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Four new species of the genus *Eupachyrrhynchus* Heller, 1912 (Coleoptera: Curculionidae: Entiminae) from Luzon Island, Philippines

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Four new Pachyrhynchini species from the genus *Eupachyrrhynchus* Heller, 1912 from the Luzon Island, Philippines were described and illustrated: *E. auromaculatus* sp. nov.; *E. barbalsi* sp. nov.; *E. barsevskisi* sp. nov.; *E. viridimaculatus* sp. nov.

Key words. Coleoptera, Curculionidae, Pachyrhynchini, *Eupachyrrhynchus*, taxonomy, Philippines, Luzon Island

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INTRODUCTION

The genus *Eupachyrrhynchus* Heller, 1912 (Entiminae: Pachyrhynchini) currently includes three valid species, two of which consist into mimetic relationship: *E. badiovittatus* Yoshitake, 2017 from Luzon Island, Cagayan Valley region, *E. rukmaneae* Barševskis, 2016 from Marinduque Island, and type species *E. superbus* Heller, 1912, exact locality of the type species is marked as Philippines, but, according to observations of Schultze as well as DUBC material, I suspect that *E. superbus* is distributed at Northern Luzon, Sierra Madre and Isabela Provinces (Heller, 1912; Schultze, 1924).

Genus is characterized by the following features: rostrum as in *Trichomacrocyrtus* – dorsally bulging at apical part and with impression at basal part, with longitudinal medial groove, strongly pubescent, scape of antennae reaching posteriorly to posterior margin of eye; elytra strongly convex, laterally broadened, dorsally depressed, posterior decline abrupt, in females apex expressed, projecting dorsally; tibia similar as in *Macrocyrtus* Heller, 1912, with protrusions along internal margin, protrusions significantly smaller than in *Macrocyrtus*.

During my study of Pachyrhynchini, I discovered four new taxon's that belong to genus *Eupachyrrhynchus*, two of them, *E. barsevskisi* sp. nov. and *E. viridimaculatus* sp. nov. seemed strongly different from the type *E. superbus* mainly by characters of pronotum which is more narrow along basal margin, rounded, yet, other genera significant differences were not found and both of the species were placed in the genus *Eupachyrrhynchus* as a new valid species. *E. barbalsi* sp. nov. and *E. auromaculatus* sp. nov. is more closely related to *E. superbus* Heller, 1912 according to characters of pronotum, yet, shape of genitalia and other morphological characters (see differential analyses) allows to delaminate the species. All of the new species are distributed on Luzon Island, the Phillipines, description of those new species are provided herein.

MATERIAL AND METHODS

The study was based on specimens deposited at the Daugavpils University Beetle Collection (DUBC).

The laboratory research and measurements have been carried out using Nikon SMZ 745T and NIS – Elements 6D software. The illustrations were made using digital camera Canon EOS 6D with Canon MP-E 65mm macro lens, using stack shot system and Helicon Focus auto montage, subsequently was edited using Photoshop.

Label data are cited *verbatim*. In the text the following symbols and abbreviations were used:
/ = different lines
// = different labels
LB = body length, from apical margin of pronotum to the apex of elytra
LE – elytral length
LP = pronotal length
LR = length of the rostrum
WE = maximum width of the elytra
WP = maximum width of the pronotum
WR = maximum width of the rostrum

Number of specimens examined is written in brackets after citation of the label.

RESULTS

***Eupachyrrhynchus auromaculatus* sp. nov.**
Fig.2A, 4A-C.

Type material. Holotype, female: ''PHILIPPINES / Luzon, Cagayan, Sta. Ana / VII. 2019 / local collector leg.'' (white rectangular label, printed); ''HOLOTYPE / *Eupachyrrhynchus auromaculatus* / Rukmane 2019 / det. Rukmane 2019'' (red rectangular label, printed) (DUBC).

Description. Female. Measurements: LB: 11.1; LP: 3.4; WP: 3.2; LE: 7.9; WE: 5.7; LR: 1.9; WR: 1.3. N=1 for all measurements. Dorsal habitus as in Fig.2A.

Body dark purple, shiny, with markings of golden round to recumbent scales on elytra, pronotum, rostrum, femur and underside; underside with weaker lustre, metasternum densely covered with golden scales, slightly pubescent; roundish patch of scales on each side of ventrite I; ventrites II-V without scales, mingled with long light hairs that are more intense near apex.

Head sub ovate, weakly punctured and slightly pubescent; genae with few single golden scales, short light hairs along ventral part; forehead narrow, nearly 1.5 times as wide as eye width; rostrum strongly pubescent, with short light hairs dorsally; long light hairs from antennal scape to labrum; in dorsal contour nearly straight, moderately rounded, narrow apex, bulging along apical 1/2 , gradually decreasing to base; dorsally with longitudinal groove from middle of rostrum to middle of forehead, deep sub ovate depression on basal part, apical part slightly bulging; patch of scales along depression; eyes moderately convex, medium sized, slightly prominent from the outline of the head. Antennae slender; segment I nearly 1.5 times as long as segment II, 3 times as long as wide, segment II 1.5 times longer than segment III, 1.5 times longer than wide, segments III-VI sub-equal in size, gradually increasing to club, width and length equal, segment VII slightly bigger, wider than long, club lanceolate, nearly 2.5 times longer than wide; Rostrum longer than wide, LR/WR 1.46.

Prothorax sub cylindrical, longer than wide, LP/WP 1.06, with the following scaly markings: 1) wide longitudinal line on each side of disc, from basal margin to apical; 2) narrow transverse line slightly before the middle on disc, line connects both longitudinal lines; 3) big ovate patch on each latero-ventral part, patch connected with longitudinal line along basal part of the pronotum; slightly punctured, nearly smooth; in dorsal contour narrowest along apical margin, increased to widest just before midline, then rounded and straight to sub basal part where very slightly incurved, then slightly increased along basal margin; apical margin bent out in direction to apex; sub apical transverse groove well defined, basal margin slightly bent out.

Elytra subspherical, widest just after the middle; in dorsal contour strongly increased from basal margin to basal ½, then more gradually increased to widest just after the middle, rounded and decreased to apical 1/3 and very strongly decreased to extended apex; each elytron with the following scaly markings: 1) small roundish patch at sub basal part along interval II-III; 2) big ovate medial patch along intervals II-IV; 3) transverse line just before the middle from interval IV to lateral margin; 4)narrow transverse line on apical ½ along interval V to lateral margin; 5) small roundish patch on apical ½ along interval III; 6) wider line on apical 1/3 from suture to lateral margin; 7) wide longitudinal line along lateral margin; LE/WE: 1.39; wider and longer than prothorax, WE/WP: 1,78, LE/LP: 2.32; with finely expressed intervals, pubescent at apical part; with few short golden hairs near apex.

Front coxa with patch of round scales, mingled with hair-like scales; femora with patch of scales on apical part, sparsely pubescent; front tibia with long golden hairs along internal margin and apical part, mingled with small protrusions with spikes; mid and hind tibia with long, rare golden hairs along internal margin and bigger protrusions; tarsomere I slightly longer than II, narrow at base and strongly increasing to apex, basal margin nearly 2.5 times narrower than apical margin, tarsomere II slightly wider than I.
Female genitalia as shown in Fig.4A-C.

Male. Unknown.

Differential analyses. *E. auromaculatus* sp. nov. on general appearance is similar to *E. barsevskisi* sp. nov. also from Cagayan Valley, but is easily distinguishable by the following features: *E. barsevskisi* sp. nov. is without scally markings on elytra and pronotum, elytra much more rounded, pronotum more convex, widest just before the middle, rostrum wider, legs thick while *E. auromaculatus* sp. nov. is with unique golden scally markings on elytra and pronotum, body purple, not coppery golden, legs thin, forehead narrower compared to eye width, spermatheca of *E. barsevskisi* nearly two times bigger, different shape.

Distribution. Luzon Island, Cagayan Valley.

Etymology. This species is named after its golden markings on the body.

***Eupachyrrhynchus barbalsi* sp. nov.**
Fig.1B, 3A-D.

Type material. Holotype, male: ''PHILIPPINES / Luzon, Sierra Madre, Disimungal/ Madela / IX. 2015 / local collector leg.'' (white rectangular label, printed); ''HOLOTYPE / *Eupachyrrhynchus barbalsi* / Rukmane 2019 / det. Rukmane 2019'' (red rectangular label, printed) (DUBC).

Description. Male. Measurements: LB: 12.5; LP: 3.9; WP: 4.6; LE: 8.0; WE: 6.5; LR: 2.8; WR: 1.9. N=1 for all measurements. Dorsal habitus as in Fig.1B.

Body black, shiny, with markings of light blue and golden round to recumbent scales on elytra, pronotum, rostrum, femur and underside; underside with weaker lustre, metasternum moderately covered with golden and blue scales, slightly pubescent; ventrites without scally markings.

Head subovate, weakly punctured and slightly pubescent; genae without scally patch; forehead narrow, nearly 1.5 times as wide as eye; rostrum strongly pubescent, with short light hairs dorsally; long light hairs from antennal scape to labrum; in dorsal contour nearly straight, weakly bulging along apical 1/2; dorsally with longitudinal groove from middle of rostrum to middle of forehead, deep sub triangular depression on basal part, apical part slightly bulging; patch of scales along depression; eyes moderately convex, big, slightly prominent from the outline of the head. Antennae slender; segment I slightly longer than segment II, 4 times as long as wide, segment II 2.5 times longer than segment III, 2.5 times longer than wide, segments III-VII subequal in size, gradually increasing to club, club lanceolate, nearly 2.5 times longer than wide; Rostrum longer than wide, LR/WR 1.47.

Prothorax subcylindrical, wider than long, WP/LP 1.18, with the following scaly markings: 1) two big longitudinally elongated patches of light blue scales circumscribed by golden scales on basal part of the disc, each redirected laterally; 2) small transversely elongated patch on sub apical part on dorso lateral part of the disc; 3) big ovate patch on each latero-ventral part; in dorsal contour narrowest along apical margin, strongly increased to apical ½, then more gradually increased to widest just before the middle, then straight to slightly incurved basal ½ and straight to base; apical margin slightly bent out in direction to apex. Elytra subspherical, with well defined intervals; in dorsal contour strongly increased from basal margin to basal ½, then more gradually increased to widest middle, rounded and decreased to apical 1/5 and rounded to apex; elytra with markings of light blue scales in the middle, circumscribed by golden scales, patches on each elytron located as following: 1) small roundish patch at sub basal part along interval II-III; 2) big ovate medial patch from suture to interval IV; 3) small triangular patch at sub basal part near lateral margin; 4) big transversely elongated patch just before middle from interval V to lateral margin; 5) rounded sutural patch just before the apex; 6) four small roundish patches on apical part; 7) longitudinal line along lateral margin from apex to basal 1/2 ; LE/WE: 1.23; wider and longer than prothorax, WE/WP: 1.41, LE/LP: 2.05.

Aedegal body as shown in Fig. 3A-D.

Female. Unknown.

Differential analyses. *E. barbalsi* sp. nov. on general appearance is similar to *E. superbus* sp. nov. by its shape of pronotum which is widened on base, but is easily distinguishable by the following features: 1) different shape of male aedegal body (Fig.3E-H); 2) different pronotal and elytral markings (Fig.1A); 3) rostrum of *E. superbus* narrowed at base, not straight as in *E. barbalsi* sp. nov.; 4) suture of *E. superbus* smooth, suture of *E. barbalsi* sp. nov. with deep groove, margins bent out.

Distribution. Luzon Island, Sierra Madre region.

Etymology. This species is named after my groom Jānis Bārbals, in appreciation of all support and understanding during the research.

***Eupachyrrhynchus barsevskisi* sp. nov.**
Fig.2B, 4D-F.

Type material. Holotype, female: ''PHILIPPINES / Luzon, Cagayan, Baggao / VIII. 2014 / local collector leg.'' (white rectangular label, printed); ''HOLOTYPE / *Eupachyrrhynchus barsevskisi* / Rukmane 2019 / det. Rukmane 2019'' (red rectangular label, printed) (DUBC).

Description. Female. Measurements: LB: 13.4; LP: 4.6; WP: 4.7; LE: 8.6; WE: 7.0; LR: 2.8; WR: 1.9. N=1 for all measurements. Dorsal habitus as in Fig. 2B.

Elytra coppery, with strong golden tingle, prothorax more purplish, with golden tingle, legs coppery, shiny, antennae and tarsus black; following golden markings of round recumbent scales on the body: 1) small elongated patch on each lateral margin medially; 2) ovate patch on each lateroventral part of prothorax; 3) patch of scales on rostrum dorsally; 4) patch of scales on each femur apically; 5) few separate scales on genae; underside with weaker lustre, metaster-

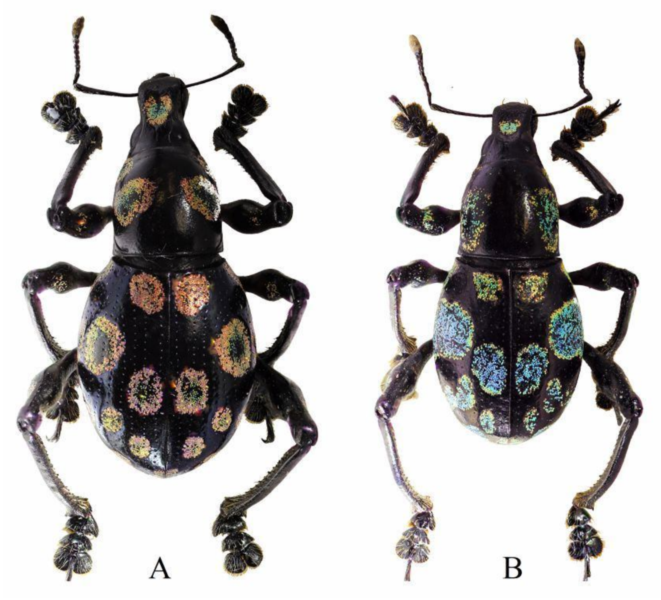

Fig. 1. Dorsal habitus of A – *E. superbus* Heller, 1912; B – *E. barbalsi* sp. nov

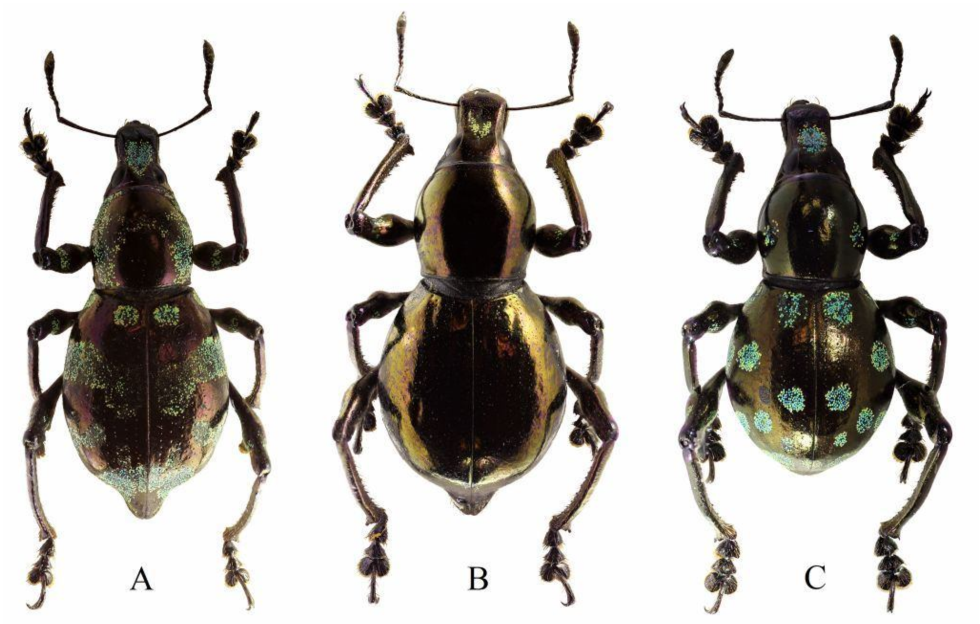

Fig. 2. Dorsal habitus of A – *E. auromaculatus* sp. nov. female; B – *E. barsevskisi* sp. nov. female; C – *E. viridimaculatus* sp. nov. female

Fig. 3. Male genitalia of *E. barbalsi* sp. nov. (A-D); *E. superbus* sp. nov. (E-H); *E. viridimaculatus* sp. nov. (I-L); A, E, I – aedegal body in lateral view; B, F, J – aedeagal body in ventral view; C, G, K – sternite IX in ventral view; D, H, L – tegmen in ventral view

Fig. 4. Female genital of *E. auromaculatus* sp. nov. (A-C); *E. barsevskisi* sp. nov. (D-F); A, D – sternite VIII in ventral view; B, E – ovipositor in ventral view; C, F – spermatheca

num rarely covered with golden scales, slightly pubescent; ventrites without scales; few roundish shales on front coxa.

Head sub ovate, weakly punctured and slightly pubescent; forehead wider, nearly 2 times as wide as eye width; rostrum strongly punctured, slightly pubescent, with rare short light hairs laterally; in dorsal contour nearly straight, moderately rounded, narrow apex, bulging along apical 1/2 , slightly incurved at the middle and straightened to base; dorsally with shallow longitudinal groove from middle of rostrum to middle of forehead, deep sub ovate depression on basal part, apical part slightly bulging; eyes medium sized, not prominent from the outline of the head. Antennae slender; segment I slightly bigger than segment II, 4 times as long as wide, segment II 3 times longer than segment III, 2.5 times longer than wide, segments III-VI sub-equal in size, small, gradually increasing to club, width and length equal, segment VII slightly bigger, wider than long, club lanceolate, nearly 3 times longer than wide; Rostrum longer than wide, LR/WR 1.47.

Prothorax sub spherical, nearly same length and width, WP/LP 1.02; moderately punctured; in dorsal contour dorsal and apical margin nearly same length, widest just before the middle.

Elytra subspherical, widest just at the middle; LE/WE: 1.23; wider and longer than prothorax, WE/WP: 1.49, LE/LP: 1.87; with finely expressed intervals, pubescent at apical part; with long golden hairs near apex.

Legs thick, front coxa mingled with few moderate long white hairs; femur pubescent, with sparse short light hairs in all length; front tibia with long dark hairs along internal margin, protrusions bigger than in other species, golden hairs on rest part of the tibia; long, sharp, dense thorns on ventro-apical part; protrusions on mid and hind tibia bigger; mucrones well-pronounced.

Genitalia as shown in Fig. 4D-F.

Male. Unknown.

Differential analyses. *Eupachyrrhynchus barsevskisi* sp. nov. on general appearance is similar to *E. auromaculatus* sp. nov. (see differential analyses of *E. auromaculatus* sp. nov.).

Distribution. Luzon Island, Cagayan Valley.

Etymology. This species is named after my supervisor, Prof. Arvīds Barševskis, for his support, advices and indispensable help during the research. This golden beetle is the best portraiture to display the golden character of him as person.

***Eupachyrrhynchus viridimaculatus* sp. nov.**
Fig.2C, 3I-L.

Type material. Holotype, male: ''PHILIPPINES / Luzon, Isabela, San Pablo / IX.2015 / local collector leg.'' (white rectangular label, printed); ''HOLOTYPE / *Eupachyrrhynchus viridimaculatus* / Rukmane 2019 / det. Rukmane 2019'' (red rectangular label, printed) (DUBC).

Paratypes (7 males, 11 females): ''PHILIPPINES / Luzon, Isabela / VII.2016 / local collector leg.'' (B&); ''PHILIPPINES / Luzon, Isabela / X.2016 / local collector leg.'' (female); ''PHILIPPINES / Luzon, Isabela, San Pablo / X.2014 / local collector leg.'' (2 males); ''PHILIPPINES / Luzon, Isabela, San Pablo / VIII.2015 / local collector leg.'' (4 females); ''PHILIPPINES / Luzon, Isabela, San Pablo / XI.2015 / local collector leg.'' (2 males, 5 females); ''PHILIPPINES / Luzon, Isabela, San Pablo / XII.2015 / local collector leg.'' (male); (all on white rectangular labels, printed); all with additional red printed label: ''PARATYPE / *Eupachyrrhynchus viridimaculatus* / Rukmane 2019 / det. Rukmane 2019'' (DUBC).

Description. Male. Measurements: LB: 10.7; LP: 3.8; WP: 3.9; LE: 6.4; WE: 5.9; LR: 2.0; WR: 1.6. N=1 for all measurements. Dorsal habitus as in Fig. 2C.

Body coppery, shiny, with patches of green round to recumbent scales, patches circumscribed by golden round scales; underside with weaker lustre, metasternum densely covered with green and golden scales, ventrites without scaly markings, long light hairs near apex.

Head sub ovate, weakly punctured and slightly pubescent; rostrum laterally without scales, with long light hairs along ventral part and from antennal scape to labrum; forehead bolging dorsally, nearly 1.8 times as wide as eye width, slightly wrinkled near inner margin of each eye; rostrum strongly pubescent, with short light hairs at apical part; in dorsal contour straight; dorsally with longitudinal groove from middle of rostrum to middle of forehead, shallow depression on basal part, apical part slightly bulging, dorsolateral parts slightly wrinkled; patch of scales along basal depression; eyes moderately convex, medium sized, slightly prominent from the outline of the head. Rostrum longer than wide, LR/WR 1.25.

Prothorax subspherical, slightly wider than long, WP/LP 1.02, with the following scaly markings: 1) small roundish patch of scales on each dorsolateral part medially on disc; 2) subovate patch on each latero-ventral part; 3) small rounded patch along apical margin of each lateral part medially; slightly punctured; widest just in the middle. Elytra subspherical, widest just in the middle; each elytron with the following scaly markings: 1) two rounded patches along subbasal part, first from interval II to III, second along lateral margin; 2) two round patches just before middle, one from interval VI to VII, second along lateral margin; 3) median match from interval II to III; 4) six patches on apical part, patches closer to apex biger; 5) sutural patch at apical 1/3; LE/WE: 1.08; wider and longer than prothorax, WE/WP: 1.51, LE/LP: 1.68; intervals well expressed.

Front coxa with patch of round scales, mingled with hair-like scales; femora with patch of scales on apical part, sparsely pubescent; front tibia with long golden hairs along internal margin and apical part, mingled with small protrusions with spikes; mid and hind tibia with long, rare golden hairs along internal margin and bigger protrusions.

Genitalia as shown in Fig. 3I-L.

Female. Measurements: LB: 12.0; LP: 3.8; WP: 4.0; LE: 7.8; WE: 6.9; LR: 2.1; WR: 1.7. N=1 for all measurements. WP/LP 1.05; LE/WE 1.13; LR/WR 1.24; LE/LP 2.05; WE/WP 1.73. Elytra wider, legs thinner, protrusions on hind tibia as well as I and II tarsite smaller than in males, rest as in males.

Differential analyses. *Eupachyrrhynchus viridimaculatus* **sp. nov.** on general appearance is similar to *E.superbus* Heller, 1912 from the same region, but is easily distinguishable by its smaller, more rounded body, different elytral and prothoral markings, as well as narrow base of *E. viridimaclats* **sp. nov.** that is straight in *E.superbus* Heller, 1912.

Distribution. Luzon Island, Isabela Province.

Etymology. This species is named after its greenish markings on the body.

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