A spectacular new species of *Ophicrania* Kaup, 1871, from Mindanao, Philippines (Phasmatodea, Phasmatidae, Platycraninae).

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Abstract

A new species of *Ophicrania* Kaup, *Ophicrania sagittarius* **n. sp.** from Mindanao Philippines as well as its eggs are described and illustrated for the first time together with notes on the food plant and habitat. The species differs from all other species in the genus by the striking colour and the absence of wings.

Key words

Ophicrania sagittarius **n. sp.**, Platycraninae, Philippines, Mindanao, Mount Apo, *Pandanus.*

Introduction

Species belonging to the tribe of the Platycranini are only rarely found, this is mainly due to their arboreal way of life and the close relation with their food plant where they blend in perfectly. Recently a revision of the genus *Megacrania* Kaup, 1871 was published (Hsiung, 2007), a revision at species level of the genus *Ophicrania* is desperately required as well. The last time a new *Ophicrania* species was described, was by Brock in 1999 and like many other *Ophicrania* species, it is only known from one sex. The last description based on both sexes was by Günther in 1937 but Günther misplaced this species, as well as *Ophicrania meridionalis* Günther, 1932. The correct names should be *Graeffea leveri* (Günther, 1937) **comb. n.** and *Graeffea meridionalis* (Günther, 1932) **comb. n.**

The first *Ophicrania* egg was described as early as 1871 by Kaup, the founder of ootaxonomy. Kaup stated: "Dieses Ei ist das sonderbarste, welches ich kenne, und, trügt mich mein Schlufs nicht das alle Eier von einem und demselben Genus sich in der allgemeinen Forn ähnlich sehen müssen" [This egg is the most peculiar egg that I know, and, unless I am very much mistaken, eggs belonging to a same genus have to look alike in shape]. Indeed, as Kaup stated, all *Ophicrania* eggs look alike and can be distinguished by the clear median line from *Megacrania* Kaup, 1871 (Sellick, 1997).

Including this new species, 19 species of *Ophicrania* are known at present. Nine species occur in the Philippines.

Checklist of Philippine species belonging to *Ophicrania*

Below an alphabetical list of *Ophicrania* species so far recorded from the Philippine Islands is presented. The known distribution given is based on literature sources (Bruner, 1915; Otte & Brock, 2005) and collection of the authors. Many species are only known from one locality and many of the localities aren't detailed. Most of the time only the island or just Philippines is mentioned on the labels.

1. *Ophicrania brunni* (Redtenbacher, 1908: 378) [*Arrhidaeus*]
   [Samar: Palapa]
2. *Ophicrania nigricornis* (Stål, 1877: 41) [*Arrhidaeus*]
   [Philippine Islands]*
3. *Ophicrania nigroplagiatus* (Redtenbacher, 1908: 376) [*Arrhidaeus*]
   [Luzon]
4. *Ophicrania nigrotaeniatus* (Redtenbacher, 1908: 377) [*Arrhidaeus*]
   [Luzon: Valle de Bulusan]
5. *Ophicrania palinurus* (Westwood, 1859: 135 pl. 2: 6) [*Necroscia*]
   [Luzon: Quezon National Park]
6. *Ophicrania sagittarius* **sp. n.**
   [Mindanao: Mount Apo, Tampakan]

7. *Ophicrania stygius* (Westwood, 1859: 192 pl. 2: 3) [*Necroscia*]
   = *Ophicrania stali* (Kirby, 1896: 741) [*Arrhidaeus*]
   [Albay, N.E. Luzon]
8. *Ophicrania vittipennis* (Stål, 1875: 85) [*Arrhidaeus*]
   [Luzon]
9. *Ophicrania viridinervis* (Stål, 1875: 85, pl. 17: 2) [*Arrhidaeus*]
   [Luzon: Sierra Madre]

* Bragg (2001) also recorded this species from Sabah and Sarawak, but the material was badly damaged so there are doubts whether this is really the same species.

Abbreviations used :
BMNH: British Museum of Natural History, London, England.
IRSBN: Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.
JB: private collection Joachim Bresseel, Meise, Belgium.
MB: private collection Mark Bushell, Wiltshire, England.
MG: private collection Marco Gottardo, Ferrara, Italy.
HT: holotype.
PT: paratype.
SMI: Sagittarius mines inc.

Ophicrania sagittarius n. sp.

Material
HT, ♂ : Philippines, Mindanao, Mount Apo, Lake Agko, 16.III.2008, ex coll. JB (IRSNB)
PT [2 ♂♂, 1 ♀, 1 egg]: ♀ Philippines, Mindanao, Mount Apo, Lake Agko, 16.III.2008, ex coll. JB (IRSBN); ♂ Philippines, Mindanao, Mount Apo, Lake Agko, 16.III.2008, ex coll. JB (BMNH); 1 egg Philippines, Mindanao, Mount Apo, Lake Agko, III.2008, ex collection MB (IRSBN) ; ♂ Philippines, Mindanao Island, Mt. Apo, 1300 m, 27.III-10.IV.2006, leg. R. Cabale, collection MG

Figure 1. Male holotype mating with female paratype.

Diagnosis
Atypical *Ophicrania* species because it lacks wings in which it differs from the type species *Ophicrania striaticollis* Kaup, 1871 as well as by its smaller size and striking colours.
The most closely related species appears to be *Ophicrania apterus* (Redtenbacher, 1908) from Papua New Guinea. Only the female is known of this species. Although its name suggests the total lack of wings, it still possesses small scale-like tegmina. All the types of *O. apterus* (Redtenbacher, 1908) are lost, but the authors examined a specimen out of the collection of Frank H. Hennemann. *O. apterus* is differently coloured: a white dorsal longitudinal line

reaching from head till the end of the abdomen.

The most closely related Philippine species is *Ophicrania nigricornis* (Stål, 1877). The female has developed tegmina, but the alae are not visible. The male is fully winged. Heads and bodies of both sexes are coloured orange and black.

Furthermore this is the first *Ophicrania* species described that occurs with certainty on the island of Mindanao and with both sexes completely wingless.

Etymology

This species is named after the Sagittarius Mines, Inc. (SMI) for their efforts to study and breed stick insects in their field trials (Tampakan, Mindanao, Philippines) and create environmental and biodiversity awareness within the community.

Description

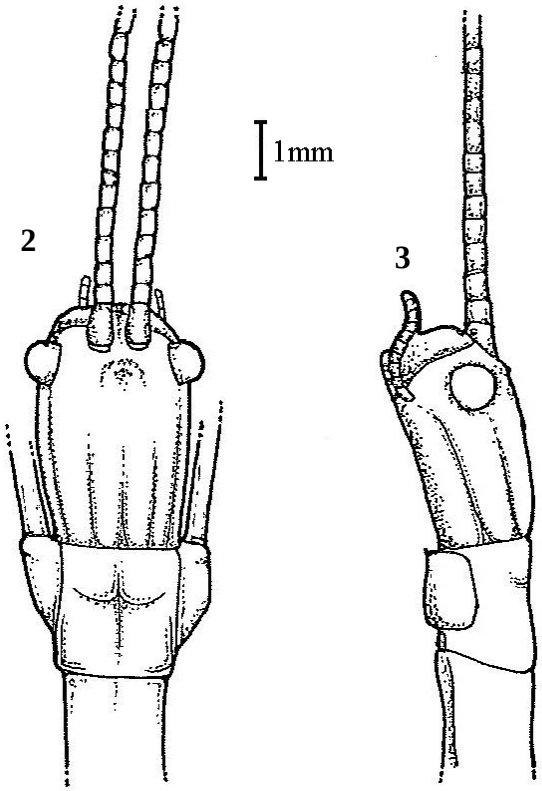
All colouration taken from photographs of live specimens.

Male (figs. 1-5 & 11)

Whole body with a shiny appearance and wingless. Measurements see table 1.

Head: Much longer than wide, uniformly deep blue-green, with a raised oval area between the eyes. Mouthparts orange. Antennae orange and consisting of 20 segments. Scapus flattened, pedicellus short and almost spherical. Following segments slightly setose. Third segment as long as scapus and pedicellus combined. Segment IV as long as third, then gradually becoming longer until segment XIII, segment XIV-XVII again shorter. Last segment again longer with a darker end.

Thorax: Completely shiny orange and smooth. Prothorax shorter than head, pronotum with a median transverse groove. Mesothorax longer than head and prothorax combined. Cylindrical in cross section, smallest diameter in the centre. Metathorax short with a lateral raised area which reaches the metacoxae.

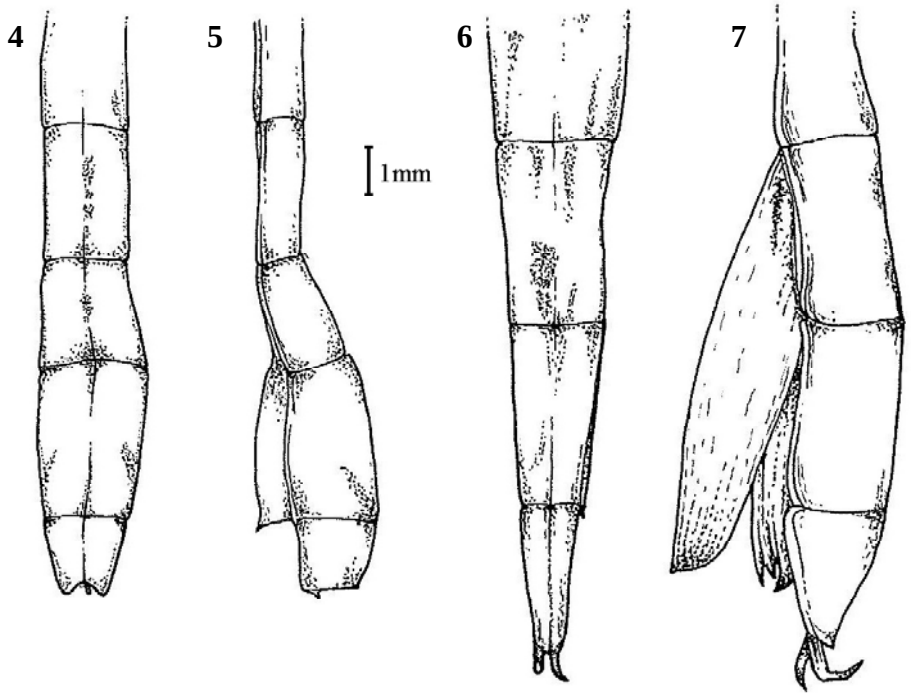


Figures 2-3. Male head and prothorax: **2.** dorsal view, **3.** lateral views.

Legs: Greenish- blue with a setose ventral area, carinae indistinct. Profemora curved and compressed basally. Ventral part bearing two small spines; one apically and one subapically. Mesofemora as profemora, but shorter and ventral spines more distinct. Metafemora with three spines, the first one not as distinct as the two following. Tibia compressed laterally and with a spine at the apex. Tarsomeres greenish- blue with orange colouration at apexes, pretarsus dark orange. Probasitarsus very long, longer than all tarsomeres combined. Third tarsomere about two thirds as long as second. Fourth tarsomere very short. Fifth tarsomere widened latero- apical. Meso- & metaprobasitarsus about as long as following tarsomeres. Basitarsi and al tarsomeres with a very small spine at the apex.

Claws curved, arolia large reaching the end of the claws.

Abdomen: Same colouration as thorax. Median segment smooth and separated from thorax by a transverse depression at the end of the metanotum and by lateral ridges. Segment II about one third longer than median segment. Segment II-VI more or less from the same length. Segment VII a bit shorter than proceeding segments. Segment VIII – X with a distinct ridge dorso- medially. Segment VIII half as long as segment VII, segment IX slightly longer than VIII and segment X shorter again with apically a short division postero- medially. Cerci short, slightly exceeding the last segment. Poculum rounded with a carina ventro-medially.



Figures 4-7. Apices of abdomens.
4. Male, dorsal view. **5.** Male, lateral view. **6.** Female, dorsal view. **7.** Female, lateral view.

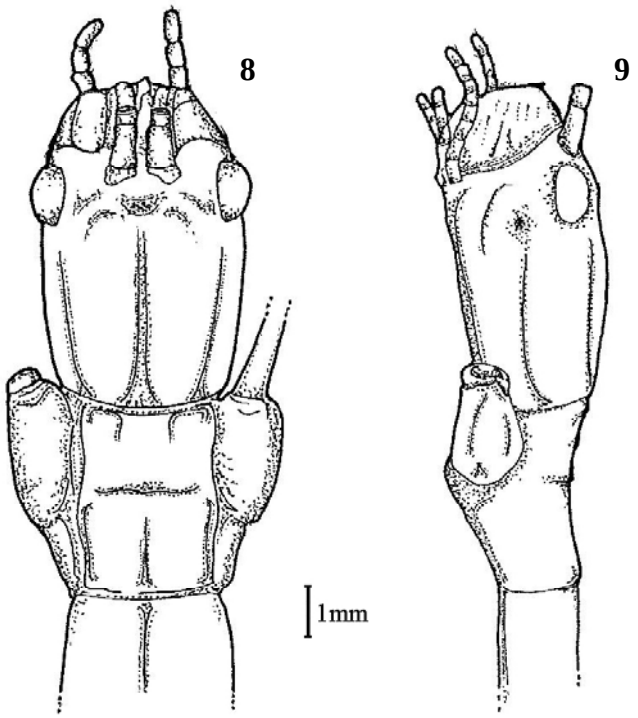
Female (figs. 1, 6-10)

Differently coloured and broader body than in male, the specimen has lost much of its original colouration during preservation. Measurements see table 1.

Head: Typically for the subfamily very large, colour deep blue-green with black cheeks. Anterior half of head a slightly darker green-blue. Mouth-parts orange. Eyes orange with a raised oval area between the eyes and a depression posterior and anterior of this area. Vertex possessing three longitudinal depressions. One median depression reaching from the raised oval area between the eyes till the start of the pronotum. Two other depressions, each starting at the posterior side of the eye and ending at the sides of the pronotum. The cheeks possess a pseudoforamen under the posterior side of the eye, just above the lateral black markings. Antennae broken but examined before damage. Antennae orange, a bit longer than head and prothorax combined, consisting of scapus, pedicellus and 19 following segments. Scapus flattened, pedicellus short and almost spherical. Following segments slightly setose. First segment about as long as scapus. Segment II & III decreasing length, segments IV-VII increasing again in length. After segment VII gradually reducing in size till segment XVIII,

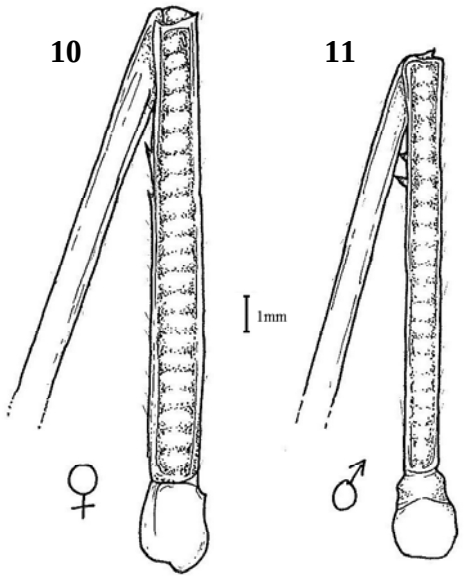
last segment as long as segment XVII & XVIII combined.

Thorax: Dorsal surface of thorax blue-green with orange longitudinal markings on metanotum. Edges of all dorsal segments orange. Ventral surface uniform orange. Prothorax shorter than head, pronotum with a median transverse and longitudinal groove forming a cross. Mesothorax smooth and about four thirds the length of the head and prothorax combined. Cylindrical in cross section, smallest diameter in the centre. Metanotum about as long as pronotum with a lateral raised area that reaches the metacoxae.



Figures 8-9. Female head and prothorax. **8.** dorsal view. **9.** lateral view.

Legs: Greenish-blue with small scattered patches of blue-black and with a setose ventral area, carinae unlike male distinct but unarmed. Apexes of all leg segments with small area of orange colouration. Only one foreleg present. Profemur compressed and curved basally, almost triangular in cross-section, bearing one small spine subapically. Mesofemora shorter, bearing three successive spines subapically. Metafemora reaching the end of abdominal segment V, bearing four successive spines subapically. Tibia all unarmed. Probasitarsus very long, longer than all tarsomeres combined. Basitarsi and all tarsomeres with a very small spine at the apex. Tarsomeres gradually reducing in size. Claws curved, arolia large reaching the end of the claws.



Figures 10-11. Left metafemur. **10.** Female, **11.** male.

Abdomen: Deep blue-green with orange-brown mark on dorsal surface of abdominal segment VIII. Edges of all dorsal segments with orange edges. Ventral surface of abdomen uniform orange with connecting tissue between dorsal and ventral plates a slightly darker orange. Median segment a bit longer than metanotum. Separated from the thorax by a transverse depression at the end of the metanotum and by lateral ridges.

Segment II about one third longer than median segment. Segment II-VII more or less from the same length. Segment VIII slightly shorter than segment VII and segment IX slightly longer than segment VII. Segment X with a dorsomedial ring and rounded posteriorly. Cerci orange and about as long as last segment. Operculum not passing last segment, with a black pit on both sides anteriorly. Praeopercular organ indistinct.

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Ophicrania sagittarius	HT, ♂ (IRSNB)	PT, ♂ (BMNH & MG)	PT, ♀ (IRSNB)
Body:	52.9	41.2 – 51.8	69.8
Head:	4.4	4.4 – 4.5	7.1
Pronotum:	3.0	2.8 – 2.9	3.8
Mesonotum:	11.2	10.4 – 10.6	14.2
Metanotum:	2.8	2.7 – 3.0	3.5
Median segment:	2.8	2.6 – 2.9	4.2
Profemora:	19.7	18.4 – 19.0	23.6
Mesofemora:	11.2	10.0 – 10.9	13.3
Metafemora:	15.2	14.3 – 14.9	17.0
Protibiae:	20.4	18.8 – 19.2	25.3
Mesotibia	11.0	10.3 -10.5	13.5
Metatibia	15.1	14.0 -15.2	17.0
Antennae:	16*	17.8 – 18.3	/

Table 1: measurements of *Ophicrania sagittarius* **sp. n.** [mm]. *few segments missing.

Eggs (fig. 12-13)
Description: Capitulum missing but conical like as in other *Ophicrania* species. Capsule also typical for the genus, laterally compressed and pitted all over the surface. Posterior part of ventral and dorsal side elevated, forming a 'split' polar area with an impression in the centre from lateral perspective. General colouration of capsule greyish to brown.

Micropylar plate small and shaped in the form of a raindrop, with in its centre a slightly elevated area. Micropylar cup present and slightly elevated. Micropylar plate coloured like capsule, except for the outer margin, the median line and the central region which are reddish brown.

Figures 12-13. Egg capsule.
12. dorsal view. **13.** lateral view.

Measurements (without capitulum): width 2mm; height: 2,1mm; length: 4,6mm.

Comments
The type specimens were found at Lake Agko Campsite, Mt. Apo, Mindanao, although they have also been found in Tampakan during field trials (pers. comm. B. Mabanta). The area is highland secondary rainforest with a large amount of biodiversity. When initially handled the insects produced a milky fluid from defensive glands located in the front corners of the prothorax. The scent of this fluid was reminiscent of peppermint, very similar to a number of *Megacrania* spp. The insects were in plain view on the upper surface of the leaves. The

combination of their bright colour with the defensive fluid produced, would suggest that this is a very effective deterrent against potential predators.

This species was found high up on pandan trees (*Pandanus* sp.; Pandanaceae); because of the considerable damage to these trees, it is probably their only foodplant. It is the first record of a species not belonging to the genus *Megacrania* that is found to feed on *Pandanus*. Recently, damage to pandan plants due to stick insects was reported from Panay island: unfortunately the specimens collected in Panay were lost, but a specimen from Bohol was identified "most probably" as *Megacrania batesii* Kirby, 1896 (Lit & Eusebio, 2008). Although according to Hsiung (2007) *Megacrania alpheus* (Westwood, 1859) is also present in the Philippines and the type locality (Ceylon) is probably in error.

Acknowledgements

Special thanks go out to Benjie Mabanta (Manila, Philippines) for making research on the Philippine Phasmatodea possible. Thanks to Ellen Caluwé (Londerzeel, Belgium) for accompanying and assisting the authors. Marco Gottardo (Ferrara, Italy) is thanked for providing measurements and data of his specimen. Thanks are due to Efren O. Sarmiento (Tampakan, Philippines), Claire Dacanay (Tampakan, Philippines), Jose Sebua (General Santos, Philippines) and Sagittarius Mines Inc. (SMI) for their help in Mindanao. Dr. Phil E. Bragg (Nottinghamshire, England) and Frank H. Hennemann (Kaiserslautern, Germany) are thanked for providing necessary literature, comments and data.

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