

# BULLETIN OF THE ALLYN MUSEUM

*Published by*  
THE ALLYN MUSEUM OF ENTOMOLOGY  
Sarasota, Florida

Number 13

26 July 1973

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## THE HELICONIANS OF BRAZIL (LEPIDOPTERA: NYMPHALIDAE). PART V. THREE NEW SUBSPECIES FROM MATO GROSSO AND RONDÔNIA

Keith S. Brown, Jr.

Centro de Pesquisas de Produtos Naturais  
Centro de Ciências Médicas, U.F.R.J.  
Ilha do Fundão, Rio de Janeiro ZC-32, Brasil

In the course of an intensive systematic, biological, and chemical investigation of aposematic butterflies of the nymphaline tribe Heliconiini, the author has had occasion to examine a large number of museum collections, in Brazil and in other American countries. In the Museu Nacional in Rio de Janeiro, there was discovered an unrecognized form of *Heliconius astraea* Staudinger 1896, represented by a small number of specimens from southern Amazonas and Rondônia, mixed with the known *Heliconius egeria hyas* Weymer 1884 (for the reasons for separation of *H. astraea* from *H. egeria* (Cramer), see part II of this series, Brown and Mielke, 1972). A further specimen of this new form was examined in the Allyn Museum of Entomology in Sarasota, Florida, originally in the W. J. Kaye collection, now part of that Museum.

In this last collection, as well as in the U. S. National Museum in Washington, and illustrated in the literature (Collenette and Talbot, 1928), there was found a new subspecies of *Heliconius ethilla* Godart 1819, quite similar to, but distantly separated geographically from, the Colombian *H. e. metalilis* Butler 1873.

During excursions to central and central-western Brazil to obtain sufficient material of these two heliconians to permit their formal description, the author discovered two additional new forms of Heliconiini. One of these, confined to central-western Mato Grosso, proved to be an unknown subspecies of *Heliconius aeode* (Hübner 1809-13). A number of specimens transitional between this new form and the subspecies to the northwest, *H. aeode faleria* Fruhstorfer 1910, were later seen in the Allyn Museum and the British Museum (Natural History). The latter collection also contained representatives of the new subspecies of *astraea* and *ethilla*, mentioned above.

The second new form discovered was a black-suffused extreme phenotype of the common and widespread *Dione juno* (Cramer 1779-80), present in pure populations in a variety of areas in the Distrito Federal. This was originally regarded as a new subspecies to be here described together with the three new *Heliconius*

forms. It was later decided, however, to validate the name *suffumata* Hayward 1931 and apply it to these uniform *juno* populations in Brasília. The name was originally published to denote an aberrational specimen from Paraguay; the original description and figure of this specimen, however, fit the Brasília form so closely that it does not seem justified to introduce a new name. This form is therefore redescribed and illustrated here under the validated name *Dione juno suffumata*, which receives a new status as a recognizable and isolated subspecies.

The existence of these four forms was mentioned, and the *astraea* was illustrated, in Part II of this series (Brown and Mielke, 1972). No names were applied to the three new *Heliconius* subspecies, which are to be considered as described in the present paper. The name *suffumata* was used in a subspecific sense in the first Appendix of Part II and may be considered as validated as of that publication, though its redescription and official new status are included here.

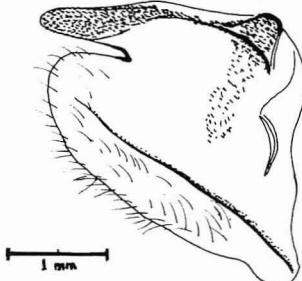
### 1. *Heliconius astraea rondonia*, K. Brown, new subspecies

(Plate I, Figs. 1, 4; Plate IV, top; Text-Figures 1-2)

Adult ♂ morphologically identical (Text-Figure 1) to *Heliconius astraea astraea*, differing from the nominate subspecies (Plate I, Figure 2) only in the presence of large yellow spots in the outer third of the forewing cell and the inner half of forewing space Cu<sub>1</sub>-Cu<sub>2</sub>, causing the yellow forewing median band to be square and centered over the end of the cell (Plate I, Figure 1), rather than rectangular and distal to the cell. Differs from the superficially similar *H. egeria hyas* (Plate I, Figure 3) morphologically (see Emsley, 1965 and Brown and Mielke, 1972) and in the less elongated forewing, and clearer and usually longer rays on the hindwing, with the hindwing cubital vein always black. As in other *astraea* and *egeria* forms, the dennis and rays are very bright red in fresh specimens, fading rapidly to orange-red in older specimens or after death, and the underside (Plate I, Figure 1) is extensively washed over with silvery-gray, fading to gray-brown after death, and bears a long yellow costal streak on the hindwing and a shorter yellow costal spot on the forewing. ♀ wing-pattern similar to that of ♂; morphology (Text-Figure 2) as reported for *egeria* ♀ (Emsley, 1965). Forewing 42-48 mm (base to apex); head markings all white; thorax markings yellow dorsally, mostly white ventrally; abdomen markings and ventral stripe yellow.

HOLOTYPE ♂ and ALLOTYPE ♀ donated by the author to the Museu Nacional, Rio de Janeiro; Km. 70 of the Vilhena-Pimenta Bueno highway, Rondônia (woods and creek flowing down to northeast of road), elevation 400 m., October 19, 1971, K. Brown leg.

PARATYPES: two ♂ and one ♀, same locality, 19-X-71, collected and retained by K. Brown; one pair, creek flowing down to north of same highway at Km. 81, 19-X-71, and one ♂, 22-VI-71, collected and retained by K. Brown; three ♂, Manicoré,



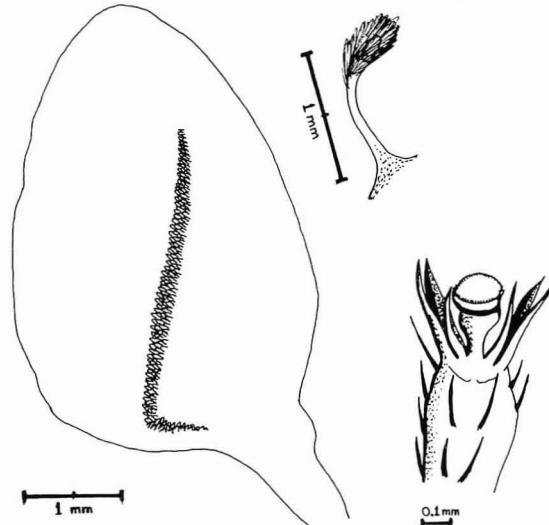
Text-Figure 1: *Heliconius astraea rondonia*, Paratype ♂ from Manicoré, Amazonas, in the Museu Nacional, internal aspect of left genital valve.

Rio Madeira (generalized locality?), in the Museu Nacional, Rio; one ♂, collected by the Comissão Rondon in southeastern Rondônia, in the Museu Nacional, Rio, and one ♂, same data, ceded by the Museu Nacional to K. Brown; one ♂, probably captured near Vilhena by B. Steingruber, in the collection of K. Brown; three ♂, 11 Km. west of Vilhena on the road to Pimenta Bueno, Rondônia, elevation 600m., 11-VII-72, in the collection of W. W. Benson, Rio de Janeiro; one pair, same date and locality, donated by W. W. Benson to the Museu de Zoologia da Universidade de São Paulo; one ♂, same locality, 6-VII-72, and one ♂, Km. 57 of the Vilhena-Pimenta Bueno highway (elevation 450 m.), on sand where clothes being washed, 6-VII-72, in the collection of the Departamento de Zoologia, Universidade Federal do Paraná, O. Mielke leg.; one ♂ from the "Cuyabá-Corumbá River System" (for discussion of this locality, probably in northern Mato Grosso or eastern Rondônia in the Amazon drainage, see Part II) in the Allyn Museum of Entomology, Sarasota, Florida (ex W. J. Kaye collection); and five ♂, same data, in the British Museum (Natural History).

Additional specimens of this subspecies have been seen, sufficiently closely to permit positive identification, flying over the Vilhena-Pimenta Bueno highway 13 and 30 Km. (north)west of Vilhena, in heavy woods and open cerradão, respectively. The known collection points and probable range of the subspecies are shown in the Map; it is to be expected in hilly forested areas over much of the "dry island" of the southeastern Rio Madeira region (southern half of the middle Amazon Basin), where it probably evolved during a recent dry climatic cycle and remains isolated today.

Sympatric *Heliconius* species at the type-locality (Plate IV) include *H. b. burneyi* (Hübner), *wallacei flavescens* Weymer, *xanthocles paraplesius* Bates x *melete* Felder, *doris doris* (Linné) and form "delila" (Hübner), *numata* (Cramer) and varieties including "silvana" Cramer and "mirus" Weymer, *ethilla eucoma* (Hübner) (Plate II, Figure 14), *erato venustus* Salvin and transitions to *e. amazona* Staudinger, and *sara thamar* (Hübner).

*Heliconius astraea rondonia* is one of the largest and highest-flying of the heliconians; it has been observed in normal social chasing over the tops of 30-



Text-Figure 2: *H. a. rondonia*, Allotype ♀ from Km. 70, Vilhena-Pimenta Bueno highway, Rondônia, bursa copulatrix, abdominal process, and mesopretarsus.

meter trees, and almost never descends below five meters from the ground in ordinary flight. For purposes of collection, it may be easily attracted down to the ground by a large bright red or orange cloth, as can other members of the *wallacei*-group of the genus *Heliconius* (the author is grateful to Dr. W. W. Benson for information on this method, long used by collectors in French Guyana for *H. egeria*, which permitted the collection of the type-series of *H. a. rondonia* at Km. 70). In nature, it flies from 7:30 AM to 4:00 PM, visiting flowers (especially high vines of *Gurania* (Curcubitaceae) and *Passiflora glandulosa*) frequently during all this period, but delaying on them most in mid-morning. The flight is very fast, powerful, and fluttery, interspersed with rapid turns and spectacular dives; the descent to the red cloth is made by a vertical drop on half-closed wings or a direct spiralling dive, followed by brief hovering near the cloth and a rapid climb to exit. The cloth distracts both males and females from all their normal activities, including chasing, flower visiting, and pre-oviposition behavior. Both sexes (especially males) are also known to come down to wet sand during the warmer hours of the day.

The subspecies probably prefers restricted high humid wooded patches near medium-sized streams within relatively dry cerrado areas, and has been seen flying over open cerrado and cut-over wooded areas where flowers are abundant. It may occur south over much of northwestern Mato Grosso into the upper Paraguay River system, and north along the Rio Madeira to the Manicoré area, but its center of abundance is apparently on the northwestern escarpment of the Serra dos Parecis in extreme southeastern Rondônia.

Although a female was observed in pre-oviposition fluttering before a growing shoot of *Passiflora (Distephana) coccinea* at Km. 70, she did not lay eggs, and a caterpillar obtained from an egg expressed from this female (Plate I, Figure 4) did not grow well on *P. coccinea*, though some feeding activity was evidenced. The foodplant in Vilhena is almost surely *P. (D.) glandulosa*, with which the species is closely associated there. Possibly, like some populations of the closely related *H. burneyi*, the caterpillar of *astraea* locally uses primitive passion vines in the subgenus *Astrophea* (W. W. Benson, personal communication). The lowest-flying member of the group, *H. wallacei* Reakirt, is always closely associated with members of *P. (Distephana) (glandulosa, coccinea, quadriglandulosa, and vitifolia)*, while *H. burneyi* is usually found associated with these and has been discovered and bred through on *P. coccinea*.

The subspecies name is considered a substantive in the feminine gender, in apposition with the genus and species names, and is chosen to indicate the principal area where the butterfly is found, the Brazilian territory of Rondônia. This name in turns honors the Brazilian hero Merchal Cândido Mariano da Silva Rondon, world-famous for his humanitarian work in exploring the southwestern Amazon Basin and making lasting peace with the Indian nations of the area, without damage to their culture, dignity, or traditional lands.

## 2. *Heliconius aoede eurykleia* K. Brown, new subspecies

(Plate I, Figures 5, 8, 10; Text-Figures 3-4)

Adult ♂ morphologically identical (Text-Figure 3) to *H. aoede lucretius* Weymer 1890, differing from this subspecies principally in the distal truncating of the forewing yellow median band, the reduction of the dennis-marking on the forewing to three basal lines of variable length and width, and the deeper red color of these lines and of the hindwing rays (Plate I, Figure 5). The color-pattern closely resembles those of the sympatric species *H. melpomene penelope* Staudinger 1894 (Plate I, Figure 9) and *H. erato venustus* Salvin 1871 (Plate IV), which also bear truncated forewing bands and reduced and reddened dennis markings. For comparison, *H. aoede lucretius* Weymer, 1890 (Plate I, Figure 6), with a full forewing band and orange dennis and rays, flies together with the very similar *H. melpomene vicina* Ménétriés 1857 and *H. erato reductimacula* Bryk 1953 and *lati-*

*vitta* Butler 1873 in the northwestern and western Amazon. Just northwest of *eurycleia* populations, *aoede* may be found as the form *faleria*, with a full orange dennis and a less constricted yellow forewing band, flying with the very similar *H. melpomene madeira* Riley, 1919 and *H. erato* form "constricta" Joicey & Kaye, 1917 (transition *amazona/venustus*; see Plate IV). The hindwing rays in *eurycleia* are moderately well expressed on both wing surfaces (Plate I, Figures 5, 8). The ♀ is similar to the ♂, but has a heavier abdomen, more rounded forewings, and no wide anterior androconial patch on the hindwings; the morphology is as reported previously for the species (Text-Figure 4; Emsley, 1965). Forewing length 29-33 mm (males), 31-35 mm (females); head markings all white; forewing ventral costal spot red; hindwing ventral costal streak yellow; hindwing paired submarginal white dots poorly developed to absent; antenna tips yellow.

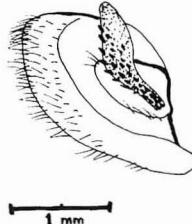
HOLOTYPE ♂ and ALLOTYPE ♀, donated by the author to the Museu Nacional, Rio de Janeiro; Areia Branca, 203 Km. south of Vilhena on the highway to Cuiabá (Km. 575, Cuiabá-Pôrto Velho), gallery forest to east of road, 650 m. elevation, October 16, 1971, K. Brown leg.

PARATYPES: One ♂ and two ♀, same locality, 16-X-71; three ♂ and a ♀, same locality, 23-VI-71 (Plate I, Figure 8); one ♂ and two ♀, same locality, 5-VII-72; two ♂ and two ♀, same locality, 11-VII-72; one ♂, same locality, 12-VII-72, all collected and retained by K. Brown; one pair, same locality, 23-VI-71, ceded to the British Museum (Natural History), K. Brown leg; one pair, same locality, 11-VII-72, ceded to the Allyn Museum of Entomology, K. Brown leg.; one ♂, same locality, 11-VII-72 in the collection of W. W. Benson, Rio de Janeiro; two ♀, 11-VII-72, and four ♂ and two ♀, 12-VII-72, same locality, in the collection of the Departamento de Zoologia, Universidade Federal do Paraná, O. Mielke leg.; one pair, same locality, 11pVII-72, ceded to the Museu Nacional, Rio, K. Brown leg.; one ♂, 14 Km. south of the Posto Uirapuru, Km. 562 of the Cuiabá-Pôrto Velho highway, 14-VII-72, collected and retained by O. Mielke; one ♂, Rio Branco where crossed by the trail from Salto do Céu to Rio Vermelho, upper Rio Cabacal (Paraguay drainage), northwest of Cáceres, Mato Grosso, 400 m. elevation, 6-VI-71, collected and retained by K. Brown (Plate I, Figure 8).

A pair in the Allyn Museum, and five ♂ and one ♀ in the British Museum (Natural History), from the "Cuyabá-Corumbá River System" (see discussion of this locality above), are apparently transitional between *eurycleia* and *faleria*, possessing a more complete dennis and a less truncated yellow forewing band than any of the paratypes (Plate I, Figure 7). An identical form (♀) was captured by the author in Vilhena on 6-VII-72.

This subspecies is expected to occur locally in deep riparian woods throughout the forested parts of the Serra dos Parecis in central-western Mato Grosso (Map), and perhaps may be discovered flying in other parts of the range of *H. melpomene penelope* in the forests of northern Bolivia, although *H. aoede lucretius* is the form present in areas just east of Lake Titicaca.

Like other known subspecies of *H. aoede*, *eurycleia* is a deep forest insect, preferring spottily lit humid areas near streams and flying and landing principally



Text-Figure 3: *Heliconius aoede eurycleia*, Holotype ♂ from Areia Branca, Km. 575 of the Cuiabá-Pôrto Velho highway, Mato Grosso, internal aspect of left genital valve.

in the shade. The males survey a small territory from a moderately high perch, but are only mildly aggressive towards other males; they occasionally promenade over small circuits inside the woods, but are not much given to flying unless disturbed, and are very difficult to see when landed in the shade. The females, likewise, spend much time landed, or flying slowly through the forest at low to moderate elevations. As they lay their minute white eggs in large rafts, they are only rarely seen in actual inspection of their food-plant; but they are not normally encountered more than a few dozen meters away from this plant.

In Areia Branca, the humid streamside woods are full of Ipecac flowers (*Cephaelis ipecacuanha*, Rubiaceae), which are very attractive to the local heliconians (which may be their principal pollinators), including *erato venustus* and transitions to *e. phyllis* (Fabricius) (Plate III, Figure 20), *melpomene penelope*, and *eurycleia*. Other local *Heliconius* species include *wallacei flavesrens*, *numata superioris*, and *sara thamar*. From Areia Branca southward and eastward (including south of Uirapuru, only 20 Km. southeast), *eurycleia* is found together with *m. penelope* and *e. phyllis*, in a fairly large and exceptional area of non-parallel variation of these last two species. In many areas, other subspecies of *aoede* may be found on both red (*Gurania* and Rubiaceae) and white (Compositae, Eupatoriae) flowers.

Unlike all other species of *Heliconius* examined, *aoede* and its close relatives *metharme* Erickson and *godmani* Staudinger do not seem to collect pollen for amino-acid nutrition (Gilbert, 1972).

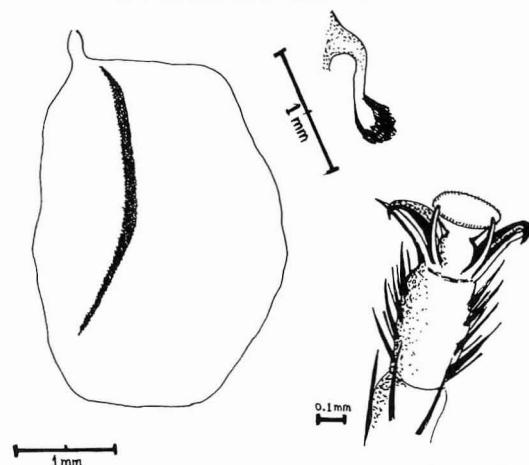
The egg of *eurycleia* (Plate I, Figure 10), expressed from a female, is very small, white, and subspherical, as with other *aoede* subspecies, and if expressed hatches only rarely. The probable foodplant, as with *H. metharme* and other subspecies of *H. aoede*, is *Dilkea* (probably *Johannesii*), a primitive sapling-like passifloraceous plant which only rarely produces flowers or characteristic tendrils.

The subspecies name is a substantive in the feminine gender, in apposition with the genus and species names, chosen to remember Odysseus' faithful nurse, who was a constant companion of his wife Penelope during her nineteen years of loneliness.

### 3. *Heliconius ethilla chapadensis* K. Brown, new subspecies

(Plate II, Figures 11-12; Plate III, Figures 15-17; Text-Figures 5-6)

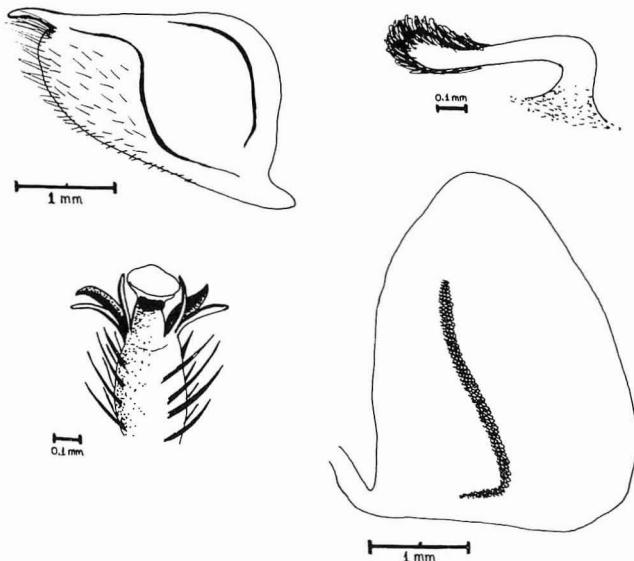
Rather similar to the Colombian and Venezuelan *H. e. metalilis* both



Text-Figure 4: *H. a. eurycleia*, Allotype ♀ from the same locality, bursa copulatrix, abdominal process, and mesopretarsus.

morphologically (Text-Figures 5 and 6) and in color-pattern (Plate II, Figures 11-13), being differentiated by complete geographic isolation (separated by at least 1500 Km. from *H. e. eucoma*, see Plate II, Figure 14) and in the following additional manners (see comparison in Figures 11-12 versus 13-14):

Character	<i>chapadensis</i>	<i>metalilis</i>	<i>eucoma</i> form "numismaticus" Weymer, 1894
Forewing yellow subapicals	small (diameter of second about 3 mm), always only three	larger (diam. of second 3-4 mm), often 4	larger as in <i>metalilis</i> (smaller to absent in typical <i>eucoma</i> )
Forewing yellow postmedian band	almost always continuous, or if narrow, tinuous, interrupted at vein $M_3$ by a broad triangular black spot	discontinuous; ruptured by black scaling overlying vein $M_3$	almost always discontinuous as in <i>metalilis</i> ; in <i>eucoma</i> , broad and continuous, with the cubital spots reduced.
Forewing endcell black spot	shortened, subtriangular or squarish	elongated, subrectangular	elongated, subrectangular
Hindwing median bar	always orange ventrally	always yellow ventrally	usually orange ventrally
Two white subapical spots on ventral hindwing	small, nearly obsolescent	larger, well-marked	usually larger, sometimes yellowish



Text-Figure 5: *Heliconius ethilla chapadensis*, Holotype ♂ from Buriti, Chapada de Guimaraes, Mato Grosso, internal aspect of left genital valve; and allo-type female, same locality, bursa copulatrix, abdominal process, and mesopretarsus.

Forewing 38-44 mm.; one distinct red basal spot on the under surface of the hindwing, characteristic of all *ethilla* subspecies (K. Brown, revision in preparation); marginal white streaks on the dorsal and ventral hindwing usually well developed.

**HOLOTYPE ♂** and **ALLOTYPE ♀** donated by the author to the Museu Nacional, Rio de Janeiro; Colégio Evangélico de Buriti, Chapada de Guimarães, central Mato Grosso, 650 m. elevation, May 23, 1969 and June 9, 1970, respectively, K. Brown leg.

**PARATYPES:** from the same locality, collected and retained by K. Brown: one ♂ 28-XII-68, five ♂ and one ♀ 23-V-69, one pair 24-V-69, three ♂ 25-V-69, one ♂ 26-V-69, five ♂ 27-V-69, one ♂ 6-VI-70, one ♂ 9-VI-70, one ♂ 16-VI-70, one ♂ 19-VI-70, one ♂ 29-V-71, five ♂ 30-V-71 (these will be opportunely distributed to major *Heliconius* collections); from the same locality, one ♂ 12-II-67 and one ♂ 24-I-70 in the collection of Nirton Tangerini, Rio de Janeiro; one ♂ 25-V-69 in the collection of S. S. Nicolay, Virginia Beach, Virginia; and one ♂ and two ♀ collected by C. L. Collenette, 17 to 30-VI-1927, in the British Museum (Natural History), numbers 1474, 1724, and 1493 (Joycey leg.).

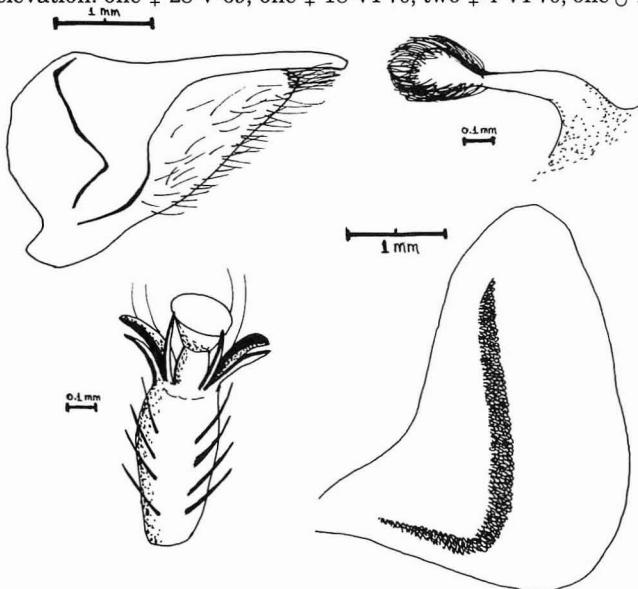
From "Cuyabá" (probably also the Chapada area), three ♂, in Drawer 1925 of the U. S. National Museum, Washington.

From "Amazons", collected by H. H. Smith (probably also Chapada), one ♂ in the British Museum (Natural History).

From "Matto Grosso", one pair, labelled "*numata illustris*" and numbered (Staudinger/Bang-Hass??) 825 and 827, in the Allyn Museum of Entomology, and one ♂, numbered 717, in the British Museum (Natural History).

From São José da Serra (Cabaceira do Rio das Mortes), 102 Km. east of Cuiabá on the road to Rondonópolis, Mato Grosso, 650 m. elevation, one ♂ 22-V-69, collected and retained by K. Brown.

From São Vicente, 90 Km. east of Cuiabá on the road to Rondonópolis, 600 meters elevation: one ♀ 28-V-69, one ♀ 18-VI-70, two ♀ 4-VI-70, one ♂ 15-VII-72,



Text-Figure 6: *Heliconius ethilla metalilis*, Rio Negro, Meta, Colombia, ♂, internal aspect of right genital valve, and ♀, bursa copulatrix, abdominal process, and mesopretarsus.

one ♂ 24-VI-72, all collected and retained by K. Brown; one ♀ 15-VII-72 from a gallery woods at Km. 97, in the Departamento de Zoologia da Universidade Federal do Paraná, O. Mielke leg.

From 17 Km. south of the Posto Uirapuru, Km. 562 of the Cuiabá-Pôrto Velho highway, one ♂ 13-VII-72; two further examples were seen here on 14-VII-72. This specimen shows some characters transitional to *H. e. eucoma*, but still falls near the normal range of variation for *chapadensis* from farther east.

A specimen of *H. ethilla eucoma* taken 70 Km. northwest of Vilhena, in Rondônia, shows very little if any intergradation towards *chapadensis* (Plate II, Figure 14). The only example of the new subspecies presently known outside of the Chapada de Guimarães is that captured in Uirapuru, but it should eventually be found elsewhere in central or northwestern Mato Grosso (Serra dos Parecis). Only 200 Km. east of the Chapada de Guimarães, on the Serra do Roncador (Royal Society Base Camp, Mato Grosso Expedition), *ethilla* occurs monomorphically as *e. narcaea* Godart 1819 (*fide* D. Gifford, Edinburgh), while a northeastern Brazilian variant of *e. eucoma* has recently been collected by W. W. Benson in the highlands of central Goiás (see Map).

Most subspecies of *ethilla*, including *chapadensis*, are open-woods butterflies, adaptable to second growth and even city gardens, but definitely preferring forest edges in steep areas. The males choose small clearings - treefalls, trails, ridgetops, or cuts - usually near water, to promenade back and forth during the warmer hours of the day, often landing on moderately high leaves to survey the area, or chasing other males which are promenading in the same area. The females stay more in the shade, behaving much like the ithomiines (usually *Tithorea*, *Melinaea*, and *Mechanitis*) which they resemble in color-pattern, and briefly visiting favored flowers for nectar and pollen from early dawn through afternoon; most oviposition occurs near midday, and the females and larvae accept a fairly wide range of passion vines.

The probable foodplant of *chapadensis* in Buriti is *Passiflora* (*Granadilla*) *cornuta*; larvae were readily bred through on *P. (Distephana) glandulosa* and would probably accept most silvaniform/*melpomene* foodplants without difficulty. The early stages (Plate III, Figures 15-17) are typical for *ethilla* (see Beebe, Crane, and Fleming, 1960), although the egg is much larger than that of *e. metalilis*, approaching the size of that of *e. ethilla* or *e. narcaea*. The mature larva (Figure 18) is almost devoid of dark spots, as with essentially all *ethilla* larvae.

The subspecies name is an adjective in the feminine genitive singular, derived from the name of the geographical region where the form occurs.

#### 4. *Dione juno suffumata* Hayward, 1931: NEW STATUS

(Plate III, Figure 18)

This subspecies is readily distinguished from the nominate form by the extensive invasion of the red-orange areas on the upper surface by the black borders, producing a very dark forewing apex and broad black hindwing margin. The useful parameters are as follows:

width of black border (tangent to minima in adjacent cells) along:

<i>25 juno juno</i> (Rio de Janeiro and Mato Grosso)	<i>16 juno suffumata</i> (Brasília area)
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FW vein M	1.5-4.3 mm (latter in females)	4.2-6.0 mm (males) 9.5-11.0 mm (females)
FW vein Cu <sub>1</sub>	1.0-2.5 mm	1.7-3.3 mm
HW vein M <sub>1</sub>	3.0-4.5 mm	4.2-6.0 mm
HW vein Cu <sub>2</sub>	3.2-5.2 mm	5.0-7.2 mm

The red-orange color of the underside is also of a deeper red than in most other *juno*, and the underside is more contrasted in color (yellow/dark scaling) than in specimens from other regions.

Although this subspecies was originally described as an aberration from a single specimen from Paraguay, it occurs essentially monomorphically in the Brasília area and may eventually be found in other parts of central or south-central Brazil. In the Cuiabá area of Mato Grosso, populations show occasional dark forms near *suffumata*, but are mostly *j. juno* (Plate III, Figure 19), with occasional light specimens approaching the far western *j. andicola* Bates, 1864 also present.

Specimens examined (collection of K. Brown, to be distributed opportunely):  
Parque do Gama, DF, three ♂ and one ♀ 9-VI-66, three ♂ and one ♀ 14-V-69,  
two ♂ and one ♀ 17-V-69, two ♂ 22-V-71.

Parque Zoológico, Brasília, one ♂ 3-II-67.

Fercal, Ribeirão da Contagem, DF, one ♂ 8-II-70.

Brasília Country Club, DF, one ♂ 15-V-69, one ♂ 8-II-70.

#### ACKNOWLEDGEMENTS

The author is grateful for discussions, information, hospitality, and field assistance, to the Colégio Evangélico de Buriti (especially Ary Antonio Nogueira, Dale Tutje, Gordon Trew, Adail Sandoval), E. W. Schmidt-Mumm (Bogotá) Woodruff W. Benson (Rio), Olaf H. H. Mielke (Curitiba), Stanley S. Nicolay (Virginia), Nirton Tangerini (Rio), Karl Ebert (Rio Claro, São Paulo), Michael G. Emsley (Virginia), Alfredo do Rêgo Barros (Museu Nacional, Rio), Lee D. Miller (Allyn Museum, Sarasota, Florida), Helmuth Holzinger (Vienna), R. I. Vane-Wright and T. G. Howarth (British Museum), P. Viette (Paris Museum), W. Forster (Munich collection), F. M. Brown (American Museum), and W. D. Field (U. S. National Museum). Financial support is gratefully acknowledged, from the Conselho Nacional de Pesquisas, the Banco Nacional do Desenvolvimento Econômico, the Ministério do Planejamento (FINEP/FNDCT), the National Science Foundation (GB 5389 XI), and the CPEG of the UFRJ.

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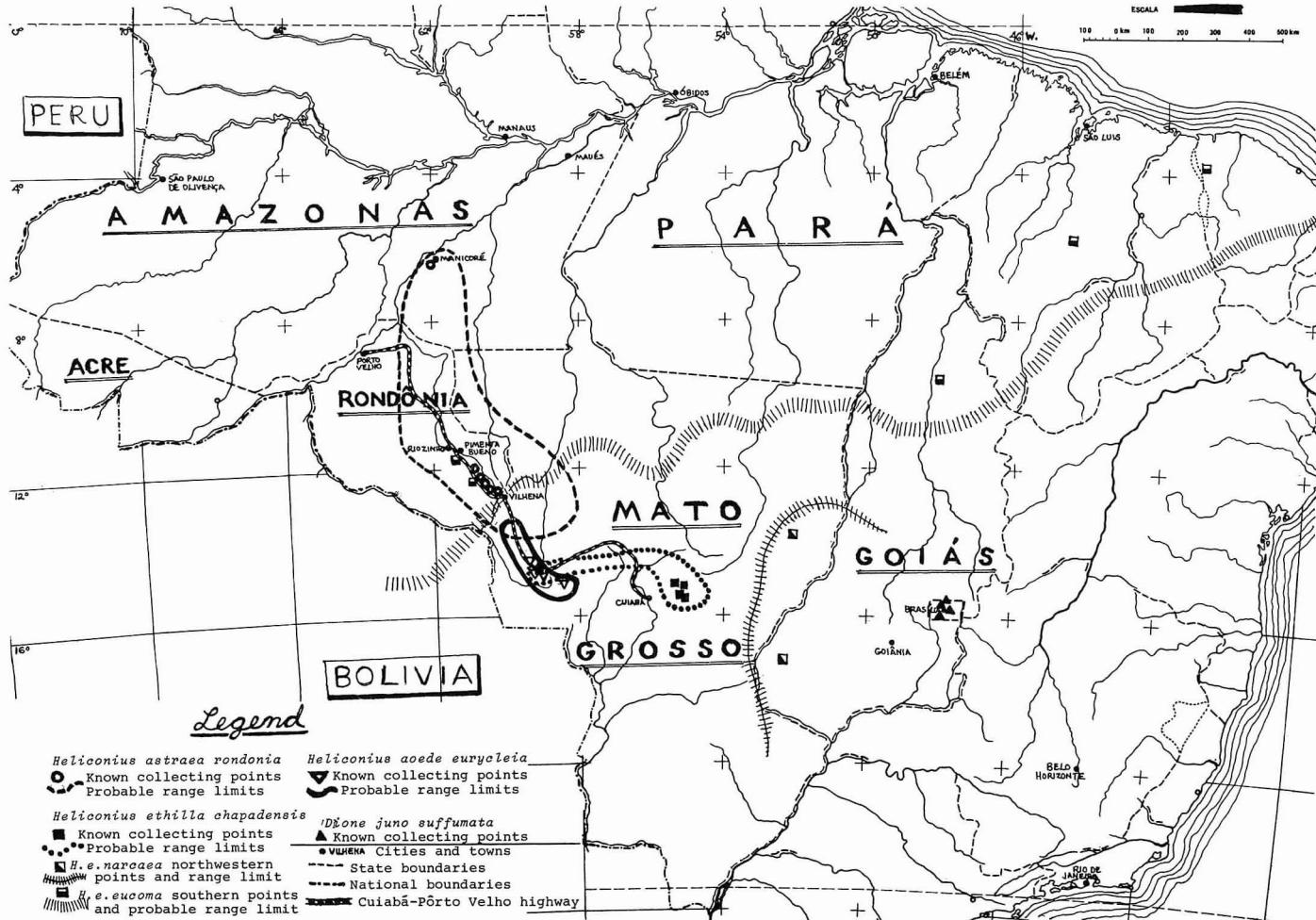


Plate I, *Heliconius*. All butterflies slightly less than life size (about 0.85x), colored black, yellow and red; eggs 17x life size, creamy white. Fig 1, *H. astraea rondonia* subsp. nov., Holotype ♂ (upper figures) and Allotype ♀ (lower figures), dorsal (left) and ventral (right) surfaces; Km. 70, Vilhena-Pimenta Bueno highway, Rondônia, October 19, 1971 (Museu Nacional, Rio de Janeiro, K. Brown leg.). 2, *H. a. astraea*, São Paulo de Olivença, Amazonas (Museu Nacional, Rio). 3, *H. egeria hyas*, Maués, Amazonas (Museu Nacional). 4, *H. astraea rondonia*, egg, from Allotype ♀. 5, *H. aoede eurycleia* subsp. nov., Holotype ♂ (upper figures) and Allotype ♀ (lower figures), dorsal (left) and ventral (right) surfaces; Areia Branca, Km. 575, Cuiabá-Pôrto Velho highway, Mato Grosso, October 16, 1971 (Museu Nacional, Rio de Janeiro, K. Brown leg.). 6, *H. aoede lucretius*, Mitu, Rio Vaupes, COLOMBIA (collection K. Brown: J. Glassberg leg.). 7, *H. aoede faleria* with visible *eurycleia* infusion, "Cuyabá-Corumbá River System" (probably southeast Rondônia) (Allyn Museum of Entomology). 8, *H. aoede eurycleia*, three Paratypes, dorsal surface; upper two topotypical, 23.vi.1971, lower from trail from Salto do Céu to Rio Vermelho, Alto Rio Cabacal, western Mato Grosso (collection K. Brown). 9, *H. melpomene penelope*, Areia Branca (collection K. Brown). 10, *H. aoede eurycleia*, egg, from Paratype ♀.

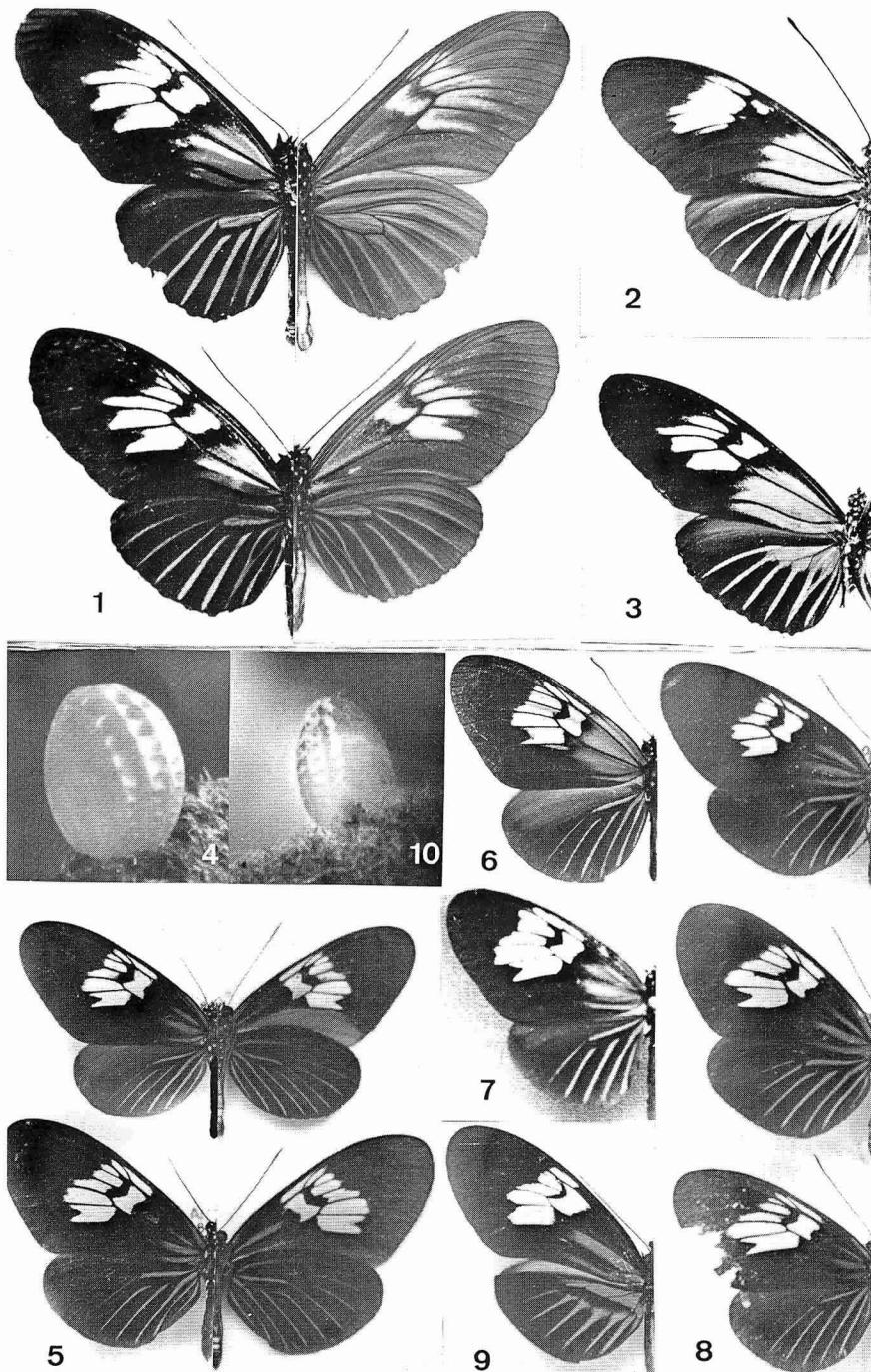
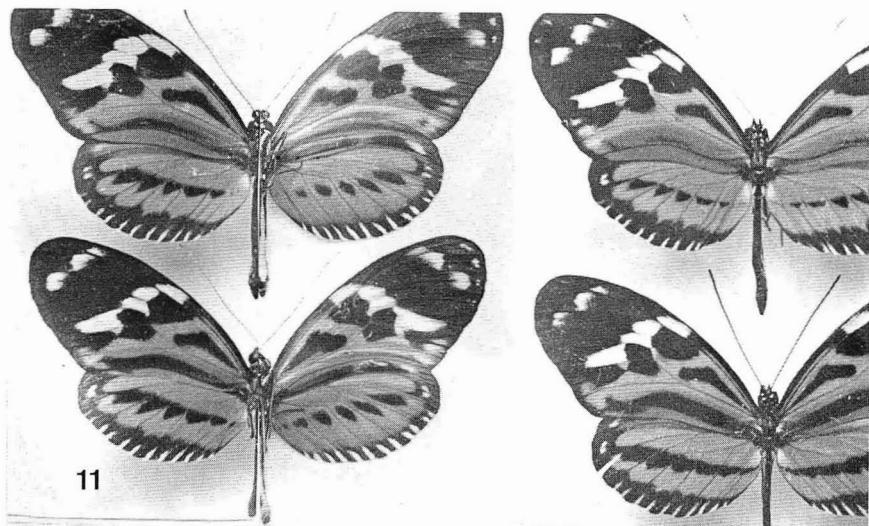
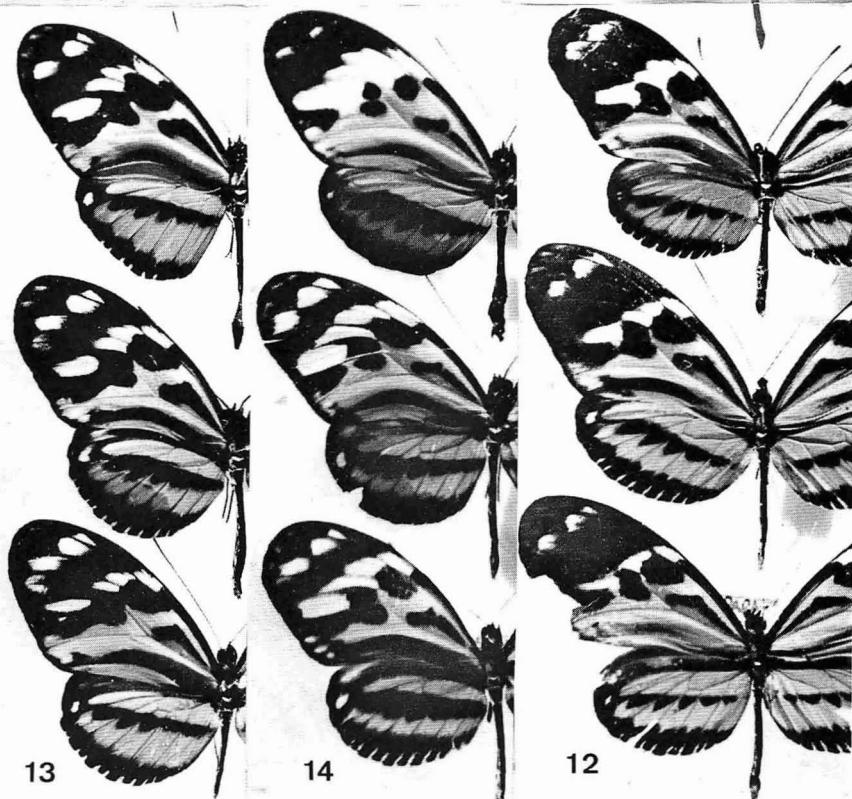


Plate II, *Heliconius*. All butterflies 0.85x life size; orange, yellow and black. Fig. 11, *H. ethilla chapadensis* subsp. nov., Holotype ♂ (upper figures) and Allotype ♀ (lower figures), dorsal (left) and ventral (right) surfaces; Buriti, Chapada de Guimarães, central Mato Grosso, May 23, 1969 and June 9, 1970 (Museu Nacional, Rio de Janeiro, K. Brown leg.). 12, *H. ethilla chapadensis*, five Paratypes from Buriti and São Vicente, Mato Grosso, 1969-1972 (collection K. Brown). 13, *H. ethilla metalilius*, three variants from the Rio Negro, Meta, COLOMBIA (collection K. Brown). 14, *H. ethilla eucoma*. Upper: typical individual from Km. 70, Vilhená-Pimenta Bueno highway, Rondônia, June 22, 1971; center: frequently captured form, Óbidos, Pará, September, 1970; lower: form "numismaticus", Óbidos, August, 1967 (collection K. Brown).



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Plate III, *Heliconius* and *Dione*. Egg 17x life size, yellow; third instar larva 4x, creamy; fifth instar larva 2x, white, both with yellow-orange head; butterflies 0.85x life size, orange and black (18-19) or black, yellow and red (20). 15, *H. ethilla chapadensis*, egg from Paratype ♀. 16, Same, third instar larva, lateral view. 17, Same, mature (fifth instar) larva, lateral view. 18, *D. juno suffumata*, ♂ (upper figures) and ♀ (lower figures), dorsal (left) and ventral (right) surfaces, Parque do Gama, Distrito Federal (collection K. Brown). 19, *D. j. juno*, dorsal (left) and ventral (right) surfaces, São Vicente, 90 Km. east of Cuiabá, Mato Grosso (collection K. Brown). 20, Variants of *Heliconius erato* from the hybridized population at Areia Branca, Km. 575 of the Cuiabá-Pôrto Velho highway, Mato Grosso, all on October 16, 1971 (collection K. Brown).

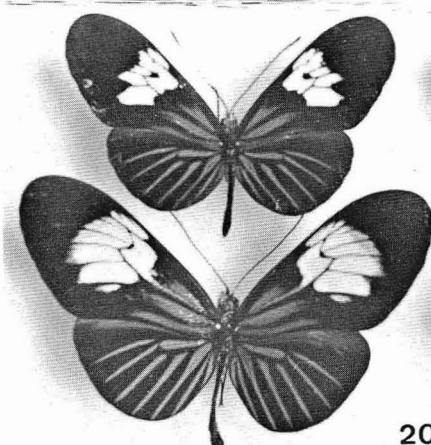
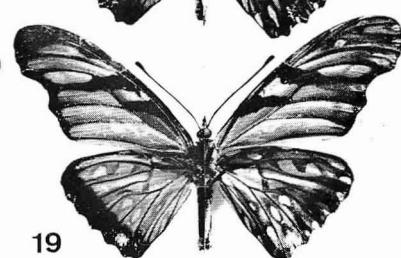
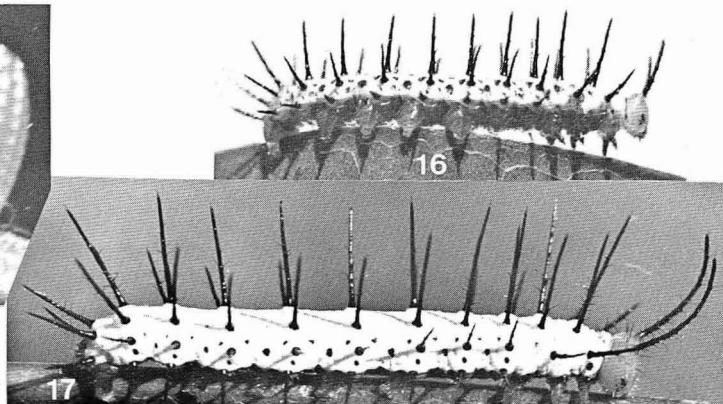
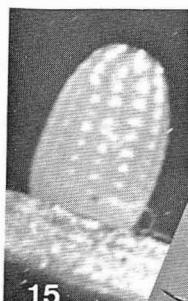


Plate IV. Mimetic complex of dennis-rayed heliconians in southeastern Rondônia (between Vilhena and Riozinho), in the Bolivian/Madeiran blend zone. All 0.4x, black, yellow and red (collection K. Brown). A, *Heliconius astraea rondonia*, ♂ (left) and ♀ (right), Km. 70, Vilhena-Pimenta Bueno. B, *H. elivatus aquilina* Neustetter, Riozinho. C, *H. elivatus perchlora* Joicey & Kaye, Riozinho. D, *H. b. burneyi*, Km. 70. E, *H. xanthocles* nr. *paraplesius*, Km. 70. F, *H. xanthocles melete*, Km 70. G, *H. melpomene madeira*, Riozinho. H, *H. d. doris*, form "delila", Km. 70. I, *H. aoede faleria* x *lucretius*, ♂, Riozinho. J, *H. a. faleria*, ♀, Riozinho. K, *Eueides tales pythagoras* Kirby, near form "barcellinus" Zikán, Km. 70. L, *H. erato*, three variants from Km. 70; center is near typical *vetustus*. M, *H. demeter eratosignis*, ♂ (upper figure) and two ♀ variants, Riozinho.

