

NEW RESULTS ON DELIAS FROM THE CENTRAL MOUNTAIN RANGE OF IRIAN JAYA (LEPIDOPTERA: PIERIDAE)

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ABSTRACT

Five new species and four new subspecies of *Delias* are described from the central mountain ranges of Irian Jaya, Indonesia. *D. luctuosa gottsi* subsp. n. and *D. callista callipulchra* subsp. n. from Tembagapura (137° 8' E.), the south side of the Puncak Jaya, former Carstensz Peak, *D. pseudomarguerita* sp. n. from Homeyo (136°53' E.), *D. virgo* sp. n., *D. neeltje* sp. n. and *D. phippii mulia* subsp. n. from the middle ranges (137°30'—138°E.), *D. hemianops* sp. n. from Abmisibil in the Star Mountains (141° E.), *D. langda langda* sp. n. from langda (140° E.) and *D. langda watlangku* subsp. n. from the northeastern side of the Baliem Valley (139° E.).

INTRODUCTION

Intensive and continuous collecting butterflies of the genus *Delias* during the last ten to fifteen years in various areas of Irian Jaya, not only by the authors, but also by other collectors, resulted in much new material. Besides additional material to the results of expeditions (Arfak Mountains, Wissel Lakes, Puncak Jaya, Baliem Valley, Mt. Goliath and Star Mountains), much material was collected in areas never visited by collectors before. This material will lead to revisions of old studies and to descriptions of new species and subspecies. This article is another contribution in trying to bring the new results to a wider forum of entomologists, interested in the richness of the *Delias* fauna of Irian Jaya.

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— Lepidoptera; Pieridae; *Delias*; new species; Irian Jaya; Indonesia.

Diagnosis

Delias luctuosa is first described from Mt. Groome, PNG, by Jordan, 1912. Roepke (1955) added a new subspecies from the Baliem Valley: *D. luctuosa archboldi*, including a yellow and a white ♀-form and a creamy male: f. ♂ *buteracea*. In 1989 Okano described *D. luctuosa mizukamii* from Kundiawa, close to Madang, PNG. Henk van Mastrigt (1990) described *D. luctuosa kuning* from Langda and the Star Mountains, which subspecies recently is found in more western areas, between Langda and the Baliem Valley. The here described new subspecies from Tembagapura, is the most western *luctuosa* found up till now.

Male : upperside of fore wing white with black costal border, slightly entering discal cell. Terminal border very broad in cells M_1 , M_2 and M_3 , reaching LDC, narrowing towards tornus, where slightly curving along dorsum; two white subapical spots; inner edge irregular. Veins visible, particularly at underside of discal cell. Upperside of hind wing translucent white. Black border variable in size: often narrow in cells R_s and M_1 , undulate at vein M_2 and M_3 and broad in cells Cu_{1a} , Cu_{1b} and $1A+2A$, sometimes only some black diffusion at vein-ends. Underside of fore wing creamy white. Costal border black. Terminal border of same size as on upperside, including two small white spots with some black diffusion, just outside discal cell. Three subapical yellow spots and two smaller terminal ones. Underside of hind wing creamy white ground colour. Black costal border connected to black anal band and enclosing distinct pearshaped basal spot which colour varies from dark maroon red to orange. Broad (2–4 mm) dark maroon-red postdiscal band, crossing from costa at $Sc+R_1$, to anal border. Inner edge of red band bordered with narrow black band (1–2 mm), from costa at $Sc+R_1$ curving to anal border and broadly entering cell R_s . Discal area with maroon diffusion at inner side, pink diffusion in central area, to creamy along black band. Dorsal border white with five black spots at vein-ends from elongated at vein M_1 , rounded at veins M_2 , M_3 and Cu_{1a} , to triangular at vein.
Length of fore wing: (26) 29–32 mm.

Female : upperside of fore wing distinctly white; much broader black border, especially in cells M_3 , Cu_{1a} and Cu_{1b} , with two subapical stripes (rather than spots). Veins as in male. Upperside of hind wing white, with very broad border along termen and distal part of dorsum, enclosing two white spots in $Sc+R_1$ and R_s . Underside of fore wing as in male with broad black border, not as wide as on upperside, which is easily visible from underside: looks like grey band at inner edge of black border. Discal cell with yellowish gloom. Undersides of hind wing similar to male, but with triangular

to v-shaped spots along termen grey rather than white. Postdiscal band red brown, not dark maroon.

Length of fore wing: 31.5 mm.

Derivation of name : this subspecies is named in honour to Mr. Robert Gotts in Sidney, who was the first to bring this subspecies to the attention of the authors.

Delias callista callipulchra subsp. n.
(pl. I, fig. 2; pl. II, fig. 2; map 2)

Type material : holotype ♂, Irian Jaya/xii. 1990/Henk van Mastrigt; MZB; paratypes: same data as holotype, 17.xi.1979, 2♂, HM; 18.ix.1979, 1♂, HM; 1982, 1♂, RG; ii.1991, 1♂, RG; 17.iii.1991, 1♂, RG; vi. 1991, 1♂, 1♀, RG; vii.1991, 1♂, GG; 29.viii.1991, 1♂, GG; viii. 1991, 1♀, RG. ix.1991, 1♂, GG; 1♂, RG; x.1991, 1♂, RG; 19.xii. 1991, 1♂, RG and 1991, 1♂, GG; Tembapapura, 6000 ft, 27.i.1991, 1♂, GG; 2000 m, 10.iv.1991, 2♂, BT; 28.xii.1991, 1♀, JP; 2000 - 2500 m, viii-ix.1991, 1♂, GG; 2100 m, 14.xi.1991, 1♂, GG; Tem - bagapura, 1850 m, R. Waa, 10.ii.1991, 1♂, HM; 7000 ft, vii.1991, 1♂, GG; 28.viii.1991, 1♂, DB; 12.xii.1991, 1♂, DB and ii.1992, 3♂, DB; 7500 ft, 14.viii.1991, 1♂, DB; 2100 m, 17.xii.1991, 1♂, HM; 5.i.1992, 1♂, GG; 14.i.1992, 1♂, BT, 26.iii.1992, 1♂, GG and 6.iv.1992, 1♂, GG; 2300 m, 23.xii.1991, 1♂, HM; 1850 m, 5.iv.1992, 1♂, HM and 23.vi.1992, 1♀, HM; Tembapapura, headwaters of Kawari, 2200 m, 1.iii.1992, 2♂, HM and 2400 m, 10.iv. 1991, 1♀, BT; Tembapapura, Zagam Tunnel, 2400 m, 21.iii.1992, 1♂, HM; R. Utikini, 2400 m, 12.xi.1991, 1♂, DB.

Delias callista is described by K. Jordan (1912) from Mount Goliath, at the southside of the central mountain range in Irian Jaya, close to the 140° longitude. Roepke (1955) described *D. callista callipareia* from the Baliem Valley and its environments (1800–2700 m.), with the f. ♂ *luteola*. In 1982, finally, Schroder and Treadaway described *D. callista raymondi* from the Weyland Mountains. *D. callista* from Tembapapura is closer to *callipareia*, than to *raymondi*.

Male : upperside fore wing white. Black costal border not entering discal cell connected with thin irregular LDC. Terminal border, from 10 mm at apex to 1 mm at tornus, including one, two or three white subapical spots. Inner edge irregular. Upperside of hind wing translucent white with very narrow black border and black vein-ends at M_1 , M_2 , M_3 and Cu_{1a} . Underside of fore wing creamy white with black discal border connected with large irregular LDC. Terminal border of same size as on upperside, with three orange and

yellow subapical spots, of which second is largest one, and with one small linear terminal spot of same colour followed by very small colourless second one. Underside of hind wing with white ground-colour. Black parts of costal border connected with black anal border, including large basal yellow spot with red diffusion, reaching white costal part. Black postdiscal band (width 1-1.5 mm) curving from anal border to costa at vein Sc+R₁ and entering broadly cell Rs; outer edge bordered with red line, which is slightly narrower. White discal part with red diffusion at innerside along black line and with yellow diffusion filling large parts of discal cell and M₁, M₂, Cu_{1a} and Cu_{1b}; vein-parts white. Discal border black; at inner edge bordered by creamy yellow band not reaching red postdiscal band. Vein-parts between postdiscal and border black with black triangles at vein-ends, except at Rs.

Length of forewing: (26) 28-32 mm.

Female: upperside of fore wing white with broad black border, entering discal cell and including LDC, from 18 mm along costal border to 6 mm at tornus; having three pinkish looking subapical spots and one or two very small terminal spots. Upperside of hind wing translucent white; 6 mm wide black border with white spot in Rs, variable in seize. Underside of fore wing creamy white with black border 2 mm narrower than on upperside, which is visible from underside, with three red subapical spots followed by two red and one white terminal spots. Large curved LDC slightly connected with black costal and with terminal border by some black diffusion. Underside hind wing as in male. However, black postdiscal band broader (width 2 mm); yellow scales in discal part accompanied by some red ones which makes the yellow diffusion looking darker. Black spots at vein-ends triangular and more rounded. Length of forewing: 30-32 mm.

Derivation of name. — 'Callipulchra', an adjective in apposition, is derived from the Greek word 'KALLOS' (beauty) and the Latin word 'pulcher' (= beautiful).

Delias neeltje sp.n.

(pl. I, fig. 3; pl. II, fig. 3; map 3)

Type material. — Holotype ♂: Irian Jaya/Centr. Bergland/Mulia, R. Jambi/x.1991/G. Gerrits, MZB. Paratypes: Kembruk Sinak, R. Jambi, vi.1990, 2 ♂, GG; 1 ♂, DM; idem, ix.1990, 1 ♂, GG; Mulia, R. Jambi, x.1991, 2 ♂, GG; Sinak, vi.1991. 1 ♂, HM; Kembruk-Sinak, ii.1991, 2 ♂, GG; 1 ♂, DB; idem, xi-xii.1990, 2 ♂, HM; Mulia-Ilu, vii.1991, 1 ♂, GG; 1991, 1 ♂, GG; 1 ♂, ZMA; Ilu, ix.1991, 1 ♂, HM and vi.1992, 1 ♂, HM.

This species is closely related to *D. clathrata* Rothschild & Talbot, 1904, including the subspecies *limata* Jordan, 1930, which is known from the central mountain ranges of Papua New Guinea, over 500 km east from the type localities of this new species.

It differs from *D. clathrata* in the much larger extend of white areas on upperside of fore wing and on undersides of both wings, and in having four bright red subapical spots on underside of fore wing.

Male : upperside of fore wing creamy white with black costal border which does not enter cell but forms narrow LDC, not reaching distal lower angle of cell. Black border along termen much broader at apex than at tornus; inner edge serrate. Basal area with grey-black diffusion. Two pinkish-red subapical strips in cells R_3 and R_4 . Veins are clearly visible. Upperside of hind wing creamy white and translucent: pattern underside visible from above. Basal area with grey-black diffusion. Veins clearly visible. Narrow black border along termen undulate. Underside of fore wing milky white. Black border along termen, narrowing towards tornus; inner edge serrate. It does not enter posterior half of discal cell and narrowly reaches black border of apex, enclosing one white spot at distal 2/3 of costa. Band of four bright subapical spots with the second, largest one pointed inwards. Veins clearly visible, Underside of hind wing snowy white with dark subbasal band from costa towards dorsum, crossing discal cell at subbasal level. Second much broader band, consisting of seven distinctly separated black spots, from costa to dorsum, crossing discal cell at submedian level. Basal area and dorsum rich dark yellow: costal margin white. Small black pear-shaped band from costa to dark yellow basal area. Black marginal border narrow and undulate at innerside.
Length of fore wing: 27-31 mm.

Female : unknown

Derivation of name: 'Neeltje', a noun in apposition. In honour to Mrs. Neeltje Gerrits-Vlasblom, the wife of the first author, for all her patience and acceptance concerning the entomological interests of her husband.

Delias phippii mulia subsp. n.
(pl. I, fig. 4; pl. II, fig. 4; map 4)

Type material : holotype ♂, Irian Jaya/Centr. Bergland/Mulia x.1991/G. Gerrits, MZB; paratypes, Mulia-Sinak, vi-vii.1989, 1 ♂, GG; vii.1990, 1 ♂, DM; 9 ♂, GG; 5 ♂, HM; ix.1990, 1 ♂, GG; x-xi.1990, 2 ♂, DB; 1 ♂, DM; 17 ♂, GG; 6 ♂, HM; 1990, 1 ♂, DM and ii.1991, 1 ♂, GG;

This new species is closely related to *D. marguerita* Joicey & Talbot, 1922, from which it differs in the underside of the hind wing by a small red subbasal spot (instead of a long streak) and by its large black area at the tornus.

Male : upperside of fore wing white with black costal border, not entering discal cell, and very narrow black terminal border: from 5 mm in cell Rs to 1 mm in cell Cu_{1b}. Upperside of hind wing translucent white with very narrow black border. Underside of fore wing with black border of same size as an upperside, including three yellow subapical spots, followed by a terminal one. Underside of hind wing white. Black costal area connected with black anal area, including pear-shaped basal spot, anteriorly white and posteriorly red. Black anal area has small red subbasal spot. Outer parts of cells Cu_{1a} Cu_{1b} and 1A+2A black. Creamy discal area often open to discal border; sometimes some tracks of the red postdiscal curve visible. Anal area dirty grey green.
Length of fore wing: 23 mm.

Female : unknown

Derivation of name : 'Pseudomarguerita', a noun in apposition, is derived from the words 'pseudo-' and 'marguerita', to underline the wrong supposition that this *Delias* belongs to *marguerita*.

Delias virgo sp. n.

(pl. I, fig. 6; pl. II, fig. 6; map 6)

Type material : holotype ♂: "Irian Jaya/Centr. Bergland/Ilaga R. Jila/ 20.vii.1988/Henk van Mastrigt", MZP; paratypes: same as holotype, 1 ♂, HM; same, but 22.v.1988, 5 ♂, HM; 9.iv.1989, 4 ♂, HM; 2 ♂, ZMA; x.1990, 1 ♂, HM; 2.v.1990, 2 ♂, GG; 4.v.1990, 1 ♂, HM; 7.vi.1991, 2 ♂, HM; 15-20.ix.1990, 5 ♂, HM and 18.iv.1991, 1 ♂, ZMA; 1 ♀, HM; Ilaga, 10.viii.1988, 4 ♂, HM; 1988, 1 ♂, GG and 27.viii.1988, 4 ♂, ZMA; Ilaga, R. Wuluen, 17.xi.1990, 2 ♂, HM; Sinak-Mulia, vi-vii.1988, 2 ♂, GG and x-xi.1990, 12 ♂, HM; 2 ♂, ZMA; Mulia, ii.1991, 1 ♂, HM; Mulia, R. Jambi, 6.ix.1991, 12 ♂, GG; Mulia-Ilu, x-xi.1990, 4 ♂, GG; vii.1991, 5 ♂, GG; x.1991, 20 ♂, GG; 3 ♂, DM; 2 ♂, DB; Beoga, xii.1989, 2 ♂, GG.

This species is closely related to *D. hapalina conspectirubra* Joicey & Talbot, 1922. However, it differs from this in the underside of the hind wing, where the black postdiscal band which accompanies a red one at the innerside, is very poor and often nearly totally absent; the red band is always more complete and broader than the black one.

Description

Male : upperside of fore wing white to creamy white with narrow, black costal border, sometimes with one or two very small white subapical spots. Black border from 8 mm along termen to less than 1 mm at tornus. Outer end of veins black. Upperside of hind wing creamy white and translucent with narrow black border; whole creamy white and translucent with narrow black border; whole pattern of underside visible from above. Underside of fore wing white greyish veins. Black border narrower than on upperside, especially in cells Cu_{1a} , Cu_{1b} and $1A+2A$, with three yellow subapical spots and two yellow terminal ones. Sometimes black LDC, connected by black vein R_4 with black border. Underside of hind wing white with greyish veins. From middle of costa a 1-2 mm broad curved black line extends through inner part of discal cell along yellow green anal area to bottom of Cu_{1a} . In Cu_{1b} it is connected with black border and with black postdiscal band at inner side of red one. This red band reaches at least till Cu_{1b} , and exceptionally till costa. Discal area not always with creamy to yellow gloom. Long, white, basal mark with small, yellow, proximal spot.

Female : upperside of fore wing with broader black border as in male, with two subapical spots. Black LDC. Upperside of hind wing translucent white with 4-5 mm broad black border from M_1 to tornus. Underside of fore wing as in male, with some yellowish gloom, especially in bottom of discal cell; black LDC. Underside of hind wing much more black than in male. Broad black border narrows undulate white line between red band and black border. Length of fore wing: Ilaga population: (25) 26-28 mm.; Sinak-Mulia population: 23-26 mm.

Derivation of name. — 'Virgo', a noun in apposition, means 'virgin', and is given because of the very reduced black markings in comparison with *hapalina*.

Delias hemianops sp. n.
(pl. I, fig. 7; pl. II, fig. 7; map 7)

Type material : holotype ♂, Irian Jaya/Pegunungan Rintang/Abmisibil 2000m/R. Okbon/25.iv.1991/Henk van Mastrigt MZB; paratypes, same data as holotype, 25.vi.1991, 1 ♀. HM and 22-27.i.1992, 1♂; HM; Batimban, Okim 1900 m, ix.1987, 1 ♂, HM and 23.ix.1991. 1 ♂, HM; Puncak Lukon, 24.v.1991, 2 ♂, HM; Gn. Lukon 25.vii.1991. 1 ♀. HM.

This species is closely related to *Delias mariae walshae* Roepke, 1955, but is undoubtedly a good species. It differs from *D. mariae walshae* by the absence of the black submarginal spot on the underside of the hind wing. It differs from all other members of the *mariae*-subgroup by the absence of the basal spot on the underside of the hind wing.

Male : upperside of fore wing milky white with broad, black costal border, entering discal cell. Black border along termen much broader at apex than at tornus; with curved and slightly diffuse inner edge, without subapical or terminal spots. Upperside of hind wing milky white and translucent: pattern of underside visible from above. Narrow black border. Underside of fore wing nearly totally black with three orange subapical spots and sometimes one or two very small orange terminal spots. At least small part of cell 1A+2A white with some black diffusion, sometimes reaching till vein Cu_{1a} . Underside of hind wing black at innerside and orange with white veins at outside. Black border varying in width from less than 1 mm at $Sc+R_1$, to 4 mm at Cu_{1b} . Separation between black and orange is more or less straight to irregular, from middle of costal margin to tornus, cutting off under part of discal cell.

Female : at upperside both wings as in male with slightly broader black border; fore wing with four orange subapical spots, of which the two outer ones are very poor. Underside both wings as in male; only subapical and terminal spots on underside of fore wing some larger.

Length of fore wing: 26-28 mm.

Derivation of name : 'Hemianops', an adjective in apposition, is derived from the medical term 'hemianopsia', half blindness. This name characterises the composition of the hind wing underside, specific to this butterfly.

Delias langda sp. n.

This new species is closely related to *D. oktanglap* Mastrigt, 1990, with which it occurs together at Langda. It will be a link between *D. oktanglap* and *D. rileyi* Joicey & Talbot, 1922. Both sides of fore wing and the upperside of hind wing are similar to *D. oktanglap*. The hind wing underside, however, does not have a light submarginal band, has reduced yellow stripes and spots, and so closely resembles *D. rileyi*.

Two different subspecies are recognised within this new species. The first one occurs in the environment of Langda (140° E.); the second one occurs at the north-eastern side of the Baliem Valley (139° E.) and differs from the first one by two or three subapical tips on the up-

perside of fore wing and on underside of hind wing by largely white discal cell and very reduced black diffusion.

Delias langda langda subsp.n.
(pl. I, fig. 9; pl. II, fig. 9; map 9)

Type material : holotype ♂, Irian Jaya/Centr. Bergland 140° O/Langda Kerabuk/R. Teri/20.xi-10.xii.1991/Henk van Mastrigt, MZB; paratypes, same data as holotype, but 20.iv.1991, 1♂, ZMA; 26.iv.1991, 1♂, HM; 4.v.1991, 2♂, HM; 13.v.1991, 2♂, HM; 22.v.1991, 1♂, HM; 26.v.1991, 1♂, HM; 29.v.1991, 1♂, HM; 26.vi-1.vii.1991, 2♂, GG; 1♂, HM; 2-20.ix.1991, 4♂, HM; 2-17.xi.1991, 2♂, ZMA; 1-20.iii.1992; 1♂, ZMA and 31.iii.1992, 1♂, HM; Kerabuk, R. Teri & R. Minyo, 1-20.iv.1991, 1♂, HM; 2-11.ix.1991, 1♂, HM and 23.ix-5.x.1991, 1♂, HM; Kerabuk, R. Minyo, 1-10.ix.1991, 1♂, HM; Langda, iv.1992, 1♂, HM; Sumtamon, Dirik, R. Onyi, 3-24.ix.1991, 2♂, HM.

Male : upperside of fore wing white, with black border from 1.5 mm outside discal cell to tornus, inner edge not curved and slightly serrate. Very thin bar at top of discal cell. Upperside of hind wing white with black border from Sc+R₁ to Cu_{1b}, 3 mm wide in M₁ narrowing to both ends. Underside of fore wing 1/3 white in bottom, with black diffusion. Large black border is connected with nearly totally black discal cell and enclosing three yellow subapical spots and three or four yellow to white marginal spots — with thin white line to margin border. Veins between discal cell and border partly black. Underside of hind wing brown to dark brown. Costal border white with yellow basal streak. Inner part of hind wing brown with two small yellow spots. Discally three to four thin yellow streaks in underpart and yellow spot connected with white terminal border. Dark brown border with undulate edge at inner-side — visible because of darker brown colour than inner part — having a row of six thin linear yellow marks in line with the above mentioned yellow spot and marks. All these yellow spots are very poor, except the spot in cell M₁.
Length of fore wing: 26-29 mm.

Female : unknown.

Derivation of name : 'Langda', a noun in apposition, is the name of the main village, close to the creek where the holotype originates from.

Delias langda watlangku subsp. n.
(pl. I, fig. 8; pl. II, fig. 8; map 8)

Type material : holotype ♂, Irian Jaya/Centr. Bergland Pass Valley/R. Watlangku/24-28.ii.1992/Henk van Mastrigt, MZB; paratypes and same data as holotype, 13 ♂, HM and 11 ♂, ZMA; 31.i-1.ii.1992, 1 ♂, HM; 5-6.iv.1992, 2 ♂, HM and 6 ♂, MZB; 26-31.v.1992, 36 ♂, HM; Pass Valley, R. Biong, 28-30.i.1992, 4 ♂, HM and 6 ♂, ZMA; idem, 18-20.22.ii.1992, 6 ♂, HM; 4 ♂, ZMA; 1-3.iv.1992, 3 ♂, GG and 8 ♂, HM; 10-14.iv.1992, 30 ♂, HM; 22-25.v.1992, 22 ♂, HM; 6-7.vii.1992, 13 ♂, HM; 10.vii.1992, 10 ♂, HM; 13.vii.1992, 6 ♂, HM; 15.vii.1992, 10 ♂, HM; 16.vii.1992, 10 ♂, HM; 17.vii.1992, 6 ♂, HM; Pass Valley, R. Bik, 21.ii.1992, 2 ♂, HM; 2 ♂, ZMA; 2.iv.1992, 2 ♂, HM; 12-15.iv.1992, 2 ♂, GG; 11 ♂, HM and 2 ♂, MZB.

Male : upperside of fore wing as in *langda langda*; however, with two white subapical spots. Upperside of hindwing as in *langda langda*. Underside of fore wing without black diffusion. Between large LCD and black border large white spot with black veins. Veins in white part greyish black. Underside of hind wing as in *langda langda*.

Length of fore wing: 26-29 mm.

Female : unknown

Derivation of name : 'Watlangku', an noun in apposition, is the name of an area, north-east of the Baliem Valley, where the holotype originates from.

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TYPE MATERIAL *DELIAS* IN ARTICLES OF HENK VAN MASTRIGT

Abbreviations of collections:

- AS — Private collection of Atuhiro Sibatani, Kyoto, Japan
 BT — Private collection of Bernard Turlin, Andresy, France
 CT — Private collection of Collin Treadaway, Limbach, BRD
 DB — Private collection of Danny Burk, Mihawaka, U.S.A.
 DM — Private collection of David Mannering, Staplehurst, Kent, U.K.
 DR — Private collection of David Rushen, E. Sussex, U.K.
 ERII — Private collection II of Edward Reissingen, Keufbeursen, BRD.
 GG — Private collection of Fred Gerrits, Buderim, Australia
 HM — Private collection of Henk van Mastrigt, Jayapura, Indonesia.
 JP — Private collection of John G. Pasko, Thousands Oaks, California, USA
 KMNH — Kitakyushu Museum of Natural History, Kitakyushu, Japan
 KUCGE — Kyusu University, College of General Education, Fukuoka, Japan
 MGM — Private collection of M. G. Morris, Dorchester, U.K.
 ML — Private collection of Michael Lockwood, Houma, U.S.A.
 MZB — Museum Zoologicum Bogoriense, Bogor, Indonesia
 RG — Private collection of Robert Gotts, Sydney, Australia
 RMNH — National Natuurhistorisch Museum (Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands
 SM — Private collection of S. Morinaka, Saitama, Japan
 TN — Private collection of Takashi Nishizawa, Tokyo, Japan
 UF — University of Florida, College of Liberal Arts & Sciences, Gainesville, Florida, USA.
 ZMA — Instituut voor Taxonomische Zoologie (Zoologisch Museum), Amsterdam, The Netherlands

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Buderim, Australia — Wamena, Indonesia

NEW RESULTS ON *DELIAS* FROM THE CENTRAL MOUNTAIN
 RANGE OF IRIAN JAYA (LEPIDOPTERA: PIERIDAE)

Delias luctuosa gottsi subsp. n.

— Holotype ♂:

Irian Jaya/Centr. Bergland/ TEMBAGAPURA/ vii.1991/G. Gerrits',
 MZB;

— Paratypes (41/57 ♂, 2/3 ♀):

Tembagapura, 2300 m. Wagenon,	viii-ix.1990,	2 ♂, HM;
	i.1989-ix.1990,	1 ♂, HM;
Tembagapura, 1980,		1 ♂, GG;
		1 ♂, RG;
	xii.1990,	1 ♂, GG;
		2 ♂, RG;
		2 ♂, RG;
	ii.1991,	1 ♂, GG;
		1 ♂, RG;
	vii.1991,	1 ♂, RG;
	ix.1991,	1 ♂, ZMA;
	3.x.1991,	2 ♂, GG;
	5.x.1991,	1 ♂, GG;
	x.1991,	1 ♂, GG;
	ix-x.1991,	1 ♂, HM;
	1991,	1 ♂, HM;
	2000-2500 m. viii-ix.1991	2 ♂, GG;
Tembagapura, R. Waa, v. 1991,		1 ♂, GG;
	7000 ft. vii.1991,	1 ♂, GG;
	8.viii.1991,	1 ♂, DM;
	2000 m, 19.xii.1991,	1 ♂, BT*;
	2000-2100 m, 11.xii.1991,	1 ♂, GG;
	2100 m, 25.xi.1991,	1 ♂, GG;
	11.xii.1991,	2 ♂, HM;
	ii.1992,	1 ♂, BT*;
	2.ii.1992,	1 ♂, BT*;
	19.ii.1992,	1 ♂, BT*;
	3.iii.1992,	1 ♂, BT*;
	8.iii.1992,	2 ♂, HM;
	15.iii.1992,	2 ♂, HM;
	11.v.1992,	2 ♂, GG;
	8.vi.1992,	1 ♂, HM;
	19.vi.1992,	1 ♂, HM;

2300 m 8.1.1992,	2 ♂, BT;*
8000 ft, 8.iv.1991,	1 ♂, ML;
7000 ft, 9.vi.1991,	1 ♂, ML;
Tembagapura, R. Aghawagong, 2100-2400 m, 4.xii.1991,	1 ♂, GG;
Tembagapura, R. Kawiki, 2200 m, 8.iii.1992,	1 ♂, HM;
2400 m, 2.v.1992,	1 ♂, GG;
16.xii.1991,	1 ♂, BT;*
Tembagapura, 8000-8200 ft, i.1992,	1 ♂, HM;
2000 m 3.ii.1992,	1 ♂, BT;

Delias callista callipulchra Subsp. n.

— Holotype ♂ : Irian Jaya/Tembagapura/xii.1990/Henk van Maastricht, MZB.

— Paratypes (28/37 ♂, 3/6 ♀):

Tembagapura, 17.xi.1979,	2 ♂, HM;
18.ix.1979,	1 ♂, HM;
1982,	1 ♂, RG;
ii.1991,	1 ♂, RG;
17.iii.1991,	1 ♂, RG;
vi.1991,	1 ♂, RG;
vii.1991,	1 ♂, RG;
29.viii.1991,	1 ♂, GG;
viii.1991,	1 ♂, GG;
ix.1991,	1 ♂, RG;
x.1991,	1 ♂, GG;
19.xii.1991,	1 ♂, RG;
1991,	1 ♂, RG;
6000 ft, 27.i.1991,	1 ♂, GG;
2000 m, 10.iv.1991,	2 ♂, BT;*
28.xii.1991,	1 ♂, JP;*
2000-25000 m, viii-ix.1991,	1 ♂, GG;
2100 m, 14.xi.1991,	1 ♂, GG;
1850 m, R. Waa, 10.ii.1991,	1 ♂, HM;
7000 ft, vii.1991,	1 ♂, GG;
2100 m, 17.xii.1991,	1 ♂, HM;
5.i.1992,	1 ♂, GG;
14.i.1992,	1 ♂, BT;*
26.iii.1992,	1 ♂, GG;
6.iv.1992,	1 ♂, GG;
2300 m, 23.xii.1991,	1 ♂, HM;

1850 m, 1.iv.1992,	1 ♂, HM;
23.vi.1992,	1 ♂, HM;
headwaters of Kawiki,	
2200 m, 1.iii.1992,	2 ♂, HM;
2400 m, 10.iv.1991,	1 ♂, BT;*
Zagam Tunnel, 2400 m,	
21.iii.1992,	1 ♂, HM;
??	6 ♂, DB;*
??	1 ♂, DB;*

Delias neeltje sp. n.

— Holotype ♂ : Irian Jaya/Centr. Bergland/Mulia R. Jambi/x.1991/G. Gerrits, MZB;

— Paratypes (17 ♂):

Kembruk-Sinak, R. Jambi,	vi.1990,	2 ♂, GG;
		1 ♂, DM;
	ix.1990,	1 ♂, GG;
Mulia, R. Jambi,	x.1991,	2 ♂, GG;
Sinak,	vi.1991,	1 ♂, HM;
Kembruk-Sinak,	ii.1991,	2 ♂, GG;
	xi-xii.1990,	1 ♂, DB;
Mulia-Ilu,	vii.1991,	2 ♂, HM;
	1991,	1 ♂, GG;
		1 ♂, GG;
		1 ♂, ZMA;
Ilu,	ix.1991,	1 ♂, HM;
	vi.1992,	1 ♂, HM;

Delias phippsi mulia subsp. n.

— Holotype ♂ : Irian Jaya/Centr. Bergland/Mulia x.1991/G. Gerrits, MZB;

— Paratypes (105 ♂) :

Mulia-Sinak,	vi-vii.1989,	1 ♂, GG;
	vii.1990,	1 ♂, DM;
		9 ♂, GG;
		5 ♂, HM;
	ix.1990,	1 ♂, GG;
	x-xi.1990,	2 ♂, DB;
		1 ♂, DM;
		17 ♂, GG;
		6 ♂, HM;

	1990,	1 ♂, DM;
	ii.1991,	1 ♂, GG;
Mulia-Ilu	v.1991,	8 ♂, HM;
	vii.1991,	3 ♂, DB;
		20 ♂, GG;
		2 ♂, RG;
Mulia, R. Jambi,	6.ix.1991,	8 ♂, GG;
		1 ♂, HM;
Mulia,	x.1991,	13 ♂, GG;
		5 ♂, HM.

Delias pseudomarguerita sp. n.

— Holotype ♂ : Irian Jaya/Centr. Bergland/Homeyo Bilai/Zamandonga/R. Baylabu/3.v.1991/G. Gerrits, MZB;

— Paratypes (12 ♂) :

Homeyo Bilai; Zamandonga R. Baylabu	3.v.1991,	3 ♂, GG;
		3 ♂, HM;
	24.v.1991,	5 ♂, GG;
		1 ♂, ZMA;

Delias virgo sp. n.

— Holotype ♂ Irian Jaya/Centr. Bergland/Iraga R. Jila/20.vii.1988/Henk van Mastriht, MZB;

— Paratypes (101 ♂) :

Iraga R. Jila	20.vii.1988,	1 ♂, HM;
	22.v.1988,	5 ♂, HM;
	9.iv.1989,	4 ♂, HM;
		2 ♂, ZMA;
	x.1990,	1 , HM;
	2.v.1990,	2 , GG;
	4.v.1990,	1 , HM;
	7.vi.1991,	2 , HM;
	15-20.ix.1990,	5 , HM;
	18.iv.1991,	1 , ZMA;
		1 , HM;
Iraga,	10.viii.1988,	4 , HM;
	1988,	1 , GG;
	27.viii.1988,	4 , ZMA;
Iraga, R. Wuluen,	17.xi.1990,	2 , HM;
Sinak-Mulia,	vi-vii.1989,	2 , GG;
	x-xi.1990,	12 , HM;
		2 , ZMA;

Mulia,	ii.1991,	1 *	HM;
Mulia, R. Jambi,	6.ix.1991,	12	GG;
Mulia-Ilu,	x-xi.1990,	4	GG;
	vii.1991,	5	GG;
	x.1991,	20	GG;
		3	DM;
		2	DB;
Beoga,	xii.1989,	2	GG;

Delias hemianops sp. n.

— Holotype ♂ : Irian Jaya/Pegunungan Bintang/Abmisibil 2000 m/R. Okbon/25.iv.1991/Henk van Mastrigt MZB.

— Paratypes (5 ♂, 2 ♀) :

Abmisibil 2000 m, R. Okbon	25.vi.1991,	1	HM;
	22-27.i.1992,	1	HM;
Batimban, Okkim 1900 m,	ix.1987,	1	HM;
	23.ix.1991,	1	HM;
Puncak Lukon,	24.v.1991,	2	HM;
Gn. Lukon	25.vii.1991,	1	HM.

Delias langda langda sp. n.

— Holotype ♂ : Irian Jaya/Centr. Bergland 140° O/Langda Kerabuk/R. Teri/20.xi-10.xii.1991/Henk van Mastrigt, MZB.

— Paratypes (27 ♂) :

Langda Kerabuk, R. Teri,	20.iv.1991,	1	ZMA;
	26.iv.1991,	1	HM;
	4.v.1991,	2	HM;
	13.v.1991,	2	HM;
	22.v.1991,	1	HM;
	26.v.1991,	1	HM;
	29.v.1991,	1	HM;
	26.vi-1.vii.1991,	2	GG;
		1	HM;
	2-20.ix.1991,	4 ♂	HM;
	2-17.xi.1991,	2 ♂	ZMA;
	1-20,iii,1992,	1 ♂	ZMA;
	31.iii.1992,	1 ♂	HM;
Kerabuk, R. Teri & R. Minyo,	1-20.iv.1991,	1 ♂	HM;
	2-11.ix.1991,	1 ♂	HM;
	23.ix-5.x.1991,	1 ♂	HM;
Kerabuk, R. Minyo,	1-10.ix.1991,	1 ♂	HM;
Langda,	iv.1992,	1 ♂	HM;
Sumtamon, Dirik, R. Onyi,	3-24.ix.1991,	2 ♂	HM.

Delias langda watlangku subsp. n.

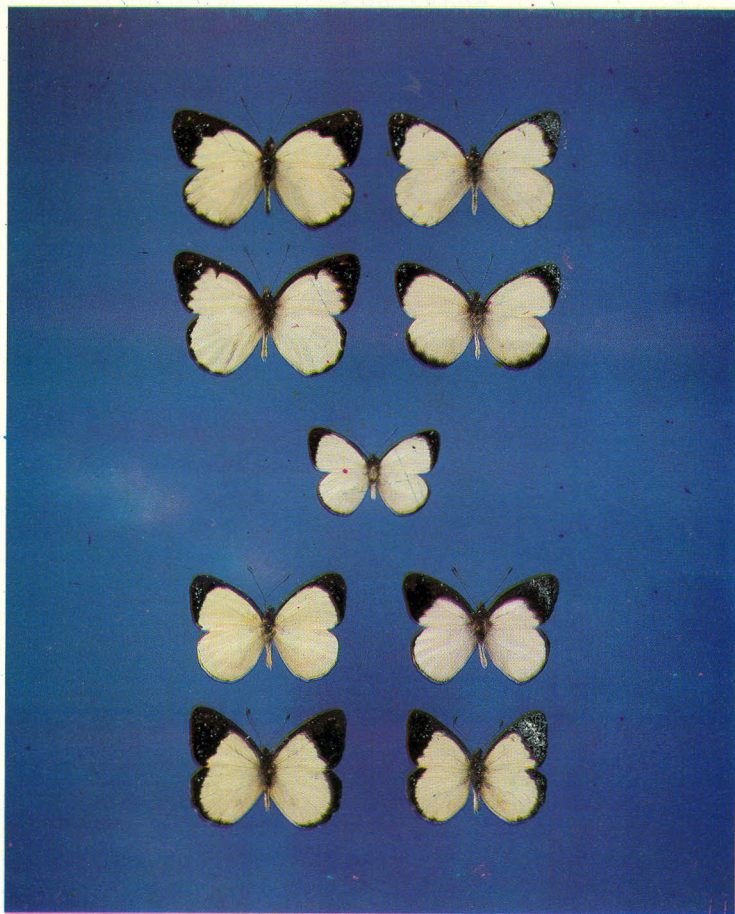
— Holotype ♂: Irian Jaya/Centr. Bergland/Pass Valley/R. Watlangku/
24-28.ii.1992/Henk van Mastrigt, MZB.

— Paratypes (153/228 ♂) :

Pass Valley, R. Watlangku,	24-28.ii.1992,	13 ♂, HM;
		11 ♂, ZMA;
	31.i-1.ii.1992,	1 ♂, HM;
	5-6.iv.1992,	2 ♂, HM;
		6 ♂, MZB;
	26-31.v.1992,	36 ♂, HM;
R. Biong,	28-30.i.1992,	4 ♂, HM;
		6 ♂, ZMA;
	18-20.22.ii.1992,	6 ♂, HM;
		4 ♂, ZMA;
	1-3.iv.1992,	3 ♂, GG;
		5 ♂, HM;
		3 ♂, HM;*
	10-14.iv.1992,	13 ♂, HM;
		17 ♂, HM;*
	22-25.v.1992,	22 ♂, HM;
	6-7.vii.1992,	13 ♂, HM;*
	10.vii.1992,	10 ♂, HM;*
	13.vii.1992,	6 ♂, HM;*
	15.vii.1992,	10 ♂, HM;*
	16.vii.1992,	10 ♂, HM;*
	17.vii.1992,	6 ♂, HM;*
R. Bik,	21.ii.1992,	2 ♂, HM;
		2 ♂, ZMA;
	2.iv.1992,	2 ♂, HM;
	12-15.iv.1992,	2 ♂, GG;
		11 ♂, HM;
		2 ♂, MZB.



pl. I, figs. 1-9. New species of the genus *Delias*: uppersides of ♂ holotypes. 1, *D. luctusa gottsi*; 2, *D. callisat callipulchra*; 3, *D. neeltje*; 4, *D. phippsi mulia*; 5, *D. pseudomarguerita*; 6, *D. virgo*; 7, *D. hemianops*; 8, *D. langda wat langku*; 9, *D. langda l angda*.



pl. II, figs. 10-18. New species of the genus *Delias*: undersides of ♂ holotypes. 10, *D. luctuosa gottsi*; 11, *D. callista callipulchrā*; 12, *D. neeltje*; 13, *D. phippii mulia*; 14, *D. pseudomarguerita*; 15, *D. virgo*; 16, *D. hemianops*; 17, *D. langda wat langku*; 18, *D. langda langda*.