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NEW AND ADDITIONAL RECORDS OF COSTA RICAN BUTTERFLIES

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ABSTRACT.– Seven butterfly species, *Lieinix poasina, Eurema agave, Adelpha massilia, Junonia genoveva, Castilia griseobasalis, Morpho catenarius* and *Caligo oedipus*, are reported as new to the Costa Rican fauna. Three additional species were reported for the country since the publication of DeVries (1987). Numerous other records are presented which extend the known distribution and flight season in Costa Rica.

KEY WORDS: *Actinote*, *Adelpha*, *Anteos*, *Anthanassa*, *Ascia*, *Brassolis*, butterflies, *Caligo*, Callidulidae, *Castilia*, *Catoblepia*, *Chlosyne*, *Cissia*, Costa Rica, *Cyllopsis*, distribution, *Dynamine*, *Ectima*, *Epiphile*, *Eresia*, *Eunica*, *Euptychia*, *Eurema*, *Eurytides*, *Haematera*, *Heliconius*, *Junonia*, *Lieinix*, *Morpho*, *Napeogenes*, Nymphalidae, *Panacea*, Papilionidae, *Parides*, *Pereute*, Pieridae, *Pteronymia*, *Pyrrhogyra*, *Siproeta*, *Taygetis*.

The publication of DeVries (1987) made the Costa Rican butterfly fauna the best known in the Neotropics. That book, which treated the Papilionidae, Pieridae and Nymphalidae, serves as an excellent all around resource and point of reference from which collections of Costa Rican butterflies may be evaluated. I examined some recently collected material from that country and herein report extensions of distribution in space and time. All previously known information is from DeVries (1987) unless another source is specifically cited. Included are seven species not mentioned therein (plus recent literature records of three species are repeated to completely update that book). Nomenclature follows that of DeVries (1987) unless mentioned otherwise; taxonomic comments are offered for a few taxa.

PAPILIONIDAE

Parides photinus (Doubleday). Recorded as flying from Jul to Sep, there are ♂ specimens taken on 7 Mar 1986, 7 and 10 Apr 1989 and 14 Dec 1984, all from the vicinity of Atenas, Alajuela Province.

Parides childrenae childrenae (Gray). A ♂ is from higher than the reported elevational range (to 800m) on the Tuis-Moravia Road, 2-4km E of Bajo Pacuare (ca 1000m), Cartago Province on 7 Oct 1987.

Papilio androgeus epidaurus Godman & Salvin. No flight season was specifically indicated but this was suggested as only during the early part of the rainy season. A fresh ♂ was taken towards the end of the wet season (8 Sep 1987) near Finca El Rodeo, San José Province.

Eurytides pausanias prasinus (Rothschild & Jordan). Thought to be confined to the Carrillo Belt in Costa Rica, a ♀ was taken (another seen) south of there at mud on the Rio Blanco-Petroleo Road, 5.8km S of Rio Blanco, Limón Province on 4 Sep 1987.

Eurytides branchus (Doubleday). A ♀ from the Atlantic slope, near Puerto Viejo, Limón Province, 9 Mar 1986 is out of its recorded distribution (Pacific slope) and flight season (Jun- Aug).

PIERIDAE

Lieinix poasina (Schaus). DeVries did not mention this taxon described from Costa Rica. D'Abrera (1981) illustrated it as a form of *Lieinix cinerascens* (Salvin). *L. poasina* flies with that species (Schaus, 1913) and is similar to it. The ventral markings are somewhat different and the hindwing of the ♀ has a dark

Fig. 1. *Lieinix poasina* (Schaus): ♀ (dorsal surface) - COSTA RICA: Cartago Province; Ruta 2, 1km E Vivero Forestal Pacifica, 23 Dec 1984.
Fig. 2. *Lieinix poasina* (Schaus): ♀ (ventral surface) - same specimen as Fig. 1.

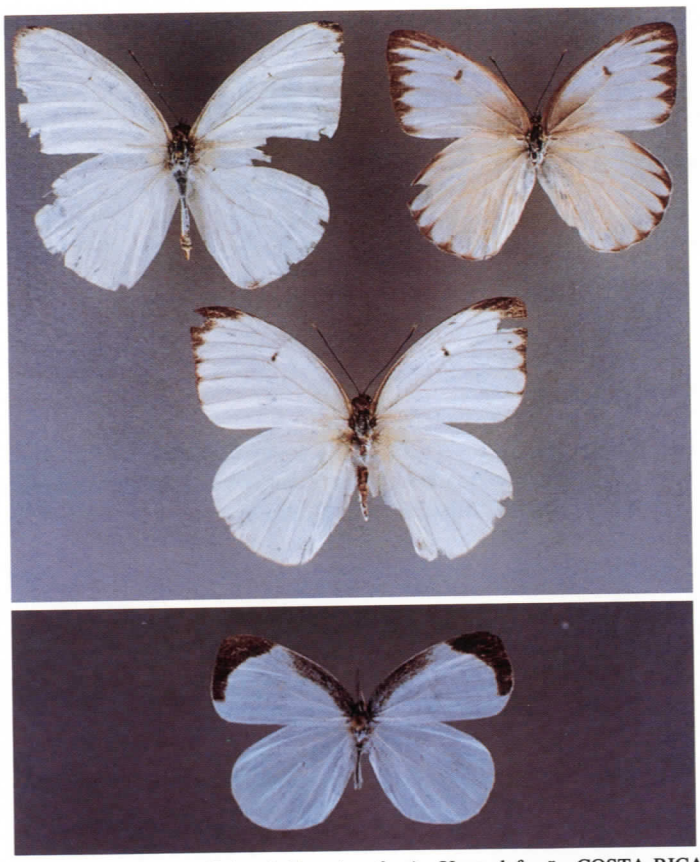


Fig. 3. *Ascia limona* (Schaus) (dorsal surface): Upper left, ♂ - COSTA RICA: Alajuela Province; vicinity of Atenas, 27 Dec 1984. Upper right, ♀ - COSTA RICA: San José Province, Desamparados, Monte Claro, 9 Aug 1986. Lower, ♀ - COSTA RICA: Alajuela Province; vicinity of Atenas, 25 Dec 1984.

Fig. 4. *Eurema agave mana* (Boisduval): ♀ (dorsal surface) - COSTA RICA: Limón Province; Puerto Viejo, 9 Mar 1986.

margin as broad as on *Lieinix viridifascia* (Butler). The blunter tips of the forewings distinguishes *L. poasina* from that taxon. One ♀ (Figs. 1, 2) is from Ruta 2, 1km S of Vivero Forestal Pacifica, Cartago Province, 23 Dec 1984 (elevation of 1600m, much lower than reported for *L. cinerascens* of above 2500m).

Pereute charops (Boisduval). Recorded as occurring above 1200m, there is a ♂ from the cerro just west of Patarra (ca. 1000m), 12 Oct 1987 and a ♀ from Ruta 7, 10.3km E of Puriscal (ca. 800m), 17 Sep 1987, both in San José Province.

Ascia limona (Schaus). DeVries thought that this species had not been seen for eighty years and suggested it occurred only in the Atlantic slope lowlands. I have seen three specimens (Fig. 3) which appear to be of this taxon: a ♂ (forewing length = 40 mm) from the vicinity of Atenas, Alajuela Province, 27 Dec 1984; a ♀ (39mm) from the same location, 25 Dec 1984 (this specimen does not have the marginal triangles on the dorsal hindwing) and a ♀ (35mm) from Monte Claro, Desamparados, San José Province, 9 Aug 1986. These are all Pacific slope locations and from an elevation of about 1000m.

Anteos maerula (Fabricius). Recorded only from the Pacific slope, there is a ♂ from the Atlantic slope at Germania, Ruta 32, Limón Province, 5 Oct 1987.

Eurema nicippe (Cramer). Reported as rare between 500 and 1200m on the Meseta Central, a ♀ was taken at Finca La Pacifica, near Cañas, 100m, Guanacaste Province on 16 Dec 1984.

Eurema mexicana bogotana (Felder & Felder). For some reason, DeVries did not recognize this distinct subspecies (e.g., Klots, 1929) which occurs from Costa Rica to Columbia. Males differ from *Eurema mexicana mexicana* (Boisduval) by having broader black margins (this extending considerably further posteriorly on the hindwing), lacking the broad yellow costal area on the dorsal hindwing and having very little yellow in the discal cell of the ventral forewing. Females have narrow black margins (this represented only by black-scaled anterior veins on the hindwing), less extensive basal yellow flush on the dorsal hindwing and less yellow in the discal cell of the ventral forewing.

Eurema agave mana (Boisduval). This species was not reported for Costa Rica (but see Llorente-Bousquets and Luis-Martinez, 1987). I have seen a ♂ from near Finca La Selva, near Puerto Viejo, Heredia Province, 14 Mar 1986 and two ♀s from Puerto Viejo, Limón Province, 9 Mar 1986.

This small (15-17mm), white *Eurema* (Fig. 4) has a black margin on the forewing which ends above the tornal angle and a blackish smudge along the forewing costa which does not connect with the black on the margin. The dorsal hindwing is immaculate white. The ventral surface is white with yellow overscaling along the forewing costal and outer margins and over the entire hindwing. *Eurema albula* (Cramer) is usually larger, often with black on the hindwing margin and without black along the forewing costa. Females of *Eurema daira* (Godart) and *Eurema elathea* (Cramer) have black on the hindwing margin and the black along the forewing costa extends to the black of the outer margin.

The subspecific name follows that used by Godman and Salvin (1889) and Llorente-Bousquets and Luis-Martinez (1987).

NYMPHALIDAE

Panacea procilla lysimache (Godman & Salvin). DeVries (1988) recently collected this species in Costa Rica.

Ectima thecla astricta Fruhstorfer. Jenkins (1985) recorded this species for Costa Rica from San Vito, Puntarenas Province. DeVries reported only *Ectima erycinoides erycinoides* Felder & Felder (as *Ectima rectifascia* Butler & Druce) from the country.

Dynamine agacles Dalman. This was reported as rare in areas "centered around the Osa Peninsula." There are specimens from north of there at Rio Catarata, Ruta 2, Puntarenas Province taken on 3 Apr 1989 (2 ♂), 12 Sep 1987 (1 ♀) and 2 Oct 1986 (1 ♂).

Dynamine theseus Felder. Reported as very rare and only from San Mateo, a ♀ is from Rio Catarata, Ruta 2, Puntarenas Province on 2 Oct 1986, flying with the very similar *D. agacles*.

Dynamine ate (Godman & Salvin). This species is still relatively common south of Guapiles, near Germania, Limón Province with several specimens taken in Sep 1986 and Oct 1987.

Dynamine salpensa Felder. Pacific slope records were reported only from the Osa Peninsula. A ♀ is from north of there at Rio Catarata, Ruta 2, Puntarenas Province on 2 Oct 1986.

Dynamine thalassina. Boisduval. This species was reported as very rare around Limón on the Atlantic slope and Palmar on the Pacific slope. I have seen a ♂ from 3-6km N of Buenos Aires on the road to Ujarraz, Puntarenas Province, 13 Sep 1987 on the

Fig. 5. Upper row, *Adelpha massilia* (Felder) (dorsal surface): Left, ♂ - COSTA RICA: Alajuela Province; Rio Grande de Tarcoles, near Balsa, 30 Aug 1987. Right, ♀ - COSTA RICA: Puntarenas Province, Rio Pita (Tarcolitos), 18 Sep 1987.
Lower row, *Adelpha iphiclus* (Linnaeus) (dorsal surface): Left, ♂ - COSTA RICA: Alajuela Province, Rio Grande de Tarcoles, near Balsa, 30 Aug 1987. Right, ♀ - COSTA RICA: Alajuela Province, vicinity of Atenas, 29 Aug 1987.
Fig. 6. Upper row, *Adelpha massilia* (Felder) (ventral surface) - same specimens as Fig. 5. Lower row, *Adelpha iphiclus* (Linnaeus) (ventral surface) - same specimens as Fig. 5.

Pacific slope and ♀s from the Atlantic slope in Limón Province at Germania on 12 Sep 1986; Rio Victoria, S of Rio Blanco on 12 Apr 1989 and 4 Sep 1987 and in Heredia Province at Finca Selva Verde, Chilamate on 26 Sep 1986.

Eunica pusilla Bates. DeVries did not report this species from Costa Rica. Jenkins (1990) examined material from two locations on the Pacific slope: Palmar Norte (Puntarenas Province) and Cañas (Guanacaste Province).

Eunica sydonia caresa Hewitson. Reported as very rare in Costa Rica and known from three locations; Jenkins (1990) listed additional locales. An additional ♂ from near Atenas (Alajuela Province) was taken on 10 Apr 1989. The synonymy follows Jenkins (1990).

Epiphile orea plusios Godman & Salvin. In addition to the reported flight period of Jan to Jun, a fresh ♂ was taken at Finca Las Cruces, 5km S of San Vito de Java, Puntarenas Province on 30 Sep 1986.

Pyrrhogyra neaerea hypsenor Godman & Salvin. Although reported as common in Guanacaste Province on the Pacific slope, DeVries only saw museum specimens of this species from the Atlantic slope. Single ♂s were taken in a forest near Finca La Selva, vicinity of Puerto Viejo, Sarapiqui District, Heredia Province on 31 Mar 1989 and 25 Sep 1986.

Haematera pyramus thysbe (Doubleday). Only two records were known from Costa Rica, those from the Guapiles area. An additional ♂ was taken at wet sand on the bank of Rio Victoria, 3.7km S of Rio Blanco, Limón Province on 4 Sep 1987. *Callidula* was stated to be the senior synonym of *Haematera* by Brown (1988), but the first type-species designation made the genus the type-genus of the moth family Callidulidae.

Adelpha boeotia boeotia (Felder & Felder). This species was known on the Pacific slope only "around the Osa Peninsula" and at elevations below 700m. A ♂ was taken near Finca Las Cruces, 5km S of San Vito de Java (ca. 1100m), Puntarenas Province on 30 Sep 1986.

Adelpha delinita uta Fruhstorfer. Reported to occur below 700 m in elevation, a ♂ is from about 1000m on the Tuis-Moravia Road, 2-4km E of Bajo Pacuare, Cartago Province on 7 Oct 1987.

Adelpha basiloides (Bates). Recorded only on the Pacific slope, there are Atlantic slope specimens from Playa Bananito, Limón Province, 13 Sep 1986 (2 ♀) and from Finca Bejuco, Ruta 9, Chilamate, Heredia Province, 28 Sep 1987 (1 ♀).

Adelpha massilia (Felder). This species has not been reported from outside of Mexico (Beutelspacher, 1976, D'Abrera, 1987). In Costa Rica, it probably has been confused with *Adelpha iphiclus* (Linnaeus) and is about the same size (23-31mm) as that species. *A. massilia* (Figs. 5, 6) is most easily distinguished from *A. iphiclus* by a broader subapical orange patch, that portion in cell M_2 is nearly as broad as in cell M_1 (this is very narrow on *A. iphiclus*, usually as a small posteriorly pointing triangle in line with the distal edge of the orange bar in cell M_1). The wings of *A. massilia* are somewhat more rounded than those of *A. iphiclus* and the white bands tend to be broader. There are additional subtle differences in pattern, especially on the venter, and the genitalia differ. DeVries' figure is correctly identified as *A. iphiclus*.

I have examined specimens of *A. massilia* from numerous Pacific slope locations from sea level to about 1000m from near Manuel Antonio de Quepos. This species appears most common above 500m from Villa Colon (San José Province) to Guanacaste Province at Playa Coco south to Puntarenas Province the Atenas area (Alajuela Province). This material was taken between late Aug and late Dec.

Adelpha iphiclus (Linnaeus). In light of the apparent confusion of this taxon with *A. massilia*, DeVries' discussion of this may need modification once all relevant material is examined. I have seen *A. iphiclus* (Figs. 5, 6) from the Atlantic slope between 100 and 800m (Chilamate, Heredia Province and near La Virgin del Socorro, Alajuela Province) and from several locations on the Pacific slope (vicinity of Atenas, Alajuela Province south to Rio Catarata, Puntarenas Province), in several areas flying with *A. massilia* but appearing less common. The dates of this material spans the same time frame as for *A. massilia* above.

Siproeta superba eunoe Fox & Forbes. Previously recorded for Jan to Apr, a ♂ from between Villa Colon and Finca El Rodeo, San José Province was taken on 3 Oct 1987.

Junonia. DeVries indicated the possibility of more than one species of this genus occurring in Costa Rica yet included his discussion under the name *Junonia evarete* (Cramer). The common phenotype (Figs. 7, 8 and as illustrated by DeVries) appears to be that of *Junonia genoveva* (Cramer) as outlined by Turner and Parnell (1985) [but note that Scott (1986) applied these names in reverse of Turner and Parnell (1985)]. It has the pale area on the forewing pale orange and extending to the outer margin on the venter, relatively distinct markings and ocelli on the brownish ventral hindwing and dark antennae with pale clubs. A rare phenotype (Figs. 7, 8) has the pale area on the forewing brownish-white and not extending to the outer margin on the venter, a dark gray ventral hindwing with indistinct markings and pale antennae with dark clubs. This may be *Junonia evarete*. Both were caught at Matalimon, Puntarenas Province on 15 Mar 1986. More study is needed, especially of the early stages. *J. evarete* larvae feed on Black Mangrove (*Avicennia germans*, Avincenniaceae) on Jamaica (Turner and Parnell, 1985) and this species may similarly be confined to coastal locations in Costa Rica.

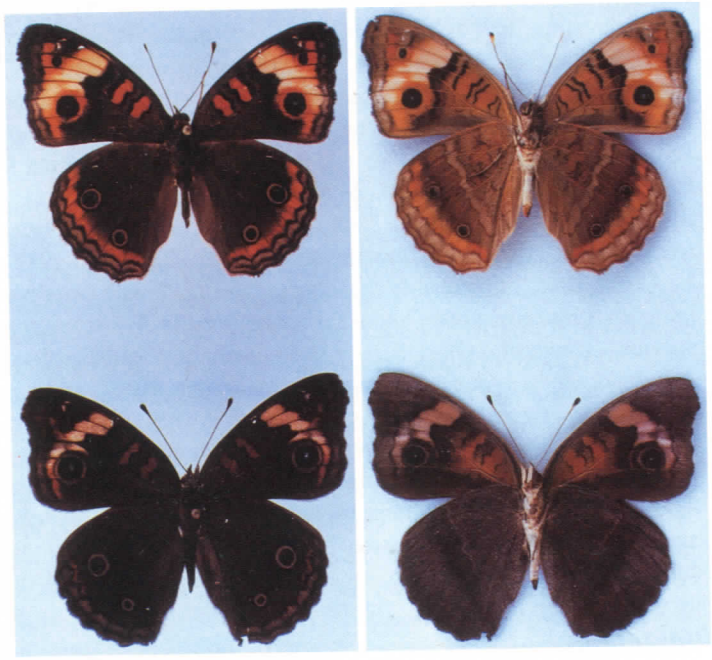


Fig. 7. Upper, *Junonia genoveva* (Cramer): ♀ (dorsal surface) - COSTA RICA: Heredia Province, Ruta 9, Chilamate, 30 Mar 1989. Lower, *Junonia evarete* (Cramer): ♀ (dorsal surface) - COSTA RICA: Puntarenas Province: Matalimon, 15 Mar 1986. **Fig. 8**. Upper, *Junonia genoveva* (Cramer): ♀ (ventral surface), same specimen as Fig. 7. Lower, *Junonia evarete* (Cramer): ♀ (ventral surface) - same specimen as Fig. 7.

Actinote guatemalena (Bates). This rare species was known only from the Finca La Selva area in Heredia Province. Additionally, it was taken along the San Miguel-San Carlos Road, 8.5km E of Aguas Zarcas, Finca El Abanico, Alajuela Province on 29 Sep 1987 (4 ♂, 1 ♀, Fig. 9). Brown (1988) considered this and the following taxon as subspecies of *Actinote pellenea* Hübner.

Actinote melampeplos Godman & Salvin. Two ♂s taken at 3km E of Turrialba, Ruta 10, Cartago Province on 8 Mar 1986 do not match the illustration in DeVries of *A. melampeplos* (but which they may be); their phenotype appears nearest that of *Actinote cedestes* Jordan known from Ecuador (D'Abrera, 1987). The hindwing has only a very faint orange tinge, not strong as on other *A. melampeplos* that I have seen. The black areas are narrower than on *A. guatemalena* leaving broader pale areas on both wings. Additionally, the black along the veins of both wings and in mid cells of the hindwing is thinner (Fig. 9).

Actinote lapitha (Staudinger). The Costa Rican distribution was reported as "centered around the Osa Peninsula" with adults known from Feb to Mar (occasionally to Jun). Three ♂s were taken at Rio Largato, Ruta 2, 1.0km W of Rio Claro, Puntarenas Province on 11 Sep 1987.

Heliconius ismenius telchinia Doubleday. This subspecies was reported to occur mainly on the Atlantic slope with Pacific slope records confined to the Meseta Central (but see DeVries, *in* Janzen 1983). Typical specimens have been taken away from here at several locations on the Pacific slope: near Atenas, Alajuela Province (Dec 1984); Monteverde, Puntarenas Province (17 Sep 1986); Ruta 34, 7.9km S of Los Palmneros, Puntarenas Province (21 Sep 1987, 1 ♀ plus 3 ♂ of *Heliconius ismenius clarescens* Butler) and Ruta 1, 1.0km W of Rio Piedras, Guanacaste Province (24 Sep 1987).

Heliconius ismenius clarescens Butler. This phenotype was thought to be confined to the Pacific slope. There is a ♂ from 1.0km N of Santa Clara, Limón Province, 5 October 1987 and another ♂ from Aguas Claras, 13.0km W of Guayabo, Alajuela Province, 24 Sep 1987 (taken with a ♂ of *H. i. telchinia*); both locations are on the Atlantic slope. These data suggest that the relationships of the the two taxa require closer attention.

Heliconius sara fulgidus Stichel. Reported as confined to the Atlantic slope, a ♀ of this phenotype was taken on the Pacific slope near Atenas, Alajuela Province on 9 Oct 1987. Perhaps the previously reported taxon on this slope, *Heliconius sara theudela* Hewitson, is confined to the southwestern portion of the country.

Chlosyne melanarge (Bates). Reported as "only present during the rainy season," a pair was taken on 17 Dec 1984, 1.5km NW of Rio Piedras, Ruta 1, Guanacaste Province.

Chlosyne poecile (Felder). Recorded from San Mateo southward, there are recent records from north of there. One ♂ is from the Monteverde Road, 7.8km N of Ruta 1, Puntarenas Province, 16 Sep 1986 and a ♀ is from Ruta 1, 1.5km NW of Rio Piedras, Guanacaste Province on 17 Dec 1984. Additionally, there is a series of *Chlosyne* from the Upala Road, 10.5km S of Bijagua,

Fig. 9. Upper, *Actinote* near *melampeplos* Godman and Salvin: ♂ (dorsal surface) - COSTA RICA: Cartago Province, Ruta 10, 3km E Turrialba, 8 Mar 1986. Lower, *Actinote guatemalena* (Bates): ♂ (dorsal surface) - COSTA RICA: Alajuela Province, San Miguel-San Carlos Rd., 8.5km E Aguas Zarcas, Finca El Abanico, 29 Sep 1987. **Fig. 10**. *Chlosyne poecile* (Felder) / *Chlosyne erodyle* (Bates) blend zone: ♂ (dorsal surface) - COSTA RICA: Guanacaste Province; Upala Road, 10.5km S Bijagua, 22 Sep 1988. **Fig. 11**. Upper row, *Castilia myia* (Hewitson) (dorsal surface): Left, ♂ - COSTA RICA: Alajuela Province; Ruta 11, Rio Colorado, 22 Sep 1987. Right, ♀ - COSTA RICA: Alajuela Province; Rio Virilla, vicinity of Guacima, 7 Sep 1987. Lower row, *Castilia griseobasilis* (Röber) (dorsal surface): Left, ♂ - COSTA RICA: Limón Province; Germania, 15 Apr 1989. Right, ♀ - COSTA RICA: Heredia Province; 3.8km N Santa Clara, 5 Sep 1987. **Fig. 12**. Upper row, *Castilia myia* (Hewitson) (ventral surface) - same specimens as Fig. 11. Lower row, *Castilia griseobasilis* (Röber) (ventral surface), same specimens as Fig. 11.

Guanacaste Province taken on 22 Sep 1987. Most of these are typical *C. poecile* but 3 ♂ and 2 ♀ have small white forewing spots and are of the *Chlosyne erodyle* (Bates) concept and others have the yellow spots reduced in size and with some white spots (Fig. 10). The phenotype with paler forewing macules was named *Chlosyne poecile rubrigutta* Röber. Higgins (1960) considered this to be a distinct form but it probably represents specimens intermediate between *C. poecile* and *C. erodyle*. This suggests that *C. poecile* and *C. erodyle* may be conspecific. To the northwest at Guayabal, Alajuela Province, specimens are typical of *C. erodyle*.

Anthanassa sosis (Godman & Salvin). Previous records were from above 2000m. A ♂ is from a lower elevation (ca. 1800m) on Ruta 1, 14.3km N of San Isidro de General, San José Province taken on 3 Apr 1989.

Anthanassa atronia (Bates). Reported only for San Mateo on the Pacific slope and from elevations of 600-1000m, a ♂ was taken with the above taxon and *Anthanassa crithona* (Salvin) at Ruta 1, 14.3km N of San Isidro de General (1800m), San José Province on 3 Apr 1989. Another Pacific slope record is a ♂ taken along the road from Villa Colon to Finca El Rodeo, San José Province on 2 Oct 1987.

Anthanassa otanes sopolis (Godman & Salvin). Very rare and previously known only from Vulcan Poas in Costa Rica, a ♂ was taken at Monteverde, Puntarenas Province on 25 Sep 1987.

Anthanassa tulcis (Bates). This was reported only for the Pacific slope. It is also relatively common at low elevations south of Germania, Limón Province on the Atlantic slope with records for March, Apr and Sep. There are also Atlantic slope specimens from Aguas Claras, 13km N of Guayabo, Alajuela Province, 24 Sep 1987 and from Ruta 10 at Rio Reventazon, Cartago Province, 8 Mar 1986.

Eresia eutropia Hewitson. No records were reported from outside the San Vito area. A ♂ is from Ruta 7, 10.3km E of Puriscal, 26 Sep 1987 and a ♀ is from Rio Chirripo Pacifico, 5.0km N of Rivas, 14 Sep 1987, both in San José Province.

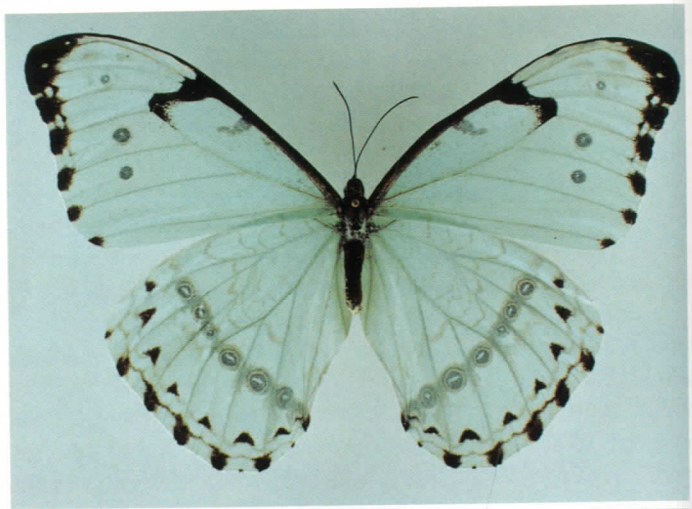
Castilia eranites (Hewitson). The Pacific slope distribution was known from San Mateo southward. A ♀ was taken north of this on the Monteverde Road, 25km N of Ruta 1, Puntarenas Province on 17 Sep 1986.

Castilia myia (Hewitson). DeVries considered this and *Castilia griseobasalis* (Röber) as forms although Higgins (1981) treated them as distinct species. The only difference between these mentioned by DeVries was the color of the base of the ventral forewing. Numerous other differences exist: *C. griseobasalis* is smaller (♂ forewing = 17-19mm, ♀ = 19-21mm) than *C. myia* (♂ = 18-21mm, ♀ = 20-23mm), the forewing spots are smaller (subapical spots are often absent on the ♂), the spots in cells CuA_1 and CuA_2 angle inward and are parallel to the outer margin (these are more or less perpendicular to the inner margin on *C. myia*), the dorsal forewing base is completely dark (on *C. myia* there is usually a reddish subbasal bar in the discal cell and the ♀ usually has additional reddish spots further basad in the discal cell and in cell CuA_2), the hindwing white band is narrower and the ventral hindwing is grayer (yellow-brown on *C. myia*). The key difference is the base of the ventral forewing which is tannish-olive on *C. griseobasalis* and reddish-brown on *C. myia*.

I have seen specimens of *C. myia* (Figs. 11, 12) from the Atlantic slope taken in Mar, Apr and Sep.

Castilia griseobasalis (Röber). DeVries considered this as a form of *C. myia* and reported it known only from the Atlantic slope (but see DeVries, *in* Janzen 1983). As outlined above, this appears to be a distinct species (Figs. 11, 12) and it occurs on both slopes. Most specimens examined were from between elevations of 500m and 1000m on the Pacific slope from the vicinity of Atenas (Alajuela Province) and Paso Ancho (San José Province) south to near Buenos Aires (Puntarenas Province). The dates involved are from late Aug to early Jan and one in late Mar. Atlantic slope records are from Aguas Claras, 13.0km N of Guayabo, Alajuela Province south to the Panama border at Paraiso, Limón Province in Apr and Sep. The only location among the above where this species and *C. myia* were taken together was at 3.8km N of Santa Clara, Heredia Province on 5 Sep 1987.

Napeogenes cranto paedaretus Godman & Salvin. Recorded for the Cordillera de Telemanca (but see DeVries, *in* Janzen 1983), this taxon was collected north of there at Rio Angel, vicinity of La Virgin del Socorro, Alajuela Province on 1 and 13 Apr 1989 (2 ♂, 1 ♀).



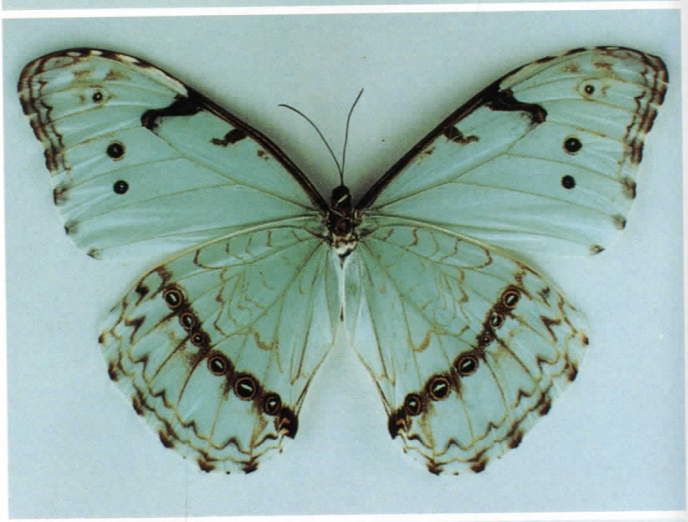


Fig. 13. *Morpho catenarius* Perry: ♂ (dorsal surface) - COSTA RICA: Puntarenas Province, 5km S San Vito de Java, Sep 1986.

Fig. 14. *Morpho catenarius* Perry: ♂ (ventral surface) - same specimen as Fig. 13.

Fig. 15. *Catoblepia xanthicles xanthicles* (Godman and Salvin): ♀ (dorsal surface) - COSTA RICA: Cartago Province, Ruta 10, Rio Chitaria, 8 Mar 1986.

Pteronymia agalla Godman & Salvin. Reported as absent in the dry season, two ♂ and two ♀ were taken in late Dec 1984 near Atenas, Alajuela Province.

Pteronymia parva (Salvin). A ♂ is from the Upala Road, 10.5km S of Bijagua, Guanacaste Province on 22 Sep 1987. This species was previously reported only from the Atlantic slope in Jun and Jul.

Morpho catenarius Perry. A ♂ (Figs. 13, 14) taken in late Sep 1986 from nearly at the Panama border near Finca Las Cruces, 5km S of San Vito de Java, Puntarenas Province, represents the first reported occurrence of this species in Costa Rica. This is an almost unbelievable record as the species is reported only from Paraguay, Uruguay and southern Brazil (D'Abrera, 1984) but I was present as it was captured. The other white *Morpho* known from the country, *Morpho polyphemus catarina* Corea & Chacon, occurs in the mountains of Guanacaste Province.

Morpho granadensis polybaptus Butler. A ♂ from Ruta 9 at Rio Angel, Alajuela Province taken on 29 Sep 1987 and a ♀ from Finca Selva Verde, Ruta 9, Chilamate, Heredia Province taken on 28 Sep 1987 extends the know flight period (Feb-Mar, Jul-Aug).

Brassolis isthmia Bates. Additional records of this very rarely collected species in Costa Rica are for Limön Province: Puerto Viejo, 11 Apr 1989 (2 ♂) and Ruta 36, Playa Bananito, 9 Mar 1986 (1 ♂).

Catoblepia xanthicles xanthicles (Godman & Salvin). Another rare species, a ♀ was taken on Ruta 10 at Rio Chitaria, Cartago Province on 8 Mar 1986. This specimen (Fig. 15) has a narrow orange marginal band on the dorsal hindwing, a feature reported by DeVries as absent on this species (but see figure in D'Abrera, 1987).

Caligo oedipus fruhstorferi Stichel. This species was not included in the Costa Rican fauna by DeVries (1987) yet he illustrated (Plate 46, figs. 2, 4, 6) three specimens as *Caligo illioneus oberon* Butler (this latter species is correctly identified on Plate 46, fig. 5). The differences on the dorsal surface are obvious. The basal blue of *C. illioneus* is extensive and shining (especially distally) and the initial impression when flushed is of a *Morpho*. Additionally, the forewing submarginal dark band is distinctly outlined on both sides by a buff colored line. The basal area of the wings of *C. oedipus* is blue-gray, this less extensive than the blue area on *C. illioneus*. The anterior half of the forewing is buffy brown (blue basally, dark distally on *C. illioneus*) and the buff outlines of the submarginal band are suffused and indistinct.

The ventral surface of *C. illioneus* is dark gray-brown in contrast to the paler, more buffy brown of *C. oedipus*. A key difference is the pattern in the forewing discal cell. On *C. illioneus*, there is a pale macule at the distal end followed by a brown area striated with black and then a regular pale bar just before mid cell. A similar, but broader bar occurs beyond mid cell. On *C. oedipus*, the distal end of the discal cell has a narrow pale macule followed by a clear pale brown area marked with a double looped black line. The two pale bars are very irregular in outline. The ♀s of both species are similar to their respective ♂s but larger.

I have seen material of *C. oedipus* from the lowlands of the Atlantic slope, Heredia Province (Chilamate and Puerto Viejo areas where it flies with the apparently less common *C. illioneus*) taken in Mar and Sep and from near Siquirres, Limón Province taken in Apr.

Cyllopsis pephredo (Godman). This species was reported as uncommon in Jun, Jul and Aug. It appears to be not uncommon in some areas of the San José area (San José Province) with specimens examined from Feb to Apr and Sep to Oct.

Taygetis celia keneza Butler. This was reported as uncommon on the Atlantic slope (but see DeVries, *in* Janzen 1983). A Pacific slope record is a ♀ from the vicinity of Finca Las Cruces, 5km S of San Vito de Java, Puntarenas Province taken on 29 Sep 1986.

Euptychia jesia Butler. This species occurs to elevations near 1000m (W of Atenas, Alajuela Province), considerably higher than the 500m reported by DeVries.

Euptychia westwoodi Butler. A ♀ was taken at Rio Angel, vicinity of La Virgin del Socorro, ca. 850m on 13 Apr 1989 above the reported elevational range from sea level to 500m.

Cissia usitata (Butler). There are two phenotypes involved in DeVries' concept of this species. The Pacific slope phenotype (Figs. 16, 17) is plain with few and small ocelli on both wing surfaces. This is identical to DeVries' figure of *C. usitata* from Panama and to material from Ecuador. It was previously recorded on the Pacific slope from Quepos south to the Osa Peninsula. I have seen material from as far north as near Atenas, Alajuela Province and to nearly 1000m in elevation. This phenotype also occurs on the Atlantic slope, especially northward (Upala, Guayabal, Aguas Claras, all Alajuela Province) and sparingly southward with the following phenotype.

Most Atlantic slope material (Figs. 16, 17) is brighter with more and larger ocelli and the genitalia differ. I have seen material only from the Atlantic slope to about 700m in elevation and from the Chilamate District, Heredia Province southward.

Cissia ocirrhoe (Fabricius). The current concept of this species, formerly known as *Cissia hesione* (Sulzer) (see Brown, 1988), also involves two phenotypes in Costa Rica. Males of the first (Figs. 18, 19 and as illustrated by DeVries) have a broad brown margin on the dorsal forewing extending nearly full width to the posterior margin, the median brown band usually extends broadly in the discal cell to at least vein M_3 and the basal portion of the discal cell is largely clouded with brown. The ventral surface is banded whitish and brown, the forewing has one distinct apical ocellus (plus one or two indistinct ocelli posterior to this) and the hindwing has two relatively large and prominent ocelli, two vague ocelli between them and a small apical ocellus. Females are similar to ♂s but with the brown median band of the dorsal forewing extending further posteriorly and brown submarginal scaling on the hindwing, especially anteriorly. This is the phenotype which extends southward into northern South America, probably representing true *C. ocirrhoe* (*fide* L. D. Miller). I have seen material of this phenotype largely from the Pacific slope below about 1000m in elevation and from near Atenas, Alajuela Province southward. The only specimens I have seen from north of here were from the Atlantic slope, north of Bijagua on the road to Upala, Alajuela Province. Dates for this material are in Mar, Apr, late Aug-early Oct and Dec.

The second phenotype (Figs. 18, 19) has the brown marginal

Fig. 16. *Cissia usitata* (Butler) (dorsal surface): Upper row, Atlantic slope phenotype. Left, ♂ - COSTA RICA: Limón Province; Germania, 5 Oct 1987. Right, ♀ - COSTA RICA: Limón Province; Germania, 10 Mar 1986. Lower row, Pacific slope phenotype. Left, ♂ - COSTA RICA: Alajuela Province, vicinity of Atenas, 25 Dec 1984. Right, ♀ - COSTA RICA: Alajuela Province, vicinity of Atenas, 19 Dec 1984. **Fig. 17**. *Cissia usitata* (Butler) (ventral surface): Upper row, Atlantic slope phenotype - same specimens as Fig. 16. Lower row, Pacific slope phenotype - same data as Fig. 16. **Fig. 18**. *Cissia ocirrhoe* (Fabricius) (dorsal surface): Upper row, Pacific slope phenotype. Left, ♂ - COSTA RICA: San José Province; vicinity of Villa Colon, 16 Sep 1987. Right, ♀ - COSTA RICA: Puntarenas Province; Ruta 2, Rio Volcan, 13 Sep 1987. Middle row, Atlantic slope phenotype. Left, ♂ - COSTA RICA: Heredia Province, vicinity Puerto Viejo, 25 Sep 1986. Right, ♀ - COSTA RICA: Limón Province, Herediana, 10 Mar 1986. Lower row, Atlantic slope phenotype, dark form. ♂ - COSTA RICA: Limón Province, Playa Bananito, 8 Mar 1986. **Fig. 19**. *Cissia ocirrhoe* (Fabricius) (ventral surface): Upper row, Pacific slope phenotype - same specimens as Fig. 18. Middle row, Atlantic slope phenotype - same specimens as Fig. 18. Lower, Atlantic slope phenotype, dark form - same specimen as Fig. 18.

band of the forewing narrowing posteriorly; the median brown band is narrow, short and ending posteriorly entirely within the discal cell and the basal portion of the discal cell is entirely white with brown restricted to the costa. The ventral surface is similar to the phenotype described above but the brown bands tend to be slightly broader, there is nearly always two or three relatively distinct apical ocelli on the forewing and the hindwing ocelli tend to be larger and the central pair is more prominent. Females are very similar to the Pacific slope phenotype except the median brown band on the dorsal forewing is shorter and more sharply defined and there is much less brown on the dorsal hindwing (this usually occurring only above the ventral ocelli). This phenotype is known from Mexico southward into Central America (*fide* L. D. Miller). I have seen material only from the Atlantic slope below about 700m from the Chilamate District, Heredia Province southward. Dates for these are in Mar-Apr and Sep-Oct. Also illustrated (Fig. 18, 19) is an uncommon form with more expansive brown on the ventral surface.

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LITERATURE CITED

Beutelspacher, C. R.

1976. Estudios sobre el genero *Adelpha* Hübner en Mexico (Lepidoptera: Nymphalidae). *Rev. Soc. Mex. Lepid.* (Mexico City), 2:8-14.

Brown, K. S., Jr.

1988. Book review: The butterflies of Costa Rica and their natural history: Papilionidae, Pieridae, Nymphalidae. *J. Lepid. Soc.* (Los Angeles), 42:240-244.

D'Abrera, B.

1981. *Butterflies of the Neotropical Region, part 1 Papilionidae & Pieridae*. East Melbourne: Lansdowne. 172 pp.

1984. *Butterflies of the Neotropical Region, part II. Danaidae, Ithomiidae, Heliconidae & Morphidae*. Victoria: Hill House. 220 pp.

1987. *Butterflies of the Neotropical Region, part III Brassolidae, Acraeidae, & Nymphalidae (Partim)*. Victoria: Hill House. 140 pp.

DeVries, P. J.

1987. *The butterflies of Costa Rica and their natural history: Papilionidae, Pieridae, Nymphalidae*. Princeton: Princeton Univ. Pr. 327 pp.

1988. Notes on *Panacea procilla lysimache* (Nymphalidae) from Costa Rica. *J. Res. Lepid.* (Santa Barbara), 27:140-141.

Godman, F. D., and O. Salvin

1889-90. *Biologia Centrali Americana. Zoologie, Insecta, Lepidoptera, Rhopalocera*. vol. I. London.

Higgins, L. G.

1960. A revision of the melitaeine genus *Chlosyne* and allied species (Lepidoptera: Nymphalidae). *Trans. Roy. Ent. Soc. London*, 112:381-467.

1981. A revision of *Phyciodes* Hübner and related genera, with a review of the classification of the Melitaeinae (Lepidoptera: Nymphalidae). *Bull. Br. Mus. (Nat. Hist.)* (London), (Ent.) 43:77-243.

Janzen, D. H. (ed).

1983. *Costa Rican natural history*. Chicago: Univ Chicago Pr. 816 pp.

Jenkins, D. W.

1985. Neotropical Nymphalidae. IV. Revision of *Ectima*. *Bull. Allyn Mus.* (Sarasota), 95:1-30.

1990. Neotropical Nymphalidae. VIII. Revision of *Eunica*. *Bull. Allyn Mus.* (Sarasota), 131:1-177.

Klots, A. B.

1929. A revision of the genus *Eurema* Hübner (Lepidoptera, Pieridae). Part II: New World species, taxonomy and synonymy. *Ent. Amer.* (Lancaster), (n. s.) 9:99-171.

Llorente-Bousquets, J., and A. Luis-Martinez

1987. Una neuva subespecie de *Eurema agave* Cramer (Lepidoptera: Pieridae; Coliadinae). *Folia Ent. Mex.* (Mexico City), 71:17--25.

Schaus, W.

1913. New species of Rhopalocera from Costa Rica. *Proc. Zool. Soc. London*, 1913:339-367

Scott, J. A.

1986. *The Butterflies of North America: a Natural History and Field Guide*. Stanford: Stanford Univ. Pr. 583 pp.

Turner, T. W., and J. R. Parnell

1985. The identification of two species of *Junonia* Hübner (Lepidoptera: Nymphalidae): *J. evarete* and *J. genoveva* in Jamaica. *J. Res. Lepid.* (Santa Barbara), 24:142-153.