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## TWO NEW SPECIES OF GENUS *PHAENOSERPHUS* KIEFFER, 1908 (HYMENOPTERA, PROCTOTRUPIDAE) FROM THE SIBERIA AND RUSSIAN FAR EAST

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*Phaenoserphus chernovi* Kolyada, sp. n. from Siberia and *Ph. kurilensis* Kolyada, sp. n. from Kuril Islands and Magadan region are described and illustrated.

KEY WORDS: Hymenoptera, Proctotrupidae, *Phaenoserphus*, taxonomy, new species, Siberia, Russian Far East.

**В.А. Коляда. Два новых вида рода *Phaenoserphus* Kieffer, 1908 (Hymenoptera, Proctotrupidae) из Сибири и с Дальнего Востока России // Дальневосточный энтомолог. 2012. N. 239. C. 1-9.**

Описываются и иллюстрируются *Phaenoserphus chernovi* Kolyada, sp. n. из Сибири и *Ph. kurilensis* Kolyada, sp. n. с Курильских островов и Магаданской области.

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### INTRODUCTION

The genus *Phaenoserphus* Kieffer, 1908 includes 26 species worldwide; six of them have a wide Holarctic area (Johnson, 1992). There are 10 Palaearctic species including ones describe below (Kolyada, 1998; 2000). The members of the genus are distributed mainly in a moderate forest area but also can be found in high latitudes

and arctic tundra. They can penetrate far into the south and east (mountains of Central Asia) through the highland habitats and can reach the Oriental area: India (Kashmir, the Kerala mountains), Nepal, South China, Northern Thailand (Koyada, unpublished data). The biology of this genus is poorly studied, but all available data confirm its endoparasites in larvae of Carabidae (Critchley, 1973; Townes, 1981). The systematic of the genus is complicated and confused because of the reason of its strong variability and large species areas.

While preparing the keys for the "Key of the insects of Russian Far East" (Koyada, 2000) it was supposed that new taxa should be described earlier. However, it has not been happened. I describe these taxa from genus *Phaenoserphus* below.

## MATERIAL AND METHODIC

All photographs were obtained with a stereomicroscope Leica M165 and camera Leica DFC450. The montage of the image layers was performed with Helicon Focus 5.1. The material used in the paper: collections of Zoological Institute, St. Petersburg (ZISP) and Zoological Museum of Moscow State University (ZMMU). The author expresses sincere gratitude to the curators of these collections. I am most grateful to L. Masner, Canadian National Collection of Insects, Ottawa, Canada (CNCI) and D. Wahl, American Entomological Institute, Gainesville, Florida, USA (AEI) for the loan of comparative material.

## TAXONOMY

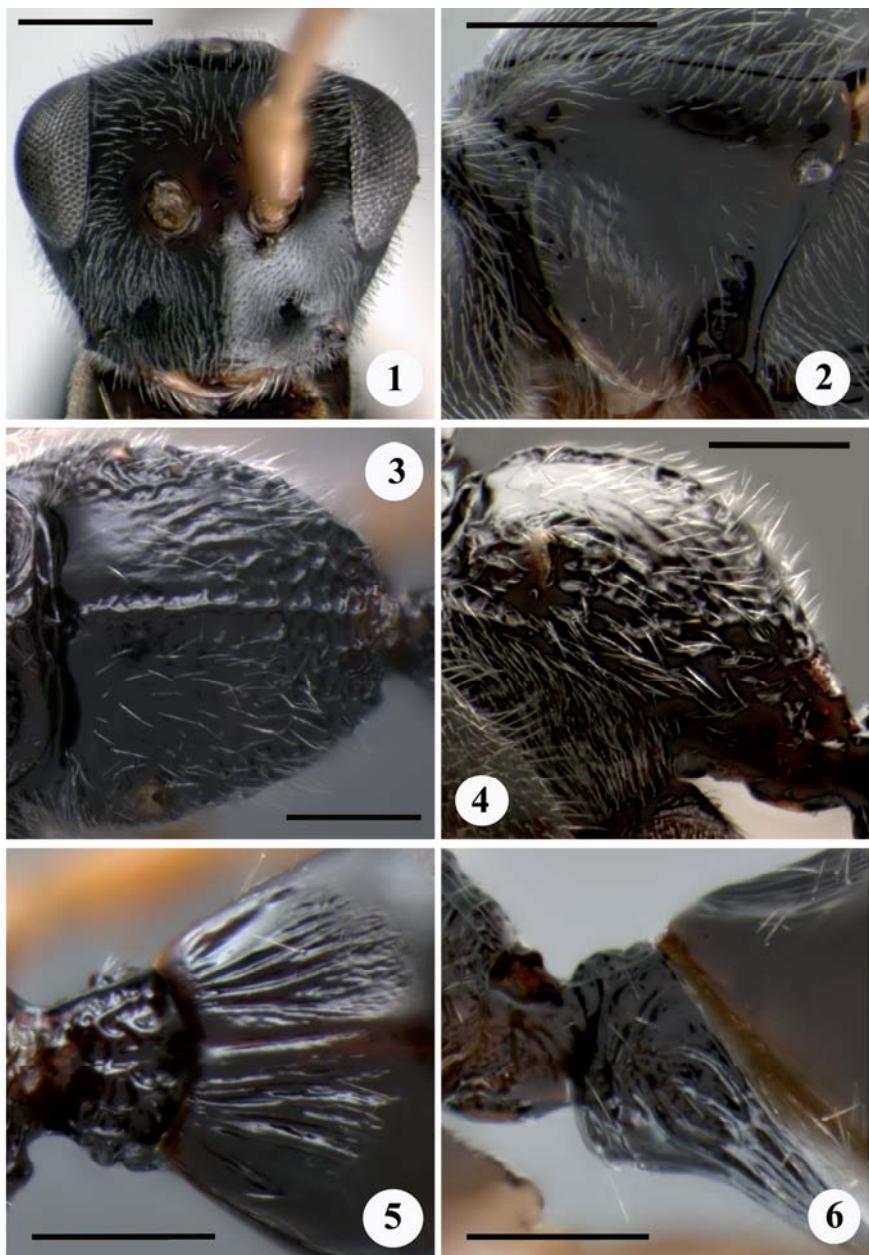
### Genus *Phaenoserphus* Kieffer, 1908

#### *Phaenoserphus chernovi* Kolyada, sp. n.

Figs 1–13

*Phaenoserphus chernovi* Kolyada, 2000: 578, nom. nud.

TYPE MATERIAL. Holotype – ♀, Russia: **Yakutya (Sakha)**, Yakutya, Tiksi / 31.VIII 1980 (D. Kasparyan) [ZISP]. Paratypes: 1 ♂, with same label as holotype; **Krasnoyarsk reg.**, 1 ♀, Yeniseysk Governorate / Lower Tunguska River / above Vivi River / 28.VII 1873 (Chekanovskii) [ZISP]; 2 ♀, 2 ♂, Taimyr Peninsula / Agapa River head / Pyasina River tributary, 28.VI 1960 / "conclusion" [probably reared] from larva of *Carabus* / (Yu. Chernov); 1 ♀, Taimyr, Khatanga / mouth of Yantaradach River / 7.VII 1971 (A. Rasnitsyn & A. Ponomarenko); 1 ♀, Taimyr, Khatanga / Kotuj River, Kresti village / 24.VII [19]71 (I. Sukacheva & V. Zherikhin); 1 ♀, Evenkya / Stat. Nat. Biosphere Res. "Tsentralsibirsky" / mouth of Ayacha River / 6–11.VII 2007 / pitfall (A. Kuvaev) [ZMMU]; **Tyumen reg.**, 1 ♀, YNAO, Polar Ural / Sob' River / 50 km NW Labitnangi / 14.VII 1994 (D. Kasparyan); 13 ♂, the same place, but 17–18.VII 1994 (D. Kasparyan) [ZISP].



Figs 1–6. *Phaenoserphus chernovi* sp. n., paratype, female: 1 – head, front view; 2 – pronotum; 3 – propodeum, dorsal view; 4 – propodeum, lateral view; 5 – stalk, dorsal view; 6 – stalk, lateral view.



Figs 7–13. *Phaenoserphus chernovi* sp. n., paratypes, female (7, 8, 10, 11, 13) and male (9, 12): 7 – ovipositor sheath; 8, 10–12 – antenna; 9 – tyloids on antenna; 13 – habitus, lateral view.

**DESCRIPTION. FEMALE.** Fore wing length 2.5-3.9 mm. Temple about 0.4 times as height as eye. Genal carina angled to meet oral carina at 80°, usually with short stub of carina originating from angulation. Relation of first flagellar segment width to length 1:3.6, and of 10-12 segments 1:2.2; 1:1.9; 1:2.1 respectively. Hairs on side of pronotum with large median bare spot that 2.5-3.0 times as large as tegula. Epomia present. Mesopleuron with horizontal groove complete, mesopleural furrow foveolate.

Propodeum abruptly sloped posteriorly, with two basal large smooth spots dorsally. Propodeum with moderately obvious but obliterate reticulate sculpture. Metasomal stalk short and wide, relation its length to height and width 1:0.5:0.65. Syntergite basally with median longitudinal groove, somewhat not reaching first pair of thyridiae, with 5-6 additional lateral grooves from each side.

Ovipositor sheath 0.46 times as long as hind tibia, with small longitudinal wrinkles. Ratio of ovipositor sheath width to length 0.4.

Body black; stigma, apical third of antennae fuscous; base 2/3 antennae, tegula, fore coxa, and legs yellowish brown; ovipositor sheath black with yellowish tint apically.

**MALE.** Differs from female in the following: temple about 0.3 times as height as eye; male antennae cylindrical, not flattened. Tyloids granulose oval. Metasomal stalk longer and narrower.

**DISTRIBUTION.** Russia: Siberia (Tyumen region, Krasnoyarsk krai, Yakutia).

**ETYMOLOGY.** The species is named after the outstanding ecologist, researcher of the Arctic, Yuri Ivanovich Chernov.

**BIOLOGY.** Reared from larva of *Carabus* sp. (Carabidae).

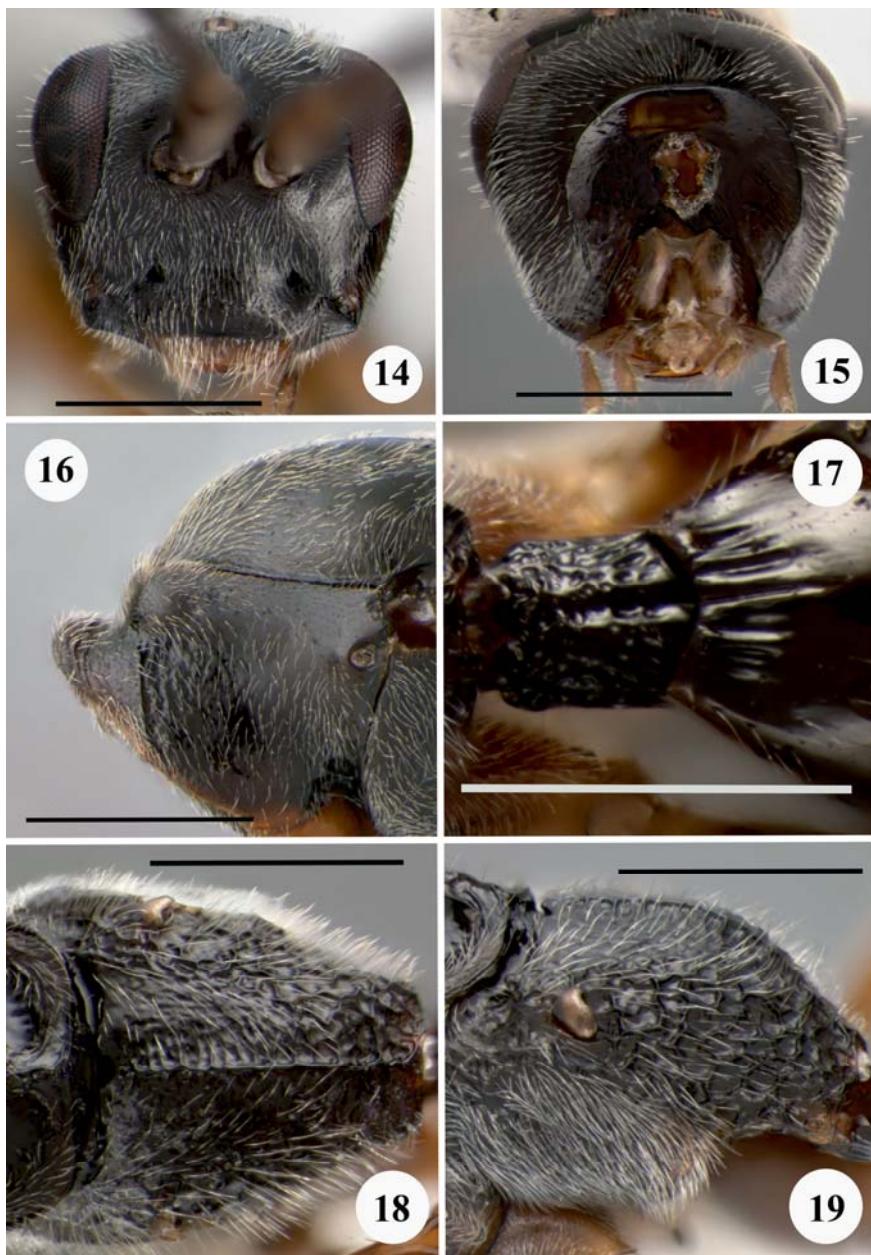
**DIAGNOSIS.** This species is similar to *Phaenoserphus viator* (Haliday, 1839) by many characters, but differs by having the hairs on side of pronotum with large median bare spot that is 2.5-3.0 as large as the tegula, by propodeum abruptly sloped posteriorly with two large smooth spots basally; by having propodeum with moderately obvious but obliterate reticulate sculpture. The male of this species differs that of *Ph. viator* by having antennae cylindrical, not flattened.

***Phaenoserphus kurilensis* Kolyada, sp. n.**

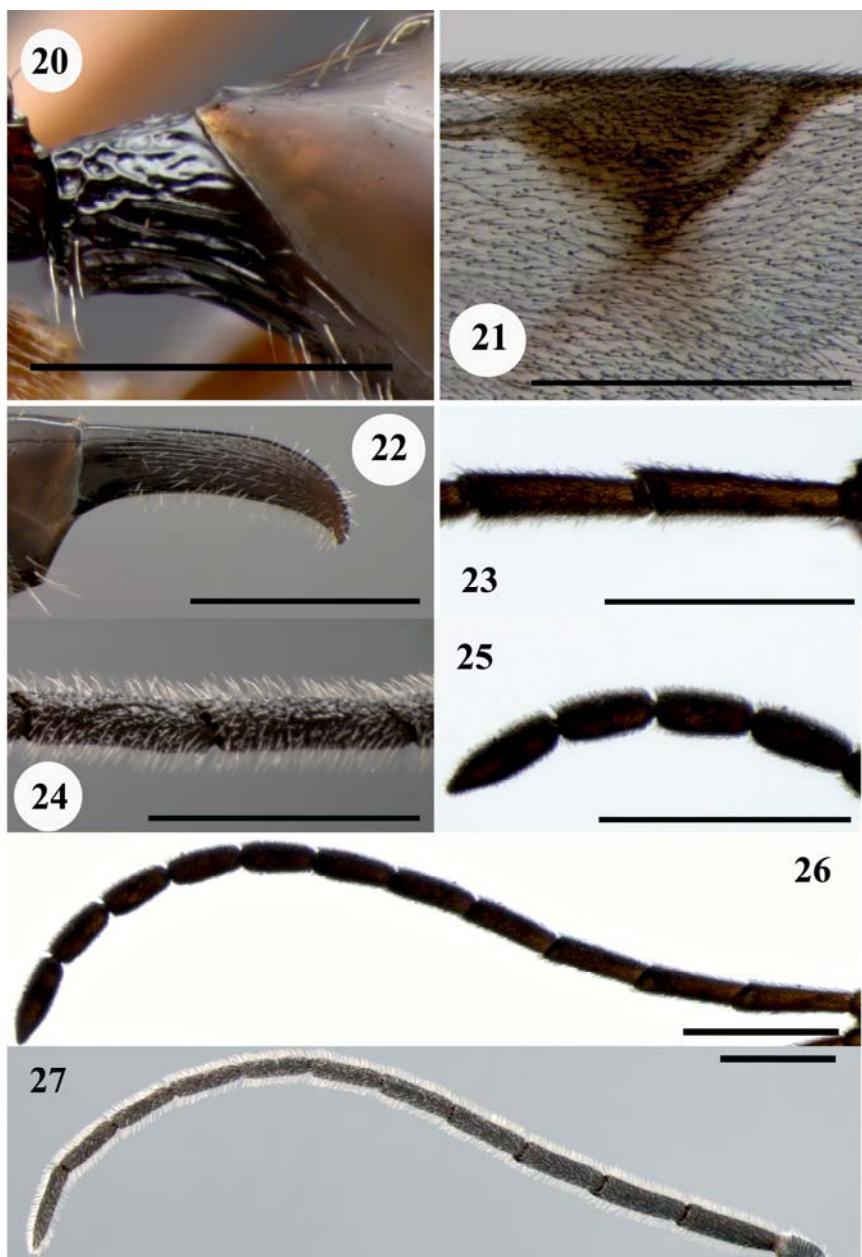
Figs 14-29

*Phaenoserphus kurilensis* Kolyada, 2000: 578, nom. nud.

**TYPE MATERIAL.** Holotype – ♀, Russia: **Kuril Islands**, Paramushir Is. / 4 km NW Severokurilsk [50°44'22"N, 156°08'43"E] / 5.VIII 1997 (A. Lelej & S. Storozhenko) [ZISP]. Paratypes: 1 ♀, the same place as holotype, but 27.VIII 1976 (G. Anufriev); 2 ♀, Ekarma Is. [48°57'55"N, 153°55'17"E], 10.VIII 1996 / volcano slope, sweeping on grass and bushes of *Alnus fruticosa* (A. Lelej) [ZISP]; 1 ♀, Iturup Is., Kurilsk / 11.VII 1976 (V. Ermolenko); 4 ♀, Shikotan Is., Malokurilsk / 27.VII 1976 (V. Ermolenko); **Magadan Reg.**, 2 ♂, 50 km N Magadan / 13-18.VIII 1975, (V. Marshakov) [ZMMU].



Figs 14–19. *Phaenoserphus kurilensis* sp. n., paratype, female: 14 – head, front view; 15 – head, back view; 16 – pronotum; 17 – stalk, dorsal view; 18 – propodeum, dorsal view; 19 – propodeum, lateral view.



Figs 20–27. *Phaenoserphus kurilensis* sp. n., paratypes, female (20–23, 25, 26) and male (24, 27): 20 – stalk, lateral view; 21 – stigma; 22 – ovipositor sheath; 23, 25–27 – antenna; 24 – tyloids on antenna.

**28**



**29**



Figs 28–29. *Phaenoserphus kurilensis* sp. n.: 28 – holotype, female; 29 – paratype, male.

**DESCRIPTION. FEMALE.** Fore wing length 4.0 mm. Temple about 0.4 times as height as eye. Genal carina curved smoothly and evenly toward oral carina, without distinct angulation, meeting oral carina at less than 80°. Relations of first flagellar segment width to length 1:4.3, and of 10-12 segments 1:2.4; 1:2.4; 1:2.3 respectively. Pronotum between collar and scrobe with fine weak surface irregularity. Side of pronotum covered with hairs without bare spots. Epomia present. Propodeum dorsally with weak wide reticulation. Hairs on upper face of propodeum of moderate length, their sockets separated by 0.5 length of the hairs. Metasomal stalk quadratic, relation of length to height and width 1:0.9:1. Syntergite basally with median longitudinal groove, somewhat not reaching first pair of thyridiae and also with 5-6 additional lateral grooves on each side. Ovipositor sheath 0.46 times as long as hind tibia, with small and fine longitudinal wrinkles. Ratio of ovipositor sheath width to length 0.25.

Body black; stigma, antennae, tegula, ovipositor sheath fuscous; legs brown.

**MALE.** Differs from female in the following: temple about 0.3 times as height as eye. Male antennae cylindrical, not flattened. Tyloids present in form of a weak narrow ridge that is 0.5 as long as a segment. Metasomal stalk longer and narrower.

**DISTRIBUTION.** Russian Far East: Kuril Islands (Paramushir, Ekarma, Iturup, Shikotan), Magadan region.

**ETYMOLOGY.** The species is named after the Kuril Islands, where the holotype has been collected.

**DIAGNOSIS.** This species is similar to *Phaenoserphus borealis* Hellén, 1941 by many characteristics, but differs by having obviously shorter metasomal stalk, by shorter and thicker ovipositor sheath. Body larger, forewing length 4.0 mm.

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## 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-жий 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: Calinaginiæ) 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

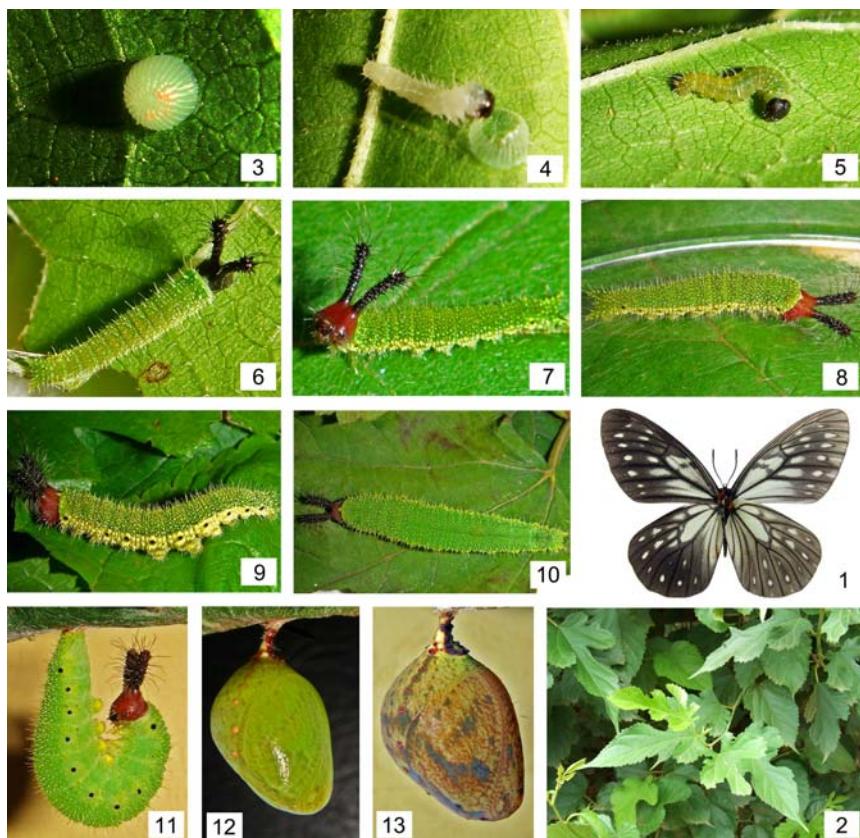
The field site was situated near the hilltop of Xishan National Forest Park, Kunming, China (24.960°N, 102.623°E, 2340 m) with broad-leaf forests being the major vegetation. Weekly observations were made of eggs, larvae, and pupae. Adults (Fig. 1) were collected by netting and packed in paper triangles. 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 buphonias*: 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 forth 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 of 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. buphanas* 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

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