

BULLETIN OF THE ALLYN MUSEUM

3621 Bayshore Rd.
Sarasota, Florida 33580

Published By
The Florida State Museum
University of Florida
Gainesville, Florida 32611

Number 106

30 December 1986

A NEW SPECIES OF *TMOLUS* (LYCAENIDAE) WITH NOTES ON THE *EUPTYCHIA WESTWOODI* (SATYRIDAE) MIMICRY COMPLEX

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INTRODUCTION

Johnson and Matusik (1986) in describing an apparently endemic *Tmolus* from Hispaniola (hereafter "n. sp. Hispaniola") have reviewed the female genitalia of the species presently placed in that genus. These include *T. azia* (Hewitson), *T. cydrara* (Hewitson), *T. echion* (Hewitson), *T. mutina* (Hewitson), and *T. venustus* (Druce). Their study offers a basis for further additions to the species diversity of the genus and makes relevant a companion review of the male genitalia of the group.

While curating at the Allyn Museum on Entomology (AME), another undescribed species of *Tmolus* was discovered. Specimens of this species were found among unidentified Venezuelan material which, interestingly, included a number of superficially similar but taxonomically disparate taxa: *Thecla una* Hewitson (Lycaenidae), *Arawacus aetolus* Sulzer (Lycaenidae) and *Euptychia westwoodi* Butler (Satyridae). Nearly all of these specimens were collected in the Federal District (FD) of Venezuela—those figured in Figs. 1-2 at Miranda (FD) with others in larger series taken at Caracas, Chacaito and Niaguatate (all FD) along with some from adjacent Aragua. As notable from the figures, all of these specimens are white on the upper surface of the wings with dark forewing apices. The *E. westwoodi* specimen from Miranda (Fig. 1 [3], [6]) was unusually small (forewing expanse, base to apex 12.5 mm.). Forewing expanse in specimens of *E. westwoodi* at the AMNH (based on a sample of 20) ranges from 14.8 mm. to 16.7 mm. (\bar{X} , 15.5 mm.).

The above-mentioned circumstances elicited more than casual interest since *E. westwoodi* has been suggested as the model for a mimicry complex by Singer, Ehrlich and Gilbert (1971). In particular, an almost completely white *Tmolus* is unusual. All other *Tmolus* are either iridescent blue above or, if not, mostly gray. Singer, Ehrlich and Gilbert documented *E. westwoodi*'s larval foodplant usage of the lycopsid *Selaginella*, and also recorded three other Neotropical *Euptychia* ovipositing on this plant. They noted a paucity of insect herbivores utilizing *Selaginella* and (citing work by Kaplanis, Thompson, Robbins, and Bryce, 1967) attributed to this plant "potent biochemical defenses." Singer *et al.* suggested such defenses may render adults of the few known *Selaginella*-utilizers distasteful to predators. They concluded that: "Several species of *Euptychia* are involved in interesting and little understood mimetic complexes, often involving species of Lycaenidae. *Euptychia westwoodi* itself appears to be in a complex with *E. hesione* and *Mesosemia molina*

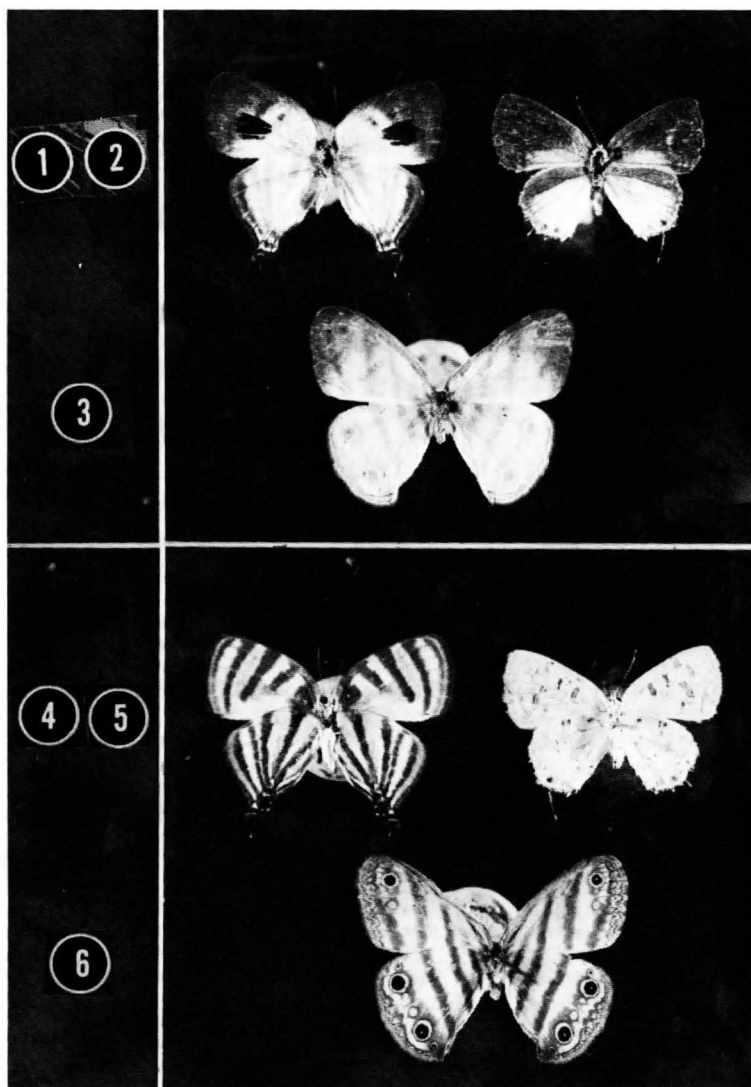


Figure 1. Upper surface (1-3) and under surfaces (4-6) of three variously resemblant but taxonomically disparate taxa from Miranda, Federal District, Venezuela, (same collection locality as specimens figured in Fig. 2.) Entries include 3,6: unpalatable *E. westwoodi* (Satyridae) *sensu* Ehrlich, Singer and Gilbert (loc. cit.); 1,4: example of traditionally acknowledged mimic of *E. westwoodi*, the genus *Arawacus* (Lycaenidae), species *aetolus*; 2,5: specimens of *Thecla una* (Lycaenidae) resembling upper surface of above taxa and both surfaces of specimens illustrated in Fig. 2. Figured specimen of *E. westwoodi* is smaller and with less apical black than most (see text). Specimens of traditionally acknowledged Riodinidae mimics of *E. westwoodi* are shown in Fig. 3. Fig. 1 specimens all AME.

(Lycaenidae, Riodinidae [sic])". Subsequent to the above research, lepidopterists have also come to view the genus *Aravacus* Kaye (Lycaenidae: Theclinae) as a mimic of the white *Euptychia* morph (Lee D. Miller, AME, pers. comm.). No further discussion of this supposed mimicry complex has appeared in the literature. Several recent investigations and commentaries on mimicry (Papageorgis, 1975; Turner, 1983; Sheppard, Turner, Brown, Benson and Singer, 1985) have implications concerning the kind and breadth of mimicry which may be going on in the *E. westwoodi* complex.

The present paper has been divided into two sections: (1). Description of a new *Tmolus* species and (2). Notes on the *Euptychia westwoodi* mimicry complex including (a). some commentary regarding the above-cited works, (b). a compilation of data concerning wing coloration and geographic distributions in the white *Euptychia* (Appendix I) and various lycaenid and riodinid taxa (Appendix II).

Taxonomic Treatment

Figures 1 and 2 illustrate the female and male genitalia of the known species of *Tmolus*, respectively. Johnson and Matusik (1986) illustrate wing undersurfaces of all these taxa. In context with these data the following new taxon is described:

Tmolus albimimicus, new species

Figs. 2, 4[1], 5[1]

DIAGNOSIS. Distinguished from all other known *Tmolus* as follows. Wing Upper Surface: *albimimicus* with both sexes white except for black forewing apices. Other *Tmolus*: (a). males iridescent blue [all species except *azia*] with females gray [*mutina*, *cydrara*, female of *venustus* unknown]; (b). both sexes gray-white with forewing apices darker gray and hindwing with marginal spots and orange anal lobe [*azia*] or (c). female warm gray on forewing with hindwing dull gray to bluish, both wings with some iridescence basad [n. sp. Hispaniola, male unknown]. Wing Under Surface: *albimimicus* with both sexes white except for vivid orange in Y-shaped configuration on forewing and faint to obsolescent

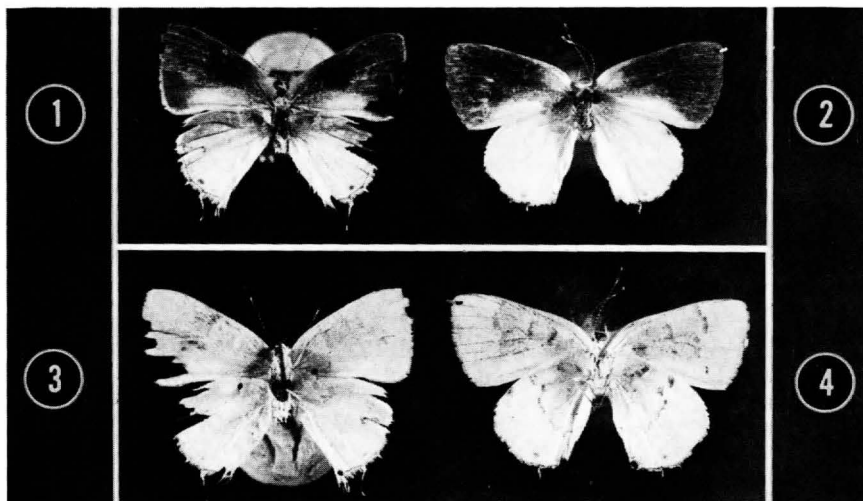


Figure 2. Upper surfaces (1,2) and under surfaces (3,4) of primary types of *Tmolus albimimicus*, new species. 1,3: allotype male, 2,4: holotype female. Note similarity of upper surface characters to those of taxa figured in Figure 1 and to entry 2 of Figure 3. Types are AME.

orange medial band on hindwing. Lacking any other markings or suffusions. Other *Tmolus*: (a). both sexes with medial band of orange on hindwing only [*azia*]; (b). both sexes with orange blotches or spots in various areas of either or both wings [*cydrara*, *echion*, *venustus* (only male known)]; (c). both sexes marked as above [b]. and with black or brown wing bands [*cydrara*, *venustus* (only male known)]; (d). both sexes with single median to postmedian black and white band on both wings [*mutina*]; or (e). markings additional to those above in the form of outstanding gray or blue-gray suffusions either on forewing centrad [*cydrara*], hindwing submarginad [*venustus*], or in limbal area [n. sp. Hispaniola].

DESCRIPTION. *Male.* Wing Upper Surface: ground white on both wings except for apex and discal areas of forewing which are fuscous to black with intense black at apex of discal cell at androconial scent brand. Hindwing without marginal or submarginal spots and with tail at terminus of vein CuA_2 . Fringe white on both wings. Wing Under Surface: ground white. Forewing with emphatic orange line or dot-line from costa to vein CuA_2 and with large orange slash in discal cell. Hindwing with emphatic discontinuous orange medial line, comprised of orange spots in vein interspaces across entire wing. Black dot at anal lobe. Length of forewing: 11.5 mm. (allotype), 11.0 mm. (paratype). *Female.* Wing Upper Surface: similar to male but with pattern more contrasting. Length of forewing: 12.0 mm. (holotype). *Male Genitalia* [all terms in quotes *sensu* Johnson, 1976, 1986]: Fig. 4, [1]. Amongst *Tmolus* most similar to *echion* (Fig. 4, [3]) in ventral and lateral view of the valvae and saccus but with "bilobed configuration" of valvae flared more distad at cephalad base and flared again at juncture with "caudal extension." Caudal extension narrowest of genus and with pointed termini as in *echion* and *cydrara*. Aedeagus short (as in *mutina*) with length (aedeagus removed and placed with cephalad terminus at tip of saccus) less than one third longer than length from saccus tip to vincular arc. *Female Genitalia*: Fig. 5, [1], as in male showing strong resemblance to *echion* (in antrum-like configuration of ductus bursae) but like *mutina* in extreme length. See also Fig. 5 explanation.

TYPES. Holotype, female, Miranda, District Federal, Rio Chacaito, 980 m., February 15, 1936, R. Lichy. Allotype, male, same data, but September 9, 1934. *Paratypes.* AME: one male, data as above except Miranda, January 1, 1938. AMNH [located subsequent to completion of study]: two females, Puerto Cabello (adjacent Parque Nacional and Federal District), April, 1908; May, 1909.

DISTRIBUTION. Currently known from the type locality and immediately adjacent areas from early September until May.

REMARKS. The female of *albimimicus* has been chosen as the primary type for two reasons: (1) it is fresh and emphatically marked and (2) *T. n. sp. Hispaniola* was also described from a holotype female. Amongst the taxa of Figs. 1 and 2, *albimimicus* was initially recognizable as a *Tmolus* by the under surface orange markings which characterize

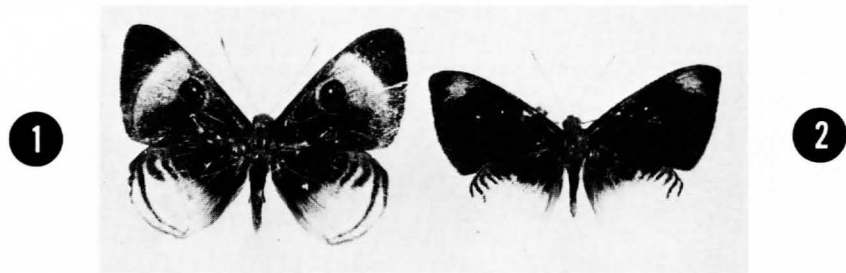


Figure 3. 1. *Mesomenia philocles* Linnaeus, Venezuela (AMNH) representing resemblance to Group 2 *Euptychia* of Appendix I, a variegated white and black appearance, and with large discal spot as on *Arawacus* and *T. albimimicus*, new species. 2. *M. metope* Hewitson, Venezuela (AMNH) representing resemblance to Group 1 *Euptychia* of Appendix I, highly contrasted white and black appearance, and with notable resemblance to upper surface white and black pattern of *T. albimimicus*.

members of the genus. *T. una*, though nearly identical to the *Tmolus* on the wing upper surface, is speckled with sparse black spots beneath. *E. westwoodi* and *A. aetolus*, similar to the above species on the wing upper surface, both display prominent black stripes beneath. These differences, and their possible mimetic significance as regards white *Euptychia* and *Mesosemia* will be discussed further below. Brief comment is necessary concerning some superficial similarity between *albimimicus* and figures of *T. inoa* Godman & Salvin (*sensu* Draudt, 1919) and *T. maevia* Godman and Salvin (*sensu* Godman & Salvin, 1887). The figure of *T. inoa*, corresponding to the Draudt text, is white with black forewing apices above. In Godman and Salvin (1887) *T. inoa* is figured completely dark brown above, and *T. maevia* white and black with under surface similar similar to Draudt's *T. inoa*. Both of these taxa, however, have extensive submarginal hindwing markings beneath and scattered to heavy orange postbasal dots. *T. inoa* (Mexico) and *T. maevia* (Mexico-Costa Rica) have genitalia of the "Phrutus Group" of Draudt, not *Tmolus*. I examined and dissected all types (BMNH) of the above, along with somewhat similar *T. cardus* Hewitson.

ETYMOLOGY. The name means "white mimic" and is formed from the Latin *albi* and a latinization of "mimic".

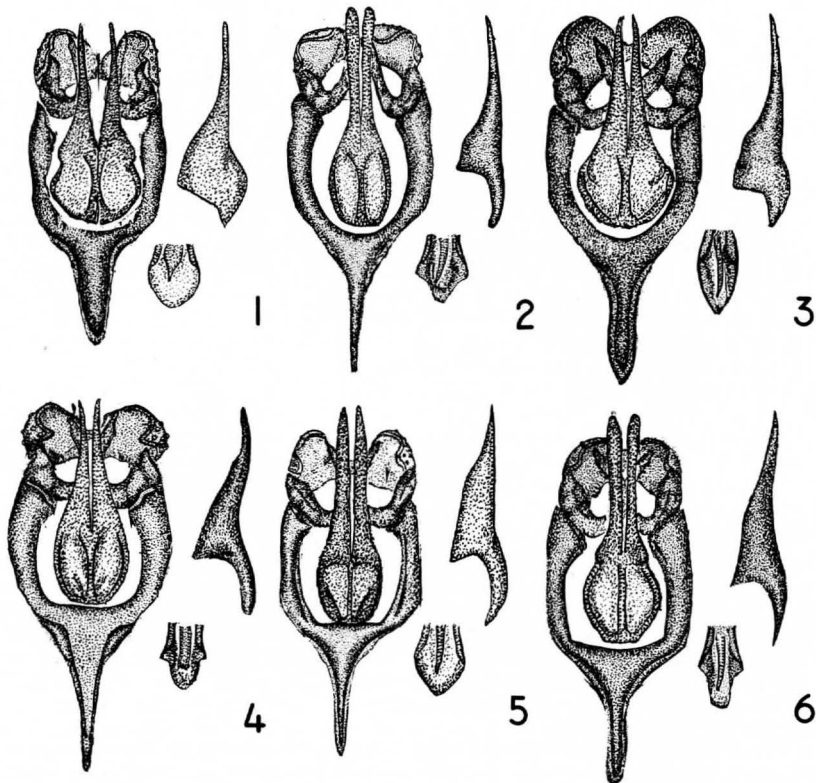


Figure 4. Male Genitalia of taxa of *Tmolus*: left, male genitalia with aedeagus removed (ventral view); right, valve (lateral view); beneath/between, caudad terminus of aedeagus with cornutus. Taxa: 1. *albimimicus*, new species. 2. *azia*, Cordoba, Mexico (AMNH); 3. *echion*, Cordoba, Mexico (AMNH); 4. *cydrara*, Mismar, Guyana (AMNH); 5. *mutina*, Obidos, Brazil (AMNH); 6. *venustus*, Venezuela (AMNH); a male of the hispaniola taxa of Johnson and Matusik (loc. cit.) (Fig. 4:6) has not been available for study.

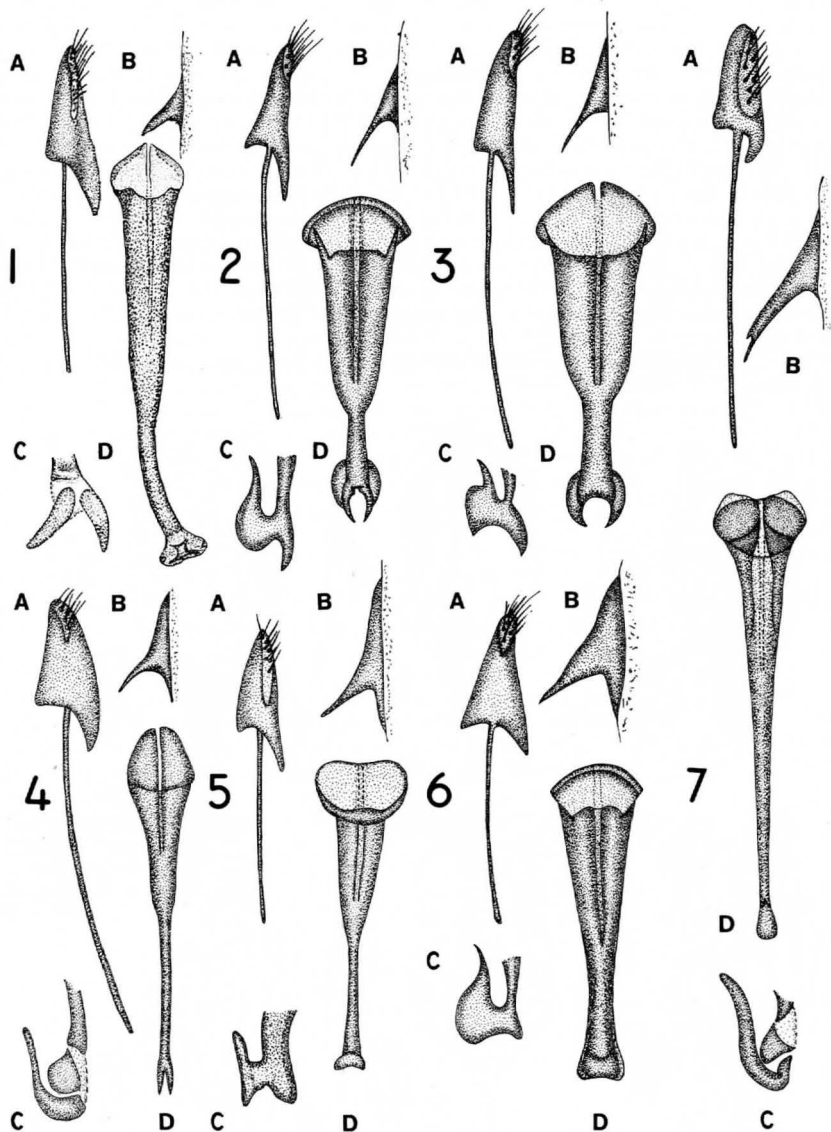


Figure 5. Female Genitalia of taxa of *Tmolus*. a. papillae anales with associated apophyses; b. signum; c. cephalad terminus of ductus bursae (lateral view); d. genital plate (ventral view) Taxa: 1. *albimimicus*, new species. 2. *azia*, Port-of-Spain, Trinidad-Tobago (AMNH); 3. *azia*, Jalapa, Mexico (AMNH) [2. and 3. illustrated to show variation range]; 4. *echion*, Colima, Mexico (AMNH); 5. *cydrara*, Pucallpa, Peru (AMNH); 6. new species of Johnson and Matusik, 1986, from near La Romana, Dominican Republic (AMNH). 7. *mutina*, "Colombia", (AMNH); A female of *venustus* has not been available for study. Reference detailed discussion of genitalic comparisons in Johnson and Matusik (loc. cit.).

Notes on the *E. westwoodi* Mimicry Complex

Recent compilations regarding mimicry in butterflies include the following considerations relevant to understanding the mimetic interactions possibly occurring in the *E. westwoodi* mimicry complex:

(1). Degrees of pattern resemblance in and between models and mimics vary significantly with evolutionary time, making it possible to observe in various syntopic and synchronic taxa different degrees of success in achieving resemblance to the model (Papageorgis, 1975, p. 522, 530; Turner, 1983, p. 279, 281; Sheppard, Turner, Brown, Benson and Singer, 1985, p. 582, 586). This apparently results from several simultaneous processes. The non-palatable Muellierian complexes are undergoing convergence of wing pattern. However, palatable Batesian mimics of the Muellierian complex can cause taxa of these latter to undergo divergence. In addition the Batesian mimics themselves undergo an interaction of convergence and/or divergence of pattern due to their coexistence and palatability (Sheppard, Turner, Brown, Benson and Singer, 1985, pp. 433-434; 574-575; 582-583; 597). Along with the causal relation between convergence and divergence toward or away from the pattern model, coexisting mimetic taxa have also undergone adaptive canalization of wing pattern in relation to substrate and available light (Papageorgis, 1975 pp. 524-532). Hence, wing patterns amongst mimetic taxa may be far more varied than might be expected from the simplest notion of resemblance to a particular model.

(2). Wing upper surfaces and/or under surfaces, or other salient external features may be variously active in the mimetic patterns; mimetic and cryptic patterns, and combinations of these may also be simultaneously active (Papageorgis, 1975, p. 530; Sheppard, Turner, Brown, Benson and Singer, 1985, pp. 441-448).

These current views of mimicry phenomena invite a broader interpretation of the kinds and degrees of pattern resemblance which may be active in the reported *E. westwoodi* mimicry complex. Two topics need to be considered:

1. *White Euptychia as a Muellierian Mimicry Complex*: This has already been suggested by Singer, Ehrlich and Gilbert (1971, p. 1342). A review of the kinds of wing patterns and geographic distributions of these taxa (Appendix I) supports this possibility. All of the white *Euptychia* have generally sympatric distributions, with one species (*hesione*) distribution exceeding the others southward. There are two general kinds of white and black upper surface patterns in the group, with both of these having similar striped under surfaces. Batesian mimics of this complex could, therefore, variously resemble the upper and/or under surfaces of these satyrid species. It is interesting, however, that the color morph of white *Euptychia* corresponds to none of the syntopic and synchronic color groups noted by Papageorgis (1975, p. 524) as occurring in mimetic butterflies studied by her in Peru. The only possible association might be with her "Tiger" color group cited as variously banded on a yellow ground color.

2. *Batesian Mimics of the White Euptychia Complex*: Taxa of *Mesosemia* and *Arawacus* have already been suggested as probable mimics of the *E. westwoodi* complex. It is of particular interest that a survey of *Mesosemia* taxa in the AMNH (Appendix II) indicates two general categories of upper surface wing pattern in *Mesosemia* which generally correspond to those of the white *Euptychia*. All of these *Mesosemia* have generally striped under surfaces. Examples of the extremes of upper surface coloration are shown in Figure 3. One of these taxa (*metope*, Fig. 2[2]) shows remarkable resemblance to *albimimicus*. Amongst Theclinae, Appendix II lists a wide array of taxa which variously resemble the upper and/or under surfaces of white *Euptychia*. Also listed are taxa with particular resemblances to some marked wing characters of *Mesosemia* and *Arawacus* not present in the white *Euptychia*. At present there is no way to ascertain how many of these taxa may actually be involved in mimicry. However, investigation of the kinds of wing pattern resemblances reviewed in Appendix II will be relevant to an eventual understanding of the degree of Batesian mimicry of the white *Euptychia* morph. The basic categories of pattern resemblance between various Theclinae, Riodinidae and white *Euptychia* involve marked resemblance to the upper and/or under surfaces of the white *Euptychia*, respectively. *Mesosemia* and *Arawacus* have been cited as mimics of white *Euptychia*

based on upper and under surface resemblances. *Tmolus albimimicus* has been suggested based on upper surface resemblance. The compilation in Appendix II, however, suggests a far wider breadth of wing pattern similarity which should be considered in any future studies of possible Batesian mimicry of the white *Euptychia* complex. Nearly all the data in Appendix II are new and several generalities are apparent which have not been considered before in relation to white *Euptychia*, riordinid and thecline taxa. These include:

A. Upper and under surface patterns in *Mesosemia* and white *Euptychia* are divisible into two similar pattern categories (see Appendix I and Appendix II, A).

B. In Theclinae, most taxa similar to white *Euptychia* are like the "Group 1" *Euptychia* pattern category (see Appendix II, B, Group 1).

C. Wing pattern combinations in numerous Theclinae variously resemble those of white *Euptychia*. In such thecline taxa, these similarities occur on (a) the upper and under surfaces in both sexes (Appendix II, B, Group 1, B & C); (b) a single surface in both sexes (Appendix II, B, Group 1, A; Group 4); (c) one or the other surfaces but in only one sex (Appendix II, B, Group 3, A & B); or (d) the upper and/or under surfaces of only particular wings but in both sexes (Appendix II, B, Group 3, C). In addition, there are a number of other thecline taxa which while quite different from white *Euptychia* on either the upper or under surface show at least one surface with some general resemblance to the marked white/black or striped patterns of these satyrids (Appendix II, B, Group 5). Since it seems unlikely that the frequency and degree of this similarity could occur by chance alone, the possibility that many of these taxa mimic white *Euptychia* needs to be investigated.

D. The above [C.] wing patterns combinations, (a), (c), and (d) occur both in Riordinidae taxa (Appendix II, A) and Theclinae taxa (Appendix II, B). The possibility that such categories represent generalized Batesian mimic morphs common to numerous taxa needs to be investigated.

E. The variation in size and location of forewing ocelli in various Riordinidae (see Appendix II, A, Group 6) is instructive concerning the occurrence of black orbs in the postdiscal forewing area in many Theclinae (as in *albimimicus*, *Arawacus*, and taxa of Appendix II, B, Group 6). Ocelli location in riordinid genera *Leucochimona*, *Perophthalma* and *Mesosemia* ranges respectively, from submarginal (the location in white *Euptychia*) basad to the subapical and postdiscal areas. If these various placements all afford mimetic advantage, this may be relevant to the frequency of dark postdiscal orbs in many Theclinae. These latter occur quite apart from, and in addition to, the dark androconial patches found in some males of Theclinae.

The discovery of *Tmolus albimimicus* and recent literature concerning mimicry in butterflies suggests the need for further study of the mimetic interactions possibly occurring in the white *Euptychia* mimicry complex. There has been relatively little consideration of this group in studies of Neotropical mimicry phenomena. The number of taxa actually involved in a *Euptychia*-based mimicry ring may be quite large.

ACKNOWLEDGEMENTS

Thanks are due Drs. Lee D. Miller and Jacqueline Miller (AME) for comments involving this paper. Review comments by Dr. John Rawlins (Carnegie Museum of Natural History) were particularly helpful. Bonnie Gardner provided most of the illustrations.

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APPENDIX I
WING PATTERN CATEGORIES OF WHITE *EUPTYCHIA*
AND GENERAL GEOGRAPHIC DISTRIBUTIONS

General Note: White *Euptychia* differ principally in the pattern of white and black coloration on the wing upper surface; on the under surface nearly all of them display distinct white and black stripes (see Fig. 1 [6]).

Group 1

Upper surface almost all white except forewing apices dark:

- E. westwoodi* (AMNH): Colombia, Venezuela, Panama, Costa Rica, northeast, north-central Brazil.
- E. mollina* Huebner (AMNH): Venezuela, Colombia, Panama, Guatemala, Mexico (Oaxaca, Veracruz, Hidalgo, San Luis Potosi).

Group 2

Upper surface white but with extensive apical and subapical darkening on forewing, and sometimes on hindwing:

- E. metaleuca* Boisduval (AMNH): Colombia, Ecuador, Honduras, Guatemala, Nicaragua, Mexico (Veracruz, Tabasco, Oaxaca).
- E. lydia* Cramer (AMNH): Guyana, French Guiana, Trinidad-Tobago, Colombia, Panama.
- E. binocula* Butler (AMNH): Venezuela, French Guiana, Trinidad-Tobago, northeast Brazil, Colombia.
- E. hesione* Sulzer (AMNH): Ecuador, Peru, Bolivia, Argentina, Brazil, Colombia, Paraguay, Trinidad-Tobago, Guyana, Honduras, Guatemala, Costa Rica, Nicaragua, Mexico (Chiapas, Campeche, Veracruz, San Luis Potosi, Oaxaca, Tabasco).

APPENDIX II
CATEGORIES OF WING PATTERN SIMILARITY BETWEEN THE WHITE
EUPTYCHIA AND TAXA OF THE RIODINIDAE AND THECLINAE

A. Categories of Wing Pattern Similarity Between White *Euptychia*, *Mesosemia* and Other Riodinid Taxa.

General Note: Taxa listed below include those represented in the AMNH, using identifications of that institution, and including all taxa with possible distributional overlap with white *Euptychia*. Nearly all *Mesosemia* have darkened postdiscal orbs on the forewing above unless postdiscal/subapical darkening is so extreme as to obscure these (see Fig. 3, *M. philocles* and *M. metope* as examples of these patterns, respectively).

Group 1

Wing pattern above like Group 1 *Euptychia* (Appendix I); beneath variously striped: *M. coea* Huebner, *M. metope* Hewitson, *M. olivenca* Bates, *M. zanoa* Hewitson.

Group 2

Wing pattern above like Group 2 *Euptychia* (Appendix I); beneath variously striped: *M. philocles* Hewitson, *M. machaera* Hewitson, *M. jeziela* Butler, *M. tymetus* Cramer, *M. zonalis* Godman & Salvin, *M. sirenia* Stichel, *M. judicialis* Butler.

Group 3

Wing pattern above like Group 2 *Euptychia* in male only; female not white: *M. messeis* Hewitson, *M. ulrica* Cramer.

Group 4

Wing color above brown or blue, sometimes with brown stripes; band of white both above and beneath on hindwing: *M. melaena* Hewitson, *M. methion* Hewitson.

Group 5

Wing pattern striped above and beneath, but in shades of brown: *M. rhodia* Godart, *M. edice* Godart.

Group 6

Other Riodinidae with noteworthy wing pattern similarities to white *Euptychia*.

Subgroup A. *Hyphilaria* Huebner species: ground color broadly white (or yellow) above and beneath with dark brown (or black) wing bars or stripes.

Subgroup B. *Leucochimona* Stichel species: forewing with submarginal eyespots much like those of white *Euptychia*. *Perophthalma* Westwood species: forewing with eyespots ranging from subapical to submarginal (as in white *Euptychia*) to postdiscal (as in *Arawacus*, *Mesosemia*, and *T. albimimicus*).

B. Categories of Wing Pattern Similarity Between White *Euptychia* and Certain Theclinae

General Note: Listed below are numerous Theclinae taxa with various degrees of wing pattern resemblance to white *Euptychia*. Since taxonomic relations and distributional data are poorly known for many of these, names are listed as in Draudt (1919) and included are all taxa with any degree of known distributional overlap with white *Euptychia*. Contrasted to *Mesosemia*, most Theclinae taxa resembling white *Euptychia* are like *Euptychia* Group 1 of Appendix IA on the wing upper surfaces. Groupings below are in relation to degrees and kinds of resemblance to white euptychiine wing patterns. In order to conserve space, the terms "above" ("upper surface") and "beneath" ("under surface") are used interchangeably as appropriate.

Group 1

Like white *Euptychia* above; subgroups listed below have varying degrees of under surface similarity to white *Euptychia*.

Subgroup A. White above with black forewing apices; negligibly striped pattern beneath: *Thecla sedecia* Hewitson, *T. cardus* Hewitson, *T. arola* Hewitson, *T. cinniana* Hewitson.

Subgroup B. White above with black forewing apices; moderately striped pattern beneath: *Thecla dumenilii* Godart.

Subgroup C. White above with black forewing apices; distinct white and black (or brown) stripes beneath: *Thecla phaea* Godman & Salvin, *T. togarna* Hewitson, *T. linus* Fabricius, *T. lincoides* Draudt (these generally associated with *Arawacus* by authors); *T. numen* Druce, *T. tomlinsoni* Druce.

Group 2

Like Group 1 taxa, except ground color above light silvery blue, not white.

Subgroup A. Bluish white above, with black forewing apices; negligibly striped pattern beneath: *Thecla clytie* Edwards. *T. ines* Edwards, *T. cleon* Fabricius, *T. uzza* Hewitson.

Subgroup B. Bluish white above, with black forewing apices; moderately striped pattern beneath: *Thecla dolyllas* Cramer, *T. hamila* Jones.

Group 3

Taxa with either (a). one sex (b). forewing or hindwing or (c). one or the other surface like white *Euptychia*.

Subgroup A. Male white above, with black forewing apices; distinct white and black (or brown) stripes beneath. Female blue above; striped beneath as male: *Thecla leucogyna* Felder, *T. phaea* form.

Subgroup B. Female white above, with black forewing apices; distinct white and black (or brown) stripes beneath. Male blue above; striped beneath as female: *Thecla sito* Boisduval, *T. phydela* Hewitson.

Subgroup C. Forewing blue above; with black forewing apices; hindwing white above; distinct white and black (or brown) stripes beneath; form of *Thecla numen* Druce.

Group 4

Both sexes with distinct white and black (or brown) stripes beneath; above blue, sometimes with black apices.

Thecla erybathis Hewitson, *T. battus* Cramer, *T. aufidena* Hewitson, *T. phaleros* Linnaeus.

Group 5

Like Group 4 taxa, but not only blue above; striped beneath, but stripes not extremely similar to white *Euptychia*.

Subgroup A. Above neither blue nor white, and without black forewing apices; beneath one to two distinct white and black (or yellow and black) bands: *Thecla arza* Hewitson, *T. calatia* Hewitson, *T. tabena* Godman & Salvin, *T. hyacinthus* Cramer.

Subgroup B. Above neither blue nor white, and without black forewing apices; beneath with several distinct brown and yellow bands; *Thecla selina* Hewitson, *T. pholeus* Cramer, *T. bactriana* Hewitson.

Group 6

Taxa with variously enlarged dark-colored orbs at end of the discal cell (in additional to androconium, if on male).

Subgroup A. White above with emphatic blackened discal orb: *Thecla linus* Fabricius, *T. lincoides* Draudt, *T. togarna* Hewitson, *T. dumenilii* Godart.

Subgroup B. Blue above with emphatic blackened discal orb: *Thecla critola* Hewitson, *T. aurora* Druce, *T. polibetes* Cramer, *T. tagyra* Hewitson, *T. floralia* Druce, *T. candidus* Druce, *T. gigantea*, *T. hamila* Jones, *T. tephraeus* Huebner, *T. hemon* Cramer, *T. melidor* Druce.

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