

ON A CONTINENTAL SUBSPECIES OF *CHRYSOZEPHYRUS RARASANUS* FROM CHINA (LEPIDOPTERA: LYCAENIDAE)

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ABSTRACT.—*Chrysozephyrus rarasanus* (Matsumura), a species formerly considered as an endemic of Taiwan, is now found from continental China and described as a new subspecies: *C. rarasanus occiduus* n. subsp. The new subspecies has less intensive metallic green scaling on wings compared to the nominotypical subspecies. Larva of the new subspecies feeds on *Quercus sessilifolia* (Fagaceae), the same host utilized by the nominotypical subspecies. Due to the fact the plant is widely distributed, it is likely that *C. rarasanus* is much more widespread in distribution than currently recognized.

KEY WORDS: China, *Chrysozephyrus rarasanus occiduus* n. subsp., Fagaceae, hostplant, Oriental, Taiwan, taxonomy, Theclini.

It has been six decades since *Chrysozephyrus rarasanus* (Matsumura) was described from Taiwan (Matsumura, 1939). Since then, this species has always been regarded as a species endemic to Taiwan (Howarth, 1957; Shirôzu, 1960; Hsu *et al.*, 1986; Watanabe, 1998). Nevertheless, material evidently belonging to this species has been found in collections from western China. These specimens have wider dark margins on both forewings and hindwings, and are herein considered to represent a new subspecies.

MATERIAL AND METHODS

Material used in this study will be deposited to the collections listed below.

- BMNH Department of Entomology, the Natural History Museum, England.
IZASB Institute of Zoology, Academia Sinica, Beijing.
NTNU Department of Biology, National Taiwan Normal University, Taipei.
TF Tomoo Fujioka Collection, Tokyo.

Measurements are defined and abbreviated as follows:

- Forewing length (FL): distance from the base of forewing to the apex.
Hindwing length (HL): distance from the base of hindwing to the distal tip of vein Cu2 excluding the "tail"-like projection.
Dark margin of Forewing (FM): distance between termen and the distal edge of the metallic green scaling in cell Cu1 of forewing.
Dark margin of hindwing (HM): distance between termen and the distal edge of the metallic green scaling in cell Cu1 of hindwing.

Terminology of wing patterns follows Nijhout (1991). The description of genitalia follows Klots (1970).

Chrysozephyrus rarasanus occiduus Hsu, new subsp.

(Fig. 1-2, 5, 6-7, 10-12)

Diagnosis.—The dark margin on upperside of both wings is significantly broader in *C. r. occiduus* (Fig. 1, ratio of FM/FL = 0.0543 ± 0.0028, ratio of HM/HL = 0.1424 ± 0.0111; n = 7) than in the nominotypical subspecies (Fig. 2, ratio of FM/FL = 0.0420 ± 0.0036, ratio of HM/HL = 0.1053 ± 0.0124; n = 9) ($t = 6.9348$, $df = 14$, $p < 0.01$ for FL/FM, $t = 6.2279$, $df = 14$, $p < 0.01$ for HL/HM). The ventral serrated lobe of brachium in *C. r. occiduus* (Fig. 9) is more produced than in the nominotypical subspecies (Fig. 8).

Description.—**MALE** (Fig. 1-2). Length of forewing 17.4-19.6mm (mean = 18.80 ± 0.92mm; n = 7); length of antenna 7.5-8.5mm (mean = 7.96 ± 0.39

mm; n = 7). **Head.** Hairy, vertex brown, frons dark brown but mixed with white medially. White, narrow rim surrounding eye; eye semi-oval, densely covered with long, buff setae; labial palpus porrect, with third segment pointed downwards, covered with dark brown mottled with white; maxillary palpus reduced, invisible; proboscis unscaled; antenna smoothly scaled, naked at terminal end of nudum. **Thorax.** Dark brown dorsally, white ventrally; legs white, mottled with brown on tarsi. **Forewing.** Termen, costa slightly concave, dorsum straight. Ground color of upperside dark brown, overlaid with metallic green tinged with blue scaling except distal margin along termen. Ground color of underside buff gray. Discal spot represented as thin, brown bar. Distal band of central symmetry system a slightly serpentine, tilted, white line from R3 through Cu2, edged with brown proximally. Submarginal band, "g"-element as defined by Nijhout (1991) fused into faint, dark brown band edged with white, prominent posteriorly, abruptly attenuate towards apex. Fringe with inner cilia dark brown, outer cilia white. **Hindwing.** Contour of wing slightly produced at distal end of M1, Cu1; Cu2 bearing long, "tail"-like projection distally. Ground color of upperside dark brown, overlaid with metallic green tinged with blue scaling proximally, leaving broad, dark margin. Ground color of underside buff gray. Discal spot represented as faint, thin, brown bar. Distal band of central symmetry system forming prominent, white line, rebent twice into a "W"-shaped marking posteriorly. Submarginal band consisted of faint, broad, white band mixed with black, a black dot enclosed within orange circle in cell Cu1, and a tornal orange patch edged by black and metallic blue scaling anteriorly and posteriorly. "g"-element consisted of a string of arch-like, faint, white markings. Fringe with inner cilia dark brown, outer cilia white except in cell Cu1, Cu2, where outer cilia forming proximal, white layer and distal, dark brown layer. **Abdomen:** Dark brown dorsally, white ventrally. **Male genitalia** (Fig. 6-7, 9-12): Ring-shaped sclerites of 9 + 10 segments with posterior end slightly concave; saccus enlarged, rod-like, approximately 0.32 X height of tegumen; brachium abruptly bentover, forming sharp angle with serrated lobe ventrally, caudal end pointed but slightly bent upwards at distal end; valva bearing curved, elongate, distal process with terminal end truncated, harpe setose, forming a slightly produced, angled lobe. Phallus elongate, slightly downcurved posteriorly with truncated caudal end; aedeagus 1.21 X phallobase. Juxta pincer-like, attenuate ventrally.

FEMALE: unknown.

Types.—Holotype ♂: CHINA.—Guizhou Prov.: Tongren Pref., Jiangkou Xian, Mt. Fangjingshan, 1350-1800m, 18/19 Jun 1995 (IZASB). Paratype 2 ♂: same data as holotype (1 dissected, genitalia YFH 1067) (IZASB, NTNU); 4 ♂, same locality as holotype, 17/19 Jun 1997 (BMNH, NTNU, TF).

Etymology.—An adjective of Latin, from *occiduus* = western, named so because this new taxon was found far west of the distributional range previously recognized for the nominal species.

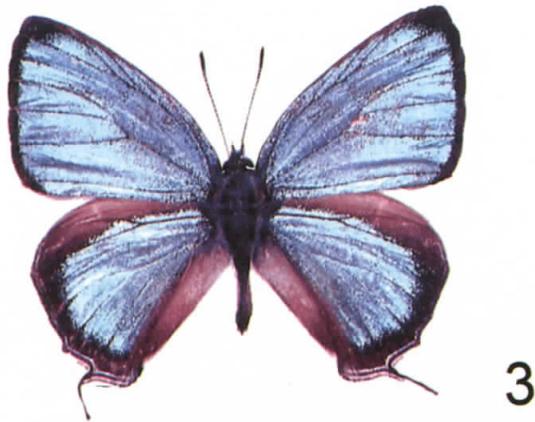


Fig. 1-2. *Chrysozephyrus rarasanus occiduus* Hsu, new subsp. Holotype male: 1) upperside; 2) underside.

Fig. 3-4. *Chrysozephyrus rarasanus rarasanus* (Matsumura): 3) upperside; 4) underside.

Fig. 5. Ovum of *Chrysozephyrus rarasanus occiduus* Hsu, new subsp. on *Quercus sessilifolia*.

Host association.— *Quercus sessilifolia* (Fagaceae) (rearing lot number HSU 97B33).

Biology.— Two ova were observed from the base of dormant buds of *Q. sessilifolia* at approximately 3m above ground from the type locality (HSU 97B33). Only one ovum hatched; the larva grew successfully to pupation. The pupa failed to emerge but completed development, and the genitalia were subsequently dissected to confirm its status. The chorion of the ovum has shallow, net-work-like sculptures (Fig. 5), which is characteristic for *C. rarasanus* according to Koiwaya (1988).

Remarks.— Although *C. rarasanus* currently is known only from two distantly separated areas, namely Taiwan and Guizhou Province of southwestern China, this species is expected to be recognized as a widespread species since its host plant, *Q. sessilifolia*, is widespread throughout southern China south of the Chang Jiang (= Yangtze River) (Hsu and Jen, 1998).

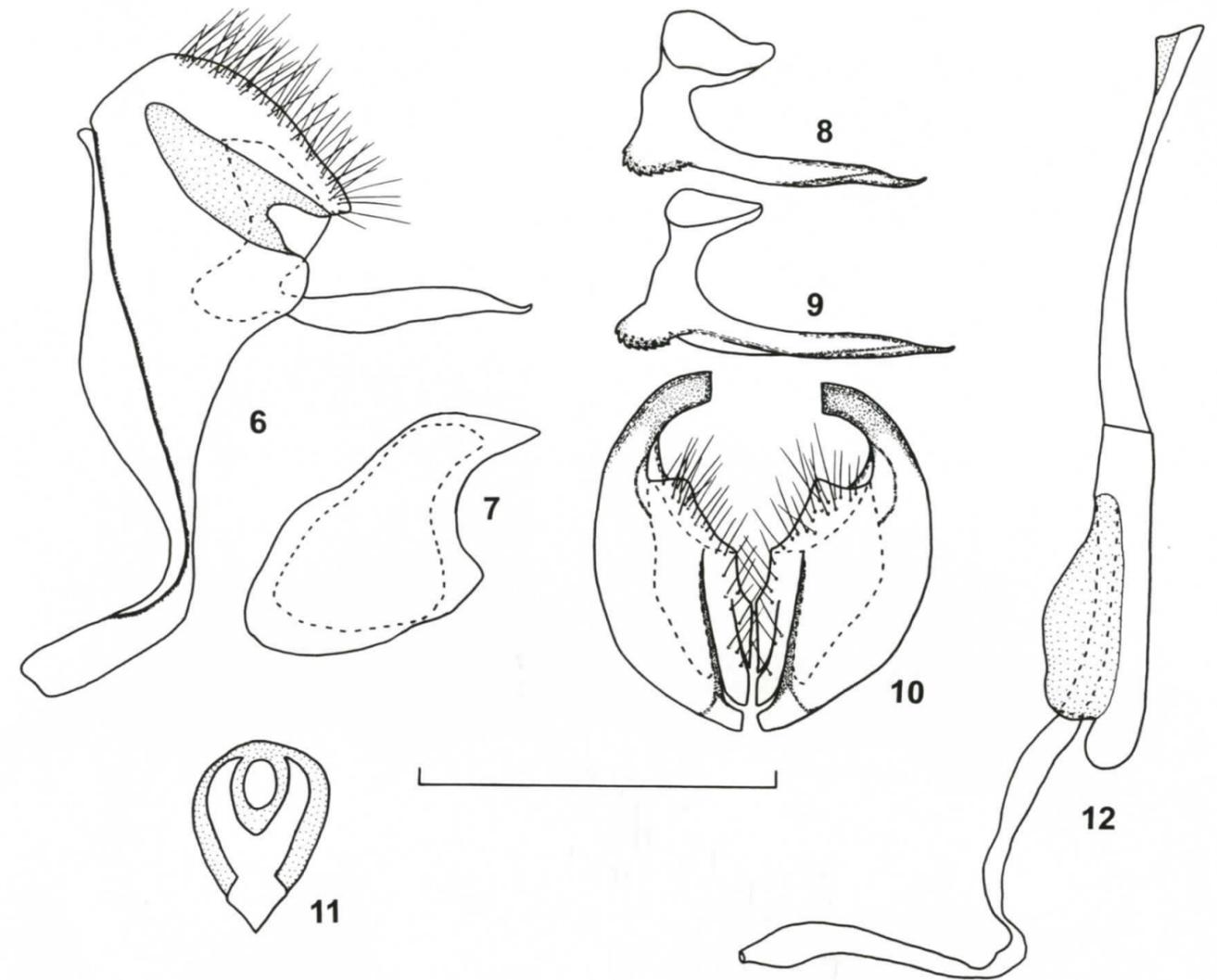


Fig. 6-7, 9-12. Male genitalia of *Chrysozephyrus rarasanus occiduus* Hsu, new subsp.: 6) lateral view of 9 + 10 genitalic segments with left brachium removed; 7) lateral view of left valva; 9) lateral view of left brachium; 10) ventral view of valvae; 11) posterior view of juxta; 12) lateral view of phallus (scale = 1 mm).

Fig. 8. Lateral view of left brachium of *Chrysozephyrus rarasanus rarasanus* (Matsumura).

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