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REDISCOVERY OF *ADELPHA LAPITHA* HALL, 1929 (NYMPHALIDAE) ON HISPANIOLA, WEST INDIES.

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INTRODUCTION

The nymphalid butterfly genus *Adelpha* Hübner, 1819, is known by four species from the West Indies. *Adelpha abyla* (Hewitson, 1850), occurs on Jamaica, and *A. iphicles* *iphimedia* Fruhstorfer, 1916, is found on Cuba and the Isla de la Juventud. Two closely related species (often considered conspecific; but see Ramos, 1982:60, and Brown and Heineman, 1972:171) occur on Hispaniola (*A. gelania* [Godart, 1824]) and Puerto Rico (*A. arecosa* [Hewitson, 1847]).

The four Antillean species (of which only *A. iphicles* is not an endemic; the subspecies *iphimedia* is, however, endemic and apparently very distinctive from its mainland relatives [Brown and Heineman, 1972:170-172]) are easily divided into two groups. *Adelpha gelania* and *A. arecosa* resemble each other, in that both have the FW distinctly falcate and the UP pale line cream (rather than white), narrow, and on the UPFW extending apically, almost reaching the apex. The two other species, *A. abyla* and *A. iphicles* resemble each other in having broad UP white bands that extend only as far anteriorly on the FW as M₃, where they are abruptly truncate. Both have a bold orange subapical blotch, separated from the white band but "related" to it. The latter two species likewise have a communality of UN patterns, in that the extra-white-band areas are longitudinally lineate or striate; the UN extra-cream-band areas in *gelania* and *arecosa* are not lineate or striate but are more solidly brown. Although there are indications of darker and lighter bands in these areas, these bands are not lines or striae.

In 1981, Héctor Ludovino Dominguez, then at the Museo Nacional de Historia Natural in Santo Domingo, República Dominicana, took a single individual of an *Adelpha* that resembled the Jamaican-Cuban pair of species. His specimen came from the vicinity of Pirámide 204, in the Sierra de Neibe near the Dominico-Haitian border, at an elevation of about 1900 m, an area of mixed pine-hardwoods. The butterfly seemed to be an upland forest inhabitant. Apprised of the presence on Hispaniola of a new *Adelpha*, I (with Frank Gali) in 1981 and 1982 visited the highlands of the Sierra de Neiba without success. With Joel W. Rayburn, I made several more visits to the same area in 1983, again fruitlessly. The butterfly remained a mystery until 1984, when I, with William W. Sommer, took

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a single individual north of Azua, near xeric-mesic transitional forest at 305 m. This specimen, like its predecessor, remained unique.

In February 1985, Fernando L. Gonzalez and I visited the Azua locality; amazingly, the first butterfly seen there by Gonzalez was (we now know) another individual of this same species! It escaped capture. No individuals were seen or taken during June-August 1985. But the "new" *Adelpha* seemed to be unaccountably "common" in May-August 1986 and in December 1986. We encountered individuals (not all collected!) at several localities (comments on ecology below) and collected eight. In October 1986, David K. Wetherbee took two individuals in the vicinity of Restauración, Prov. Dajabón, R.D., in the Cordillera Central near the Dominico-Haitian border. Although his butterflies are from a mountain range, the elevation is not high (550 m). Dominguez's original specimen is the only one that has come from extremely high elevation. Finally, one of Robert Powell's students at Avila College took a rather worn individual in March 1988.

The "new" *Adelpha* resembles *A. abyla* and *A. i. iphimedia* in general coloration and pattern, but it differs from those two species in many ways. It also resembles the mainland *A. fessonia* (Hewitson, 1847), in general schema of markings. But from these three species it differs in many ways (and in even more ways from *A. gelania* and *A. arecosa*).

Certain that these specimens were an undescribed taxon, I submitted a manuscript to Jacqueline Y. Miller at the Allyn Museum of Entomology (AME). In the review process, the manuscript was given for review to Gerardo Lamas M., Curador de Entomología at the Museo Javier Prado, Lima, Perú. He graciously pointed out that the description and photographs of the "new" species agreed very well with the brief description and drawing of *Adelpha cestus lapitha* Hall, 1929. That taxon was described from a single male from "Colombia"; no further material has been secured in South America. Lamas felt certain that the "new" Hispaniolan *Adelpha* was indeed that taxon, and J.Y. and Lee D. Miller concurred, as do I. The present paper gives additional information on the taxon. I consider, as will be documented beyond, *lapitha* a species distinct from *cestus*.

Hall's description is brief and may be conveniently quoted in its entirety:

"Differs from *A. c. cestus* Hew. in the much narrower white band on both wings, which is only 3 mm. wide at inner margin of fore wings and costa of hind wings. *Underside*: Ground-colour much darker than is *cestus*; the subbasal white stripe, white median band and submarginal line prominent, but the other markings, including the subapical spot on the fore wings, nearly obsolete."

Adelpha lapitha Hall, 1929

(Fig. 1. Female, UP and UN [AME])

(Fig. 2. Male genitalia [AS 21303])

Males. FW length 25-30 (N=8; \bar{x} =27.6; all measurements in millimeters); UP generally very dark brown (Pl. 56L7; all color codes from Maerz and Paul, 1950); UPFW crossed from about the midpoint of the inner margin to the midpoint of the costa by a rather broad (2.3-3.0 in Cu_1 - Cu_2 ; \bar{x} =2.8) white band just marginal to the end of the FW cell, the band almost straight or slightly (but obviously) bowed; proximad to this FW band, three short dull reddish (Pl. 7J6) bars, the central one the most distinct and extending from R_2 to 2A, the most distal less distinct and extending from R_2 to the lower border of the cell, the most proximal (which virtually covers the FW base) less conspicuous and extending from R_2 to 2A; a subapical orange blotch (Pl. 4D11), at times almost semilunar with its convex margin more or less following the curvature of the falcate wing tip, from the costa to M_2 ; a small, slightly duller orange, diffuse submarginal spot in Cu_2 -2A; postdiscal area with very vague indications of one or two pale longitudinal lines; UPHW with a broad (1.9-2.8 in M_2 - M_3 ; \bar{x} =2.3) white band from above the anal angle to midcosta, this band tapering from Cu_2 to the margin; the discal area with two dull reddish bars, one short and confined to the cell, the other more proximal and extending from $Sc+R_1$ to the lower

edge of the cell; an orange blotch at the anal angle enclosing a tiny black dot near 2A and a larger black triangular dot in Cu_2-2A ; margins almost black, with a fine dark brown submarginal line, followed proximally in turn by a slightly wider black line, these two lines somewhat scalloped posteriorly where they cross the veins; another black line postdiscally (marginad to the white band but not appressed to it), which is rather irregular posteriorly where it crosses the veins; UN rich reddish brown (Pl. 7L10), much paler than the UP; UNFW patterned like UPFW, but all markings more distinct except for subapical orange blotch and orange dot in Cu_2-2A , the former represented on UN by a dull orange-tan area (Pl. 6D9), the latter by a rather diffuse reddish orange area; submarginal area between the two paler markings distinctly reddish (Pl. 8J6), and a reddish line following the outer edge of the white bar; a whitish to white fine submarginal line, another following the inner edge of the most proximal of the red discal bars, and some white basically; UNHW pattern like UPHW, including orange spot and included dot and triangle on anal angle, and red discal bars, the more basal bent anteriorly and extending toward (but not reaching) the inner extreme of the costal margin; a pair of white lines, one of which extends submarginally from the inner margin to the costa and is the posterior partner of the similarly placed line on the UNFW, thus forming a complete white line from FW costa to HW inner margin; the second UNHW white marginal line along the inner margin and separated from the first by a narrow band of ground color; outer edge of UNHW paralleled by a chalky white submarginal line, diffuse but still obvious, this line expanded anteriorly in $Rs-Sc+R$, to give a diffuse chalky white area almost touching the white band, and posteriorly extending around the anal angle, almost to touch the posterior end of the white band, and sending a fine white "line" to parallel the end of that band; outer margin of HW reddish; postdiscal area with two reddish bands, more or less paralleling the white band, rather dull and inconspicuous; no UNHW lines or striae; antennae shafts brown, tips of clubs dull orange; abdomen brown dorsally and laterally, white ventrally.

Females. FW 32 ($N=2$); UP and UN color and pattern like males; FW somewhat less falcate than that of males, the difference not subtle; UPFW white band 3.0-3.2 in Cu_1-Cu_2 ; UPHW white band 2.6-2.9 in M_2-M_3 .

Specimens. (all from República Dominicana): AS 21423 (female) (now in AME): San Juan, 9 km E Vallejuelo, 610 m, 24.xii.1986, J. Escobio; AS 13562 (male): Azua: 5 km S Peralta, 305 m, 28.v.1984, A. Schwartz; AS 18236 (male): Azua: 5 km S Peralta, 305 m, 16.vi.1986, A. Schwartz; FLG (Fernando L. Gonzalez) 4924 (male): San Juan: 9 km E Vallejuelo, 610 m, 11.viii.1986, F. L. Gonzalez; AS 19745 (male), AS 19785 (female), FLG 4637 (male), FLG 4662 (male): San Juan: 9 km E Vallejuelo, 610 m, 5.viii.1986, F. L. Gonzalez, A. Schwartz; FLG 2697 (male): Azua: 2.5 km W, 6.6 km N Azua, 183 m, 8.vi.1986, F. L. Gonzalez; AS 21303 (male): Dajabón: Restauración, 550 m, 7.ix.1986, D. K. Wetherbee; RP (Robert Powell) 146 (now in AS) (male): 30 km N junction Hwy. 2 and Hwy. 44, near Villarpando, 370 m, 12.iii.1988.

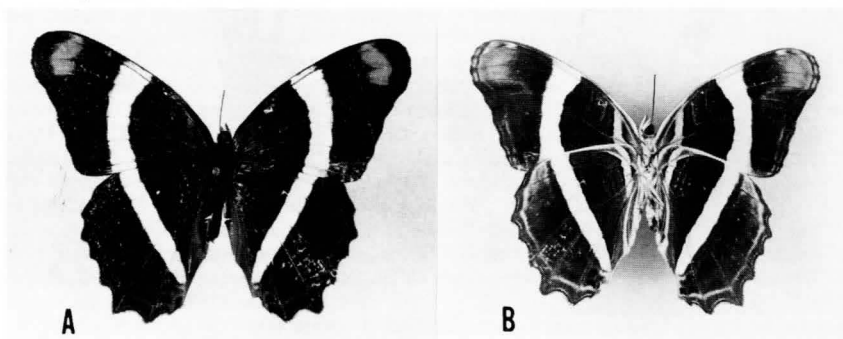


Figure 1. *Adelpha lapitha*; dorsal (A) and ventral (B) views of female.

Male genitalia. The male genitalia of *A. lapitha* may be described as follows (Fig. 2). The uncus and tegumen are flat dorsally, with only a faint indication of a pretegumental groove. The vinculum is broad dorsally and tapers ventrally; the saccus is short and stout. The valvae are long, digitiform, without teeth distally, and truncate proximally. There is a toothed lobe at the middle of the saccular fold. The penis is short, slightly sinuate, and bulbous posteriorly. The male genitalia of *A. abyta* are remarkably similar. Presented with genitalia of the latter and asked to which species those genitalia should be assigned, I would not be able to distinguish them.

On the other hand, the male genitalia of *A. fessonia* are similar also. But the distal ends of the valvae have a prominent recurved process bearing seven recurved teeth. The male genitalia of *A. i. iphimedia* are even more distinct. Their general configuration (= tegumen, uncus, saccus, vinculum) is like that of *A. fessonia*, *A. abyta*, and *A. lapitha*, but the valva has 12 more or less straight teeth, not mounted on a recurved process, at its distal end. There is also a large dorsal spine, directed posteriorly, that is toothed on its anterior margin, as well as a short untoothed spine or process on the dorsoanterior portion of the valva. The valvae of *A. i. iphimedia* are thus structurally quite different from not only *A. fessonia*, but also *A. abyta* and *A. lapitha*. The penis is short and slightly bowed. The relationship (on the islands) as far as male genitalia are concerned, of *A. lapitha* seems closer to *A. abyta* than to *A. fessonia* or *A. i. iphimedia*.

Comparisons. As pointed out in the introduction, *A. lapitha* bears no truly close resemblance to any of the West Indian *Adelpha*. In fact, it is simple to differentiate *A. lapitha* from its Antillean congeners, most especially if one groups *A. gelania* and *A. arecosa* together, and *A. abyta* and *A. i. iphimedia* together.

From *A. gelania* and *A. arecosa*, *A. lapitha* differs in many ways. The condition, in each character, of *A. gelania* and *A. arecosa* is enclosed in parenthesis. *Adelpha lapitha* has the UP band white and broad (cream and narrow), extending to costal margin (extending to apex), and UPFW orange subapical blotch and a small orange spot in Cu₂-2A (no orange blotch or spot on UPFW), antennae brown with tips of clubs orange (antennae brown), FW falcate in male, less so in female (FW falcate in both sexes). All three species have reddish discal bars on the UP and UN of both wings, and all have the extra-white or extra-cream-band areas without distinct striae or lines. The phenotype of *A. lapitha*, in contrast to those of *A. gelania* and *A. arecosa*, is very different.

Adelpha lapitha is more similar to *A. abyta* and *A. i. iphimedia*, but the differences once again are striking (characters of the latter two taxa in parentheses). *Adelpha lapitha* has the UPFW white band extending to the midcosta (truncate at M₃), a subapical orange blotch on UPFW that is semilunar and convex apically (more or less circular and "dented")

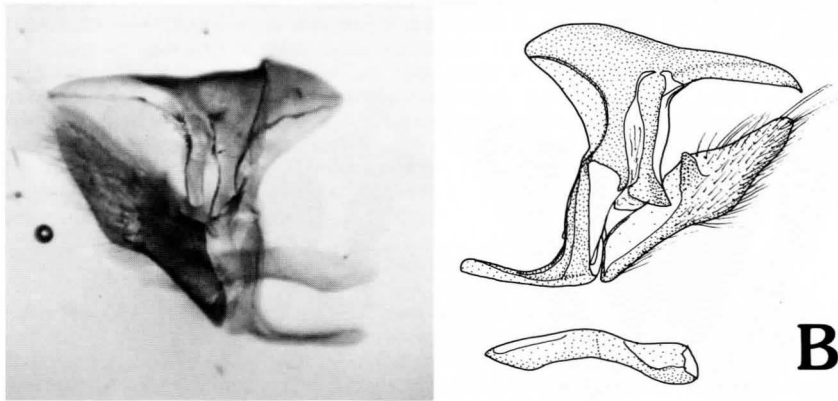


Figure 2. *Adelpha lapitha*, male genitalia: (A) lateral view and (B) lateral view with valva and penis removed.

apically, or subrectangular), an orange dot in Cu_2-2A (absent), no pale lines between white band and margin on UPHW (2 or 4 pale lines), antenna shaft brown with orange tip to antennal club (antennae brown), UNFW and UNHW without obvious and striking lines or striae (distinctly lineate or striate discad to white band). Once again, it is almost simpler to differentiate the taxa than to show in what ways they resemble each other! In fact, *A. abyala* shares more characters with *A. i. iphimedia* than both do with *A. lapitha*.

I have previously compared *A. lapitha* with mainland *A. fessonia*. That species resembles the *abyala-iphimedia-lapitha* trio and, because of its "northern" distribution on the mainland, might be considered to be the ancestor (or closest relative) of *A. lapitha*. The male genitalia, however, are quite distinct (see above). But one has only to look at Pls. 30 and 31 in Lewis (1973), or the photographs in Miller and Miller (1970) and Steinhäuser and Miller (1977), to appreciate some of the large number of South American and Meso-American species of *Adelpha* that have this (or modifications thereof) general schema of pattern. Interestingly, only one species illustrated (*Adelpha zalmona* Hewitson) has the FW band extending to the costa.

In this context, Brown and Heinemann's (1972:170) comments about the genus *Adelpha* are perhaps pertinent: "Until a thorough revision of [the genus] is undertaken, the development [= evolution] of the genus cannot be outlined. A great many 'species' have been named... Careful attention to the details of the male genitalia, especially the shape and distribution of teeth on the distal end of the valvae, may be useful for diagnosing species that are superficially alike." It should be recalled that these authors considered each of the then-named four Antillean species separate (i.e., *A. i. iphimedia* was not regarded as a subspecies of *A. iphicles*, a course that has very much to recommend it).

Adelpha lapitha differs from *A. fessonia* in the same ways that it differs from *A. abyala* and *A. i. iphimedia*. *Adelpha fessonia* has the UP white band incomplete, broad, and truncate at M_3 , has the UPFW subapical orange blotch subrectangular and somewhat flattened apically, lacks an orange dot in Cu_2-2A , lacks red discal bars on the UPFW, has about 3 pale lines between the white band and the FM margin, has the antennae totally brown, has the FW not distinctly falcate, and is very distinctly lineate on the UNHW disc, and between the white band and the margin.

I have held off until last that comparison which is perhaps the most pertinent. Since *A. lapitha* was described as a subspecies of *A. cestus*, it is with that species that the former presumably has its closest affinities. Unfortunately, *A. cestus* is uncommon in collections, and I have been unable to locate a male for genitalic preparation. But the single female I have examined, plus Hall's description, brief as it is, are indeed diagnostic of *A. lapitha*; his plate likewise is well executed. The two taxa appear to have the same size (FW length in female *A. cestus* 31 mm). A striking difference between them is the width of the UP white band, which is much broader — 5.6 mm in *A. cestus*, 2.3-3.0 mm in *A. lapitha* in FW Cu_1-Cu_2 , and 4.6 mm in *A. cestus*, 1.9-2.9 in *A. lapitha* in HW M_2-M_3 .

The two species differ in several other ways. The UPFW orange spot, present in Cu_2-2A in *A. lapitha*, is absent in *A. cestus*. The UNHW has no pale marginal-submarginal lines in *A. lapitha*, but *A. cestus* has 3 pale marginal-submarginal lines (like *A. fessonia*). The UN in *A. lapitha* is very dark brown, so that all pale or reddish discal lines are faint to absent, whereas in *A. cestus* the UN is much paler, and both FW and HW discs are distinctly lineate. Correlated with the UN color is the expression of the UNHW dark red discal bars. These are one, whose anterior end is bent distinctly costad, in *A. lapitha*, and two in *A. cestus*, the innermost of which (homologous to the single bar in *A. lapitha*) ends abruptly at $Sc+R_1$. The antennal shafts are brown in *A. cestus*, but both antennae are broken and the color of the clubs is indeterminate.

In summary, the differences between *A. cestus* and *A. lapitha* are by no means subtle, and I regard the two taxa as distinct species. It seems likely that *A. lapitha* is an insular derivative of South American *A. cestus*. To regard the two taxa as species rather than subspecies is here a conservative course.

Remarks. *Adelpha lapitha* is primarily an inhabitant of xeric areas at elevations between 183 and 1900 m. The last-cited elevation is that of the Dominguez specimen from the Sierra de Neiba; other than this very high elevation, individuals I and others have taken

or observed are from no higher than 610 m.

The first specimen (AS 13562) was found resting on a leaf 1.5 m above the ground in a small charcoal-maker's clearing behind a large shrub of *Tournefortia hirsutissima* (Boraginaceae), a plant that is immensely attractive to a wide spectrum of butterflies but on which the *A. lapitha* was not feeding. The time of collection was 1338 h and the temperature 38°C. Another individual was seen on the same day and in the same precise place but was not collected. On 16.ii.1985, Gonzalez saw another individual at this precise site; no time nor temperature were recorded. AS 18236 was taken at the same locality adjacent to the paved road as the latter passes a hillslope with transitional xeric-mesic forest on one side and a large open field with scattered trees on the other. The butterfly flew along the road about 1 m above the road surface and alighted on a leaf of a shrub with the wings open and vividly exposed; the time was 1340-1630 h at a temperature of 35°C.

At another nearby locality (Azua: 2.5 km W, 6.6 km N Azua, 183 m), Gonzalez caught one (FLG 2697) *A. lapitha* and saw three more on 8.vi.1986. The individual taken was feeding on the white flowers of a small unidentified tree in *Acacia* woods. The time was 1510-1600 h and the temperature 35°C. On 21.vi.1986, an *A. lapitha* was seen flying along the edge of the paved road adjacent to *Acacia* forest at the same locality. The time was 1250-1410 h and the temperature 32°C. The individual was not netted.

AS 21423 was taken under peculiar circumstances. Escobio and I, driving a Volkswagen, stopped at the roadside. Within 10 seconds, an *A. lapitha* flew about me in tight circles; it was netted by Escobio. The area is xeric scrub and thorn forest. On the same day, another *A. lapitha* was seen by me as it fed on *Ageratum conyzoides* (Asteraceae), abundantly in bloom and very attractive to a large number of species of butterflies. The *A. conyzoides* was along a fence row in a small oasis through which a tiny stream was flowing. Disturbed while feeding, the butterfly took flight, first moving above the stream for perhaps one minute, and then, pursued by Escobio, dashed along a wide path into the *Acacia* forest where it was lost. These observations and collection took place at 1030-1415 h and a temperature of 28°C.

Four other specimens (AS 19745, AS 19785, FLG 4637, FLG 4662) were taken at this same locality by Gonzalez and me. These butterflies, with many other species, were feeding on roadside *Croton barahonensis* (Euphorbiaceae) at 1110-1435 h and a temperature of 35°C. Still another (FLG 4924) was taken by Gonzalez on 11.viii.1986, while it too fed on *C. barahonensis*. The time was 1100-1430 h and the temperature 32°C. The day was overcast, ending in rain.

The specimen from Restauración (AS 21303) was secured in pine woods (Wetherbee, *in lit.*, 21.xi.1986). The Villarpando individual was taken in *Agave-Acacia* scrub at 1000-1030 h at 29°C.

Finally, one can only wonder about the history of the holotype of *A. lapitha*. The fact that Hall (1925) himself collected on Hispaniola for two months in 1924 (although, according to his itinerary, not within the range of *A. lapitha* as known today) makes one speculate that he himself collected the holotype somewhere on Hispaniola, accidentally overlooked it while studying and reporting on his collection in 1925, and later "discovered" the specimen. Since nothing similar to *A. lapitha* was then known from the islands, he may have assumed that it was from Colombia. The possibilities are almost endless; the coincidences are intriguing.

ACKNOWLEDGMENTS

My thanks are due to Jose Escobio, Frank Gali, Fernando L. Gonzalez, Joel W. Rayburn, and William W. Sommer, several of whom made efforts at securing specimens of this striking butterfly but unfortunately did not succeed. My thanks also go to David K. Wetherbee, who graciously donated one of his two specimens to me; his comment (that this species is "fit to be a coat of arms" because of its beauty) is very apropos. Robert Powell and his students were very fortunate in taking a specimen of this poorly represented species. H. Ludovino Domínguez allowed me to examine his original specimen. Susan

Borkin (Milwaukee Public Museum) lent specimens of *A. i. iphimedia*, and Frederick H. Rindge (American Museum of Natural History) lent me a specimen of *A. cestus*. Jacqueline Y. Miller made a male genitalic preparation (AME 6990) of *A. i. iphimedia* in the Allyn Museum of Entomology. Gerardo Lamas, J. Y. and L. D. Miller, and D. W. Jenkins have all contributed to my recognition of *A. lapitha*. I thank all the above for their help and cooperation. The photographs of the holotype are the work of Juan Carlos Espinoza, and that of the male genitalia of Fernando L. Gonzalez with the line drawing by J. Y. Miller.

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pp. 35-36, the photographic plates were reversed: the figure legend for Figure 5 should be properly associated with the photographic plate which appears on p. 36 and vice versa.

p. 37, Figure 7E, is *F. notacastanea*, male, and 7F, female, same species.

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