ISSN 2079-178X

Hong Kong Entomological Bulletin

Volume 7 (1) OCTOBER 2015

Hong Kong Entomological Bulletin

Published by the Hong Kong Entomological Society

Volume 7 (1) October 2015

Contents

Cover photograph: *Eucamaragnathus angulicollis*, dorsal view, photo by B. Guénard, HKU.

The Hong Kong Entomological Bulletin publishes papers reporting on all aspects of Insecta in Hong Kong and the wider bioregion, including biology, behaviour, ecology, systematics, taxonomy, genetics and morphology. Papers can be original research results, reviews or short communications. There is no page limit to the manuscripts and no page charge will be applied. At the editors' discretion, an independent review of submitted manuscripts will be sought from an appropriate authority.

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First record of the Carabidae subfamily Apotominae LeConte, 1853 from Hong Kong

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ABSTRACT

The first record for the Apotominae LeConte, 1853 for Hong Kong is given. Previous records of the group for China are discussed.

Key words: Coleoptera, Carabidae, Apotominae, *Apotomus*, Hong Kong

INTRODUCTION

The Apotominae is a small subfamily, consisting of a single genus *Apotomus* Leconte with just over 20 species recorded in all zoological regions except the Neararctic (Erwin 1980), the distribution generally being irregular.

Specimens of *Apotomus* are quite distinctive and can be separated from all other Carabidae in Hong Kong in having the following four features:

1. mesacoxal cavities entirely enclosed by the sterna, the mesepimera not attaining the coxae, as in Harpalinae;
2. rocoxal cavities with two openings inwards;
3. mandibles with a fixed seta in the scrobe, as in Trechinae;
4. elytra entire at the apex.

There are three other features that make this genus very distinctive: obsolete lateral borders to the pronotum, body penduculate, and very long and narrow labial palps. These features, coupled with the long thin legs, give members of the genus the appearance of an Elmidae at first sight, at least in the author's experience.

It is only in the last 20 years that this subfamily has been recorded in China. Wrase (2003) lists no species as occurring in Hong Kong or China. However, Lei (1998) was the first to record this subfamily for China, recording the wide-ranging species *Apotomus atripennis* Motschulsky 1858 in Hubei Province. Tian (2000) described A*potomus qiongshanensis* Tian 2000 from Hainan Island.

DESCRIPTION

A female specimen (Figure 1) was collected on 23 September 2010 in Wang Tong, Lantau Island at night time, close to a mercury vapour light. It moved very slowly and was capable of flight. In this specimen the appendages and body parts were very weakly connected, such that when the abdomen was dissected all the appendages dropped off. The specimen was stored in dimethyl-hydantoin-formaldehyde . It was compared with at least one specimen of *A. qiongshanensis*, in the Insect collection of the South China Agricultural University, but differs from that species in being paler and lacking the pronotal foveae. It differs from *A. atripennis* in having the entirety of its antennae pubescent. It is probable that this is an undescribed species, though more material is needed in order to ascertain its status.

ACKNOWLEDGEMENT

I thank Ming-Yi Tian of The South China Agricultural University, Guangzhou, for the loan of Apotomus specimens.

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FIGURE

Figure 1. *Apotomus* sp. 23 September 2010 in Wang Tong, Lantau Island.

First record of the subfamily Hitelinae (Coleoptera, Carabidae) for Hong Kong and China

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ABSTRACT

The first record of *Eucamaragnathus angulicollis* (Jeanel 1937) and the subfamily Hitelinae for Hong Kong, China and the Palaearctic fauna (in the lateral sense) is given. The habitat requirements and where the specimen may have originated from are discussed.

Key words: Carabidae, Hitelinae, Coleoptera, Hong Kong, *Eucamaragnathus angulicollis*

INTRODUCTION

The Hiletinae is a small and little known subfamily of Carabidae with pan-tropical distribution. It contains two genera: *Hiletus* with six species confined to Tropical Africa and the more widely distributed *Eucamaragnathus* with 15 species (Erwin & Stork 1985 and Assman et al 2011).

METHODS

On 20 November 2014, Graham Reels was sampling with a dip net in Luk Keng marsh, as part of a Hong Kong University freshwater invertebrate survey he was conducting. In the waterlogged grasses and low-lying herbs at the back of Luk Keng village he netted a medium- to large-sized Carabidae beetle. This was passed on to the author, along with other Coleoptera specimens collected by Mr Reels during the course of the invertebrate survey. Most of these specimens are currently deposited in the author's collection.

RESULTS

Initial examination of the specimen revealed geniculate antennae (see figure 1), deeply sculptured head and zigzag shaped mandibles (figure 2) clearly indicating it did not belong to any of the previously known, locally occurring carabid groups. Using the key given in Andrewes (1929), the author was able to place the specimen in Hiletinae.. The specimen was identified as *Eucamaragnathus* (*Parahiletus*) *angulicollis* (Jeanel 1937) using Erwin & Stork's (1985) and Negre's (1967) keys.

Eucamaragnathus angulicollis (Jeanel 1937)

Differential diagnosis to known species of *Eucamaragnathus* after Erwin & Stork (1985):Elytron with stria five and seven continued to apex and with apex rounded; pronotum with lateral channel and adjacent surface punctate; abdominal sternum two coarsely punctured. The length of the Hong Kong specimen at 10.0 mm is slightly under the 10.8 - 12.0 mm range given by Erwin & Stork (1985).

Although only previously recorded from Vietnam, this species has quite a large distribution, the most southerly being Ho Chi Min city (Saigon), latitude 10o 45'N, to the most northerly; the type locality Chiem Hoa , latitude 22o 12'N (almost the same latitude as Hong Kong (22o 14'N).

ACKNOWLEDGEMENT

I thank Dr. Borislav Guéorguiev of the National Museum of Natural History, Sofia, Bulgaria for advice and help with literature and Dmitri Fedorenko, Russian Academy of Sciences for reviewing the original manuscript. I also thank Graham Reels of Hong Kong University for providing the specimen and Prof. Benoit Guénard; HKU for the imaging of *E. angulicollia*.

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FIGURES

Figure 1: Dorsal view of *Eucamaragnathus angulicollis* (Photo, B. Guénard)

Figure 2: Dorsal view of the head (Photo, B. Guénard)

Figure 3: Dorsal view of the pronotum (Photo, B. Guénard)

An agenielline wasp with a particular nest architecture: *Phanagenia* sp.1 (Pompilidae, Pepsinae)

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ABSTRACT

The nesting biology of *Phanagenia* sp.1 using nest trap is presented, it is the first detailed account of the natural history of the genus. I also give a detail description of both females and males. The species is a tube-renter building a linear succession of cells divided by mud partitions in pre-existing cavities. It preys on spiders in the family Araneidae. It is the first record of the genus *Phanagenia* in China and Hong Kong.

Key words: *Phanagenia* sp.1, Araneidae, tube-renter

INTRODUCTION

Phanagenia is a small genus comprised of African and Oriental species, and a single Nearctic representative *Phanagenia bombycina* (Cresson, 1867) (Wasbauer, 1987). There are eight Oriental species thus far described (Tsuneki, 1989), essentially from Taiwan and Japan, with none previously known from continental China (likely due to our knowledge paucity of the fauna of this region). The species discussed here is a new record for China and Hong Kong.

The biology of *Phanagenia* is mostly unknown. *P. bombycina* is the only species for which exists fragmentary information on parasitoids and nest architecture. It is known to build independent mud cells under rocks or bark (Peckham & Peckham, 1898; Peckham & Peckham, 1905; Savin, 1924; Townes, 1957; Krombein and Hurd, 1979b; Evans, 1997).
Species in the tribe Angeniellini are known to display varied nesting behaviours particularly with regards to nest architecture, from globular clusters of independent or agglutinated cells affixed to various substrates (Weaving, 1994; Kurczewski & Edwards, 2012; Barthélémy & Pitts; 2012) to linear successions of cells separated by mud partitions or other debris inside cavities (Weaving, 1994; Evans, 1997; Staab et al, 2014).
Because the present species readily accepts nest traps, I use the terminology of "renters" as accepted by others (Evans & West Eberhard, 1970; Iwata, 1976) to describe its nesting habits. The renting of a linear cavity (tube) where successive cells are built further qualifies its behaviour; this habit is variedly named as "wood-nesting", "cavity-nester" and "twig-nester" (Krombein, 1967; Evans & West Eberhard, 1970; O'Neil, 2001) but I have chosen here to differ by using "tube-renter" as a more explicit short for the behaviour.

Our current knowledge of the nesting habits of pepsines wasps is still rudimentary, particularly in *Phanagenia* spp. The present description adds information to the life histories of members of the tribe Angeniellini. It is to my knowledge the only detailed account of the nesting habits of the genus *Phanagenia* for which nothing was previously known.

MATERIALS & METHODS

The nesting biology of *Phanagenia* sp.1 was studied using nest traps made from hollow bamboo canes of various lengths and internal diameters, they were cut so that one end was closed by the nodal septum. Each segment was given a unique number and the canes were bound together in bundles of seven. The bundles were placed in and collected from the author's garden in Sai Kung Country Park, Hong Kong. They were always located in shaded environments, affixed to low branches of various trees. Upon collection these traps were opened using a pen knife to split the bamboo segment, and the contents were recorded. They were then placed individually in Ziploc® bags for brood emergence.
Measurements were taken with precision stainless steel callipers for cells, cell partition dimensions and cocoon wall thickness. At dissection, photographs of each nest and its contents were taken with a Nikon D200 equipped with a Nikkor 60mm macro-lens and a Sunpak D12 ring flash. Images were treated using Nikon Capture NX and Adobe Photoshop CS2 softwares. The habitus pictures of *Phanagenia* sp.1 were taken with Leica M205 C microscope and stacking software LAS v.4. at increments of 20-50 steps.

Spider prey were identified by Dickson Wong Chi Chun, Hong Kong based on photographic records.

RESULTS

I reared four nests of *Phanagenia* sp.1 and their physical data are presented in Table 1.

Phanagenia sp.1 specimens examined, all from the author's collection:

Females, series of 12 specimens; all Pak Sha O, Hong Kong, (UTM) 50Q KK 242 849, 70m (asl), C. Barthélémy, Refs.: 0499.A.Hy.1, 0496.A.Hy.1a, 0496.A.Hy.1b, M138.C.Hy.1,M066.C.Hy.4, M067.C.Hy.5a, M067.C.Hy.5b, M072.C.Hy.7, M097.C.Hy.3, M118.C.Hy.1a, M118.C.Hy.1a, M138.C.Hy.1.

Males, series of five specimens; all Pak Sha O, Hong Kong, (UTM) 50Q KK 242 849, 70m (asl), C. Barthélémy, Refs: M076.C.Hy.13a, M076.C.Hy.13b, 0496.A.Hy.2, 0497.A.Hy.1, 0535.A.Hy.1.

Specimens where either reared (references starting with a numeral) or caught in a Malaise trap (references starting with M).

DESCRIPTION OF SPECIES

Female Phanagenia sp.1 (Figs. 1-3)
Females 9.3-13mm long (mean = 11.3mm, n = 12) with a forewing span of 8.4-11mm (mean = 9.3mm, n = 12). Body mostly glabrous, save for the clypeus with sparse long setae apically and lateral-central part of pygidium. Body and legs uniformly coloured dark grey. Clypeus convex in lateral view, rounded apically and strait laterally. Forewing with vein M of cell 2Rs twice as long as vein M of cell 1Rs. Forewing with hyaline marking along the sides of veins Rs to 1cu-a and covering half of cell 2R1, 2RS, 2M and totally cell 1Rs.

Male Phanagenia sp.1 (Figs. 4-5)
Males 7.5-8.5mm long (mean = 7.9mm, n = 5) with a forewing span of 6.1-8.6mm (mean = 7mm, n = 5). Body covered in very short dense setae, most dense on the lateral sides of mesosoma, the gena and coxae, on clypeus extending above the antennal sockets, most dense below the sockets. In addition apical part of clypeus and mandibles with long sparse setae. Coxae with dense short setae. Legs with short setae less dense than body. Clypeus rounded. For wing with vein M of cell 2Rs 1/3 longer than vein M of cell 1Rs. Forewing markings similar to female, less marked particularly along veins Rs to 1cu-a. Body colouration identical to female, save for forelegs coloured brown to light brown (tarsi).

This is the first record of the genus for Hong Kong and China.

OBSERVATIONS & DISCUSSION

Nest architecture (Figs. 6-9)
In a departure from the known nesting biology of *P. bombycina* (Kurczewski & Edwards, 2012), the present species is a tube-renter and builds cells separated by mud partitions inside bamboo segments, but presumably also in any available linear cavities.

Phanagenia sp.1 uses a mixture of mud/clay to fashion thin cell partitions not too dissimilar to those of *Trypoxylon* spp. (Crabronidae) (Figs.6-7). In three out of four nests examined the mother fabricated a nest plug formed by a series of interspaced partitions, these were 3-12mm apart. A proper vestibular cell was formed on the same nests and was 20-80mm long (Fig.9). Nests of this species have 3-7 cells (mean = 3.8; n = 4) (Table 1), which measure 9-25mm long (mean 13.3; n = 13). This species uses cavities that are 4.5-11.5mm in diameter (mean = 8.7, n = 4), a rather wide range of 1:2.5. My small data set (15 cells, four nests) does not show any correlation between cell length and its rank within the nest and between the number of cells and the length of the cavity.
From the nest architecture of this species consisting of a succession of cells in a linear cavity, one can easily infer that the construction of a cell precedes prey capture as it would be impossible for the female to build any form of partition with a prey item present in the narrow cavity. Only in the first cell would the female place a prey item before construction began, as I never found any preliminary plugs in these cells. Construction before prey furnishing is a characteristic that *Phanagenia* sp.1 seems to share with all nest building pompilids (Shimuzu and Ishikawa 2002).

Prey
As with all other pompilids the mother provides one prey item per cell. As observed, none of the prey had been amputated which is rare amongst the tribe but could be explained by the spider's relatively small size.

The prey of *Phanagenia* sp.1 was ascertained in one instance, although it had been partially consumed and was identified as *Neoscona* sp. or *Araneus* sp., both in the family Araneidae (orb spinning spiders). The prey were mature specimens, but I was unable to ascertain their sexes. The known prey of *P. bombycina* belong to the families Lycosidae (*Lycosa avida* Walck, *L. gulosa* Walck), Salticidae (*Maevia vittata* (Henz)) and Agelenidae (*Agelenopsis* sp.) (Peckham & Peckham, 1898; Savin, 1924; Townes, 1957; Evans & Yoshimoto, 1962; Kurczewski & Kurczewski, 1968; Iwata, 1976; Krombein, 1979) which are all wandering spiders, although Agelenid spiders do weave sheet webs in grass, all have vastly different ecologies to that of Araneidae.

Brood (Fig. 8)
I was unable to determine the development time of the brood. Nests of *Phanagenia* sp.1 collected in late October and December saw the emergence of adults in end of March to mid-April the following year, with the larvae diapausing as pre-pupal larvae in their cocoons.
The double layered cocoons are typically pill shaped (Figs. 6-7). The first layer is a loose assemblage of silk strands that attaches and suspends the cocoon to the cell walls, while the second layer is finely spun silk. The cocoons of *Phanagenia* sp.1 are also firmly attached to the posterior cell partition via the meconium cap. The second layer of the cocoon measures 0.02-0.03mm thick, it is clear white when fresh, turning light brown after a few days.

On the 11 cells containing a live brood of *Phanagenia* sp.1, I obtained a sex ratio of approximately 1:1 female to male (6:5).

Voltinism
Nests of *Phanagenia* sp.1 collected in March had been initiated the previous year and the adult wasps emerged in April of the following year. The nests collected in October were possibly the last nests of the year, which would account for an active period of at least six months. From personal observations the average larval development time of many tube-renting aculeates wasps is rarely longer than 3-4 weeks in Hong Kong, save for diapausing larvae. In consequence it can be inferred that *Phanagenia* sp.1 is multivoltine locally, with presumably more than three generations a year.

Natural enemies and brood death

Out of 15 cells one was parasitised (6.66%) by an unidentified species of Chrysididae and three (20%) died for reasons not associated with parasitism, the brood not developing, the egg having probably failed as the prey were intact/unconsumed at opening of the nests. The total brood mortality was 26.66%.

Various parasitoids in the families Ichneumonidae, Eulophidae, Mutillidae and Pompilidae (Muesebeck et al., 1951; Townes, 1962; Krombein, 1963a & b; Krombein & Hurd, 1979a & b) have been reared from *P. bombycina*. Although the record I make here of a chrysidid wasp is not entirely surprising, it nevertheless adds to our knowledge of the life histories of *Phanagenia* spp.

CONCLUSION

The variability of nest biology within the tribe is well illustrated by this genus where vastly different architectures can be found for the two species for which it is known *Phanagenia* sp.1 and *P. bombycina*. The prey taken also shows intra-generic variability implying vastly different hunting grounds and techniques. It is not inconceivable that there may be even further variations within the genus as new descriptions are made.

Although many vespoid wasps have stereotyped behaviours, permitting generalisations of their biologies, the pompilids seem to be an exception and display a large array of variable behaviours, although generally considered “primitive”. Further studies on the life histories of the Oriental and African species of *Phanagenia* would be most interesting to increase our knowledge of this fascinating family.

ACKNOWLEDGMENTS

I am very grateful to, James Pitts, Utah State University, USA for his identification of *Phanagenia* sp.1 and the review of the original manuscript; Benoit Guenard and Ying Luo both from Hong Kong University for training me and giving me access to the Leica imaging station of the Department of Ecology (HKU). I also wish to extend my gratitude to Graham Reel, Hong Kong for editing the English on the original manuscript.

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FIGURES & TABLE

Trap reference	Date Collected	No. of Cells	Vestibular cells	Length, mm	Dia., mm	No. Cells Parasitised	Brood mortality (Non-Parasite)	Brood Mortality Total	No. of emerged adults
PSO-085.A2	13-Mar-11	2	?	140	4.5	0	0	0	2
PSO-197.A3	27-Oct-12	3	3	170	11.5	0	0	0	3
PSO-199.A1	27-Oct-12	7	2	167	11.3	1	2	3	4
PSO-248.A2	06-Dec-14	3	1(?)	174	7	0	1	1	2
	Total	**15**	**-**	**-**	**-**	**1**	**3**	**4**	**11**
	Mean	**3.8**	**2.5**	**162.8**	**8.6**	**0.3**	**0.8**	**1.0**	**2.8**
	Max.	**7.0**	**3.0**	**174.0**	**11.5**	**1**	**2.0**	**3.0**	**4.0**
	Min.	**3.0**	**2.0**	**140.0**	**4.5**	**0**	**0**	**0**	**2.0**

Table 1. Nest data of *Phanagenia* sp.1

Figure 1. Lateral habitus of female *Phanagenia* sp.1 (Photo Author)

Figure 2. Head view of female *Phanagenia* sp.1 (Photo Author)

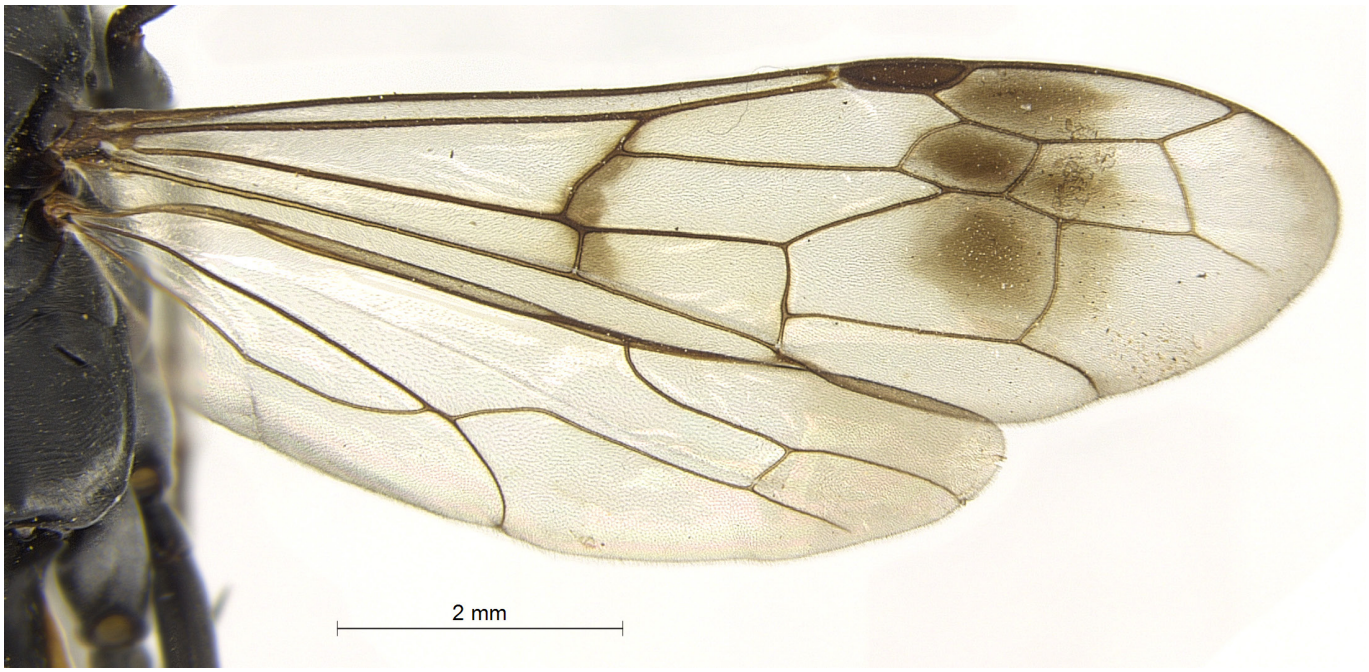

Figure 3. Wing of female *Phanagenia* sp.1 (Photo Author)

Figure 4. Lateral habitus of male *Phanagenia* sp.1 (Photo Author)

Figure 5. Head view of male *Phanagenia* sp.1 (Photo Author)

Figure 6. Typical nest of *Phanagenia* sp.1 at opening of trap, Trap ref. PSO-197.A3. (Photo Author)

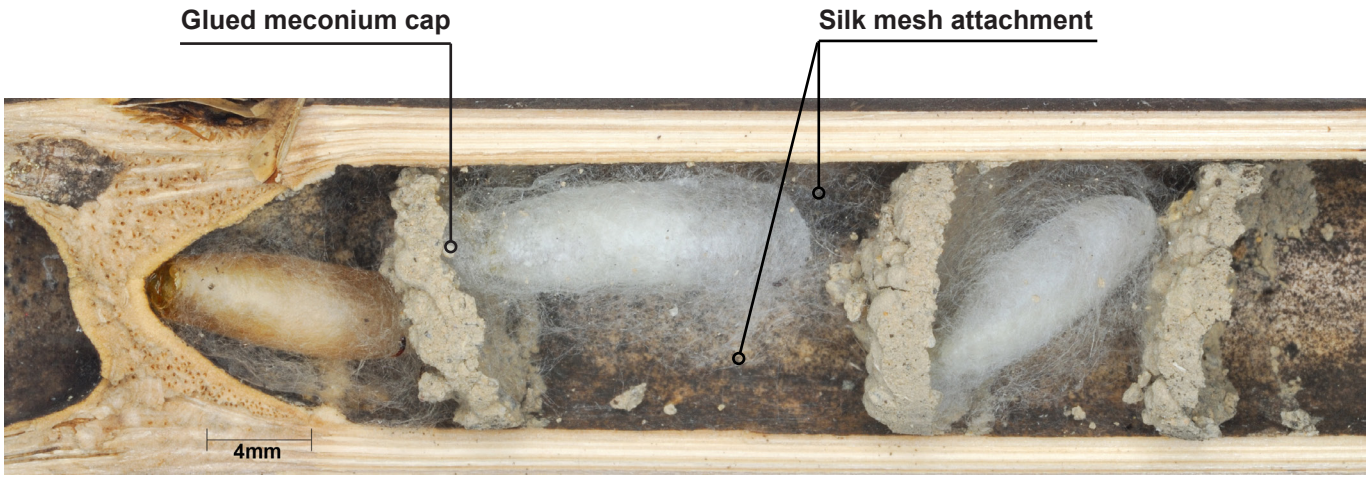

Figure 7. Cell arrangement and cocoons of *Phanagenia* sp.1, Trap ref. PSO-197.A3. (Photo Author)

Figure 8. Brood of *Phanagenia* sp.1, Trap ref. PSO-199.A1. (Photo Author)

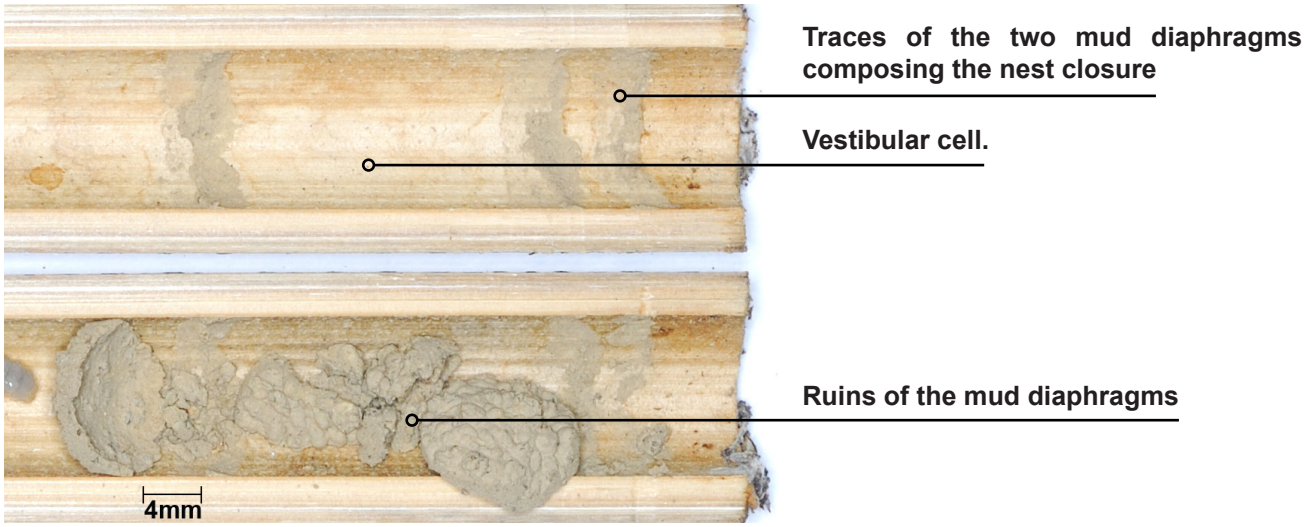

Figure 9. Nest closure of *Phanagenia* sp.1, Trap ref. PSO-199.A1. (Photo Author)

First record of the genus *Entoria* Stål, 1875 (Phasmida: Phasmatidae: Clitumninae) from Guangdong with descriptions of two new species

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ABSTRACT

The genus *Entoria* Stål, 1875 is reported for the first time from Guangdong, China. Two new species, *E. guangdongensis* **sp. nov**. and *E. heishidingensis* **sp. nov**., are described.

Key words: Phasmida, *Entoria*, new species, Guangdong, China

廣東新紀錄屬長肛蜷屬並記述二新種（蜷目：蜷科：克蜷亞科）

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摘要：本文首次報導廣東的新紀錄屬長肛蜷屬，並記述長肛蜷屬2新種：廣東長肛蜷 *Entoria guangdongensis* **sp. nov**. 及黑石頂長肛蜷 *Entoria heishidingensis* **sp. nov**.。

關鍵字：蜷目，長肛蜷屬，新種，廣東，中國

INTRODUCTION

Stål erected the genus *Entoria* in 1875 (Stål, 1875). Thirty-one species are recognized in this Palaearctic and Oriental genus (Otte and Brock, 2005; Hennemann et al., 2008; Chen and He, 2008; Ho, 2013a, 2013b). To date fourteen species are recognized for Mainland China and most of them occur in the southern regions including Hainan, Fujian, Sichuan, Zhejiang and Hong Kong. *Entoria* was not previously recorded from Guangdong until the present author collected some specimens during two recent collecting trips in the northern parts of Guangdong. They are described as new species, *Entoria guangdongensis* sp. nov. and *E. heishidingensis* sp. nov., in this paper.

MATERIALS AND METHOD

Illustrated drawings are based on the type material which were dried and pined after the collecting trips. No food plant feed by the collected specimens was observed. Measurements of the specimens are given in millimetres. Ootaxonomic description refers to Clark (1976a, 1976b, 1979, 1988, 1998) and Clark-Sellick (1997). The types are deposited in the private collection of George Ho Wai-Chun (GH), Hong Kong. The author has examined all type material of Entoria species which are deposited in Beijing Forestry University, Beijing, China (BFU), Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS), National Taiwan University, Taipei, Taiwan (NTU) and Tianjin Natural History Museum, Tianjin, China (TMNH). Types deposited in Natural History Museum, London, England (BMNH) and Naturhistorisches Museum Wien, Vienna, Austria (NHMW) are consulted with the images of Phasmida Species File Online (Brock, 2015). Compared with the described species, the two recently collected Guangdong taxa are considered undescribed. To advance our knowledge on the new taxa and its related taxa, a key to species of the genus from the continental China is given.

RESULTS

Genus *Entoria* Stål, 1875

Type-species: *Entoria denticornis* Stål, 1875, by subsequent designation of Kirby, 1904: 327.

Diagnosis: Body slender, dull colouration, mostly dark brown or dark gray in female and black in male. Head oval; female vertex with a pair of lamellae, spines or horns, male vertex with a pair of small spines or granule-like horns or unarmed. Antennae distinctly segmented, shorter than profemora. Thorax cylindrical; female usually covered with sparse and small granules; smooth in male. Abdomen cylindrical and slender; median segment shorter than metanotum; female anal segment with emargination posteriorly, supra-anal segment elongate, operculum scoop-shaped; male anal segment split into two semi-terga; cerci small in both sexes. Legs slender; female profemora with serrations, mesofemora and metafemora with lamellae basally; male femora lacking distinct armature, tibiae with small spines subapically.

Key to the species of *Entoria* from continental China

Female:

1. Profemora not serrate ventrally. . . **2**
- Profemora serrate ventrally. . . . **3**

2. Seventh sternum lacking preopercular organ. . . . *E. laminata* Cai & Liu, 1990 [Fujian]
- Seventh sternum with distinct preopercular organ. . . . . *E. hei* Ho, 2013 [Hong Kong]

3. Vertex with a pair of spines. . . . **4**
- Vertex with a pair of lamellate horns. . . **5**

4. Hind margin of anal segment with u-shaped emargination. . . . . .
. . *E. sichuanensis* Cai & Liu, 1990 [Sichuan]
- Hind margin of anal segment with v-shaped emargination. . . . . .
. . *E. fuzhouensis* Cai & Liu, 1990 [Fujian]

5. Apex of operculum not exceeding end of supra-anal segment. **6**
- Apex of operculum exceeding end of supra-anal segment. **7**

6. Mesonotum with sparse and small granules. .
. . *E. guangdongensis* **sp. nov**. [Guangdong]
- Mesonotum lacking granules. . .
. . . *E. wuyiensis* Cai & Liu, 1990 [Fujian]

7. Operculum lacking elevated keels anterolaterally.
. .*E. baishanzuensis* Chen & He, 1995 [Zhejiang]
- Operculum with elevated keels anterolaterally. **8**

8. Vertex with a pair of apically rounded horns. .
. . *E. heishidingensis* **sp. nov**. [Guangdong]
- Vertex with a pair of apically pointed horns. .
E. victoria Brock & Seow-Choen, 2000 [Hong Kong]

Male:

1. Vertex with a pair of small spines or small granule-like horns. **2**
- Vertex lacking small spines or small granule-like horns. **5**

2. Vertex with a pair of small granule-like horns.
. . . *E. bituberculata Bi,* 1993 [Fujian]
- Vertex with a pair of small spines. . . **3**

3. Semi-terga straight. .*E. hei* Ho, 2013 [Hong Kong]
- Semi-terga curved inward. . . . **4**

4. Mesotibiae and metatibiae lacking spines subapically. . . . . .
. *E. victoria* Brock & Seow-Choen, 2000 [Hong Kong]
- Mesotibiae and metatibia with 2-3 small spines subapically. . . . . .
. . *E. heishidingensis* **sp. nov.** [Guangdong]

5. Mesonotum with yellowish stripe. . . **6**
- Mesonotum lacking yellowish stripe. . . **7**

6. Legs with yellowish markings. . .
. *E. baishanzuensis* Chen & He, 1995 [Zhejiang]
- Legs lacking yellowish markings. . .
. . . *E. fujianensis* Cai & Liu, 1990 [Fujian]

7. Femora with black apex. . . .
. . . . *E. gracilis* Bi, 1993 [Fujian]
- Femora completely yellowish brown. . .
. . . . *E. humilis* Bi, 1993 [Fujian]

Entoria guangdongensis **sp. nov.** (Figs. 1-4, 11)

Types: Holotype, ♀, Ruyang, Ruyuan, Guangdong, China, 12.VI.2010, George Wai-Chun Ho; Paratype, 23 eggs (naturally laid by Holotype female), same data as Holotype female.

Differentiation: This new species is similar to *Entoria victoria* Brock & Seow-Choen, 2000 but differs in parallel-sided mesonotum, apex of operculum not reaching the end of supra-anal plate and apex of ovipositor not exceeding the tip of operculum.

Etymology: This new species is named after the type-locality, Guangdong.

Description of female (Figs. 1-2, 11): Large *Entoria*. Body slender. General colour of body and legs grayish brown, with blackish markings of irregular size.

Head: Oval, moderately tapering posteriorly after compound eyes. Vertex with a pair of lamellae, apices pointed apically and towards laterally; also with a shallow depression before the lamellae. Occiput slightly rounded. Median occipital furrow distinct, posterior apex reaching posterior margin of head. Compound eyes light brown, small, prominent and rounded. Ocelli very small and oval, placed above compound eyes. Antennae 26-segmented, covered with golden setae; first segment depressed and elliptical, median carina distinct, longer than combined length of second and third segments; third segment cylindrical, 2.5 times longer than second segment; terminal segment with rounded apices, 3 times longer than subapical segment.

Thorax: Pronotum shorter than head, broadened posteriorly, with longitudinal and transverse sulci crossing near centre, posterior margin rounded. Mesonotum 5.3 times length of pronotum, sparsely covered with small granules, parallel-sided, median line distinct. Mesopleurae with pale granules and small pits. Metanotum 3.5 times length of median segment, parallel-sided, with few small granules. Mesosternum and metasternum covered with minute granules, denser than mesonotum.

Abdomen: Cylindrical and slender, sparsely covered with short black setae, distinctly denser on ventral surface; also with small granules throughout abdomen. Median segment near square. Fifth tergum being longest segment. Fourth tergum almost as long as sixth tergum. Eighth tergum longer than combined length of ninth tergum and anal segment. Anal segment with u-shaped emargination on posterior margin. Supra-anal plate as long as eighth tergum, apex pointed. Operculum acuminate, with elevated keels anterolaterally, also with 6 lateral keels, not reaching apex of supra-anal plate. Ovipositor exposed, almost reaching apex of supra-anal plate, apex pointed. Cerci very small and short, tapering behind, apices pointed.

Legs: Very slender. Profemora almost as long as combined length of pronotum, mesonotum and metanotum,

with 10 to 11 serrations in basal half of posterodorsal carina, posteroventral carina with 11 to 12 serrations. Protibiae unarmed. Posterodorsal, anteroventral and posteroventral carinae of mesofemora and metafemora with a rounded lobe basally. Posterodorsal and posteroventral carinae of mesotibiae and metatibiae with a lobe near base. Mediodorsal carina of mesofemora and metafemora with a serrate lobe near apex. Mediodorsal carina of mesotibiae and metatibiae with a slightly raised lobe at base.

Male: Unknown.

Measurements: See Table 1.

Distribution: Guangdong (Ruyuan), China.

Description of eggs (Figs. 3-4): The capsule is cylindrical, brown to grayish brown, with irregular-sized black markings; surface rough, densely covered with minute granules, posterior pole rounded. Operculum flat, brown to grayish brown, covered with small granules, central area with a short tubercle; rim with sparse hair-like fringes. Micropylar plate oval shape, central ridge distinctly shorter than length of micropylar plate, as long as median line. Micropylar cup placed at the posterior area of micropylar plate.

Measurements: Length, 5.6-6.0; width, 1.2-1.3; height, 1.5-1.7.

Entoria heishidingensis **sp. nov.** (Figs. 5-10, 12-13)

Types: Holotype, ♀, Heishiding Nature Reserve, Fengkai, Guangdong, China, 25.VII.2012, George Wai-Chun Ho; Paratypes, 1♂, same data as holotype; 22 eggs (naturally laid by Holotype female), same data as Holotype female.

Differentiation: This new species is similar to *Entoria victoria* Brock & Seow-Choen, 2000 but can be separated by apically rounded horns on vertex and densely granulated thorax in female; and mesotibiae, and metatibia with 2-3 small spines subapically in male.

Etymology: This new species is named after the type locality, Heishiding Nature Reserve, Guangdong, China.

Description of female (Figs. 5-6, 12): Large *Entoria*. Body slender. Covered with short blackish setae. General colour of body and legs grayish brown.

Head: Oval, tapering posteriorly after compound eyes. Vertex with a pair of ear-like lamellae, thickened basally, apices rounded. Occiput slightly rounded. Median occipital furrow distinct. Compound eyes small, prominent and rounded, it length about 3.5 times in that of cheek. Antennae with 27 segments, covered with short setae; first segment depressed and elliptical, median carina distinct, longer than combined length of second and third segments; third segment cylindrical, 2 times longer than second segment; terminal segment with rounded apices, 3 times longer than subapical segment.

Thorax: Pronotum shorter than head, almost parallel-sided, with longitudinal and transverse sulci crossing at centre, anterior margin curved inward, posterior margin rounded. Mesonotum 5.5 times length of pronotum, covered with small granules, moderately expanded posteriorly, median line distinct. Metanotum 3.5 times length of median segment, with lesser granules than mesonotum.

Abdomen: Cylindrical and slender. Median segment near square. Sixth tergum being longest segment. Seventh tergum as long as eighth tergum. Seventh sternum with indistinct preopercular organ. Eighth tergum shorter than ninth tergum. Anal segment shorter than eighth tergum, longer than ninth tergum, with u-shaped emargination on posterior margin. Supra-anal plate elongate, as long as combined length of ninth tergum and anal segment. Operculum acuminate, with elevated keels anterolaterally, also with 6 lateral keels, exceeding posterior apex of supra-anal plate. Ovipositor exposed, exceeding posterior apex of operculum, apex pointed. Cerci small and short, tapering behind, apices pointed. Legs: Very slender. Left mid leg and left hind leg lost. Profemora almost as long as combined length of pronotum, mesonotum and metanotum, with 10-13 serrations evenly distributed on posterodorsal carina, posteroventral carina with 6 serrations. Right protibia with a triangular lamella near apex. Anteroventral and posteroventral carinae of right mesofemur and right metafemur with a rounded lobe basally. Medioventral carina of right mesotibia and right metatibia with a raised lobe at base. Male (Figs. 7-8, 13): Medium-sized. Smaller and thinner than female. Body slender. Dull colour, generally in black.

Head: Light brown. Oval, tapering posteriorly. Vertex with a pair of granule-like horns between compound eyes. Occiput moderately convex. Compound eyes small and rounded, its length about 3 times in that of cheek. Antennae with 26 segments, almost reaching apices of protibia; first segment constricted and depressed basally, 4 times length of second segment, as long as third segment.

Thorax: Pronotum light brown, shorter than head, parallel-sided, anterior margin curved inward, posterior margin truncate; transverse and longitudinal sulci crossing at centre. Mesonotum 7.3 times length of pronotum, shorter than mesofemora, with distinct median carina. Metanotum shorter than mesonotum, 5.3 times length of median segment.

Abdomen: Smooth and slender. Median segment black with light brown posterior margin, rectangular, longer than wide. Fourth to sixth terga equal in length. Seventh tergum shorter than sixth tergum. Eighth tergum expanded posteriorly. Anal segment as long as eighth tergum, longer than ninth tergum, dilated as two distinct segments; both semi-terga with thickened apices, in-

ner surfaces with minute teeth, strongly curved inward. Poculum cup-shaped, reaching posterior margin of ninth tergum. Cerci short, slightly curved inward, apices rounded.

Legs: All legs rufous brown, darker at apices. Left foreleg and right hind leg lost. Profemur unarmed, curved basally, longer than metafemur. Metafemur shorter than combined length of head, pronotum and mesonotum. Apex of metafemur reaching seventh tergum. Anteroventral and posteroventral carinae of mesofemora and metafemur with 3-6 indistinct spines subapically. Mesotibiae and metatibia with 2-3 small spines subapically.

Measurements: See Table 1.

Distribution: Guangdong (Fengkai), China.

Description of eggs (Figs. 9-10): The capsule is cylindrical, bluish grey; surface rough, densely covered with minute granules, posterior pole rounded. Operculum flat, grayish brown, covered with small granules; rim with sparse hair-like fringes. Micropylar plate oblong, central ridge as long as the length of micropylar plate, longer than median line. Micropylar cup placed near the posterior area of micropylar plate.

Measurements: Length, 4.2-4.4; width, 1.0-1.1; height, 1.2-1.3.

DISCUSSION

Entoria Stål, 1875 is a rather diversified genus with currently sixteen recognized species in the Clitumninae of Mainland China (Hennemann et al., 2008; Chen and He, 2008; Ho, 2013a, 2013b). Most species were described based on single or couple of specimens, which could cause difficulty in identifying existing or new taxa. Eggs obtained from the collected specimens are important to assist identification. Further collections of the existing taxa from type locality and study including DNA barcoding should be done to advance our knowledge on the genus and its closely related genera such as Mesentoria Chen & He, 2008, Metentoria Brunner von Wattenwyl, 1907 and Paraentoria Chen & He, 1997.

ACKNOWLEDGMENTS

I wish to thank deeply Paul Brock (United Kingdom) for giving valuable comments to the improvement of the manuscript; staff of the Heishiding Nature Reserve, Guangdong, China for their kind assistance; and Beijing Forestry University, Beijing, China, Institute of Zoology, Chinese Academy of Sciences, Beijing, China, National Taiwan University, Taipei, Taiwan and Tianjin Natural History Museum, Tianjin, China for giving access to the corresponding collections.

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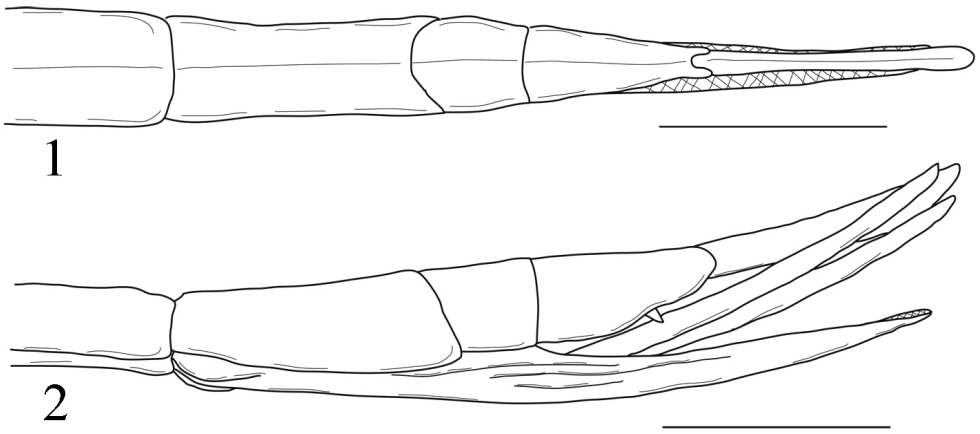
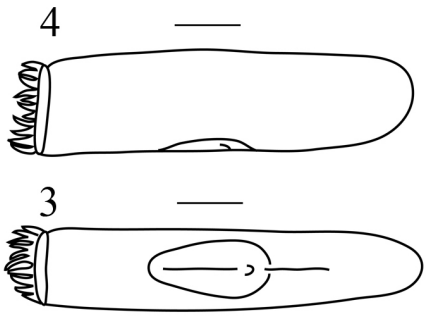
TABLE & FIGURES

Body part	***Entoria guangdongensis* sp. nov.**	***Entoria heishidingensis* sp. nov.**	
	Holotype female	**Holotype female**	**Paratype male**
Body	136	133	102
Head	7	7	4
Antennae	16	16	43
Pronotum	4.5	4	3
Mesonotum	24	22	22
Metanotum	14	14	16
Median segment	4	4.5	3
Profemur	44	41	49(right)
Mesofemur	28	24(right)	31
Metafemur	35	32(right)	39(right)
Protibia	49	51	49(right)
Mesotibia	32	29(right)	36
Metatibia	43	37(right)	48(left)

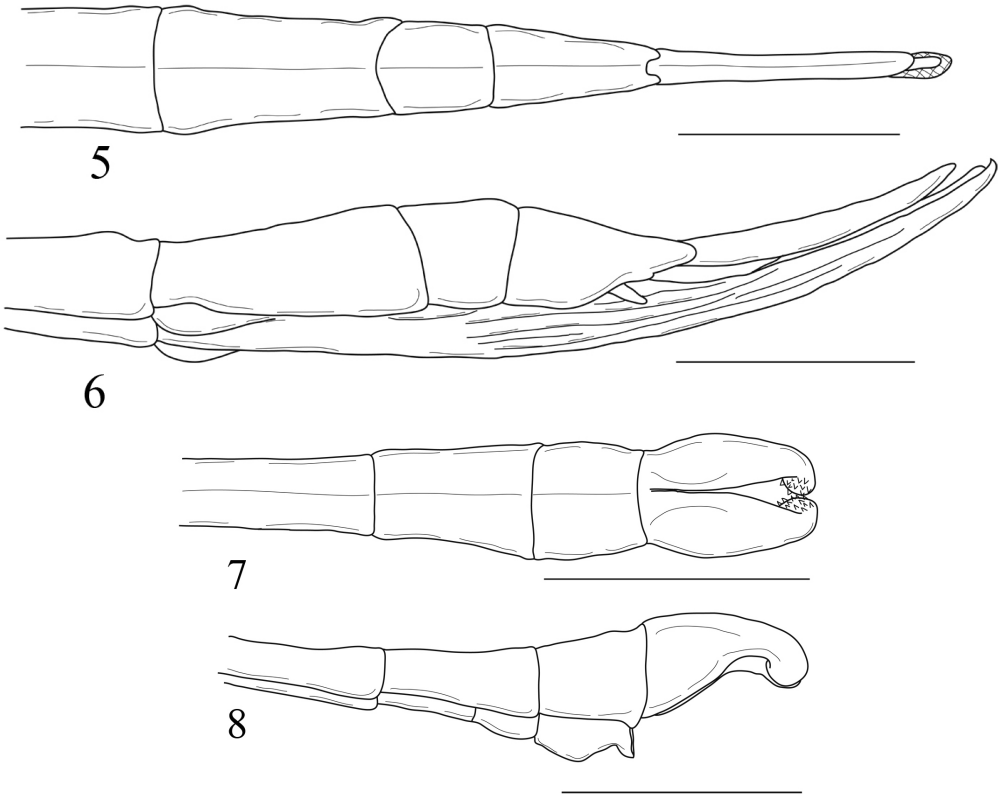
Table 1. Measurements of *Entoria guangdongensis* **sp. nov**. and *Entoria heishidingensis* **sp. nov**. (mm.)



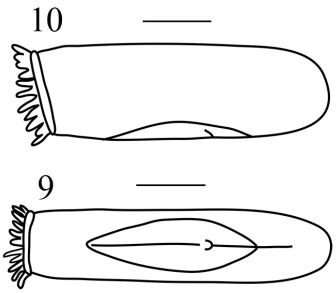
Figures 1-2. *Entoria guangdongensis* **sp. nov**. [scale bar 5 mm] (Drawings by author). 1. Female, end of abdomen, dorsal view. 2. Female, end of abdomen, lateral view



Figures 3-4. *Entoria guangdongensis* **sp. nov**. [scale bar 1 mm] (Drawings by author). 3. Egg, dorsal view. 4. Egg, lateral view



Figures 5-8. *Entoria heishidingensis* **sp. nov**. [scale bar 5 mm] (Drawings by author). 5. Female, end of abdomen, dorsal view. 6. Female, end of abdomen, lateral view. 7. Male, end of abdomen, dorsal view. 8. Male, end of abdomen, lateral view.



Figures 9-10. *Entoria heishidingensis* **sp. nov**. [scale bar 1 mm] (Drawings by author). 9. Egg, dorsal view. 10. Egg, lateral view

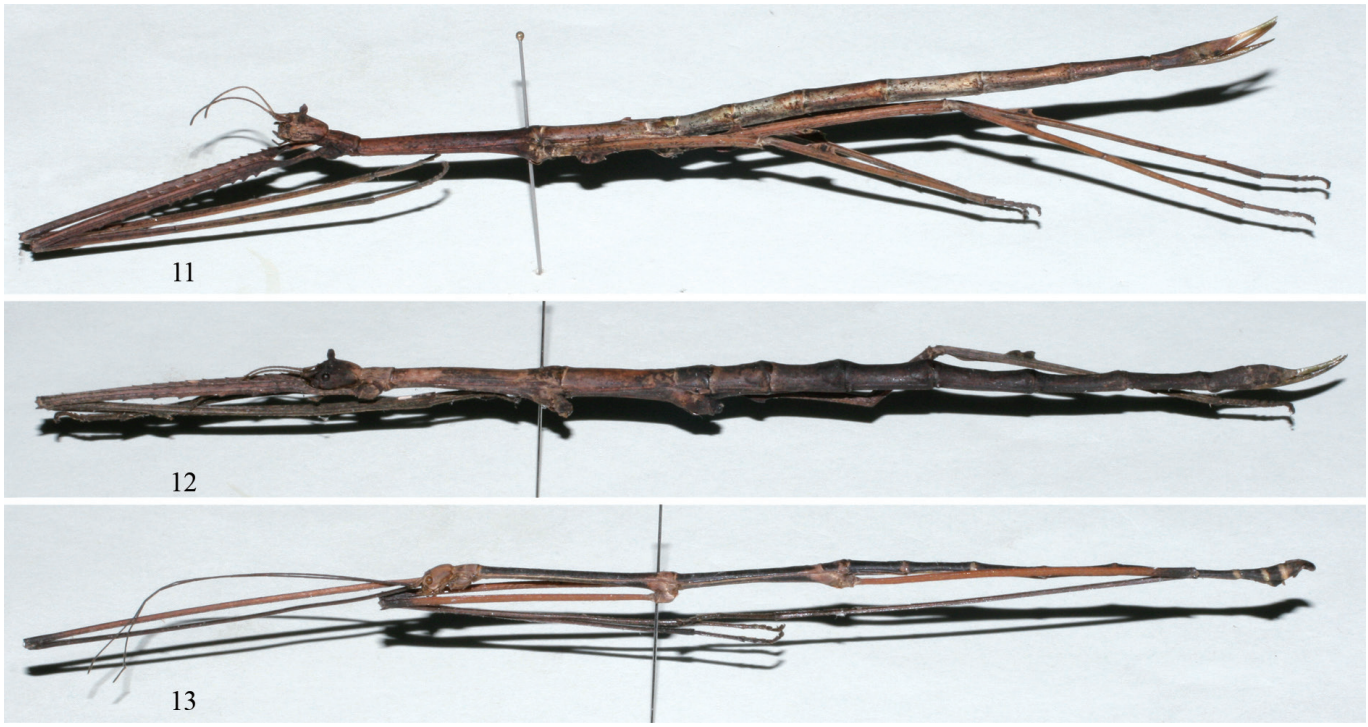


Figure 11-13. Habitus of *Entoria* spp. (Photo by author). 11. *Entoria guangdongensis* **sp. nov**., female, holotype. 12. *Entoria heishidingensis* **sp. nov**., female, holotype. 13. *Entoria heishidingensis* **sp. nov**., male, paratype.