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## A NEW SPECIES OF *DELIAS* (LEPIDOPTERA: PIERIDAE) FROM NEW IRELAND ISLAND, BISMARCK ISLANDS, PAPUA NEW GUINEA

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**ABSTRACT:** A new *Delias* in the *Isse* Group is comparatively described from New Ireland, in the Bismarck Islands.

**Key Words:** *Delias laknekei*, *D. lytaea*, *Isse* Group

### Introduction

Since its description almost two centuries ago, the genus *Delias* Hübner 1819 has had many species attributed to it, especially from 1885 to about the 1930's, a time that may be characterized as the "Golden Age of *Delias* description". Talbot (1928-1937), in his definitive study of the genus, attributed 154 species to *Delias*, a number that Parsons (1999: 296-299) raised to about 165. Braby and Pierce (2007) recently reported on the systematics, biogeography and diversity of *Delias*, indicating that the genus is monotypic with eight major lineages and a suggested origin in the Australian Region.

There have not been many species added to the list of *Delias* species in the ensuing years, but that number keeps increasing, albeit at a lesser rate at present. Still, finding a new species of *Delias*, while not as common as it once was, remains a noteworthy event and we were pleasantly surprised to recently obtain specimens of just such an animal from the island of New Ireland, Bismarck Archipelago, Papua New Guinea. Attempts to identify this insect were fruitless, and accordingly we are reporting on it at this time. Many *Delias* in the Australian Region are plain white above, with or without charcoal-gray to black markings costally, around the apex of the forewing and variably down the

margin of the wing as well as on the hindwing. The under surface of the wings are more characteristic with the dark markings of the upper surface usually elaborated upon and encompassing paler spots subapically on the forewing and submarginally on the hindwing. The disc of the hindwing is frequently some shade of orange to yellow, shades often partially duplicated on the disc of the forewing. Such is the case with the butterfly described herein.

*Delias laknekei* L. Miller, Simon & Wills, n. sp.

Figures 1, 2, 5 (♂ genitalia)

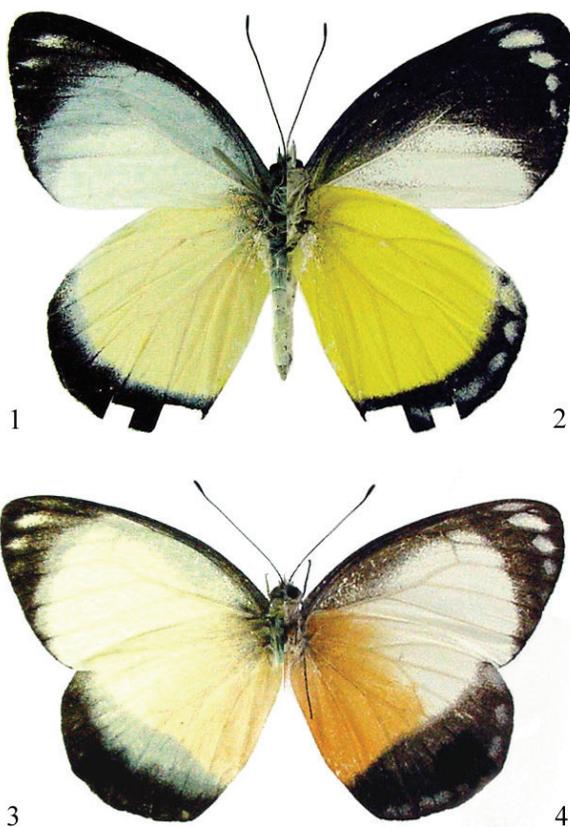
Diagnosis: Similar only to *D. laknekei* is *D. lytaea* Godman and Salvin 1878 (Figs. 3, 4, ♂), 6 (♂ genitalia)) also from the Bismarck Group with an outlying population from New Georgia in the Solomon Islands. The two sister species are perhaps sympatric, certainly at least parapatric on New Ireland, and *laknekei* is thus far unrecorded elsewhere in the Bismarcks. *Delias laknekei* and *D. lytaea* are the only species known to date that have the forewing subapical and hindwing submarginal spots white or gray with none colored otherwise.

Upper surface of both species similar, but *laknekei* has the charcoal-gray forewing apical area better defined and with white subapical spots more prominent. Under surface of wings much different in the two species: forewing of *laknekei* much darker with costa and apex entirely blackened to  $Cu_1$  (nomenclature of wing veins and cells follows Miller, 1970; the cubital veins are commonly denoted  $CuA_1$  and  $CuA_2$ , but the two nomenclatures are otherwise synonymous) and margin broadly darkened to tornus; subapical pale spots smaller but more clearly defined in *laknekei*. Forewing cell totally blackened in *laknekei*, in *lytaea* only anterior part of cell blackened. Hindwing beneath entirely yellowed basad of narrow (2-3 mm) dark margin in *laknekei*; margin with five relatively large submarginal gray-white spots; in *lytaea* area basad of dark margin two-toned, area from mid-cell anteriorly white, area posteriorly of mid-cell yellow slightly shaded with orange; dark margin much broader, bulged in middle to point where it touches the cell end; gray-white submarginal spots slightly better defined and more prominent in *laknekei*; sizes of both species comparable.

*Description: Male.* Head with sparse charcoal gray vestiture, that of thorax and abdomen uniformly pale gray; eyes dark brown; palpi gray; antenna blackish brown, club unicolorous; legs slightly darker than thorax.

Forewing upper surface chalky white; costa black throughout, but overscaled with white at base; black apex encompassing more than half space between cell end and apex, strongly black, but irrorated with white basad and bearing three subapical white dashes in spaces  $Rs-M_1$  to  $M_2-M_3$ , the former being much the more extensive; marginal black band tapering sharply to above 2A; tornus concolorous with ground color; fringes uniformly black. Hindwing upper surface chalky white with a moderate (4 mm) black to charcoal marginal band from  $Sc+Rs$  to tornus; otherwise unmarked; fringes uniformly black. Forewing under surface whitish from inner margin to near cell;  $Cu_2$  slightly darkened charcoal-gray toward middle; costa, margin and all of discal cell strongly darkened, bases of all cells anteriorly of  $Cu_1$  completely black to charcoal; inner edge of marginal patch dentate; five enclosed white subapical dashes from  $R_5$  to  $M_3-Cu_1$  of which one in  $Rs-M_1$  is longest; fringes uniformly black. Hindwing under surface uniformly bright chrome yellow, unmarked save for moderate (4 mm) black marginal

band from Rs to tornus enclosing six white intracellular dashes, the anteriormost of which is largest and the more posterior of which are slightly overscaled with charcoal; fringes uniformly black. Length of forewing 30-32 mm (holotype male 31 mm).



Figures 1-4: *Delias* species. 1, 2: *D. laknekei*, new species, Holotype male, upper (1) and under (2) surfaces: [PAPUA NEW GUINEA: NEW IRELAND PROVINCE]: New Ireland [Island]: Lelet Plateau, 1000 m.; xii.2005 (Lakneke). 3, 4: *D. lytaea* (Godman and Salvin), male upper (3) and under (4) surfaces: no locality, [Bismarck Islands].

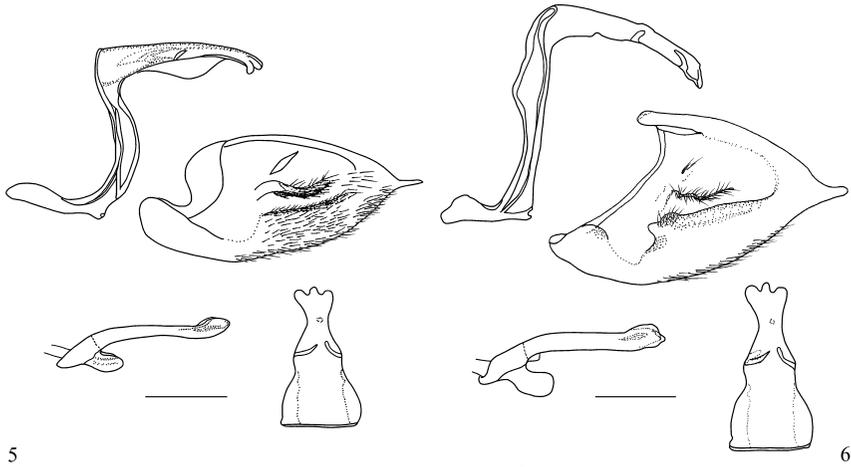
Male genitalia of the two species comparable, those of *laknekei* illustrated in Fig. 5, those of *lytaea* in Fig. 6. Uncus of both species trilobate, that of *lytaea* somewhat narrower and more elongated than that of *laknekei*; valva of *laknekei* broader and more ornamented internally on the cuiller, also with a blunter terminal spine; saccus of *laknekei* longer and narrower than in *lytaea*; penis of *laknekei* longer and thinner than that of *lytaea*.

*Female.* Unknown.

Described from three males from New Ireland Island, Papua New Guinea. *Holotype male*: [PAPUA NEW GUINEA]: NEW IRELAND [PROVINCE]: Lelet Plateau, 1000 m; xii.2005 (Lakneke); male genitalia prep. M-7912 (Jacqueline Y. Miller). *Paratypes*: two males, same data as holotype.

*Disposition of types*: Holotype male deposited in collection of McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, Florida, USA; one male paratype each in private collections of M. J. Simon and L. Wills.

*Etymology*: This species is named for the indigenous collector of the type series, M. Lakneke.



Figs. 5-6: *Delias* male genitalia. 5, *D. laknekei*, Holotype male, male genitalia dissection M-7812 (Jacqueline Y. Miller). 6, *D. lytaea* male, male genitalia dissection M-7913 (Jacqueline Y. Miller); data as in figures 1-4. Line = 1 mm.

*Discussion*: The only complete taxonomic revision of *Delias* was that of G. Talbot (1928-1937), which included all of the then known taxa occurring from India and China to Australia and the outlying islands. That author recognized six species in his Group 19 (the "Isse Group") comprised of orange- to yellow-disced ventral hindwing species (Talbot 1937: 431-433) in which *D. laknekei* is included. They are distributed from the Moluccas and the Bismarcks to Australia, well within the range of *laknekei*.

The sister-species of *D. laknekei* is *D. lytaea*, also from the Bismarcks, that is well illustrated by Talbot (1937 [1928-1937]: pl. 61, figs. 6, 7), D'Abrera (1977: 150, top two illustrations), Parsons 1999: pl. 34, fig. 853) and Tennant (2002: pl. 40, figs. 1-3; the New Georgia subspecies). It is of some interest that during several years of collecting on New Ireland neither Messrs. Wills nor Lakneke has collected *D. lytaea* to date.

Inasmuch as all *Delias* feed as larvae upon Loranthaceae and derive substantial protection by sequestering noxious compounds from them, it is postulated that these species form Müllerian mimicry complexes and also serve as Batesian models for other less protected species, often pierids, such as members of *Cepora* Billberg 1820 (Parsons 1999). There would seem to be an advantage to the pairing of *D. laknekei* and *lytaea* in a

Müllerian mimicry regime, and these two species may well serve as the models for *Cepora perimale quadricolor* (Godman and Salvin 1877), but even here, the resemblance is not prepossessing.

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