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Phyllium shurei n. sp., a third species of leaf insect from Java, Indonesia (Phasmida, Phylliidae)

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Abstract. – A new species, *Phyllium* (*Pulchriphyllium*) *shurei* n. sp. is described and illustrated from Java, Indonesia. *Phyllium* (*Pulchriphyllium*) *shurei* n. sp. is currently only known from a male specimen, therefore only a key to known *Phyllium* males from Java is included. Nomenclature note are added about the name *Phyllium* (*Pulchriphyllium*) *lambirensis* Seow-Choen, 2017.

Cumming R. T. & Le Tirant S., 2018. – *Phyllium shurei* n. sp., a third species of leaf insect from Java, Indonesia (Phasmida, Phylliidae). *Faunitaxys*, 6(1) : 1 – 5.

ZooBank : <http://zoobank.org/76907036-205E-44B4-9E12-5BA0A39ABA80>

Introduction

A new species of leaf insect, *Phyllium* (*Pulchriphyllium*) *shurei* n. sp. is described and illustrated from Java, Indonesia. It is surprising that the island of Java is the type locality for this new species because of the island's popularity as a tourist destination and the breeding center for other popular *Phyllium* species commercially available (Fig. 1). However, the camouflage of the leaf insect family has allowed many species to be overlooked for years, even in very popular locations. The discovery of *Phyllium* (*Pulchriphyllium*) *maethoraniae* Delfosse, 2015, from Chiang Mai Province of northern Thailand, named from a single unique female specimen, is another surprising discovery from a very popular destination. To date only the holotype male specimen has been recovered of *Phyllium* (*Pulchriphyllium*) *shurei* n. sp., and it is the hope of the authors that the recognition of an additional species from Java will prompt the search for this rare species and for the currently unknown female.

Materials and Methods

Photo in Fig. 1 was taken by Maman Cahyana in Sukabumi, West Java, Indonesia. Photos in Fig. 2 were taken by the first author at the San Diego Natural History Museum using a Canon 5D Mark II and a MP-E 65mm macro lens and were stacked using Zerene photo stacking software, version 1.04, 64-bit. Photos in Fig. 3 were taken by René Limoges of the Montréal Insectarium using a Nikon D810 DSLR camera with Nikon Micro-Nikkor 200 mm f/4 lens on Manfrotto 454 micrometric positioning sliding plate. Lighting was provided by two Nikon SB-25 flash units with Cameron Digital diffusion photo box. Adobe Photoshop Elements 13 was used as

post processing software. The measurements of the holotype were made to the nearest 0.1 mm using digital calipers. The holotype is deposited in the Montreal Insectarium type collection.



Fig. 1. - Breeding cage in Western-Java, Indonesia commonly used to breed *Phyllium* (Photos courtesy of Maman Cahyana (pictured center)).

Taxonomic placement

The exterior lobe of the protibia is reduced almost to the status of the *Phyllium* (*Phyllium*) subgenus, however the other prominent lobes of the meso- and metatibiae, and serrate antennae clearly place the new species in the *Phyllium* (*Pulchriphyllium*) subgenus and the *bioculatum* species-group as per Hennemann *et al.*, 2009. *Phyllium* (*Pulchriphyllium*) *shurei* n. sp., is morphologically similar to *Phyllium* (*Pulchriphyllium*) *mannani* Seow-Choen, 2017, which unfortunately is also only known from male specimens, with the female of both species currently unknown. The common issue of only finding male specimens is likely due to their ability to fly and propensity to fly to lights at night making them frequently the only sex collected at light traps at night as the females are left behind in the foliage due to their inability to fly.

Differentiation

– *Phyllium* (*Pulchriphyllium*) *shurei* n. sp. can immediately be differentiated from congeners on Java by the rounded shape of the abdomen (rectangular in *Phyllium* (*Pulchriphyllium*) *pulchrifolium* Audinet-Serville, 1838, and spade-shaped in *Phyllium* (*Phyllium*) *jacobsoni* Rehn & Rehn, 1933).

– *Phyllium* (*Pulchriphyllium*) *shurei* n. sp. is more morphologically similar to *Phyllium* (*Pulchriphyllium*) *mannani* Seow-Choen, 2017, and can be differentiated from it by the exterior profemoral lobe with an angle of $\sim 130^\circ$ (*Ph. (Pu.) mannani* $\sim 100^\circ$), and lobes of the meso- and metatibia less prominent (*Phyllium (Pu.) mannani*, mesotibia with a fine distinct point, mesotibia with a prominent large lobe) (Fig. 2).

– *Phyllium* (*Pulchriphyllium*) *shurei* n. sp. is now the third species *Phyllium* described from Java and is here differentiated from congeners.

Phyllium (*Pulchriphyllium*) *shurei* n. sp.

(Fig. 2C, 3A-B)

ZooBank : <http://zoobank.org/5331AA73-D007-499F-B867-C58D0CBAB295>

Holotype, ♂: Indonesia, West-Java, Sukabumi Regency, Kabandungan Village (August, 2016) [Coll. RC 16-258]. Holotype with red label deposited in the type collection of the Montreal Insectarium.

Coloration. – Coloration of the holotype is based on the dried specimen and it is assumed the living individual had a darker green coloration. Overall color is a pale green ranging from a lime green to a pale yellow-green. *Alae* are transparent with the sclerotized section slightly darker with a green hue. *Antennae*, *eyes*, and *eyespot* on abdominal segment V are a light tan/brown color.

Morphology

Head. – *Capsule* as long as wide, with a slightly irregularly granulose *vertex*, including a wide posteromedian tubercle with

a short but notable seta on each side. Three well-developed ocelli project up from the vertex and are very distinct.

Antennae. – Long and slender, with 22 *segments* (including the *scapus* and *pedicellus*) covered in evenly spaced setae, except for the terminal three segments which are covered in shorter, more dense setae.

Thorax. – *Pronotum* slightly longer than wide with a posterior margin that is slightly wider than half the width of the anterior margin. Anterior and lateral margins with distinct rims which are marked with a single row of evenly spaced thin setae, posterior margin lacking setae and a distinct rim.

– *Mesopraescutum*, at its widest, is slightly wider than long, gradually narrowing toward the posterior. – *Raised surface* of the mesopraescutum with irregular, warty, granulation running the length of the medial sagittal plane starting at the anterior rim, which lacks a distinct spine medially. – *Lateral margins* of the mesopraescutum irregularly armed with ~ 8 major tubercles and 3-4 minor tubercles of varying sizes. The largest of the tubercles include a short dark setae in their center.

– *Mesopleurae* gradually diverging, armed with 7-8 major tubercles and 4-5 minor tubercles of varying size and spacing, some of which are slightly irregular in shape. Each tubercle has at least a single stout dark setae projecting from it, with some of the largest tubercles occasionally marked with 2-3 setae.

– *Mesonotum anterior* ridge only distinct along the center, tapering quickly before reaching the lateral margins and lacking a prominent medial spine.

– *Pro-* and *mesosternum* covered in irregularly sized and spaced minor granules, *metasternum* less granular than *pro-* and *mesosternum*.

– *Tegmina* reaching the posterior of abdominal segment II.

Alae. – Well developed, when folded, reaching the posterior margin of abdominal segment IX, with exposed section of folded alae slightly sclerotized.

Abdomen. – *Segments II* through anterior half of VI gradually widening, with VI the widest segment of the body. – *Segment V* with an eyespot (diameter of ~ 2.0 mm) on each side of the midline. – *Posterior half of VI* through anal abdominal segment converging, and slightly rounded edges creating a gentle lobed abdominal edge. – *Anal abdominal segment X* slightly wider than long, with the apex not particularly broad. – *Poculum* broad, starting halfway through abdominal segment VIII and ending in a broad rounded apex that reaches the anterior margin of segment X, lateral margins not reaching the lateral margins of the abdominal segment. – *Cercus* with about half the length protruding from under the anal segment, cercus are relatively short, broad, and relatively flat without strongly curved margins. – *Vomer* short and wide, only reaching half way through the anal segment, apical spine hooked upward pointing into the paraproct.

Legs. – *Interior profemora lobe* rounded with 4 serrate, unevenly spaced teeth with large dipping spacing between the largest of the teeth. – *Exterior lobe*, slightly wider than interior, obtuse angle of $\sim 130^\circ$ and edges but with 5 small serrate teeth on the distal half. – *Protibiae exterior lobe* greatly reduced and only slightly noticeable on the anterior edge, interior lobe a rounded triangle spanning the entire length of the protibia. – *Mesofemora*, exterior lobe gently arcing with three prominent teeth; interior lobe rounded, with five serrate teeth and thinner than the exterior lobe. – *Metafemora exterior lobe* with a smooth edge and thinner than interior lobe. – *Metafemora interior lobe* slightly wider than exterior and armed with 6-7 small serrate teeth that are more prominent near the distal end. – *Mesotibia* with a small rounded exterior lobe slightly on the

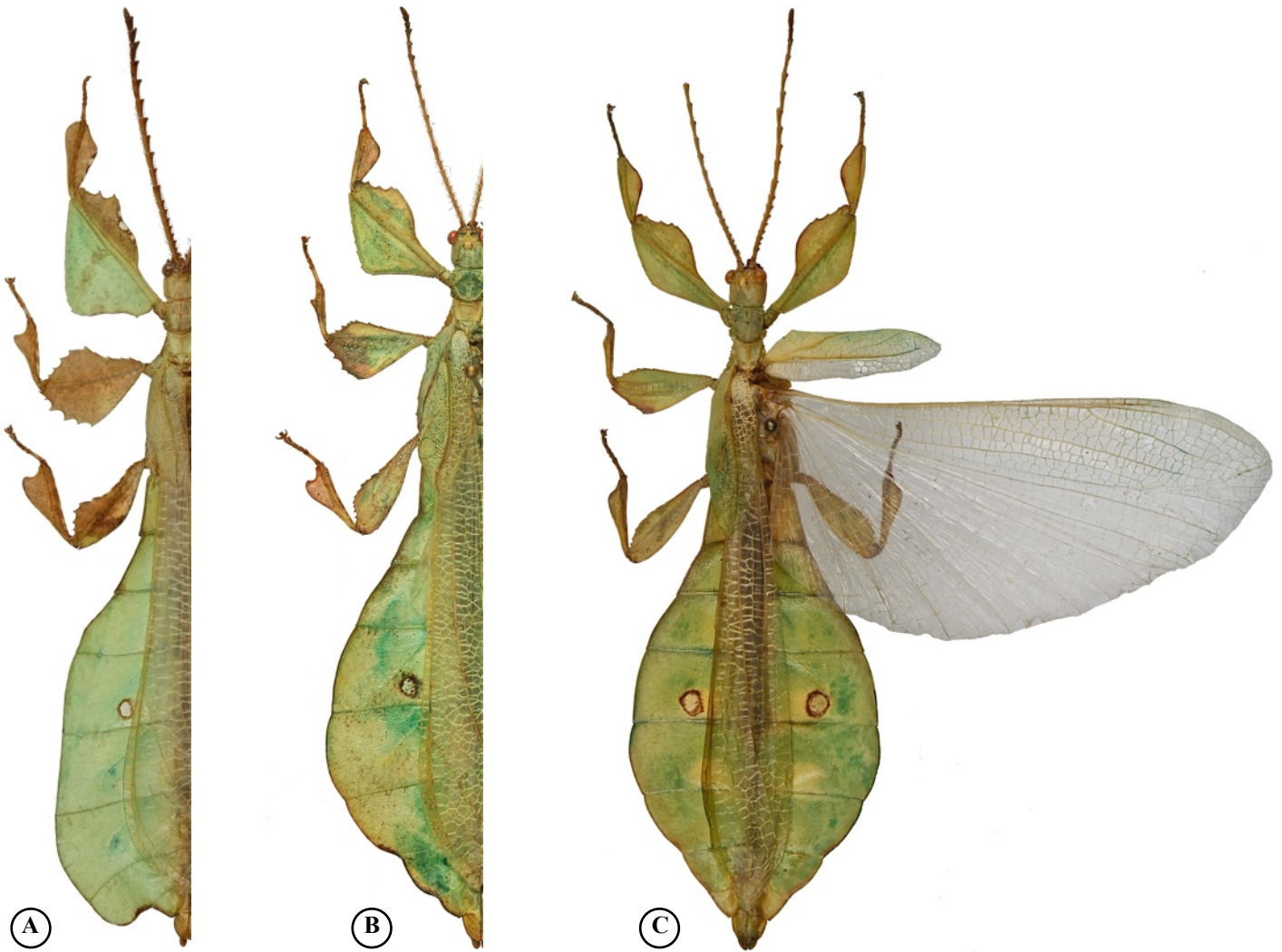


Fig. 2. - Males, dorsal view. - **A:** *Phyllium (Pulchriphyllium) pulchrifolium* (West-Java) [Coll. RC 16-153]. - **B:** *Ph. (Pu.) mannani* (Sabah, Borneo) [Coll. RC 16-100]. - **C:** holotype *Phyllium (Pulchriphyllium) shurei* n. sp. [Coll. RC 16-258].

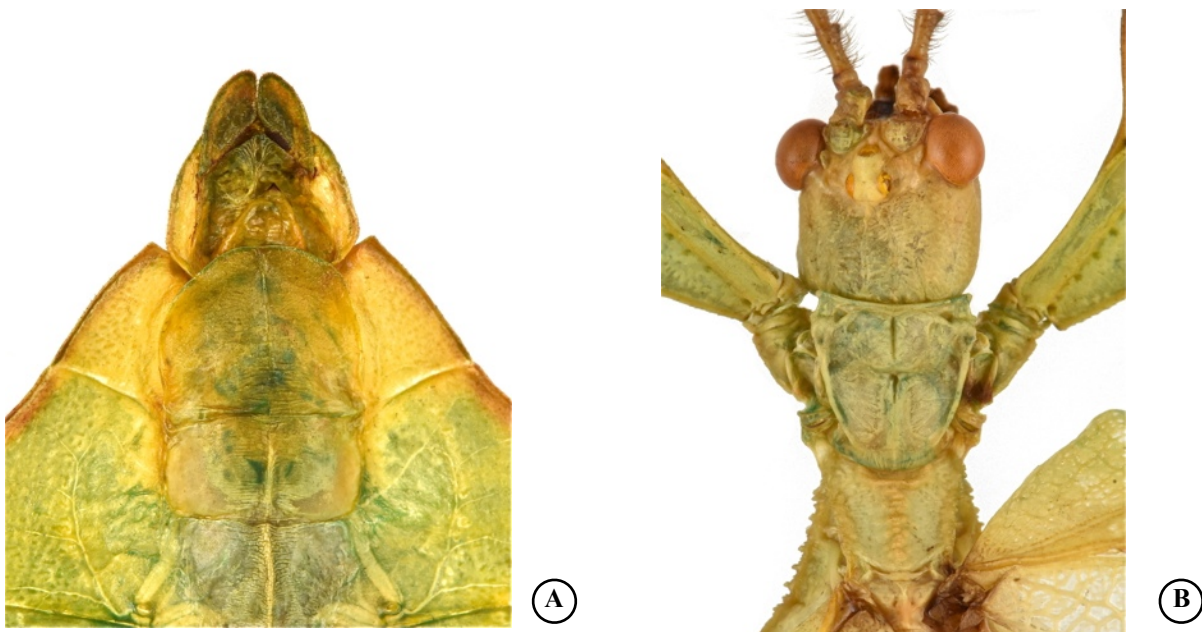


Fig. 3. - Male holotype of *Phyllium (Pulchriphyllium) shurei* n. sp. [Coll. RC 16-258]. - **A:** ventral of genitalia. - **B:** dorsal of base of antennae, head, and thorax.

distal half, about as wide as the tibia itself. – *Metatibiae exterior lobe* the largest of the tibial lobes, a rounded scalene triangle larger on the distal end.

Measurements [mm].

- length of body (including head and cerci, excluding antennae): 57.8
- length/width of head: 3.1/3.2
- length of pronotum: 2.8
- length of mesonotum: 3.0
- length of tegmina: 15.5
- greatest width of tegmina: 4.6
- length of alae: 43.7
- greatest width of abdomen: 21.3
- length of profemora: 10.3
- length of mesofemora: 8.3
- length of metafemora: 9.0
- length of protibiae: 6.0
- length of mesotibiae: 5.2
- length of metatibiae: 7.4
- length of protarsi: 4.4
- length of antennae: 22.0.

Key to known *Phyllium* males from Java, Indonesia

1. Several or all tibia with an exterior lobe; antennae ventrally serrate: (subgenus (*Pulchriphyllium*)) 2.
— All tibia lacking an exterior lobe; antennae simple/filiform: (subgenus (*Phyllium*)) 3.
2. Exterior lobe of profemora a clear obtuse angle ~130°; exterior lobe of protibia reduced to only a sliver, many times smaller than the interior lobe; abdomen ovular with segment VII converging towards the apex: *Phyllium (Pulchriphyllium) shurei* n. sp.
— Exterior lobe of profemora ~100° angle; exterior lobe of protibia notable and only slightly thinner than interior; abdomen rectangular in appearance with segments V-VII parallel to slightly widening: *Phyllium (Pulchriphyllium) pulchrifolium* Audinet-Serville, 1838
3. Exterior lobe of profemora greatly reduced, several times thinner than the interior lobe; abdomen spade-shaped with V the widest segment, all the rest tapering towards the apex: *Phyllium (Phyllium) jacobsoni* Rehn & Rehn, 1933

Nomenclatural note

To maintain accordance with ICZN article 34.2, Seow-Choen's 2017 description of *Phyllium (Pulchriphyllium) lambirensis* needs to be respelled to *Phyllium (Pulchriphyllium) lambirensis* Seow-Choen, 2017. Adjectival species names such as this one named after the type locality, Lambir Hills, must agree with the gender of the genus. In this case, *Phyllium* is a neuter genus and the suffix must agree.

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Amber MacInnis for proofreading the author's first draft. Francis Seow-Choen for discussion on the Bornean sister species *Phyllium (Pulchriphyllium) mannani* Seow-Choen, 2017. Jim Berrian at the San Diego Natural History Museum, for years of entomological support. Paul

Etymology. – The new species is named to honor Max Shure, friend to the first author and fellow adventurer passionate about international travel and entomology.

Distribution. – *Phyllium (Pulchriphyllium) shurei* n. sp. is currently only known from the type-locality in Western Java, Indonesia. Just north of Java, the island of Borneo is home to *Phyllium (Pulchriphyllium) mannani* Seow-Choen, 2017, this close proximity of distributions coupled with the morphological similarity to *Phyllium (Pulchriphyllium) shurei* n. sp. makes them likely adelphotaxon. Within the first authors collection *Ph. (Pu.) mannani* Seow-Choen, 2017 appears to be one of the most frequently encountered *Phyllium* males from Borneo next to *Ph. (Ph.) bradleri* Seow-Choen, 2017 and therefore it is surprising that its sister species *Ph. (Pu.) shurei* n. sp., is now the least commonly encountered *Phyllium* species from Java.

Brock for the revision of the paper and interesting discussion on the statut and study of *Phyllium*. René Limoges, entomological technician at the Montreal Insectarium for taking photos for this work as well as for many professional courtesies.

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Résumé

Cumming R. T. & Le Tirant S., 2018. – *Phyllium shurei* n. sp., un troisième insecte feuille de Java, Indonésie (Phasmida, Phylliidae). *Faunitaxys*, 6(1) : 1 – 5.

Une nouvelle espèce du genre *Phyllium* est décrite de Java, avec illustrations et photographies. Une clé de détermination des *Phyllium* mâles de Java est donnée ainsi que des précisions de nomenclature concernant *Phyllium (Pulchriphyllium) lambirensis* Seow-Choen, 2017.

Mots-clés. – Phasmatodea, Phasmida, Phylliidae, Phylliinae, Phylliini, *Phyllium*, Java-Ouest, Indonésie, nouvelle espèce, mâles, clé de détermination.

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Illustration de la couverture : Indonésie, Java-Ouest, Sukabumi, localité type de *Phyllium (Pulchriphyllium) shurei* n. sp.

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