

## SHORT COMMUNICATION

Xin Zhang<sup>1)</sup>, Shao-ji Hu<sup>2)</sup>. THE IMMATURE STAGE OF *CALINAGA BUPHONAS* OBERTHÜR, 1920 (LEPIDOPTERA: NYMPHALIDAE). – Far Eastern Entomologist. 2012. N 239: 10-12.

**Summary.** The morphology, behavior, and voltinism of the immature stage of *Calinaga buphonas* Oberthür, 1920 were reported by conducting field observation and laboratory rearing experiment in Yunnan Province, China.

**Key words:** Lepidoptera, Nymphalidae, *Calinaga*, immature morphology, larval behavior, food plant, China.

Синь Чанг<sup>1)</sup>, Шао-юй Ху<sup>2)</sup>. Преимагинальные стадии *Calinaga buphonas* Oberthür, 1920 (Lepidoptera: Nymphalidae) // Дальневосточный энтомолог. 2010. N 239. С. 10-12.

**Резюме.** По результатам лабораторного эксперимента и полевых наблюдений описываются морфология и поведение преимагинальных стадий *Calinaga buphonas* Oberthür, 1920, а также число генераций у этого вида в провинции Юньнань (Китай).

### INTRODUCTION

The immature stages and host plants of *Calinaga* species (Lepidoptera: Nymphalidae: Calinaginae) are poorly known in China (Chou, 1998). The field observation and a rearing experiment were performed by the authors from March to November 2009 to obtain such information of *C. buphonas* Oberthür, 1920. This species had been confused with *C. buddha* in Western China until recently (Okano & Okano, 1984; Chou, 1994; Lee, 1995; Huang, 2003; Wang, 2005).

### MATERIALS AND METHODS

The field site was situated near the hilltop of Xishan National Forest Park, Kunming, China (24,960°N, 102,623°E, 2340 m) with broad-leaf forests being the major vegetation. Weekly observations were made of eggs, larvae, and pupae. Adults (Fig. 1) were collected by netting and packed in paper triangles. Numerous eggs, larvae, and host leaves were collected from a woody plant, *Morus australis* (Fig. 2) and stored in plastic containers. Adults were enclosed in a glass container (350 × 200 × 150 mm) with their natural host plant to collect eggs. Eggs on the host leaves were placed separately into 90 mm Petri dishes paved with moist tissue paper. After the 2nd instar larvae were reared in the glass container to maintain temperature and humidity and provide sufficient food. The rearing conditions were 20-25 °C, 50% RH, and 12 h L/D.

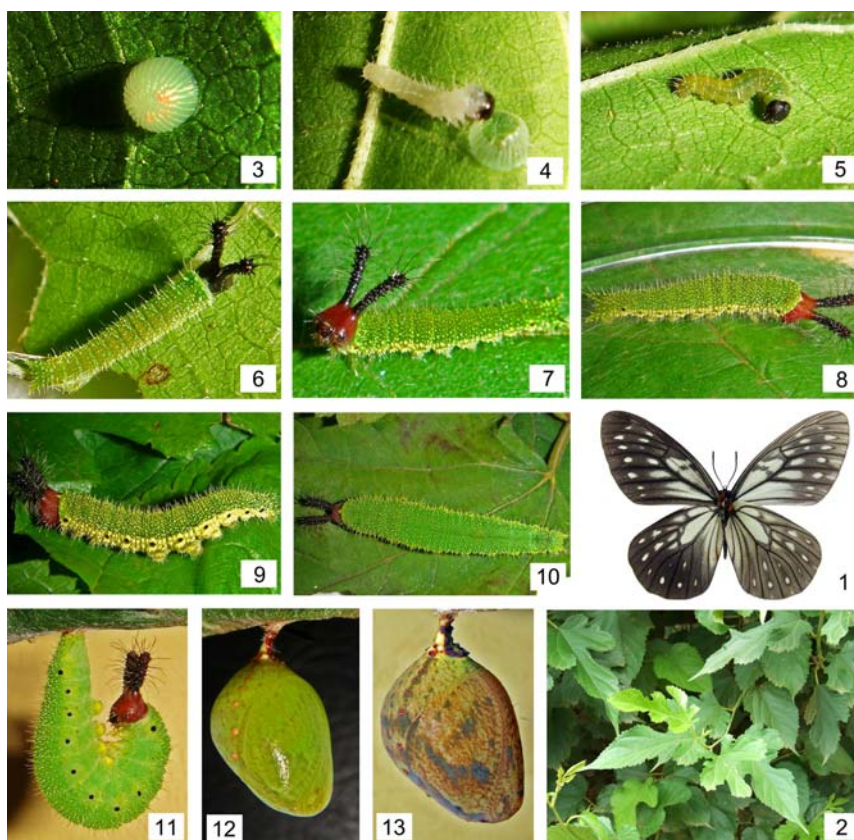
### RESULTS

#### *Calinaga buphonas* Oberthür, 1920

Figs 1, 3–13

EGG. Hemispherical, 0.8–1.0 mm in diameter and 0.3–0.5 mm in height, creamy white and covered with 32 longitudinal striae (Fig. 3). Singly laid on the underside of host leaves and hatched in the morning. Duration of egg was 6–7 days.

**LARVAE.** The 1st instar larvae 2–3 mm in length; with blackish brown head; whitish translucent body, and two rows of symmetrical fine, short setae on the dorsum, and a row of fine, short setae on each side of body (Figs. 4–5). The newly hatched larvae ingested egg shells before ingesting the margin portion of tender leaves. Duration of the 1st instar larva 5–6 days. The 2nd instar larvae are 10–12 mm in length; head as above but with a pair of club-shaped horns covered with long black setae; body yellowish green with irregular tubercles, translucent setae and bifurcated pygidium (Fig. 6). Duration of the 2nd instar larva 8–9 days. The 3rd instar larvae 15–18 mm in length; head dark red with black ocelli and horns, body bright green with well-developed, yellowish green tubercles, stigma black, except those in segment 2 and 3 (Fig. 7) which are yellowish green. Duration of the 3rd instar larva 15–17 days. The 4th instar larvae 38–45 mm in length, head as in the 3rd instar, the body densely covered with yellow and white tubercles with a milky yellow ventral side



Figs 1–13. The adult, natural host plant, and immature stage of *Calinaga buphonas*: 1 – male adult, upperside on the left half and underside on the right half; 2 – natural host plant, *Morus australis*; 3 – egg; 4 – 1st instar larva ingesting the egg shell; 5 – 1st instar larva after ingesting host leaf; 6 – 2nd instar larva; 7 – 3rd instar larva; 8 – 4th instar larva; 9 – 5th (final) instar larva; 10 – final instar larva before pupation; 11 – prepupation; 12 – pupa (green form); 13 – pupa (brown form).

(Fig. 8). Duration of the 4th instar larva 10–13 days. The 5th (final) instar larvae 48–55 mm in length and resemble the fourth instar, but with ocelli encircled by translucent whitish tubercles, and an emerald green body before pupation (Figs. 9–11). Duration of the 5th instar larva 23–25 days.

PUPA. Adheraena; fruit-shaped and smooth; 11–15 mm in length, 8–12 mm in width; fruit green (green form) or yellowish brown (brown form) with irregular dark markings and dark red stigma (Figs. 12–13). Duration of the pupa 280–283 days.

LARVAL BEHAVIOR. Larvae lived solitarily, and from the 2nd instar on, they expelled each other by waving their horns when they encountered a conspecific. The 3rd instar larvae began to build “nests” by rolling the margin of host leaves. The final instar larvae pupated under leaves or on branches in the morning. The acceptance of a closely related plant, *M. alba*, was tested on both laboratory-reared larvae and wild-caught larvae. Acceptance was 0% in both cases.

VOLTINIS. *C. buphonas* is univoltine in Central-Yunnan altiplano according to field observation and rearing experiment. The voltinism in elsewhere of its distribution has not been studied.

#### ACKNOWLEDGEMENTS

The authors would like to express their sincere thanks to Ms. Sophie Miller for improving the earlier drafts of this paper.

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