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The new Oriental stick insect genus *Baculomia* gen. nov. with two new species from Vietnam including the first stick insect feeding on sugarcane (Phasmida, Phasmatidae, Clitumninae, Clitumnini)

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Front cover: *Baculomia pumatensis* et sp. nov., Vietnam, Nghe An Province, Pu Mat National Park, 4–9.VII.2017. Left: ♂, right: ♀.

The new Oriental stick insect genus *Baculomia* gen. nov. with two new species from Vietnam including the first stick insect feeding on sugarcane (Phasmida, Phasmatidae, Clitumninae, Clitumnini)

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Abstract

The genus *Baculomia* gen. nov. is described in the tribe Clitumnini to accommodate two new species from Vietnam and *Ramulus siamensis* (Brunner von Wattenwyl, 1907) from Thailand. *Baculomia pumatensis* sp. nov. from Pu Mat National Park is described based on both sexes and egg and *B. baviensis* sp. nov. is described from a single male from Ba Vi National Park. The new combination *Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov. is proposed. An identification key and a distribution map are provided as well as details on the biology of *B. pumatensis* sp. nov. that was found feeding on spontaneous sugarcane, *Saccharum officinarum* L. (Poaceae), and on *Rubus* sp. (Rosaceae).

Keywords: Phasmatodea, *Ramulus*, Indochina, Global Taxonomy Initiative, sugarcane.

Introduction

The identification of specimens of stick insects collected in the framework of the Global Taxonomy Initiative project “A step further in the entomodiversity of Vietnam” revealed that a new genus needs to be erected to include two new species from North and northern Central Vietnam. The new genus belongs to the Clitumnini in the Clitumninae. Five genera and 17 species of Clitumnini are currently recorded from Vietnam (BROCK *et al.*, 2019), twelve of which are in the genus *Ramulus* Saussure, 1862. Scrutiny of the species currently in *Ramulus* led to the conclusion that *R. siamensis* (Brunner von Wattenwyl, 1907) also belongs to the newly recognized genus.

The present paper aims to describe the new genus *Baculomia* gen. nov. and the two new species from Pu Mat and Ba Vi national parks respectively, to transfer *Ramulus siamensis* to the new genus and to provide a distribution map and identification key to the treated species.

Material and methods

Due to their nocturnal behaviour, the specimens of *Baculomia* gen. nov. were collected at night. A light-weight and water-proof Petzl MYO RXP head torch was used during collecting. Females were kept alive in a mesh pop up cage (exo terra explorarium™) for producing eggs. The specimens were euthanized by an injection with ethanol, then stored in airtight plastic “zip”-bags in wood chips (used in rodent cages) and sprinkled with ethylacetate (EtOAc) to

prevent rotting, mould and to keep the specimens flexible. The bags were frozen on arrival and the specimens mounted later on.

For each picture of the new species, a number of photographs were taken with a Canon 700D camera equipped with a Sigma 50 mm Macro lens (for adults), or with a Leica EZ4W stereomicroscope with integrated camera (for eggs), stacked with CombineZ software and optimized with Adobe Photoshop CS3. The distribution map was produced with SimpleMapp (SHORTHOUSE, 2010). Observations were done with a Leica MZ8 stereomicroscope and measurements taken with an electronic calliper.

The nomenclature of the morphological characters follows BRAGG (2001); the egg morphology follows that of CLARK SELICK (1997; 1998). The description of the colouration is based on live specimens.

Micro-ct scanning and data acquisition of an egg of *Baculomia pumatensis* sp. nov. were performed using the XRE UniTOM system (TESCAN, XRE GHENT Belgium). No filter was used. Following parameters were set: tube voltage of 70 kV, tube power of 3 W and exposure time of 1600 ms. Finally 1500 projections (1 average per image) at a voxel size of 2 µm were acquired during the scanning process. The resulting projections were reconstructed using the XRE Recon software version 1.0.0.65. For the visualization, rendering of the data and to create a video, the software Drishti version 2.6.5 was used. The exported video was finally edited into the software Shotcut version 5.6.1. to add text annotations.

Acronyms used for the collections:

MNHN = Muséum National d'Histoire Naturelle, Paris, France.

RBINS = Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

VNMN = Vietnam National Museum of Nature, Hanoi, Vietnam.

Abbreviations:

N.P.: National Park

HT: holotype

PT: paratype

Taxonomy

Family **Phasmatidae** Gray, 1835

Subfamily **Clitumninae** Brunner von Wattenwyl, 1893

Tribe **Clitumnini** Brunner von Wattenwyl, 1893

Genus ***Baculomia* gen. nov.**

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Type species: *Baculomia pumatensis* Bresseel & Constant sp. nov. by present designation.

ETYMOLOGY. The genus name is formed by the combination of the Latin noun *baculum*, meaning stick, and “mia”, derived from the Vietnamese name “cây mía”, designating plants of the genus *Saccharum* L. (Poaceae; sugarcane and allies). The name refers to the stick-like shape of the body and to one of the host plants observed for a species of the genus.

DIAGNOSIS

The genus can be differentiated from all other known genera of Clitumnini, 1893 by the following combination of characters:

- 1) Characteristic head shape, head smooth with widest part at eyes and slightly tapering towards the posterior.
- 2) Head almost twice as long as pronotum and only slightly wider than pronotum.
- 3) Praeopercular organ in females absent.
- 4) Female subgenital plate only slightly longer than tergum VII; about as high as anal segment, with mediolongitudinal carina in the posterior half.
- 5) Poculum of males relatively flat, projecting over posterior margin abdominal tergum IX.
- 6) Egg very small compared to body size, with capsule angular and rugose, operculum flat, polar area concave; micropylar plate flat, not protruding on lateral surfaces of capsule.

Baculomia gen. nov. is very similar to the Clitumnini genera *Cuniculina* Brunner von Wattenwyl, 1907, *Parabaculum* Brock, 1999 and *Ramulus* Saussure, 1862 but can be easily distinguished from these genera by comparing the length of the subgenital plate (or the last three abdominal terga) of the females with tergum VII. *Baculomia* gen. nov. has the subgenital plate as long or indistinctly longer than tergum VII whereas in *Cuniculina* and *Ramulus* it is distinctly longer than tergum VII; in *Parabaculum*, the subgenital plate is almost twice as long as tergum VII. *Cuniculina* can also be easily distinguished by its egg morphology with the capsule strongly elongated, the polar area deeply incised, the operculum bearing a high rim tapering and ending in a tip dorsally.

DESCRIPTION.

Body: stick-like with comparatively large head.

Head: surface smooth; distinctly longer than wide with widest part at eyes, slightly narrowing towards the posterior; dorsal portion slightly convex with indistinct mediolongitudinal line. Antennae relatively short, consisting of 24–35 segments. Scapus elongated, strongly flattened dorsoventrally. Pedicellus very short, distinctly narrower than scapus and knob-like.

Thorax: pronotum smooth, distinctly shorter and narrower than head; lateral margins slightly sinuate; anterior margin concave and slightly raised. Prozona with mediolongitudinal line and shallow impression medially; central transverse impression not reaching lateral margins; posterior margin more or less straight. Mesonotum with raised mediolongitudinal line; more or less parallel-sided; slightly wider at anterior and posterior margins.

Legs: profemora compressed and curved basally, distinctly higher than wide; all carinae present. Mesofemora with few minute black spines along posterior portion of medioventral carina. Metafemora longer than mesofemora, armed as mesofemora.

Abdomen: median segment and abdominal terga smooth.

Males with tergum X split into two semi-tergites with inner surface armed with minute, black hook-like teeth. Vomer absent. Cerci relatively short, slightly incurving, not reaching apex of semi-tergites. Poculum slightly projecting over abdominal tergum IX, with basal portion convex; apical portion tapering.

Females with tergum X slightly longer than IX and slightly tectiform, very weakly notched posteriorly. Epiproct developed, triangular and with mediolongitudinal carina. Cerci elongated, more or less cylindrical, reaching apex of abdomen. Subgenital plate narrow and almost parallel-sided in ventral view, strongly tapered posteriorly; slightly keeled, with a mediolongitudinal carina in posterior half and reaching posterior margin of anal segment.

NOTE. The new genus *Baculomia* gen. nov. is a typical stick-like Clitumninae with antennae shorter than the profemora; males have a longitudinally split, internally dentate anal segment and lack an external vomer. *Baculomia* gen. nov. is placed in the tribe Clitumnini following the key to the tribes of Clitumninae provided by HENNEMANN & CONLE (2008).

Species included

<i>B. baviensis</i> sp. nov.	[Vietnam, Ba Vi N.P.]
<i>B. pumatensis</i> sp. nov.	[Vietnam, Pu Mat N.P.]
<i>B. siamensis</i> (Brunner von Wattenwyl, 1907) comb. nov.	[Thailand]

Identification key to the species of *Baculomia* gen. nov.

MALES

1. Body colouration predominantly orange 2
- Body colouration without any orange.....*Baculomia baviensis* sp. nov.
2. Head orange, meso- and metafemora green
.....*Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov.
- Head whitish with mediolongitudinal black line, meso- and metafemora orange
.....*Baculomia pumatensis* sp. nov.

FEMALES*

1. Meso- and metatibiae with ventral carinae unarmed.....
.....*Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov.
- Meso- and metatibiae with distinct small spines on the ventral carinae in the posterior portion.....*Baculomia pumatensis* sp. nov.

* The female of *B. baviensis* sp. nov. is unknown.

***Baculomia baviensis* sp. nov.**

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Figs 1–2

ETYMOLOGY. The species epithet refers to the type-locality of the species, Ba Vi National Park in North Vietnam.

TYPE MATERIAL. VIETNAM: holotype ♂: Vietnam, Hanoi pr., Ba Vi N.P., 21°4'4"N 105°21'30"E, 25-29.VI.2015, night collecting, leg. J. Constant & J. Bresseel, I.G.: 33.092 (RBINS).

DIAGNOSIS. Easily distinguished from the two other species of *Baculomia* gen. nov. by its body without orange, unarmed tibiae, the rounded apex of the poculum and the much shorter and broader, apically more or less rounded semi-tergites. Female and eggs unknown.

DESCRIPTION.

MALE (Fig 1)

Measurements: see table 1.

Colouration: head light brown, with some darker brown markings; two longitudinal dark lines behind eyes. Pronotum pale brown with black mediolongitudinal line. Meso- and metanotum, median segment and abdominal terga with three black longitudinal stripes, one medially and the others laterally. Femora and tibiae orange brown with darkened apex.

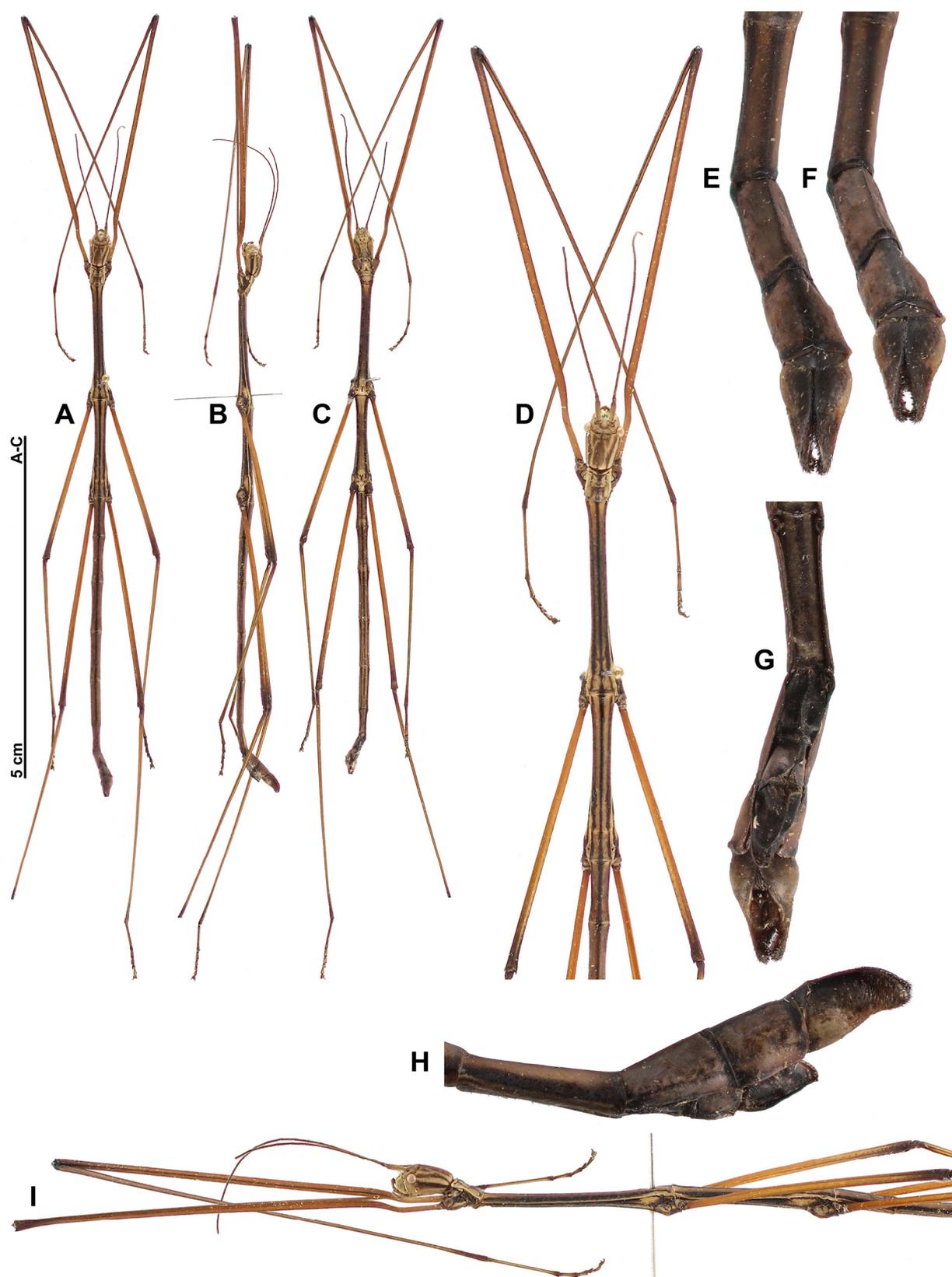


Fig. 1. *Baculomia baviensis* sp. nov., holotype ♂ (RBINS). A, habitus, dorsal view. B, habitus, lateral view. C, habitus, ventral view. D, head and thorax, dorsal view. E, terminalia, anterodorsal view. F, terminalia, dorsal view. G, terminalia, ventral view. H, terminalia, lateral view. I, head and thorax, lateral view.

Head: surface smooth, about two times longer than wide, with widest part at eyes, slightly narrowing towards the posterior; dorsal portion slightly convex with weak mediolongitudinal line, more definite near occiput. Eyes quite small, circular and projecting. Antennae relatively short, consisting of 24 segments ($n = 1$). Scapus elongated, strongly flattened dorsoventrally with lateral margins almost straight. Pedicellus very short, distinctly narrower than scapus and knob-like. Antennomere III longer than IV and V combined.

Thorax: pronotum smooth, distinctly shorter and narrower than head. Lateral margins slightly sinuate; anterior margin concave and slightly raised. Anterolaterally with a minute impression. Prozona with a mediolongitudinal line and a shallow impression medially. Central transverse impression not reaching lateral margins. Metazona with weak mediolongitudinal line not reaching posterior margin. Posterior margin more or less straight. Mesonotum with a raised mediolongitudinal line; more or less parallel-sided with anterior and posterior margins slightly wider; about six times as long as pronotum. Mesopleura smooth. Metanotum as mesonotum, about four times as long as pronotum. Metapleura as mesopleura.

Legs: profemora compressed and curved basally, distinctly higher than wide. All carinae present and unarmed. Mesofemora with few minute black spines along posterior portion on medioventral carina. Metafemora longer than mesofemora, armed as mesofemora. Protibiae carinate, distinctly longer than profemora and unarmed. Mesotibiae slightly longer than mesofemora, carinate and unarmed. Metatibiae slightly shorter than metafemora, armed as mesotibiae. Probasitarsus strongly elongated, longer than following tarsomeres combined.

Abdomen: median segment slightly shorter than pronotum. Abdominal terga smooth, terga II–IV gradually increasing in length; IV–V about the same length; VI–VII gradually decreasing in length; VIII about half the length of VII and widening towards the posterior; IX slightly shorter than VIII; X split into two semi-tergites with inner portion armed with minute, black hook-like spines. Semi-tergites tapering from lateral view, slightly incurving with apex rounded. Vomer absent. Cerci relatively short, slightly incurving, not reaching apex of semi-tergites. Poculum slightly projecting over abdominal tergum IX and with basal portion convex; apical portion flattened and tapering; apex rounded from ventral view (slightly deformed in the preserved specimen).

BIOLOGY. The specimen was collected at night time, in subtropical evergreen forest.

Table 1. Measurements [in mm] of *Baculomia baviensis* sp. nov.

<i>Length of</i>	HT ♂
Body:	82.9
Head:	5.5
Pronotum:	3.0
Mesonotum:	17.2
Metanotum:	12.0
Median segment:	2.7
Profemora:	37.6
Mesofemora:	22.9
Metafemora:	30.3
Protibiae:	43.8
Mesotibiae:	25.1
Metatibiae:	34.5

DISTRIBUTION. Vietnam, Hanoi Province (Fig. 2).



Fig. 2. *Baculomia* spp., distribution map.

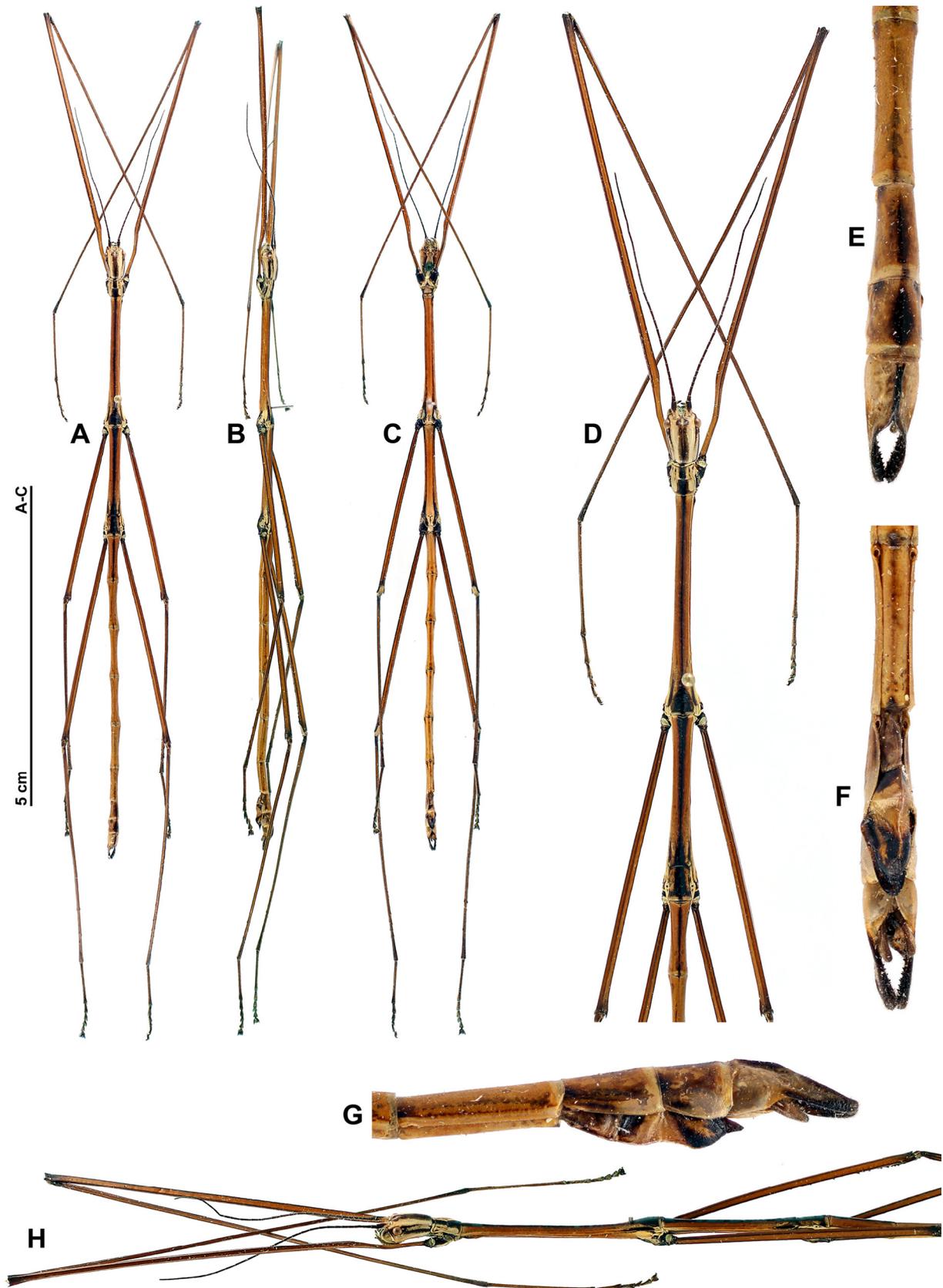


Fig. 3. *Baculomia pumatensis* sp. nov., holotype ♂ (RBINS). A, habitus, dorsal view. B, habitus, lateral view. C, habitus, ventral view. D, head and thorax, dorsal view. E, terminalia, dorsal view. F, terminalia, ventral view. G, terminalia, lateral view. H, head and thorax, lateral view.

***Baculomia pumatensis* sp. nov.**

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Figs 2–9

ETYMOLOGY. The species epithet refers to the type-locality of the species, Pu Mat National Park in northern Central Vietnam.

TYPE MATERIAL. VIETNAM: holotype ♂: Nghe An Province, Pu Mat National Park, 18°59'N 104°40'E, 4–9.VII.2017, night collecting, GTI project, leg. J. Constant & J. Bresseel, I.G.: 33.498 (RBINS).

Paratypes (23♂♂, 16♀♀): same data as holotype (20♂♂, 13♀♀: RBINS; 3♂♂, 3♀♀: VNMN).

ADDITIONAL MATERIAL. Eggs: same data as holotype (RBINS).

DIAGNOSIS. Males are easily distinguished from *B. baviensis* sp. nov. by their predominantly orange body colouration, meso- and metatibiae armed with minute spines on all carinae in the distal portion, the triangular apex of the poculum and much longer and slender semi-tergites. It can be distinguished from *B. siamensis* (Brunner von Wattenwyl, 1907) comb. nov. by the lack of orange on the head in males and the rounded posterolateral angles of the anal segment in females (acute in *B. siamensis*).

DESCRIPTION.

MALE (Figs 3–4)

Measurements: see table 2.

Colouration: head and pronotum whitish with broad black line dorsally; two longitudinal black lines behind eyes. Antennae with scapus whitish on basal half and black on distal half; other antennomeres black. Meso- and metanotum orange brown, with black mediolongitudinal line and black triangular marking posteriorly. Median segment orange brown with broad black mediolongitudinal line and transverse subapical black marking. Abdominal terga II–VII orange brown with black mediolongitudinal line on terga II and VII. Femora and tibiae orange brown with black carinae.

Head: surface smooth and glossy, about two times longer than wide, with widest part at eyes; dorsally slightly convex with small raised area between eyes; mediolongitudinal line behind raised area. Eyes quite small, circular and projecting. Antennae relatively short, consisting of 28–32 segments ($n = 5$). Scapus elongated, strongly flattened dorsoventrally with inner margin almost straight and outer margin rounded. Pedicellus very short, distinctly narrower than scapus and knob-like. Antennomere III longer than IV and V combined.

Thorax: pronotum smooth, distinctly shorter and narrower than head. Lateral margins slightly sinuate; anterior margin concave and slightly raised; minute impression anterolaterally. Prozona with mediolongitudinal line and shallow impression medially; central transverse impression not reaching lateral margins. Metazona with indistinct mediolongitudinal line not reaching posterior margin; posterior margin more or less straight. Mesonotum with raised mediolongitudinal line, more or less parallel-sided with anterior and posterior margins slightly wider; lateral margins slightly thicker; about six times the length of pronotum. Mesopleura smooth. Metanotum as mesonotum, about four times the length of pronotum. Metapleura as mesopleura.

Legs: profemora compressed and curved basally, distinctly higher than wide. All carinae present and unarmed; medioventral carina indistinct. Mesofemora with medioventral carina

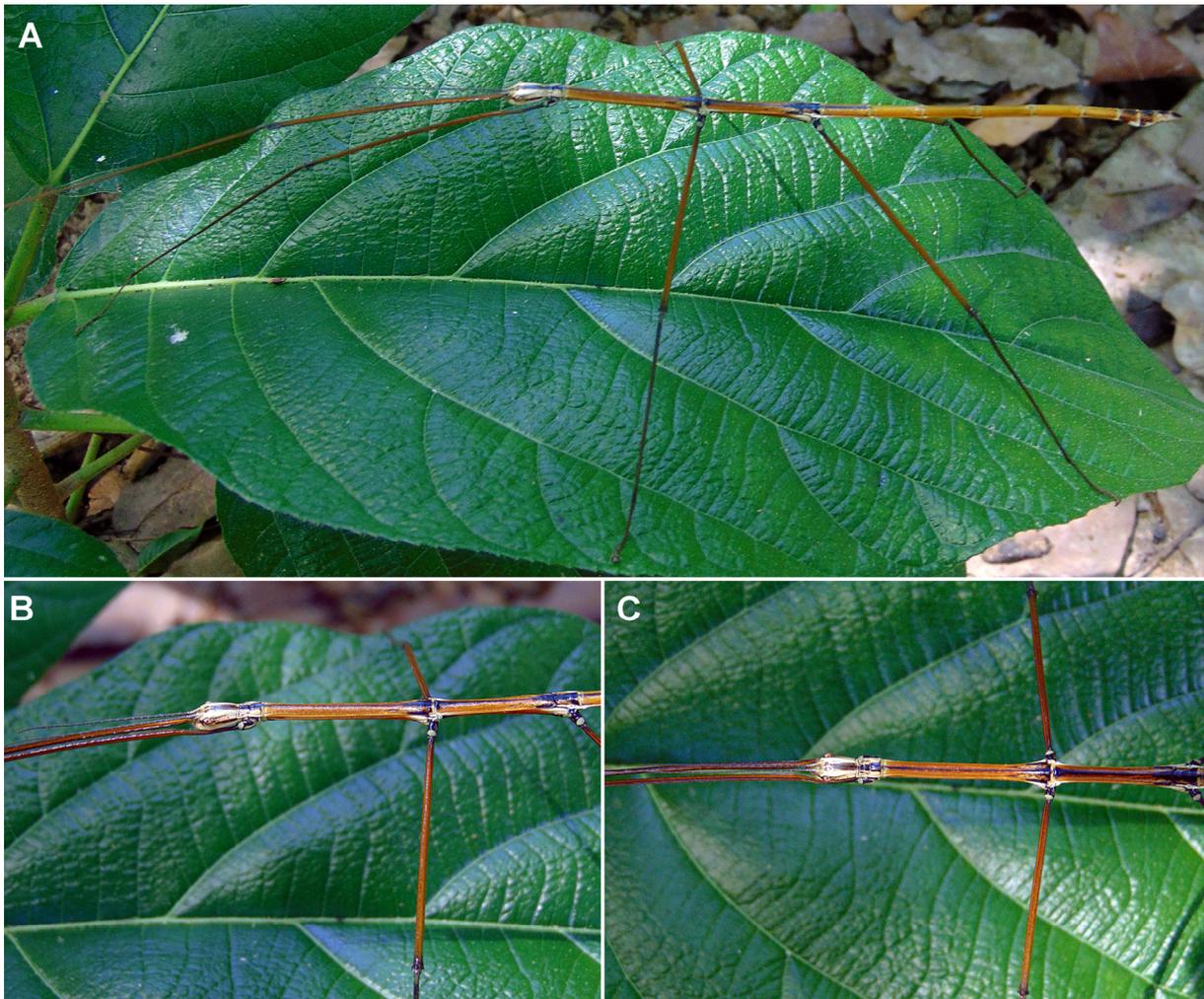


Fig. 4. *Baculomia pumatensis* sp. nov., ♂, Vietnam, Nghe An Province, Pu Mat National Park, 4–9.VII.2017. A, habitus. B, head and thorax, dorsolateral view. C, head and thorax, dorsal view.

with few minute black spines, more concentrated in distal portion; other carinae unarmed. Metafemora slightly longer than mesofemora, armed as mesofemora. Protibiae carinate, distinctly longer than profemora and unarmed. Mesotibiae about as long as mesofemora, carinate and armed with some minute, elongate and acute spines in distal portion of all carinae. Metatibiae slightly shorter than metafemora, armed as mesotibiae. Probasitarsus strongly elongated, longer than head and pronotum combined and more than 1.5 times longer than following tarsomeres combined. Meso- and metabasitarsus about as long or longer than following tarsomeres combined.

Abdomen: median segment about as long as pronotum. Abdominal terga smooth. Terga II–III gradually increasing in length; III–V about the same length; VI–VII gradually decreasing in length; VIII about half the length of VII and widening towards the posterior; IX slightly shorter than VIII; X with anterior half with mediolongitudinal carinae, later split into two strongly elongated and incurving semi-tergites; inner portion armed with minute, black hook-like spines. Semi-tergites strongly tapering from lateral view and with apex black. Vomer absent. Cerci elongated, more or less cylindrical, slightly incurving, not reaching apex of semi-tergites. Poculum slightly projecting over abdominal tergum IX with basal portion convex and apical portion flattened and strongly tapering; apex triangular from ventral view.



Fig. 5. *Baculomia pumatensis* sp. nov., paratype ♀ (RBINS). A, habitus, dorsal view. B, habitus, lateral view. C, habitus, ventral view. D, head and thorax, dorsal view. E, terminalia, dorsal view. F, apex of metatibia and tarsus, dorsal view. G, apex of metatibia and tarsus, ventral view. H, terminalia ventral view. I, terminalia, lateral view. J, head and thorax, lateral view.



Fig. 6. *Baculomia pumatensis* sp. nov., ♀, Vietnam, Nghe An Province, Pu Mat National Park, 4–9.VII.2017. A, habitus, lateral view. B, habitus, dorsal view. C, head and thorax, dorsolateral view. D, head and thorax, dorsal view.

FEMALE (Figs 5–6)

Measurements: see table 2.

Body: body and head predominantly grass green dorsally, darker green ventrally. Head with two pale longitudinal lines dorsally close to eyes; laterally with a longitudinal pale line close to ventral margin. Pronotum with lateral margins whitish. Meso- and metanotum with lateral margins yellowish. Median segment and first abdominal terga with lateral margins whitish. Femora with pinkish base, otherwise green; tibiae green.

Head: surface smooth and glossy; longer than wide and distinctly elongated, narrowing towards the posterior; dorsally slightly rounded and with mediolongitudinal line. Eyes small, circular and projecting. Antennae short, consisting of 32–35 segments ($n = 5$). Scapus elongated, strongly flattened dorsoventrally with inner margin almost straight and outer margin rounded. Pedicellus very short, distinctly narrower than scapus, slightly flattened dorsoventrally and knob-like.

Thorax: pronotum smooth, distinctly shorter and narrower than head; lateral margins slightly sinuate; anterior margin concave and slightly raised; anterolaterally with a minute impression. Prozona with mediolongitudinal line and shallow impression medially; central transverse impression not reaching lateral margins. Metazona with weak mediolongitudinal line not reaching posterior margin; posterior margin more or less straight. Mesonotum with mediolongitudinal line, more or less parallel-sided; lateral margins slightly thickened and about 6 times the length of pronotum. Mesopleura smooth. Metanotum as mesonotum, more than four times the length of pronotum. Metapleura as mesopleura.

Legs: profemora about as long as meso- and metanotum combined; compressed and strongly curved basally; all carinae present; anterodorsal and anteroventral carinae raised and laterally flattened; anterodorsal carina with some minute spines basally. Mesofemora slightly longer than mesonotum; medioventral carina basally unarmed, with minute black spines more concentrated in distal portion, other carinae unarmed. Metafemora longer than mesofemora, but shorter than profemora, armed as mesofemora. Protibiae carinate, distinctly longer than profemora and unarmed; medioventral carina distinct. Mesotibiae about as long as mesofemora, carinate and armed with some minute, elongate and acute spines in distal portion of all carinae. Metatibiae slightly longer than metafemora, armed as mesotibiae. Probasitarsus strongly elongated and longer than head.

Abdomen: median segment about as long as pronotum. Abdominal terga smooth. Terga II–IV gradually increasing in length; IV–V about the same length; VI–IX gradually decreasing in length; VIII about half the length of VII; IX distinctly shorter than VIII; X slightly longer than IX and slightly tectiform, weakly notched posteriorly. Epiproct well developed, triangular and with mediolongitudinal carina. Cerci elongated, more or less cylindrical, reaching apex of abdomen. Subgenital plate narrow and almost parallel-sided from ventral view, strongly tapered posteriorly; slightly keeled, with mediolongitudinal carina in posterior half and reaching posterior margin of anal segment.

EGG (Fig. 7)

Measurements (in mm). Length: 2.2; width: 1.3; height: 1.1.

Lateral view: capsule angular, operculum flat, ventral margin sinuate, dorsal margin with micropylar plate area straight and basal portions near operculum and polar area oblique, polar area concave; lateral surface rough, brown with paler raised wrinkles. Capsule widest at lateroventral margins. Ventral part of capsule with mediolongitudinal ridge centrally and two distinct, sinuate longitudinal grooves laterally; surface of grooves covered with minute pale granules. Dorsal portion with micropylar plate margin weakly defined. Micropylar plate flat with posterior margin rounded; anteriorly with distinct posterolateral angles, tapering centrally. Micropylar cup reddish brown, concave and circular. Median line distinct and coloured as micropylar plate. Antero- and posterolateral margins of dorsal portion with two short longitudinal grooves, surface of grooves covered with minute pale granules. Operculum oval, dark brown with some raised paler granules near outer rim and centrally with a small, more or less circular marking consisting of raised paler granules; area inside central marking weakly concave. Polar area indented centrally; surface as lateral surface of capsule; lateral margins slightly raised.

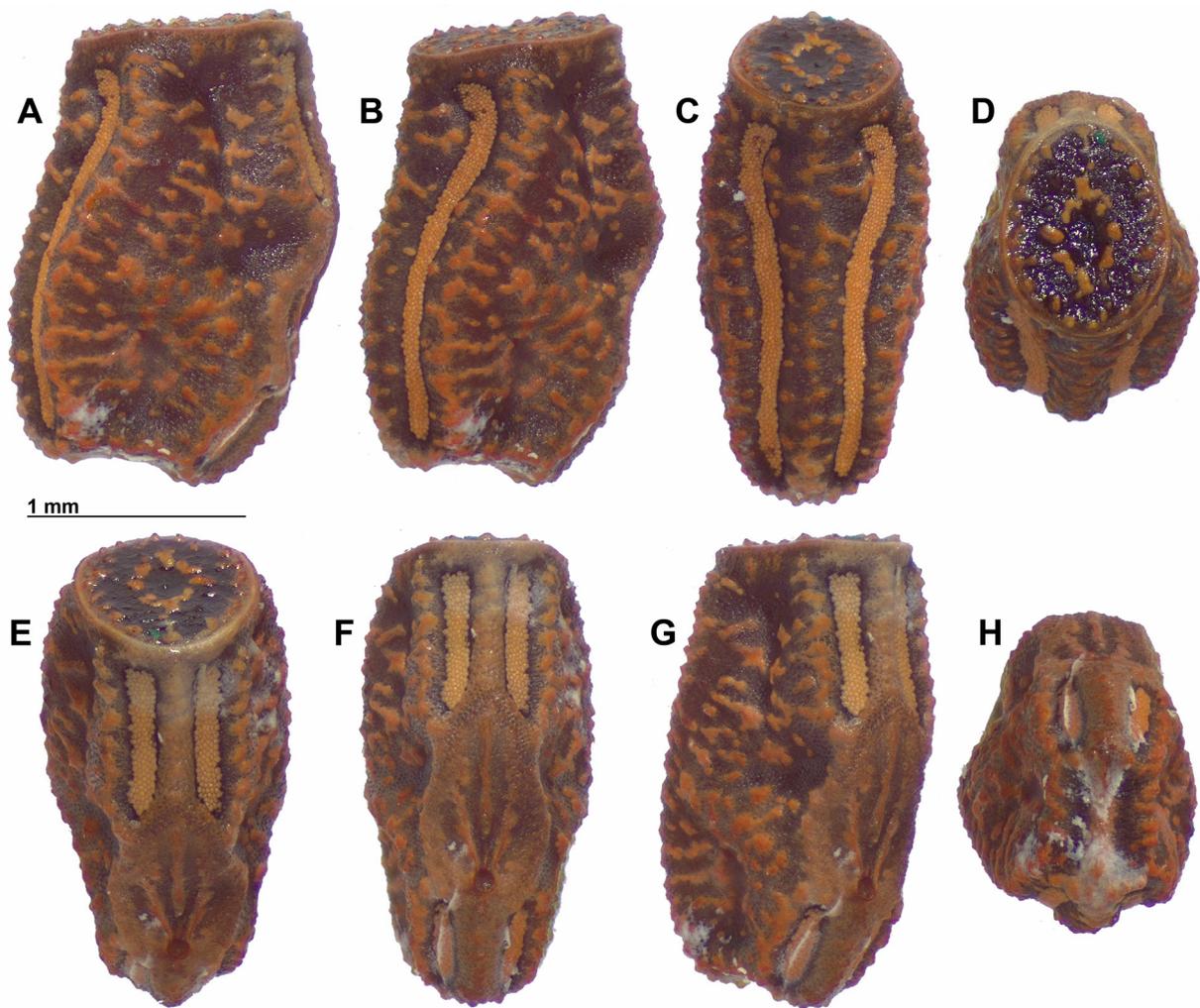


Fig. 7. *Baculomia pumatensis* sp. nov., eggs. A, laterodorsal view. B, lateral view. C, ventral view. D, operculum. E, anterodorsal view. F, dorsal view. G, posterodorsal view. H, polar area.

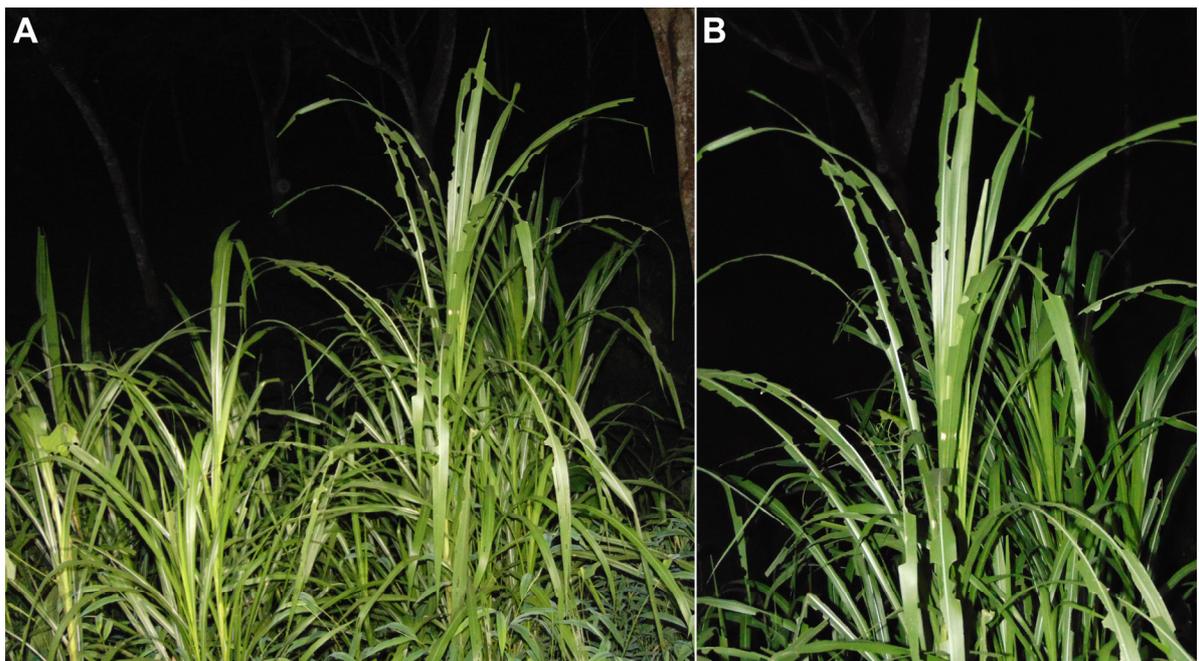


Fig. 8. *Baculomia pumatensis* sp. nov. A–B, feeding damages on *Saccharum officinarum* L. (Poaceae), Vietnam, Nghe An Province, Pu Mat National Park, near station, 9.VII.2017, at night.



Fig. 9. *Baculomia pumatensis* sp. nov. on *Rubus* sp., Vietnam, Nghe An Province, Pu Mat National Park, botanical garden, 4.VII.2017, at night. A, ♂. B, ♀.

BIOLOGY (Figs 8–9). The species was found at night in disturbed habitat at the headquarters of the National Park: most of the specimens were found along a small road near the buildings on *Saccharum officinarum* L. (Poaceae – identification by V.H. Nguyen pers. com. IV.2019) that showed heavy damages due to feeding (Fig. 8), some specimens were also found at the same place as well as in the botanical garden feeding on *Rubus* sp. (Rosaceae) (Fig. 9).

DISTRIBUTION. Vietnam: Nghe An Province (Fig. 2).

SUPPLEMENTARY MATERIAL. Video footage of 3D reconstruction of egg:

<http://virtualcollections.naturalsciences.be/virtual-collections/entomology/phasmidae/phasmatidae/clitumninae/baculomia-pumatensis-bresseel-constant-2019>

Table 2. Measurements [mm] of *Baculomia pumatensis* sp. nov.

<i>Length of</i>	HT ♂	PT ♂♂	PT ♀♀
Body:	105.6	100.4–119.0	135.8–147.2
Head:	6.8	6.2–6.4	9.0–9.2
Pronotum:	3.5	3.4–3.8	4.5–4.9
Mesonotum:	22.5	21.4–26.5	26.3–29.9
Metanotum:	15.5	14.9–18.5	17.4–20.1
Median segment:	3.4	3.0–3.6	4.3–4.5
Profemora:	45.9	43.3–55.3	40.6–50.7
Mesofemora:	29.4	29.7–34.2	28.9–31.1
Metafemora:	35.8	36.1–41.1	34.8–36.8
Protibiae:	55.5	53.8–63.5	49.5–61.4
Mesotibiae:	30.0	28.1–35.2	26.1–33.5
Metatibiae:	39.3	36.3–45.6	33.2–40.4

***Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov.**

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Figs 10–15

Clitumnus siamensis BRUNNER VON WATTENWYL, 1907: 193 [described].*Baculum* sp. – BRAGG, 1995: 3 [culture stock and breeding]. — VAN GORKOM, 1995: 11 [origin of culture stock]. — POTVIN, 1995: 39 [description, egg, rearing], figs 1–7 [habitus and terminalia ♂ and ♀, egg, nymph].*Ramulus siamensis* – BROCK, 2003: 22, 64 [rearing, figured]. — OTTE & BROCK, 2005: 307 [catalogued]. — HARMAN, 2012: 16 [culture stock origin]. — DELFOSSE *et al.*, 2019: 225 [types catalogued].

MATERIAL EXAMINED.

TYPE MATERIAL. (examined from photographs) THAILAND: syntypes: 1♂ (Fig. 10), 2♀♀ (Fig. 11): Siam, J. M. Bel, 1893 (MNHN).

ADDITIONAL MATERIAL. THAILAND: 1♂ : Thailand, Don N. Mal, I.G. 32.217 (RBINS).

MATERIAL EXAMINED FROM PHOTOGRAPHS: 1♂ (Fig. 12): Thailand, Kuri Buri National Park, 22.IX.2016, I. Dugdale & P. Phetsri.

DIAGNOSIS.

Most closely related to *B. pumatensis* sp. nov. Males share the overall orange body colouration, but can be easily distinguished by the completely orange head, the orange front legs with green base and the green mid and hind femora. Females share the lateral longitudinal pale line close to ventral margin, a definite and carinate epiproct and have the subgenital plate only slightly longer than tergum VII but can be differentiated by the smaller size (118–120 mm vs 135.8–147.2 mm in *B. pumatensis* sp. nov.) and the more acute posterolateral angles of the anal segment.

DISTRIBUTION. Thailand (Fig. 2). The following data were extracted from iNATURALIST (2019): Na Kluea, Bang Lamung District, Chonburi (12°56'N 100°53'E); Doi Phu Nang N.P. (19°N 100°9'36"E); Pang Mapha, Mae Hong Son (19°31'21"N 98°14'46"E); Mae Phrao (19°21'57"N 99°12'8"E).

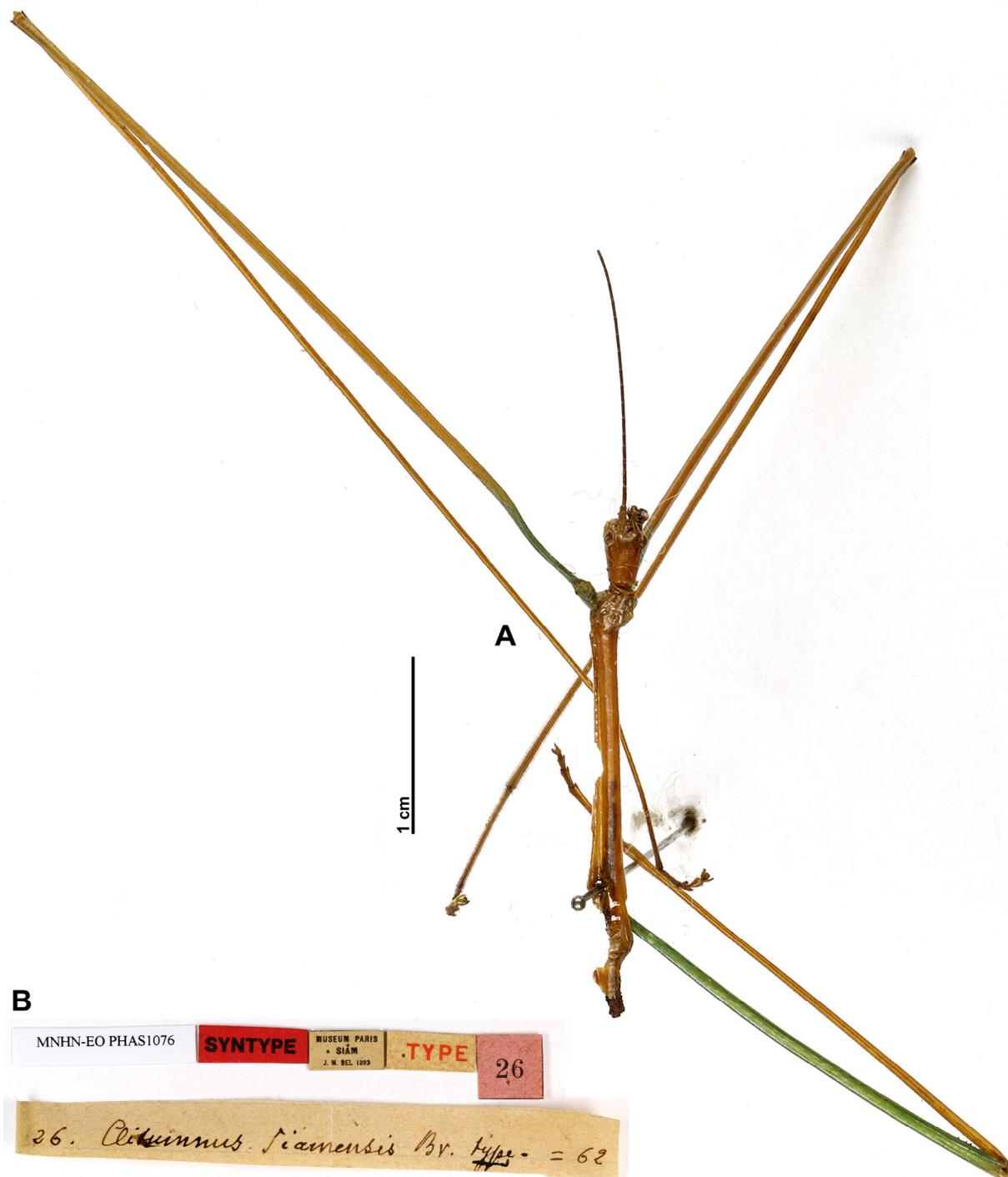


Fig. 10. *Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov., syntype ♂ (copyright MNHN). A, habitus, dorsal view. B, labels.

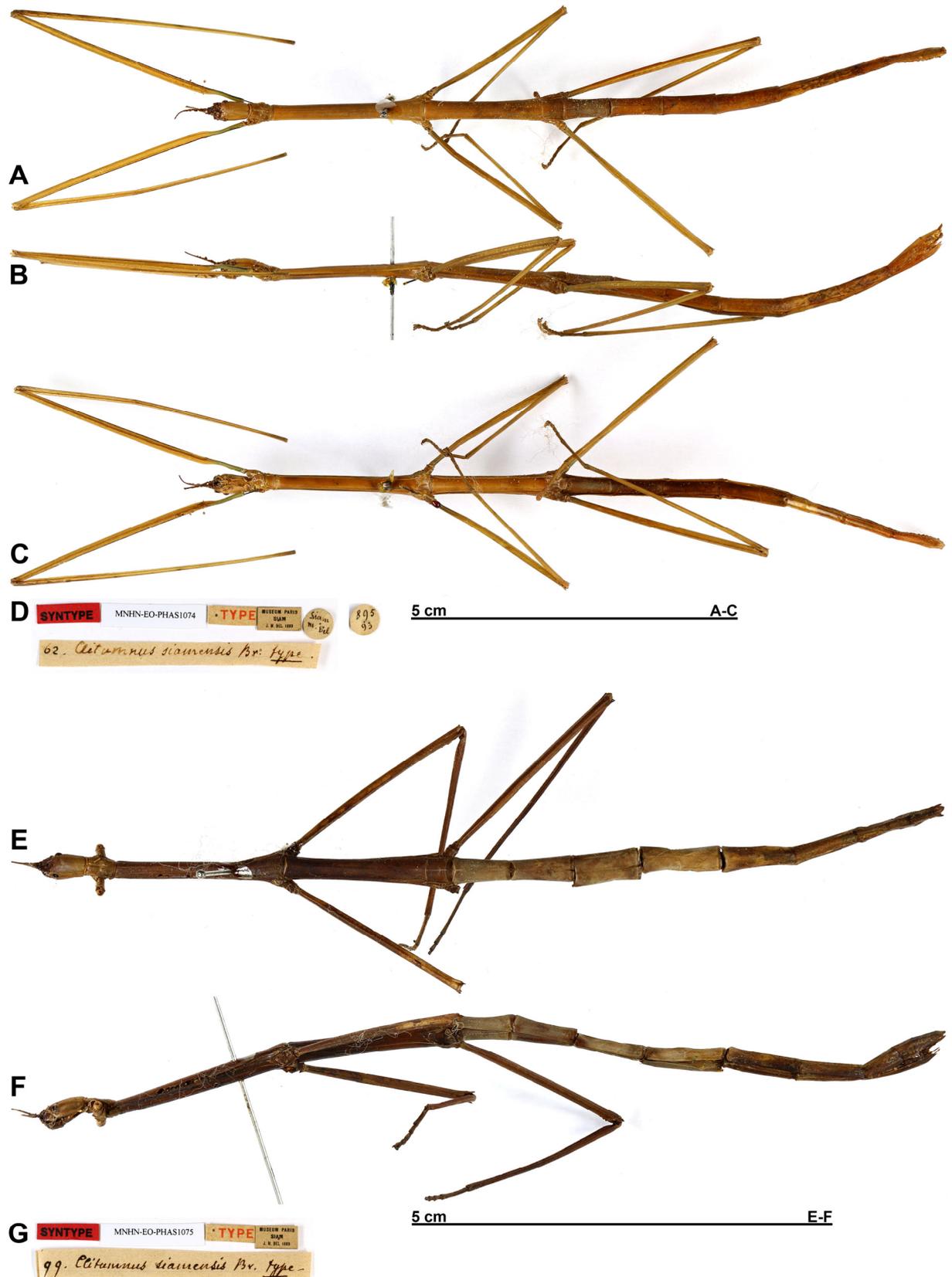


Fig. 11. *Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov., syntypes ♀ (copyright MNHN). A–D, first syntype A, habitus, dorsal view. B, habitus, lateral view. C, habitus, ventral view. D, labels. E–G, second syntype E, habitus, dorsal view. F, habitus, lateral view. G, labels.



Fig. 12. *Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov., ♂ (photographs by F. Hennemann). A, habitus, lateral view. B, anterior portion of body, dorsal view. C, anterior portion of body, lateral view. D, terminalia, dorsal view. E, terminalia, ventral view. F, terminalia, lateral view.

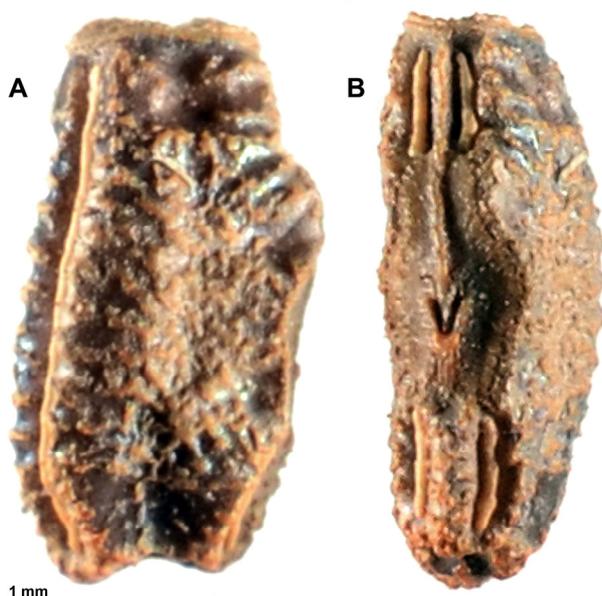


Fig. 13. *Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov., egg (photographs by F. Hennemann). A, lateral view. B, dorsal view.

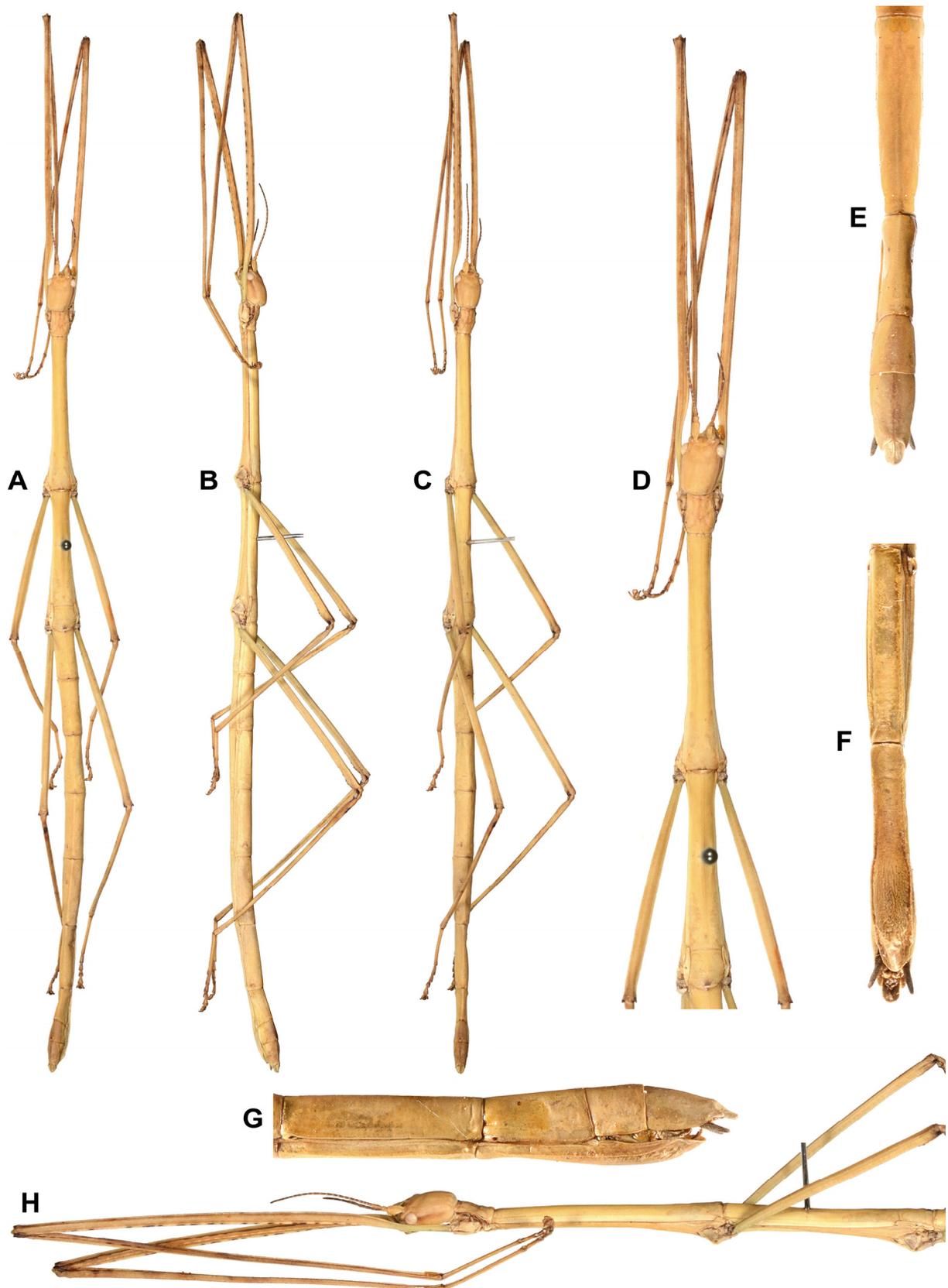


Fig. 14. *Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov., ♀ (photographs by F. Hennemann). A, habitus, dorsal view. B, habitus, lateral view. C, habitus laterodorsal view. D, anterior portion of body, dorsal view. E, terminalia, dorsal view. F, terminalia, ventral view. G, terminalia, lateral view. H, anterior portion of body, lateral view.



Fig. 15. *Baculomia siamensis* (Brunner von Wattenwyl, 1907) comb. nov., ♂ in nature, Thailand, Kuri Buri National Park, 22.IX.2016 (photographs by I. Dugdale and P. Phetsri). A, habitus, laterodorsal view. B, anterior portion of body, laterodorsal view. C, caudal portion of body, laterodorsal view.

Discussion

The present work adds a new genus and two new species of Clitumnini to the fauna of Vietnam which now counts six genera and 19 species. The tribe Clitumnini remains highly problematic as several genera were poorly defined, hence the generic placement of many species remains questionable. As an example, the genus *Ramulus* Saussure, 1862 and its four synonyms need a complete revision. Although we have already transferred nine species from *Ramulus* to appropriate genera (BRESSEEL & CONSTANT, 2014, 2017, 2018; CONSTANT & BRESSEEL, 2018), the genus still contains more than 150 species about half of which are described from China, although the type species *Bacillus humberti* Saussure, 1862, currently a synonym of *Ramulus pseudoporus* (Westwood, 1859), originates from Sri Lanka. A revision of *Ramulus* requires a redescription of the type species including the characters of the male, female and egg. Based on this it will be possible to confirm or refute the placement of the other species in *Ramulus*.

In Pu Mat National Park, *B. pumatensis* sp. nov. is clearly polyphagous as it was found feeding on plants belonging to two very separate families: sugarcane, *Saccharum officinarum* L. (Poaceae) and wild bramble, *Rubus* sp. (Rosaceae). However, despite the presence of many other species of plants around, it was only found on these two plants, hence its host plants list may be rather restricted. POTVIN (1995) also noted that *B. siamensis* in captivity accepted Rosaceae (*Rubus* spp., *Rosa* spp., *Pyracantha* sp.) but refused *Quercus* sp. (Fagaceae), *Hedera helix* L. (Araliaceae) and *Ligustrum vulgare* L. (Oleaceae). In the wild, this species was also photographed on Poaceae (Fig. 15). The damages caused by *B. pumatensis* sp. nov. on the spontaneous sugarcane plants in Pu Mat N.P. were quite impressive, and it cannot be excluded that this species might become a pest for cultivated sugarcane under specific conditions. More study in and around sugarcane plantations in Nghe An Province should be conducted to assess the pest potential of the species. In China, other species of stick insects were recorded on crop Poaceae like maize (*Zea mays* L.) (4 species), rice (*Oryza sativa* L.) (2 species) and sorghum (*Sorghum bicolor* (L.) Moench) (1 species) (HENNEMANN *et al.*, 2008) but it is the first time that a stick insect species is recorded to feed on sugarcane. Additional fieldwork in Ba Vi N.P. is necessary to document the female, egg and biology of *Baculomia baviensis* sp. nov., especially to verify if this species feeds on species of the genus *Saccharum* L. like *B. pumatensis* sp. nov.

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