

SYSTEMATIC NOTES ON *DRYAS IULIA* (HELICONIIDAE)

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Dryas iulia Fabricius 1775 is a distinctive, common, and widespread neotropical heliconiid. Its many subspecies have been reviewed partially or completely by Riley (1926), Comstock (1944), Emsley (1963), and Brown & Heineman (1972). Despite this attention, several matters of taxonomic and systematic importance remain unresolved. Five of these are discussed here: (1) a new subspecies for the Florida populations; (2) resurrection of the name *alcionea* Cramer for the South American subspecies; (3) revised authorships of the Cuban and the Central American subspecies; (4) fixation of a type locality for the name *cillene* Cramer and the consequent disposition of that name; and (5) notes on systematic affinities among the various subspecies.

***Dryas iulia* largo** Clench, new subspecies

Superficially closely resembling *carteri* Riley 1926 (Bahamas) and *nudeola* Bates 1934 (Cuba), but differing in these respects: from both in the absence of androconia on veins M_2 and M_3 of the fore wing above in males, and in the slightly heavier, basally directed fuscous "teeth" on the termen in interspaces M_2 - M_3 - Cu_1 . Additionally it differs from *carteri* in both sexes by the absence of a purplish cast to the underside (common, but not universal, in *carteri*), and from *nudeola* by the shape of the cell-end bar in the male on the fore wing above: its sides are parallel or anteriorly convergent in *largo* (as in *carteri*), posteriorly convergent in *nudeola*.

Holotype. Male, Key Largo, Monroe Co., Florida, "2/10/30" [10 Feb. or 2 Oct.], leg. J. R. Haskin, figured in color in Holland (1931: pl. 71 fig. 1) as "*Colaenis cillene*."

Paratypes. 1 ♂ 1 ♀, same data as holotype, the female figured in Holland (1931: pl. 71 fig. 2); 6 ♂ 9 ♀, same locality, 1-7.viii, ex coll. W. R. Sweadner (and possibly collected by him), C. M. Acc. 12938; 1 ♀, same locality, 3.i.1945, leg. A. Avinoff, C. M. Acc. 13495; 3 ♂ 3 ♀, same locality, 21-23.iv.1964, leg. A. I. Good, ex coll. A. I. Good, C. M. Acc. 24049; 1 ♂ same locality, 15.ii.1958, leg. Lee A. Pollard, ex coll. L. & S. Miller, C. M. Acc. 21269 and 21733; 1 ♀, NE corner of Monroe Co., Florida, 22-31.vii, ex coll. W. R. Sweadner (possibly collected by him), C. M. Acc. 12938. In all, 11 ♂ 15 ♀ paratypes.

Holotype and all paratypes, C. M. Ent. type series no. 678.

Most authors (e.g., Klots, 1951) have held this to be the same as the Cuban subspecies, which usually has been called (incorrectly: see be-

low) *cillene* Cramer. Bates (1934, 1935) thought that Florida specimens more resembled those of Cuba (in which he was correct), but concluded that at least provisionally Cuban, Bahamian, and Floridian specimens should all be united under one name, *nudeola*. Brown & Heineman (1972) similarly lump all three. Emsley (1963), however, pointed out the distinctive androconial difference separating the Florida subspecies from those of Cuba and the Bahamas, and he recognised all three subspecies; but he incorrectly called the Florida form *cillene*.

Dryas iulia alcionea Cramer 1779 (New Status)

Cramer (1779: 38, under *cillene*) gives Suriname as the type locality for both *cillene* and *alcionea*. His figures of *cillene* show that this locality is incorrect for that name (see below); but the figures of *alcionea* (*op. cit.*: pl. 215 figs. A, F, G) agree well with Guiana specimens before me, and Suriname can be taken as the probable source of *alcionea*.

Two names have been applied to the South American subspecies in the past: nominate *iulia* Fabricius 1775 and *cillene* Cramer 1779. Brown & Heineman (1972) show that nominate *iulia* actually came from St. Croix, Virgin Ids., with *juncta* Comstock 1944 (TL: Puerto Rico) accordingly a synonym. The name *cillene* is shown below to have been based on Jamaican material. This leaves *alcionea* as the oldest available name for the South American subspecies. The name *titio* Stichel 1907 (TL: Bolivia) falls to *alcionea* as a synonym: I have examined a series of specimens from Bolivia and can see no way to separate them from Guiana material. The subspecies *alcionea* is widely distributed in South America, including Trinidad and Tobago, but is replaced along the Pacific coast southward to Ecuador by the otherwise Central American subspecies *moderata*.

Authorships of the Names *nudeola* and *moderata*

Brown & Heineman (1972) correctly note that the name *nudeola*, as originally proposed by Stichel (1907), is inadmissible under the International Code of Zoological Nomenclature. Stichel gave it explicitly as an infrasubspecific form, a quadrinomial. Bates (1934, 1935) raised *nudeola* to subspecific status, by which action he becomes the author of the name, as Brown & Heineman point out. They, however, mistakenly thought that Bates first took this step in 1935, whereas the original action was a year earlier (Bates 1934). The correct name for this subspecies, which inhabits Cuba, Isla de Pinos, and perhaps also the Cayman Islands, is therefore *Dryas iulia nudeola* Bates 1934.

By the same token, authorship of the name for the subspecies *moderata* (which inhabits Central America from Texas to Panama and on into South America along the Pacific coast to Ecuador) must also be changed. Stichel (1907) gave the name quadrinomially to a nearly immaculate male from Honduras. Riley (1926) appears to have been the first to use the name in a subspecific way, so *moderata* must correctly be attributed to him: *Dryas iulia moderata* Riley 1926.

The subspecies *moderata* is quite variable, males ranging from a nearly immaculate form to one that is rather well marked with fuscous. Emsley (1963) restricted the name *moderata* to the nearly immaculate form and applied the name of the South American subspecies (which he incorrectly called *i. iulia*) to the darker form. By his strange interpretation, then, two different subspecies occur sympatrically in Central America. This, of course, is wrong. First, the two forms are connected by intermediates in quantity and in all degrees; second, the darker form at its darkest is still considerably more lightly marked than is *alcionea*; and third, sympatric subspecies are ordinarily impossible and should never be considered without a full explanation of what would have to be most extraordinary circumstances. This Emsley does not give, nor do I know of any reason for such a view.

The Name *cillene* Cramer 1779

This name has long been a subject of controversy. Cramer (1779: 38, pl. 215 figs. D, E) figured *cillene* and cited its locality as Suriname. The figure shows a bright, nearly immaculate male with a cell-end spot, no spot on M_3 , a dusting of black scales along the costa and radial vein just beyond the cell, a well crenulated hind wing termen with a sprinkling of fuscous scales in a similarly crenulate, thin terminal band. Despite Bates's (1934) statement that Cramer's figure of *cillene* "can be matched with specimens from northern South America much more easily than with Cuban ones" (so completely incorrect that I can only assume that he had before him from "northern South America" either mislabelled specimens or material from the western South American portion of the range of *moderata*), it is immediately evident that Cramer's figure represents a specimen from some area other than South America.

Opinions on the application of the name *cillene* have been remarkably diverse. Bates (1934, 1935) considered it South American (Suriname); Riley (1926), Comstock (1944), and many others have considered it Cuban. Emsley (1963) used it, strangely, for the Florida subspecies (as distinct from that of Cuba). Brown & Heineman (1972) were uncertain of its application.

It is most unlikely that Cramer had any Cuban material at all (Bates, 1934), and even more unlikely that he had any material from southern Florida. Suriname, the given type locality, is equally unlikely because of the appearance of the figured specimen. Whence, if not from one of these places, might Cramer's *cillene* have come?

Cramer did have access to Jamaican material (Brown & Heineman, 1972), so I have considered this possibility. I carefully compared his figures with a large Jamaican series (42♂ 24♀) and this comparison has convinced me that his specimen was in all probability of Jamaican origin. These points are significant:

Most similarly pale populations (notably those of Florida, Cuba, the Bahamas and usually Middle America) have the hind wing border of the male consisting of a thin terminal black line (usually divided lengthwise by an exceedingly thin pale line) and a basad row of crenulations, two per interspace. In Jamaica this is rarely true. Usually the hind wing border is so thin and linear as to appear almost absent, in which it resembles some Middle American pale phase specimens; but sometimes it is heavier, and the thickening appears to be simply a sprinkling of black scales along the border, following the border but not arranged in any linear pattern. I have seen this particular border only in specimens from Jamaica. It is exactly what Cramer depicts in his figure of *cillene*.

The hind wing of the Jamaican subspecies is noticeably more deeply crenulate than in any other subspecies of *iulia*, a major character separating it from the pale phase *moderata* (Riley, 1926), which it otherwise often much resembles. These deep crenulations are accurately shown in Cramer's figure of *cillene*.

The cell-end spot on the fore wing above is mostly absent or exceedingly thin and linear in Jamaican males, but it does appear, about as strong as Cramer shows, in some Jamaican specimens (2♂, Low River and Christiana).

Cramer's figure of the underside shows on the hind wing a dark (orange-ocher) waved pm or st line, and a basal dark area consisting only of an anterior large spot (Rs-M₂) and a posterior small one (Cu₁-Cu₂). In Cuban specimens the space between the waved line and the termen is usually filled with darker color (grayish pink-ocher) and the basal area of the wings is solidly dark. In many Jamaican specimens, however, the colors and pattern agree closely with Cramer's figure and even in those with a darkened basal area the places corresponding to the spots in Cramer's figure are darker still and stand out as spots or patches.

In short, the characteristics shown by Cramer's figures of *cillene* are all Jamaican, some of them uniquely so. Specimens from no other area agree even remotely as well. I conclude that Jamaica must have been the source of *cillene* and accordingly designate that island as type locality.

The name *delila* Fabricius 1775 (described as from "America") was also in all probability based on a Jamaican specimen (Brown & Heineman, 1972). It has four years' priority over *cillene*, which must therefore be placed as a synonym: *Dryas iulia delila* Fabricius 1775 (= *cillene* Cramer 1779, new synonymy).

Systematic Affinities Among the Subspecies

It seems not to have been noticed before that the many subspecies of *Dryas iulia* can be divided into two groups according to the color of the costal area of the hind wing upperside of the female. These may be called (i) *the Antillean group*, in which this costal area is nearly as dark as the rest of the wing and contrasts conspicuously with the white costal area of the male; and (ii) *the Continental group*, in which this costal area is white like that of the male.

The following check list of *iulia* subspecies shows how they are apportioned between the two groups. I have seen no females of nominate *iulia*, *warneri*, *dominicana*, *martinica*, *lucia* or *framptoni*. Dr. Frederick H. Rindge kindly examined material in the American Museum of Natural History for me and he reports (*in litt.*) that females of nominate *iulia* have dark costal borders (Antillean group), and that females of *dominicana* have costal borders "light or with some dark," which could indicate that the transition from the light bordered Continental group to the dark bordered Antillean group occurs on Dominica. The remaining unexamined subspecies I have placed solely on the basis of geography. It should be noted that Brown & Heineman (1972) have synonymized *warneri* to nominate *iulia*, but evidently only on theoretical grounds. Pending actual study of specimens I recognise it, as did Comstock (1944).

***Dryas iulia* Fabricius 1775**

(i) Antillean group

- a. **largo** Clench, n. ssp. Southern Florida.
- b. **nudeola** Bates 1934. Cuba; Isla de Pinos; Cayman Ids. (?).
- c. **carteri** Riley 1926. Bahamas.
- d. **hispaniola** Hall 1925. Hispaniola.
- e. **iulia** Fabricius 1775. Puerto Rico; Virgin Ids. (TL: St. Croix).
= *juncta* Comstock 1944 (TL: Adjuntas, Puerto Rico).
- f. **warneri** Hall 1936. St. Kitts.

(ii) Continental group

- g. **dominicana** Hall 1917. Dominica; Guadeloupe.
- h. **martinica** Pinchon & Enrico 1969. Martinique.
- i. **lucia** Riley 1926. St. Lucia.
- j. **framptoni** Riley 1926. St. Vincent; Barbados; Grenadines; Grenada.
- k. **alcionea** Cramer 1779. Most of South America.
= *titio* Stichel 1907 (TL: Bolivia)
- l. **moderata** Riley 1926. Middle America from Texas to Panama, and southward along the Pacific coast of South America to Ecuador.
- m. **delila** Fabricius 1775. Jamaica.
= *cillene* Cramer 1779 (TL: Jamaica).
= *delia* dos Passos 1964 (misspelling of *delila*).

It is clear that *D. iulia* has reached the West Indies by two different routes. One of these was evidently northward from South America along the Lesser Antilles into most of the Greater Antilles and Florida; the other was from Middle America (perhaps from the bulge of Honduras/Nicaragua) to Jamaica, the only island in the Greater Antilles with a representative of the Continental group.

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