A REVIEW OF THE GENUS *HYPOTHYRIS* HÜBNER (NYMPHALIDAE), WITH DESCRIPTIONS OF THREE NEW SUBSPECIES AND EARLY STAGES OF *H. DAPHNIS*¹

KEITH S. BROWN, JR.

Departamento de Zoologia, Instituto de Biologia, Universidade Estadual de Campinas, C.P. 1170, Campinas, São Paulo, Brazil, 13.100

ABSTRACT. The Neotropical genus *Hypothyris* (Lepidoptera: Nymphalidae: Ithomiinae: Napeogenini) is regarded on biosystematic grounds, as including 16 species divided into 137 geographical subspecies (34 still undescribed). The distributions of *Hypothyris* subspecies have been used to help define centers of butterfly endemism (at the lowest recognized taxonomic level) in the Neotropical forests; these correlate well with areas of high probability for forest continuity during the cool-dry spell at the end of the Würm-Wisconsin glaciation, 13,000–20,000 years ago. Three new subspecies described for the little-known *H. daphnis* D’Almeida extend its range to Amapá, extreme northwestern Pará, southern Maranhão, and the lower Rio Madeira. The early stages of the new subspecies from Amapá (illustrated) are similar to those of other solitary-feeding species of *Hypothyris*.

Fox & Real (1971) revised the Neotropical genus *Hypothyris* Hubner (Napeogenini). This revision was concluded under extenuating circumstances, after the death of the senior author and with limited access to important type material in British and continental museums; nevertheless, it was a major step in understanding the systematics of these mimetic butterflies.

Recent fieldwork in the Neotropics and visits to the British Museum (Natural History) led to a new revision of the biosystematics of the genus and the relation of natural biogeographical units to taxonomic names. This work was presented as a preliminary reorganization of Fox and Real’s order for the genus (Brown, 1977). This supplementary revision has now been further refined (Brown, 1979; Mielke and Brown, 1979) by additional field and museum study, especially the examination of Haensch and Weymer types in the Museum für Naturkunde (Humboldt-Universität, Berlin). The new biosystematic vision of this complex genus, including 16 species and 137 subspecies (34 of them undescribed), is supported by morphological studies and the discovery of intergrading populations in narrow hybridization zones between subspecies (Figs. 1–12; Appendix). Final definition of this genus and of other genera in the tribe will only be possible,

¹ The Ithomines of Brazil (Lepidoptera: Nymphalidae), Part VI; and Geographical Patterns of Evolution in Neotropical Lepidoptera, Part VII. For previous parts, See Brown (1977, 1979). Dedicated to the memories of Richard M. Fox and Harry K. Clench, who stimulated and assisted this research during the author’s visits to the Carnegie Museum.
The genus *Hypothyris* was among the most useful in the isoline determination of endemic centers for butterfly subspecies in the Neotropical forests (Brown, 1979, 1980; see Fig. 13). Of the 62 discrete
FIGURE 4
Subspecies of Hypothyris fluonia

FIGURE 5
Hypothyris vallonia & semifulva
FIGURE 6
Hypothyris gemella, daphnis & mansuetus

FIGURE 7
Subspecies of Hypothyris moebiusi
FIGURE 10
Distribution of the subspecies of *Hypothyris euclea*

ALTIMETRIC RANGE (meters)

0-200m(A), 200-600m(B), 600-1200m(C), 1200-1800m(D)
FIGURE 11
Subspecies of Hypothyris lycaste & H. anastasia
areas predicted by geoscientific evidence to represent regions of high probability for long-term forest stability through the major climatic variations of the late Pleistocene (Fig. 14), all but 10 corresponded to regional subspeciation patterns in a majority of local sets of the 123 species (and 867 subspecies) of Heliconiini and Ithomiinae analyzed (Brown, 1979: 146B). Of the 44 major endemic centers recognized for this set of butterfly subspecies, 38 could be seen in those of the genus *Hypothyris* (Appendix). It is hoped that this "palaeoecological forest refuge model" (Fig. 14) may be evaluated by the examination of regional subspeciation patterns in a variety of groups of Neotropical forest Lepidoptera. Most of the centers of endemism detected in the Heliconiini and Ithomiinae (which correlate well with the regions of high probability for stability in the geoscientific model) have also been seen in a variety of other sedentary forest butterfly groups ex-

**Fig. 12.** Male genital armatures of *Hypothyris* species, right side, with details of valve tip (from above) when important; schematic.
amined at the level of regional subspecies (Morphinae, Brassolini, Phyciodes sensu lato, Callicorini, Charaxinae, Troidini, Dismorphinae, and a variety of Lycaenidae and Hesperioidea), as the model would predict. Note, however, that the model does not relate to species biogeography (since many butterfly species pre-date the Pleistocene), nor to local species diversity (which is usually determined by parameters of the physical environment that set a limit on packing of the species potentially present). Indeed, many of the subspecies hybridization quadrants (black in Fig. 13) show exceptionally high species diversity, and are often the source of many dispersive and weedy "commercial" Lepidoptera.

**Subspecies and Biology of Hypothyris daphnis**

By far the least known species in the genus *Hypothyris* is *H. daphnis* D'Almeida (Figs. 6, 15–21). Two of the subspecies, *H. d. daphnis* and *H. d. daphnoides*, were described only recently (1945). Three additional subspecies have come to light in the past six years, extending the continuous range of this characteristic species to the limits of the Amazon forest in Brazil, east of the basins of the Rios Madeira and Cuminá. The early stages of one of these new subspecies were observed in central Amapá in mid-1978, and are described briefly here. The three new subspecies also are described. Material is distributed to museums in which *H. daphnis* is poorly or not represented.

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**FIG. 13.** Centers of butterfly subspecies endemism in the Neotropical forests (Brown, 1979, 1980), based on 3500 localities, 1520 quadrants (of $30' \times 30'$ latitude and longitude), and quadrant lists for 123 species and 867 subspecies of forest Heliconiini and Ithomiinae (including all the *Hypothyris*). A double correction is applied for hybridization of subspecies or mixing of semispecies; blacked-in quadrants have negative endemism values for all endemic centers represented in their lists (i.e., more than half of the of the subspecies recorded and associated with any one center are present in populations hybridized with equivalent or conspecific taxa from other centers). Single crosshatching indicates endemism values above $\frac{1}{3}$; double crosshatching indicates values over $\frac{2}{3}$ of the corrected maximum for the center. (This maximum value is given after the name of each center; the number which follows in parentheses is the maximum if no correction for hybridization is applied.)

**FIG. 14.** Regions of high probability for the continuity of humid tropical forest during the long cold, dry spell which terminated the Würm-Wisconsin glaciation, 13,000–20,000 years ago (Brown, 1979, 1980). Areas were determined by a summation of separate data sets from paleoclimatological, pedological (soil characters), geomorphological (surface landforms), and vegetational analyses, including subtraction for especially unfavorable soils and vegetation types and a double positive value for especially favorable soils.
FIGURE 13: Centers of subspecies endemism in Neotropical forest butterflies (1980)

COLOMBIA & ECUADOR
- Nechí 13(23)
- Chocó 12(18)
- Cauca 9(13)
- Magdalena 4(11)
- Santa Marta 6(6)
- Villavicencio 17(25)
- Putumayo 10(20)
- Chimbó 24(24)
- Abitagua 12(22)
- Súquia 16(18)
- Napo 7(22)

CENTRAL AMERICA
- Guatemala 19(19)
- Veracruz 18
- Tuxtla 14
- Guerrero 8
- Pacifico 14
- Verapaz 19
- Chiriquí 18(24)
- Darién 10(21)

SOUTHERN ANDES
- Marañón 9(10)
- Huallaga 13(18)
- Ucayali 14(26)
- Chanchamayo 11(19)
- Inambari 10(19)
- Yungas 19(25)
  1 La Paz 19
  2 Cochabamba 19

SOUTH AMERICA
- Belem 14(15)
- Marajó 5(7)
- Tapajós 22(26)
- Rondônia 16(25)

LOWER AMAZON
- Pernambuco 6(6)
- Araguaia 7(7)
- Bahia 8(10)
- Rio de Janeiro 12(13)

AMERICA TROPICAL
- Caracas/T 3
- Catatumbo 7(9)
- Rancho Grande 19(20)
- Sucre/Trinidad 10(10)
- Apure 10(10)
- Pantepui 8(8)
- Roraima 6(8)
- Venturi 3(3)
- Imerí 11(13)
  1 Vaupés 8
  2 Nebílina 11
- Oiapock 18(22)

SOUTH AMERICA
- Madeira 5(7)
FIGURE 14: Paleoeocological Forest Refuges

AMERICA TROPICAL
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6. Hachí
7. Chocó
8. Chibchas
9. Casca
10. Magdalena
11. Santa Marta
12. Catatumbo
13. Río Grande
14. Suru-Trinidad
15. Apure
16. Villavicencio
17. Putumayo
18. Napo
19. Abitagua-Serra
20. Sucua
21. Morona
22. Huallaga-Pachites
23. Sierra del Divisor
24. Chanchamayo
25. Inambari
26. Yungas
27. Uquipue
28. Guaporé
29. Imataca
30. Chichívero
31. Bocay-J-Catucamu
32. Parima
33. Mochamortá
34. Arapi
35. Nobilla
36. San Gabriel
37. Vaupés
38. Apaporis
39. Giana
40. Borinane
41. Yapyque
42. Sierra do Novo
43. Jari-Trombetas
44. Monaus
45. Caplin-Garupi
46. Carajás
47. Tapajós-Xingu
48. Rondônia-Aripuanã
49. Purus
50. Jurua
51. Loreto-Lapurá
52. Diquiba
53. Cariri-Arapuá
54. Pirambuco
55. Ribá
56. Agreste
57. Quê
58. Pará-Paraná
59. Paraíso-Paraná
60. Iguazu
61. Alegre
62. Rio de Janeiro

- 60% PROBABILITY
- 80-100% PROBABILITY

SUGGESTED NAMES
H. daphnis shows a characteristic pattern of distribution and abundance, in relation to the endemic centers (Fig. 13). The species appears uncommonly in restricted localities between the nuclei (regions with highest values for endemism) and the peripheries (regions where endemism values are positive but fall below 50% of the maximum) (Fig. 6). This suggests a partial marginalization process for the species, similar to but less accentuated than that in H. leprieuri (Fig. 8), which almost always occurs at the peripheries of endemic centers (endemism values near to 0). This distribution would maintain strong isolation between the subspecies of daphnis, but allow extensive hybridization in the subspecies of leprieuri.

The relationship of H. daphnis to H. gemella remains unresolved until more biological information is available. They are similar but not identical in male genitalia (Fig. 12); allopatric (Fig. 6); but they are not closely homologous in color-pattern elements. Together, they form a well-segregated subgroup within the genus Hypothyris.

Further discussion of speciation patterns in the genus Hypothyris and the biological distribution patterns of H. leprieuri and other species, as well as description of the many other new subspecies, must await additional fieldwork. Meanwhile, it is hoped that the species concepts presented here may be further tested in the field and in the laboratory, so that the genus may be better understood.

Hypothyris daphnis

Diagnosis. A Hypothyris characterized externally by the presence of a highly elongated submarginal spot in forewing space R₅-M₁, contrasting with a small rounded spot directly above it in space R₄-R₅; and internally by male genitalia with a long thick penis and a fairly short and much narrower saccus, and three distinct teeth external to the tip of the valve. Sexes similar, with females having a larger wingspan, more rounded and opaque wings, and no hair-brush on the hindwing costa. Dorsal and ventral wing surfaces similar; abdomen yellow ventrally. Distributed in Brazil, from Amapá to Ron-
dônìnìa; apparently absent west of the Rio Cuminá (Paru do Oeste, Erepecuru), north of the Solimões/Amazonas (where replaced by the congener H. gemella), and in the upper Amazon (where not substituted by any close species).

**Key to subspecies**

1a. Forewing median yellow patch broad, continuous from costal to anal margin, with postmedian yellow band narrow, broken into separate spots  

1b. Forewing median and postmedian yellow bands nearly equal in width, separated by an irregular undulate black band  

2a. Hindwing median black band narrow, margin with large yellow spots  

2b. Hindwing median band broad or fused with all-dark margin  

3a. Hindwing median band broken into four widely separated spots  

3b. Hindwing median black band essentially continuous  

4a. Forewing median black band jagged, postmedian yellow band narrow, often discontinuous; hindwing orange above a jagged black median band, with prominent yellow spots in the dark marginal area  

4b. Forewing postmedian black band smoother, postmedian yellow band broad and continuous; hindwing orange above a smooth narrow median black band, no prominent yellow spots in narrow marginal black  

The distributions of the subspecies are shown in Fig. 6; all are illustrated in Figs. 15–19. Description of the three new subspecies follows notes on the two described previously by D'Almeida (1945).

*Hypothyris daphnis daphnis* D’Almeida, 1945  
(Figs. 6 & 15)

**Forewing** (24–27 mm) with a jagged black band dividing the median-postmedian yellow region into two discontinuous crossbands of nearly equal width. **Hindwing** medium black band jagged but continuous; orange costally of this; marginal black including large yellow spots.

**Distribution.** Northwestern Mato Grosso, extreme southern Amazonas, most of Rondônia to extreme northern Bolivia (Guayeramerin). Registered localities and coordinates:

Cidade Humboldt, Rio Aripuanã, Mato Grosso (10°13’S, 59°22’W)  
Mina Igarapé Preto, Amazonas (8°34’S, 61°10’W)  
Cachoeira do Samuel, Rio Jamari, Rondônia (8°45’S, 63°27’W)  
Rio Jamari, Rondônia (southwest of 9°S, 63°W)  
Porto Velho, Rio Madeira, Rondônia (8°45’S, 63°53’W)  
São Carlos, Rio Madeira, Rondônia (9°05’S, 64°05’W)  
44 km N of Ariquemes, Rondônia (9°35’S, 63°03’W)  
26 km SW of Ariquemes, Rondônia (10°04’S, 63°13’W)  
Porto Velho to Vilhena, km 260, Rondônia (10°18’S, 62°39’W)  
Jarú, Rondônia (10°27’S, 62°27’W)—very abundant in region  
Riozinho, Rondônia (11°30’S, 61°20’W)  
Jiparaná (Vila de Rondônia), Rondônia (10°52’S, 61°57’W)  
Guajara-Mirim/Guayeramerin, Rio Madeira, Rondônia/Bolivia (10°47’S, 65°20’W)

*Hypothyris daphnis daphnoides* D’Almeida, 1945  
(Figs. 6 & 16)

**Forewing** (24–27 mm) crossed by a broad continuous yellow median patch and a narrow, broken postmedian spot-band. **Hindwing** black median band jagged, margin with large yellow spots.
Distribution. Area between the Xingu and Tapajós Rivers, Pará, Brazil, principally between 3° and 5° south latitude. Registered localities and coordinates:

- 22 km W of Belo Monte, Rio Xingu, Pará (Rodovia Transamazônica) (3°05'S, 51°52'W)
- Brasil Novo, km 35, Altamira a Itaituba, Pará (Rodovia Transamazônica) (3°18'S, 52°33'W)
- km 100, Altamira a Itaituba, Pará (3°29'S, 53°01'W)
- km 124, Altamira a Itaituba, Pará (3°32'S, 53°11'W)
- km 162, Altamira a Itaituba, Pará (3°39'S, 53°29'W)
- km 185, Altamira a Itaituba, Pará (3°43'S, 53°44'W)
- Ruropolis Presidente Médici, km 1552 Cuiabá-Santarém (junction with Rodovia Transamazônica), Pará (4°04'S, 54°56'W)
- Igarapé Tinga, km 1557 Cuiabá-Santarém, Pará (4°01'S, 54°58'W)
- km 190, Santarém a Ruropolis (km 1578 Cuiabá-Santarém), Pará (3°53'S, 54°54'W)
- Monte Cristo, Rio Tapajós, Pará (4°05'S, 55°38'W)

Hypothyris daphnis madeira Brown new subspecies
(Figs. 6 & 17)

Forewing 25–29 mm (large for the species). Similar on the forewing to H. d. daphnis, but with the median black band smoothed to form a near-interrupted sinuate spot-band and a subtriangular cubital spot; black cell-spot large, rounded. Hindwing median black bar broken up into four separate oval spots.

Types. HOLOTYPE ♀, km 519 Manaus-Porto Velho highway, Amazonas, Brazil, ravine to west of road (6°31'S, 62°54'W), 17 Sept. 1978 (K. Brown), deposited in the Museu Nacional (Rio de Janeiro). ALLOTYPE ♂, Lago Acará, Rio Madeira, Amazonas, Brazil (southwest of 6°S, 62°W), Museu Nacional (Rio de Janeiro). One ♀ and 15 ♂ PARATYPES, same data as holotype; ♀ paratype distributed to each of the Museu Nacional (Rio de Janeiro), Departamento de Zoologia da Universidade Federal do Paraná (Curitiba), Museu Goeldi (Belém), Instituto Nacional de Pesquisas da Amazônia (Manaus), Allyn Museum of Entomology (Sarasota), American Museum of Natural History, National Museum of Natural History, Cornell University Collection, Carnegie Museum (Pittsburgh), Museum National d'Histoire Naturelle (Paris), Museum für Naturkunde (Berlin), and Zoológisches Sammlung des Bayerischen Staates (Munich); ♀ and 3 ♂ retained in author's collection. 3 ♀ and 5 ♀ PARATYPES, same data as holotype except collected by D. Gifford; one pair deposited in the British Museum (Natural History), ♀ in the Royal Scottish Museum (Edinburgh), 2 ♀ and 3 ♂ retained by D. Gifford, Brasília. One ♀ PARATYPE, "among (below) Manaus," from Stoffel collection via H. Descimon, collection of the author.

Hypothyris daphnis clenchi Brown new subspecies
(Figs. 6 & 18)

Forewing (24–27 mm) not so heavily nor jaggedly marked with black as in H. d. daphnis, with a continuous and broad yellow postmedian band reducing the apical black area. Hindwing with median band smooth and narrow; marginal black also narrow with no yellow spots; disc translucent yellow in both sexes.

Hypothyris daphnis amapaensis Brown new subspecies
(Figs. 6 & 19)

Forewing (23–26 mm) similar to H. d. daphnoides, with a broad yellow median patch and four small postmedian spots. Hindwing much darker, the marginal black area without light spots, and the black median band heavy, occasionally fused to the marginal black.

Types. HOLOTYPE ♂ and ALLOTYPE ♀, Lourenço (Mines), Amapá, Brazil (2°19'N, 51°38'W), 29 June 1978 (K. Brown), donated to the Museu Nacional, Rio de Janeiro. 7 ♂ and 15 ♀ PARATYPES, same locality, 27 June to 1 July 1978 (K. Brown); one pair in each of the Museu Goeldi (Belém), the British Museum (Natural History), the American Museum of Natural History, and the Allyn Museum (Sarasota); ♀ in each of the Museu Nacional (Rio de Janeiro), Instituto Nacional de Pesquisas da Amazônia (Manaus), Departamento de Zoologia da Universidade Federal do Paraná (Curitiba), National Museum of Natural History (Washington), Cornell University collection (Ithaca), Carnegie Museum (Pittsburgh), Museum National d'Histoire Naturelle (Paris), Museum für Naturkunde (Berlin), and Zoologisches Sammlung des Bayerischen Staates (Munich); 3 ♂ and 2 ♀ retained in the author's collection. 3 ♀ PARATYPES, Uru, km 75 Calçoene-Lourenço, Amapá, Brazil (2°27'N, 51°24'W), 25–26 June 1978 (K. Brown), in the author's collection. ♀ PARATYPE, no locality (probably near Calçoene, Amapá), in the Museu Goeldi, Belém. ♂ PARATYPE, Tiriós, upper Rio Paru do Oeste (=Cumimá), Pará, Brazil (2°14'N, 55°57'W), 29 Jan. 1975 (F. Bührnheim), in the author's collection.

Juvenile stages of Hypothyris daphnis amapaensis

During work in Lourenço, Amapá, in June 1978, I had occasion to observe two females of H. daphnis amapaensis ovipositing on plants of Solanum asperum L.-Cl. Rich.; one was a small bush on a field-and-stream edge (a typical habitat, where this plant is heavily attacked by Hypothyris euclea all over tropical Brazil), the other was a small tree in the middle of very dense forest above a small stream. A number of eggs and larvae in various stages were collected from these two plants. The larger larvae were reared to adults on the leaves of S. asperum, giving one male and one female (not paratypes). A brief summary of the early stages follows:

Egg subspherical (flattened where attached to leaf), glistening white, 0.5 mm in diameter, with numerous horizontal and vertical ridges, much as in the eggs of other solitary Hypothyris and many other Ithomiinae.

Larva (hatching after at least four days) initially translucent yellow, changing to greenish after feeding. First three instars (two to three days each) with few distinguishing marks other than the usual development of a "corrugated effect." They progress from rasping the underside of leaves to chewing at the edges.

Fourth instar larva similar to the fifth (Fig. 20). Mature larva near 30 mm in length; dorsally gray-green, supralaterally strong ochre yellow in a wide band. Semicircular lateral projections, one per segment, on the thorax and abdomen; each segment divided unequally in five "corrugations." Head and anal segment light greenish-white.

Total duration of larval feeding stage was about two weeks.

Prepupa doubled over in a "U" loop; whitish to yellowish. Duration one day.

Pupa (Fig. 21) brown, with some weak reflectiveness on wing-cases; strongly bowed
to assume the typical humped shape of many ithomiine pupae; eyes projecting in cones; wing cases and abdomen spotted with darker brown. Not nearly as silvered as most Dirceenine pupae, but very similar to Hypothyris ninonia, H. euclea, and other Hypothyris pupae in shape and coloration. Duration eight days.

**Adults** emerge in the early morning, and fly before midday. They may then be found sparingly in the heavy, humid forest in steep ravines of the Serra Lombard around Lourenço Mines, where they fly all day long and are readily attracted to *Heliotropium* bait.

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**LITERATURE CITED**


**APPENDIX**

Speciation and subspeciation in *Hypothyris* (Ithomiinae: Napeogenini)

The fundamental organization of the genus *Hypothyris*, based principally on male genitalia as employed in Fox & Real (1971), needs very little change. Fieldwork in hybridization zones has produced some unexpected indications of conspecificity of taxa maintained separate in that revision. A survey of the genitalia of most of the members

**Note:** Brown (1979) is available from the author to those who are studying the systematics and biogeography of Neotropical Lepidoptera. Mielke & Brown (1979) includes a taxonomic revision of the subfamily; it is available from either of the authors. Both include English summaries of the most important points.
of the genus (Fig. 12) also led to some surprises; not only did the genital armatures show appreciable variation within externally homogeneous populations, but also appreciably different genitalia were seen in patently conspecific taxa. For this reason, a biogeographical component was included along with the morphological parameters in the laying out of polytypic species (Figs. 2–11). Biological information from natural hybrid zones was employed whenever available; for example, it supported conspecificity of *H. vallina* and *H. pellucida* with *H. ninonia*, of *H. hygia* and *H. rowena* with *H. fluonia*, of *H. "aemilia"* and *H. fulminans* with *H. semifulva*, of *H. pyrippe* with *H. mamercus*, of *H. philetaera* and *H. laphria* with *H. euclea*, and of *H. honesta* with *H. anastasia*. Some of these unions were also supported by the biology of juvenile forms. In other cases, biological data confirmed the incompatibility of closely related species of similar morphology, such as *H. connexa* and *H. ninonia*, or *H. lycaste* and *H. anastasia*. Wide sympathy and strongly variant morphology suggested separate species status in the cases of *mansuetus* and *moebiusi*, *leprieuri* and *euclea*, and *vallonia* and *fluonia*. Many other decisions were educated guesses, based on a combination of morphology, biology, biogeography, and homology of minor color-pattern characters; for example, there is as yet no compelling biosystematic evidence for the association of *H. daeta* and *H. fimbria* with *H. ninonia* (although *diphes* seems secure there), of the Amazonian and Andean groups of subspecies of *H. mamercus* with each other, of *H. mayi* with *H. thea*, or of *H. glabra* with *H. lycaste*. The genitalia of *H. lycaste antonia* (Fig. 12) are very deviant within this species, and it may not be interfertile with *H. l. limosa*, though a recent common ancestry for the two seems very likely.

Examination of the respective types revealed that *Hypothyris glabra carvalhoi* (sensu Fox & Real) is in fact a subspecies of *Rhodussa cantobrica*, as originally described by D'Almeida. The very yellow, but ventrally orange-washed *ninonia* from north of the Roraima area (in Bolivar, Venezuela—Imataca center, Fig. 13) corresponds to *my­sottis* (Haensch), differing from *colophonia* D'Almeida from south of Roraima in Brazil, and "pellucida," "vallina," and "colosseros" are transitions between these and neighboring subspecies (see Fig. 2). *Napeogenes seminigra* is in fact a subspecies of *Hypothyris fluonia* (and an older name for "satterwhitei" Fox & Real), as is the "problematic" *H. manaos*. *Maenas* is actually a transition between the extreme melanic phenotype illustrated by Fox & Real (1971) and a new subspecies from lower elevations (Fig. 9); for the sake of stability this name should be applied to all orange-and-black populations from higher elevations in the Peruvian Andes. Weymer's *nemea* is an older name for Real's "surinamensis," but "neustetteri" and its senior synonym "bifasciata" are intergrades between *H. euclea philetaera* and *H. e. caldasensis*. The correct name for the Pernambuco subspecies of *H. ninonia* is *evanescens* Haensch or, if the original description be impugned for mistaken reference to an earlier name, is *evanescens* D'Almeida, 1923 (as a form) or 1939. Weymer's *daetina*, a dark chocolate form, must remain a species inquendium until it is recaptured in Bahia. The oldest name for Riley's *medea* is *castanea* Butler (the male lectotype as designated by Mielke & Brown, 1979: 90, not the female illustrated by Butler = *a. anastasia*). The holotype designated by Haensch for his *latefasciata* is a senior synonym of *fugitiva* Fox, while Feisthamel's *leprieuri* (used with an extra "i" by Fox & Real for the Oyapock subspecies of *H. ninonia* = *H. n. latefasciata*) is actually the oldest named subspecies of the complex represented elsewhere by *ignorata*, *michaelisi*, *catilla*, *ninyas*, and a host of new subspecies (Fig. 8).

*H. semifulva* has two month's priority over "aemilia" for the species including both, which is fortunate because the latter name represents a rare transitional form between *H. s. angelina* and *H. s. pallisteri*.

The types of essentially all names have been seen. The majority of geographical subspecies recognized here (marked with an asterisk in Fig. 1) were studied in monomorphic populations in the field, in the appropriate regions. Names marked with a dagger on the list below were dissected to verify male genitalia, or slides prepared by Fox or Godman were examined in collections in the National Museum of Natural History or the British Museum, respectively.
Most specimens should be able to be rapidly identified with the drawings and geographical ranges shown in Figs. 2-11. In cases of doubt, the genitalia can be compared with those schematized in Fig. 12. The taxa which are most often confused on superficial characters are ninonia/connexa and gemella/vollonia in the Pantepui area, some thealeprieuri (note the different shape of the FW yellow median band, especially the distal border), meterus/semifulva/anastasia in the high Andes (genitalia work best), ninonia/euclea/mamercus in parts of the Amazon (the long narrow penis of the first can often be directly observed without a lens or dissection), semifulva/manuensis in central Peruvian valleys (note the distal border of the FW yellow band), leprieuri/euclea/ninonia in various parts of the Amazon (compare the FW yellow fascia carefully), and anastasia with like species in the upper Amazon (the disjunct comma-mark in FW space Cu1–Cu2 will identify all anastasia subspecies).

At least ten, perhaps twenty more subspecies of Hypothyris should appear with intensive work in still little-explored parts of the Neotropics (in addition to the 31 already identified and still undescribed). Several of these, especially from the Marajo and Ventuari regions, are already in hand but awaiting broader field data and longer series to help decide on their status.

A list of the recognized specific and subspecific taxa follows, along with the association of each with an endemic center (Fig. 13) as used in the quantitative analysis of corrected endemism (Brown, 1979, 1980).

**Genus Hypothyris Hübner, 1821**

<table>
<thead>
<tr>
<th>Subspecies</th>
<th>Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>ninonia</td>
<td>Madagala (?)</td>
</tr>
<tr>
<td>granadensis (Haensch, 1905)</td>
<td>Villavicencio</td>
</tr>
<tr>
<td>fimbria (Hewitson, 1855)</td>
<td>Putumayo</td>
</tr>
<tr>
<td>daphnes Fox, 1971</td>
<td>Ucayali</td>
</tr>
<tr>
<td>latipennis (Tessmann, 1928)</td>
<td>Inambari</td>
</tr>
<tr>
<td>anastasia (Hauberg)</td>
<td>Guaporé</td>
</tr>
<tr>
<td>manuscript subspecies (Brown)</td>
<td>Imataca</td>
</tr>
<tr>
<td>completomaculata (Zikán, 1941)</td>
<td>Pantepui</td>
</tr>
<tr>
<td>mutilla (Hewitson, 1867)</td>
<td>Imeri</td>
</tr>
<tr>
<td>completa (Haensch, 1905)</td>
<td>Guiana</td>
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<tr>
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<td>Manaus</td>
</tr>
<tr>
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</tr>
<tr>
<td>neimyi (Riley, 1931)</td>
<td>Belem</td>
</tr>
<tr>
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<td>Tapajós</td>
</tr>
<tr>
<td>manuscript subspecies (Brown)</td>
<td>Rondônia</td>
</tr>
<tr>
<td>tenebralis (Staudinger, 1884)</td>
<td>Madeira</td>
</tr>
<tr>
<td>teveanescens (Haensch, 1909)</td>
<td>Tefc</td>
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<tr>
<td>laeta (Boisduval, 1836)</td>
<td>Loreto</td>
</tr>
<tr>
<td>meterus (see Fig. 3)</td>
<td>Pernambuco</td>
</tr>
<tr>
<td>zeuxis Fox, 1945</td>
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<td>Putumayo</td>
</tr>
<tr>
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<td>Andes</td>
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<td>Pantepui</td>
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<td>Imeri</td>
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For the full list of subspecies and their center, see the text.
Genus *Hypothyris* Hübner, 1821, continued.

<table>
<thead>
<tr>
<th>Species</th>
<th>Location</th>
<th>Subspecies</th>
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<tr>
<td><em>semiultra</em> (see Fig. 5)</td>
<td>Villavicencio</td>
<td><em>leprieuri</em> (Feisthamel, 1835)</td>
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<td><em>fulminans</em> (Butler, 1873)</td>
<td>Putumayo</td>
<td>Oiapock</td>
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<tr>
<td><em>putumayensis</em> Fox &amp; Real, 1971</td>
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<td>Belém</td>
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<td><em>satura</em> (Haensch, 1903)</td>
<td>Huallaga</td>
<td>Tapajós</td>
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<td>Napo</td>
<td>Cachimbo</td>
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<td>Puerto Cabello</td>
<td>Tapajós-S</td>
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<td>Rondônia</td>
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<td>Chiriquí</td>
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<td>Darién</td>
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<td>Nechi</td>
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<td>Chocó</td>
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<td>Rancho Grande</td>
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<td>Abitagua</td>
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