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Four new species of the genus *Doliops* Waterhouse, 1841 (Coleoptera: Cerambycidae) from Mindanao Island, the Philippines

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Four new species of the genus *Doliops* Waterhouse, 1841 (Coleoptera: Cerambycidae) from Mindanao Island (the Philippines) are described and illustrated: *D. cabrasae* sp. n., *D. imomzodai* sp. n., *D. ziedonisi* sp. n. and *D. rukmaneae* sp. n. The genus *Doliops* in the world fauna is now represented by 54 species.

Key words: Coleoptera, Cerambycidae, *Doliops*, fauna, new species, taxonomy, Mindanao, Philippines

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INTRODUCTION

The genus *Doliops* Waterhouse, 1841 belongs to the tribe Apomecyni and subfamily Lamiinae. Species of this genus are distributed in the Philippines and Taiwan archipelagos. The mimicry between species of the genus *Doliops* and members of the genera *Pachyrrhynchus*, *Metapocyrtus* etc. (Curculionidae: Pachyrrhynchini) is remarkable (Barševskis, 2013, 2014). The genus *Doliops* is now represented in the world fauna by 54 species. In last five years were described 23 new species of this genus (Barševskis 2013, 2014, Barševskis & Jaeger, 2014, Barševskis & Cabras, 2016, Yoshitake & Yamasako, 2016, Vives 2013, 2014).

During the study of specimens of *Doliops* deposited in the Daugavpils University Beetle Collection (DUBC), four new species from Mindanao Island (the Philippines) were found. The main aim of the present paper are descriptions of all these taxa.

MATERIALS AND METHODS

All types of new taxa are deposited in the collection of the Daugavpils University,

Coleopterological Research Center (Ilgas, Daugavpils Distr., Latvia) - DUBC. All specimens used in this research have been collected in the Philippines by local collectors. High-resolution habitus images of *Doliops* species, including type specimens and additional material, are available at Cerambycidae of the World web-project http://www.cerambycidae.org (Barševskis et al (eds.) 2017).

The laboratory research and measurements have been made by *Nikon* AZ100, *Nikon* SMZ745T and *Zeiss* Stereo Lumar V12 digital stereomicroscopes, NIS-Elements 6D software, and *Canon* 60D and *Canon* 1 Ds Mark II cameras.

RESULTS

***Doliops cabrasae* sp. n.**
(Fig. 1A, B, C)

Type material. Holotype: female. Philippines: Mindanao Isl., Lanao del Sur, Wao, 11.2016, local collector leg.
Paratypes: male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 01.2017, local collector leg.; male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 01.2017, local collector leg.; female - Philippines: Mindanao Isl., Lanao del Sur, Wao, 01.2017, local collector leg.; male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 04.2017, local collector leg.; female - Philippines: Mindanao Isl., Lanao del Sur, Wao, 04.2017, local collector leg.; male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 05.2017, local collector leg.; male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 05.2017, local collector leg.; male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 05.2017, local collector leg.; male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 05.2017, local collector leg.;female - Philippines: Mindanao Isl., Lanao del Sur, Wao, 05.2017, local collector leg.; female - Philippines: Mindanao Isl., Lanao del Sur, Wao, 02.2017, local collector leg.; male - Philippines: Mindanao Isl., Lanao del Sur, Wao, 05.2017, local collector leg.

Distribution. Philippines: Mindanao Island.

Description. Body with strong golden metallic luster (except one paratype with black elytra). Elytra with circle-shaped and wavy bands of yellow-greenish scales. Body length: 12.4 - 14.0 mm, maximal width: 5.2 - 5.9 mm.

Head almost square, parallel-sided, with large bilobate eyes. Part of head between eyes and antennal bases with impressed longitudinal band of yellow - greenish scales and thin straight median line. Frontal part of head behind clypeus convex, very glossy, with delicate punctation and pubescence. Longitudinal band of yellow-greenish scales beginning from median portion of head between eyes and extending almost to base of head and sometimes continues on pronotum as short rudiment. This wide longitudinal band has very narrow median line. Cheeks under eyes with wide spot of yellow-greenish scales. Mandibles and genae with four to five long black lateral setae. Labrum convex, glossy, with apical emargination, pubescence, small punctures and covered with long setae. Clypeus short, shiny, transverse. Head metallic golden, glossy, with very fine microsculpture, punctation and fine tomentum. Basal area of antennae weakly protrunding. Antennae long and slender, with short pubescence and apical brush of setae of third antennomere and with several long setae at following antennal segments, except apical three - four antennomeres. 1-2 antennomeres with strong metallic luster and very fine pubescence. Antennomere 3 widened apically, black, with brown basal part. Antennomere 4 testaceous basally and darkened apically, with very fine pubescence. Remaining antennomeres testaceous, tomentose.

Pronotum subcylindrical, very convex, especially anteriorly, distinctly wider as long, anterior margin prominent, posterior margin double, sinuous, metallic golden colored, shiny,

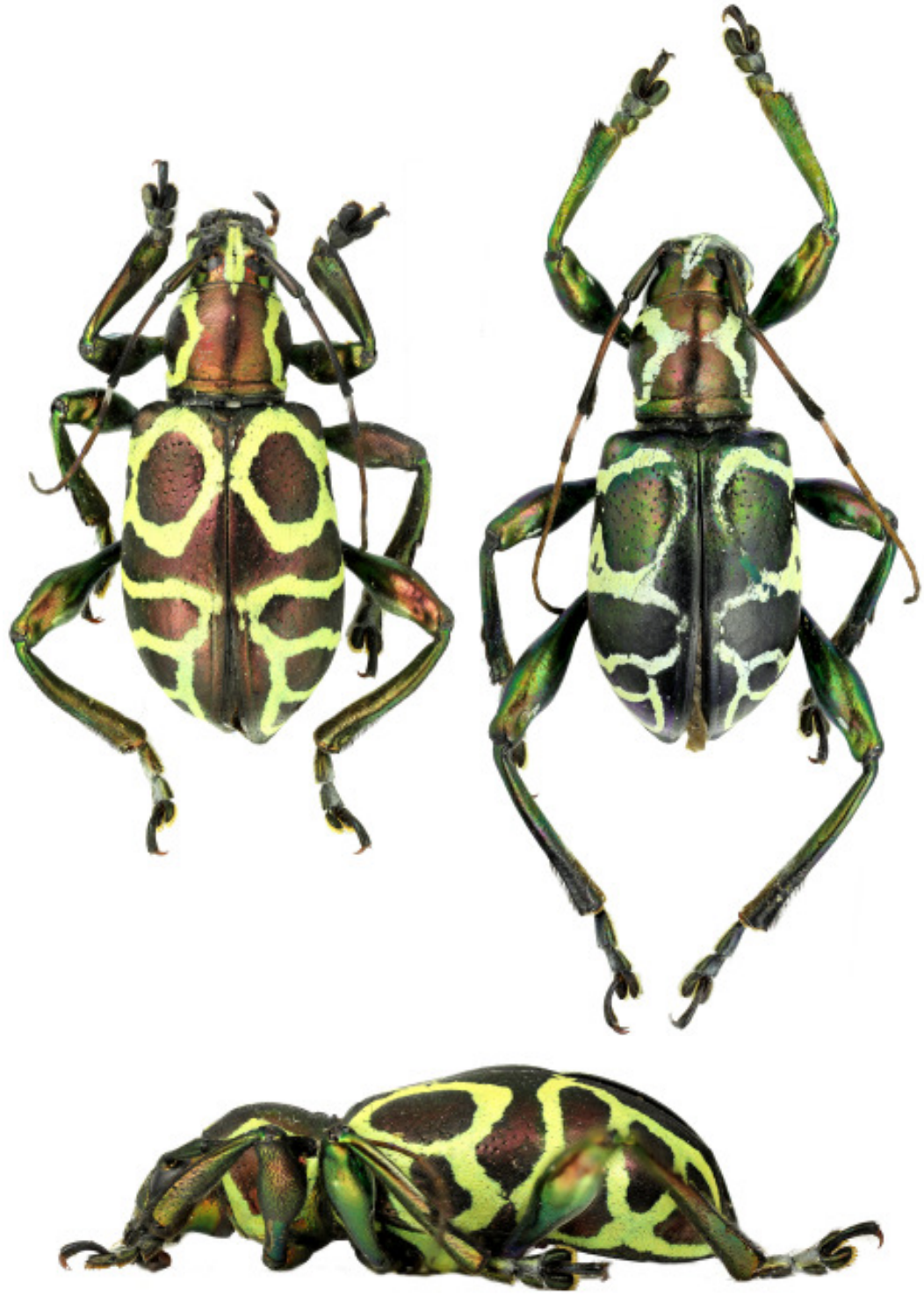


Fig. 1. *Doliops cabrasae* sp. n.: A - holotype (dorsal view), B - holotype (lateral view), C - paratype (dorsal view)

with transverse microsculpture and very sparse lateral punctation. Pronotal disc glossy, shiny, with very fine microsculpture. Lateral parts of pronotum with wide circle-shaped spot, which internal sides of some paratypes slightly brings together.

Scutellum wide, rounded apically, shiny and tomentose, golden coloured or black. *Pars stridens* with very fine transverse microsculpture.

Elytra convex, shiny, with strong metallic luster and circle-shaped wavy bands of yellow-greenish scales, with microsculpture. Dorsal circle behind shoulders large, convergent with smaller lateral circle. Large dorsal circle stretching almost to middle of elytra and sometime convergent with wavy bands forming three transverse convergent spots apically (Fig. 1). Latero-apical parts of elytra with few protruding shoulders bumps. Width of elytra at shoulders: 4.4 - 4.8 mm; maximal width of elytra behind middle: 5.4 - 5.9 mm. Anterior and lateral parts of elytra with sparse coarse punctures, fine microsculpture and pubescence.

Meso-, metaepimera and sternites spotted laterally, covered by greenish scales. Legs short and robust. Femora strongly widened at apical third, very shiny, more or less pubescent, with strong golden metallic luster and with small

Fig. 2. *D. coriticoi* Cabras & Barševskis, 2016 (holotype, dorsal view) (Cabras, Barševskis 2016)

elongate greenish apical spot. Tibia flattened at internal margin, with fringe of dark setae. Dorsal surface of tarsomeres covered by dark pubescence. Apical parts of tibia and tarsi covered by numerous setae.

Differential diagnosis. By the general shape of the body and elytra, the new species is similar to *D. coriticoi* Cabras & Barševskis, 2016 (Mindanao Isl., Bukidnon, Mt. Kiamo), but differs by the coloration of elytra: the new species has golden - colored (one paratype - metallic dark) elytra with large dorsal circle behind shoulders, which covered by yellow scales and convergent with smaller lateral circle (Fig. 1); elytra of *D. coriticoi* are black - colored, with small dorsal and lateral circles, which covered by green scales and not convergent with smaller lateral cirkle (Fig. 2).

Mimicry. *D. cabrasae* sp. n. mimics the weevil *Pachyrrhynchus cf. speciosus* (Curculionidae) (Fig. 8).

Etymology. The species named after my colleague, entomologist Analyn Anzano Cabras (Davao, Mindanao, Philippines) in appreciation of cooperation.

***Doliops imomzodai* sp. n.**
(Fig. 3 A, B, C, D)

Type material. Holotype: male - Philippines: Mindanao Isl., Bukidnon, 01.2014, local collector leg.
Paratypes: female - Philippines: Mindannao Isl., Bukidnon, 12.2013, local collector leg.; male - Philippines: Mindanao Isl., Bukidnon, 05.2016, local collector leg.; female - Philippines: Mindannao Isl., Bukidnon, Cabanglasan, 03.2014, local collector leg.; male - Philippines: Mindannao Isl., Bukidnon, Cabanglasan, 03.2014, local collector leg.; female - Philippines: Mindannao Isl., Bukidnon, Cabanglasan, 03.2014, local collector leg.; female - Philippines: Mindannao Isl., Bukidnon, Cabanglasan, 08.2014, local collector leg.; female - Philippines: Mindanao Isl., Bukidnon, San Fernando, 02.2014, local collector leg.; female - Philippines: Mindanao Isl., Bukidnon, San Fernando, 02.2014, local collector leg.; male - Philippines: Mindanao Isl., Bukidnon, San Fernando, 03.2014, local collector leg.; female - Philippines: Mindanao Isl., Bukidnon, San Fernando, 03.2014, local collector leg.

Distribution. Philippines: Mindanao Island.

Description. Body and legs with strong golden metallic luster (except two specimens with black elytra and legs), very shiny. Body surface with pale yellow or greenish metallic shiny scale strips forming net- shaped pattern on elytra. Basal parts of elytra of some specimens with isolated circle-shaped spots and with wavy bands of yellow or greenish scales at apical part. Body length: 10.9-13.4 mm, maximal width: 4.5 - 5.8 mm.

Head almost square, parallel-sided, with large bilobate eyes. Part of head between eyes and antennal bases with impressed longitudinal band of yellow or greenish scales and thin straight median line. Frontal part of head behind of clypeus convex, very glossy, with delicate microsculpture and pubescence. Longitudinal band of yellow or greenish scales beginning from median portion of head and extending almost to base of head, and sometimes will continues on pronotum as short rudiment. Thin median line of frontal longitudinal band continues from basal part of head to clypeus. Cheeks under eyes with spot of yellow or greenish scales. Mandibles and genae furnished with some long black setae laterally. Labrum convex, glossy, in frontal part concave, with pubescence, small punctures and covered with long setae. Clypeus short, shiny, transverse. Head metallic golden-colored or black, glossy, with very fine microsculpture, punctation and fine tomentum. Basal area of antennae weakly protrunding. Antennae long and slender, with short pubescence and a apical brush of setae of third and with some long setae at following antennal segments, except last three - four apical

segments. Two basal antennal segments with strong golden metallic luster or black, with greenish metallic luster and very fine pubescence. Third antennal segment brown basally, black and widened apically. Fourth antennal segment testaceous basally and darkened apically, with very fine pubescence. Remaining segments testaceous and tomentose.

Pronotum subcylindrical, very convex, wider than long, anterior margin prominent, posterior margin double, sinuous, disc anteriorly bulging; metallic golden - colored or black, shiny, with very fine transverse microsculpture and very sparse lateral punctation. Pronotal disc glossy, shiny, with very fine microsculpture. Lateral part of pronotum whith wide circle - shaped spot.

Scutellum wide rounded apically, shiny and tomentose, golden - coloured or black. *Pars stridens* with very fine transverse, net-shaped microsculpture.

Elytra convex, with strong metallic luster, and surface with pale yellow or greenish metallic shiny scale strips forming net- shaped pattern on elytra, sometime at basal part with isolated circle- shaped spots, andwith wavy bands and circle - shaped bands of yellow or greenish scales in apical part.(Fig. 3). Latero-apical parts of elytra with protruding well developed shoulders bumps. Width of elytra at shoulders: 4.0-4.9 mm;maximal width of elytra behind middle: 4.5 - 5.8 mm. Elytra with very fine microsculpture, anterior and lateral parts with sparse and coarse punctures,and with pubescence.

Meso-, metaepimera and sternites spotted laterally, covered by greenish scales (also specimens with yellow net-shaped pattern of elytra). Legs massive, relatively robust. Femora strongly widened at apical third, very shiny, with strong golden-colored metallic luster or black, with greenish metallic luster and with small elongate pale yellow or greenish apical spot, more or less pubescent. Tibia flattened at external border, with fringe of dark setae. Dorsal surface of tarsomeres covered by dark pubescence. Apical parts of tibia and tarsi covered by numerous setae.

Differential diagnosis. The new species by coloration and the general shape of body is similar to *D. cabrasae* sp. n. (Mindanao Isl., Lanao del Sur, Wao) (Fig. 1), but differs from this species by some characters shape of elytra: elytra of the new species has golden (two specimens - black) surface with pale yellow or greenish scale strips forming a net - shape pattern, sometimes with isolated circle- shaped smaller spots only at the basal portion (Fig. 3A), but elytra of *D. cabrasae* sp. n has very large dorsal circle behind shoulders, which covered by yellow scales and convergent with smaller lateral circle (Fig. 1 A). New species also similar to *D. villalobosi* Heller, 1926 from Samar Island, but differs by other shape of pale dravings on elytra (Fig. 4).

Male genitalia. Lateral view of aedeagus and

Mimicry. *D. imomzodai* sp. n. mimics the weevil *Pachyrrhynchus cabrasae* (Curculionidae) (Fig. 8).

Etymology. The species named after prominent Tajik philologist, rector of Tajik National University, my good friend and collegue Imomzoda Muhammadyusuf Saidali (Dushanbe, Tajikistan) in appreciation of cooperation, his hospitality and friendship.

Note. All previously published findings of *D. villalobosi* Heller, 1926 on Mindanao Island, relate to this species. *D. villalobosi* is distributed in Samar Island only.

***Doliops ziedonisi* sp. n.**
(Fig. 5A, B)

Type material. Holotype: female. Philippines: Mindanao Isl., Cotabato, Alamada, Asik Asik Falls env.,06.2015, local collector leg.

Distribution. Philippines: Mindanao Island.

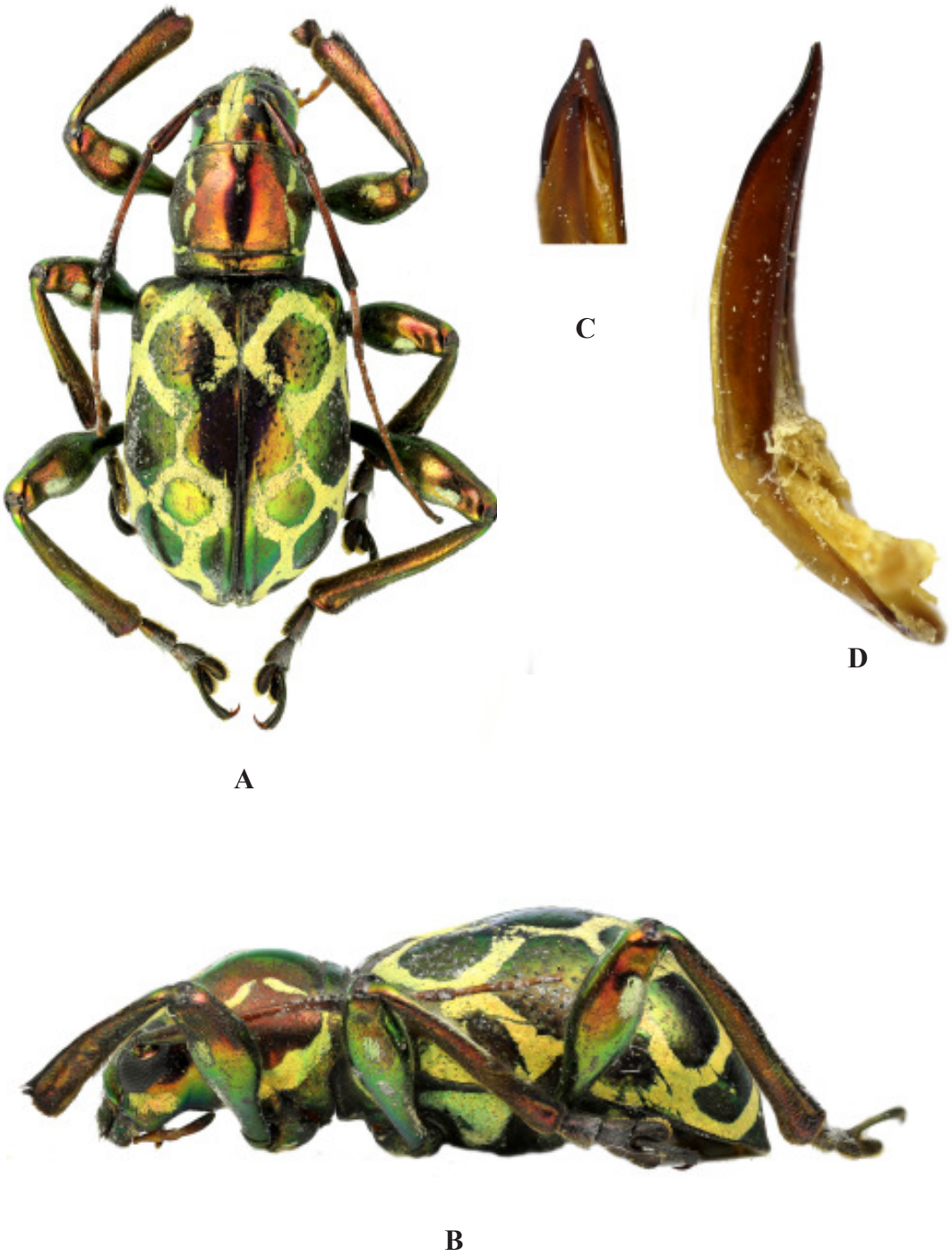


Fig. 3. *Doliops imomzodai* sp. n.: A - holotype (dorsal view), B - holotype (lateral view), C - *aedeagus* (lamella, dorsal view), D - *aedeagus* (lateral view),

A

Description. Body black. Elytra with spots and wavy bands of greenish scales. Body length: 12.9 mm, maximal width: 5.8 mm.

Head almost square, parallel-sided, with large bilobate eyes. Part of head between eyes and antennal bases with impressed longitudinal band of greenish scales and thin straight median line. Frontal part of head behind of clypeus convex, with coarse, transverse microsculpture and pubescence. Longitudinal band of greenish scales starts between eyes and continues almost to base of head and continue on pronotum as short rudiment. Thin median line of frontal longitudinal band extending only from basal to frontal part of eyes and extended to clypeus as thin keel, apical part of which with radially spaced wrinkles. Cheeks under eyes with wide spot of greenish scales. Labrum glossy, in frontal part concave, with pubescence, small punctures and covered with long setae. Clypeus short, shiny, transverse, yellow-brown. Head black and glossy, with transverse microsculpture, punctation and fine tomentum. Basal area of antennae weakly protrunding. Antennae long and slender, with short pubescence and a brush of setae internally at apex of third and with some long setae at following antennal segments. Two basal antennal segments with strong metallic luster and very fine pubescence. Third antennal segment brown basally, black and widened apically. Fourth antennal segment testaceous basally and darkened apically, with very fine white dense pubescence. Remaining segments testaceous

B

Fig. 4. *Doliops villalobosi* Heller, 1926 (Samar Isl., Philippines): A - dorsal view, B - lateral view

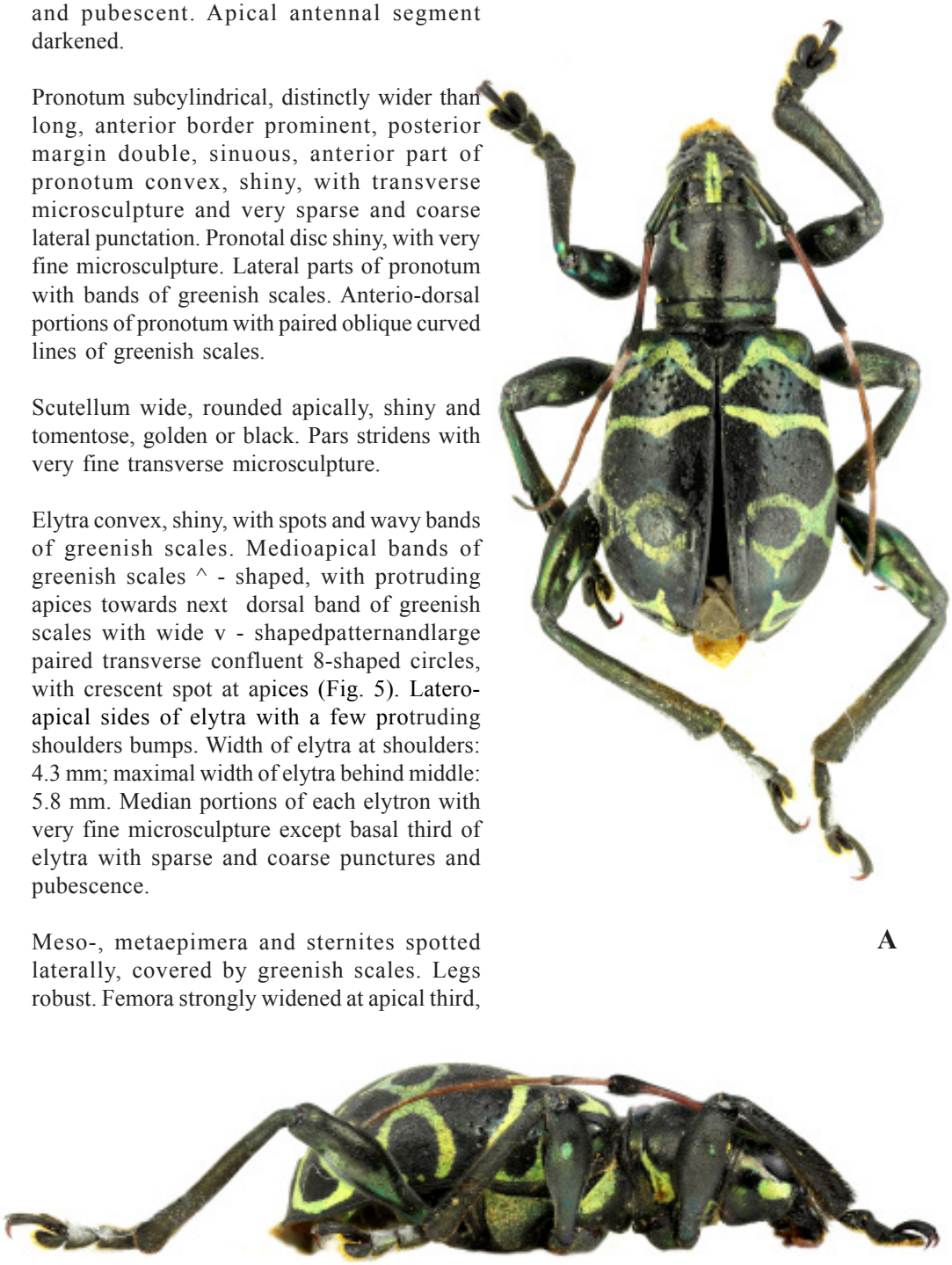
and pubescent. Apical antennal segment darkened.

Pronotum subcylindrical, distinctly wider than long, anterior border prominent, posterior margin double, sinuous, anterior part of pronotum convex, shiny, with transverse microsculpture and very sparse and coarse lateral punctation. Pronotal disc shiny, with very fine microsculpture. Lateral parts of pronotum with bands of greenish scales. Anterio-dorsal portions of pronotum with paired oblique curved lines of greenish scales.

Scutellum wide, rounded apically, shiny and tomentose, golden or black. Pars stridens with very fine transverse microsculpture.

Elytra convex, shiny, with spots and wavy bands of greenish scales. Medioapical bands of greenish scales ^ - shaped, with protruding apices towards next dorsal band of greenish scales with wide v - shapedpatternandlarge paired transverse confluent 8-shaped circles, with crescent spot at apices (Fig. 5). Latero-apical sides of elytra with a few protruding shoulders bumps. Width of elytra at shoulders: 4.3 mm; maximal width of elytra behind middle: 5.8 mm. Median portions of each elytron with very fine microsculpture except basal third of elytra with sparse and coarse punctures and pubescence.

Meso-, metaepimera and sternites spotted laterally, covered by greenish scales. Legs robust. Femora strongly widened at apical third,



A

B

Fig. 5. *Doliops rukmaneae* sp. n.: A - dorsal view, B - lateral view

shiny, black, with small elongate greenish spot at apex, more or less pubescent. Tibia flattened at internal margin, with fringe of dark setae. Dorsal surface of tarsomeres covered by dark pubescence. Apical parts of tibia and tarsi in covered by numerous setae.

Male unknown.

Differential diagnosis. Based by the general shape of the body, the new species is similar to *D. cabrasae* sp. n. (Mindanao Isl., Lanao del Sur, Wao), but differs by the details of the coloration of the elytra: new species has black elytra with wavy bands of greenish scales, from which medioapical bands of scales ^ - shaped, next band wide v -mshaped with two transverse confluent 8 - shaped circles with crescent spots at apices (Fig. 5). Elytra of *D. cabrasae* has large dorsal circle behind shoulders, which covered by yellow scales and convergent with smaller lateral circle (Fig. 1).

Mimicry. It is not clear. Currently we do not known any *Pachyrhynchus, Metapocyrtus, Macrocyrtus* or other weevil (Curculionidae) species with similar shape of elytra.

Etymology. The species is named after the famous Latvian folk poet Imants Ziedonis (3.5.1933-27.2.2013), in gratitude for his contribution to the Latvian and world culture.

***Doliops rukmaneae* sp. n.**
(Fig. 6 A,B)

Type material. Holotype: Female. Philippines: Mindanao Isl., Bukidnon, 12.2013, local collector leg.

The holotype with damaged antennae (without apical antennal segments).

Distribution. Philippines: Mindanao Island.

Description. Body black. Elytra black, with spots and transverse wavy band of greenish scales. Body length: 13.7 mm, maximal width: 6.0 mm.

Head almost square, parallel-sided, with large bilobate eyes. Part of head between eyes and antennal bases with impressed longitudinal band of greenish scales and thin straight median line. Frontal part of head behind of clypeus convex, with coarse, transverse microsculpture and pubescence. Longitudinal band of greenish scales beginning between eyes and extending almost to base of head. Thin median line of frontal longitudinal band continues only from basal part of head to clypeus. Cheeks under eyes with wide spot of greenish scales. Labrum convex, glossy, with apical emargination, with pubescence, small punctures and long setae. Clypeus short, shiny, transverse, yellow-brown. Head black and glossy, with very fine microsculpture, punctation and tomentum. Basal area of antennae weakly protrunding. Antennae long and slender, with short pubescence and brush of setae internally at apex of third and with some long setae at following antennal segments. Two basal antennal segments with strong metallic bronze luster and very fine pubescence. Third antennal segment dark brown basally, black and widened apically. Fourth antennal segment testaceous basally and darkened apically, with very fine white dense pubescence. Remaining segments testaceous and pubescent.

Pronotum subcylindrical, wider than long, anterior margin prominent, slightly interrupted in middle, posterior margin double, impressed in middle, sinuous, anterior part of pronotum convex, shiny, with very fine microsculpture and without sparse, coarse lateral punctation. Each lateral part of pronotum with wide circle-shaped spot of greenish scales.

Scutellum wide rounded apically, shiny and tomentose, golden - coloured or black. *Pars stridens* with very fine net - shaped microsculpture and some sparse punctures.

A

Elytra convex, shiny, with spots and wavy bands of greenish scales.Apical elytralspots of greenish scales subtriangular, with wide rounded angles, but laterally it continues to margin of elytra. Behind middle of elytra situated transverse wavy band, and at basal third of elytra situated paired wide subtriangular spots (Fig. 6A). Lateral side of elytra with few protruding shoulder bumps. Width of elytra at shoulders: 4.7 mm; maximal width of elytra behind middle: 6.0 mm. Basal half of elytra with sparse and coarse punctures and pubescence, apical half of elytra with very fine microsculpture, without visible punctation.

Meso-, metaepimera and sternites spotted laterally, covered by greenish scales. Legs short and robust, black, with green metallic luster. Femora strongly widened at apical third, shiny, with small elongate greenish spot at apex, more or less pubescent. Tibia flattened at internal margin, with fringe of dark setae. Dorsal surface of tarsomeres covered by dark pubescence. Apical parts of tibia and tarsi with numerous setae.

Male unknown.

Differential diagnosis. By the general shape of the body and elytra, the new species is similar to *D.geometrica* Waterhouse, 1842 (Mindanao Isl., Samar Isl., Leyte Isl.), but

B

Fig. 6. *Doliops rukmaneae* sp. n.: A - dorsal view, B - lateral view

A

B

Fig. 7. *Doliops geometrica* Waterhouse, 1842: A - dorsal view, B - lateral view

differs by the coloration of the elytra. The new species has black elytra and characteristic apical, median and basal spots (for details see the description above). The body of *D. geometrica*is golden or greenish metallic, basal parts of elytra with large triangular spots, without wide rounded angles behind middle, with more or less straight (not wavy) transverse band and triangular apical spot. Lateral parts of pronotum of a new species with wide circle - shaped spot of greenish scales, the same spot of *D. geometrica* elongated, interrupted in frontal and basal parts of pronotum. (Fig. 7).

Mimicry. It is likely that *D. rukmaneae* sp. n. mimics the weevils *Pachyrrhynchus speciosus* (Curculionidae) (Fig. 8).

Etymology. The species named after my colleague Anita Rukmane (Daugavpils University, Daugavpils, Latvia) in appreciation of cooperation.

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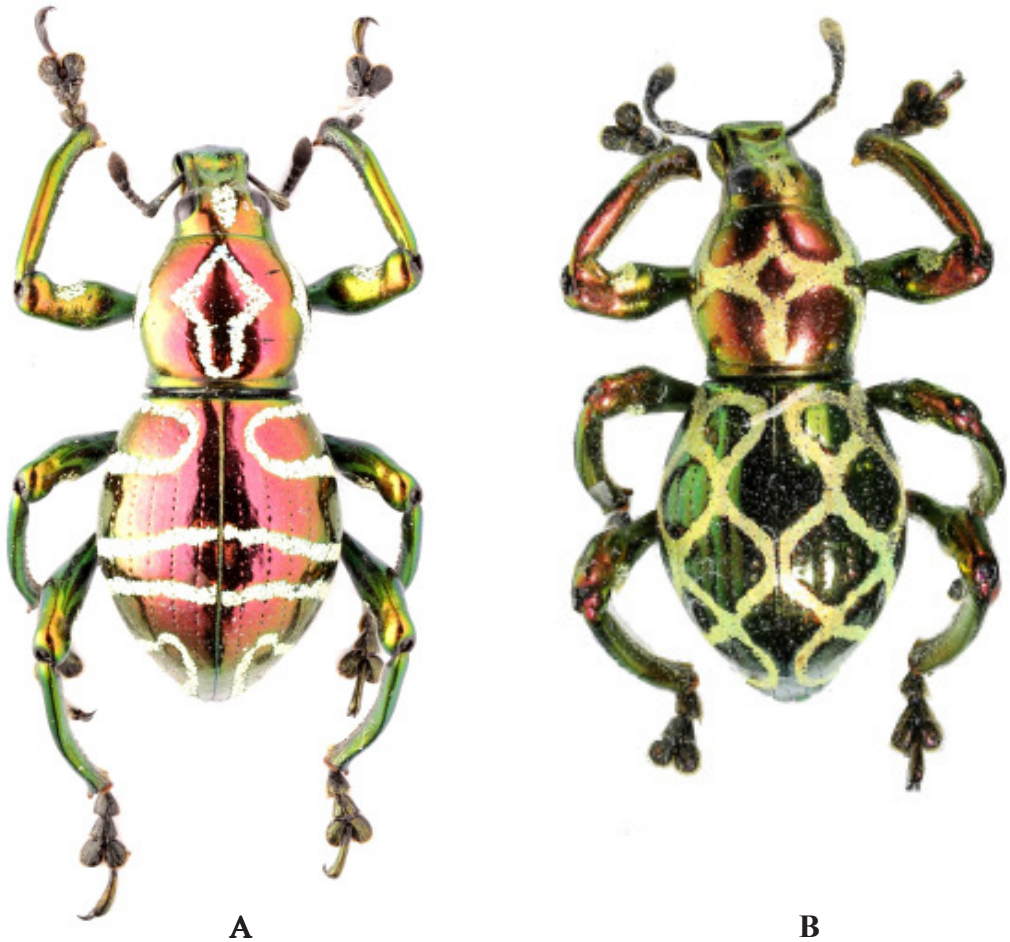

Fig. 8. Weevils of the genus *Pachrhynchus* Bilberg, 1820 (Coleoptera: Curculionidae): A - *P. speciosus* Waterhouse, 1841; B - *P. cabrasae* Rukmane & Barševskis, 2016

Anichtchenko and Anita Rukmane for help in preparation of the photographs of the beetles.

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