

XV. *Observations upon certain species of the Lepidopterous genus Terias, with descriptions of hitherto unnamed forms from Japan.* By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Read October 6th, 1880.]

(PLATE VI.)

THE difficulty of discriminating between the species of the genus *Terias* has long been admitted by lepidopterists, and many of them have attempted to evade it by regarding the species of this group as extremely liable to variation.

Now, although it cannot be positively proved that the multitudinous similar forms in this genus are constant to their characters, the examination of a long series of individuals from one locality seems to indicate that hybridization, rather than extreme variation, is the factor which produces the apparent gradations from one type to another.

In the group of species allied to *T. hecabe* there are no two more distinct forms than the heavily-bordered type and the species named by M. De L'Orza *T. mandarina*; and it is noteworthy that in the first the female is extremely scarce; in *T. mandarina* this sex is commoner than the male; in colouring also the *T. hecabe* type reminds one of the genus *Colias*, but *T. mandarina* is far more like *Gonepteryx*; yet, with a series of 154 specimens of this section of the genus from Nikko, I have been able to arrange a perfect gradational series of scarcely differing forms from the most heavily-bordered of the Japanese representative of *T. hecabe* to the palest *T. mandarina* in which the border has practically disappeared.

Superficially, therefore, it would seem that these apparently very distinct species were wholly untenable, and that the *T. anemone* of Felder, which stands half-way between their extreme variations, was only one of the gradations which proved them to be identical: this view of the case would commend itself to almost any entomologist who examined merely a selected series of specimens; but when one carefully compares upwards of



150 specimens, and discovers that the absence of six of them, referable to only two gradations, would at once leave the three species as sharply defined as any in the genus, it naturally occurs to him to examine those six specimens more minutely, and see whether they do not exhibit differences *inter se* which point rather to hybridization than variation for their origin; such I have found to be the case, and, therefore, in the absence of positive evidence of identity founded upon careful breeding, I do not hesitate to regard the *T. hecabe* group, as represented in Japan by three species.

That the species of *Terias* are not necessarily subject to great variation is evidenced by an examination of series of the two other Japanese species, *T. betheseba* and *T. jægeri*; of the first of these I have examined twenty specimens from Nikko, which exhibit no variation whatever; of the second species I have examined thirty-nine specimens, which only vary in the yellower or redder tint on the under surface of the secondaries.

Descriptions of the Japanese forms of the *T. hecabe* group of *Terias*:—

1. *Terias mariesii*, sp. n. Pl. vi. fig. 1.

a. Male only differs from *T. hecabe* in its brilliant lemon-yellow instead of dark gamboge-yellow colouring. In this respect it shows no variation. The female is of a sulphur-yellow colour, and is extremely rare.\*

b. Rather larger than the type, the border of the secondaries of about half the width, and emitting short black spurs upon the veins. Fig. 2.

c. The border of the primaries slightly narrower, especially near the external angle, the outer border of the secondaries inconstant, the under surface with the ordinary markings feebly indicated. Fig. 3.

d. Like the type form (a) excepting that the black border of the primaries is of little more than half the width at external angle; size very variable. Fig. 4.

e. Similar to the preceding, but with narrower border to the secondaries. Fig. 5.

f. Similar to e, excepting that the border of the primaries is distinctly narrower towards the external angle, and the border towards the costa not angulated. Fig. 6.

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\* Only one female occurred in the collection, and none of *T. anemone*.



The form which follows this appears to be a hybrid between *T. mariesii* and *T. anemone*, and therefore may be provisionally named. Fig. 7.

*Terias hybrida*.—The outer border of the primaries rather wider throughout than *T. anemone*, the inner margin exhibiting from eight to nine fairly regular sinuations, of which the two on the median interspaces are broader but scarcely less prominent than the others, the costal margin more or less bordered by a narrow black band; secondaries with the outer border varying from a narrow band to a series of dots; size variable.

## 2. *Terias anemone*. Fig. 9.

*Terias Anemone*, Felder, Wien. Ent. Monatschr. vi. p. 23 (1862).

a. Resembles the preceding form, and therefore differs from Felder's type in having a more or less pronounced black border to the secondaries; the border of the primaries is about as wide as in *T. hybrida*, but the sinuation of its inner edge is only strongly defined upon the median interspaces. Figs. 8, 10.

b. Typical *T. anemone*, with slightly narrower border to the primaries than in var. a, and dotted margin to the secondaries. Fig. 9.

c. The costal margin of the primaries only slenderly black close to the apical border, and the external border reduced to little more than a sinuated line towards the external angle; secondaries as in preceding form. Fig. 11.

*Terias connexiva*.—The outer border almost as in var. c of *T. anemone*. but the apical portion with an inward angulation, as in the darkest forms of *T. mandarina*; the length of the apical patch variable; in one out of our three examples it is as short as in *T. mandarina*; one of the specimens with the short apical patch has the oblique dash characteristic of *T. mandarina* on the under surface of the primaries; size variable. Fig. 12.

I have little doubt that this is a hybrid between *T. anemone* and *T. mandarina*.

## 3. *Terias mandarina*. Figs. 16 and 18.

*Terias mandarina*, De L'Orza, Lep. Jap. p. 18 (1869).

a. Very like the preceding form, but the outer border of the primaries giving place to black marginal dots



from below the third median branch, the apical portion distinctly angulated internally; the under surface (as in *T. mandarina* generally) almost always with an oblique subapical brown dash on the primaries; females commoner than males. Fig. 13.

*b.* Apical border of primaries much narrower, not angulated internally; female rather darker than usual; not common. Fig. 14.

*c.* Apical border still narrower, not sinuated towards the costal margin; female rare. Fig. 15.

*d.* Typical *T. mandarina*, the apical border greyish and interrupted in both sexes; the external border only represented by dots at the extremities of the veins; female common. Fig. 16.

*e.* No border at all, but the black marginal dots elongated upon the subcostal branches of the primaries so as to form little oblique costal dashes; female commoner than the male. Fig. 17.

I have thus shown that we now possess a complete gradation of slightly differing forms linking the two most dissimilar types of the *T. hecabe* section of the genus *Terias*, just as in the genus *Euploea* we possess all the links between the very different-looking *E. dolosa* and *E. violetta*, and in *Teracolus* numerous links, of which more are always coming in, tending to unite the whole of the wonderfully dissimilar forms in that genus; in *Panopea* also and *Neptis*, with many other groups, the intermediates are constantly coming and making the discrimination of species more difficult, and the study of entomology more interesting; in a century from the present time, if collectors labour as assiduously as they have done of late, it will be impossible, I believe, for any entomologist to decide without rearing it from the egg whether any form is a species, a hybrid, or a variety.

So far as I have been able to judge, the *T. hecabe* and *T. mandarina* of China are constant; the intermediate *T. anemone* does not appear to come from that country, in which case hybridization cannot modify the typical forms.

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