

BUTTERFLIES FROM THE MARQUESAS*

By

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The small collection of Rhopalocera, containing only three species, was sent by Mr. Edward P. Mumford, Director of the Pacific Entomological Survey, to Mr. Edward Meyrick and by him entrusted to us for determination and record. The account of *Danaida (Danaus) plexippus* and *Hypolimnas bolina* was written by Professor Poulton, the description of *Atella marquesana*, new species, by Mr. Riley. In copying and confirming the numerous data very kind help was given by Mr. B. M. Hobby, and in studying the past history of *D. plexippus* and *H. bolina* considerable assistance was received from Commander J. J. Walker, whose experience has been of the utmost value.

Danaida plexippus, Linnaeus.

The reasons for adopting the specific name *plexippus* in place of *archippus*, Fabricius, are set forth in a note by Riley¹ in which it is also shown that Auri-villius had come to the same conclusion.

The following records of the specimens of *D. plexippus* included in the collection are grouped under the various islands, following a general north to south arrangement.

Eiao: uplands toward south end, altitude 1,500 feet, October 1, 1929, 2 males, 1 female, Adamson; altitude 2,000 feet, April 21, 1931, 2 males, 2 females; altitude 1,700 feet, April 22, 1931, 2 females; altitude 1,800 feet, April 22, 1931, 3 females; altitude 1,600 feet, April 23, 1931, 1 female; altitude 1,600 feet, April 24, 1931, 4 males, 5 females; altitude 1,800 feet, April 30, 1931, 1 male, 1 female; LeBronnec and H. Tauraa.

Uahuka: Hane Valley, March 9, 1931, sea level, 3 males; altitude 150 feet, March 10, 1931, 4 males, 2 females; altitude 100 feet, March 12, 1931, 1 male; altitude 30 feet, March 15, 1931, 2 males; Vaipae Valley, altitude 300 feet, March 18, 1931, 2 males; LeBronnec and H. Tauraa.

Hivaoa: Atuona Valley, near sea level, July 22, 1929, 9 males, 9 females; "low level," July 22, 1929, 6 males, 1 female; Mumford and Adamson.

Mohotani: altitude 1,200 feet, February 1, 1931, 6 males, 1 female; altitude 1,000 feet, February 2, 1931, 8 males, 4 females; LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 22, 1930, 4 males, 1 female; Uia [Ouia] Valley, altitude 100 feet, September 2, 1930, 4 males, 4 females; LeBronnec.

¹ Riley, N. D., The Rhopalocera of the St. George Expedition, from French Oceania: Ent. Soc. London, Trans., pt. 2, pp. 454-455, 1928.

* Pacific Entomological Survey Publication 7, article 24. Issued July 10, 1934.

The 95 specimens of *D. plexippus* (58 males, 37 females) with their precise data are of great interest when considered in relation to the earlier history of this species in the Pacific,² summarized in the following passage from the paper placed last in the footnote:

Commander Walker's two papers record the earliest observed appearance of *plexippus* and its food-plant, *Asclepias curassavica*, in the various islands, their increase and apparent establishment, except in New Caledonia, where both plant and insect suffered a decrease between 1881 and 1900. Mr. Collenette's paper shows that on the visit of the *St. George* in 1925 the butterfly was not seen on three islands in which Commander Waker found it commonly or plentifully in 1883. On one island (Fatuiva) it was fairly common in both years, on one (Hivaoa) abundant in 1883, almost absent in 1925. Finally, on two islands where it was seen in 1883 neither the insect nor the food-plant could be found in 1925.

Mr. Collenette concludes that "the present scarcity of the butterfly on these islands is due to the dying out of its food supply. It arrived in the wake of the *Asclepias*, and is suffering a temporary or permanent reverse with the disappearance of the plant." The cause of this disappearance is at present uncertain.

The same paper records that in 1925 *D. plexippus* was "fairly common on Fatuiva (where 7 males, 1 female were taken at sea level), but so rare on Hivaoa that the single male recorded . . . was the only specimen identified with certainty." The 15 males and 10 females captured on Hivaoa (July 22, 1929) by the Pacific Entomological Survey are in striking contrast with the above statement and, confirmed by the other data here tabulated, certainly appear to disprove the existence of any progressive decline in the numbers of the species.—E.B.P.

***Hypolimnas bolina*, Linnaeus.**

Specimens of *H. bolina* were obtained from only two islands.

Uahuka: Penau Ridge, altitude 1,570 feet, February 26, 1931, 1 female (*j*); Vaikivi Valley, altitude 1,150 feet, March 6, 1931, 1 female (*k*); Teivipuhipuhi, altitude 1,250 feet, 3 males, 1 female (*l*), altitude 1,350 feet, 2 males, 2 females (*m, n*); Hiniaehi Valley, altitude 300 feet, March 10, 1931, 1 male; Hane Valley, altitude 150 feet, March 10, 1931, 1 male, March 15, 1931, 1 female (*o*); Vaipae Valley, altitude 200 feet, March 17, 1931, 1 male; Haave [Haavei] Valley, altitude 170 feet, March 19, 1931, 4 males; Tauheeputa, altitude 1,770 feet, March 23, 1931, 3 males, 1 female (*p*); LeBronnec and H. Tauraa.

Nukuhiva: Taiohe, sea level, July 26, 1931, 1 female (*q*), LeBronnec and H. Tauraa.

The above series of *H. bolina*, including 15 males and 8 females, affords

² Walker, J. J., *Anosia plexippus* L. (*Danais archippus*, F.), a study in geographical distribution: Ent. Monthly Mag., vol. 22, pp. 217-224, 1885. The Geographical Distribution of *Danaida plexippus*, L. (*Danais archippus*, F.), with especial reference to its recent migrations: Ent. Monthly Mag., vol. 50, pp. 181-193, 224-237, 1917.

Collenette, C. L., The present status of *Danaida plexippus*, L. in the Pacific islands: Ent. Monthly Mag., ser. 3, vol. 61, pp. 198-202, 1925.

Poulton, E. B., and Riley, N. D., The Rhopalocera of the St. George Expedition, from French Oceania: Ent. Soc. London, Trans., pt. 2, pp. 453-454, 1928.

an interesting comparison with the larger series of 28 males and 9 females collected by the St. George Expedition in 1925,³ the females being compared with those taken by Commander Walker, March 10-11, 1883, in Fatuhiva. The St. George Expedition collected *H. bolina* in four of the Marquesas Islands: Hivaoa (12 males, 6 females), Fatuhiva (3 males), Tahuata (6 males, 2 females), and Nukuhiva (7 males, 1 female). As these nine 1925 females are indicated by the letters *a* to *i* in the paper in which they are recorded, the eight females of the present paper are lettered *j* to *q* in order to facilitate comparison.

The patterns of females *j-q* are either non-mimetic (A.) or male-like (B.), no example of the Polynesian mimetic form *euploeoides* Poulton (C.) occurring among them. This classification is proposed in a brief account of the patterns of Fijian and Polynesian female forms of *H. bolina* with a table and references to the original descriptions.⁴ Figures of female forms quoted below are from the colored plates of this memoir, reproducing Miss Tassart's beautiful drawings; the accompanying page references may be found in the same publication.

The eight female forms recorded in the present paper are as follows: females *j*, *l*, *m*, and *o* are the female form *thomsoni* Butler (= *moseleyi*, Butler) and closely resemble plate 52, figure 1 (number 7 in family 6), described on page 660. The females differ from the figure in the apparent absence of any orange tinge in the submarginal markings, which are of a pale greyish tint, but the worn condition of *l* and *o* must be taken into account. In all four the white spots within the submarginal markings of the forewing are reduced in size and posteriorly in number, but faint traces of a hindwing series, absent from the figure, are visible in *o*. A very slight indication of "nerina red" (p. 652) can be detected on the forewing of *m*, similar to the reddish trace visible on plate 53, figure 2. The central blue patch of the hindwing is least developed in *o*, but both elements—opaque blue scales and iridescent blue "mirror"—can be recognized in a good light. The former element is strongest in *m*, the latter in *l*.

Females *k* and *n* are "male-like," resembling plate 48, figure 4 (number 4 in family 3), determined on p. 657 as the female form *nareisi*, Butler, but "with emphasized white patches." The pale spots within the submarginal markings of both wings, in the figure, are greatly reduced in the forewings of *k*, less so in *n*, and absent from the hindwings of both, which also differ in the greater development of marginal blue (especially in *n*) around the central white patch of the hindwing.

³ Poulton, E. B., and Riley, N. D., The Rhopalocera of the St. George Expedition, from French Oceania: Ent. Soc. London, Trans., pt. 2, pp. 461, 462, 1928.

⁴ Poulton, E. B., Mimicry in the butterflies of Fiji considered in relation to the euploeine and danaine invasions of Polynesia and to the female forms of *Hypolimnas bolina* L. in the Pacific: Ent. Soc. London, Trans., pts. 3, 4, pp. 564-691, 1923.

Females *p* and *q* resemble plate 47, figure 2 (number 7 in family 2), determined on p. 656 as “the form *montrouzieri* (Butler) but with less development of orange than in the type.” There is apparently slightly less of this tinge in the subapical forewing area of *q*, as compared with the figure; also less in the submarginal region of the forewing and in the submarginal markings of both wings. In making this distinction between *p* and *q* it is necessary to bear in mind the difference in their condition, the former being far less worn. The series of small pale spots within the submarginal markings of the hindwing, present in the figure, are wanting in both specimens, while the white spots of the forewing series are, except for the two nearest the costa, reduced to points and evanescent or absent posteriorly. Also, when compared with the figure, the opaque blue scales are less developed in the central wing patch of both specimens.

Comparing these 8 females with the 9 St. George Expedition females, the general resemblance is evident. All the latter and half of the former were considered to be forms of *H. thomsoni*. In the greater prevalence of the “*nerina* red” marking and an emphasized marginal pattern, the St. George Expedition females (1925) are more brightly colored and strongly marked than those of the Pacific Entomological Survey (1931) although less so than the five taken by Commander Walker (1883) on Fatuhiva more than 40 years earlier. Allowing for the limited amount of material available for study and the fact that nearly all the females were collected on different islands in each of the three visits (1883, 1925, and 1931), we are led to the tentative conclusion that the Marquesas were originally invaded by a form of *H. bolina* with *nerina* or *nerina*-like (*elliciana*, Fruhstorfer) females accompanied by or combined with the patterns of dark, orange-bordered *montrouzieri*-like females and that both these patterns are being and have largely been already replaced by the male-like patterns *naresi* and especially *thomsoni*.

—E.B.P.

***Atella marquesana*, new species.**

Male

Very similar to *A. gaberti* Guérin, but of a lighter fulvous ground color, above and below, and almost devoid of the somewhat olivaceous tinge which is a feature of that species.

On the upper side the black marginal border is as in *A. gaberti*, but the wavy submarginal line is much narrower on both wings, less sinuous, and not connected to the black border at the veins. The black postdiscal spots on both wings are very small, sharply defined, and mostly crescentic or somewhat subtriangular though variable in shape. The transverse discal band, which in *A. gaberti* extends generally in well-developed fashion from the costa to vein 2, is in *A. marquesana* very faint below vein 3; and the inner transverse band is narrower, especially anteriorly, where also it is much more strongly curved; a short black line lies just within and parallel to the discocellulars.

On the under side the ground color of the forewing is just a shade brighter fulvous than in *A. gaberti*, but the apical, costal (narrowly), and basal areas are more definitely greenish ochreous, as is also the hindwing, which in its general tone recalls strongly the underside of certain palaeartic *Argynnis* such as *A. aglaia*. The transverse markings of

the upper side are repeated beneath, and all are straighter and less sinuous than those of *A. gaberti* but at the same time rather less conspicuous, except the transverse cell markings of the forewing. These lines are black and prominent though narrow; the first two are joined top and bottom to form a rough oval; the third, however, runs parallel to an exactly similar line just beyond the discocellulars. Length of forewing (apex damaged) 24 mm.

Fatuhiva: Uia [Ouia] Valley, altitude 100 feet, September 2, 1930, holotype male, unique, LeBronnec.

It will be evident from the figure that this insect is indeed very close to *Atella gaberti*, which appears to be confined to Tahiti and Moorea, and is undoubtedly derived from the same stock. Among the 27 examples of the latter insect with which it has been compared in the British Museum, however, there is not one that makes any real approach to it in respect to the features described. Although the genitalia have not been dissected out, such portions of them as are visible—though imperfectly—suggest that a fuller examination would probably reveal slight differences in the shape of the extremity of the clasper in the two species, if not in other features as well. A more obvious structural difference is furnished by the palpi, in which the length of the third segment as compared with the second is far less in *A. marquesana* than in *A. gaberti*. (It is interesting to recall that another endemic Marquesan butterfly, *Libythea collenettei* Riley, differs markedly from all the other species of its genus by the smallness of its palpi.) The Marquesas are separated from the Society Islands by a distance of something like 1,000 miles, and there is little doubt that this separation has existed for a considerable period of time. In view of all the circumstances, there appears to be every justification for regarding *Atella marquesana* as a species distinct from *A. gaberti*.

The discovery of this endemic *Atella* in Fatuhiva lends further support to the view expressed by Meyrick and others, that the insect fauna of the Marquesas indicates that these islands represent the relics of some much larger land mass. Also it serves to confirm the accuracy of an observation made by Commander Walker in 1883,⁵ to the effect that he had seen "an *Atella*?" in March on Nukahiva and Hivaoa, an observation once doubted by Riley, who considered that the supposed *Atella* was probably *Libythea collenettei*.

—N.D.R.

⁵ Walker, J. J., Presidential address: Ent. Soc. London, Proc., p. 106-107, 1919 (1920).