New subspecies of *Delias* HÜBNER, 1819 (Lepidoptera: Pieridae) from Irian Jaya (Indonesia)

Vasili K. TUZOV and Sergei V. CHURKIN

Dr. Vasili K. TUZOV, Novocheremushkinskaya str. 51-2-45, RUS-117418 Moscow, Russia
Dr. Sergei V. CHURKIN, Yubileinyi prosp. 14-168, RUS-143952 Reutov, Moscow reg., Russia

Abstract: *Delias rileyi extremus* ssp. nov. and *Delias mira mavrodii* ssp. nov. (locus typicus of both subspecies: Balim valley, Watlangu) from the highlands of Irian Jaya (Indonesia) are described. Both holotypes (♂♂) are deposited in Darwin State Museum (Moscow).

Neue Unterarten von *Delias* HÜBNER, 1819 (Lepidoptera: Pieridae) aus Irian Jaya (Indonesien)

Zusammenfassung: *Delias rileyi extremus* ssp. nov. und *Delias mira mavrodii* ssp. nov. (locus typicus beider Subspecies: Balim-Tal, Watlangu) werden aus den Hochländern von Irian Jaya (Indonesien) beschrieben. Beide Holotypen (♂♂) werden im Darwin State Museum (Moskau) deponiert.

Introduction

Irian Jaya or West Irian – the Indonesian part of the island of New Guinea – is one of the few regions of the world where the Rhopalocera fauna has been studied only fragmentary thus far. In view of this, a group of explorers (I. PLYUSHCH, I. CHERNYAK, V. TUZOV, S. CHURKIN, and D. SINETSKY) ventured two expeditions to Irian Jaya in 1994 and 1995 collecting the material which forms the basis for the present work.

In the course of the first expedition in January-February 1994 the following areas were visited: outskirts of Sorong in the range of 50 km; Manokwari District (Arfak Mountains, including several villages and Anggi Lakes); the Balim Valley (mostly the north-eastern mountain slopes); outskirts of Sentani and Jayapura.

In January-February 1995 a wider area was covered adding Biak Island, Asmat territories from Senggo to Agats along Wildeman, Siretsj and Betsj Rivers, as well as Habbema Lake in the highlands (3300 m) and its near surroundings. Here some excursions to even higher elevations (up to 3800 m) were undertaken. Also many localities around the Balim Valley were visited and explored.

The vast material collected during both expeditions comprises approximately 300 species including some new taxa. The holotypes of the new taxa will be donated to the Darwin State Museum (Moscow), the paratypes are in the collections of the Zoological Museum of the Zoological Institute (St. Petersburg), the Natural History Museum, London, and in the private collections of V. P. MAVRODI and of participants of the expeditions.

Acknowledgments

The authors extend their sincere gratitude to V. P. MAVRODI for his financial and moral support. They also thank I. PLYUSHCH and I. CHERNYAK for assistance in te field work and D. PANTELEEV who provided his material for study. We appreciate the contribution to this work made by our colleague V. PLETNEV who has taken photographs of new species and subspecies. Special thanks to A. SIBATANI who provided his scientific publications and references.

Abbreviations

TL	type locality
BMNH	The Natural History Museum, London (formerly British Museum (Natural History))
DSM	Darwin State Museum (Moscow)
ZMZI	Zoological Museum of the Zoological Institute (Sankt-Petersburg)
MSU	Moscow State University

Systematic part

The island of New Guinea represents a centre of speciation of the genus *Delias* HÜBNER, 1819 which is widely distributed in South-East Asia. Almost two thirds of the 220 species known of this genus inhabit New Guinea and adjacent islands. In recent years a number of publications was published devoted to New Guinean *Delias* (MASTRIGT 1989, 1990; MORINAKA et al. 1991, 1993, ORR & SIBATANI 1985, 1986, PARSONS 1989, SCHMITT 1992 a, 1992 b, SCHRÖDER & TREADAWAY 1982). A detailed monograph by YAGASHITA et al. was published in 1993. Nevertheless this genus is still insufficiently known, especially for some of the highland species. Such little known species groups comprise those of *Delias rileyi* and *Delias mira*. The first group contains 2 species: *D. hikarui* YAGASHITA, 1993 and *D. rileyi*

Joicey & Talbot, 1922. The investigations carried out by A. Sibatani and other authors (Sibatani 1988, Sibatani & Nishizawa 1982, Mastrigt & Sibatani 1991) helped to establish that the nominotypical subspecies of *D. rileyi* is found in the Weyland Mountains (TL: Menoo Valley). *D. rileyi yofona* Schröder & Treadaway, 1982 was described from the area further to the East (TL: Wissel Lake). *D. rileyi nishizawai* Mastrigt & Sibatani, 1991 is found in the Ilaga range (TL: Ilaga, River Namunggun). Our specimens of *Delias rileyi* from the Pass Valley (to the east of the Balim Valley) differ clearly from other subspecies and are described below.

Delias rileyi extremus ssp. nov. (Figs. 1, 2)

Holotype: ♂; Indonesia, Irian Jaya, Balim valley, Seg river, Watlanggu, 1800 m, 7.-10. I. 1995. The holotype will be donated to the Darwin State Museum (Moscow).

Paratypes: 2 ♂♂, same data, coll. V. Tuzov; 2 ♂♂, same data, coll. V. Mavrodi; 3 ♂♂, same data, coll. S. Churkin; 2 ♂♂, same data, coll. I. Plyushch; 2 ♂♂, same data, coll. I. Chernyak; 1 ♂, same data, ZMZI, 1 ♂, same data, BMNH.

Description and diagnosis

Male. Length of forewing 28-30 mm (holotype 29 mm). Upperside of the forewings as in nominotypical subspecies. Upperside of the hindwings with broad black border (as in ssp. *nishizawai*). Underside of the forewings is darker than in other subspecies, particularly in the discal cell which is almost entirely dark. Underside of the hindwings is also darker because the white area near the costa is much reduced. Small yellow spots and strokes are well developed.

The figures of genitalia are not given since they do not provide differences useful for determination.

Female unknown.

Etymology. Extremus – Latin source of "extreme". This reflects the extreme location of the population and the darkest colour variation.

Habitat. The type series of males was collected along a river at the altitude of 1800 m (Fig. 5).

Comments. The populations of the various regions appear to form a cline.

The group of *Delias mira* includes a number of little known taxa with great internal variations. According to YAGASHITA et al. (1993) the following taxa are currently included in this group: *D. catocausta catocausta* JORDAN, 1911 (TL: Goliath Mt.) (= *nigerrima* ROEPKE, 1955), *D. catocausta eefi* MASTRIGT, 1990 (separate sp.?) (TL: Star Mts.), *D. inexpectata* ROTHSCHILD, 1915 (TL: Snow Mts.), *D. mira mira* ROTHSCHILD, 1904 (TL: Owgarra, P.N.G.), *D. mira reversa* ROTHSCHILD, 1925 (TL: Rawlinson Mts., P.N.G.), *D. mira excelsa* JORDAN, 1930 (TL: Herzog Mts., P.N.G.) (= *roepkei* SANFORD & BENNET, 1955), *D. mira autumnalis* ROEPKE, 1955 (separate sp.?) (TL: Wilhelmina Mt.), *D. mira hiemalis* ROEPKE, 1955 (TL: Charles Louis Mts.), *D. klossi klossi* ROTHSCHILD, 1915 (TL: Snow Mts.), *D. klossi chrysanthemum* ROEPKE, 1955 (TL: Wilhelmina Mt.), and *D. nakanokeikoae* YAGASHITA, 1993 (TL: Central Mts.).

The taxonomic status of the subspecies of *Delias mira* is not clear. Subspecies *autumnalis* and *hiemalis* originating from Irian Jaya are very similar in appearance. All subspecies from Papua New Guinea very closely resemble each other. Thus far intermediate taxa were unknown. We have collected *D. mira autumnalis* in the mountains to the west of Balim Valley. In the mountains to the east of Balim Valley we found specimens with characters transitional to the group of *mira-reversa-exelsa*. The description of this new subspecies is given below.

Delias mira mavrodii ssp. nov. (Figs. 3, 4)

Holotype: ♂, Indonesia, Irian Jaya, Balim valley, Seg river, Watlanggu, 1800 m, 19. I. 1995. The holotype will be donated to Darwin State Museum (Moscow).

Paratype: 1 ♂, same data, coll. V. TUZOV.

Description and diagnosis

Male. Length of the forewings 24–25 mm (holotype 25 mm). Upperside of the forewings with a broad black border extending to $^2/_3$ of the wing. It is wider than that of the nominotypical subspecies and like that of ssp. *excelsa*. White apical spot is not well distinct. The black border on the upperside of the hindwings is similar to that of the other subspecies. Underside of the forewings with white triangular area joined to the anal edge. The apical spots and basal stroke are yellow (the respective marks of subspecies *autumnalis* and *hiemnalis* are red). The ground colour of the underside hindwing is brown with whitish veins. The anal area is white

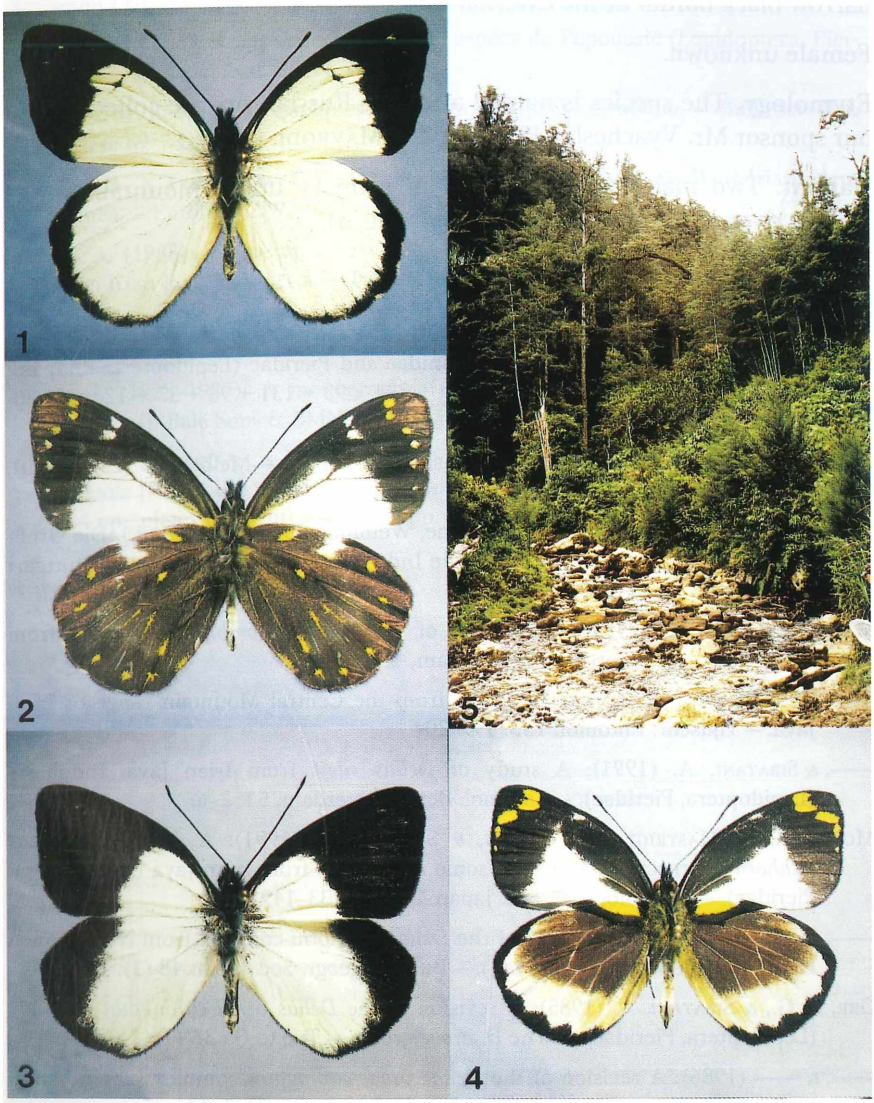

Fig. 1: *Delias rileyi extremus* ssp. nov., holotype ♂ (upperside). **Fig. 2:** *Delias rileyi extremus* ssp. nov., paratype ♂ (underside). **Fig. 3:** *Delias mira mavrodii* ssp. nov., holotype ♂ (upperside). **Fig. 4:** *Delias mira mavrodii* ssp. nov., paratype ♂ (underside). **Fig. 5:** Mid mountain forest (Balim valley, Seg river) — habitat of *Delias mira mavrodii* ssp. nov. and *Delias rileyi extremus* ssp. nov.

with yellow suffusion and extends to the vein M1. Marginal area with narrow black border at the external side.

Female unknown.

Etymology. The species is named after the Russian private collector and our sponsor Mr. Vyacheslav Panteleevich MAVRODI.

Habitat. Two males were collected in primary upper mountain forest along a river at the elevation of 1800 m (fig. 5).

References

BRIDGES, C. A. (1988): Catalogue of Papilionidae and Pieridae (Lepidoptera: Rhopalocera). – Urbana (Ill.) (the author), VII + 324 + 93 + 131 + 98 + 37 + 12 pp. + appendices [pages not numbered consecutively].

D'ABRERA, B. (1971): Butterflies of the Australian Region. – Melbourne (Lansdown), 415 pp.

FRUHSTORFER, H. (1910): 2. Familie: Pieridae, Weißlinge. *In:* SEITZ, A. (ed.), Die Großschmetterlinge der Erde. 9. Band, Die Indo-Australischen Tagfalter. – Stuttgart (A. Kernen), pp. 119-190 + pls.

MASTRIGT, H. J. G. VAN (1989): Taxonomy of the *Delias mesomblema* subgroup from Irian Jaya. – Entomol. Ber., Amsterdam, **49** (1): 8-14.

—— (1990): New (sub-)species of *Delias* from the Central Mountain range of Irian Jaya. – Tijdschr. Entomol. **133**: 197-204.

——, & SIBATANI, A. (1991): A study of *Delias rileyi* from Irian Jaya, Indonesia (Lepidoptera, Pieridae). – Entomol. Ber., Amsterdam, **51**: 2-6.

MORINAKA, S., MASTRIGT, H. J. G. VAN, & SIBATANI, A. (1991): A rewiew of *Delias eichhorni* ROTHSCHILD, 1904 and some of its allies from Irian Jaya (Lepidoptera, Pieridae). – Bull. Biogeogr. Soc. Japan **46** (16): 133-149.

——, ——, & —— (1993): A study of the *Delias eichhorni*-complex from New Guinea Island (Lepidoptera, Pieridae) (1). – Bull. Biogeogr. Soc. Japan **48** (1): 17-26.

ORR, A. G., & SIBATANI, A. (1985): A revision of the *Delias aroae-cuningpuri* complex (Lepidoptera, Pieridae). 1. The *D. aroae* group. – Tyô to Ga **36** (1): 1-25.

——, & —— (1986): A revision of the *Delias aroae-cuningpuri* complex (Lepidoptera, Pieridae). 2. The *D. cuningpuri* group. – Tyô to Ga **37** (1): 1-14.

PARSONS, M. (1989): A new *Delias* subspecies, a new *Sabera*, and a new *Parantica* from Papua New Guinea (Lep.: Pier., Hesp., Nymph.). – Bishop Museum Occas. Pap., **29**: 193-198.

—— (1991): Butterflies of the Bulolo-Wau valley. – Honolulu (Hawaii) (Bishop Museum Pr.), 280 pp.

SCHMITT, O. (1992 a): *Delias dolleyae* nouvelle espèce de Papouasie (Lepidoptera, Pieridae). – Bull. Sci. Nat. 75/76: 68.

—— (1992 b): Révision de quelques *Delias* du groupe V: *geraldina*. – Bull. Sci. Nat. 75/76: 69-73.

SCHRÖDER, H., & TREADAWAY, C. G. (1982): Neue *Delias*-Formen aus West-Irian, Neuguinea. – Entomol. Z. 92: 334-338.

SIBATANI, A. (1988): A note on *Delias rileyi* JOICEY et TALBOT (Lepidoptera, Pieridae) from Irian Jaya, Indonesia. – Tyô to Ga 39 (1): 81-82.

——, & NISHIZAWA, T. (1982): *Delias rileyi* JOICEY et TALBOT, a little known pierid from Irian Jaya. – Tyô to Ga 32 (3/4): 179-181.

TALBOT, G. (1928-1937): A monograph of the Pierine genus *Delias*. Parts 1-6. – London (J. Bale Sons & BMNH), v + 656 pp., 16 col. pls., 55 b&w pls.

YAGASHITA, A, NAKANO, S., & MORITA, S. (1993): An illustrated list of the genus *Delias* HUBNER [sic] of the world (ed. Y. NISHIYAMA). – Tokyo (Khepera), text vol. xv + 384 pp., plates vol. [XIII] + 409 + VI pp.

Received: 5. x. 1996