

Catopyrops ancyra almora, a Lycaenid Butterfly New to Taiwan: a Case of Biological Invasion from the Philippines

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ABSTRACT

Catopyrops, a genus of Lycaenidae previously unrecorded to Taiwan, was found from Lanyu, an island southeast of Taiwan. The collected samples, identified as *C. ancyra almora*, presumably invaded from the Philippines by natural pathways. This species might have established successfully because samples were being obtained four years after its discovery at Lanyu. Possible larval hosts include *Pipturus arborescens* (Urticaceae), *Caesalpinia* species (Fabaceae) and *Glochidion* species (Euphorbiaceae), thus this butterfly has the potential to invade the main island of Taiwan and the other islands along the eastern coast of Taiwan.

Key words: Polyommataini, Lanyu, stray species, invasive, new record

Introduction

Catopyrops is a small Polyommataini genus, consisting of six species, distributed from Assam through southeastern Asia to the southern Pacific Ocean (Seki *et al.* 1992; Eliot, 1992). Taxonomically this genus is closely allied to *Nacaduba*, a species-rich genus in southern Asia, the south Pacific, and Australia (Tite, 1963); however, the joint of the radius vein (Rs) of the hindwing to the first median vein (M1) is much more proximal in *Catopyrops* than in *Nacaduba*. Morphology of male genitalia and androconia of the two genera also differ considerably (Eliot, 1992). Although the members of *Catopyrops* occur in the Philippines, just south of Taiwan, no butterflies of this genus had been recorded from Taiwan. In 1998 the first author found *C. ancyra* flying abundantly at Lanyu (Orchid Island), an island southeast of Taiwan. Additional individuals of the same species were observed on the same island two years later in 2000, and again in 2002, suggesting this species may be successfully established on Lanyu. In this article, we report this species as new to the butterfly fauna of Taiwan, and recommend monitoring its ability to invade to

the main island of Taiwan. The samples collected from Lanyu are tentatively regarded as individuals of the subspecies *almora* of *C. ancyra*.

Materials and Methods

Samples of *Catopyrops* were collected in July and August, 1998, August, 2000, and August, 2002, from Lanyu (= Orchid Island), Taidong Co., Taiwan. The samples were compared with *Catopyrops* specimens collected from the Philippines, including 1♂ in April, 1991, from Luzon; 6♂ in February and March, 1994, from Mindoro, and 10♂2♀ in July, October, and November, 1991, from Marinduque. Length of forewing was used as the criteria for size comparison between the two regions. The names of the wing veins are abbreviated as the follows: R = radius, M = median, CuA = anterior cubital. Voucher specimens are deposited in the following institutes: Department of Biology, National Taiwan Normal University, Taipei (NTNU); National Museum of Natural Science, Taichung (NMNS); Institute of Zoology, Academia Sinica, Beijing (IOZ); Chongqing Natural History Museum, Chongqing (CNHM).

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Taxonomic Accounts

Catopyrops ancyra almora (Druce, 1873)

(Figures 1-2, ♂; Figures 3-4, ♀)

Diagnosis. ♂: Forewing length 10.40 ± 1.12 mm; antenna length 5.52 ± 0.39 mm ($n = 13$). Termen subequal to dorsum in length. Hindwing with a long, slender, tail-like process at the tip of vein CuA2. Upperside color metallic violet, with a black, round dot in cell CuA1 distad. A small, black patch present at tornus. Underside ground color pale gray. Both bands of central symmetry system gray bands edged with white. Discal spots as short, gray bands edged with white. Parafocal and submarginal bands forming two series of brown markings sandwiched by curved, white lines. A prominent black spot crowned with an orange lunule in cell CuA1 distad.

♀: Forewing length 10.54 ± 0.39 mm; antenna length 5.29 ± 0.35 mm ($n = 8$). Wing configuration similar to that of male except forewing termen slightly more convex. Upperside ground color dark brown with proximal blue, metallic scalings. A series of white lunules present on hindwing distad. A prominent, black spot crowned with an orange lunule in cell CuA1 distad. Underside patterns similar to those of male. Fringe brown mixed with white.

In Taiwan, no *Catopyrops* species has hitherto been recorded (Shirôzu & Ueda, 1992; Hsu, 1999). Only the species in the genus *Nacaduba* may be confused with the *C. ancyra* reported here. A few features are useful to separate this species from *Nacaduba* species in Taiwan: 1) The size of *C. ancyra* is usually smaller. With forewing length of 8 – 11 mm, *C. ancyra* is even smaller than *Nacaduba berenice leei* (forewing length 10.5 – 14.0 mm; data resource: Hsu, 1990), the smallest *Nacaduba* species in Taiwan; it also occurs at Lanyu (Hsu, 1990), making the two species sympatric. 2) Forewing length of termen is approximately equal to that of dorsum in *C. ancyra*, but is shorter than that of dorsum in *Nacaduba*. 3) Distal band of central symmetry system of forewing is straight posteriorly in *C. ancyra*, whereas the band in cell CuA1 and CuA2 of *Nacaduba* is in a much more proximal position. 4) An orange lunule crown present on CuA1 spot of hindwing upperside in females of *C. ancyra*, but absent from *Nacaduba* females.

Larval hostplants. The recorded larval hosts of *C. ancyra* include *Pipturus argenteus* (Urticaceae), *Caesalpinia bonduc* (Fabaceae), and *Glochidion* sp. (Euphorbiaceae) in Australia and New Guinea (Braby, 2000). Females of *C. ancyra almora* were observed ovipositing on *P. arborescens* (Urticaceae) at Lanyu (Jia-Lung Jean, personal communication). If this plant proves to be a suitable host plant, then *C. ancyra* has the potential to invade the east coast of Taiwan island and Ludao (= Green Island), an island just north of Lanyu. According to Yang *et al.* (1996) and Yang *et al.* (1997), the plant grows in these areas. Moreover, *Caesalpinia* and *Glochidion* species are commonly distributed on Taiwan island (Liu, *et al.*, 1998), they may also be suitable larval hosts of *C. ancyra almora*.

Specimens examined. 6♂3♀. TAIWAN: TAIDONG Co., Lanyu Is., Badai Bay, VII. 3/4. 1998, Coll. C. C. Lu (CNHM, IOZ, NMNS, NTNU); 5♂4♀. TAIWAN: TAIDONG Co., Lanyu Is., Langdao, VIII. 18/22. 1998, Coll. C. C. Lu & C. Y. Hung (IOZ, NMNS, NTNU); 2♂1♀: TAIWAN: TAIDONG Co., Lanyu Is., Sidaogou, VIII. 11. 2000, Coll. C. C. Lu (NTNU); 1♂. TAIWAN: TAIDONG Co., Lanyu Is., Langdao, VIII. 12. 2000, Coll. C. C. Lu (NTNU); 2♂. TAIWAN: TAIDONG Co., Lanyu Is., Langdao, VIII. 15. 2002, Coll. C. Y. Hung (NTNU).

Remarks. Samples of *Catopyrops ancyra* collected from Lanyu are considerably smaller (forewing length 10.45 ± 0.94 mm, $n = 21$) than those from the Philippines (forewing length 12.73 ± 0.61 mm, $n = 18$) ($df = 37$, $t = -8.84$, $p < 0.001$), but we think the most likely source of the Lanyu population is the Philippines, as no morphological difference can be detected between the samples from the two areas except size. Prior to 1998, no record of any *Catopyrops* exists in Lanyu, an island with a long history of scientific study (Yamanaka, 1980; Hsu, 1999). This suggests an exotic source of *C. ancyra* found on this island. The smaller size of the Lanyu lycaenid may be due to nutritional and ecological, rather than taxonomic reasons. The Lanyu colony of this small butterfly was probably founded by individuals carried to the island via wind, or the other natural means.

Seki *et al.* (1992) regarded the population of *C. ancyra* from the Philippines as the subspecies *almora* Druce, a race described from Borneo (Tite,

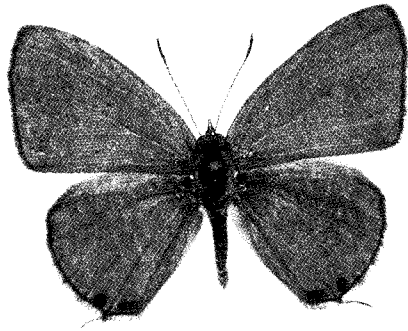


Figure 1. Upperside of *Catopyrops ancyra almora* ♂; TAIWAN: TAIDONG Co., Lanyu Is., Langdao, VIII. 18/22. 1998, Coll. C. C. Lu & C. Y. Hung (NTNU).



Figure 2. Underside of *Catopyrops ancyra almora* ♂; TAIWAN: TAIDONG Co., Lanyu Is., Langdao, VIII. 18/22. 1998, Coll. C. C. Lu & C. Y. Hung (NTNU).

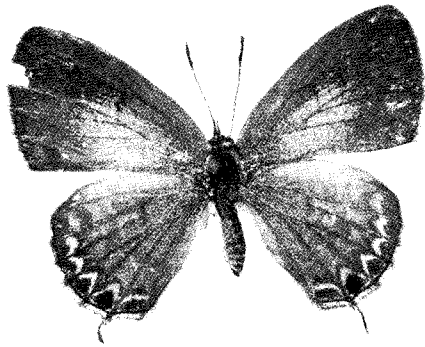


Figure 3. Upperside of *Catopyrops ancyra almora* ♀; TAIWAN: TAIDONG Co., Lanyu Is., Langdao, VIII. 18/22. 1998, Coll. C. C. Lu & C. Y. Hung (NTNU).



Figure 4. Underside of *Catopyrops ancyra almora* ♀; TAIWAN: TAIDONG Co., Lanyu Is., Langdao, VIII. 18/22. 1998, Coll. C. C. Lu & C. Y. Hung (NTNU).

1963). Consequently we adopt this name for the samples collected from Lanyu. It is interesting that when Tite (1963) published his comprehensive review of the genus *Nacaduba* and its allied genera, he did not include the Philippines in the distribution range for *Catopyrops*, neither did a later work by D'Abrera (1986). Whether populations of *C. ancyra* from the Philippines possess the same external or genetic features as those from Borneo is an open question, pending future investigation.

In the past few years, many butterfly species have successfully invaded Taiwan either by natural or anthropogenic pathways; for instance, two amathusiid species became established on the northern shores of Taiwan by the late 1990s, possibly introduced accidentally as a result of human activity (Shirôzu, 2001). *Catopsilia scylla cornelia*, a pest of cultivated *Cassia* (Fabaceae) and a rare stray species prior to 1990s, became abundant in southern Taiwan in the early 1990s (Chen, 1999). The addition of previously novel species to local, native ecosystems are cause for concern (e.g. Rohrbach, 2000), for these species may compete with indigenous species for resources, and lacking natural enemies, their population size may grow out of control. It is important to monitor the Lanyu populations of *C. ancyra* and their effects on the local fauna and flora. The potential for and results of invading other regions of Taiwan by this species should be evaluated.

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臺灣地區灰蝶科之一新記錄種：來自菲律賓的曲波灰蝶

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摘 要

本文自臺東縣蘭嶼記錄臺灣新記錄種灰蝶，即曲波灰蝶 *Catopyrops ancyra*。 *Catopyrops* 屬蝴蝶過去在臺灣地區尚未有記錄，而本文報告之樣品經比較研究暫判定係屬於曲波灰蝶分布於婆羅洲及菲律賓地區之亞種 *C. ancyra almora* (Druce)。蘭嶼產的本種判斷係來自菲律賓地區，但有可能業已在該島立足，由於曲波灰蝶可能以蕁麻科之落尾麻、豆科之蘇木屬以及大戟科之饅頭果屬為幼蟲寄主，因此將來有侵入臺灣本島及其他東部離島的可能。

關鍵詞：藍灰蝶族，蘭嶼，偶產種，入侵，新記錄