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A new species of *Phyllium* (*Phyllium*) Illiger, 1798 from Mindanao, Philippines (Phasmida, Phylliidae)

ROYCE T. CUMMING
Entomology Department, San Diego Natural History Museum, POB 121390, Balboa Park, San Diego, California, United States. 92112-1390. E-mail: roycecumming@gmail.com

A new species of leaf insect, *Phyllium* (*Phyllium*) *fallorum* **n. sp.** is described and illustrated. In addition a key to the current known species of *Phyllium* Illiger, 1798 from the Philippines is provided. This species is currently only known from the single unique holotype, which will be deposited in the San Diego Natural History Museum. Measurements of anatomical figures were made to the nearest 0.1 mm. Photos were taken using a Canon 5D Mark II and a MP-E 65mm macro lens and stacked using Zerene photo stacking software, version 1.04, 64-bit. Currently, ten species of *Phyllium* Illiger, 1798 have been described from the Philippines, with *Phyllium* (*Phyllium*) *fallorum* **n. sp.** the eleventh. Of the eleven known species from the Philippines, five are only known from female specimens.

Differentiation. The lack of developed alae, place *Phyllium* (*Phyllium*) *fallorum* **n. sp.** within the *siccifolium* species-group as described by Hennemann *et al*., 2009. *Phyllium* (*Phyllium*) *fallorum* **n. sp.** appears most closely related to *Phyllium* (*Phyllium*) *woodi* Rehn & Rehn, 1933 because of the smaller size, wart-like thoracic tubercles, as well as the broad rounded anal segment that appears wider than long. *Phyllium* (*Phyllium*) *fallorum* **n. sp.** can however be distinguished from *Phyllium* (*Phyllium*) *woodi* Rehn & Rehn, 1933 by the profemora lobes and serration, subgenital plate, and length of the gonapophyses. From *Ph. woodi* it differs by the interior lobe of the profemora with approximately a right angle (more obtuse in *Ph. woodi*) with six small teeth unevenly spaced (six large evenly spaced teeth in *Ph. woodi*), and almost smooth outer margin of the profemora (acutely serrate in *Ph. woodi*). In addition to the profemora giving an easy differentiation, the genitalia differ by a broad subgenital plate with convex sides creating a rather spade-shaped appearance (sides of subgenital plate in *Ph. woodi* rather straight creating a triangular appearance) and the gonapophyses that are longer than the anal segment (shorter in *Ph. woodi*, not reaching the apex).

***Phyllium* (*Phyllium*) *fallorum* n. sp. (Figures 1 & 2).**

Holotype: ♀: Philippines, Mindanao, Davao Del Sur, Kapatagan X-2015 [Coll. RC 16-121].

Description: Small size for the genus (66.5 mm, only 10.2 mm longer than current smallest *Phyllium* (*Phyllium*) *riedeli* Kamp & Hennemann, 2014). A rather robust species in several aspects; a broad smooth head, robust thoracic tubercles, and broad abdomen/subgenital plate. Coloration is based on a photo of the specimen shortly after being collected. Figures are of the specimen after being dried resulting in some loss of color.

Coloration. Overall coloration a pale green more akin to lime green. Venation of the tegmina slightly darker and more orange especially closer to the base. Compound eyes, mesopraescutum, mesopleurae, and antennae of an orangish nature as well. Mesocoxae with conspicuous black interior mark surrounded by a burnt red color.

Morphology. Head capsule about as wide as long, with vertex smooth, lacking significant protuberances. Antennae (3.8 mm), consisting of nine segments with the pars stridens on antennomere III with 27 teeth. Pronotum with anterior margin concave and slight convex lateral margins converging to a straight posterior margin. Pronotum anterior margin is approximately 1.6 times wider than the posterior margin. Anterior and lateral margins of the pronotum have a distinct rim whereas the posterior margin lacks a distinct rim. Prosternum is slightly granulate with no notable structures. Mesopraescutum wider than long, slightly narrowed posteriorly. Lateral rims with 7+/- tubercles of varying sizes (5 major, ~2 minor). Mesopraescutum mediolongitudinal carina distinctly raised with three large tubercles along the sagittal plane, with the most prominent located on the concave rim of the anterior. Mesopleurae angled at around 45 degrees; strong lateral margin with 5 major tubercles and a notable but smaller tubercle between major tubercles III and IV. Face of the mesopleurae marked with two pits, one on the anterior third and one on the posterior third, with the anterior pit larger and more noticeable. Mesosternum somewhat uniformly granulose continuing onto the metasternum. Tegmina

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(length 40.1 mm, maximum width 16.5 mm) extending almost to the posterior of abdominal segment VII. Alae are drastically underdeveloped and almost unrecognizable as alae. Abdominal segments II–IV gradually widening with IV the widest segment, first 2/3 gradually widening and the posterior 1/3 parallel. Abdominal segments V–X gradually tapering towards the apex. Segments VI–VIII gently rounded creating a crenate edge. Anal segment wider than long with a broad, rounded apex. Subgenital plate ovular in shape with posterior margin slightly passing over the anterior margin of anal segment X. Gonapophyses longer than the anal abdominal segment, protruding to about half the length that the cerci extend past the apex. Cerci are slightly cupped with a granular surface. Profemora with a moderately wide rounded exterior lobe and triangular interior lobe. Interior lobe wider than exterior lobe, anterior edge dentate with six small teeth spaced in groups of two. Protibiae lacking exterior lobe, interior lobe very reduced and only present on the posterior half as a scalene rounded triangle. Exterior and interior lobe of mesofemora gently rounded with the exterior lobe slightly wider and interior lobe slightly serrate. Exterior and interior lobe of metafemora gently rounded with interior lobe wider and serrate.

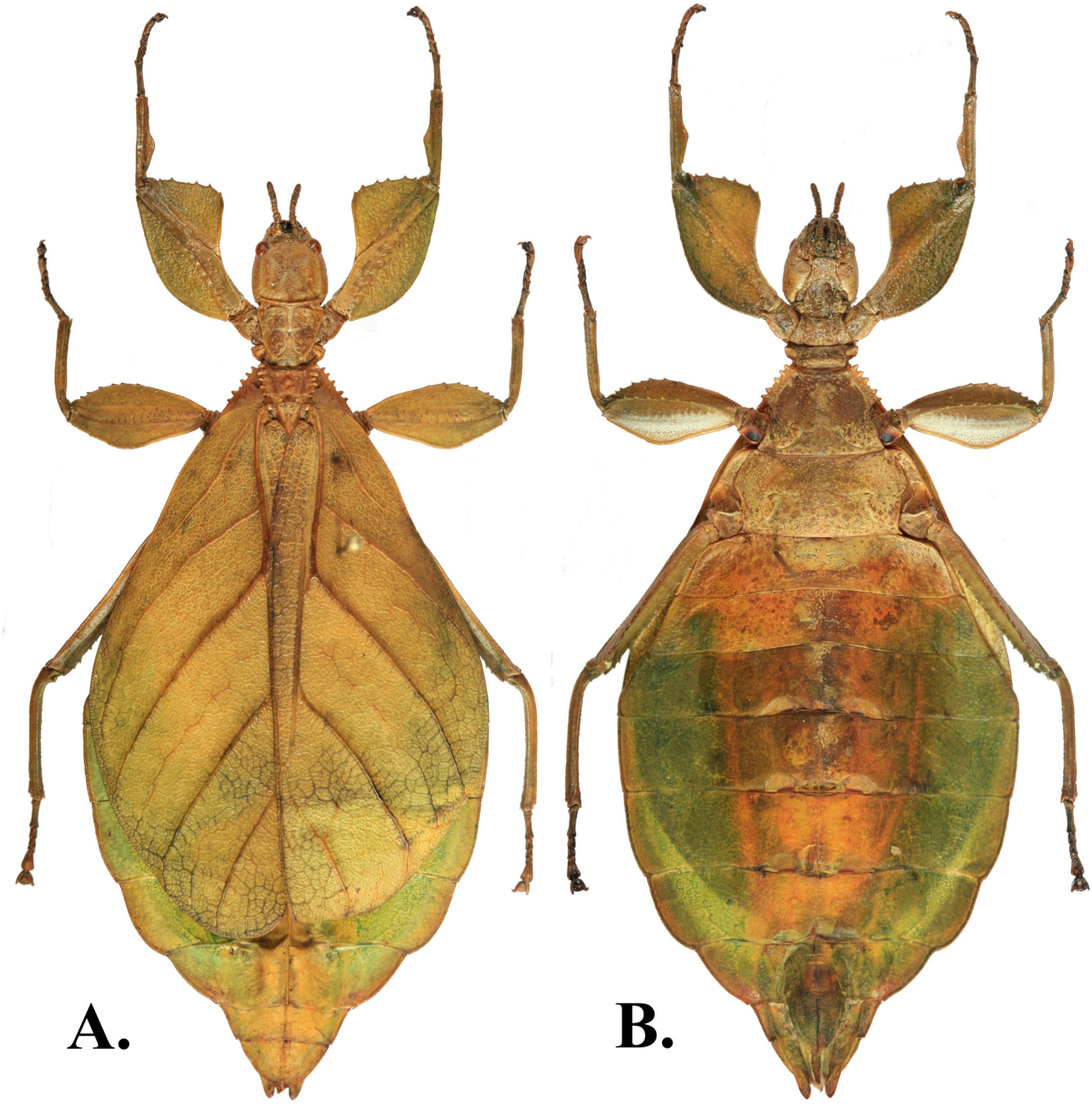

FIGURE 1. *Phyllium* (*Phyllium*) *fallorum* **n. sp.**, **A:** dorsal view; **B:** ventral view.

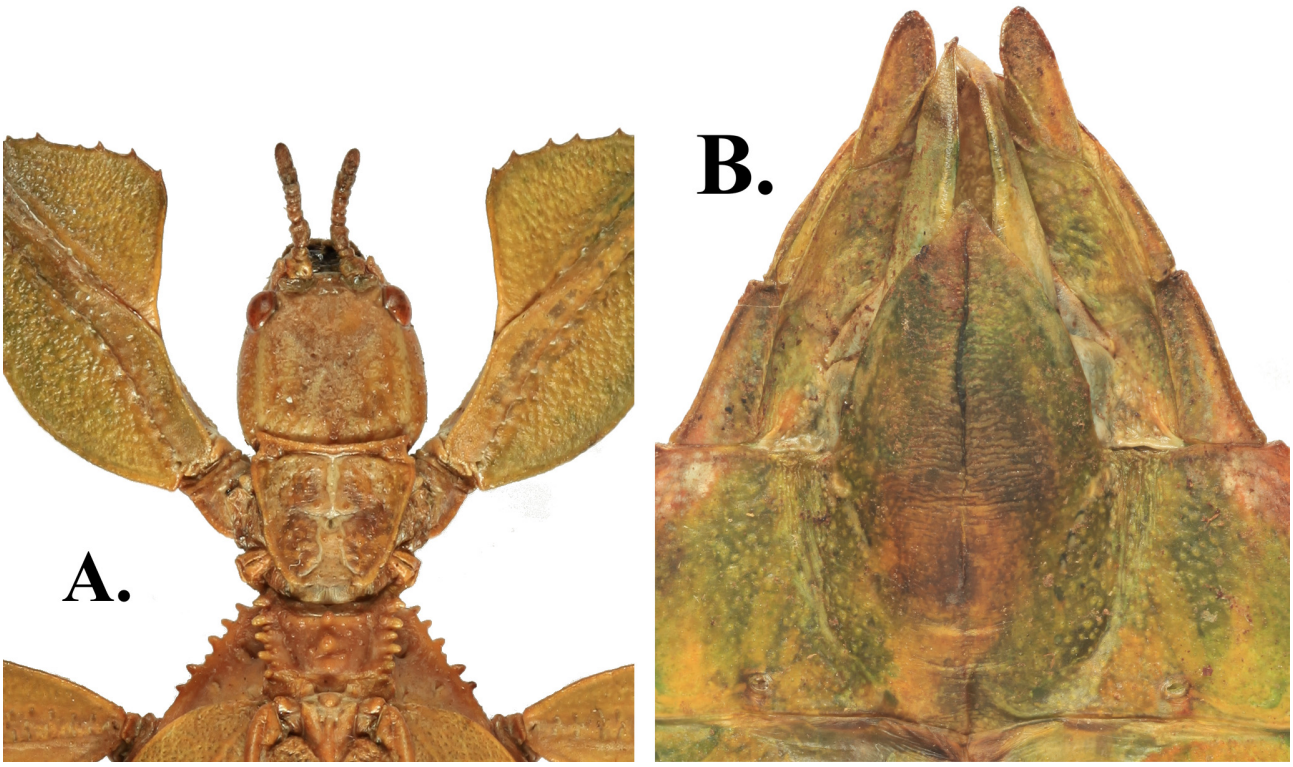

FIGURE 2. *Phyllium* (*Phyllium*) *fallorum* **n. sp.**, **A:** antennae, head, pronotum, and mesothorax; **B:** genitalia, ventral view.

Measurements [mm]: Length of body 66.5, length/width of head 5.8/5.9, pronotum 4.7, mesonotum 4.7, length/width of tegmina 40.1/16.5, greatest width of abdomen 31.0, profemora 11.9, mesofemora 10.5, metafemora 13.5, protibiae 7.4, mesotibiae 7.9, metatibiae 11.4, antennae 3.8.

Etymology: This new species is a patronym named to honor the Fall family of BioQuip Products, California, United States. BioQuip Products was born in 1947 when Richard Fall began manufacturing entomology drawers in the family's garage. Wife Louise Fall and sons, Ken and Chris, continue to run the family work today.

Key to the known female *Phyllium* (*Phyllium*) ILLIGER, 1798 of the Philippines

1. Alae well-developed; (*celebicum* species group) ..... .2.
- Alae rudimentary; (*siccifolium* species group) ..... 3.
2. Abdominal segment VII lateral margin with distinct lobe; angle of exterior lobe of profemora approaching 90 degrees; (Marinduque, Luzon & Batan) ..... *ericoriai* HENNEMANN *et al.*
- Abdominal segment VII lateral margin with indistinct lobe & converging posteriorly; angle of exterior lobe of profemora obtuse; (Northern Luzon) ..... *bonifacioi* LIT & EUSEBIO
3. Anal abdominal segment (X) distinctly wider than long, with a broad apex ..... 4.
- Anal abdominal segment (X) appearing longer than wide, with a narrow apex ..... 6.
4. Subgenital plate with concave sides creating a small fine point that that hardly projects over the posterior margin of abdominal segment IX; ("Philippines") ....*geryon* GRAY
- Subgenital plate margins straight or slightly convex creating a more prominent plate ..... 5.
5. Outer margin of exterior lobe of profemora acutely dentate; teeth of interior lobe large and approximately evenly spaced; subgenital plate margins straight and gonapophyses not passing the apex of abdominal segment X; (Sibuyan) ....*woodi* REHN & REHN
- Outer margin of exterior lobe of profemora relatively smooth; teeth of interior lobe small and paired creating uneven spacing; subgenital plate margins convex and gonapophyses passing over the apex of abdominal segment X; (Mindanao) ....*fallorum* n. sp.
6. Antennae with 10 segments ..... 7.
- Antennae with 9 segments ..... 8.
7. Medium sized species (77.5–88.0 mm); Abdominal segments VII & VIII with widely rounded lobes; 5–7 equally sized/spaced acute teeth on the interior lobe of the profemora; longer subgenital plate almost reaching the apex of the anal abdominal segment; (Northwestern Luzon) ....*philippinicum* HENNEMANN *et al.*
- Small species (65.0 mm); Abdominal segments VII & VIII with acute lobes extending posteriorly; five unequal, prominent, and

triangular teeth on the interior lobe of the profemora; shorter subgenital plate only reaching halfway way through the anal abdominal segment; ("Philippines")..... *bilobatum* GRAY

8. More than 30 teeth on the pars stridens of antenomere III..... 9.
- 23–27 teeth on the pars stridens of antenomere III; (Mindanao, Leyte, & Samar*)..... *mabantai* BRESSEEL *et al.*

9. 33–35 teeth on the pars stridens of antennomere III; V & VI abdominal lateral margins ranging from subparallel to parallel... 10.
- 40 teeth on pars stridens of antennomere III; abdominal segments V–X distinctly converging creating a triangular body shape; (Palawan)..... *palawanense* GRÖßER

10. 34 teeth on the pars stridens of antenomere III; five teeth on profemora interior lobe roughly placed evenly from each other; absence of a median spine on the transverse anterior ridge of the mesopraescutum; (Mindoro)..... *mindorense* HENNEMANN *et al.*
- 33–35 teeth on the pars stridens of antennomere III; four teeth on interior lobe of profemora with a larger distinct gap between the 2nd and 3rd; V & VI abdominal lateral margins consistently parallel; abdominal segment VII with lobes variable, if strongly lobed, profemoral teeth prominent, if lobe reduced or absent the teeth of the profemoral lobe are also reduced in size; presence of a median spine on the transverse anterior ridge of the mesopraescutum; (Palawan)..... *gantungense* HENNEMANN *et al.*

* The range of *P. mabantai* Bresseel *et al*., 2009 is here noted to be more extensive than noted by the original authors. Fresh material from both Leyte and Samar islands have since been recovered belonging to *P. mabantai* Bresseel *et al*., 2009.

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