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# Systematic study of *Megacrania* species of Malo, New Hebrides (Cheleutoptera: Phasmatidae)

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## Abstract

The identity of the subspecies *Megacrania batesi speiseri* Carl, 1915 (Carl spelled *batesii* as *batesi* in error) from Malo, New Hebrides is clarified. Carl's subspecies is elevated to the species *Megacrania speiseri* Carl, 1915 and morphological characters are redescribed with measurements. A key of the genus *Megacrania* is provided.

## Key words

stick insects, taxonomy, Phasmatidae, *Megacrania*, asian pacific, species

## Introduction

Carl (1915) described female specimens collected from Malo, New Hebrides as the subspecies *Megacrania batesi speiseri*. Hsiung (2007) doubted the identity of *M. batesi speiseri* but was unable to access any of Carl's type specimens for further study at that time. Hsiung (2007) went on to describe a specimen from Efate, New Hebrides as *Megacrania obscurus* and wondered whether Carl's subspecies might belong to *M. obscurus*.

Willemse (1926) described three females and a nymph collected in New Hebrides, Espir.-Santo Isl. as a new species, *Megacrania bakeri*, originating from the same region as Carl's subspecies. He gave only a brief description with simple measurements of antennae, thorax, femur and subgenital plate and did not give critical information on the wings; the species has been only rarely mentioned since his publication.

Hsiung (2007) misrepresented "Fidji" island as the locality of Willemse's *M. bakeri* and Carl's subspecies *M. batesi speiseri* when he cited Gunter's (1931) paper. Actually there was no record indicating *Megacrania* species to occur in Fidji. Gunter (1931) listed *M. batesi speiseri* occurring in New Hebrides. Shiraki (1932) followed Günther's reference and made a key to known world species of *Megacrania* which included five species; *M. bakeri* Willemse was one of them.

The author finally received a syntype specimen of Carl's *Megacrania batesi speiseri* from Naturhistorisches Museum Basel in 2008 and compared it with the type specimen of *M. batesii* from the Solomon Islands and Hsiung's (2007) species of *M. obscurus* from Efate, New Hebrides (see Tables 1 to 3); it was found that they were distinctly different species and it was concluded that Carl's type specimen was not a subspecies of *M. batesii* and should be accorded full species status as *Megacrania speiseri* Carl, 1915. Since Carl did not give a detailed description of this species, a complete description and measurements are given. The author also updates here the key to the species of *Megacrania* (Hsiung 2007).

## A revised key to the species of *Megacrania*

1. Mesonotum granulose ..... 2  
— Mesonotum smooth ..... 12
2. Mesonotum sparsely granulose; cerci short, not reaching apex of operculum. Philippines ("Ceylon" probably erroneous). . . . . *alpheus* (Westwood)  
— Mesonotum densely granulose; cerci long, reaching or surpassing apex of operculum. . . . . 3
3. Lateral margins of pronotum and mesonotum slightly spinose . . . . . 4  
— Lateral margins of pronotum and mesonotum conspicuously spiny . . . . . 10
4. Subgenital plate not surpassing extremities of cerci . . . . . 5  
— Subgenital plate surpassing extremities of cerci . . . . . 8
5. Subgenital plate just reaching extremities of cerci. Admiralty Is . . . . . *vickeri* Hsiung  
— Subgenital plate not reaching extremities of cerci . . . . . 6
6. Granules of mesonotum robust and sharp; hind wing reaching a little beyond hind margin of 3<sup>rd</sup> abdominal tergum. Taiwan . . . . . *tsudai* Shiraki  
— Granules of mesonotum slightly elongate not quite sharp; hind wing reaching a little beyond hind margin of 3<sup>rd</sup> abdominal tergum . . . . . 7
7. Mesonotum with >60 granules, the lateral margin slightly spiny; tegmina ovate, shorter than mesonotum; posterior margin of anal segment nearly rounded. Solomon Is, Australia, New Guinea . . . . . *batesii* Kirby  
— Mesonotum with 60 granules, the lateral margin not spiny; tegmina ovate, slightly longer than mesonotum; posterior margin of anal segment nearly square. Borneo . . . . . *rentzi* Hsiung
8. Hind wing extending a little beyond posterior margin of 2<sup>nd</sup> abdominal tergum; mesonotum with 80 oval granules; posterior margin of anal segment nearly round, slightly concave medially. Malo, New Hebrides . . . . . *speiseri* Carl  
— Hind wing reaching or extending beyond posterior margin of 3<sup>rd</sup> abdominal tergum, mesonotum with more or less 80 granules. Posterior margin of anal segment nearly round, slightly or not concave medially . . . . . 9

**Table 1.** Morphological differences between Carl's female syntype of *Megacrania batesi speiseri* (Malo) (now *Megacrania speiseri*) and the lectotype of *M. batesii* (Solomon IIs).

Characters	<i>M. batesi speiseri</i>	<i>M. batesii</i> (Solomon IIs)
Mesonotum	With about 40 oval granules, its lateral margin with weak needle-like spines	With 67 nearly round and distinct granules, its lateral margin but little spiny, the first 3 spines of the lateral margin stronger than the rest
Wings	Elongate-ovate, as long as mesonotum; hind wing 1.93× as long as tegmina	Elongate-ovate, shorter than mesonotum, hind wings 1.89× as long as tegmina
Anal segment	Posterior margin of anal segment nearly round, slightly concave medially	Posterior margin of anal segment smooth, not concave medially

**Table 2.** Morphological differences between Carl's female syntype of *M. batesi speiseri* (Malo, New Hebrides) and female type specimen of *M. obscurus* (Efate, New Hebrides).

Characters	<i>M. batesi speiseri</i>	<i>M. obscurus</i>
Mesonotum	2× length of pronotum, its surface with about 40 distinct oval granules	2.7× length of pronotum, its surface with 70 indistinct granules evenly distributed over the anterior 0.65 of its length
Wings	Hind wing 1.93× as long as tegmina, extending a little beyond the posterior margin of 2 <sup>nd</sup> abdominal tergum	Hind wing 2× as long as tegmina, extending a little beyond the posterior margin of third abdominal tergum
Legs	Anterior femora about 1.98× as long as mesonotum	Anterior femora about 1.75× longer than mesonotum
Coloration	Brownish-testaceous	Generally pale green, mesonotum and abdomen light brown

**Table 3.** Morphological differences between Carl's female syntype of *M. batesi speiseri* from Malo and *M. batesii* species from Kala, New Guinea.

Characters	<i>M. batesi speiseri</i>	<i>M. batesii</i>
Mesonotum	Surface with about 40 oval granules, its lateral margin with needle-like spine	Surface with 80 rather strong granules, its lateral margins moderately spiny
Hind wing	1.9× as long as mesonotum, extending a little beyond the posterior margin of 2 <sup>nd</sup> abdominal tergum	1.2× as long as mesonotum, reaching the posterior margin of the 2 <sup>nd</sup> abdominal tergum
Coloration	Brownish-testaceous	Head, pronotum, legs and wings pale green, rest of body reddish-brown

9. Hind wing nearly reaching posterior margin of 3<sup>rd</sup> abdominal tergum; mesonotum with 70 narrow small distinct granules; posterior margin of anal segment slightly cleft medially. Admiralty Is . . . . . *artis* Hsiung  
— Hind wing surpassing posterior margin of 3<sup>rd</sup> abdominal tergum; mesonotum with 86 small, elongate and distinct granules; posterior margin rounded, smooth and not cleft medially. Efate, New Hebrides . . . . . *obscurus* Hsiung

10. Lateral margin of mesonotum spiny, the first few anterior teeth not expanded basally; anal segment not cleft medially. Indonesia, New Guinea, Pelew Id . . . . . *wegneri* Willemse  
— Lateral margin of mesonotum spiny, the first few anterior teeth closely expanded basally and closely connected; anal segment cleft medially . . . . . 11

11. Mesonotal surface with 60 granules, the lateral margin spiny, the first three anterior teeth closely connected; hind wing reaching only to center of 3<sup>rd</sup> abdominal tergum. Indonesia (Key Inseln, Obi Id, Boeroe) . . . . . *brocki* Hsiung  
— Mesonotal surface with 95 granules, lateral margin very spiny, first two anterior teeth closely connected; hind wing reaching 4<sup>th</sup> abdominal tergum. New Guinea . . . . . *spina* Hsiung

12. Body and hind wing long (130 mm, 36 mm); femora serrated ventrally, with distinct spines along the keels. Color: pale green. Fiji, Solomon Is, New Britain . . . . . *phelaus* (Westwood)  
— Body and hind wing short (98 mm, 21mm); femora not serrated, with only a few minute spines ventrally. Color: yellowish black. New Guinea . . . . . *nigrosulfurea* Redtenbacher

### *Megacrania speiseri* Carl, 1915

The systematic status of Carl's *M. batesi speiseri* has been confused with *Megacrania alpheus* Westwood for a long period. Gunter (1931) followed Carl's publication and listed *M. batesi speiseri* occurring in New Hebrides. Four years later, he believed that *Megacrania batesii* Kirby was a synonym of *Megacrania alpheus* (Gunter 1935). Willemse (1926) described a new species, *Megacrania bakeri*, from New Hebrides. Thirty years later, he listed both *Megacrania batesii* and *Megacrania bakeri* as synonyms of *Megacrania alpheus* (Willemse 1955). Bragg (2001) listed Carl's *M. batesi speiseri* as a synonym of *M. alpheus*, when he studied the stick insects of Borneo. Otte and Brock (2005) doubted the validity of Bragg (2001), listing *M. batesii batesii* as a synonym of *M. alpheus*. Actually, *M. alpheus* is a very unique species whose holotype does not match any of the types of *Megacrania*. At the present, only one species is known to occur in Borneo, which is *Megacrania rentzi* Hsiung. Hsiung (1991, 2007) also noted that the locality of the type of *M. alpheus* might not be Ceylon, but rather a mislabelled Philippine specimen.

*Megacrania batesi speiseri* Carl, 1915, Phasmiden von Neu-Caledonien unden Loyalty-Inseln, pp. 173-178. In: Sarasin F., Roux J. (Eds) Nova Caledonia, Recherches Scientifiques en Nouvelle-Caledonie et aux lies Loyalty Zoologie Az. — Bragg 2001. Phasmids of Borneo. Nat. Hist. Pub (Borneo): 402 (*partim*). — Zompro and Brock. 2003. Revue Suisse de Zoologie 110(1): 23 (type data). — Gunter 1935. Overdruk Uit Het Natuurhistorisch Maandblad Nos 10 en 11: 125-126. — Willemse 1955. Treubia vd. 23, part 1: 44-45 (*partim*). — Bragg 2001. Phasmids of Borneo. Nat. Hist. Pub (Borneo): 402 (*partim*). — Zompro and Brock 2003. Revue Suisse de Zoologie

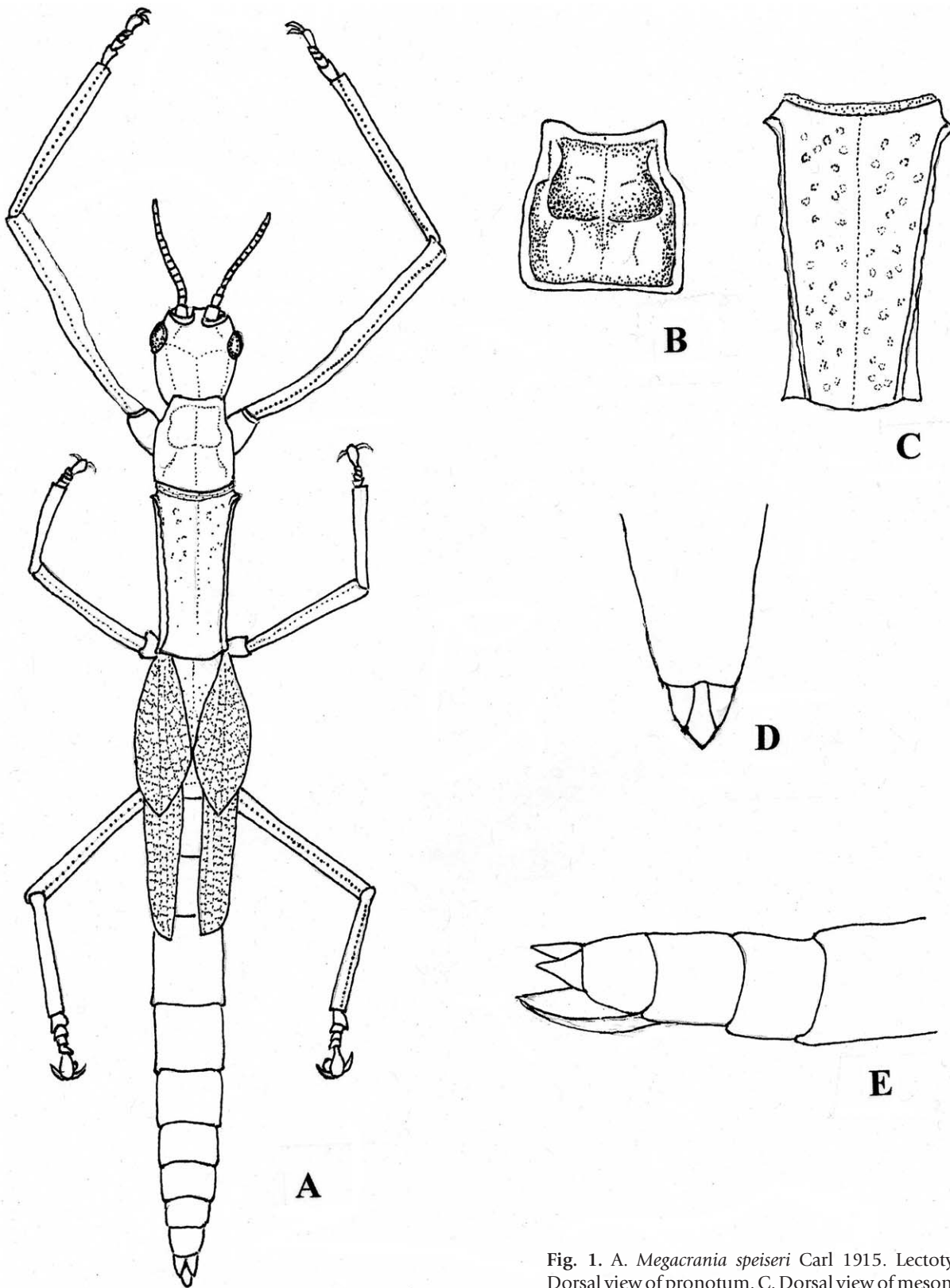


Fig. 1. A. *Megacrana speiseri* Carl 1915. Lectotype (female). B. Dorsal view of pronotum. C. Dorsal view of mesonotum. D. Dorsal view of abdominal apices. E. Lateral view of abdominal apices.

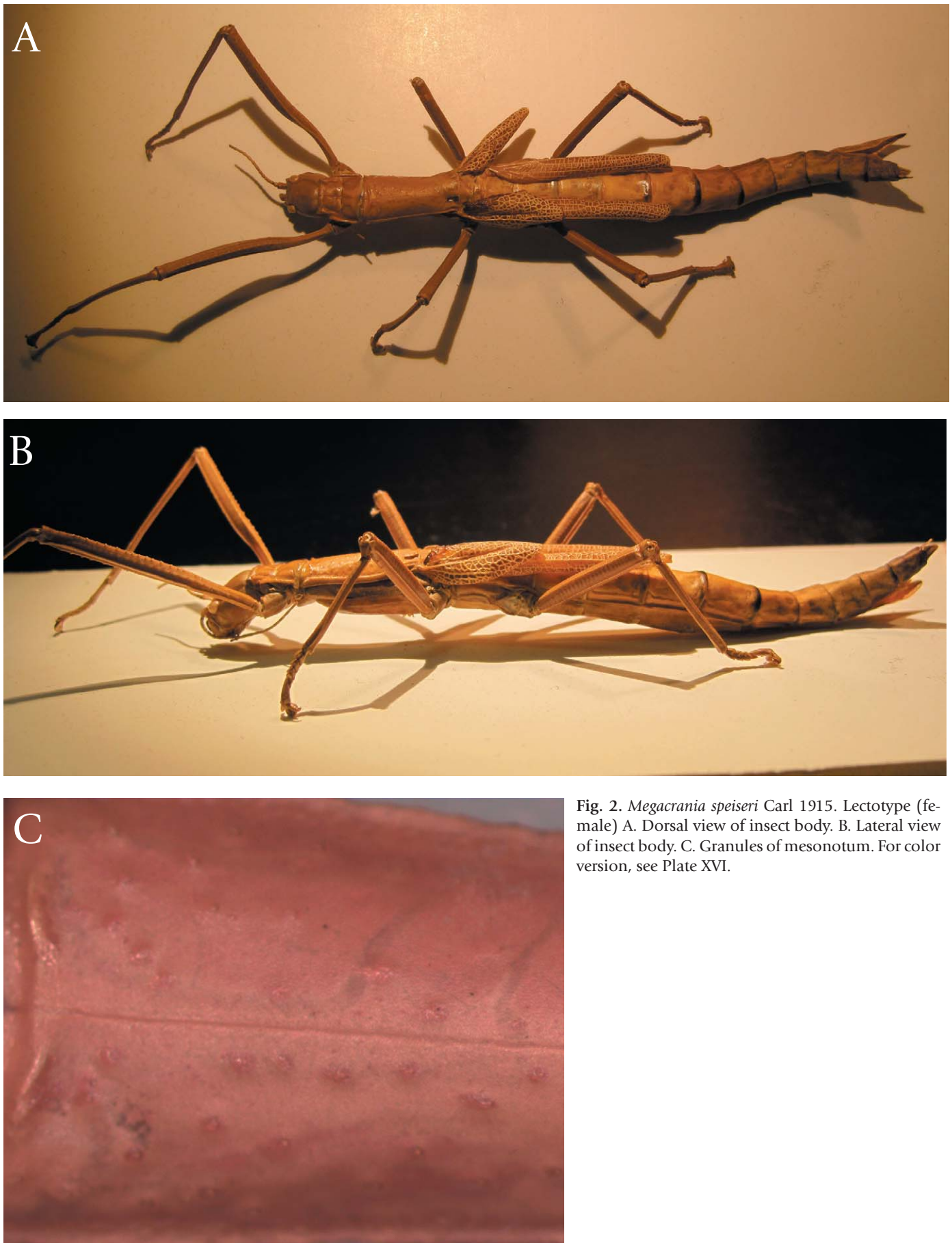


Fig. 2. *Megacrania speiseri* Carl 1915. Lectotype (female) A. Dorsal view of insect body. B. Lateral view of insect body. C. Granules of mesonotum. For color version, see Plate XVI.

110(1): 23 (type data). — Otte & Brock 2005. Phasmida species file. Catalog of stick and leaf insects of the world. 197. — Hsiung 2007. Journal of Orthoptera Research 16(2): 207.

*Megacrania bakeri* Willemse, 1926. Transactions Entomological Society London 1925: 513-529 (*partim*). — Günther 1931. Mitteilungen aus dem Zoologischen Museum in Berlin 14: 753-831 [pp. 779-828] (*partim*). — Shiraki 1932. Zoological Society Japan 45: 108-111 (*partim*). — Willemse 1955. Treubia Vol. 23, Part 1: 44-45 (*partim*) — Otte & Brock 2005. Phasmida species file. Catalog of stick and leaf insects of the world. 197. — Hsiung 2007. Journal of Orthoptera Research 16 (2): 207.

*Type*. — Lectotype (designated from Carl's syntype ♀, Malo. Deposited in Naturhistorisches Museum, Basel [Figs 1, 2])

*Description*. — **Head**: oval, slightly porrect, a little longer than broad. **Thorax**: pronotal disc as long as broad, slightly narrowed at anterolateral angles, dorsal surface uneven with strongly defined margins; mesonotum 2× length of pronotum, its surface with numerous (left 36-38, right about 41) oval granules; the granules of the posterior part are less strong than those of the anterior part; the lateral margins with weak needle-like spines. **Wing**: tegmina elongate-ovate, as long as mesonotum; hind wing 1.93× as long as tegmina and extending a little beyond posterior margin of second abdominal tergum. **Leg**: anterior femora about 1.98× as long as mesonotum, with ridge bearing five spines visible in ventral view, the mid femora with 2 on the left, 4 on the right, hind femora with 2 on the left and 2 on the right. **Abdomen**: elongate, segments I-V wider than remaining ones; posterior margin of anal segment nearly round, slightly concave medially; cerci broad, triangular in shape; subgenital plate gradually narrowing apically and slightly extending beyond cerci, its ventral surface with a longitudinal ridge.

*Coloration*. — Brownish-testaceous.

*Measurements*. — (length in mm) ♀: body 105.0; pronotum 8.0; mesonotum 16.0; tegmen 16.0; hind wing 31.0; front femur 28.00; median femur 15.5; hind femur 18.0; front tibia 23.0; median tibia 13.5; hind tibia 15.0.

*Type material*. — Lectotype female (designated). Bears five labels: 1. a (hand written, on a small red square paper); 2. Malo ♀ Dr. Speiser, XI. 1911 (black hand writing); 3. *Megacrania batesi* kby ♀ var., Dr. Speiser XI. 1911 (hand written on a brown paper); 4. Ei eutu. F. Hennemann.

*Distribution*. — Known only from Malo, New Hebrides.

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