

***EURYTIDES* AND OTHER COSTA RICAN OSA PENINSULA SURPRISES (LEPIDOPTERA: PAPILIONOIDEA)**

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ABSTRACT.— A possible new subspecies of *Eurytides dioxippus* (Hewitson) (Papilionidae) found on Costa Rica's Osa Peninsula is illustrated, together with notes on its appearance and behavior. An undescribed *Euptychia* (Satyrinae) found on Osa (also other Costa Rican localities and Panama), is also illustrated, together with records and field notes on other interesting Osa captures including the rarely collected *Cissia gomezii* Singer, DeVries & Ehrlich (Satyrinae).

KEY WORDS: Amazon, Andes, Bolivia, Brassolinae, Caribbean, Central America, *Chusquea*, Colombia, distribution, *Graphium*, Guyana, Ithomiinae, Leptocircini, Lycaenidae, Marantaceae, Mesoamerica, Mexico, Neotropical, Nymphalidae, Pacific, Panama, Papilionidae, Peru, Pieridae, Riodinidae, Satyrinae, South America, Sulawesi, Venezuela, Zingiberaceae.

A SURPRISE *EURYTIDES*

During the course of hundreds of days exploring lowland rainforests in Costa Rica (mostly the Osa Peninsula's remote Llorona Plateau) and Guyana (numerous localities), one of many enigmas was: where are the swordtail swallowtails (*Eurytides*)? As for the Osa Peninsula, observations of *Eurytides* included a couple of *E. marchandii panamensis* (Oberthür) males sipping moisture along the Rio Brujo, a solitary *E. protesilaus dariensis* (Rothschild & Jordan) disturbed and sent winging while doing the same along the same large stream (different year and section of the Rio Brujo), and a very few specimens seen on the wing in sunny openings in the upper forest levels. That was it for *Eurytides*.

Possibly seen was *Eurytides lacandones* (Bates), a species rarely collected in Costa Rica. According to Tyler *et al.* (1992), *E. lacandones* is a race of *E. dioxippus* (Hewitson). I believe this is correct. What is slightly strange is that *E. d. lacandones* (Mexico to W. Panama on the Caribbean slope) is somewhat closer in facies to *E. d. diores* (Rothschild & Jordan) (central Colombia to Bolivia - east slope of the Andes), than to the intervening *E. d. dioxippus* (central Panama to Colombia).

Guyana proved no more bountiful for *Eurytides*. The bonanza was seeing a few swordtail *Eurytides* along the Potaro River near the magnificent Kaieteur Falls. Other than these, again, a very few *Eurytides* were seen on the wing during numerous days in the field.

Consultations with Neotropical lepidopterists with much field experience stressed that *Eurytides* are very seasonal. I had been exploring the Osa from December through July in different years — beginnings of the dry season, dry season, dry/rainy season transition, beginning of the rainy season, and full rainy season — and still so few *Eurytides*! To make the puzzle even more baffling, while exploring a couple of large forest streams in north Sulawesi, Indonesia, in December, 1987, I saw more *Graphium* (very close relatives of *Eurytides*) in a few seconds than I saw in hundreds of days in the incredibly rich New World tropics! As many as 10 species of Leptocircini in incredible numbers along one stream in one day, part of perhaps the greatest butterfly spectacle I have witnessed to this day.

With this backdrop of *Eurytides* dearth and *Graphium* multitudes, I again visited Costa Rica's Osa Peninsula in January, 1994.



Fig. 1-2. Costa Rica swallowtail: 1) *Eurytides dioxippus* (subspecies) male, upperside (Playa Rio Pargo, Osa Peninsula, Costa Rica). 2) *Eurytides dioxippus* (subspecies) male, underside (same as 1).



Fig. 3-6. Costa Rica butterflies: 3) Undescribed *Euptychia* male, upperside (collected in Panama by Gordon Small). 4) Undescribed *Euptychia* male, underside (same as 3). 5) Undescribed *Euptychia* female upperside (collected in Panama by Gordon Small). 6) Undescribed *Euptychia* female underside (same as 5).

And with great surprise, I found *Eurytides* in good numbers along the coast of Corcovado National Park, from San Pedrillo to Llorona. And with further surprise, good numbers flew of what was supposed to be a rare species in Costa Rica: *E. 'lacandonnes'*. For a number of days, this area where the Rio Pargo greets the sea, was host to numerous *E. 'lacandonnes'* and a few glorious *E. marchandii* (Boisduval). By midday, under the hot, dry season sun, from 5 to 10 *E. 'lacandonnes'* and a couple of *E. marchandii* would be found feeding at the edge of the Rio Pargo's small lagoon. Most were fresh to very fresh, suggesting a recent emergence for *Eurytides* as a whole. A single *E. protesilaus* (Linnaeus) in flight was also seen. I had finally hit on the right season! I have seen no more breathtaking sight than a couple of *E. 'lacandonnes'* and a solitary *E. marchandii* feeding at streamside on the beach where the waterfall at Llorona plunges over the cliff!

The Osa *E. 'lacandonnes'* were so large and bright, at first I thought they might be *E. orabilis* (Butler). Even after deciding they were *E. 'lacandonnes'*, I was not quite sure until comparing them to specimens in the Costa Rican National Museum collection. Even then, in several ways they seemed closer in facies to the cloud forest species, *E. calliste olbius* (Rothschild & Jordan), than to the one or two smaller, darker specimens of Central American *E. d. lacandonnes*. The same was true when I compared them to *E. c. olbius* and a couple of Central American *E. d. lacandonnes* in the American Museum of Natural History collection. The mystery was illuminated when Dr. Andy Brower brought over a copy of the Tyler *et al.* (1992) book, *Swallowtail Butterflies of the Americas*. This book,

along with the museum specimens, gave a clear overview of the various taxa and their known ranges.

Like *E. dioxippus diores*, the *Eurytides* I caught has a more prominent subapical forewing band than *E. dioxippus lacandonnes*. But in this band, in the general lighter, brighter appearance, in the larger, more prominent marginal lunules of the hindwing, and in the light inner margins of the tails, the Osa *Eurytides* resembles *E. calliste olbius* more than *E. d. lacandonnes* or any other *E. dioxippus* subspecies. But the telltale sign of cell forewing spots rather than bars, their cream instead of yellow color on the forewing underside (same on the FW underside subapical band), along with sea level habitat rather than cloud forest, point strongly to a *E. dioxippus* subspecies for the Osa *Eurytides*. But then why does the Osa *Eurytides* look closer to *E. calliste olbius* overall than to Caribbean slope *E. d. lacandonnes*? Could this be attributed partly to environmental factors such as climate – in effect a much longer, more prominent dry season on the Osa than the Caribbean slope?

This question and others need further study to resolve the definitive relationships between *E. dioxippus dioxippus*, *E. d. lacandonnes*, *E. d. marae* Racheli, Bollino & Sala (SW Venezuela), *E. d. diores*, the Osa *E. dioxippus*, *E. calliste calliste* (Bates), and *E. calliste olbius*. Information on the hostplant and early stages would be most helpful (as far as I know, they remain unknown). Have other *Eurytides* similar to the Osa specimens been taken in other wet forest habitats of Pacific drainage Costa Rica and western Panama, and would they together with the Osa specimens represent a new race?



Fig. 7-8. Costa Rica habitats: 7) Playa Llorana, Osa Peninsula. Hundreds of brown pelicans, *Eurytides dioxippus* subspecies and *Eurytides marchandi panamensis* males taking minerals from the moist beach sand, many other beauties in transit, even an *Euenus candidus* female! 8) Plateau forest of the Llorona/Los Planes plateau, Osa. *Cissia gomezi* found here, plus many other satyrines, ithomiines, riodinids, hairstreaks, skippers, *Heliconius pachinus*, and *H. hewitsoni*.

I later found *Eurytides* seasonally numerous on a long trip to Amazonian Peru. More recently, on a field trip in March 1999, back to the incomparable Kaieteur Falls and Gorge, in Guyana, with my partner Dr. Robert Hannen (American Museum of Natural History, New York), 3 or 4 *Eurytides* species (including *E. dolicaon* (Cramer)) were seen flying in the gorge in fair numbers. It is good to see these exquisite creatures in the field.

OTHER OSA SURPRISES

Together with a surprise *Eurytides*, many other surprises were revealed to me while exploring the majestic Osa Peninsula rainforest. During between 100-200 days exploring the Osa Peninsula during 7 trips, most of it on the remote Llorona Plateau, interesting records were bound to occur. I came across a small number of species not recorded from Costa Rica's Pacific slope in DeVries' (1987) excellent natural history, a sight record of a species not recorded from Costa Rica (according to DeVries), and an undescribed species not recorded in DeVries' book, among other interesting records.

PIERIDAE

Perrhybris lypera (Kollar), recorded only on the Caribbean drainage by DeVries (1987), is fairly common in season on the Llorona plateau. In the dry season and early rainy season, males can be found flying at canopy and subcanopy level within the forest, zooming down to the understory in both large and small tree fall light gaps or sunny openings in the forest. I have never seen males along the forest edge of the streams in the area and I have not seen a female. They do seem local, as stated by DeVries. I am fairly certain I have seen *Perrhybris pyrria* (Fabricius) males as well but have not captured any, so this remains speculative.

NYMPHALIDAE

There seems to be a possible sight record for the ithomiine *Olyras insignis* Salvin from ridge and ravine country at approximately 150m, quite a bit below the 500m lower elevational limit given by DeVries (1987), but in the ravine habitat mentioned by him. If not for the elevation difference, I would have more confidence in my sighting.

A probable sight record was made of *Prepona dexamenus* Hopffer, which according to DeVries (1987) has not been recorded from Costa Rica. The underside of *Prepona dexamenus* is unmistak-

able among Costa Rican *Prepona*. In May, on a ridge, I saw a pair, both somewhat worn, flying and landing around and on lianas surrounding a large forest tree. I saw *P. dexamenus* as early as 8 in the morning and feeding at a sap flow from one of the lianas at 4 in the afternoon.

I believe the most common (though not very common) *Archaeoprepona* on the Llorona plateau is *A. camilla* (Godman & Salvin), a species DeVries (1987) has recorded only for the Caribbean drainage. The *Archaeoprepona* I mostly saw were very large, blue bands (no hint of green) on the upperside, and distinctly yellow brown on the underside with a series of small submarginal ocelli. Unfortunately, I have no notes or recollection of the black medial line on the HW underside being jagged (*A. camilla*) or undulate (*A. demophon centralis* (Fruhstorfer)), a telltale sign for determining between the species. The first time I saw Neotropical nymphalines and others feeding on oozing sap (from a liana), could you blame me for thinking I was in paradise? At times *A. camilla*? and *A. meander amphimachus* (Fabricius) could be seen feeding in close proximity and even almost side by side, with *Nessaea aglaura* (Doubleday), *Callicore atacama manova* Fruhstorfer and others joining the party!

Two other nymphalines not recorded by DeVries (1987) from the Pacific slope are *Adelpha salmoneus salmonides* Hall and *Chlosyne gaudealis* Bates. In the dry season (Feb-Apr), I found *A. salmoneus salmonides* not uncommon; in the early rainy season (May) it was common. Early in the morning (8-9 am) individuals would perch at subcanopy to middle story level around tree fall light gaps, usually higher than other *Adelpha* species. Around midday when it was sunny, *A. salmoneus salmonides* could usually be found perched at shrub level in a light gap, coming down to the lower forest levels when the hot midday sun was shining directly into the forest understory. Could they perhaps have been males waiting for females around host plants in the understory?

I have seen and caught only one specimen of what may possibly have been *Chlosyne gaudealis*; unfortunately, the specimen was lost to ants. As in the habitat related by DeVries (1987), I caught the specimen along the Rio Brujo's riparian edge just before the Rio Brujo joined the larger Rio Corcovado. Excited about a catch of *C. gaudealis* and the anticipated confluence of these two large forest streams, I left the pinched specimen lying on my net on the Rio Brujo's bank and went on to explore the confluence and to ascertain whether it would be easy to follow the Rio Corcovado downstream at some later time. Perhaps a quarter hour later, including an

encounter with *Historis odius* (Fabricius), I returned to the dismay of finding the prized *Chlosyne* covered and decimated by ants. Hopefully never again would I leave an unattended catch in tropical rainforest with its multifarious hungry mouths. But not having learned my lesson completely, some years later I left a *Pheles heliconides* (Herrich-Schäffer) (Riodinidae) specimen unattended for a brief time in Guyana's incomparable Kaieteur gorge. During that instant, a tiny wasp had decapitated my prize!

Also to be mentioned is that *Eresia eutropia* Hewitson or a member of its complex is not uncommon on the Osa Peninsula. DeVries (1987) cites this species "as occurring at around 1,000m associated with the slopes of Volcan Chiriqui in the San Vito area." Its occurrence on the Osa extends its known range for Costa Rica's Pacific slope and at a lower elevation (ca. 150m) than DeVries records for this species in Costa Rica.

In May, I captured the brassoline *Catoblepia orgetorix* subspecies (*championi*? Bristow) and saw several others. I believe I have seen them in the dry season also. DeVries (1987) had *C. o. championi* only recorded from the Caribbean drainage. In May they were usually seen from 3-5 pm when I disturbed them in the understory while walking on forest trails. They would fly a short distance and subsequently perch 1-1.5m up on shrubs/other vegetation, usually where they became inaccessible.

On that same trip I saw another brassoline feeding on a liana's oozing sap, the same liana that attracted *Prepona dexamenus*, *Agrius amydon philatelica* DeVries, *Archaeoprepona* sp., *Tigridia acesta* (Linnaeus), and *Nessaia aglaura* among others. From my notes describing the color and markings of the underside, it possibly could have been *Opoptera staudingeri* Godman & Salvin and not *Catoblepia*. DeVries (1987) puts the lower limit of altitudinal range for *O. staudingeri* at 700m; we were at 150m.

A very exciting record was finding *Cissia gomezi* Singer, DeVries & Ehrlich (Satyrinae) fairly common at times. According to DeVries (1987), only four specimens were known when he wrote his book, all from Costa Rica. One of the specimens was reared from a larva on the Osa Peninsula. In May, during the early rainy season, *Cissia gomezi* was the most common euptychiine (*Euptychia* is an omnibus grouping containing *Euptychia*, *Cissia*, *Chloreyptychia*, *Megeuptychia*, and others) satyrine besides *Chloreyptychia arnaea* (Fabricius). It was fairly common but local, especially in areas of the dissected Llorona/Los Planes Plateau (ca. 150m) where the ridges are broad, resulting in a small plateau effect. Here, they were mostly found in tree fall light gaps and sunny openings in the forest nearby. I saw 3 or 4 individuals, possible more, in an area. On sunny days they (males?) were active from 0915 to 1130h (possibly earlier and later), their flight fast, erratic and very pugnacious. Their encounters with each other often consisted of fast, spiraling upward flight into the upper understory/ middle story, with a subsequent return to the understory for one or both individuals after disengagement. They also chased after *Parides childrenae* Gray, other insects, even the occasional falling leaf! In the understory they perched in strong sunlight on vegetation close to ground level (up to about 1 1/2m up), often with wings spread and flattened. When the sun became obscured or it became overcast, they flew up into the upper understory/ middle story and disappeared until the sun returned. As related by DeVries (1987) concerning studies of European satyrines, "small light gaps are high quality resources for satyrid males. The light gaps are vigorously defended against intruding males and are courtship arenas to attract females." This seemed exactly the type of behavior to which I was witness. I did see a pair in courtship flight flying in slow circles close to the ground at 1130h.

As opposed to my May records, in the dry season (Feb-Apr) I

mostly encountered *C. gomezi* as occasional solitary individuals in the afternoon. They would perch at shrub level in the forest understory and fly slowly a short distance away if disturbed. I also encountered *C. gomezi* when I explored Cerro Brujo (ca 600m.) at elevations up to between 500 and 600m.

I would also like to mention a most exciting satyrine record in the capture over the years of three specimens (2 females and a male) of an undescribed *Euptychia* species not in DeVries (1987) book. Dr. DeVries has stated (pers. comm.) that he has taken this species at LaSelva on the Caribbean slope. The male and female specimens photographed were captured by the late Gordon Small in lowland Panama. I would think there are a few other specimens in various collections. I believe it is very closely related to *E. insolata* Butler & Druce, and like *E. insolata* is sexually dimorphic, the male brown and the female white. It is easily distinguished from *E. insolata* by the ocelli pattern on the hindwing below. Two fairly large ocelli (smaller than the large tornal ocellus of *E. insolata*) at the tornus (slightly larger) and the apex each have a small satellite (away from the tornus and apex) contained within the brown ring and light yellow patch. I took one of the females in the afternoon along a small forest stream. The specimen had been perhaps looking for host plants in order to oviposit. Along this same stream, I have found other *Euptychia* females (*E. jesia* Butler, and/or *E. mollis* Staudinger, and/or *E. westwoodi* Butler). One female of these species was seen ovipositing on a sprawling fern (that usually occurs in large patches) along the Rio Brujo's bank. The other two individuals of this undescribed species that were captured, a male and another female, were taken at shrub level in the forest understory.

Since finishing this manuscript, I have also discovered two males of this taxon or a very closely related taxon in the American Museum of Natural History collection. They were collected in Colombia from the Rio Opun region, north of Tunja, Boyaca province, elevation? and were erroneously placed with *E. picea* Butler. Sometime later, Jason Hall and Keith Willmott showed me a few specimens of this taxon (or a very close relative) from their extraordinary Ecuadorian butterfly collection. Memory tells me they came from the Andes east slope. Is there a possibility that this taxon has been described?

LYCAENIDAE

Of the 30 or so hairstreak species I have taken and seen on the Osa, a few are no doubt interesting records. I have caught one *Brevianta prepenna* Godman & Salvin and seen a few others. According to Dr. Robert Robbins (pers. comm.), *B. prepenna* is more known from mid-elevation forests (above 500m) than at the lower elevation (ca 150m) I took it on the Osa Peninsula.

During my first two trips to the Osa, I caught (but did not keep) what appeared to be *Thecla orobia* Hewitson or a close relative (according to Dr. Robbins I possibly took *T. cosmophila* Tessman, which is known from Costa Rica; *T. orobia* is yet unknown from Central America). Both specimens caught were gloriously fresh males, one taken in January (dry season), the other in July (rainy season). Unfortunately, I have been unable to capture any since.

While exploring the ridges (ca 600m) around Cerro Brujo, I took a female *Thecla guapila* Shaus in a light gap in the afternoon. According to Dr. Robbins, this species is only known from Costa Rica so far and this was the first record of the species on the Pacific slope.

I found *Evenus candidus* (Druce) females fairly common, possibly an emergence, with the beginning of the rainy season in May. They were usually seen around midday, when they flew from shrub/small tree to shrub/small tree in the understory and one female

was seen walking along the leaf twigs of a small tree (investigating?, for what?). They were seen less often perching from 1-2m high in sunny light gaps. Incredibly, I also saw what appeared to be another one at Llorona, flying over the beach/along the cliffs at 0830h, before it flew to a cliff side shrub! I caught a worn female in mid-July (rainy season) — never have seen *E. candidus* in the dry season — suggesting it is seasonal with a main emergence in the early rainy season. As for males, my only evidence of their existence was finding a male forewing on the forest floor on a ridge top, in an area that I saw a jacamar a few days later. I think males stay mostly in the upper forest levels.

RIODINIDAE

After looking at DeVries' (1997) excellent volume on Costa Rican riodinids, I include a few records of note from my many days on the Osa. I took a single *Euselasia procula* Godman & Salvin on the Cerro Brujo ridge (ca. 600m) in February. The only specimen I have caught, it was perched low in a light gap in the afternoon.

DeVries (1997) cites the hostplant of *Eurybia patrona persona* Staudinger as *Calathea inocephala* (Marantaceae). On more than one occasion I have found *E. p. persona* adults flying around patches of *Costus* (Zingiberaceae). On one occasion, a few adults were flying around a large patch of *Costus* at the base of the plateau slope near Llorona. My experience with *Eurybia* in the field in Costa Rica and Guyana leads me to believe that *Costus* is also a hostplant for *Eurybia patrona persona*.

In January along a rocky bank of the Rio Pargo, I found a solitary forewing of what appears to be an *Anteros renaldus indigator* Stichel. This is my only experience with this wonderful genus in Costa Rica.

DEPOSITION OF SPECIMENS

The *Eurytides dioxippus* subspecies specimen that was photographed is now in the Smithsonian. One specimen is at the Allyn Museum and two others are at the Costa Rican National Museum. The male and female undescribed *Euptychia* that were photographed are Smithsonian specimens caught by the late Gordon Small in Panama. One female that I caught on the Osa was donated to the Allyn Museum. *Cissia gomezi* specimens I collected are in the Costa Rican National Museum, the Allyn Museum (now in Gainesville, FL), the Smithsonian, and also in Dr. DeVries collection. Unfortunately, some specimens were destroyed in transit from that trip.

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