

Taxonomy of the *Delias mesoblema* subgroup from Irian Jaya (Lepidoptera: Pieridae)

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Abstract: A revision of the *Delias mesoblema* (Jordan, 1912) subgroup is presented on the basis of a study of recently collected specimens in the central mountain ranges of Irian Jaya, Indonesia. As now treated, four species are recognized within this subgroup, one of which is described as new. In addition, two new subspecies are described.

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Introduction

Since 1983 I have collected *Delias* butterflies extensively in the central mountain ranges of Irian Jaya (former Dutch New Guinea). This material, together with museum specimens, gives a new perspective on the *Delias mesoblema* subgroup. The butterflies of this subgroup are found at high elevations: over 1200 m in the western region, over 1700 m in the centre and over 1850 m in the eastern part of the mountain ranges (fig. 13). No species of this group are yet known from Papua New Guinea. They fly over small rivers and streams in primary woods, where the sun can easily come through. However, they do not appear to settle readily for they are underrepresented in assemblages of *Delias* ssp. found at rest.

Relatively speaking, the species of this subgroup are not very rare and normally are among the five to ten most common kinds of *Delias*.

Depositories

The abbreviations given below have been used in the lists of material and throughout the text.
BMNH – British Museum (Natural History), London

DR – Private collection of Mr. David Rushen, Eastborne, United Kingdom

HM – Private collection of the author, Jayapura
MGM – Private collection of Dr. M. G. Morris, Dorchester, United Kingdom
RMNH – Rijksmuseum van Natuurlijke Historie, Leiden
ZMA – Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Amsterdam

Taxonomy

The identity of Delias mesoblema and its relatives

D. mesoblema was originally described by Jordan (January, 1912 – not 1911, as usually stated) from Mount Goliath in Irian Jaya (former Dutch New Guinea). Rothschild (1915) mentions *D. mesoblema* from the Carstensz Mountains.

Talbot's (1929) description of *D. mesoblema* and the distinguishing character of this species in his "Key to Forms" (p. 213) is obviously based on specimens from Carstensz Mountains and Menoo Valley. It does not fit *D. mesoblema* from the type-locality. He adds two characteristic features to Jordan's description: "a red stripe in the base of cellule 6 ex-

tending into 7" and "In cellule 1b from near the base to the anal angle is a narrow and sharply-defined sulphur-yellow stripe". These two new characteristics only correspond with the specimens from Carstesz Mountains (collected by the Wollaston expedition in 1913) and Menoo Valley (collected by C. F. & J. Pratt in 1920/21). Talbot's figure of *D. mesoblema* shows a female from Menoo Valley.

Roepke (1955b) describes two subspecies: *D. mesoblema flavistriga* from Baliem Valley and *D. mesoblema arabuana* from the Wissel-lakes-area, which I raise here to specific rank.

Finally D'Abrera (1977) illustrates a male and a female of *D. m. mesoblema*, correcting the misidentification of these figures as *D. bakeri* Kenrick, 1909 in the 1971 edition. My research shows that the male specimen belongs to *D. flavistriga*, whilst the female represents a new taxon in this subgroup. For the sake of completeness it may be mentioned here that D'Abrera's (1971) figures of *D. m. mesoblema* in fact depict *D. luctuosa* Jordan, 1912.

The Delias mesoblema subgroup

This subgroup is probably monophyletic. The constituent species and subspecies have a specific pattern on the underside of hind wing. The subgroup can be characterized as follows: Upperside of fore wing white with black costa and black border along termen, which is much broader at apex than at tornus. Upperside of hind wing translucent white; pattern of underside partly visible from above. Underside of fore wing white; black border of more or less same size as on upperside, with three yellow to orange apical spots and three very small terminal dots of same colour. Underside of hind wing with white basal mark, partly coloured, red or yellow. Black fascia distally bordered by red from costa in cell 7 to border at vein 1b and surrounding a large discal pear-shaped area which comprises discal cell and inner parts of cells Cu_{1a}, M₃, M₂ and M₁, each having a distinct yellow patch. Ring fascia broadly connected with costal margin. Red line separated from black edge by one small and six large white patches, separated by black vein-streaks.

This subgroup is a part of the *iltis* group as defined by Talbot, consisting of *D. iltis* Ribbe, 1900 (including *D. luctuosa* as a subspecies), *D. mesoblema*, *D. bakeri* and *D. callista* Jordan, 1912.

Key to (sub)species of Delias mesoblema subgroup

1. Underside of hind wing with a sulphur-yellow streak from near the base to anal angle in cell 2A 3
 - Sulphur-yellow streak absent in cell 2A, which has the same greenish grey to yellow colour as cell 3A 2
2. Basal pear-shaped mark on underside of hind wing anteriorly white, posteriorly yellow and no red line along Rs (fig. 7)
 - *D. mesoblema*
 - Basal pear-shaped mark on underside of hind wing white, enclosing a proximal yellow spot; a red line along Rs (fig. 10)
 - *D. awongkor*
3. Basal pear-shaped mark on underside of hind wing white, enclosing a proximal red or yellow spot; a red line along Rs 4
 - Basal pear-shaped mark on underside of hind wing anteriorly white, posteriorly red; no red line along Rs 5
4. White basal pear-shaped mark on underside of hind wing with small yellow spot (fig. 11) *D. flavistriga ilagaensis*
 - White basal pear-shaped mark on underside of hind wing with small red spot (fig. 12) *D. flavistriga flavistriga*
5. Black border on upperside of fore wing narrow, not reaching discal cell (fig. 2) *D. arabuana arabuana*
 - Black border on upperside of fore wing broad, reaching end of discal cell (fig. 3) *D. arabuana modioensis*

Delias mesoblema Jordan, 1912 (figs. 1 & 7)

Delias mesoblema Jordan, 1912: 584; Talbot 1929: 215-216 (partim).

Delias mesoblema mesoblema; Roepke, 1955b: 215; D'Abbrera, 1971: 136-137; D'Abbrera, 1977: 136-137.

Material examined: "Mt. Goliath, 5-7000 ft. Centr./Dutch N. Guinea/about 139° long./January 1911/(A. S. Meek)", ♂ lectotype, 2 ♀♀ paralectotypes, BMNH.

Lectotype designation. *Delias mesoblema* was described from an unknown number of specimens. The BMNH collection contains one male and two females. The male is designated lectotype and the females have been labelled paralectotypes by the present author.

Diagnosis

The combination of the following characteristic features on the underside of the hind wing distinguishes *D. mesoblema* from the other species in this subgroup: the basal mark is anteriorly white and posteriorly yellow; there is no red line along Rs; cell 2A there has no sulphur-yellow streak, but cells 2A and 3A are uniformly greenish grey (sometimes yellowish).

Description

♂. Upperside of fore wing: black border narrow, with one very vague subapical spot. Inner edge of black border slightly serrate. Black border forms very thin line on upperside of hind wing. Underside of fore wing with black border as on upperside, with three yellow subapical spots and three small terminal dots. Underside of hind wing with basal mark which is anteriorly white and posteriorly yellow. Thick, short red line along median vein in discal cell. Black border with discrete triangular terminal spots.

Length of fore wing: 26 mm.

♀. Upperside of fore wing white. Black border broader than in ♂, with one small and two large subapical spots, three or four vague terminal dots; inner edge smooth. Upperside of hind wing white with black triangles on ends of veins. Underside of fore wing white; black border of same size as on upperside, with three yellow subapical spots and three yellow terminal dots. Underside of hind wing as in ♂, but black triangular terminal spots are more

obvious and black fascia slightly broader. Length of fore wing: 25-26 mm.

Delias arabuana Roepke, 1955 stat. nov.

Diagnosis

Delias arabuana differs from *Delias mesoblema* in the sulphur-yellow streak in cell 2A on underside of the hind wing and a posteriorly red, pear-shaped basal mark.

Delias arabuana arabuana Roepke, 1955

(figs. 2 & 8)

Delias mesoblema arabuana Roepke, 1955b: 216-217, Pl. V, fig. 9 ♂; D'Abbrera, 1971: 137; D'Abbrera, 1977: 137. *Delias mesoblema*; Rothschild, 1915: 7; Talbot, 1929: 215-216 (partim).

Material examined. Arabu Valley, 1750 m, x.1939, Boschma, ♂ holotype, 1 ♂ paratype, RMNH; same data, 1 ♂ paratype, BMNH; Snow Mountains, Utakwa River, 1200-1800 m, i-ii.1913, Wollaston, 10 ♂♂, BMNH; Tuguwai, 1750 m, ix.1976, x.1978, Van Mastrigt, 2 ♂♂, HM; Udatode, 1700 m, xii.1980, Van Mastrigt, 1 ♂, HM; Tembagapura, 1900 m, xi.1979, Van Mastrigt, 5 ♂♂, HM; same data, 2 ♂♂, DR; Bidogai, 1900 m, ii.1982, Van Mastrigt, 1 ♂, HM; Ilaga, 1950 m., x.1983, Van Mastrigt, 3 ♂♂, HM; Ilaga, 1950-2350 m, xi.1985, Van Mastrigt, 12 ♂♂, HM; same data, 5 ♂♂, ZMA; Enaro River, 1750 m, v.1984, Van Mastrigt, 1 ♂, HM.

Description

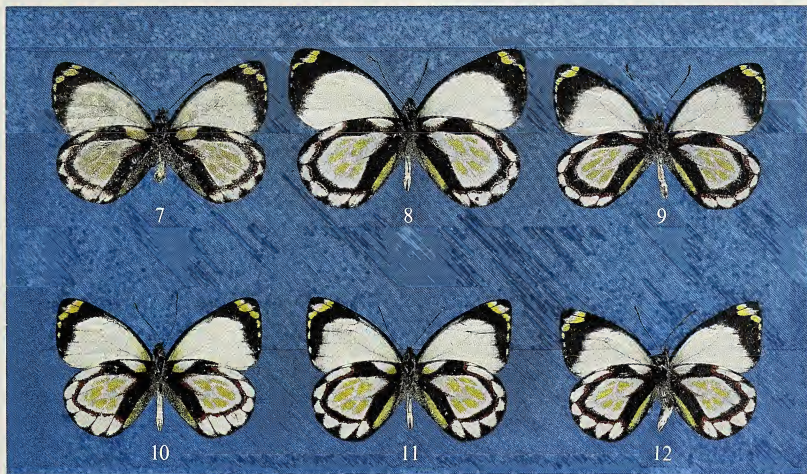
♂. Upperside of fore wing with very narrow black border, with one or two indistinct subapical spots. Inner edge of black border smooth, not serrate. Upperside of hind wing with a very thin black borderline. Underside of fore wing with black border as on upperside, with three, almost totally dark yellow subapical spots and three small, yellow terminal dots. Underside of hind wing with basal mark anteriorly white and posteriorly red; a short, thick, red line along median vein. Five yellow patches in discal area very variable in size and colour (from pale yellow to orange). Width of black and red fascia very variable. These variations are not determined according to locality. Black terminal spots shallow, weakly triangular.

Length of fore wing: 26-30 mm.

♀. Unknown.



Figs. 1-6. Butterflies of the *Delias mesoblema* subgroup; uppersides. 1, *D. mesoblema* ♀ paralectotype; 2, *D. arabuana arabuana*, ♂ Ilaga; 3, *D. arabuana modioensis*, ♂ holotype; 4, *D. awongkor*, ♂ holotype; 5, *D. flavistriga ilagaensis*, ♂ holotype; 6, *D. flavistriga flavistriga*, ♂ River Mil, between Welesi and Walaik. Figures $0.77 \times$ natural size.



Figs. 7-12. Butterflies of the *Delias mesoblema* subgroup; undersides. 7, *D. mesoblema*, ♀ paralectotype; 8, *D. arabuana arabuana*, ♂ Ilaga; 9, *D. arabuana modioensis*, ♂ holotype; 10, *D. awongkor*, ♂ holotype; 11, *D. flavistriga ilagaensis*, ♂ holotype; 12, *D. flavistriga flavistriga*, ♂ River Mil, between Welesi and Walaik. Figures $0.77 \times$ natural size.

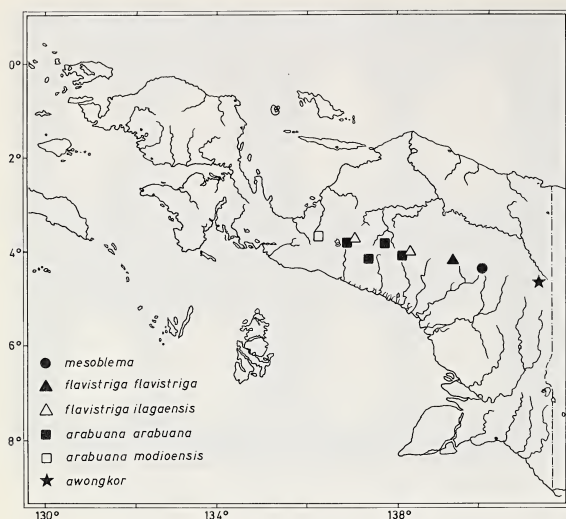


Fig. 13. Distribution of the (sub)species of the *Delias mesoblema* subgroup.

***Delias arabuana modioensis* subsp. nov.**
(figs. 3 & 9)

Delias mesoblema; Talbot 1929: 213; 215-216 (partim), pl. xlii fig. 8 ♀.

Delias mesoblema mesoblema; D'Abrera 1971: 136 fig. ♀; D'Abrera 1977: 136 fig. ♀.

Types. Holotype ♂: "Irian Jaya 1450 m/Modio, Mapia/29.v.1984 HvM", ZMA. Paratypes: Modio, Irian Jaya, 1450 m, iv.1979, iii.1984, Van Mastrigt, 3 ♂♂, HM; same location, iii.1985, M. G. Morris, 1 ♂, MGM; Menoo Valley, Weyland Mnts, xi-xii-i.1920-21, C. F. & J. Pratt, 2 ♂♂, 2 ♀♀, BMNH.

Description

♂. Differs from nominate form in having a much broader black border on upper- and underside of fore wing, which comes very close to cell (with an exception of one specimen from Menoo Valley in which black border on upper-side is more reduced in cells M_1 and M_2); inner edge of black border rounded. One quite clear subapical spot on upperside of fore wing and sometimes a second indistinct one. Yellow spots in the white central part on underside of hind wing deep yellow.

Length of fore wing: 26-29 mm.

♀. Upperside of fore wing white, sometimes

with yellowish bloom, with broader black border than in ♂, having two subapical spots and one or two indistinct terminal dots. Hind wing white with 4-4.5 mm broad, black border, sometimes having a row of five spots which are more indistinct in cells M_3 and M_2 . Underside of fore wing with 1 mm broader black border as on upperside, with three yellow subapical spots and three very small terminal dots. Underside of hind wing as in ♂, but submarginal, black fascia broader and with smaller white spots between red fascia and black triangular terminal spots.

Length of fore wing: 26-27 mm.

Derivation of name. The subspecies is named after the type-locality, the village Modio in the foothills of the Weyland Mountains, Irian Jaya.

***Delias flavistriga* Roepke, 1955 stat. nov.**

Diagnosis

Delias flavistriga differs from *D. mesoblema* and *D. arabuana* in underside of hind wing in having a white basal mark, which includes a

proximal red (ssp. *flavistriga*) or yellow (ssp. *ilagaensis*) spot. Red line along M_5 , longer and narrower than in *Delias mesoblema*, forms V-shaped figure with red line along Rs. The sulphur yellow streak in cell 2A is present as in *D. arabuana*.

***Delias flavistriga flavistriga* Roepke, 1955**
(figs. 6 & 12)

D. mesoblema flavistriga Roepke, 1955b: 215-216; pl. V fig. 10 ♀, pl. VII fig. 8 ♂; D'Abbrera, 1971: 137.

D. bakeri, D'Abbrera 1971: 137 fig.

D. mesoblema mesoblema, D'Abbrera 1977: 137 fig.

Material examined. Most Forest Camp, 2700 m, 25.x.1938, Toxopeus, ♂ holotype, RMNH; same data, but 19.x.-5.xi.1939, 7 ♂♂, 4 ♀♀ paratypes, RMNH; same data, 1 ♂, 1 ♀ paratypes, BMNH; Ibele Camp, 2250 m, xi.1938, Toxopeus, 2 ♂♂ paratypes, BMNH; Daela, Irian Jaya, 2000 m, 19.ix.1984, Claudio, 1 ♂, HM, 6-7.iii.1985, Van Mastrigt, 11 ♂♂, HM; same data, 9 ♂♂, ZMA; Ibele, Irian Jaya, 1800 m, 8.iii.1985, Van Mastrigt, 3 ♂♂, HM; same data, 3 ♂♂, ZMA; River Mil between Welesi and Walaik, Irian Jaya, 2000 m, 20.iii.1985, Van Mastrigt, 3 ♂♂, HM, 16.viii.1986, Van Mastrigt, 6 ♂♂, HM; 23.viii.1986, Van Mastrigt, 4 ♂♂, HM; 5.ix.1986, Van Mastrigt, 2 ♂♂, HM; 19.ix.1986, Van Mastrigt, 2 ♂♂, HM; 12.ix.1986, Van Mastrigt, 6 ♂♂, ZMA; route Daela-Ibele, 8.iii.1985, Van Mastrigt, 6 ♂♂, ZMA.

Description

♂. Upside of fore wing with black border, width anteriorly approx. 10 mm, along M_3 approx. 5 mm and along $1A+2A$ only 1 mm, with two (or seldom one) subapical spots. Two specimens of a very large series from Welesi, Baliem Valley, have three white dots along termen. Inner edge of border irregular. Upside of hind wing white with black terminal line. Underside of fore wing creamy white, sometimes with yellow bloom, and strongly reduced black border (1 mm narrower than on upside); inner edge of black border irregular. Three subapical spots and three dots along termen partly (half) filled in with yellow. Underside of hind wing with red proximal spot, shortly extending along lower margin, in white pear-shaped basal mark. Ring fascia connected with costal margin over a length of 3 mm. Ends of veins with black, markedly triangular spots. Sharply defined yellow streak of

variable size in cell 2A, extending from near base to anal angle.

Length of fore wing: 24-27 mm.

♀. Upside of fore wing creamy white with broad blackish border including upper part of cell, but leaving corner of cell M_2 white. Inner margin slightly arcuate. Posterior end broad. Two elongate white subapical spots. Upside of hind wing creamy with incomplete black border, consisting of an outer and an inner band, both beginning at vein Rs, former composes of black terminal triangles, inner one ends diffusely between veins Cu_{1a} and Cu_{1b} . Underside as in male, but pattern and colouration more marked and vivid, with slight trace of lemon yellow at base of fore wing, and yellow patches in hind wing darker, more orange.

Length of fore wing: 26 mm.

***Delias flavistriga ilagaensis* subsp. nov.**
(figs. 5 & 11)

Types. Holotype ♂: "Irian Jaya 2350 m/Iraga, river Namugun/9.xi.1985/Van Mastrigt", ZMA. Paratypes: same data, 5 ♂♂, HM; same data, 8 ♂♂, ZMA; Nakimome (Iraga), 2150 m, 24-26.x.1983, Van Mastrigt, 7 ♂♂, HM; same data, 1 ♂, ZMA; same locality, 5-8.xi.1985, Van Mastrigt, 9 ♂♂, HM; same data, 2 ♂♂, ZMA; Tuguwai, 1750 m, 7.iii.1978, Van Mastrigt, 1 ♂, HM.

Description

♂. Differs from nominate form in having black lunulate border on upside of hind wing and white basal mark enclosing proximal, yellow spot on underside of hind wing.

Upside of fore wing as in subsp. *flavistriga* usually with one vague subapical spot, but some specimens have several indistinct dots. Inner edge of border serrate. Upside of hind wing white, with lunulate black border. Underside of fore wing as subsp. *flavistriga*, but inner edge of black border serrate. Three subapical spots and three dots along termen partly filled in with yellow. Underside of hind wing as in subsp. *flavistriga*, but connection between ring fascia and costal margin broader and proximal spot in white pear-shaped mark in base of cell 7, is yellow instead of red.

Length of fore wing: 24-27 mm.

♀. Unknown.

Derivation of name. Ilaga is the name of the valley where this species is quite common.

Delias awongkor spec. nov.

(figs. 4 & 10)

Types. Holotype ♂: "Irian Jaya Star Mountains/ Abmisibil 1920 m/River Oktanglap/17-19.vii.1987/Van Mastrigt", ZMA. Paratypes: same data, 10 ♂♂, ZMA; same locality, 10-16.ix.1985, Van Mastrigt, 18 ♂♂, HM; same data, 6 ♂♂, DR; same data, 1 ♂, ZMA; same locality, v.1986, 1 ♂, ZMA; same locality, 20.x.1986, 2 ♂♂, RMNH, 15.ii.1987, 2 ♂♂, RMNH; Abmisibil, iii.1985, M. Morris, 1 ♂, MGM; same data, 1 ♂, HM.

Diagnosis

This species differs from *D. flavistriga* in having a more reduced black border on upperside of fore wing and no sulphur-yellow streak in cell 2A on underside of hind wing. It differs from *D. mesoblema* in underside of hind wing in having a proximal yellow spot instead of a posterior stripe in the pear-shaped basal mark and a red line along Rs.

Description

♂. Upperside of fore wing with relatively narrow, black border with small subapical spot and occasionally a second indistinct one and with smooth, not serrate inner edge. Upperside of hind wing as in *D. flavistriga flavistriga* and not lunulate as in *D. flavistriga ilagaensis*. Underside of fore wing sometimes with yellow bloom; black border not reaching tornus and its inner edge irregular. Three small subapical spots partly filled in with yellow to yellow-orange. Along termen two, or occasionally three, small yellow dots. Base of midcell is yellowish. Underside of hind wing as in *D. flavistriga ilagaensis*, but without yellow streak.
♀. Unknown.

in cell 2A. Colour of patches in discal area variable from yellow to orange.

Length of fore wing: 24-26 mm.

Derivation of name. "awongkor" is the local word for butterfly in the Sibil-language.

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