. minutaea,* below) to long series. Such rich collections of high diversity/low density taxa, like theclines, result from long term residence by a collector in a particular area. Indeed, K. S. Brown, Jr., who knew Gagarin, states

that when Gargarin caught a specimen unlike anything previously seen, he would return to its collection site again and again. Brown indicates that the type locality listed above was, at the time of Gagarin's work, virgin primary forest. Gagarin's collection sites at Joinville were also virgin primary forest; habitat at Gavea was, at least, transitional from primary to secondary forest. This suggests that the absence of other specimens of *N. pritzkeri* in any collection probably results from this habitat restriction and subsequent alteration.

Etymology. Patronym for Nicholas Pritzker.

Noreena galactica, new species
Figs. 1I, 2I, 3I

Diagnosis. In this small species (forewing base to apex 10.5 mm) the split-stripe converges in a helix-shaped configuration at the discal cell and is complemented distad by a bright white postmedian line extending to the costa. The male eighth tergal plate is cephalically non-bifurcate, valvae of the genitalia caudally constricted and elongate saccus laterally inclined.

Description. MALE: Upper surface of wings: forewing dull fuscous, base shiny steel blue; hindwing dull blue. Bipartite scent brands with distal sector ovate, twice size of basal section and more distally detached than in congeners. Under surface of wings: forewing with rather straight white postmedian stripe, costa to cell CuA1; white split-stripe on hindwing converging at discal cell in an ovate shape, making an overall helix-like configuration. White postmedian band proceeding costad from CuA1 to margin; limbal spot at cell CuA1 large, yellow, with central black spot, limbal spot near anal angle small, orangish. Limbal area unsuffused. Length of forewing: 10.5 mm (holotype). FEMALE. Unknown. MALE TERGAL MORPHOLOGY AND GENITALIA: Figures 2I, 3I. Plate over eighth tergite extending beneath seventh segment, nonbifurcate cephalad. Valvae with bilobed area steeply parabolic, slightly lobed near saccus; caudal extension extremely thin for genus, adjacent vincular spurs very wide; saccus longest of genus, inclined laterally. Aedeagus length exceeding rest of genitalia by only about one-third, caudal one-third recurved. Brush organs thin and elongate.

Type. ♂, "Collegio Baptista, Rio de Janeiro" 29 May 1938, Gagarin Collection, deposited MPM.

Distribution. Known only from type locality from May.

Remarks. Remarks concerning *N. pritzkeri* also apply to this species.

Etymology. The name refers to the helix-shaped stripe on the hindwing under surface.

Noreena molena (Jones), **new combination**
Figs. 1D, 2F, 3F, 4F

Thecla molena Jones, 1912:899, pl. 97, f. 9; Draudt, 1919:769, pl. 154e; Comstock and Huntington, 1958–1964 [1961]:171; Bridges, 1988:I.231, II.78.

Diagnosis. Both sexes very small ($\bar{x}$ forewing length of both sexes 11.0 mm compared to 13.0–16.0 mm for congeners), male above basally dingy iridescent blue, distally fuscous; female, dull brown. Beneath, split-stripe pattern greatly reduced and vague, exceeded in distinction by highly variegated ground color grizzled in bright

yellow-brown patchwork-like postmedian and submarginal patterns and by light, chevron-like, markings at the forewing subapex and across limbal area of hindwing. Male androconial brands and tergal and genital morphologies distinctive as detailed below.

Description. MALE: Upper surface of wings: forewing dull dark blue on basal two-thirds, rest of wing fuscous. Male androconial brand with bipartite sectors oblong, distal sector about one-third size of basal. Hindwing base to submargin dull dark blue, distally fuscous. Short thick tail at terminus of cell CuA2, stubby tail at vein CuA1. Under surface of wings: forewing dull brown, basal two thirds with white postmedian line, costa to cell CuA1. Postmedian ground color yellow-brown; submarginal line of gray chevron-like markings, costa to cell CuA2; yellow-gray grizzling along the apex. Hindwing dull mottled brown. Split-stripe pattern reduced, particularly at the cell-end streaks. Limbal areas with bold gray patchlike pattern in each cell, shaped distally into chevrons. Limbal spots reduced, red-orange. Length of forewing: 11.0 mm (syntype). FEMALE: Upper surface of wings: both wings dull brown, only faintly hued blue. Under surface of wings: as on male but limbal gray patchwork pattern more obsolescent. Length of forewing: 11.0 mm (lectotype). MALE ABDOMINAL MORPHOLOGY AND GENITALIA: Figures 2F, 3F. Incised posterior cavity with sides of relatively equilateral length compared to congeners, width equalling .75 length, plate extending cephalad beneath the sixth and seventh segments. Cephalic plate margin with two small smoothly rounded lobes, not prongs. Genitalic components bulbously thick and highly sculptured, valvae with bilobed areas triangular, caudal extension with raised ventral ridge and terminus tapered to a point. Vincular spurs thick and lobate, nearly bifurcate. Saccus funnel-shaped, distally angled. Aedeagus with terminus only slightly recurved. Vincular brush organs abutting entire edge of dorsal vincular wall and along slight, rounded basal anchorage lobe. Saccal brush organs elongate along margin of vinculum and valval base. FEMALE GENITALIA: Figure 4F. More dimunitive than congeners—lamellae nearly absent; ductus bursae small, caudally arched with lateral edge closely paralleling elongate sclerotized shield. Caudal component cephalically tapered, bilobate area adjoining diminutive lamellae.

Types. Syntype ♂ (Fig. 1D) and ♀, BMNH, female hereby designated lectotype, labelled "Thecla molena, type female, Dr. Jones, Castro Paraná, 2,900 ft. E. D. Jones, E. D. Jones Collection, Brit. Mus. 1919-295," syntype ♂ labelled "Thecla molena, type male, Dr. Jones, Castro Paraná, 2,900 ft. 2 May '10, E. D. Jones, E. D. Jones Coll., Brit. Mus. 1919-295, B.M. Type No. Rh 1086."

Distribution. Spatial: Known only from southeastern Brazil (see Remarks). Temporal: known specimens have May, July and November collection dates.

Remarks. The figure in Draudt (1919) does not adequately portray the mottled under surface and thin, yet vivid, split-stripe (which is more vivid on the syntype male than on the lectotype). The original Jones (1912) figure (Fig. 1D) is more accurate, though the whitish limbal markings on the actual specimen are more chevron-like, especially in the lectotype.

The species is known only from a few old specimens. These include the types, another female in the BMNH and two additional specimens in the MNHN. Comments by K. S. Brown concerning habitats at collection sites of Gagarin may apply to this species as well. *N. molena* is not included in Gagarin's collection, but Castro,

Paraná was not a major collection area for him. Perhaps, as with unique *Noreena* taxa in the Gargarin Collection, *N. molena* originally inhabited primary forest now absent from the type locality.

Material examined. BRAZIL [see type data], Caicera, Orinoco, Nov. 1898, 1♀ (BMNH); Espirito Santo, Brazil, July 1899, 1♂, 1♀ (MNHN).

Noreena lemona (Hewitson), **new combination**
Figs. 1E, 2H, 3E, 4G

Thecla lemona Hewitson, 1863–1878 [1874], 1:177, 2: pl. 69, f. 519, 520; Draudt, 1919:770, pl. 154e; Comstock and Huntington, 1958–1964 [1961]:108–109; Bridges, 1988:I.193, II.78.

Diagnosis. Like *N. molena,* dingy above and small (*N. lemona* $\bar{x}$ forewing length 12.0 mm, others see above) with ground color beneath dominated by variegated coloration; distinguished by large black-brown blotches, subapical on both wings, medial in cell CuA2 and surrounding the limbal spots. Of the tergal and genitalic distinctions noted below, the incised posterior cavity is the most notable of the genus, extending caudad from beneath the juncture of the fifth and sixth abdominal segments.

Description. MALE: Upper surface of wings: basal ground color dark iridescent azure blue becoming fuscous distad. Bipartite androconial brand with sectors oblong and of about equal size. Under surface of wings: ground color variegated light brown; outstanding dark blackish brown patches scattered throughout. Hindwing pattern with (a) postmedian band distinctly white, costa to cell CuA1, (b) white subapical line meandering, framing blackish brown blotch from costa to vein CuA1; hindwing with (a) thin split stripe clearly defined, basal area in cell CuA2 with large black-brown blotch, (b) limbal spots large, deep red, surrounded by dark black-brown ground color and (c) limbal area variegated light and dark brown with alternating bright gray-white and dark brown-black submarginal blotches, costa to vein M3. Length of forewing: 12.0 mm (BMNH). FEMALE: Upper surface of wings: ground color brown; lacking androconial scent brand. Under surface of wings: as on males. Length of forewing: 12.0 mm (lectotype). MALE TERGAL MORPHOLOGY AND GENITALIA: Figures 2H, 3E. Incised posterior cavity longest of the genus, extending caudad from juncture of fifth and sixth abdominal segments, uniquely arched dorsad beneath juncture of seventh and eighth segments. Genitalic configuration elongate for genus, saccus of equal length with valvae and thinly parabolic vincular arc. Valvae sharply angled between bilobed configuration and caudal extension; vincular spurs elongate and thin. Longest aedeagus of genus (length exceeding that of vinculum by ×2), terminally recurvate only in caudal one-third; caecum small. Vincular brush organs abutting prominent basal vincular spur (as only in *N. cambes*) saccal brush organs in short compact bundles. FEMALE GENITALIA: Figure 4G. Cephalic component straight, corpus bursae consequently removed to position more terminad caudal component. Caudal component elongate, length X3 width (beneath lamellae); lamellal lips wide, cephalically recurved. Sclerotized shield covering only caudal end of bursae, extending laterally only slightly.

Types. ♀ (Fig. 1E), BMNH labelled "Brazil, Hewitson Coll., Thecla lemona (2), B.M. type No. Rh. 694." hereby designated lectotype (see Remarks).

Distribution. Spatial: Known only from a few old specimens from southeastern Brazil with data indicating the species is locally sympatric with *N. molena* (see Remarks thereunder) and regionally sympatric with *N. pritzkeri.* Temporal: No data available (see Remarks).

Remarks. Only one Hewitson specimen appears extant in the BMNH, though the label notation "Thecla lemona (2)" on this specimen is standard BMNH procedure indicating there were originally two syntypes. A search of the collection, including the World War II reference collection (which in some cases is still not reincorporated into the general BMNH collection) has revealed only an additional non-Hewitson male. Hence, although some references (e.g., AME type catalogue) treat the extant Hewitson female as a holotype, I designate this specimen as lectotype. The figure in Draudt (1919) does not adequately portray the vividly contrasting ground color patches on this species. Habitat comments under *N. molena* Remarks may also apply to *N. lemona.*

Material examined. BRAZIL, [see type data], Castro, Paraná, Jones 2,900 ft., 1♂, 1♀ (BMNH); Espirito Santos [sic], Brazil, 1♂, 1♀ (MNHN). See Remarks under *N. molena.*

Noreena maria Johnson, MacPherson and Ingraham
Figs. 1A, 2G, 3G, 4A

Noreena maria K. Johnson, MacPherson and Ingraham, 1986:2; Johnson 1988:34; Bridges 1988:I.214, II.78.

Diagnosis. Resembling the wing pattern group *N. cambes, N. comana, N. luxuriosa* and *N. pritzkeri* but small (12–13 mm). Female brown, both sexes with forewing lines beneath convergent caudad, hindwing limbal pattern mottled black and white along the anal angle, and split-stripe rounded at the anal angle, not w-shaped. Male androconial brands and tergal and genital morphologies distinctive as detailed below.

Description. MALE: Upper surface of wings: forewing dull brown, apex to subapex, rest of wing iridescent blue; hindwing lighter iridescent blue dusted silverish toward the margin. Bipartite androconial brand with sectors of about equal size, triangular distad, oblong basad. Hindwing with tail at terminus of vein CuA2. Under surface of wings (Fig. 1A): ground color dull gray; forewing with submarginal and postmedian lines, costa to at least to vein CuA2, often converging caudad. Hindwing with split-stripe emphatic; median area costad vein M1 immaculate. Limbal area with arc of white macules in submargins, each heavily colored black at the vein interspaces, becoming one line costad, engulfing the parallel cell-end streaks and postbasal markings. Limbal spots vividly orange. Length of forewing: 12.0 mm (holotype), 11.5, 12.0 mm (paratypes). FEMALE: Upper surface of wings: as on male, but upper surface completely brown; no androconial brand. Under surface of wings: as on males but with lines of cell-end streaks often parabolic in shape and disjunct from the split-stripe. Length of forewing: 13.0 mm (allotype), 12.0 mm (paratype). MALE ABDOMINAL MORPHOLOGY AND GENITALIA: Figures 2G, 3G. Incised posterior cavity wide, oblongly hexagonal in general shape with cephalad prongs widely bifurcate and pointed. Genitalia with lateral surface of vinculum well defined; saccus broadly parabolic. Valval lobes separate; ventrad surface caudally tapered with slope to terminus somewhat jagged-edged on lateral surface. Aedeagus with small caecum,

long slender shaft and recurvate terminus; two cornuti. Vincular brush organs densely packed strips abutting the saccal vincular junction. Saccal brush organs as smaller clusters ventral along the proximal sides of the saccus. FEMALE GENITALIA: Figure 4A. Caudal component angled widely toward terminus; lamellal lips prominent. Cephalic component recurved widely distad, joining corpus bursae centrally. Sclerotized shield widely detached; point of attachment of ductus seminalis remote from ductus terminus. Adjoining arms of arched cephalic component meeting corpus bursae at midway position along its length. Two thornlike signa in cephalic half of corpus bursae.

Types. Holotype ♂, allotype ♀, AME.

Type locality. Mosconi, Salta Province, Argentina by original description.

Distribution. Spatial: presently known from numerous chapparal and chaco habitats in northwestern Argentina. Temporal: known from mid-May to late July.

Remarks. The overall rarity of *Noreena* taxa seems typified by the experience of Robert C. Eisele and Bruce MacPherson with *N. maria.* Thirty years of field collecting in northwestern Argentina has yielded only six specimens. The habitat is xeric woodland on the margin of xeric chaco vegetation. Mosconi is the type locality of several chaco and chaco margin endemic eumaeines (Johnson, 1988; Johnson, Eisele and MacPherson, 1988, 1989). As example of *N. maria* wing pattern, I have illustrated a recently caught female (Fig. 1A). This increases the number of specimens figured in the literature (see Johnson, MacPherson and Ingraham, 1986) and characterizes the marked caudal convergence of the forewing bands apparent on most specimens.

Material examined. Paratypes—type locality: 15 May 1976, leg. Bruce MacPherson, 1♀ (AME, loan by Eisele); June 1975, from Robert Eisele Collection (leg. Bruce MacPherson [correction from OD]), 1♂, (AMNH); May 1978, from Eisele Collection (leg. MacPherson), 1♀ (AMNH); other—2 km NW San Pedro, Jujuy Province, Argentina, 550 m, 2 May 1979, leg. Eisele, 1♂ (Eisele Collection); 4 km NW San Pedro, at Morro Centinela, SW ridge, 700 m, 24 July 1979, leg. Eisele, 1♀ (Eisele Collection).

Contrafacia, new genus

Figs. 5, 6, 10

Diagnosis. Distinctive in resembling taxa of Draudt's "*spurina* Group" above (Tb. IE) (bipartite androconial brands), but his "*orcynia* Group" beneath (Tb. 1C, Figs. 8, 9) (light split-striped pattern, Fig. 10B). Differing from all of these in sharing with *Noreena* nine synapomorphies (Chs. 1, 2, 5, 8–12, 15), most saliently the incised posterior cavity in males (Ch. 1, Figs. 2, 5, 8, 9) and laterally arched genitalic configuration in females (Ch. 8, Figs. 4, 5, 8, 9). Superficially distinguished from *Noreena* by reduction of the split-stripe pattern and reduced limbal spots (Fig. 10B) more characteristic of the *orcynia* Group (Tb. 1C, Ch. 17, Figs. 5, 8, 9, 10C).

Description. ADULT: Antennae fuscous, finely striped white, length about one third that of forewing base to apex; head with frons uncolored, eyes outlined white; thorax fuscous with gray to fuscous hairs profuse distad; abdomen fuscous, often with scattered blue powdering adjacent the hindwings. MALE: Upper surface of wings (Fig. 5): basal areas of forewings dull dark blue, postmedian and apical areas black. Bipartite androconial brand distad in discal area, basal component widely triangular

basad cross vein of discal cell, distal component variously oval and variously detached caudad from vein LDC. Hindwing usually of brighter iridescence than forewing: bright blue-green in one species, azure blue in the other. Long tail at terminus of vein CuA2, shorter tail at vein CuA1. Under surface of wings (Figs. 5, 10B): ground color tawney to brown, pattern with (a) whitish forewing postmedian line, costa to cell CuA1, (b) thin white hindwing medial band, variously meandering or jagged, with two to three cell-end streaks and white colored markings (blotches or dashes) in the submargin. Thecla-spot in cell CuA1 an orange orb. FEMALE: Upper surface of wings (Fig. 5): both wings silvery blue to somewhat darker iridescent blue, brown distally from postmedian area; no androconial brands. Under surface of wings (Figs. 4B, F; 5D, 10B): as on males but often with more distinction of cell-end streak component of light split stripe band. MALE TERGAL MORPHOLOGY AND GENITALIA: Figure 6. Eighth tergite specialized into posterior incised subcordate cavity with surrounding generally ovate sclerotized plate extending from beneath caudal one-half of seventh segment, laterally nearly to the spiracles, and usually indented caudo-centrad (Ch. 1, Figs. 6, 8, 9). Male genitalia similar to *Noreena* in caudal extension and terminus of valvae (Ch. 3, Figs. 3, 6, 8, 9), vincular spurs (Chs. 6, 7, Figs. 3, 6, 8, 9), vincular and saccal brush organs (Ch. 15, Figs. 3, 6, 8, 9) and general form of vinculum and saccus (Chs. 4, 5, 7, Figs. 3, 6, 8, 9) but with saccus extremely elongate as undescribed sister group X and in the "*orcynia* Group" (Tb. 1B, C). FEMALE GENITALIA: Fig. 6. Female with disjunct genital structure (Ch. 13, Figs. 6, 8, 9) but (Fig. 6) (a) ductus compactly arched proxad corpus bursae (*Noreena* taxa variously widely arched or angled), (b) ductus cephalic terminus contiguous with corpus bursae's distal sclerotized shield, (c) ductus seminalis emanating from juncture of ductus terminus and sclerotized shield and (d) cephalic juncture of ductus terminus and corpus bursae with only slight sclerotized arm extending laterally around bursal sac.

Types Species. Contrafacia mexicana, new species (Fig. 4C–F).

Distribution. Four species, distributed from Sonora, Mexico southward to Paraguay.

Etymology. The name, considered feminine, combines the Latin "*contra*" and "*facia*" and refers to the disparate wing and genitalic characters compared to outgroup taxa.

Contrafacia rindgei, new species
Figs. 5A, 6C

Diagnosis. Known only from a Sonora, Mexico female with distinctive gray-white under surface ground color, split-stripe divided into a costal line including two, ovate, cell-end streaks and a line extending caudad vein CuA1 (w-shaped along the anal margin and two limbal spots on each hindwing reduced to orangish dots). In the genitalia, the caudal component is elongate as in South American *C. australis* (though lacks the lobate lamellae of this species), not compact as in *C. mexicana* and *C. minutaea.*

Description. MALE: Unknown. FEMALE: Upper surface of wing: forewing ground color shiney light brown overshadowed with silvery blue basad especially on hindwing. Long tail at terminus of vein CuA2, short tail at vein CuA1. Under surface of wings: ground color, both wings bright whitish gray with very little variation of hue;

forewing with white postmedian band, bordered gray basad, angled steeply basad from costa to vein CuA1; hindwing with split-stripe restricted to a thin white line running from the costa to and including the cell-end streaks and a disjunct w-shaped line from anal margin to cell CuA1. Limbal spots occurring only as vague organgish dots. Submargin with vague line across wing from anal margin and intersecting the limbal spots. Length of forewing: 12.5 mm (holotype). FEMALE GENITALIA: Figure 6C. Caudal component elongate and with bilobate lamellae, similar to *C. australia*. Cephalic component compactly arched close to caudal end of corpus bursae. Juncture of ductus and corpus bursae with only slight lateral sclerotization on bursal sac. Sclerotized plate not detached; rather, conjoined with ductus proxad its cephalic terminus; ductus seminalis emanating from juncture of sclerotized shield and ductus bursae.

Type. Holotype ♀ (Fig. 5A), Port San Pedro, Sonora, Mexico, 6 January 1939, Frederick H. Rindge, taken at wildflowers in desert gully (F. H. Rindge, pers. comm.), deposited AMNH.

Etymology. The species is named for Dr. Frederick H. Rindge who collected the holotype.

Contrafacia mexicana, new species
Figs. 5B, C, 6A, B

Diagnosis. Superficially stands out among Mexican theclines by male's bipartite androconial brands and under surface (both sexes) exhibiting lightened split-stripe pattern of the brandless *ocrynia* complex. Compared to congeners, most similar to South American *C. australis* (Fig. 5) since *C. rindgei* (Fig. 4A, B) has the medial band broken into costal and anal elements. *C. australis* (known only from Paraguay/east Bolivia) is much larger ($\bar{x}$ forewing length 14.3 mm, *C. mexicana* 11.8 mm), has a less jagged split-stripe and a larger, more detached distal sector in the bipartite androconia. *C. mexicana* also has distinctive morphological characters (see below).

Description. MALE: Upper surface of wings: ground fuscous at apex of forewing and distad the submargins of hindwing. Base of forewing dull iridescent blue; hindwing with central patch of brilliant blue-green. Bipartite androconial scent brand with basal sector large and oblong, distad sector slightly detached costad from vein LDC. Long tail at terminus of vein CuA2; shorter tail at CuA1. Under surface of wings: ground color beige; forewing with vague to obsolescent submarginal band and distinct white postmedian band, costa to cell CuA1. Hindwing with moderately bright white split-stripe and prominent, variously detached, single cell-end streaks. Anal band area extremely incised in w-shape from vein CuA1 to the anal margin. Submargin, anal lobe to costa, with whitish parallel streaks in each cell, more broadly whitish toward costa. Orange spot at anal lobes and submarginal in cell CuA1. Length of forewing: 12.5 mm (allotype). FEMALE: Upper surface of wings: similar to male but duller silvery-blue; junctures of iridescent patches and distal fuscous less distinct; no androconial brand. Under surface of wings: as on males but white markings on hindwing more emphatic and cell-end streaks nearly connected to the split-stripe. Length of forewing: 11.0 mm (holotype). MALE TERGAL MORPHOLOGY AND GENITALIA: Figure 6A. Specialized eighth tergite caudally incised and of oval shape. Genitalia with extremely elongate, terminally knobbed, saccus (length over 1.25× caudal expanse of vincular arc). Vincular spurs prominent and elongate at caudo-

ventral margin of vincular arc, overlapping area with marked constriction of valve between its bilobed area and caudal extension. Aedeagus length exceeding entire length of genitalia from tip of saccus to tip of labides by about one-third; caudal terminus very slightly recurved. Vincular brush organs thickly clustered, saccal component reduced. FEMALE GENITALIA: Figure 6B. Relative to *Noreena* taxa, dual component configuration with both components compact; of *Contrafacia* taxa, caudal component relatively shorter than on congeners. Cephalic terminus of ductus bursae connected to sclerotized shield across area of corpus bursae proximal to ductus bursae, ductus seminalis emanating from this juncture. Corpus bursae with two signum with large sclerotized bases and thin central spines.

Types. Holotype ♀, allotype ♂ (Fig. 4C–F), Mexico City, September 1935, leg. Hoffman deposited AMNH. Paratypes: MPM–2♀, Mexico City, Mexico, Niedhofer Collection; AMNH—1♂, Matamoros, Puebla, 14 September 1910, Hoffman Collection.

Distribution. Montane central Mexico.

Remarks. I have made the female the holotype of the type species, consistent with the gender of *C. rindgei* and because the female genitalic characters most clearly show the sister group relationship to *Noreena.* It is unfortunate that Hoffman attached only brief data to the *C. mexicana* specimens. Though Hoffman usually placed individualized data in specimen papers, he sometimes enclosed large numbers of papers (each individually dated) in a larger envelope indicating the collecting locality. This practice appears more common for collecting areas more familiar to him ("Mexico City," "Presidio") or, perhaps, considered by him as less remote. Regarding specimens of *C. mexicana,* Hoffman may have assumed them to be *T. orcynia* by the under surface patterns. Since *T. orcynia* is considered a rather common butterfly (Draudt, 1919), it is possible that some museums may have specimens of *C. mexicana,* particularly female, included with *T. orcynia.* The MPM, though having small numbers of Mexican material, has a number of unusual samples, particularly in collections assembled by Moeck.

Etymology. The name denotes the Mexican region.

Contrafacia australis, new species
Figs. 5D, E, 6D, E

Diagnosis. Of congeners, *C. australis* is the largest ($\bar{x}$ forewing length 14.3 mm, compared to 12.2 mm, *C. mexicana*; 12.5 mm, *C. rindgei*; and 10.0 mm, *C. minutaea*), has a pronounced, jagged, split-stripe, diminutive limbal spots and (in fresh specimens) brilliant white limbal crescents (Fig. 10B). Of known males of *Contrafacia* (*C. mexicana* and *C. australis*), *C. australis* has a dark azure blue upper surface iridescence and an extremely triangular basal section of the bipartite androconial brand. In addition to generic morphological distinctions, the split-stripe band of *C. australis* distinguishes it from regionally sympatric outgroup taxa *T. ericusa* and *T. catharina,* which each have a simple postmedial band of broken slashes. Known only from southeastern Boliva and Paraguay.

Description. MALE: Upper surface of wings: apex and submarginal areas black, remaining basal areas of both wings iridescent deep azure blue. Bipartite scent brand with basal sector an extreme isosceles triangle boldly pointed distad; dorsal sector about half as large and ovate, detached slightly caudo-distally from vein LDC. Long tail at terminus of vein CuA2, short tail at vein CuA1. Under surface of wings: ground

color tawney. Forewing with postmedian band, costa to cell CuA1. Hindwing with thin, jagged mesial band and two to three thin cell-end streaks. Submargin with white parallel slashes in each cell. Length of forewing: 14.0 mm (allotype). FEMALE: Upper surface of wings: basal to medial areas dull silvery blue, distal areas brown. Tailed as male; no androconial brand. Under surface of wings: as on males but with more closure of cell-end streaks with the medial band. Length of forewing: 14.5 (holotype). MALE TERGAL MORPHOLOGY AND GENITALIA: Figure 6D. Incised posterior cavity distinctive, slightly concave at caudal edge. Genitalia similar to *C. mexicana* but with saccus less knobbed, vincular spurs more elongate, and valvae in ventral view with marked cephalic constriction followed terminally by recurvation to widely bulbous termini. FEMALE GENITALIA: Figure 6E. Disjunct configuration with caudal component elongate, lamellae oblongly ovate and bilobed (similar to *C. rindgei*). Cephalic component compactly arched, joining corpus bursae with only slight lateral sclerotization, sclerotized shield conjoined proximally to cephalic terminus of ductus bursae. Ductus seminalis emanating from juncture of sclerotized shield and ductus bursae. Two signa with broad sclerotized based constricting surface of corpus bursae.

Types. Holotype ♀, allotype ♂ (Fig. 5D), Cordillera, Santisima-Trinidad, 25°15′S, 57°38′W, Paraguay, August, B. Podtiaguin, deposited AMNH. Paratypes: CMNH—♂, Rio Surutu, E. Bolivia, 350 m, December 1913, leg. Steinbach, deposited CMNH (H. K. Clench genitalic preparation No. 1045); MPM—1♀, Nueva Italia, Paraguay, 6 July 1940; BMNH—1♀, Paraguay, 1901, Crowley Bequest; MNHN—1♀, Villa Rica, Paraguay, 10 January 1925 (Fig. 10B).

Remarks. Podtiaguin's collections from the central Cordillera of Paraguay have already been shown to include some very rare and endemic taxa (Johnson, Rozycki and Matusik, 1988). Clench, at CMNH, had separated from the collection a group of male specimens with bipartite scent brands which he tentatively identified as "sp. near *Thecla orios*" (TL Guatemala) but which evidenced distributions from SE Brazil and Bolivia northward to Honduras. All of these specimens appear morphologically as undescribed species near *T. orios* or of undescribed sister group X (Tb. 1B, Figs. 8, 9) except the male designated paratypical of *C. australis* above.

Etymology. The name, using "austral" or "south" denotes the area of geographic occurrence of this *Contrafacia* species.

Contrafacia minutaea, new species
Figs. 5F, 6F

Diagnosis. The known specimen is extremely small (female, FW, base to apex, 10.0 mm); the medial band from cell M2 is angled distinctly baso-costad and the parallel cell-end streaks detached. Antrum of genitalia with unique dorsal arch, ductus laterally arched; proximad shield on corpus bursae smallest of genus, corpus bursae extremely large, diameter of corpus bursae exceeding length of rest of genital parts.

Description. MALE: Unknown. FEMALE: Upper surface of wings: dull brown hued bluish; no androconial brand. Under surface of wings: ground color beige; forewing with vague white postmedian band, costa to cell CuA1. Hindwing with moderately bright, but thin, white medial split-stripe steeply angled baso-costad from cell M2. Parallel cell-end streaks small, detached basad from split-stripe. Limbal spot small, orangish. Limbal area unsuffused. Length of forewing: 10.0 mm (holotype). FEMALE GENITALIA: Figure 6F. Antrum uniquely inclined dorsally at juncture

with ductus bursae; ductus bursae laterally arched joining corpus bursae disto-centrad. Proximad sclerotized shield on corpus bursae small, extending to distal end of corpus bursae; corpus bursae extremely large, diameter exceeding length of all other genital parts.

Type. Holotype ♀ (Fig. 5F) labelled "Morro Dona Martha, Rio de Janeiro" [Brazil], 19 October 1938, deposited MPM.

Remarks. Remarks under *N. pritzkeri* pertain.

Etymology. The name indicates the extremely small size of the holotype.

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