



A new species of the genus *Genusa* (Lepidoptera, Geometridae, Ennominae) from China

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Genusa Walker, 1855, a genus currently included in the Hypochrosini, was originally established in the Lymantriidae, and transferred to the Geometridae by Hampson (1895), who designated *G. bigutta* Walker, 1855 as the type species, and listed *G. destituta* Walker, 1865, originally described from Cambodia, as a synonym of *G. bigutta*, though without any explanation. The only literature which compared *destituta* with *bigutta* is Swinhoe (1900), where he stated that *destituta* is hardly separable from *G. bigutta*.

At present *Genusa* is a small genus, and only known to be distributed in the Oriental Region. Holloway (1994) summarized the generic characters, and recorded 2 species for the fauna of Borneo: *G. simplex* Warren, 1897 and *G. dohertyi* Holloway, 1994. Parsons *et al.* (1999) listed 2 species in *Genusa*, and transferred *G. simplex* Warren, 1897 to genus *Genussa* Walker, 1865 without indicating any reasons (this may have been a result of a mistake in the BMNH card index). Having re-checked the external facies and the genitalia of *simplex*, we believe that *G. simplex* should be retained in *Genusa*. On this basis, the genus *Genusa* would include 4 species: *G. bigutta*, *G. dohertyi*, *G. simplex* **comb. rev.** and the new species *G. hollowayi* described here.

Holloway (1994) recognised three unnamed species from the collection of BMNH: he suggested that *destituta* might be an applicable name for the one of these, from Thailand and Burma, but he did not examine the type specimen; the second species was from N. Vietnam and Hainan, and the third from Luzon. The present work confirms that the specimens from Hainan and N. Vietnam constitute a new species on the basis of examination of the long series of specimens from Hainan and N. Vietnam in IZCAS and BMNH. Morphological differences distinguishing the new species from other known species were confirmed by checking the type specimens and male genitalia of *G. bigutta* (BM Geometrid slide no. 13388), *G. simplex* (BM Geometrid slide no. 13392) and *G. dohertyi* (BM Geometrid slide no. 13398). To investigate the validity of *destituta*, and in consideration that its type locality, Cambodia, is not geographically far from the type localities of the new species, Hainan and N. Vietnam, the authors checked photographs of the unique type specimen of *destituta* (Fig. 4), deposited in the Oxford University Museum of Natural History. Unfortunately the specimen has worn wings, and most importantly, it was found that a female abdomen belonging to a moth from a different genus was glued to the male type specimen. Therefore some uncertainty remains, particularly in the absence of further specimens from Cambodia, about the identity of *destituta*. Nevertheless, on geographical grounds, and on external comparison we agree with Holloway that this name is most likely applicable to the species from Burma and Thailand mentioned above. The male genitalia of this species are, as recorded below, well distinguished from those of the species we now describe.

Specimens used in this study are deposited in the following collections: IZCAS—Institute of Zoology, Chinese Academy of Sciences, Beijing, China, BMNH—The Natural History Museum, London, United Kingdom and OUM—The Oxford University Museum of Natural History. Genitalia were prepared following the standard procedure published by Robinson (1976). Terminology for the genitalia is based on Pierce (1914, reprint 1976), Klots (1970) and Nichols (1989). Photographs of the moths were taken with digital cameras. The plate was compiled using Adobe Photoshop software.

***Genusa hollowayi* Cui, Xue & Han sp. nov.**

Figs 1–2, 7, 13–14

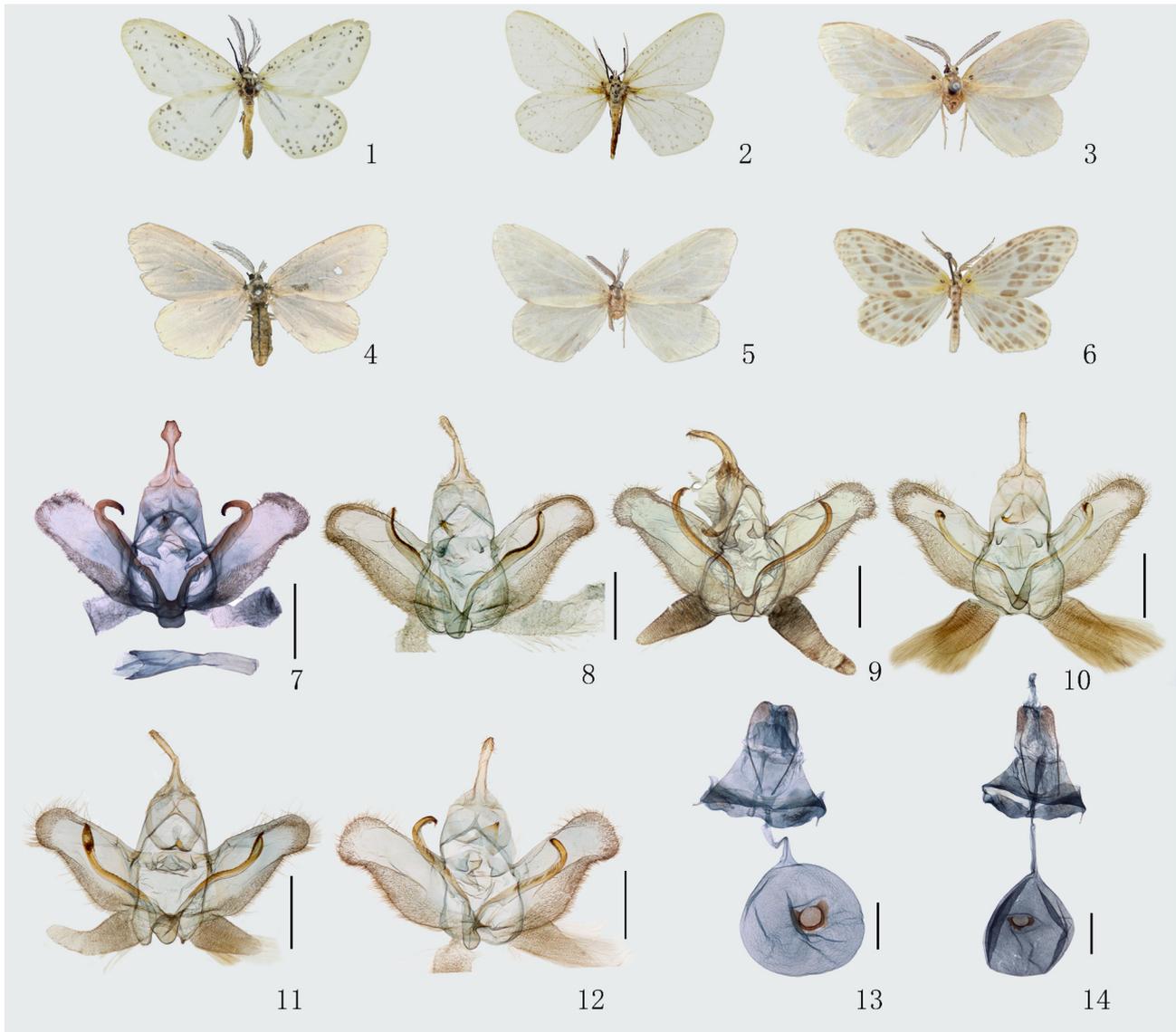
Type material. Holotype, ♂, **CHINA: Hainan** (IZCAS): Qiongzong, Limuling, 620 m, 15.V.2007, coll. Han Hongxiang. Paratypes, **CHINA: Hainan** (IZCAS): 3♂2♀, same locality as holotype, 620 m, 15.V.2007, 21.III.2008, coll. Han Hongxiang & Lang Songyun; 25♂13♀, Ledong, Jianfengling, 805–982 m, 22.III.1980, 14.IV–6.VII.1982, 24–30.III.1982, 17.VIII.1982, 7–10.XI.1983, 1.V.2007, 14–17.XII.2007, 23–27.III.2008, 23–27.V.2008, 22–26.XI.2008, coll. Liu Yuanfu *et al.* (Slide No. 2367); 1♂, Bawangling, 145 m, 18–21.XII.2007, coll. Li Jing; 9♂5♀, Wuzhi Shan, 620–900 m, 8.V.2007, 8–9.XII.2007, 1.IV.2008, coll. Li Jing *et al.*; 4♀, Tongshi, 340 m, 7.VIII.1960, 1–28.V.1973, coll. Chen Yixin (Slide No. 2366, 2368); 12♂8♀, Lingshui, Diaoluo Shan, 190–995m, 4.V.1984, 3–6.V.2007, 10–12.XII.2007, 31.III.2008, coll. Chen Zhiqing *et al.* (Slide No. 2369); 1♂1♀, 41 m, Wanning, Xinglong, 21.V.2008, coll. Lang Songyun. **Hainan** (BMNH): 2♂, Mangrin, VI.1904, Rothschild Bequest BM1939-1; 1♀, Five-fingered mountains, coll. J. Whitehead, BM99-283; 3♂, Interior Hainan, V.1920, coll. CT Bowring, Joicey Bequest BM 1934-120 (bears label in Prout's handwriting '*Genusa biguttata* (sic) Walker'); 1♂, Interior Hainan, V.1919, coll. CT Bowring, Joicey Bequest BM 1934-120; 1♂, Hainan (Interior), VII., coll. CT Bowring, labelled *G. bigutta* Walker; 1♀, Interior Hainan, V.1920, coll. CT Bowring, LB Prout collection, BM1939-643; 1♂, Haikow, VI.1920, coll. CT Bowring, 'day flying moth', Rothschild Bequest BM1939-1; 2♂1♀, Porten, Hainan, VII.1904, Rothschild Bequest BM1939-1; 1♂3♀, Youboi, Hainan, VI.1904, Rothschild Bequest BM1939-1. **VIETNAM** (BMNH): 1♂, Tonkin, Thai-Nien River basin of Fleuve Rouge, 5.I.1924, coll. H. Stevens, Sladen-Godman Trust Expedition, BM 1924-341, BM Geometrid slide no. 13405.

Description. *Head.* Antennae bipectinate in both sexes, with long rami in male and short rami in female. Frons white, not protruding. Labial palpi about 1/3–1/2 extending beyond frons; first segment white and third segment black in both sexes; second segment white ventrally and black dorsally in male, white or mixed with black dorsally in female. Vertex, patagium and tegula white. *Thorax.* Thorax with dorsal side white. Two black spots on prothorax and one black spot at middle of metathorax. Hind tibia not dilated, without hair-pencil, with two pairs of spurs in both sexes. *Wing pattern.* Forewing length: male 27–32 mm; female 30–32 mm. Both wings with apex rounded. Forewing with outer margin almost straight; anal angle gently rounded. Hindwing with outer margin rounded, slightly projecting on vein M_3 end. Wings whitish, semi-transparent. Costa of forewing and terminal half of both wings scattered with greyish black spots. Base of forewing tinged with pale yellow, a black spot present, without fovea; grey patches between veins forming an oblique middle band on forewing. Hindwing with basal half totally grey, margin of grey area almost parallel to outer margin. Fringes white. Underside identical to upperside. *Abdomen.* Abdomen with dorsal side whitish; a black spot present at middle of the first to the fifth segment respectively. Third sternite of male abdomen without setal comb. Eighth sternite unmodified. *Male genitalia* (Fig. 7). Uncus broad basally, narrow centrally, inflated apically with upper half narrower than lower half, slightly concave at apex. Socii absent. Gnathos with median process hook-like, bearing a cluster of small spines apically. Valva broad, blunt terminally, slightly concave on ventral margin near apex; densely setose on sacculus, apex, ventral margin and distal half of costa. Coremata present. Transtilla a pair of slightly sclerotized processes. Juxta pocket-like basally, with a pair of strongly sclerotized and symmetric furcae; furca gradually broadened to a distinctly hooked and tapering apex, small spines restricted to the apex of each arm. Aedeagus with anterior half broad, bifurcate anteriorly, posterior half columniform and narrow, middle part much narrower, without cornutus. *Female genitalia* (Figs 13–14). Papillae analis short and oval. Apophyses anteriores short, about 1/5 as long as apophyses posteriores. Sterigma undeveloped. Ductus bursae very narrow, as long as corpus bursae. Corpus bursae globular; signum an irregular, incomplete sclerite on a circular base (Fig. 13), or sometimes a semicircular base (Fig. 14).

Diagnosis. On wing pattern, the new species is less marked than *G. simplex* (Fig. 6), and faintly marked as *G. bigutta* (Figs 3–4) and *G. dohertyi* (Fig. 5). In the male genitalia, the new species shares a similar valva and gnathos to the other three species in *Genusa*, but can be distinguished by the distinctive furca. The apex of each arm of the furca is strongly hooked and tapering in *G. hollowayi*, less hooked in *G. bigutta* (Fig. 8) and *G. dohertyi* (Fig. 9), rounded and blunt in *G. simplex* (Fig. 10). In addition, the spines on the furca are restricted to the apex in *G. hollowayi*, *G. dohertyi* and *G. simplex*, but spread down the shaft in *G. bigutta*. The uncus is also different, being apically inflated in *G. hollowayi*, but simply stick-like in *G. bigutta*, *G. simplex*, and slightly pointed in *G. dohertyi*. The species from Thailand and Burma (probably *destituta*), mentioned above, has arms of the furca relatively straight, and a narrower uncus (Fig. 11). In the species from Luzon (Fig. 12), the arms of the furca are hooked, but the shape of the uncus is much narrower.

Distribution. China (Hainan), Vietnam.

Etymology. The specific name is dedicated to Dr. Jeremy Holloway.



FIGURES 1–14. 1–6. Adults of *Genusa*. 1–2. *G. hollowayi* **sp. nov.** 1, male, holotype, IZCAS; 2, female, paratype, IZCAS; 3, *G. bigutta*, holotype, BMNH; 4, *G. destituta*, holotype, OUM; 5, *G. dohertyi*, holotype, BMNH; 6, *G. simplex*, BMNH; 7–12. Male genitalia of *Genusa*. 7, *G. hollowayi* **sp. nov.**, paratype; 8, *G. bigutta*, holotype, BM. 13388; 9, *G. dohertyi*, holotype, BM. 13398; 10, *G. simplex*, BM. 13392; 11, BM. 13404, probably *destituta*, from Thailand; 12, *Genusa* sp., BM. 13396, from Luzon; 13–14, female genitalia of *G. hollowayi* **sp. nov.**, paratypes. Scale bars = 1 mm.

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