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Biodaudzveidības Departaments
Koleopteroloģisko pētījumu centrs

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**ĢINTS *PACHYRHYNCHUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE:
PACHYRHYNCHNI) FAUNA, SISTEMĀTIKA UN BIOGEOGRĀFIJA
ORIENTĀLAJĀ REĢIONĀ**

Promocijas darbs - publikāciju kopa
zinātnes doktora (*Ph. D.*) dabaszinātnēs grāda iegūšanai
(bioloģijas nozares, zooloģijas apakšnozarē)

Darba zinātniskais vadītājs:
Dr. biol., prof. Arvīds Barševskis

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2. Dr.biol., Prof., Artūrs Škute (Daugavpils Universitāte);
3. Dr.biol. Mārtiņš Kalniņš (AS "Latvijas valsts meži")

Promocijas padomes priekšsēdētājs: Dr. biol., prof. Inese Kokina

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Ar promocijas darbu un tā kopsavilkumu var iepazīties Daugavpils Universitātes bibliotēkā, Parādes ielā 1, Daugavpilī (Latvija) un Daugavpils Universitātes interneta mājas lapā www.du.lv

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IEVADS

PĒTĪJUMA AKTUALITĀTE

Pachyrhynchus Germar, 1824 ģints smecernieki (Curculionidae Latreille, 1802) pārstāv vienu no lielākajām vaboļu kārtas (Coleoptera), *Pachyrhynchini* tribas ģintīm Orientālajā reģionā. Lielākais īpatsvars sugu apdzīvo Filipīnu arhipelāga salas, mazāk – Taivānas un Indonēzijas salas. Orientālajā faunā *Pachyrhynchini* tribā zināmas 641 suga, 173 no kurām pārstāv *Pachyrhynchus* ģinti [2]. Ģints pārstāvji ir sastopami galvenokārt kalnainos tropu mežu biotopos, ar augstumu virs jūras līmeņa no 800m līdz 2400m. Taivānas salās mītošo sugu kāpuri attīstās koku saknēs, bet informācija par Filipīnu un Indonēzijas sugu kāpuru dzīvesveidu ir maz pētīta. Ģints pārstāvji ir atrasti gan uz vairāku vietējo, gan invazīvo augu lapām, taču nav zināma precīza informācija par īpatņu bioloģiju. Lai gan viena no visbiežāk sastopamajām *Metapocytus* Heller, 1912 ģints sugām *Metapocytus* (Trachycyrtus) *hederaephilus* Yoshitake, 2012 tiek uzskaitīta par lauksaimniecības kaitēkli, *Pachyrhynchus* ģints īpatņi novēroti reti un pārāk nelielā skaitā, lai nodarot nebūtisku kaitējumu augu kultūrām. Straujā primāro mežu izciršana un aizstādīšana ar lauksaimniecības kultūrām Filipīnu arhipelāgā ir pamats tam, ka daudzi autori [8, 14, 16, 17] ir aktualizējuši jautājumu par ġints aizsardzības nepieciešamību. Sugas ir ne tikai endēmas, bet atsevišķos gadījumos var būt sastopamas tikai konkrēta kalna teritorijā, kā, piemēram, *P. apoensis* Yoshitake, 2012, kas sastopama tikai Apo kalnā. Pilnīga meža biomasa likvidācija šajā gadījumā nozīmētu arī potenciālu sugars izmiršanu. Papildus tam, ġints pārstāvji ir plaši pārstāvēti privātajās un dabas muzeju kolekcijās, tie ir populārs tirdzniecības objekts plaši pazīstamās interneta vietnēs, tādās kā ebay un amazon. Kolekcionāru ieinteresētība retāk sastopamos īpatņos veicina vācēju vēlmi nopelnīt un pārkāpt aizliegumu par īpatņu ievākšanu īpaši aizsargājamās teritorijās, līdz ar ko īpatņi tiek masveidā ievākti un kopējais populācijas skaits samazinās. Iepriekš minēto faktoru dēļ, īpaša nozīme ir sugars precīzai, savlaicīgai identifikācijai. Ir nepieciešams revidēt vietējās faunas smecernieku sastāvu, kas kalpotu kā izglītojošs materiāls vides aizsardzības, bioloģijas un lauksaimniecības nozaru speciālistiem, pasniedzējiem un studentiem, entomologiem, ekologiemi, kā arī vietējiem iedzīvotājiem. Smecernieki ir katra sauszemes biotopa neatņemama sastāvdaļa, to daudzveidības zudumam var būt neatsveramas sekas.

Pachyrhynchus ģints vaboļu pētījumi ir kļuvuši par aktuālu tēmu pasaules entomologu vidū, sākot ar 2012. gadu pētījumiem pievērsušies gan vietējie Filipīnu, gan ārzemju, tai skaitā Taivānas, Itālijas, Japānas un arī Latvijas pētnieki, kā rezultātā sugu skaits ģintī ir pieaudzis par 87, kas ir vairāk kā puse no sugu kopskaita. Nepietiekama informācija par Filipīnu arhipelāga smecerniekiem, augstā biodaudzveidība un apdraudētības risks bija noteicošie pētījumu objekta izvēles kritēriji. Vairumam ġints sugu pieejamie faunistiskie dati datējās ar 20. gadsimta sākumu un bija uzskatāmi par nepilnīgiem, kā arī ir pieaudzis jaunu ģeogrāfisko atradņu skaits, līdz ar ko nebija skaidra sugu aktuālā izplatība un sastopamība. Pastāvēja problēmas arī ar atsevišķu sugu taksonomisko statusu. Izmantojot mūsdienīgas pētījumu metodes, pētījuma laikā ievākts un apstrādāts plašs coleopteroloģiskais materiāls, izveidots mūsdienu sistemātikai atbilstošs Orientālā reģiona sugu saraksts, kā arī atrisinātas daudzas taksonomiskās problēmas, kā rezultātā aprakstīti jauni taksoni.

PĒTĪJUMA NOVITĀTE

Pētījuma laikā apkopota un izanalizēta visa pieejamā zinātniskā literatūra par Orientālā reģiona *Pachyrhynchini* tribas specerniekiem, kas aptver bibliogrāfiskos avotus kopš 1821. gada. Darbā izmantoti oriģināli un iepriekš nepublicēti faunistiskie dati, apstrādāta Daugavpils Universitātes vaboļu kolekcija, kā arī deviņas ārzemju dabas muzeju kolekcijas, kas iekļauj lielu skaitu tipu materiāla. Pētījuma gaitā noskaidrots Orientālā reģiona *Pachyrhynchus* ģints faunas smecernieku sugu skaits un sastāvs. Orientālā reģiona faunā pašlaik konstatētas 173 *Pachyrhynchus* ģints sugas, lielākais īpatsvars sugu konstatēts jaunās atradnēs. Balstoties uz mūsdienīgiem priekšstatiem vaboļu sistemātikā, sastādīts un aprobēts Orientālā reģiona *Pachyrhynchus* ģints smecernieku anotētais, sistemātiskais katalogs, kurā norādīti sugu sinonīmi, bibliogrāfiskās atsauses, areāls un informācija, par holotipa atrašanās vietu. Pirmo reizi analizēti un precizēti faunistiskie dati, kas ievērojami paplašina priekšstatu par Orientālā reģiona faunas sugu daudzveidību, sastopamību un izplatību. Iegūtos datus būs iespējams izmantot aizsargājamo dabas teritoriju sugu sastāva precizēšanai. Izmantojot mūsdienīgas mikroskopijas metodes, tika izanalizētas un salīdzinātas sistemātiski tuvu taksonu morfoloģiskās īpašības un ģenitāliju uzbūve, tai skaitā *endophallus* forma un struktūras, kā arī to izmantošana sugu identifikācijā. Kopumā aprakstītas un publicētas 37 *Pachyrhynchus* ģints sugas un četras pasugas. Papildus *Pachyrhynchini* tribā aprakstītas četras *Eupachyrhynchus* sugas, divas *Trichomacrocyrtus* ģints sugas, trīs *Macrocyrtus* sugas, viena *Expachyrhynchus* suga, divas *Pseudapocyrtus* sugas un viena *Apocyrtus* suga. Pētījuma ietvaros izveidota *Pachyrhynchus* ģints standartkolekcija Daugavpils Universitātes vaboļu kolekcijā, kā arī turpinās darbs pie *Pachyrhynchini* tribas kolekcijas materiāla noteikšanas un papildināšanas *Metapocyrtus* ģints īpatņiem. Pārstāvēto sugu un eksemplāru skaita ziņā kolekcija ir viena no lielākajām pasaulei, ar ievērojamu tipu materiāla skaitu.

DARBA HIPOTĒZE

Veicot Orientālā reģiona *Pachyrhynchus* ģints faunas, sistemātikas, bioģeogrāfijas, kā arī ārējo morfoloģisko un ģenitāliju struktūru izpēti, palielināsies sugu skaits, būs precizēts taksonomiskais statuss, sastopamība, izplatība un daudzveidība.

AIZSTĀVĒŠANAI IZVIRZĪTĀS TĒZES

Pirmās ziņas par Orientālā reģiona *Pachyrhynchus* ģints faunu publicētas 1824. gadā, un kopš 2012. gada atsākusies intensīvi sistemātikas pētījumi. Nēmot vērā lielo materiāla daudzumu, kas konstatēts maz izpētītās Filipīnu arhipelāga provincēs, faunā vēl arvien var konstatēt zinātnei jaunas smecernieku sugas, bet lielākai daļai sugu var precizēt izplatību.

Pēdējo 10 gadu laikā sugu kopskaits ġintī palielinājies divkārtīgi, kā arī konstatēti vairāki sugu sinonīmi un daļa literatūrā norādīto sugu ir kļūdaini noteiktas, tādēļ ir jāpārskata Orientālā reģiona *Pachyrhynchus* ėgints sugu saraksts.

Izmantojot mūsdienu mikroskopijas pētījumu metodes, iespējams atrisināt daudzu sistemātiski tuvu un grūti identificējamu smecernieku sugu noteikšanas problēmas, kā arī analizēt Orientālā reģiona *Pachyrhynchus* ėgints sugu morfoloģiskās un ģenitāliju pazīmes, tai skaitā *endophallus* formu.

Veicot Orientālā reģiona *Pachyrhynchus* ėgints sugu izplatības analīzi iespējams iegūt jaunas ziņas par sugu bioģeogrāfisko izplatību.

DARBA MĒRKIS UN UZDEVUMI

Promocijas darba mērkis: Veikt ģints *Pachyrhynchus* Germar, 1824 faunas, sistemātikas un biogeogrāfijas izpēti Orientālajā reģionā, kā arī noskaidrot ģints taksonu noteikšanai būtiskas un praktiski izmantojamas pazīmes.

Darba mērķa sasniegšanai izvirzīti šādi uzdevumi:

- Apstrādāt DUBC pieejamo, kā arī pētījuma laikā iegūto materiālu, izveidojot *Pachyrhynchus* ģints smecernieku standart kolekciju. Apstrādāt lielāko vaboļu kolekciju materiālus;
- Noskaidrot ģints *Pachyrhynchus* faunas sastāvu un sastādīt sugu sistemātisko, anotēto katalogu;
- Noskaidrot un precizēt ģints *Pachyrhynchus* taksonu izplatību un sastopamību Orientālajā reģionā;
- Analizēt ārējo morfoloģisko pazīmju un ģenitāliju struktūras, tai skaitā *endophallus*, to izmantošanu taksonu identifikācijā;

DARBA REZULTĀTU APROBĀCIJA

Promocijas darbs - publikāciju kopa, kas balstīta uz 27 publicētiem zinātniskiem rakstiem starptautiski recenzējamos žurnālos:

1. Rukmane A., Barševskis A. 2016. Nine new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Philippines. *Baltic Journal of Coleopterology*, 16(1): 77 - 96.
2. Rukmane A. 2016. Six new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Philippines. *Acta Biologica Universitatis Daugavpiliensis*, 16(1): 81 - 92.
3. Cabras A. A., Rukmane A. 2016. A new species of *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Entiminae). *Acta Biologica Universitatis Daugavpiliensis*, 16(1): 123 - 127.
4. Cabras A., Cortico F., Mohagan A. B., Rukmane A. 2017. Diversity of Pachyrhynchini (Coleoptera: Curculionidae: Entiminae) in Mt. Kiamo, Malaybalay, Bukidnon, Mindanao, Philippines. *Journal of Entomology and Zoology studies*, 5(3): 979 - 983.
5. Rukmane A. 2017. New species of the genus *Pachyrhynchus* Germar (Coleoptera, Curculionidae, Entiminae) from greater Mindanao Pleistocene Aggregate island complex (Philippines). *Acta Biologica Universitatis Daugavpiliensis*, 17(1): 85 - 95.
6. Bollino M., Sandel F., Rukmane A. 2017. New species of the genus *Pachyrhynchus* Germar, 1823 (Coleoptera: Curculionidae) from Mindanao, Philippines. *Baltic Journal of Coleopterology*, 17(2): 189 - 204.
7. Rukmane A., Cabras A. 2018a. New and additional notes on the distribution of *Pachyrhynchus mollendorffi* Heller, 1899 (Coleoptera, Curculionidae), with description of new taxon from the Marinduque Island (Philippines). *Baltic Journal of Coleopterology*, 18(2): 57 - 63.
8. Rukmane A., Cabras A. 2018b. Three new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from Panay Island, Philippines. *Baltic Journal of Coleopterology*, 18(1): 65 - 76.
9. Rukmane A. 2018a. An annotated checklist of genus *Pachyrhynchus* (Coleoptera: Curculionidae: Pachyrhynchini). *Acta Biologica Universitatis Daugavpiliensis*, 18(1): 63 - 68.
10. Rukmane A. 2018b. Checklist of *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species of ZMUC (Natural History Museum of Denmark, University of Copenhagen). *Acta Biologica Universitatis Daugavpiliensis*, 18(2): 225 - 228.
11. Rukmane A. 2018c. To the knowledge of *Pachyrhynchus croesus* Oberthur, 1879 (Coleoptera: Curculionidae) species distribution and biogeography. *Acta Biologica Universitatis Daugavpiliensis*, 18(2): 229 - 232.
12. Rukmane A. 2018d. To the knowledge of *Pachyrhynchus moniliferus* Germar, 1824 (Coleoptera: Curculionidae) species distribution and biogeography with description of two new subspecies from Philippines. *Acta Biologica Universitatis Daugavpiliensis*, 18(2): 233 - 242.
13. Rukmane A. 2018e. One new species of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Philippines. *Baltic Journal of Coleopterology*, 18(2): 193 - 198.
14. Rukmane A. 2018f. Two new species of genus *Pachyrhynchus* (Coleoptera: Curculionidae: Pachyrhynchini) from Mindanao, Philippines. *Baltic Journal of Coleopterology*, 18(2): 283 - 290.
15. Rukmane A. 2019a. To the knowledge of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species from SMNH (Stockholm, Sweden) with description

- of a new species from the Sibuyan Island (Philippines). *Baltic Journal of Coleopterology*, 19(1): 41 - 50.
16. Rukmane A. 2019b. To the knowledge on the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini), corrections and additions on the *Pachyrhynchus speciosus* species group. *Acta Biologica Universitatis Daugavpiliensis*, 19(2): 253 - 260.
 17. Rukmane A. 2019c. To the knowledge of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species from HUF (Budapest, Hungary), with description of a new species from the Mindanao Island (Philippines). *Acta Biologica Universitatis Daugavpiliensis*, 19(2): 267 - 272.
 18. Rukmane A. 2019d. Four new species and two subspecies of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 19(2): 141 - 150.
 19. Bollino M., Rukmane A., Mohagan N. 2020. Two new *Pachyrhynchus* (Curculionidae: Entiminae: Pachyrhynchini) from Misamis Occidental (Mindanao, The Philippines). *Zootaxa*, 4852(3): 323 - 332.
 20. Rukmane-Bārbale A. 2020a. A new synonym of *Pachyrhynchus speciosus* Waterhouse, 1841 (Coleoptera: Curculionidae) from the Philippines. *Acta Biologica Universitatis Daugavpiliensis*, 20(1): 35 - 38.
 21. Rukmane-Bārbale A. 2020b. Short contribution to distribution and appearance of *Pachyrhynchus decussatus* Waterhouse, 1841 (Entiminae: Pachyrhynchini) with description of one new taxon from Catanduanes Island, Philippines. *Baltic Journal of Coleopterology*, 20(1): 81 - 85.
 22. Rukmane-Bārbale A. 2020c. To the knowledge of some closely related species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Luzon Island (Philippines), with usage of eversion of endophallus. *Acta Biologica Universitatis Daugavpiliensis*, 20(2): 133 - 139.
 23. Rukmane-Bārbale A. 2020d. Two new species of the genus *Pachyrhynchus* Germar, 1824 (Curculionidae: Entiminae: Pachyrhynchini) from Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 20(2): 179 - 184.
 24. Rukmane-Bārbale A., Cabras A. A. 2021. Updated distribution of *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Entiminae) from the Philippines with biogeographic affinities. *Baltic Journal of Coleopterology*, 21(2): 199 - 211.
 25. Cabras A. A., Medina M. N. D., Torrejos C., Pajota E. L., Pepito M. J., Ceballos R., Rukmane A. 2022. Annotated list of Pachyrhynchini (Coleoptera, CURculionidae, Entiminae) in Davao City, Mindanao, Philippines. *CheckList*, 18(4): 799 - 814.
 26. Rukmane-Bārbale A. 2022. New species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from the Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 22(2): 433 - 436.
 27. Patano Jr. R. R., Amoroso V. B., Cortico F. P., Cleofe C. M. B., Rukmane-Bārbale A. 2022. *Pachyrhynchus cebrem* sp. nov.: A new species of easter egg weevil (Curculionidae: Entiminae: Pachyrhynchini) from Davao De Oro, the Philippines. *Philippine Journal of Systematic Biology*, 16(1): 50 – 53.

9 zinātniskās publikācijas, kas publicētas Pachyrhynchini tribas ietvaros:

1. Rukmane A. 2019. A new species of the genus *Expachyrhynchus* Yoshitake, 2013 (Coleoptera: Curculionidae: Pachyrhynchini) from Palawan Island, Philippines. *Baltic Journal of Coleopterology*, 19(1): 35 - 40.
2. Rukmane A. 2019. One new species of the genus *Macrocyrtus* Heller, 1912 (Coleoptera: Curculionidae: Pachyrhynchini) from Luzon Island, Philippines. *Acta Biologica Universitatis Daugavpiliensis*, 19(1): 37 - 40.
3. Rukmane A. 2019. Two new species of the genus *Macrocyrtus* subgenus *exmacrocyrtus* Schultze, 1924 (Coleoptera: Curculionidae: Entiminea) from Luzon Island, Philippines. *Acta Biologica Universitatis Daugavpiliensis*, 19(2): 261 - 266.
4. Rukmane A. 2019. One new species of the genus *Trichomacrocyrtus* Yoshitake, 2018 (Coleoptera: Curculionidae: Entiminae) from Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 19(2): 159 - 162.
5. Rukmane A. 2019. Four new species of the genus *Eupachyrrhynchus* Heller, 1912 (Coleoptera: Curculionidae: Entiminae) from Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 19(2): 151 - 158.
6. Rukmane-Bārbale A. 2021. To the knowledge of the genus *Apocyrthus* Erichson, 1834 (Coleoptera: Curculionidae: Pachyrhynchini) with description of new species from Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 21(2): 181 - 188.
7. Rukmane-Bārbale A. 2021. Two new species of the genus *Pseudapocyrthus* Heller, 1912 (Coleoptera: Curculionidae: Pachyrhynchini) from Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 21(2): 189 - 198.
8. Rukmane-Bārbale A. 2022. A new species of the genus *Trichomacrocyrtus* Yoshitake, 2018 (Curculionidae: Entiminae: Pachyrhynchini) from Luzon Island, Philippines. *Baltic Journal of Coleopterology*, 22(2): 437 - 441.
9. Rukmane-Bārbale A. 2022. A new species of the genus *Apocyrthus* Erichson, 1834 (Coleoptera: Curculionidae: Pachyrhynchini) from the Marinduque Island, Philippines. *Baltic Journal of Coleopterology*, 22(2): 429 - 432.

Par promocijas darba galvenajiem rezultātiem sniegti ziņojumi 7 starptautiskajās zinātniskajās konferencēs:

1. Rukmane A., Barševskis A. To the knowledge of *Pachyrhynchus orbifer* Waterhouse, 1841 (Coleoptera: Curculionidae) species fauna, distribution and biogeography. ИТОГИ И ПЕРСПЕКТИВЫ РАЗВИТИЯ ЭНТОМОЛОГИИ В ВОСТОЧНОЙ ЕВРОПЕ. Minsk, Belarus. 6 - 8. 09. 2017. Oral presentation.
2. Rukmane A., Barševskis A. The genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) fauna, biogeography, mimicry and place in landscape protection. 9th international conference on biodiversity research. Daugavpils, Latvia. 26 - 28. 04. 2017. Poster.
3. Rukmane A. The place of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) in landscape protection. Scientific International Conference Problems of Landscape Protection and Management in XXI century. Warsaw, Poland. 20 - 22. 04. 2017. Poster.
4. Rukmane A. DNA Barcoding as additional method for species description. Example on genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae). II Conference of Young Scientists. Warsaw, Poland. 25 - 26. 05. 2017. Oral presentation.
5. Rukmane A. New species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from the Greater Mindanao PAIC (Philippines). 10th international conference on biodiversity research. Daugavpils, Latvia. 24 - 26. 04. 2019. Poster.

6. Rukmane A. New and additional knowledge on the genus *Pachyrhynchus* Germar, 1824. 1st UM National Congress and 1st Scientific Meeting of the Philippine Coleopterological Network (PhilColNet). Davao, Philippines. 27 - 28. 04. 2019. Oral presentation.
7. Rukmane A. Diversity of the genus *Pachyrhynchus* Germar, 1824 in the Oriental region. 7th meeting of Baltic coleopterologists. Olszyn, Poland. 20 – 23. 06. 2023. Oral presentation.

LITERATŪRAS APSKATS

ĢINTS *PACHYRHYNCHUS GERMAR*, 1824 FAUNAS PĒTĪJUMU VĒSTURE

Nepilnu 200 gadu laikā *Pachyrhynchus* ģints smecernieku faunu ir pētījuši Vācijas, Anglijas, Austrijas, Japānas, Filipīnu, Latvijas un citu valstu entomologi, tomēr, vairumam pētījumu ir fragmentārs raksturs.

Pirmā *Pachyrhynchus* ģints suga publicēta 1824 gadā vācu entomologa Germara darbā [47]. Monogrāfijā minēta tikai viena *Pachyrhynchus* ģints suga *P. moniliferus* Germar, 1824. *Pachyrhynchus* ģints sistematizēta 1826. gadā pie jaunatklātās *Pachyrhynchini* tribas, ko aprakstījis vācu entomologs Šoenhers [80].

Franču entomologi Eidouks un Soulajets 1839. gadā [39] publicēja *P. chevrolati* aprakstu, sugai vēlāk tika mainīts taksonomiskais statuss: *P. moniliferus* ssp. *chevrolati*.

Angļu entomologs Vaterhaus 1841 gada monogrāfijā aprakstījis 18 sugas un vienu pasugu: *P. orbifer*, *P. phaleratus*, *P. decussatus*, *P. roseomaculatus*, *P. rugicollis*, *P. jugifer*, *P. reticulatus*, *P. speciosus*, *P. schoenherri*, *P. erichsoni*, *P. erichsoni* ssp. *eschscholtzi*, *P. venustus*, *P. multipunctatus*, *P. gemmatus*, *P. cumingi*, *P. perpulcher*, *P. latifasciatus*, *P. rufopunctatus*, *P. elefans*. Divas monogrāfijā iekļautās sugas atzītas par *P. moniliferus* Germar, 1824 sinonīmiem: =*P. concinnus*, =*P. chlorolineatus*, kā arī *P. roseomaculatus* sinonīms =*P. striatus*. Papildus tribas pētījums autors publicējis 1853 gada monogrāfijā [97, 98]. Entomoloģiskais materiāls iegūts no Kuminga ekspedīcijas uz Filipīnu arhipelāga salām. Kuminga ievākto materiālu paralēli pētīja arī franču entomologs Ševrolats, kas tā paša gada ietvaros publicējis pētījumu rezultātus, vairums aprakstīto sugu klasificējami kā Vaterhausa aprakstīto sugu sinonīmi: *P. orbifer* Waterhouse, 1841 =*P. fimbriatus*, *P. glubulipennis*, *P. pretiosus*, *P. scintillans*, *P. alboguttatus*; *P. moniliferus* Germar, 1824 = *P. confinis*; *P. jugifer* Waterhouse, 1841 = *P. phodopterus*. Par valīdu atzīta viena pasuga: *P. orbifer* ssp. *gemmans*. Pētījumu turpinājumu Ševrolats publicēja 1879. gadā aprakstot *P. viridis*, kā arī 1881. gadā aprakstot divas sugas un vienu sinonīmu: *P. annulatus*; *P. lorquini*; *P. congestus* Pascoe, 1871 = *P. luteoguttatus* Chevrolat, 1881 [32, 33, 34].

Zviedru entomologs Šoenhers 1845. gadā publicēja *P. fahrei* aprakstu, kas vēlāk tika sinonimizēts kā *P. orbifer* Waterhouse, 1841 sinonīms [81].

Ģints pētījumiem pievērsās holandiešu entomologs Snellens van Vollenhovens 1864. gadā [91] publicējot pirmās *Pachyrhynchus* ģints sugas, kurās izplatītas ārpus Filipīnu arhipelāga, Indonēzijas salās: *P. morotaiensis* (Morotai), *P. forsteni* (Ternate, Halmahera). Vēlāk, 1879. gadā, franču entomologs Oberthurs [72] aprakstīja *P. croesus* no Sanghir salas. Franču entomologs Feirmeirs 1897. gadā publicēja *P. infernalis* no Ishigahi-Sima salas [41]. Savukārt 1927. gadā japāņu entomologs Sakaguchi publicēja *P. niger* aprakstu, kas vēlāk atzīta par *P. infernalis* Fairmaire sinonīmu [78].

Angļu entomologs Pascoe 1871. gadā [74] publicēja četrus jaunu sugu aprakstus: *P. argus*, *P. congestus*, *P. inclytus*, *P. pinorum*. Visas sugas tika aprakstītas no Luzon salas.

Vācu entomologs Behrens 1887. gadā publicēja astoņu jaunu sugu aprakstus: *P. annulatus*, *P. dohrni*, *P. pulchellus*, *P. sarcitis*, *P. smaragdinus*, *P. venustus*, divas no sugām atzītas par sinonīmiem: *P. chlorites* Chevrolat, 1881 = *P. rutilans*; *P. inclytus* Pascoe, 1873 = *P. modestior* [3].

Vācu entomologs Krātz 1888. gadā publicēja trīs jaunu sugu un divu pasugu aprakstus. Visas aprakstītās sugas atzītas par sinonīmiem: *P. congestus* Pascoe, 1873 = *P. immarginatus*; *P. lorquini* Chevrolat, 1881 = *P. plavopunctatus*, = *P. flavomaculatus*. Jaunatklātās pasugas: *P. congestus* ssp. *caerulans*, *P. gemmatus* ssp. *purpureus* [63].

Vācu entomologs Faunts 1895. gadā publicēja divu jaunu sugu aprakstus, viena no aprakstītajām sugām atzīta par sinonīmu: *P. morotaiensis* Volh. 1864 = *P. waterhousei*; otrā: *P. gloriosus* Faust, 1895 [43].

Austriešu entomolgs Hellers ir viens no atpazīstamākajiem *Pachyrhynchini* tribas pētniekiem. Autors aprakstījis sešas *Pachyrhynchini* tribas ģintis, vienu 1908 gadā: *Apocyrtidius* Heller, 1908; un piecas 1912. gada monogrāfijā: *Eupachyrrhynchus*, *Macrocyrtus*, *Metapocyrtus*, *Nothapocyrtus*, *Pseudapocytus*. *Pachyrhynchus* ģints pētījumu rezultātus autors pirmo reizi publicējis 1899. gadā, aprakstot *P. moellendorffii*. Par nozīmīgāko autora darbu uzskatāma 1912. gada monogrāfija, kurā autors papildus 14 sugām, divām pasugām un vienam sinonīmam publicējis arī ģints sadalījumu pa sugu grupām un publicējis pirmos datus par ģints bioloģiju. Autors 1912. gadā aprakstījis taksonus: *P. abranus*, *P. annelifer*, *P. circulatus*, *P. eques*, *P. lacunosus*, *P. moniliferus* ssp. *stellulifer*, *P. morio*, *P. nobilis*, *P. ochroplagiatus*, *P. pinorum* ssp. *transversalis*, *P. psittacinus*, *P. sanchezi*, *P. semperi*, *P. stellio*, *P. tristis*, *P. viridans*. *P. multipunctatus* Waterhouse, 1841 = *P. auroguttatus* Heller, 1912. Autors 1921. gadā publicēja trīs sugas un vienu pasugu, divas no sugām atzītas par sinonīmiem: *P. congestus* ssp. *pavonius*; *P. inclytus* Pascoe, 1873 = *P. modestior* var. *transversatus*; *P. lorquini* Chevrolat, 1881 = *P. bakeri*; *P. psittaculus*. 1923. gadā tika publicēts *P. basilanus* apraksts, kas bija pirmā un šobrīd vienīgā zināmā suga no Basilan salas. Autors 1929. gadā publicēja trīs sugu aprakstus: *P. cagayanus*, *P. digestus*, *P. equester* [48, 49, 50, 51, 52, 53]. Kuntzens 1914. gadā publicējis *P. helleri*, kas veltīta augstāk minētajam autoram [64].

Darbu pie Taivānas salās izplatītajiem ģints pārstāvjiem veicis Taivāņu entomologs Kono, pirmo pētījumu publicējot 1929. gadā [61], aprakstot četras jaunas sugas: *P. insularis*, *P. yamianus* un *P. tobafolius*, *P. sarcitis*. 1936. gadā Kano publicējis apjomīgu biogeogrāfisko apskatu, ietverot pirmos ierakstus no Babuyan salām. Savukārt 1942. gadā [62] Kono aprakstījis ģinti *Kotoshozo*, kas atzīta par *Pachyrhynchus* ģints sinonīmu, pieskaitot *Kotoshozo kotoensis* sugu *Pachyrhynchus* ģintij, papildus aprakstīta *P. sonani* [60].

Apjomīgāko darbu pie ģints pētījumiem veicis vācu entomologs Šults. Autors 1916. gadā publicējis tribas katalogu, apkopojot visus literatūras avotus un zināmās sugu atradnes. Pirmos sugu aprakstus autors publicēja 1917. gadā, aprakstot piecas jaunas sugas no Luzon salas: *P. igorota*, *P. loheri*, *P. schultzei*, *P. sumptuosus*, *P. zebra*. 1919. gadā autors publicējis divu sugu aprakstus: *P. signatus*, *P. ardentius*; vienu pasugu: *P. venustus* ssp. *insulanus*; un divas sugas, kas atzītas par sinonīmiem: *P. speciosus* Waterhouse = *P. absurdus*, *P. venustus* Waterhouse = *P. virgatus*. Autors 1920. gadā publicējis *P. erosus* aprakstu, un 1922. gadā publicēti 17 jaunu sugu apraksti: *P. amabilis*, *P. apicatus*, *P. apocyrtoides*, *P. atrocyaneus*, *P. buccasanus*, *P. chamissoi*, *P. consobrinus*, *P. corpulentus*, *P. dubiosus*, *P. halconensis*, *P. pseudoproteus*, *P. postpubescens*, *P. regius*, *P. semiignitus*, *P. signaticollis*, *P. sulphureomaculatus*, *P. taylori*; divi pasugu apraksti: *P. gloriosus* ssp. *abbreviatus*, *P. orbifer* ssp. *azureus*. Pieci jaunu sugu apraksti publicēti 1923. gadā: *P. confusus*, *P. cruciatus*, *P. libucanus*, *P. samarensis*, *P. sphaericollaris*, publicēta arī līdz šim apjomīgākā monogrāfija, kas ietver ģints taksonomiju, izplatību un plašu bioloģijas aprakstu. Trīs jaunu sugu apraksti publicēti 1924. gadā: *P. baluganus*, *P. benguetanus*, *P. negrosensis*; un divu pasugu apraksti: *P. congestus* ssp. *ocellatus*, *P. taylori* ssp. *metalescens*. Jauni izplatības dati publicēti 1925. gadā, bet 1934. gadā autors publicēja trīs jaunu sugu aprakstus: *P. davaoensis*, *P. galeraensis*, *P. rizali*; un vienu pasugas aprakstu: *P. bucasanus* ssp. *ornatus* [82, 83, 84, 85, 86, 87, 88, 89, 90, 91].

Jauns pētījumu vilnis atsākās 2012. gadā, kad Japāņu entomologs H. Yoshitake publicēja deviņas jaunas *Pachyrhynchus* ģints sugas: *P. apoensis*, *P. caeruleovittatus*, *P. hirokii*, *P. naokii*, *P. pseudamabilis*, *P. sphenocephaloides*, *P. subamabilis*, *P. tadauchii*, *P. zamboanganus* [102]. Autors veicis apjomīgu darbu gan pie ģints, gan tribas pētījumiem [45, 46, 99, 100, 102, 122, 126, 127, 128], publicējis jaunus izplatības ierakstus un bioloģijas pētījumus [111, 112, 113, 116, 118, 119, 123, 124, 127], taču lielākais ieguldījums ir veikts tribas taksonomijā, atklājot trīs jaunas *Pachyrhynchini* ģintis [104, 109, 110] un

31 *Pachyrhynchus* ģints sugas [105]. Autors 2017. gadā publicējis desmit jaunu sugu aprakstus: *P. callainimaculatus*, *P. conformis*, *P. gilvomaculatus*, *P. niisatoi*, *P. notocruciatus*, *P. sakaii*, *P. septentrionalis*, *P. sumptuosoides*, *P. obhayashii* [106, 107, 108] viena no sugām publicēta kopā ar Filipīnu izceļsmes entomoloģi Yap: *P. masatoshii* Yoshitake & Yap [129]; četrus pasugu aprakstus: *P. orbifer* ssp. *striatomaculatus*, *P. orbifer* ssp. *callainus*, *P. congestus* ssp. *mirabilis*, *P. rukmaneae* ssp. *paucisignatus*; viena no autora aprakstītajām sugām atzīta par sinonīmu: *P. rukmaneae* Barševskis = *P. takakuwaii*. Viens pasugas apraksts publicēts 2018. gadā: *P. multipunctatus* ssp. *endoi* [113]. Deviņi jaunu sugu apraksti publicēti 2019. gadā: *P. atronitens*, *P. caeruleus*, *P. circulimaculatus*, *P. florulentus*, *P. maruyama*, *P. naokae*, *P. noeli*, *P. yukae*, *P. yuukae*; viens pasugas apraksts: *P. phaleratus* ssp. *badiovittatus* [114, 115, 117, 120]; divas sugas publicētas sadarbībā ar Itāļu entomologiem: *P. octoannulatus*, *P. yoshitakeorum* Yoshitake, Bollino & Sandel [125], bet 2020. gadā publicēts viens jaunas sugas apraksts: *P. rochaorum* [121].

Ģints taksonomijas pētījumiem pievērsušies arī Itālijas entomologi Bollino un Sandel, pirmo pētījumu publicējot 2015. gadā, pētījumā ietverti trīs jaunu sugu apraksti: *P. mohagani*, *P. lubanganus*, *P. tilikinesis* [9]. Autori ir pirmie, kas sāka izmantot tēviņu dzimumorgāna iekšējā maisa piepūšanas metodi, lai atšķirtu līdzīgos taksonus. Lai gan vairums autoru darbu veltīti *Metapocytus* ģints taksonomijai, [6, 7, 10, 11, 12, 13, 79] autoru lielu uzmanību pievērsuši arī *Pachyrhynchus* ģintij, ieviešot ģints sugu dalīšanu grupās ar kopīgu morfoloģisko pazīmju kopumu. Līdzīgu grupu dalīšanas metodi izmantoja arī Hellers un Šults. Vēlāk, 2017. gadā publicēti pirmo divu grupu apraksti un atklātas divas zinātnei jaunas sugas: *P. banglas*, *P. esperanza* Bollino, Sandel & Rukmane.

Taivānas entomologu grupa Tseng vadībā ir veikusi pētījumus pie Taivānas salu endēmo *Pachyrhynchus* ģints sugu bioloģijas un etoloģijas [30, 55, 56, 68, 69], kā arī publicējusi vienas jaunas sugas aprakstu: [31]. Pētnieki veikuši apjomīgu pētījumu Babuyan salu grupā dzīvojošo sugu bioloģijā [96, 101].

Vērtīgu ieguldījumu tribas pētījumiem devuši vietējie Filipīnu zinātnieki. Pētnieku grupa no Centrālās Mindanao Universitātes Mohagan vadībā pievērsušies gan *Metapocytus* ģints taksonomijai [75, 76, 77], gan *Pachyrhynchini* tribas bioloģijai un izplatības analīzei [70, 71].

Vienu no lielākajiem ieguldījumiem tribas bioloģijā, ekoloģijā un taksonomijā veikuši Mindanao Universitātes Koleopteroloģisko pētījumu centra pētnieki Medina un Cabras vadībā. Pētnieku grupa publicējusi 25 jaunu *Metapocytus* ģints sugu aprakstus [8, 15, 16, 17, 18, 19, 20, 21, 22, 24, 26, 27, 28, 29]. Divu *Pachyrhynchus* ģints sugu aprakstus: *P. miltoni* Cabras & Rukmane, *P. obumanuvu* Cabras & Medina [23]. Pievērsušies ģints evolūcijai [35, 36, 73], kā arī ekoloģijai un izplatībai [14, 25].

MATERIĀLS UN METODIKA

LAUKA PĒTĪJUMU METODES

1. Vākšana ar entomoloģisko tīkliņu

Pateicoties ERASMUS+ sniegtajam finansējumam, 2018., 2019., 2020. un 2023. gada marta - maija mēnešos organizētas ekspedīcijas uz Filipīnu arhipelāga Mindanao salu, kur mērķgrupas indivīdi ievākti klātienē, to dabiskajā biotopā. Vākšana ar entomoloģisko tīkliņu ir pamat metode fitofāgo vaboļu ievākšanai. Mērķgrupas smecernieki neilgi pēc saullēkta kā arī pirms saulrieta uzturas uz lapu plātnēm vai rāpo pa koku stumbriem, savukārt dienas karstajā laikā slēpjās zem lapu plātnēm. To galvenā aizsarg reakcija ir krist zemē pie apdraudējuma konstatācijas. Izmantojot entomoloģisko tīkliņu iespējams gan noķert vaboli krišanas brīdī, gan sasniegt augstākos koku zarus. Izmantojot šo metodi, ievākts vairums materiāla.

2. Vaboļu nopurināšana no koku vai krūmu zariem.

Konkrēto metodi iespējams izmantot krūmiem vai nelieliem kokiem. Zem auga novieto baltu audumu un koka/krūma zarus purina, līdz uz tiem esošie smecernieki nokrīt, un tos iespējams savākt ar rokām. Konkrētā metode ir efektīva fona sugu liela skaita ievākšanai, taču, pēc novērojumiem, retākas sugas biežāk uzturas augstu koku galotnēs, kur doto metodi nav iespējams pielietot.

3. Biotopu vizuāla apskate.

3.1. Augu vizuāla apskate.

Augus, uz kuriem potenciāli var uzturēties mērķgrupas smecernieki, vizuāli apskata uz vaboļu klātbūtni. No nelielā attāluma apskata lapu plātnes no abām pusēm, koka/krūma stumbri. Augus, uz kuriem iepriekš konstatēti smecernieki, sistemātiski apskata ik pēc laika un potenciāli aktīvākajās dienas fāzēs: neilgi pēc saullēkta un īsi pirms saulrieta.

3.2. Augsnes un zemsedzes vizuāla apskate.

Ņemot vērā smecernieku aizsargreakciju krist no lapām/stumbriem zemsedzē, pēc augu vizuālas apskates apskata arī tuvāko zemsedzi. Dotā metode būs efektīva kombinācijā ar entomoloģisko tīkliņu. Vaboles konstatē, pēc kā uzmanīgi ievāc, izmantojot entomoloģisko tīkliņu.

LABORATORIJAS PĒTĪJUMU METODES

1. Materiāla montēšana un uzglabāšana

Ekspedīciju ietvaros ievāktais, kā arī Daugavpils Universitātes Vaboļu kolekcijā esošais neapstrādātais materiāls samontēts atbilstoši entomoloģisko kolekciju noformēšanas prasībām. Smecernieku imago īpatni atmērcēti verdošā ūdenī, nosusināti, izplāksnoti un ar PVA līmi pielīmēti uz atbilstoša izmēra kartona plāksnītēm, kuras uzdurtas uz atbilstoša biezuma entomoloģiskajām adatām. Vienāda līmeņa nodrošināšanai izmantots montēšanas bloks. Katram eksemplāram pievienota balta, četrstūra printēta etiķete ar ievākšanas vietas ģeogrāfisko nosaukumu, datumu un ievācēja uzvārdu. Tipu materiālam papildus pievienota sarkana, četrstūra printēta etiķete ar tipa statusu, latīnisko nosaukumu, autora un noteicēja uzvārdu.

2. Materiāla preparēšana

Visām pētījumā iekļautajām sugām preparētas ģenitālijas, kuru forma ir relatīvi nemainīga un vairumā gadījumu atšķirīga dažādu taksonu pārstāvjiem. Pētījuma gaitā analizēta gan tēviņu *aedeagus* gan mātīšu *spermatheca* forma. Problemātiski identificējamiem taksoniem veikta iekšējā maisa (*endophallus*) uzbūves izpēte. Pirms preparēšanas eksemplārs atmērcēts verdošā ūdenī, līdz tā audi kļuva mīksti.

Ģenitāliju preparēšanai izmantotas entomoloģiskās adatas ar izlocītu virsotni. Pirms *endophallus* uzpūšanas *aedeagus* vismaz stundu mērcēja 10% KOH šķīdumā. Atmērcētu *aedeagus* noskaloja ūdenī, lai atbrīvotos no KOH atliekām. *Aedeagus* pamatne uzsprausta uz atbilstoša izmēra šīrces, paramēra novilkta uz leju, apodēmas un *aedagus* ķermenis blīvi fiksēts pie šīrces ar parafilmas palīdzību, pēc kā uzpūsts, formas fiksēšanai izmantota zobu pasta, svaigiem īpatnīem iespējams izmantot ūdeni zobu pastas vietā. Veiksmīgas uzpūšanas gadījumā preparāts uzreiz fotografēts, lai izslēgtu formas maiņu, kas raksturīga vecākiem preparātiem.

3. Mikroskopiskie pētījumi un fotografēšana

Smecernieku morfoloģiskajiem pētījumiem izmantots digitālais stereo mikroskops Nikon SMZ 745T ar NIS Elements 6D 4.2. programmatūru (Canon). Fotoattēli uzņemti ar Canon EOS 6D digitālo kameru ar Canon MP-E 65mm makro objektīvu. Attēli uzņemti līmeņos ar stack shot automātisko augstuma regulēšanas sistēmu, konsekventi samontēti izmantojot Helicon Focus 8.2.7. programmatūru un apstrādāti ar Photoptea palīdzību.

4. Materiāla noteikšana

Sugu identifikācijai izmantoti sugu oriģinālie apraksti [3, 4, 9, 23, 32, 33, 34, 39, 40, 41, 42, 43, 47, 49, 50, 51, 53, 54, 62, 63, 64, 72, 74, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 96, 97, 98, 103, 106, 107, 108, 113, 114, 115, 117, 120, 121, 125, 129], kā arī apsekots tipu materiāls. Materiāla noteikšanā sniedza noderīgus padomus attiecīgās grupas speciālisti: Bollino, Sandel, Cabras.

5. Sistemātika

Taksonu sistemātika atbilstoši M. A. Alonso-Zarazaga & C. H. C. Lyal [2], Agassiz L. [1], Internacionālās Zooloģijas Nomenklatūras komisijas dokumentiem [58, 59];

Ģints un sugu katalogs sastādīts un publicēts apkopojot literatūras avotus dotā darba ietvaros. Papildus izmantoti citu autoru darbi [5, 44, 54, 57, 65, 66, 67, 93, 94].

6. Jaunatklāto taksonu aprakstīšana

Jaunatklātie taksoni pēc rūpīgas morfoloģiskās, ģenitāliju un atsevišķos gadījumos *endophallus* analīzes aprakstīti un publicēti dotā darba ietvaros. Izveidots sugars / pasugas morfoloģiskais apraksts, norādīts tipa materiāls, taksona izplatība, līdzība citām sugām un etimoloģija.

7. Izplatības analīze

Analizējot taksonu izplatības areālus, izmantoti dati no dažādiem literatūras avotiem [14, 25, 31, 37, 42, 43, 52, 55, 56, 61, 70, 71, 72, 78, 89, 96, 101, 106, 107, 111, 112, 118, 123]. Dati papildināti ar iegūto informāciju no entomoloģisko kolekciju apstrādes, kā arī ar datiem no ekspedīcijās ievāktā materiāla. Filipīnu arhipelāga biogeogrāfiskai analīzei izmantots valstī pieņemts reģionu un provinču sadalījums.

APSTRĀDĀTAIS MATERIĀLS

Darba ietvaros veikta to vaboļu kolekciju analīze, kurās ir atrodams Orientālā reģiona *Pachyrhynchini* tribas smecernieku materiāls. Pētījuma ietvaros apstrādātas sekojošas kolekcijas:

DUBC - Daugavpils Universitātes vaboļu kolekcija, Daugavpils, Latvija

MTD - Drēzdenes dabas muzeja kolekcija, Drēzdene, Vācija

NHML - Londonas dabas un vēstures muzeja kolekcija, Londona, Lielbritānija

MNHN - Francijas Nacionālā dabas un vēstures muzeja kolekcija, Parīze, Francija

SMNH - Zviedrijas dabas un vēstures muzeja kolekcija, Stokholma, Zviedrija

HNHM - Ungārijas Nacionālā dabas un vēstures muzeja kolekcijas, Budapešta, Ungārija

NHMD - Dānijas dabas un vēstures muzeja kolekcija, Kopenhāgena, Dānija

NHMB - Berlīnes dabas un vēstures muzeja kolekcija, Berlīne, Vācija

NMP – Čehijas nacionālais dabas un vēstures muzejs, Prāga, Čehija

MMBC – Morāvijas dabas un vēstures muzejs, Brno, Čehija

REZULTĀTI UN DISKUSIJA

PACHYRHYNCHINI TRIBAS ORIENTĀLĀ REĢIONA FAUNAS APSKATS

Pachyrhynchini Schoenherr, 1826

= *Somatoides*: Schoenherr, 1823-1139; = *Pachyrhynchides* Schoenherr, 1826-88; = *Pachyrhynchoidae* Agassiz, 1846-270; = *Pachyrhynchini* Chevrolat, 1847-389; = *Pachyrhynchitae* Blanchard, 1853-201; = *Pachyrhynchidae* Waterhouse, 1853-201; = *Pachyrhynchini* Stein, 1868-100; = *Pachyrrhychidae* Behrens, 1887-212; = *Pachyrhynchinae* Faust, 1892-193; = *Pachyrrhynchini* Heyne and Taschenberg, 1907-225; = *Pachyrrhynchinae* Heller, 1922-542; = *Pachyrhynchoidea* Ienistea, 1986-32

Pachyrhynchini ir sugām plaši pārstāvēta smecernieku triba Orientālā reģiona faunā. Pasaulē zināma 641 suga, kas ir apvienotas 17 ģintīs.

Taustekļi izliekti, ģenikulēti, sastāv no 11 segmentiem; taustekļu pirms posms laterāls, izliekts uz leju; biezums, izejas garums attiecībā pret acs perifēro vai distālo malu ir svarīga ģints pazīme: izeja līdz acs perifērajai malai / nesasniedz acs distālomalu / sasniedz acs distālo malu / pārsniedz acs distālo malu.

Pieaugušiem īpatņiem apaksžokļi bez rievām vai izcilīniem uz ārejās virsmas, vienmērīgi, lokveidā izliekti; segspārnu pamata stūri noapaļoti; pakaļ-gurni vienmērīgi līdz ar segspārnu malu.

***Apocyrtidius* Heller, 1908-128**

Ģints pārstāvēta ar 1 sugu: *Apocyrtidius chlorophanus* Heller, 1908 un ir vienīgā Pachyrhynchini tribas suga, kas izplatīta Borneo. Pēdējās zināmās sugas atradnes reģistrētas Mesilau reģionā.

Ģints īpatņiem raksturīgs saīsināts taustekļu pirms posms, kas nesasniedz acs iekšējo malu, taustekļi biezi, acis izteikti globulāras, spēcīgi izliektas ārpus galvas kontūras. Episternālā šuve izteikta. Segspārnu pamatnes devītais segments rievots. Apakšstilbu iekšmala nav saplacināta.

***Apocyrtus* Erichson, 1834-252**

= *Apocryptus* Chevrolat, 1841-226

Ģints pārstāvēta ar 4 sugām, kas izplatītas četrās Filipīnu arhipelāga salās. Luzona salā: *A. mcgregori* Schultze, 1924, Negros salā: *A. chapmani* Schultze, 1934. Marinduque salā: *A. auroraensis* Rukmane-Bārbale, 2021. Pamatojoties uz kolekciju datiem, *A. inflatus* Erichson, 1834, kas oriģināli izplatīta Luzona salā, izplatība papildināta ar jaunām atradnēm no Marinduque un Pollilo salām.

Ģints īpatņiem smeceris dorsāli ar dziļu, taisnu šķērsrievu, kas atdala smecera pamatni no galvas. Acis lielas, vidēji spēcīgi izspiestas ārpus galvas kontūras. Taustekļi biezi, pirms posms sasniedz acs distālo malu. Segspārnu vairodziņš pilnībā nosegts. Segspārnu pamatnes I un II segmenti saauguši. Segspārni un priekškrūšu vairogs spēcīgi noapaļoti. Jaunatkātā suga no pārejiem ģints pārstāvjiem atšķiras ar spēcīgi noapaļotiem segspārniem abos dzimumos, kas klāti ar zaļiem zvīņu plankumiem. Segspārnu struktūra spēcīgi grumbuļaina, ar izteiku rievojumu.

***Enoplocyrtus* Yoshitake, 2017**

Ģints pārstāvēta ar vienu sugu *E. marusan* Yoshitake, 2017 kas izplatīta Luzona salā.

Raksturojošās pazīmes: smeceris dorsāli bez šķērsrievas, taisns, sānu malās pie taustekļu izejas trīsstūrveida formas ieliekums; priekškāju apakšstilbi saplacināti, ar kīlveida izaugumu gar ārējo malu, pakaļkāju apakšstilbi bez izaugumiem gar iekšmalu; acis nelielas, nav izspiestas ārpus galvas kontūras.

***Eumacrocyrtus* Schultze, 1924-599**

Ģints pārstāvēta ar vienu sugu *E. canlaonensis* Schultze, 1923, kas izplatīta Filipīnu arhipelāga Negros salā.

Ģints īpatņiem raksturīgs vizuāli saplacināts ķermenis, ar izteikti vājāk dorsāli izliektiem segspārniem un priekškrūšu vairogu. Segspārni lancetveida formas, ar spēcīgi izvirzītu virsotni abiem dzimumiem. Priekškrūšu vairogs dorso-laterālajās daļās ar iespiedumiem. Taustekļi plāni, sasniedz acs distālo malu. Smeceris bez izteiktām šķērsrievām vai garenrievām, dorsāli ar seklu iespiedumu vidusdaļā. Acis nelielas, vāji izliektas ārpus galvas kontūras.

***Eupachyrrhynchus* Heller, 1912-324**

Ģints pārstāvēta ar septiņām sugām, četras no kurām aprakstītas promocijas darba ietvaros. Ģints izplatīta Luzona un Marinduque salās.

Raksturojošās pazīmes: smeceris dorsāli izliekts apikālajā daļā, ar ieliekumu bazālajā daļā, ar izteiku mediālo garenrievu, bez dziļas šķērsrievas. Taustekļi plāni, sasniedz vai gandrīz sasniedz acs distālo malu. Segspārni spēcīgi izliekti dorsālajā skatā, saplacināti laterālajā skatā. Apakšstilbi ar nelieliem izaugumiem uz iekšmalas. Acis nelielas, nav izliektas ārpus galvas kontūras.

E. auromaculatus Rukmane-Bārbale, 2020 atšķirama ar maza izmēra, violetas krāsas ķermenī, segspārni un priekškrūšu vairogs klāti ar zelta krāsas plankumiem; segspārniem izteikta kvadrātveida forma. *E. barsevskisi* Rukmane-Bārbale, 2020 atšķiras ar masīvu, zelta krāsas ķermenī bez plankumiem. Segspārni spēcīgi noapaļoti, laterālā skatā saplacināti, priekškrūšu vairogs paplašināts pirms viduslīnijas, noapaļots. *E. barbalsi* Rukmane-Bārbale, 2020 atšķirama ar īsiem, noapaļotiem segspārniem, kas klāti ar ziliem plankumiem, ķermenī melns, priekškrūšu vairogs paplašināts pie pamatnes. *E. viridimaculatus* Rukmane-Bārbale, 2020 atšķirama ar īsiem, spēcīgi noapaļotiem segspārniem, kas klāti ar zaļiem plankumiem; ķermenī vara krāsas; priekškrūšu vairogs noapaļots, pamatne nav paplašināta, laterālajā skatā segspārni nav saplacināti.

***Exnothapocyrtus* Schultze, 1924**

Ģints pārstāvēta ar piecām sugām, visas izplatītas Filipīnu arhipelāga Luzon salā: *E. cylindricollis* Heller, 1912 (=*Nothapocyrtus cylindricollis* Heller; =*Nothapocyrtus chloropunctatus* Heller), *E. alboplagiatus* Heller, 1916 (=*Nothapocyrtus alboplagiatus* Heller), *E. erytromerus* Heller, 1912 (=*Nothapocyrtus erytromerus* Heller), *E. luzonicus* Schultze, 1917 (=*Nothapocyrtus luzonicus* Schultze), *E. basifasciatus* Heller, 1912 (=*Nothapocyrtus basifasciatus* Heller).

Raksturojošās pazīmes: smeceris dorsāli bez izliekuma apikālajā daļā, ar platu, seklu ieliekumu bazālajā daļā, ar mērenu mediālo garenrievu; starp smecera pamatni un galvu iespiedums, kurš sānos pāriet rievā līdz acu distālajai malai; taustekļi plāni, pirmais posms pārsniedz acs distālo malu; acis mazas, neizspiežas ārpus galvas kontūras; priekškrūšu vairogs cilindrisks, pamatne paplašināta; segspārni laterāli saplacināti, katrs segspārns ar trīsstūrveida iespiedumu pie virsotnes.

***Expachyrhynchus* Yoshitake, 2013**

Ģints pārstāvēta ar trīs sugām, kuras izplatītas Filipīnu arhipelāga Palawan salā: *E. chloromaculatus* Yoshitake, 2013, *E. granulatus* Yoshitake, 2013, *E. palawanensis* Rukmane, 2019.

Raksturojošās pazīmes: smeceris dorsāli izliekts apikālajā daļā, izteikta šķērsrieva, kas atdala smeceri no galvas pamatnes, izteikta centrālā garenrieva; taustekļi biezi, nesasniedz acs distālo malu; acis vidēja izmēra, izspiestas ārpus galvas kontūras; segspārniem un priekškrūšu vairogam raksturīga specīgi rievota, nelīdzena struktūra, segspārni laterāli saplacināti, dorsāli vāji izliekti. *E. palawanensis* Rukmane, 2019 no citām ģints sugām atšķiras ar noapaļotu priekškrūšu vairoga un segspārnu formu, specīgi izspiestām acīm un markējumu uz priekškrūšu vairoga: atsevišķas, vienlaidus izkliedētas zaļas krāsas zvīņas.

***Homalocyrtus* Heller, 1912**

Ģints pārstāvēta ar sešām sugām, ar vairumu sugu no Luzon salas: *H. harapago* Heller, 1912, *H. intermittens* Heller, 1912, *H. tumidosus* Heller, 1912; vienu sugu no Leyte salas: *H. maculatus* Schultze, 1922 un vienu no Bohol salas: *H. subcuneiformis* Waterhouse, 1842 (=*Apocyrtus subcuneiformis*); *H. conicus* Boheman, 1845 nav zināma precīza izplatībā aizņemot Filipīnu arhipelāgu.

Raksturojošās pazīmes: Smecera dorsolaterālās malas noapaļotas; segspārni ovālas formas, specīgi paplašināti apikālajā daļā, ar platāko punktu aiz vidusdaļas; segspārni ar intensīvu apmatojumu gar segspārnu šuvi virsotnes virzienā.

***Macrocyrtus* Heller, 1912**

Ģints iedalīta divās apakšgintīs: *Exmacrocyrtus* Schultze, 1924-365 kas pārstāvēta ar sešāmsugām: *M. (E.) erosus* Pascoe, 1871, *M. (E.) ilocanus* Schultze, 1918, *M. (E.) negrito* Heller, 1912, *M. (E.) pseudopolitus* Heller, 1921, *M. (E.) caerulans* Rukmane, 2019, *M. (E.) fulgidus* Rukmane, 2019 un *Macrocyrtus* Heller, 1912 kas pārstāvēta ar deviņām sugām: *M. (M.) babuyanensis* Genka & Yoshitake, 2019, *M. (M.) benguetanus* Schultze, 1917, *M. (M.) castaenus* Pascoe, 1881, *M. (M.) contractus* Chevrolat, 1881, *M. (M.) montanus* Schultze, 1917, *M. (M.) splendidus* Genka & Yoshitake, 2019, *M. (M.) trilineatus* Schultze, 1918, *M. (M.) helleri* Janczyk, 1956, *M. (M.) stellarum* Rukmane, 2019. Visas sugars izplatītas Luzon salā.

Raksturojošās pazīmes: taustekļi plāni, sasniedz pāri acs distālajam galam; acis nelielas, maz vai nav izliektas ārpus galvas kontūras; smeceris bez dorsālās šķērsrievas, kas atdala smecera pamatni no galvas; pakalķāju apakšstilbi ar lieliem, atsevišķi izvietotiem hitīna izaugumiem.

Exmacrocyrtus Schultze: segspārnu forma ovāla vai elipsveida, sānu skatā specīgi izliekta, ar iespiedumiem pie virsotnes.

Macrocyrtus: segspārni sānu skatā saplacināti.

Jaunatklātie taksoni galvenokārt atšķirami ar unikālo plankumu markējumu uz priekškrūšu vairoga un segspārniem, kā arī analizētas atšķirības tēviņu dzimumorgānos.

***Metapocyrtus* Heller, 1912-337**

Visplašāk pārstāvētā *Pachyrhynchini* tribas ģints, ar sugu kopskaitu 308. Ģints sadalīta septiņās apakšģintīs: *Artapocyrtus* Heller, 1912 (32 taksoni), *Dolichocephalocyrtus* Schultze, 1925 (27 taksoni), *Metapocyrtus* Heller, 1912 (95 taksoni), *Orthocyrtus* Heller, 1912 (48 taksoni), *Sclerocyrtus* Heller, 1912 (4 sugas), *Sphenomorphoidea* Heller, 1912 (14 taksoni), *Trachycyrtus* Heller, 1912 (58 taksoni) un papildus 20 taksoni, kuri netiek iedalīti nevienā no apakšģintīm.

Smeceris garāks nekā plats, izņemot *Artapocyrtus* apakšģinti (garums un platums vienādi); smecera pamatne ar izteiku šķērsrievu, kas atdala smeceri no galvas; taustekļu izeja pie vai smecera virsotnē; mediāla garenrieva un variējošas formas iespiedums uz pieres; acis mēreni izspiestas, nelielas; taustekļi plāni, segmentu garums variē, pirmsais taustekļu segments sasniedz vai gandrīz sasniedz acs distālo malu; priekškrūšu vairogs punktots, izņemot atsevišķas *Orthocyrtus* sugas ar gludu priekškrūšu vairoga struktūru.

Artapocyrtus Heller: smeceris kvadrātveida vai trapezveida formas, garums un platums vienādi.

Dolichocephalocyrtus Schultze: smeceris garš un šaurs, bazālā daļa dorsāli ar kuperveida izliekumu, šķērsrieva sasniedz acs apakšējo malu, smecera sānos pie vaigiem trīsstūrveida ieliekums.

Metapocyrtus Heller: smeceris ar noapaļotām dorso-laterālajām malām; segspārni eleptiskas vai ovālas formas; priekškrūšu vairoga anteriorā mala rievota, intensīvi punktota.

Orthocyrtus Heller: smeceris ar smailām dorso-laterālajām malām; augšējā kontūrā smeceris taisns, ar sānu ieliekumiem gar šķērsrievu.

Sclerocyrtus Heller: smecera dorsolaterālā mala asa; priekškrūšu vairogs punktots; bez augšējās rievas un priekškrūšu vairoga; segspārni punktoti punktu līnijās, kas veido intervālus.

Sphenomorphoidea Heller: galva starp acīm izliekta, izteikti punktota; šķērsrieva līdz ar acs malu vai pagarināta; segspārni spēcīgi punktoti visa garumā.

Trachycyrtus Heller: Gan priekškrūšu vairogs gan segspārni spēcīgi punktoti.

No 308 sugām, 139 izplatītas Luzona salā, 78 Mindanao, 61 Visayas, bet 7 sugām izplatība nav precizēta (Filipīnu arhipelāgs). Septiņas sugas izplatītas ārpus Filipīnu arhipelāga.

Metapocyrtus ģintī atrodams vislielākais mimikrijas piemēru skaits, kur, lielākai daļai *Pachyrhynchus* ģints sugu atrodama viena vai vairākas *Metapocyrtus* ģints mimikrijas. Materiāla ievākšanas laikā konstatēts, ka *Metapocyrtus* ģints īpatņi ir sastopami daudz biežāk un lielākā skaitā par radniecīgās *Pachyrhynchus* ģints īpatņiem.

Nothapocyrtus Heller, 1912-334

Ģints pārstāvēta ar vienu sugu no Luzona salas: *N. translucidus* Heller, 1912.

Smeceris garāks nekā plats, ar platu, seklu garenvirziena rieu-iespiedumu, kas sasniedz pieres vidusdaļu; acis lielas, izvirzītas ārpus galvas kontūras; taustekļu pirmsais posms sasniedz priekškrūšu vairoga priekšējo malu; segspārni saplacināti, dorsāli spēcīgi izliekti, sašaurināti pie virsotnes.

Pantorhytes Faust, 1892-193

= *Pantorrhypes* Heller, 1935-157

Ģints pārstāvēta ar 77 sugām, kas izplatītas Papua Jaungvinejā un Zālamanu salās.

Ģints īpatņi atšķirami galvenokārt ar sarkaniem, apaļas formas izaugumiem uz segspārniem, kas raksturīgi vairumam sugu ar atsevišķiem izņēmumiem; ķermenis un ekstermitātes klātas ar īsiem, baltiem matiem; priekškrūšu vairogs spēcīgi grumbuļains; smeceris īss, plats, raksturīga šķērsrieva un garenrieva, ieliekts bazālajā daļā, vēl viens ieliekums pie mutes; taustekļi biezi, nesasniedz acs distālo malu.

***Proapocyrtus* Schultze, 1918**

Ģints pārstāvēta ar divām sugām, vienu no Luzon salas: *P. luzonicus* Schultze, 1934 un vienu no Visayas salu grupas: *P. insularis* Schultze, 1918.

Raksturojošās pazīmes: Smeceris ar izteiktu mediālo garenrievu līdz pieres vidusdaļai un šķērsrievu pie acu pamatnes; pirms un otrs taustekļu segmenti vienāda garuma; priekškrūšu vairogs dorsāli saplacināts, ar šķērsrievām abos galos; segspārni dorsāli saplacināti, laterāli izliekti asā leņķī, ar trīsstūrveida ieliekumu uz katra segspārna pie virsotnes; segspārnu virsotnes nav savienotas.

***Pseudapocyrtus* Heller, 1912-326**

Ģints pārstāvēta ar 12 sugām: *P. exsectus* Heller, 1912, *P. productus* Heller, 1912 (Filipīnas); *P. formicarius* Heller, 1912, *P. imitator* Heller, 1912, *P. schandenbergi* Heller, 1912, *P. multipunctatus* Schultze, 1918, *P. apicatus* Schultze, 1922, *P. multianulatus* Heller, 1929, *P. legoskyi* Link & Zettel, 2012, *P. madelaensis* Rukmane-Bārbale, 2021, *P. robertsasinskisi* Rukmane-Bārbale, 2021 (Luzon); *P. catanduanensis* Schultze, 1922 (Catanduanes).

Raksturojošās pazīmes: smeceris dorsāli izliekts, ar šķērsrievu kas atdala smecera pamatni no pieres; mediāla garenrieva uz pieres visa garumā; acis mazas, vāji vai nav izvirzītas ārus galvas kontūras; taustekļi plāni, pirms posms sasniedz acs iekšmalu. Promocijas darba ietvaros aprobētā *P. madelaensis* atšķiras ar spēcīgi izvirzītiem segspārniem, kas izliekti, un no sānu skata veido ventrālu ieliekumu. Jaunatklātā *P. robertsasinskisi* atšķiras ar pilnīgi melnu ķermenī bez krāsainu zvīņu marķējuma un lielākām acīm, kas spēcīgāk izvirzītas ārus galvas kontūras; segspārnu virsotne tēviņiem izliekti kvadrātveida formas.

***Sphenomorpha* Behrens, 1887-339**

Ģints pārstāvēta ar 18 sugām, kuras izplatītas vairākās Indonēzijas salās. Ģints pārstāvjiem raksturīgs spēcīgi noapaļots priekškrūšu vairogs; segspārni laterāli saplacināti; ķermenis ar spēcīgu, metālisku spīdumu; acis lielas, spēcīgi izvirzītas ārus galvas kontūras; smeceris paplašināts mutes virzienā, apikāli ar izliekumu, ieliekums pie bāzes pirms pieres; taustekļi plāni, pārsniedz acs distālo malu.

***Trichomacrocyrtus* Yoshitake, 2018**

Ģints pārstāvēta ar septiņām sugām, kas izplatītas Luzona salā: *T. calostigma* Yoshitake, 2018, *T. chlorostigma* Yoshitake, 2018, *T. hieroglyphicus* Schultze, 1917, *T. kalinganus* Schultze, 1922, *T. trivittatus* Schultze, 1922, *T. caerulans* Rukmane, 2019, *T. nubes* Rukmane-Bārbale, 2022.

Raksturojošās pazīmes: pakaļkāju apakšstilbu iekšmala noklāta ar gariem, zelta krāsas matiem; smeceris bez šķērsrievas starp pamatni un galvu; pēdu I un II posmi plati. Promocijas darba ietvaros

aprobtā *T. caerulans* atšķirama ar zilo zvīņu markējumu uz priekškrūšu vairoga un segspārniem un lielajām, spēcīgi izvirzītajām acīm, detalizētākai pārbaudei salīdzināta tēviņu dzimumorgānu forma.

ĢINTS *PACHYRHYNCHUS GERMAR*, 1824

= *Sphaerogaster* Dejean, 1821-95; = *Somatodes* Schoenherr, 1823-1139; = *Sphaerogaster* Lettreille, 1825-391; = *Sphaerogaster* Sturm, 1826-197; = *Sphaenogaster* Berthold, 1827-386; = *Pachirhinus* Latreille, 1828-596; = *Pochyrhynchus* Laporte, 1840-301; = *Pachyrhinchus* Desmarest, 1842-313; = *Pachyrhincus* Desmarest, 1842-313; = *Pachyrrhynchus* Gemminger and Harold, 1871-2243

PACHYRHYNCHUS GERMAR, 1824 ORIENTĀLĀ REGIONA ZOOGEOGRĀFIJA

Pēdējie apkopotie ģints sugu izplatības dati publicēti 1923. gadā, Schultze monogrāfijā. Apkopojumā ir iekļautas 85 sugas un 13 pasugas. Kopš 2012. gada ģints sugu kopskaits ir ievērojami pieaudzis, īpaši, mazāk pētītās salās tādās kā Samar, Leyte un Mindanao sala. Lielākais sugu skaita pieaugums konstatēts Mindanao salā, kur no 14 sugām tagad zināmas 51 (37 jaunatklāti taksoni), to var skaidrot ar jaunām sugu atradnēm no Mt. Apo Dabas parka un Bukidnon augstienēm. Plašāk izpētīti arī salas rietumi - Zamboanga kalnu reģeons. Luzona salā sugu kopskaits pieaudzis no 55 līdz 79 (24 jaunatklāti taksoni).

No 173 *Pachyrhynchus* ģints sugām, 160 izplatītas Filipīnu arhipelāgā: 79 izplatītas Luzona salā (46%), 51 Mindanao (29%), 19 Samar un Visayas salās (11%), 9 Mindoro (5%), 8 Panay un Lubang salās (5%). Viena suga konstatēta Romblon salā, kurā līdz šim *Pachyrhynchus* ģints sugas netika reģistrētas. Ārpus Filipīnu arhipelāga astoņas sugas izplatītas Taivānā un četras Indonēzijā. Sugu bioēkoloģiskā izceļsmē ir okeāniska, kas izskaidro iemeslu, kāpēc neviens no *Pachyrhynchus* ģints sugām nav sastopama Palawan un Sulu salās, kuras atdalītas no pamata Filipīnu arhipelāga salām ar barjeru. Palawan salas flora un fauna vairāk līdzinās Ķīnas, kamēr Sulu salu kompleksam ir sava unikāla flora un fauna, kas nelīdzinās tuvu esošās Mindanao salas faunai. *Pachyrhynchus* ģintī nav zināma neviens suga, kas būtu izplatīta Borneo vai Āzijas sauszemē, kas vēlreiz apstiprina faktu par sugu okeānisko izceļsmi un izplatību. Sugu izplatību ierobežo īpatnē nespēja pārvietoties lidojot, kā arī nepieciešamība pēc specifiskiem vides apstākļiem - kalnu ekosistēmām [25, 38].

Papildinātie izplatības dati atspoguļo, ka vairums sugu ir endēmas un sastopamas konkrētā salā, vai konkrētā salas daļā. Kopumā 12 sugas sastopamas vairāk kā vienā salā: *P. moniliferus* (Luzon, Mindoro, Samar), *P. multipunctatus* (Luzon, Samar), kamēr pārējās 10 izplatītas salu kompleksos, kur salas atdalījušās viena no otras pēdējā ledus laikmeta laikā (PAIC). Mindanao salu kompleksā: *P. speciosus*, *P. regius*, *P. venustus*, *P. signatus*), Luzona salu kompleksā: *P. orbifer*, *P. phaleratus*, *P. decussatus*, *P. apicatus*, *P. moellendorfi*, *P. rukmanae*). Pārējās 148 sugas izplatītas tikai vienā, konkrētā salā. Sugas, kuras izplatītas vairākās Filipīnu arhipelāga salās ar lielu varbūtību ir vecākas izceļsmes, un ir izplatījušās pa salām no Filipīnām līdz Ryukyu un Mollucas (Indonēzija). Šāda izplatība būtu iespējama Miocēna - Pleistocēna laika, kad salas atradās tuvu viena otrai un izplatība ar augu vai citu dzīvnieku palīdzību būtu iespējama. Kā apstiprinājuši Schultze [87] un Su et. al. [95] pētījumi, *Pachyrhynchus* ģints sugu pasīva izplatība ar mātes augu palīdzību ir iespējama.

Analizējot sugu izplatību un sastopamību salu iekšienē, novērotas vairākas izplatības tendences. Mindanao salā Zamboanga un Bangsamoro reģioni raksturojami kā izolēti no pārējās salas, un sugu sastāvs ir unikāls, jeb nepārklājas ar pārējās salas sugu sastāvu. Salas vidusdaļā - Caraga, Soccskagen, Davao un salas dienvideos iespējama sugu plūsmas apmaiņa, piemēram, *P. anichtchenkoi* izplatīta visos Mindanao salas centrālojos reģionos un salas ziemeļos, bet nav sastopama Zamboanga. Apkopojot, Zamboanga Peninsula izplatītas trīs sugas, ziemeļu Mindanao 30, Davao 18, Soccskagen 23, Caraga

22 un Bangsamoro sešas sugas. Luzona salā arī novērojama sugu izplatība pa atsevišķiem, savā starpā saistītiem kalnu reģioniem. Cagayan ielejā izplatītas 47 sugas, Cordillera ielejā 39, centrālajā Luzonā 25, Calabarzon 20, Ilocos un Bicol 8, Marinduque sešas sugas.

Pamatojoties uz papildinātajiem izplatības datiem, kā arī ģints morfoloģisko pazīmju analīzi, iespējams izvirzīt hipotēzi, ka *Pachyrhynchus* ģints sugu izcelsme meklējama Luzona salā ar lielāko sugu daudzveidības intensitāti. Respektīvi, sugas no Luzona salas, kas uzskatāms par izplatības centru, virzījušās ziemeļu virzienā līdz Taivānas salām, kur Cagayan ielejas salās starp Luzonu un Taivānu sastopamas vairākas *P. orbifer* un *P. moniliferus* pasugas. Dienvidu virzienā sugas izplatījušās līdz Mindanao salai un Rietumu virzienā līdz tuvākajām Indonēzijas salām. To apstiprina arī Van Dam et al. [73] filoģētiskie pētījumi, kas parāda, ka Mindanao salā izplatīto sugu ģenerācijas ir cēlušās no vairākām Luzona salā sastopamajām sugām.

PACHYRHYNCHUS GERMAR, 1824 MORFOLOGISKO PAZĪMJU UN GENITĀLIJU STRUKTŪRU ANALĪZE

Ģintij raksturīgas nelielas, no 10 līdz 30mm lielas vaboles ar reducētiem apakšspārniem; ķermēņa krāsojums: melns, zili-melns, vara krāsas, sarkans, violeti, zelta vai zaļš; taustekļi melni; raksturīgi dažādu formu un lieluma krāsainu zvīņu plankumi uz galvas, priekškrūšu vairoga un segspārniem.

Galva: izteikti ovālas līdz noapaļotas formas; **Smeceris:** smeceris ir viena no galvenajām pazīmēm, pēc kurām ģints *Pachyrhynchus* tiek nodalīta no pārējām *Pachyrhynchini* ģintīm. *Pachyrhynchus* ģints smecernieku smeceris **dorsāli** - dziļa šķērsrieva smecera centrālajā daļā, viena šķērsrieva pieres pamatnē, starp acīm, apikālā daļa vairāk vai mazāk izliekta dorsāli, taisna šķērseniski, ar lielāku centrālo vai diviem mazākiem centrālajiem iespiedumiem, kas ir sugām specifiski; centrālā garenrieva sākot no pieres līdz šķērsievai, garenrievas garums sugai specifisks: no pieres pamata, centrālās daļas vai distālās malas; bazālā daļa centrāli ar iespiedumu, kura forma un dziļums ir sugai specifiski: apļveida, trīsstūrveida vai kvadrātveida; **laterāli-** sānu skatā smeceris līdz vidusdaļā esošajai rievai taisns, apikālajā daļā izliekts dorsāli, virsotne nolaista ventrāli; bazālā daļa ar dziļu iespiedumu, kas ir sugai specifisks; **ventrāli-** apikālās daļas platumis ir sugai specifiska, svarīga pazīme, atsevišķām sugām platumis nepārsniedz taustekļu izeju dorsālā skatā, atsevišķām pārsniedz līdz 1/3 no smecera platumā katrā malā; smecera garuma un platumā attiecība vairumam sugu ir 1/1, ar iespējamu nobīdi kādā no virzieniem atkarībā no sugas; pieres struktūra sugai specifiska: gluda, ar vieglu vai dziļāku punktotumu; atsevišķām sugām smeceris dorsāli pārklāts ar īsiem matiņiem, citām to nav; sānu malas ar īsākiem matiņiem centrālajā daļā līdz gariem sariem mutes rajonā; ventrālā daļa pilnībā noklāta ar gariem sariem; **Acis un vaigi:** salīdzinoši ar citām *Pachyrhynchini* ģintīm, *Pachyrhynchus* ģints pārstāvjiem ir vidēji lielas, sfēriskas acis, kas ir izliektas ārpus galvas kontūras; acu izliekums un lielums attiecībā pret pieres platumu ir sugai specifiska pazīme, kas variē sugu grupu līmenī no ¼ līdz ½ no pieres platumā. Vaigi vairumam sugu gludi, bieži markēti ar atsevišķām apaļas vai ovālas formas zvīņām vai neregulāras formas zvīņu plankumu, var būt klāti ar īsiem, gaišiem matiem, kas paliek intensīvāki mutes virzienā. Sugām ar lielākām, spēcīgāk ārpus galvas kontūras izliektām acīm uz vaigiem raksturīgs krokojums; **Pakausis (vertex):** daļēji nosegts ar priekškrūšu vairogu, vairumam sugu gluds vai ar nelielu punktotumu, taisns; **Sānu pakausis (tempus):** atkarībā no acu lieluma, iespējams izteikts krokojums sugām ar lielākām acīm un gluds sugām ar mazākām acīm; **Taustekļu eja:** dziļa, sākas īsi pie smecera sānu malas augšējā mutes stūra, mēreni noapaļota ventrālā virzienā, spēcīgāks leņķis vidusdaļā, pēc kā taisna ventrālā virzienā, taustekļu izeja izvietota 1/3 no augšas ejas kopējā platumā.

Taustekļi: Taustekļi sastāv no 11 posmiem; **Izeja (scape):** pirmais taustekļu posms, kura garums līdzvērtīgs pārējo posmu saliktam garumam, attiecība var minimāli variēt atkarībā no sugas; forma piestiprinājuma vietā sašaurināta un paplašinās virsotnes virzienā, no sāniem forma saplacināta;

attiecībā pret acīm, izeja nesasniedz acs distālo malu; piestiprinājuma vieta izvietota smecera 1/3; **Funikuls (funicle):** sastāv no septiņiem segmentiem (antennomeres), I segments garāks par citiem, garāks nekā plats; II segments īsāks par I, bet garāks par pērējiem segmentiem, garāks nekā plats; segmenti III līdz VIII līdzvērtīgi garumā un platumā, vienmērīgi palielinās virsotnes virzienā; I, II un III-VII segment precīza attiecība ir sugai specifiska pazīme; **Virsotne (club):** ovālas līdz noapaļotas formas, sastāv no trīs segmentiem, kas vairumam sugu ir vienlīdzīgi plati, atsevišķām sugām II segments ir platāks vai pretēji – īsāks par I un III.

Priekškrūšu vairogs: gluda līdz nedaudz punktēta virsma, kas klāta ar variējošas formas un krāsu fotonu kristālu zvīņām, kas formē punktus, līnijas, plankumus vai neregulāras formas veidojumus; forma augšējā skatā spēcīgi variē atsevišķām sugu grupām: *P. moniliferus*, *P. erichsoni* sugu grupām raksturīga izteikti sfēriska priekškrūšu vairoga forma, ar spēcīgi noapaļotām sānu malām visa garumā, platākais punkts vidusdaļā, *P. congestus*, *P. ardentius* sugu grupām raksturīga ovāla priekškrūšu vairoga forma, augšējā skatā sānu malas no virsotnes ir mēreni noapaļotas, sasniedzot priekškrūšu vairoga platāko punktu pirms vidusdaļas, pēc kā sānu malas sašaurinās līdz $\frac{3}{4}$ no garuma, iztaisnojas un nedaudz paplašinās apakšējās malas virzienā, *P. inclytus* sugu grupai raksturīga taisnstūrveida priekškrūšu vairoga forma, kur augšējā skatā sānu malas ir vāji noapaļotas; sānu skatā priekškrūšu vairoga izliekums variē no gandrīz taisna (*P. digestus*) līdz sfēriskam (*P. orbifer*); priekškrūšu vairoga augšējā mala vairumam sugu nedaudz izliekta galvas virzienā, ar raksturīgu rieuva pirms malas, rieva var būt praktiski reducēta, sastāvēt no atsevišķiem punktiem vai būt nepārtraukta visa garumā; apakšējā mala taisna vai izliekta galvas virzienā, ar raksturīgu rieuva pirms malas; priekškrūšu vairoga pamatne īpatsvarām sugu taisna vai ar atsevišķām krokām, klāta ar atsevišķiem, īsiem matiņiem.

Vēders: Vēdera pamatnes segmeti: I un II segmenti saauguši kopā, spēcīgi krokoti pie pakaļgūžām, centrāli ar ieliekumu, apakšējā mala ar atsevišķām, retām fotonu kristālu zvīņām, daļēji pārklāj III segmentu; III segments minimāli izliekts, apakšējā mala taisna, struktūra taisna, sānu lamas minimāli krokotas, vairumam sugu katrā no sānu malām pa vienam zvīņu plankumam, atsevišķām sugām plankumu nav; IV un V segmenti taisni, sānu malas spēcīgāk krokotas; anālais segments izliekts pusaplī vai trīsstūrveida formā, ārējā mala biezi klāta ar īsiem, gaišiem matiņiem, iekšējā mala vidusdaļā vairumam sugu ieliekta; segmentu apmatojums ir sugām specifisks un var būt gan intensīvs ar garākiem, gaišiem matiņiem uz visiem segmentiem, ar intensīvāko apmatojumu virsotnē, vai pretēji, apmatojuma var nebūt izņemot virsotni; *metathorax* spēcīgi grumbulains, ar raksturīgām rievām un izliekumiem gar gūžām, sānu malās īpatsvarām sugu izvietoti zvīņu plankumi, gluds vai ar atsevišķiem, īsiem, gaišiem matiņiem.

Segspārni: Segspārnu forma, analogi priekškrūšu vairogam, variē pa sugu grupām, izšķirot izteikti globulārus, saīsinātus segspārnus ar spēcīgi noapaļotām sānu malām augšskatā; ovālas formas, pagarinātus segspārnus ar mēreni noapaļotām sānu malām augšskatā; šaurus, lancetveida segspārnus; sergpānu virsotne: smaila / noapaļota / izvirzīta, kvadrātveida formas; segspārni virsotnē var būt gan sakļauti, gan katrs segspārns ar atsevišķu virsotni; spēcīgākais dzimuma dimorfisms novērojams tieši segspārnu formā, jo mātīšu segspārni ir spēcīgāk izliekti, noapaļoti, dējeklis ir spēcīgi izvirzīts uz priekšu, bet tēviņiem ir raksturīga slaidāka segspārnu forma, segspārnu virsotne strupāka; segspārnu šuve vairumā gluda, atsevišķām sugām ar raksturīgu kroku; vairodiņš daļēji vai pilnīgi nosegti, forma trīsstūrveida līdz noapaļota; izšķir vairākus segspārnu struktūru veidus atkarībā no sugu grupas: segspārni gludi, bez izteikiem intervāliem vai punktējuma (*P. smaragdinus*, *P. venustus*) / segspārni ar raksturīgu punktējumu, kas nav regulāri izvietots punktujoslās (*P. apoensis*, *P. nitcisi*) / segspārni ar punktojumu, kas izvietots regulārās punktujoslās attiecīgi segspārnu intervāliem, joslas neveido rievas (*P. orbifer*, *P. cabrasae*) / punktujoslas veido dzīļākas vai seklākas rievas (*P. lacunosus*); vairumam sugu apmatojums tikai gar segspārnu virsotni īsu, gaišu matiņu veidā, atsevišķām sugām raksturīgi garāki mati visā segspārnu garumā; uz segspārniem izvietoti dažādu krāsu un formu punkti, plankumi,

līnijas, kas lielākoties savā formā ir relatīvi nemainīgi sugas līmenī, marķējuma krāsojums var būt mainīgs.

Ekstremitātes: Ekstremitāšu morfoloģiskā uzbūve būtiski neatšķiras visiem trim ekstremitāšu pāriem; gurni krokoti; augšstilbi sašaurināti pie pamatnes, paplašināti un izliekti ar platāko punktu vidusdaļā, ieliekti gar iekšmalu pirms virsotnes un noapaļoti virsotnē, var būt klāti ar krāsainu zvīņu joslu vai atsevišķām, krāsainām zvīņām vai bez zvīņu markējuma, klāti ar īsiem, retiem matiņiem; apakšstilbi vienmērīgi plati visa garumā, ieliekti uz iekšu, iekšmala klāta ar garākiem matiem līdz nelielam izaugumiem, pamatne atvērta tipa, ar mukroniem; pēdu I un II posmi vienlīdzīgi, III posms lielāks, nadziņi īsāki par pēdas garumu, pēdas augšdaļa reti klāta ar gariem, gaišiem matiem, apakša biezi pārkāta ar īsākiem matiņiem.

Dzimumorgāni: Tēviņi: Tēviņu dzimumorgānu forma ir īpaši svarīga pazīme sugu nodalīšanai. *Aedeagus* (dzimumorgāns) garums, platums un izliekums ir sugai specifiski. Īpatsvaram sugu dzimumorgāns sānu skatā ir izliekts uz aizmuguri aptuveni līdz vidusdaļai un vienmērīgi ieliekts uz iekšpusi, veidojot pusaplim līdzīgu formu, virsotnes forma var būt taisna, izliekta pamatnes virzienā, noapaļota, asa vai pagarināta kvadrātveida; dzimumorgāna ieeja (ostium) noapaļota abos galos vai asa pamatnē, līdz ar ārmalu vai veido pārkari pār ārmalu; paramēras ieliekas pamatnes virzienā, garums starp sugām variē no 1:3 līdz 1:1 attiecībā pret dzimumorgāna ķermenī; augšskatā dzimumorgāna forma lielākoties taisna visā garumā vai paplašināta pie pamatnes, virsotne sašaurināta, izvirzīta. **Mātītes:** Dējēkļa forma starp sugām maz atšķiras, variējot dējēkļa garumam atkarībā no sugas īpatņu lieluma; dējēklīm augšskatā pie virsotnes ir divi izaugumi, pa vienam katrā pusē, kuru forma ir sugai specifiska, virsotne klāta ar retiem, gariem matiem; sternīts VIII pusapaļas formas, ar retiem, gariem matiem pie virsotnes gar ārmalu; spermatēkas virsotnes izliekums un izvirzījums sugai specifiski, pamatne taisna, ar ieliekumu vai ar izliekumu.

Genitāliju struktūru analīze: Papildus metode sugu atšķiršanai sugām, ar līdzīgas formas dzimumorgānu ir tēviņu dzimumorgāna iekšējā maisa formas un struktūru analīze. Starp sugām spēcīgi variē ejakuācijas kanāla forma, hitinizētais kopulācijas gals, izliekumi pie pamatnes, izliekums un forma sānu skatā vai skatā no augšas.

PACHYRHYNCHINI TRIBAS JAUNATKLĀTIE TAKSONI

Kopējais jaunatklāto taksonu skaits Pachyrhynchini tribā sastāda **50** sugas un **četras** pasugas jeb **54 jaunatklati taksoni**. Vienas sugas status paaugstināts no pasugas līdz sugas līmenim.

37 sugas un četras pasugas jaunatklātas un publicētas *Pachyrhynchus* ģintī: *P. kraslavae* Rukmane & Barševskis, 2016, *P. marinduquensis* Rukmane & Barševskis, 2016, *P. cabrasae* Rukmane & Barševskis, 2016, *P. nitcisi* Rukmane & Barševskis, 2016, *P. antonkozlovi* Rukmane & Barševskis, 2016, *P. shavrini* Rukmane & Barševskis, 2016, *P. anichtchenkoi* Rukmane & Barševskis, 2016, *P. valainisi* Rukmane & Barševskis, 2016, *P. barsevskisi* Rukmane, 2016, *P. domino* Rukmane, 2016, *P. pseudhalconensis* Rukmane, 2016, *P. rebus* Rukmane, 2016, *P. tikoi* Rukmane, 2016, *P. miltoni* Cabras & Rukmane, 2016, *P. ilgas* Rukmane, 2017, *P. orientalis* Rukmane, 2017, *P. occidentalis* Rukmane, 2017, *P. neoabsurdus* Rukmane, 2017, *P. banglas* Bollino, Sandel & Rukmane, 2017, *P. esperanza* Bollino, Sandel & Rukmane, 2017, *P. felipeae* Rukmane & Cabras, 2018, *P. franciscoi* Rukmane & Cabras, 2018, *P. layroni* Rukmane & Cabras, 2018, *P. sergejevae* Rukmane, 2018, *P. torresi* Rukmane, 2018, *P. ottomerkli* Rukmane, 2019, *P. sagittatus* Rukmane, 2019, *P. tetramaculatus* Rukmane, 2019, *P. kirklayroni* Rukmane, 2019, *P. aedamlayroni* Rukmane, 2019, *P. mindoroensis* Rukmane & Hava, 2020, *P. yoshitakei* Bollino, Rukmane & Mohagan, 2020, *P. imitans* Bollino, Rukmane & Mohagan, 2020, *P. bollinoi* Rukmane-Bārbale, 2020, *P. cinereomaculatus* Rukmane-Bārbale, 2020, *P. subpalidius* Rukmane-Bārbale, 2022; *P. cebrem* Patano & Rukmane-Bārbale, 2023;

P. möllendorffi marinduquanus Rukmane, 2018, *P. moniliferus babuyanensis* Rukmane, 2018, *P. moniliferus herbidus* Rukmane, 2018, *P. decussatus catanduanensis* Rukmane-Bārbale, 2020;

P. cruciatus Schultze, 1923 taksonomiskais status ir paaugstināts līdz sugas līmenim.

Viena suga jaunatklāta un publicēta *Apocyrtus* ģintī: *A. auroraensis* Rukmane-Bārbale, 2020;

Četras sugas jaunatklātas un publicētas *Eupachyrhynchus* ģintī: *E. auromaculatus* Rukmane, 2019, *E. barbalsi* Rukmane, 2019, *E. barsevskisi* Rukmane, 2019, *E. viridimaculatus* Rukmane, 2019;

Viena suga jaunatklāta un publicēta *Expachyrhynchus* ģintī: *E. palawanensis* Rukmane, 2019;

Trīs sugas jaunatklātas un publicētas *Macrocyrtus* ģintī: *M. (M.) stellarum*, Rukmane, 2019, *M. (E.) caerulans* Rukmane, 2019, *M. (E.) fulgidus* Rukmane, 2019;

Divas sugas jaunatklātas un publicētas *Trichomacrocyrtus* ģintī: *T. caerulans* Rukmane, 2019, *T. nubes* Rukmane-Bārbale, 2022;

Divas sugas jaunatklātas un publicētas *Pseudapocyrtus* ģintī: *P. madelaensis* Rukmane-Bārbale, 2021, *P. robertsstasinskisi* Rukmane-Bārbale, 2021.

Sugu apraksti izveidoti detalizēti analizējot katru taksona morfoloģiskās pazīmes. Katram taksonam atrastas specifiskas, sugai raksturīgas īpašības, kas iekļautas sugas aprakstā. Kā viena no galvenajām pazīmēm sugu atšķiršanai izmantota tēviņu dzimumorgānu forma, kas, pateicoties cietajam hitīna slānim, ir nemainīga sugas ietvaros, bet variē starp atsevišķām sugām.

Viena no metodēm *Pachyrhynchus* ģints sugu klasifikācijai ir sugu dalīšana sugu grupās, kur katrā sugu grupā iekļauts sugu kopums ar grupai specifisku pazīmju sastāvu. Šāda metode izmantota ērtākai un saprotamākai sugu atdalīšanai, uzsverot, ka sugu dalīšanai pa grupām nav taksonomiskas nozīmes. Šādu metodi izmantoja Schultze un Heller, sadalot *Pachyrhynchus* ģinti septiņās (Heller)

SECINĀJUMI

1. Orientālajā faunā Pachyrhynchini tribas ietvaros ir uzskaitīta 641 suga, kas pieder 17 ģintīm, 173 sugas pieder *Pachyrhynchus* Germar, 1824 ģintij. Pētījuma rezultātā 50 sugas un četras pasugas Pachyrhynchini tribas ietvaros konstatētas kā zinātnei jaunas, 37 sugas un četras pasugas jaunatklātas *Pachyrhynchus* Germar, 1824 ģintī. Šīs ģintis ir viegli atšķiramas pēc smecera īpašībām, segspārnu formas, taustekļu pirmā posma garuma un citām ģintij raksturīgām pazīmēm.
2. Darba gaitā iegūtie faunistiskie dati ievērojami paplašina priekšstatu par Orientālā reģiona faunas smecernieku sugu daudzveidību, izplatību un sastopamību. Kopumā 152 sugām precīzēta izplatība un papildināts izplatības areāls, dati par 21 sugu zināmi vienīgi no oriģināl apraksta. *Pachyrhynchus* ģints izplatības dati apkopoti zinātniskajā publikācijā. Kopumā 79 sugas (46%) izplatītas Filipīnu arhipelāga lielākajā salā – Luzonā, 51 Mindanao (29%), 19 Samar un Visayas salās (11%), deviņas Mindoro (5%), astoņas Panay un Lubang salās (5%), 12 sugas izplatītas ārpus Filipīnu arhipelāga Taivānas un Indonēzijas salās.
3. Pētījumu rezultātā sastādīts Orientālā reģiona *Pachyrhynchus* Germar, 1824 ģints faunas anotētais katalogs, kurā tika iekļautas 145 sugas. Kopš kataloga publicēšanas ģints ietvaros aprakstītas un publicētas 28 jaunas sugas.

4. Pētījuma ietvaros ievākti unikāli dati par *Pachyrhynchini* tribas bioloģiju vairākās aizsargajamās teritorijās Mindanao salā, kas apkopoti trīs publikācijās. Secināts, ka *Pachyrhynchus* ģints īpatņiem noteicošais vides faktors ir augstums virs jūras līmeņa un īpatnī ir sastopami sākot ar 700m un augstāk, atšķirībā no radniecīgās *Metapocytus* ģints, kur īpatnī sastopami zemākos augstumos un urbanizētā apvidū.
5. Secināts, ka tālu radniecīgu sugu atšķiršanai iespējams izmantot ārējās morfoloģiskās pazīmes, tādas kā segspārnu un priekškrūšu vairoga forma, sugu grupu atšķiršanai tēviņu dzimumorgāna formu un mātītes spermatēkas formu, bet iekš sugu grupām tēviņu dzimumorgāna iekšējā maisa formu.

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Nine new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Philippines

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Rukmane A., Barševskis A. 2016. Nine new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Philippines. *Baltic J. Coleopterol.*, 16 (1): 77 - 96.

Nine new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Philippines are described and illustrated: *P. kraslavae* sp. n., *P. marinduquensis* sp. n., *P. cabrasae* sp. n., *P. nitcisi* sp. n., *P. antonkozlovi* sp. n., *P. shavrini* sp. n., *P. anichtchenkoi* sp. n., *P. valainisi* sp. n., and *P. pseudapoensis* sp. n. *Pachyrhynchus reticulatus cruciatus* Schultze, 1923, described as a subspecies of *P. reticulatus*, raised to the species level, *P. cruciatus* Schultze, 1923 stat. n. The distribution of all species is mapped.

Key words: Coleoptera, Curculionidae, *Pachyrhynchus*, fauna, taxonomy, new species, Philippines

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) belongs to the subfamily Entiminae and the tribe Pachyrhynchini comprises 14 genera mainly from the Philippines (Alonso-Zarazaga & Lyal, 1999; Yap & Gapud, 2007; Yoshitake, 2013). Members of the genus *Pachyrhynchus* as some related taxa of the tribe Pachyrrhynchini (*Metapocyrthus* Heller, 1912, *Expachyrhynchus* Yoshitake, 2013) are wingless, have striking, sometimes bizarre patterns of brightly coloured scales,

often with strong intraspecific variation between local populations. Some described species have a similar coloration and location of bright spots and scales similar as the some members of the genus *Doliops* Waterhouse, 1841 (Cerambycidae: Lamiinae); data about mimicry between species of *Pachyrhynchus*, *Metapocyrthus* and *Doliops* were provided by Starr & Wang (1992), Barševskis (2013, 2014) and Barševskis & Jaeger (2014).

The genus *Pachyrhynchus* is represented in the Oriental fauna by more than 100 species,

distributed from Japan (Ryukyu Islands) to Australia and it is more common for the Philippine archipelago (Schultze, 1923), which may be regarded as the center of the diversity (Starr & Wang 1992) and a good example of taxa with restricted distributions and great zoogeographical significance (Link & Zettel, 2012). The genus has attracted attention of entomologists: for example, nine species (Yoshitake, 2012) and three species (Bolino & Sandel, 2015) were described from the Philippines in recent years.

During the study of large material from the Philippines on the genus *Pachyrhynchus* which is deposited in our institutional collection (DUBC), five new species were found from Mindanao Island, one from Marinduque, one from Mindoro, one from Luzon and one from Visayas, Samar. The goal of our paper is to provide with descriptions of these nine species. Besides that, *Pachyrhynchus reticulatus cruciatus* Schultze, 1923, which was described as a subspecies of *P. reticulatus*, raised to the species level.

MATERIAL AND METHODS

The studied material is deposited in the following collections:

DUBC - the beetles collection of Daugavpils University, Institute of Life Sciences and Technology, Coleopterological Research Centre, Ilgas, Daugavpils District, Latvia (A. Barševskis);

SMTD - Senckenberg Natural History Collections Dresden, Museum of Zoology, Dresden, Germany (O. Jäger).

The laboratory research and measurements have been carried out using *Nikon AZ100*, *Nikon SMZ745T* and *Zeiss Stereo Lumar V12* digital stereomicroscopes, NIS-Elements 6D software. The habitus photograph was obtained with a digital camera Canon EOS 6D with Canon MP-E 65 mm macro lens, using Helicon Focus auto montage and subsequently was edited with

Photoshop. The maps of the Philippine archipelago have been drawn using the software *ArcGis 10*.

The following measurements are used in this paper and abbreviated as follows: LB - length of body; LE - length of elytra; WE - maximal width of elytra; LP - length of pronotum; WP - maximal width of pronotum; LR - length of rostrum; WR - maximal width of rostrum. All measurements are given in millimeters. The measurement methodology follows Yoshitake (2013).

RESULTS

Pachyrhynchus kraslavae sp. n.

(Fig. 1)

Type material. Holotype, male: Philippines: Mindanao Isl., Compostela Valley, Mabini, 02.2014, local collector leg. (DUBC).

Distribution: Philippines: Mindanao Island (Fig. 9).

Description. Measurements: LB: 13.7; LE: 7.4; WE: 5.2; LP: 4.1; WP: 3.8; LR: 1.3; WR: 1.4.

Habitus dorsally as in Fig. 1A; habitus laterally as in Fig. 1B.

Body and legs metallic purple; body surface mostly very glossy and with wide spots of yellow scales. Eyes, antennae and tarsomeres black. Head with several sparse, oval scales. Each side of rostrum covered with small, oval scales, apical part of rostrum with elongate yellow scales. Median part of pronotum with slightly impressed transverse band of greenish scales, connected with large round spots of yellow scales laterally. Transverse band in middle portion of pronotum with small longitudinal keel. Apical part of femora with irregular yellow scaly spots. Elytra with several scaly spots and transverse band; background of these markings with greenish luster: 1) ovate spot on basal part of each elytron extends at a

slight transverse angle from interval II to lateral margin; 2) wide transverse band in middle part of elytra; 3) apical triangular marking, with rounded angles, extends from apex of elytron to apical third of elytra. Median and apical markings are connected by a marginal stripe laterally.

Head with shallow groove-shaped impression between eyes, with coarse punctures. Eyes relatively large, moderately prominent from outline of head. Rostrum with very fine sparse pubescence, covered by brown sparse setae apically, with shallow impression in basal half, weakly bulging in apical part. Apical bulge of rostrum flattened dorsally, faintly impressed in middle part; dorsal part of rostrum interrupted by weak transverse groove. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse very short pubescence and with long setae; apical antennomeres club-shaped, subellipsoidal. Fu-

nicular segment I nearly twice as long as wide, slightly longer than II; segment II 1.5 times as long as wide, 1.4 times as long as III; segments III - VII slightly wider than long; club subellipsoidal, nearly 1.5 times as long as wide, nearly as long as funicular segments V to VII combined.

Pronotum subspherical, widest behind middle, with very fine and sparse punctuation.

Scutellum small, rounded apically.

Elytra with fine punctures and pubescence; intervals of elytra smooth, with coarse punctures in slightly impressed rows.

Legs wide, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short hairs and hair-like scales along

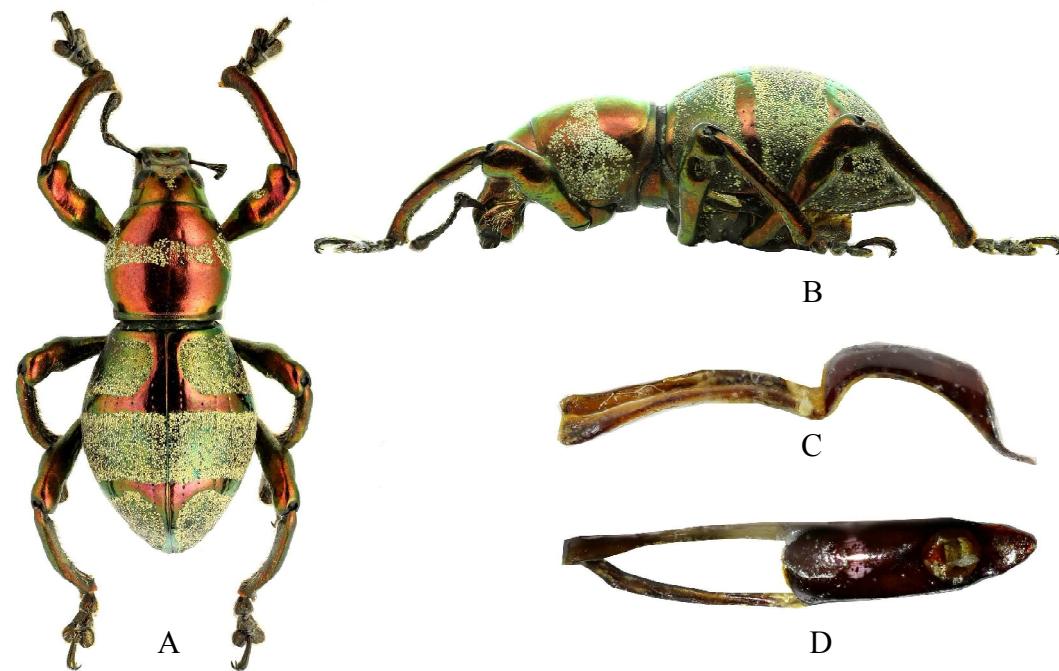


Fig. 1. *Pachyrhynchus kraslavae* sp.n. (holotype): A - dorsal view, B - lateral view, C - aedeagus (lateral view), D - aedeagus (dorsal view)

posterior margins. Tibiae with sparse pubescence, mingled with long hairs; each tibia fringed with long hairs along internal margin, sparsely mingled with stout hairs. Tarsomeres covered by sparse pale pubescence.

Aedeagus relatively short, curved in lateral view. Lamella subtriangular, rounded apically (Fig. 1 C, D).

Female unknown.

Differential diagnosis. *Pachyrhynchus kraslavae* sp. n. is similar in general appearance to *P. speciosus samarensis* Schultze, 1923 (Fig. 12), which was described from Samar Island. The new species is easily distinguishable from *P. speciosus samarensis* by the unique scaly markings on the pronotum and elytra: median part of pronotum (see dorsally) of *P. kraslavae* sp. n. with transverse band of yellow scales (compared taxa with longitudinal band of yellow scales), and with round spot of yellow scales on lateral sides of pronotum.

Etymology. The name *kraslavae* dedicated to the beautiful Latvian town Krāslava, in which were born and lived both authors of this paper.

***Pachyrhynchus marinduquensis* sp. n.**
(Fig. 2 A,E; 3 A, B)

Type material. Holotype: Male: Philippines: S Luzon, Marinduque Isl., Buenavista 07.2015, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Paratypes: 11 males: Philippines: S Luzon, Marinduque Isl., 03.2014 (1), 04.2014 (1), local collector leg.; Boac, 07.2014 (1), 08.2014 (2), local collector leg; Buenavista, 03.2013 (2), 08.2013 (1), 07.2014 (1), local collector leg; Mt. Malindig, 06. 2015 (2), local collector leg; [ex Prof. A. Barševskis coll.]; 3 females: Philippines: S Luzon, Marinduque Isl., Boac, 06.2014 (1), local collector leg; Buenavista 07.2013 (1), 08.2013 (1), local collector leg. [ex Prof. A. Barševskis coll.] (all in DUBC).

Distribution: Philippines: Marinduque Island (Fig. 4).

Description. Measurements (n=5): LB: 11.6 (mean 11.78); LE: 6.9 (mean 6.85); WE: 4.8 (mean 4.74); LP: 3.3 (mean 3.18); WP: 3.3 (mean 3.34); LR: 1.2 (mean 1.23); WR: 1.3 (mean 1.3).

Habitus as in Fig. 2A; habitus laterally as in Fig. 2E.

Body and legs black; body surface with pale yellowish, greenish or pink scale stripes forming a net-shaped pattern on elytra. Head black, glossy. Eyes protruded, hemispheric, black. Head between eyes with longitudinal central line of oval pale scales. Apical bulge of rostrum flattened dorsally. Each side of rostrum covered with small, oval and round scales. Rostrum in basal half with oblong depression and median groove. Antenna black. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with very short sparse pubescence and with long setae; apical antennomere club-shaped, covered with very fine golden pubescence.

Pronotum subspherical, widest behind middle, with very fine sparse punctuation, with pale scale line along anterior margin, median portion of pronotum with slightly impressed transverse, curved band of pale scales, which circumscribe five bare black spots dorsally: two at anterior margin, which at anterior part are confluent, two isolated spots at posterior margin and one small square spot at disc of pronotum.

Elytra with reticulate net-shaped stripes of pale scales. Each elytron divided by stripes of pale scales in nine irregular black bare spots, some of which sometime slightly confluent and two additional sutural black spots on each elytron. Intervals of elytra smooth, with coarse punctures in slightly impressed rows.

Legs wide, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered

with short hairs and hair-like scales along posterior margins. Tibiae with sparse pubescence and long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae. Tarsomeres covered by sparse pale pubescence.

Aedeagus relatively short, in lateral view curved. Lamella subtriangular, sharp apically (Fig. 3A, B).

Differential diagnosis. *Pachyrhynchus marinduquensis* sp. n. is similar in general appearance to *P. reticulatus* Waterhouse, 1841 (Fig. 2 C, G), which was described from Luzon Island. The new species is easily distinguishable from *P. reticulatus* by the shape of the male *aedeagus* (Fig. 3 A, B, E, F) and some other morphological characters. Outer margin of front femori of *P. marinduquensis* sp.n. with stripe of pale scales (*P. reticulatus* without pale scales or with some rudimentary small spots of pale scales). New species relatively slender as *P. reticulatus*, eyes more extended but legs and tarsomeres more slender and narrower.

Etymology. The name of the new species is derived from the name of the island, type locality of the new taxon.

***Pachyrhynchus cruciatus* Schultze, 1923 stat.**

n.

(Fig. 2 B, F; 3 C, D)

Examined material. 5 specimens: Philippines: Luzon Isl., Sierra Madre, Aurora, Dingalon, 07.2013 (1), 08.2013 (2), 05.2014 (1), 05.2015 (1), local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Distribution: Philippines: Luzon Island (Fig. 4).

Description. Measurements (n=5): LB: 12.63; LE: 7.13; WE: 5.57; LP: 3.62; WP: 3.92; LR: 1.35; WR: 1.41.

Habitus as in Fig. 2B; habitus laterally as in Fig. 2F

Body and legs black; body surface with pale yellowish or greenish scale stripes forming net-shaped pattern on elytra. Head black, glossy. Eyes flattened, not extended laterally, black. Head between eyes with longitudinal central line of oval pale scales widened in frontal part. Apical bulge of rostrum flattened dorsally. Each side of rostrum covered with small, oval and round scales. Rostrum in basal half with oblong depression and median groove. Antenna black. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse very short pubescence and with long setae; apical antennomere club-shaped, covered with very fine golden pubescence.

Pronotum subspherical, widest behind middle, with very fine, sparse punctuation, with pale scale line along anterior and lateral margins, dorsal part of pronotum with slightly impressed cruciform-shaped pale scales confluent with anterior and lateral margins and circumscribe four bare black spots dorsally, without one small squarish spot at disc of pronotum.

Elytra with reticulate net-shaped stripes of pale scales. Elytra with lines circumscribing bare areas not crossing at distinct angles, forming transverse cells. Intervals of elytra with microsculpture and with coarse punctures in slightly impressed rows.

Legs wide, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short hairs and hair-like scales along posterior margins. Tibiae with sparse pubescence and with long hairs; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae. Tarsomeres covered by sparse pale pubescence.

Aedeagus relatively elongated, in lateral view curved. Lamella sharp, subtriangular, slightly rounded apically (Fig. 4).

Differential diagnosis. *Pachyrhynchus cruciatus* Schultze, 1923 stat. n. is similar in gen-

eral appearance to *P. reticulatus* Waterhouse, 1841 (Fig. 2 C, G) (Luzon Island), *P. marinduquensis* sp. n. (Marinduque Island) (Fig. 2 A, E) and *P. cabrasae* sp. n. (Mindanao Island) (Fig. 2 D, H). This species is clearly distinguishable from the compared species by the characteristic shape of the pronotum with slightly impressed cruciform shaped pale scales, as well as by the different shape of the aedeagus (see Fig. 3 C, D).

Taxonomic note. This species was originally described by Schultze (1923) as a subspecies of *P. reticulatus cruciatus* Schultze, 1923. As a result of our comparative morphological studies, we raise its taxonomic status to the species level.

***Pachyrhynchus cabrasae* sp. n.**

(Fig. 2 D, H; 3 G, H)

Type material. Holotype: Male: Philippines: Mindanao Isl., Bukidnon, Mt. Kalatungan, 600–1000 m a.s.l., 07.2014, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Paratypes: 5 males: Philippines: Mindanao Isl., Bukidnon, Cabanglasan, 06.2014 (1), 07.2014 (2), 08.2015 (2), local collector leg. [ex Prof. A. Barševskis coll.]; 11 females, Philippines: Mindanao Isl., Bukidnon, Cabanglasan, 01.2014 (1), 02.2014 (1), 06.2014 (1), 08.2014 (2), 09.2014 (1), 08.2015 (3), 11.2015 (1), local collector leg. [ex Prof. A. Barševskis coll.] (all in DUBC).

Distribution: Philippines: Mindanao Island (Fig. 4).

Description. Measurements (n=5): LB: 13.67 (mean 13.15); LE: 8.53 (mean 7.95); WE: 5.73 (mean 5.83); LP: 3.73 (mean 3.76); WP: 4.2 (mean 4.02); LR: 1.47 (mean 1.58); WR: 1.6 (mean 1.55).

Habitus dorsally as in Fig. 2 D; habitus laterally as shown in Fig. 2 H.

Body and legs metallic gold, very shiny; body surface with pale yellowish, greenish or pink metallic shiny scale stripes forming a net-shaped pattern on the elytra. Head massiv, golden red, very glossy. Eyes slightly flattened, not hemispheric, black. Head between eyes with double longitudinal median line of oval pale scales. Apical bulge of rostrum flattened dorsally, with intensive punctuation. Each side of rostrum covered with small, oval and round scales. Rostrum in basal half with oblong depression and median groove. Antenna black, except first metallic gold antennomere. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with very short sparse pubescence and with long setae; apical antennomere club-shaped, covered with very fine pubescence.

Pronotum subspherical, widest in the middle, with very fine, sparse punctuation, without pale scale line along anterior margin, median part of pronotum with slightly impressed transverse, curved band of pale scales, which circumscribe five bare black spots dorsally: two at anterior margin, confluent at anterior part, two isolated spots at posterior margin and one small square spot at disc of pronotum.

Elytra with reticulate net-shaped stripes of pale metallic scales. Each elytron divided by stripes of pale scales in nine irregular, isolated, metallic dark, bare spots, and two additional sutural spots on each elytron. Intervals of elytra smooth, with coarse punctures in slightly impressed rows.

Legs massive, wide, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae and hair-like scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae. Tarsomeres covered by sparse pale pubescence.

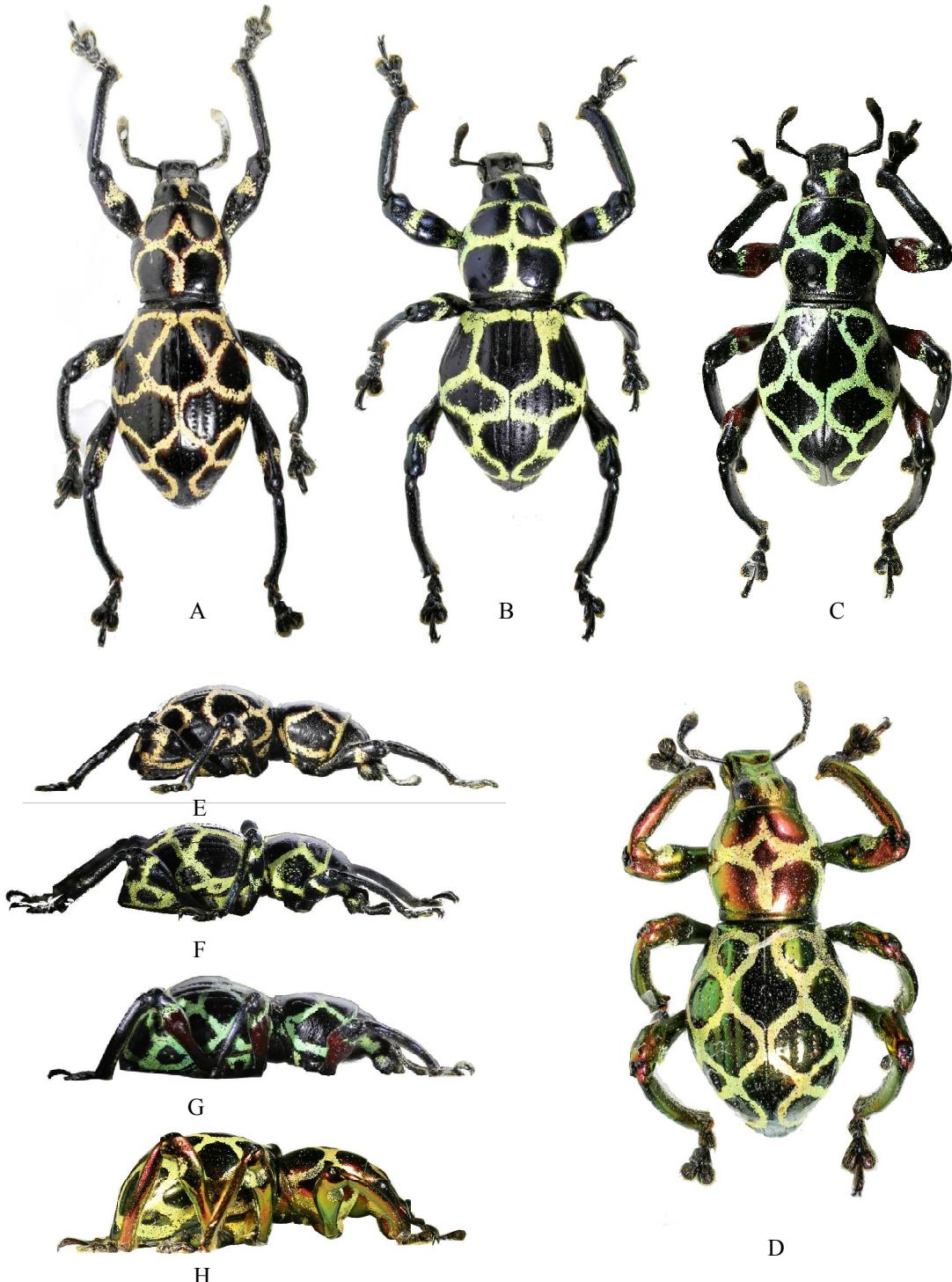


Fig. 2. *Pachyrhynchus marinduquensis* sp.n. (A - dorsal view, E - lateral view); *P. cruciatus* Schultze, 1923 stat.n. (B - dorsal view, F - lateral view); *P. reticulatus* Waterhouse, 1841 (C - dorsal view, G - lateral view); *P. cabrasae* sp.n. (D - dorsal view, H - lateral view)

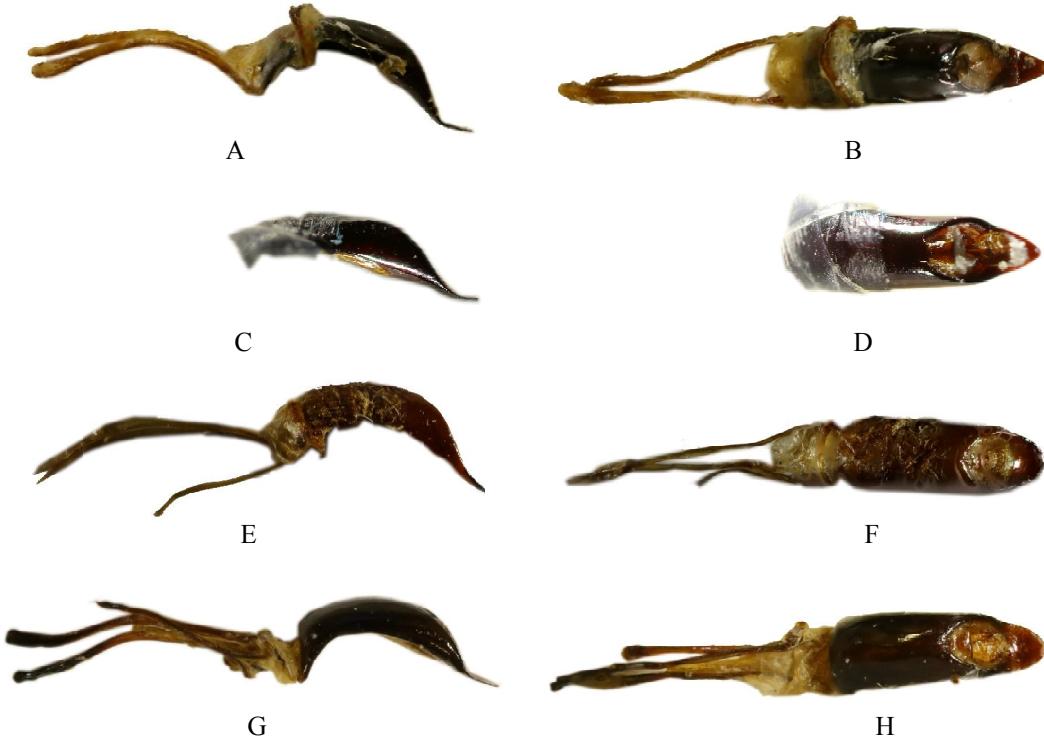


Fig. 3. Aedeagus: *Pachyrhynchus marinduquensis* sp.n. (A - lateral view, B- dorsal view); *P. cruciatus* Schultze, 1923 stat.n. (C- lateral view, D - dorsal view); *P. reticulatus* Waterhouse, 1841 (E - lateral view, F - dorsal view); *P. cabrasae* sp.n. (G - lateral view, H - dorsal view)

Aedeagus relatively short, in lateral view curved. Lamella subtriangular, apically rounded (Fig. 3 G, H).

Etymology. This species named after our colleague, the Philippine entomologist Analyn Cabras in appreciation of cooperation.

Differential diagnosis. *Pachyrhynchus cabrasae* sp. n. is similar in general appearance to *P. reticulatus* Waterhouse, 1841 (Fig. 2 C, G) and *P. marinduquensis* sp. n. (Fig. 2 A, E), known from Luzon and Marinduque Islands respectively. The new species is easily distinguishable from *P. reticulatus* and *P. marinduquensis* sp. n. by the shape of the aedeagus (Fig. 3) and some other morphological characters: body, legs and tarsomeres of *P. cabrasae* sp. n. more massive, metallic gold, very shiny (body of compared species are black), pronotum without pale scale line along anterior margin.

***Pachyrhynchus nitcisi* sp. n.**

(Fig. 5)

Type material. Holotype: Male: Philippines: Mindanao Isl., Sarangani, Malungon, 600-900 m., 04.2014, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Paratypes: 10 males: Philippines, Mindanao Isl., Agusan del Sur, Sibagat, 06. 2015 (4), local collector leg; Sarangani, Malungon, 500 - 900 m., 04.2014 (3), 05.2014 (1), 07.2014 (1), 10.2015 (1), local collector leg. [ex. Prof. A. Barševskis coll.] (DUBC). 16 females, Philippines, Mindanao Isl., Agusan del Sur, Sibagat, 06. 2015 (1), local collector leg; Sarangani, Malungon, 600

- 900 m., 05.2014 (3), 06.2014 (3), 07.2014 (2), 08.2014 (1), 06.2015 (2), 07.2015 (1), 10.2015 (1), local collector leg. [ex Prof. A. Barševskis coll.] (all in DUBC).

Distribution: Philippines: Mindanao Island (Fig. 9).

Description. Measurements (n=5): LB: 13.5 (mean 14.06); LE: 7.5 (mean 8.08); WE: 5.3 (mean 6.04); LP: 3.9 (mean 3.72); WP: 4 (mean 3.98); LR: 2.2 (mean 1.96); WR: 2.4 (mean 2.2).

Habitus dorsally as in Fig. 5A; habitus laterally as in Fig. 5B.

Body and legs metallic purple gold, very shiny; body surface with pale yellow-greenish, shiny scale spots. Head massive, golden red, very glossy. Eyes flattened, not hemispheric, black. Head between eyes with two small, oval or slightly elongated spots of pale scales. Apical bulge of rostrum flattened dorsally, with intensive fine punctuation. Each side of rostrum in basal and frontal side covered with small, oval and round scales continuing under eyes as band. Rostrum in basal half with oblong depression and median groove. Median part of rostrum with deep transverse depression. Antenna black, with small antennomeres. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse very short pubescence and with long setae; apical antennomere club-shaped, covered with very fine golden pubescence.

Pronotum subspherical, widest in middle, with very fine, sparse punctuation, with two discally interrupted transversal spots in lateral portion. Anterior and posterior margin of pronotum without pale scales, shiny.

Elytra with spots of pale yellow-greenish scales. Each elytron with eight spots of pale scales: one smaller spot dorsally and one larger spot laterally at base of elytron, one transverse spot laterally in median part of elytron, two preapical spots and two additional sutural spots on each elytron. Intervals of elytra smooth, with fine punctures in slightly impressed rows.

Legs thin, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae and hair-like scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae. Tarsomeres black, with metallic purple luster, covered by



Fig. 4. Distribution of *Pachyrhynchus marinduquensis* sp.n., *P. cruciatus* Schultze, 1923 stat.n., *P. reticulatus* Waterhouse, 1841 and *P. cabrasae* sp.n.

Aedeagus short, in lateral view curved. Lamella short and wide, subtriangular, slightly rounded apically (Fig. 5 C, D).

Differential diagnosis. *Pachyrhynchus nitcisi sp. n.* is similar in general appearance to *P. eos* Heller, 1924. The new species is easily distinguishable from *P. eos* by the shape of the *aedeagus* and by the shape of smaller spots on body surface, filled with scales (spots of *P. eos* are partially filled or only with scaled contours). Besides that, frons of the new species with two separated spots, while those of *P. eos* with one continuous spot.

Etymology. This species is named after our colleague, the biologist and GPS specialist Māris Nitcis (Daugavpils, Latvia) in appreciation of cooperation.

***Pachyrhynchus antonkozlovi* sp. n.**
(Fig. 6)

Type material. Holotype: Male: Philippines: Mindanao Isl., Sarangani, Malungon, 09.2014, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Paratype: Male: Philippines: Mindanao Isl., Sarangani, Malungon, 12.2014, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Distribution: Philippines: Mindanao Isl. (Fig. 9).

Description. Measurements (n=2): LB: 12.5 (mean 11.9); LE: 7.2 (mean 6.6); WE: 5 (mean 4.85); LP: 2.8 (mean 2.65); WP: 3.1 (mean 3.05); LR: 1.6 (mean 1.65); WR: 1.4 (mean 1.35).

Habitus as in Fig. 6A; habitus laterally as in Fig. 6B.

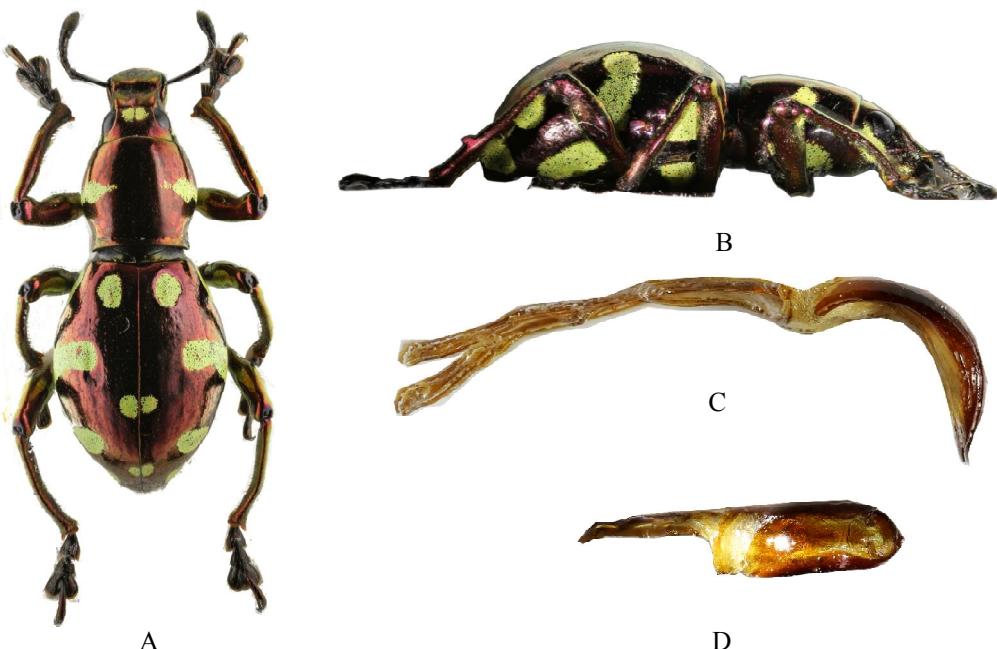


Fig. 5. *Pachyrhynchus nitcisi* sp.n. (holotype): A - dorsal view, B - lateral view, C - aedeagus (lateral view), D - aedeagus (dorsal view)

Body and legs metallic purple gold, very shiny; body surface with pale greenish, shiny scale spots. Head golden purple, very glossy, with sparse, fine punctuation. Eyes slightly extended laterally, hemispheric, black. Head between eyes without spots of pale scales, under eyes laterally with rudimentary small spot of pale scales. Apical bulge of rostrum convex, flattened dorsally, with dense fine punctuation. Each side of rostrum not covered with small, oval and round scales, smooth. Rostrum in basal half with oblong depression and median groove. Middle part of rostrum with deep transverse depression. Antenna black, with small antennomeres. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with very short sparse pubescence and with long setae; apical antennomere club-shaped, covered with very fine golden pubescence.

Pronotum subspherical, slightly flattened, widest in median portion, with very fine, sparse punctuation, in the middle with transversal band

of pale scales. Anterior and posterior margin of pronotum without pale scales, shiny.

Elytra at the basis and in the middle with transverse band of pale scales, widely interrupted near suture dorsally. Each elytron apically with V-shaped spot of pale scales widely interrupted at lateral margin. Intervals of elytra smooth, with fine punctures in slightly impressed or not impressed rows.

Legs thin, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae, without scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae. Tarsomeres black, with metallic purple luster, covered by sparse brown pubescence.

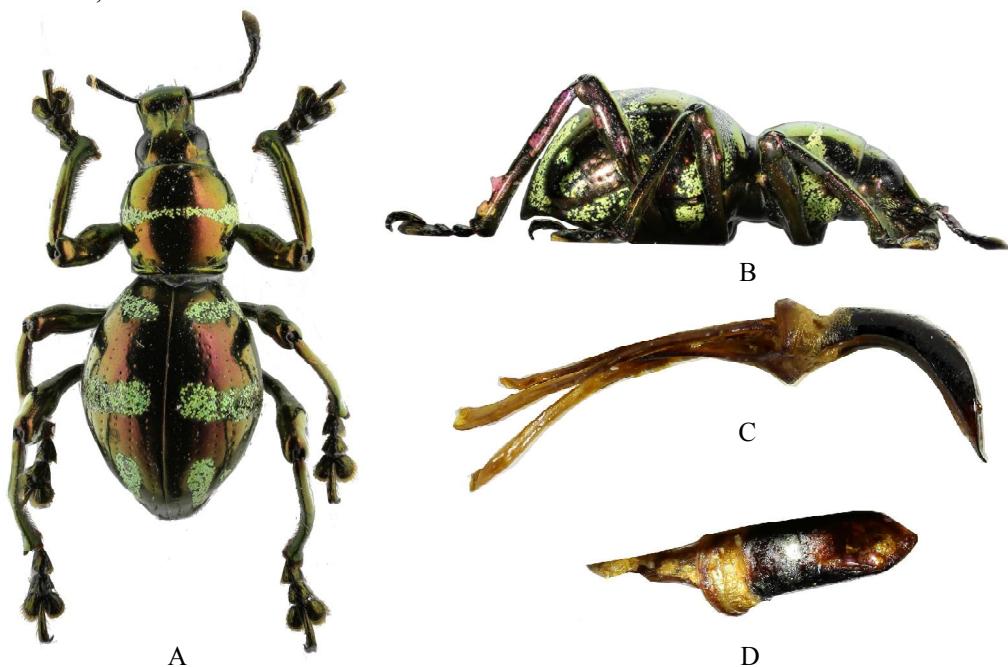


Fig. 6. *Pachyrhynchus antonkozlovi* sp.n. (holotype): A - dorsal view, B - lateral view, C - aedeagus (lateral view), D - aedeagus (dorsal view)

Aedeagus short, in lateral view curved. Lamella short and wide, slightly rounded apically (Fig. 6 C, D).

Differential diagnosis. *Pachyrhynchus antonkozlovi* sp. n. is similar in general appearance to *P. signatus* Schultze, 1919 from Siargao and Bucas islands, which has a single transverse band on the elytra and one interrupted transverse band on the pronotum, but the new species has two transverse bands and a V-shaped spot on the elytra and one transverse band on the pronotum. The new species is similar in general appearance also to *P. noaki* Yoshitake, 2012 from Mindanao, which has one uninterrupted band on the elytra and without transverse band on the pronotum.

Etymology. This species is named after our colleague, Russian entomologist and excellent beetles collector Anton Kozlov (Moscow, Russia) in appreciation of cooperation.

***Pachyrhynchus shavrini* sp. n.**
(Fig. 7 A, E; 8 A, E)

Type material. Holotype: Male: Philippines: E. Visayas, Samar Isl., Lope De Vega, 03.2016, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Paratypes: 12 males: Philippines, E. Visayas, Samar, Hinabangan, 06.2014 (2), 08.2014 (1), 03.2016 (1), local collector leg; Lope de Vega, 03.2016 (3), 04.2016 (4), local collector leg; Mabarut, 06.2015 (1), local collector leg; 1 female, Philippines: E. Visayas, Samar Isl., Lope De Vega, 03.2016, local collector leg. [ex Prof. A. Barševskis coll.] ; 7 males, Philippines: E. Visayas, Samar Isl., Hinabangan, 08.2014 (1), 11.2015 (1), 03.2016 (1), local collector leg; Lope de Vega, 03.2016 (2), 04.2016 (2), local collector leg. [ex Prof. A. Barševskis coll.] (all in DUBC).

Distribution: Philippines: Samar Island (Fig. 10).

Description. Measurements (n=5): LB: 15.1 (mean 15.16); LE: 7.8 (mean 8.02); WE: 5.7 (mean 5.78); LP: 3.5 (mean 3.88); WP: 4. (mean 4.28); LR: 1.9 (mean 1.88); WR: 2.2 (mean 2.12).

Habitus as in Fig. 7A; habitus laterally as in Fig. 7E.

Body and legs of holotype and one paratype black, three paratypes metallic purple gold, very shiny; body surface with pale greenish, shiny scale spots. Head black or golden purple, very glossy, with sparse, fine punctuation. Eyes flat, not extended laterally, black. Head between eyes with wide longitudinal band of pale scales, which is divergent near apical bulge. Head laterally under eyes and on lateral sides of rostrum with pale scales. Apical bulge of rostrum convex, flattened dorsally, with intensive fine punctuation. Rostrum in basal half with oblong depression and median groove. Middle part of rostrum with deep transverse depression. Antenna black, with small, delicate antennomeres. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with very short sparse pubescence and with long setae; apical antennomere club-shaped, covered with very fine golden pubescence.

Pronotum massive, subspherical, slightly flattened, widest in middle, with very fine, sparse punctuation, in median portion with impressed longitudinal band and two symmetrically arranged longitudinally curved spots of pale scales. Anterior margin of pronotum with narrow transverse stripe of pale scales, posterior margin without transverse stripe, only with small triangular widened basis of middle line.

Elytra with many longitudinal and with one transverse stripe of pale scales. Basal parts of each elytron dorsally with five or six, sometimes merged longitudinal bands, which end before the middle of elytra near transverse band. Apex of elytra with V-shaped band connected laterally with the transverse band and with two shorter strips not connected with either the V-shaped or

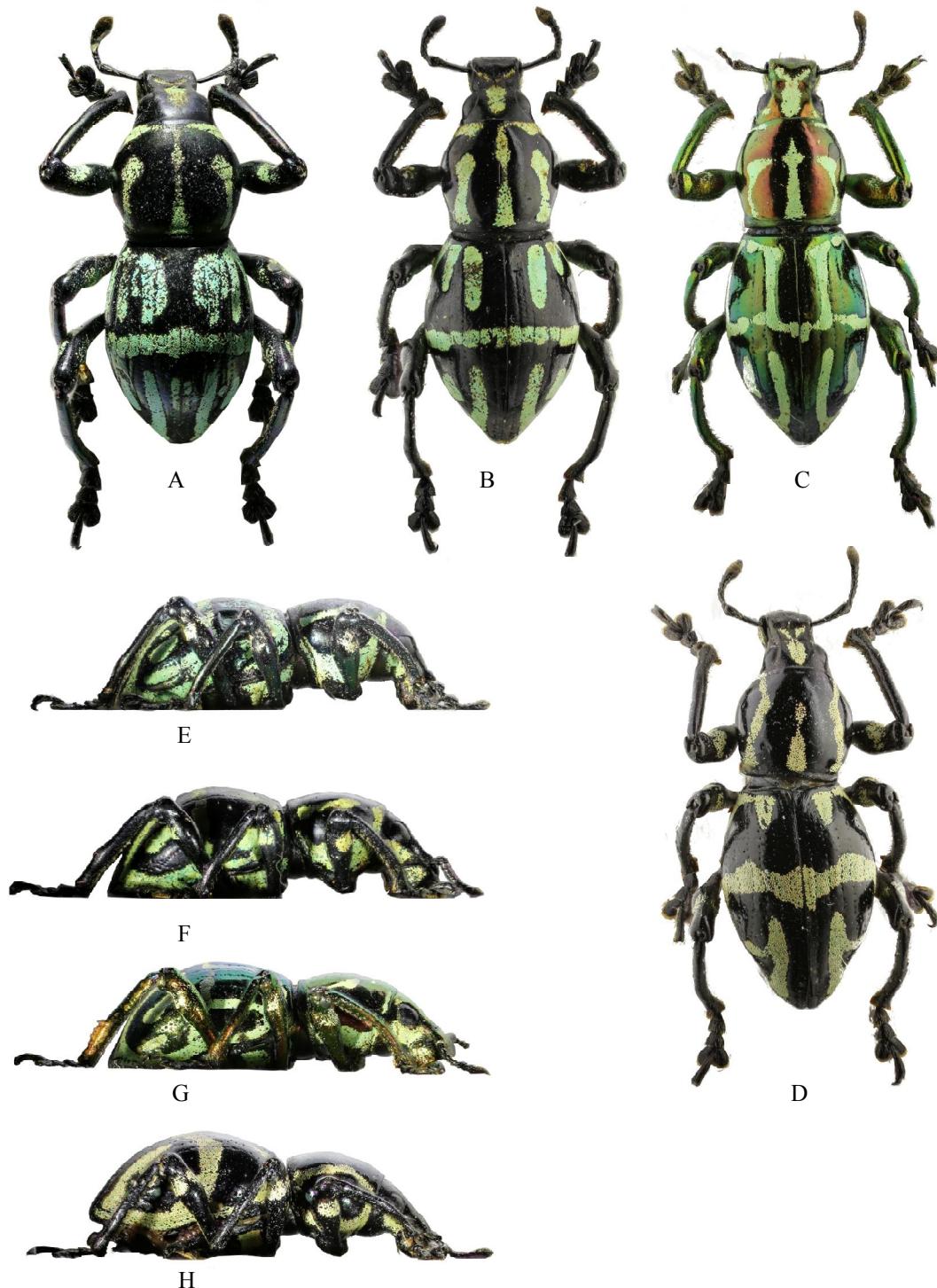


Fig. 7. *Pachyrhynchus shavrini* sp.n. (A - dorsal view, E - lateral view); *P. cumingi* Waterhouse, 1841. (B - dorsal view, F - lateral view); *P. anichtchenkoi* sp.n. (C - dorsal view, G - lateral view); *P. valainisi* sp.n. (D - dorsal view, H - lateral view)

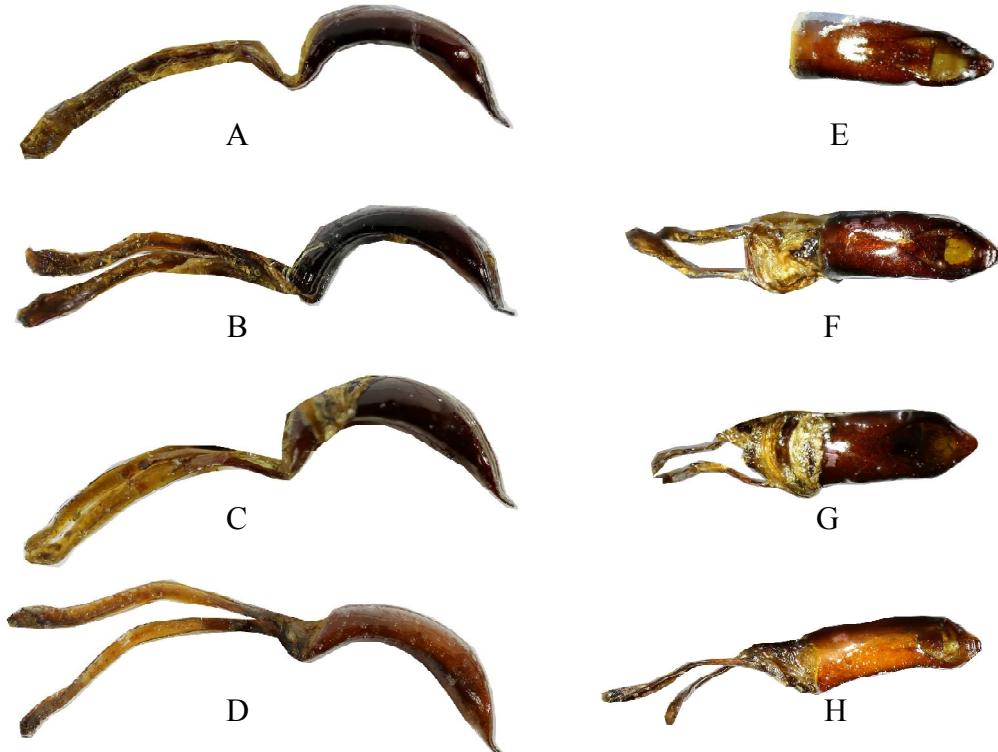


Fig. 8. Aedeagus: *Pachyrhynchus shavrini* sp.n. (A - dorsal view, E - lateral view); *P. cumingi* Waterhouse, 1841. (B - dorsal view, F - lateral view); *P. anichtchenkoi* sp.n. (C - dorsal view, G - lateral view); *P. valainisi* sp.n. (D - dorsal view, H - lateral view)

the transverse band. Intervals of elytra smooth, with fine punctures in slightly impressed rows.

Legs thin, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae and scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae. Tarsomeres black or with metallic purple luster, covered with sparse brown pubescence.

Aedeagus elongate, in lateral view curved. Lamella elongate, slightly rounded apically (Fig. 8).

Differential diagnosis. *Pachyrhynchus shavrini* sp. n. is similar in general appearance to *P. cumingi* Waterhouse, 1841 (Bohol Island), *P. anichtchenkoi* sp. n. (Mindanao Island), and *P. valainisi* sp. n. (Mindoro Island), which have different pattern of elytra and other shape of the aedeagus. Elytral differences appear in Fig. 7. Basis of each elytron of new species with five to six short elongated stripes not connected with transverse band at the middle (basis of each elytron of *P. anichtchenkoi* sp. n. with two longitudinal stripes connected with transverse band at the middle of elytra; each elytron of *P. cumingi* with three short sometime merged stripes not confluent with transverse line at the middle of elytra; Basis of each elytron of *P. valainisi* sp. n. with two very short stripes of

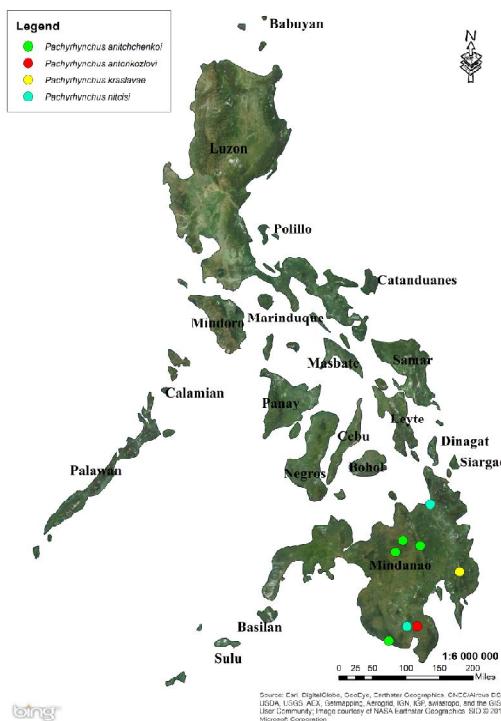


Fig. 9. Distribution of *Pachyrhynchus anichtchenkoi* sp.n., *P. antonkozlovi* sp.n., *P. kraslavae* sp.n. and *P. nitcisi* sp.n.

pale scales not connected with curved dorsally middle band).

Etymology. This species is named after our colleague Alexey Shavrin (Daugavpils, Latvia) in appreciation of cooperation.

***Pachyrhynchus anichtchenkoi* sp. n.**
(Fig. 7 C, G; 8 C, G)

Type material. Holotype: Male: Philippines: Mindanao Isl., Bukidnon, Mt. Kalatungan, 600 - 1000 m.a.s.l., 04.2014, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Paratypes: 9 males: Philippines, Mindanao Isl., Bukidnon, Cabanglasan, 11.2015 (1), 12.2015 (1), local collector leg.; Intavas, 06.2014 (3), local collector leg.; Mt. Kalatungan, 600 - 1000

m., 04.2014 (2), 06.2014 (1), local collector leg.; Panamokan, 03.2014 (1), local collector leg.; 6 females: Philippines, Mindanao Isl., Bukidnon, Intavas, 06.2014 (1), 07.2014 (1), 08.2014 (1), 10.2015 (1), local collector leg., Mt. Kalatungan, 03.2014 (1), local collector leg.; Sarrangani, Kiamba, 10.2015 (1), local collector leg. [ex Prof. A. Barševskis coll.] (all in DUBC).

Distribution: Philippines: Mindanao Island (Fig. 10).

Description. Measurements (n=5): LB: 12.9 (mean 14.34); LE: 7 (mean 7.88); WE: 4.3 (mean 5.33); LP: 3.6 (mean 3.7); WP: 3.7 (mean 3.88); LR: 1.9 (mean 1.9); WR: 1.8 (mean 1.94).



Fig. 10. Distribution of *Pachyrhynchus valainisi* sp.n., *P. shavrini* sp.n. and *P. pseudopoensis* sp.n.

Habitus as in Fig. 7C; habitus laterally as in Fig. 7G.

Body and legs metallic purple or green, very shiny; body surface with pale greenish, shiny scale spots (surface of hototype bicolor: head purple golden, elytra metallic green, very glossy; paratypes unicolor, purple golden). Head purple golden, very glossy, with sparse, fine punctuation. Eyes flat, not extended laterally, black. Head between eyes with wide longitudinal band of pale scales divergent near apical bulge. Head laterally under eyes and on lateral sides of rostrum with pale scales, with long hairs in frontal part. Apical bulge of rostrum convex, flattened dorsally, with intensive fine punctuation. Rostrum in basal half with oblong depression and median groove. Middle part of rostrum with deep transverse depression. Antenna black, with small, delicate antennomeres. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse very short pubescence and with long setae; apical antennomere club-shaped, covered with very fine golden pubescence.

Pronotum subspherical, slightly flattened, widest in middle, with very fine, sparse punctuation, in middle with impressed longitudinal band and two curved spots of pale scales symmetrically arranged longitudinally convergent in frontal part. Anterior margin of pronotum with narrow interrupted stripe of pale scales transverse dorsally, posterior margin without transverse stripe, with small triangular widened basis of middle line.

Elytra with longitudinal and transverse stripes of pale scales. From each elytron basis dorsally leave one and laterally one longitudinal band, which connected with transverse band at middle of each elytron. Lateral portions of each elytron emarginated with stripe of pale scales. Apex of elytra with V-shaped band and two shorter strips not connected with either V-shaped or transverse band. One paratype with confluent apical bands. Intervals of elytra smooth, with very fine

punctures in slightly impressed or not impressed rows.

Legs thin, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae and scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae and scales. Tarsomeres black or with metallic purple luster, covered by sparse brown pubescence.

Aedeagus short, in lateral view arched. Lamella short, apically slightly rounded (Fig. 8 C, G).

Differential diagnosis. *Pachyrhynchus anichtchenkoi* sp. n. is similar in general appearance to *P. cumingi* Waterhouse, 1841 from Bohol Island and *P. shavini* sp. n. from Samar Island, and *P. valainisi* sp. n. from Mindoro Island, which have different pattern of elytra and other form of *aedeagus*. Elytral differences appear in Fig. 7. Each elytron of new species at the basis with two elongated stripes, which connected with transverse band at the middle, but elytra of *P. shavini* sp. n. at the basis with five or six short longitudinal stripes, but each elytron of *P. cumingi* Waterh. three short, sometime merged stripes, which not confluent with transverse line at the middle of elytra. Each elytron of *P. valainisi* sp. n. at the basis with two very short stripes of pale scales which not connected with dorsally arched middle band.

Etymology. This species is named after our colleague Alexander Anichtchenko (Daugavpils, Latvia) in appreciation of cooperation.

***Pachyrhynchus valainisi* sp. n.**

(Fig. 7 D, H; 8 D, H)

Type material. Holotype: Male: Philippines: Mindoro Isl., Puerto Galera, 07.2014, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Paratype: Female: Philippines: Mindoro Isl., Baco, 10.2015, local collector leg. [ex Prof. A.Barševskis coll.] (DUBC).

Distribution: Philippines: Mindoro Isl. (Fig. 10).

Description. Measurements (n=2): LB:12.5 (mean 14.15); LE: 6.8 (mean 7.3); WE: 4.8 (mean 5.35); LP: 3.3 (mean 3.9); WP: 3.4 (mean 4.15); LR: 1.5 (mean 1.7); WR: 1.7 (mean 1.85).

Habitus as in Fig. 7D; habitus laterally as in Fig. 7 H.

Body and legs black, slightly shiny; body surface with pale yellow scale spots. Head black, with sparse, fine punctuation. Eyes slightly extended laterally, black. Head between eyes with wide elongated longitudinal band of pale scales, which divergent near apical bulge or interrupted before apical bulge. Head under eyes laterally and on lateral sides of rostrum with pale scales, with long yellow brown setae frontally. Apical bulge of rostrum flattened dorsally, with dense fine punctuation and with some yellow setae in frontal part. Rostrum in basal half with oblong depression and median groove. Median part of rostrum with deep transverse depression. Antenna black, with small antennomeres. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse very short pubescence and with long setae; apical antennomere club-shaped, covered with very fine pubescence.

Pronotum subspherical, slightly flattened, widest in middle, or before middle, with very fine, sparse punctuation, in middle with impressed longitudinal band reaches middle of pronotum and two symmetrically arranged longitudinally curved stripes of pale scales convergent or closer each other in frontal part and an anterior margin continue laterally as marginal stripe.

Elytra with longitudinal and transverse stripes of pale scales. Basis of each elytron with two short longitudinal bands ended behind shoulders and not connected with transverse arched band at middle of each elytron. Each elytron laterally emarginated with stripe of pale scales. Apex of elytra with V-shaped band from which in sutural part extending short appendix-shaped stripe. Intervals of elytra smooth, with very fine punctures in slightly impressed.

Legs thin, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae and scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae and scales. Tarsomeres black, covered by sparse brown pubescence.

Aedeagus short, in lateral view curved. Lamella short, slightly rounded apically (Fig. 8 D, H).

Differential diagnosis. *Pachyrhynchus valainisi* sp. n. is similar in general appearance to *P. cumingi* Waterhouse, 1841 (Bohol Island), *P. shavrini* sp. n. (Samar Island) and *P. anichtchenkoi* sp. n. (Mindanao Island), which have different pattern of elytra and other shape of aedeagus. Elytral differences appear in Fig. 7. Each elytron of new species at the basis with two short stripes, which not connected with transverse band at the middle, and elytra of *P. shavrini* sp. n. at the basis with five or six short longitudinal stripes, but each elytron of *P. cumingi* Waterh. three short, sometimes merged stripes, which are not confluent with transverse line at the middle of elytra and *P. anichtchenkoi* sp. n., at each elytron with two elongated stripes, which are connected with transverse band at the middle of elytra.

Etymology. This species is named after our colleague Uldis Valainis (Daugavpils, Latvia) in appreciation of cooperation.

***Pachyrhynchus pseudapoensis* sp. n.**
(Fig. 11 A, B)

Type material. Holotype: Female: Philippines: Luzon Isl., North Luzon, 06.2005, local collector leg. [ex Prof. A. Barševskis coll.] (DUBC).

Distribution: Philippines: Luzon Island (Fig. 10).

Description. Measurements: LB: 14.3; LE: 8.6; WE: 6.2; LP: 3.4; WP: 3.7; LR: 1.8; WR: 2.1.

Habitus dorsally as in Fig. 11 A; habitus laterally as shown in Fig. 11 B.

Body and legs metallic purple gold, very shiny; body surface with pale greenish, shiny scale spots. Head purple gold, very glossy, with sparse, fine punctuation. Eyes flat, not extended laterally, black. Head between eyes without longitudinal band or spot of pale scales. Head laterally under eyes and on lateral sides of rostrum with pale scales, in frontal part with long setae. Apical bulge of rostrum flattened, with intensive fine punctuation. Rostrum in basal

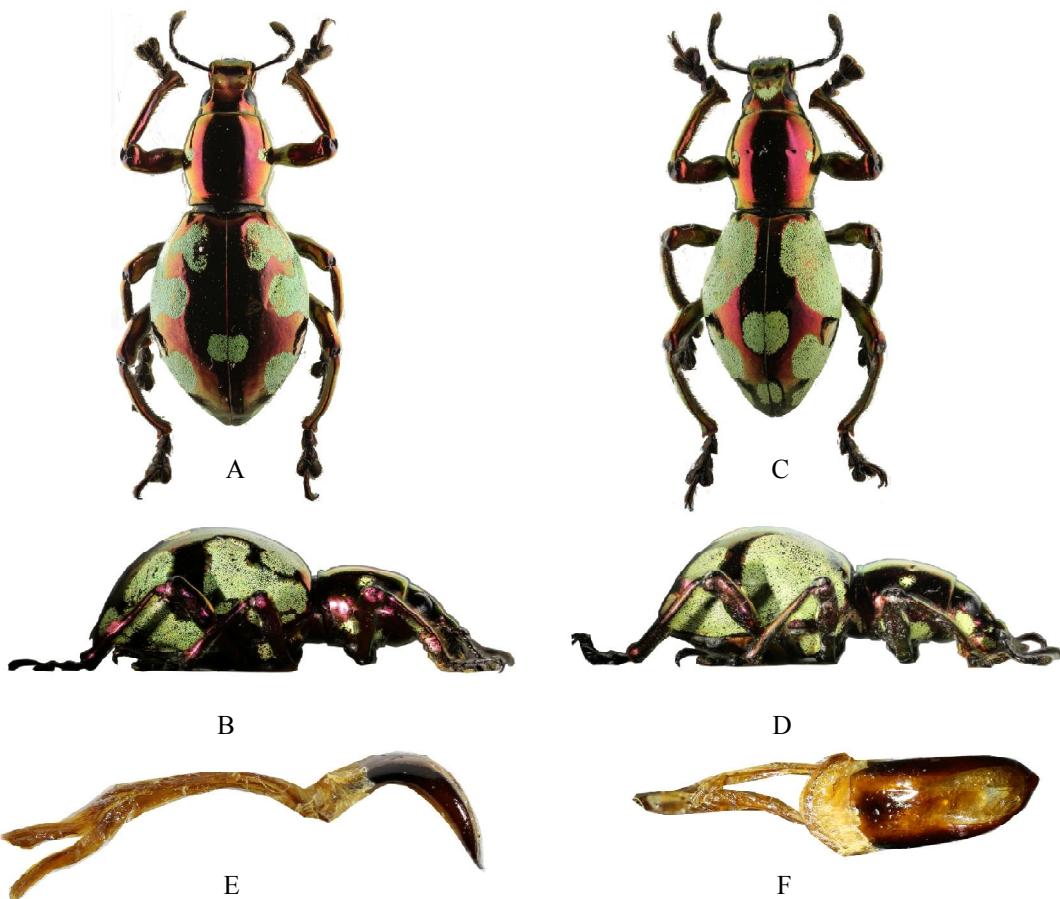


Fig. 11. *Pachyrhynchus pseudapoensis* sp.n. (holotype): A - dorsal view, B - lateral view; P. apoensis Yoshitake, 2012: C - dorsal view, aedeagus (lateral view), D - lateral view, E - aedeagus lateral view, F - aedeagus (dorsal view)

half with oblong depression and median groove. Median part of rostrum with deep transverse depression. Antenna black, shiny, with small antennomeres. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse very short pubescence and with long setae; apical antennomere club-shaped, covered with very fine golden pubescence.

Pronotum subspherical, slightly flattened, widest in middle, with very fine, sparse punctuation, in lateral parts of dorsal disc with two small spots of pale scales. Anterior and posterior margins of pronotum without narrow

transverse stripe of pale scales, lateral margin below with marginal band of pale scales.

Elytra laterally with two large irregular spots of pale scales. One irregular spot situated laterally behind shoulders and very closely to first lateral spot, on one side almost confluent with it. Intervals of elytra smooth, with very fine punctures in not impressed rows.

Legs thin, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae and scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout setae and scales. Tarsomeres metallic purple gold, covered with sparse brown pubescence.

Male unknown.

Differential diagnosis. *Pachyrhynchus pseudapoensis* sp. n. is similar in general appearance to *P. apoensis* Yoshitake, 2012 (Mindanao Island), which has different pattern of elytra. Elytral differences appear in Fig. 11. Each elytron of new species in apical part without two small sutural spots and head between eyes without spot of pale scales (elytra of *P. apoensis* with two small sutural spots and head between eyes and with slightly rounded spot of pale scales).

Etymology. The species is similar to *P. apoensis*, but it is a different species. *Pseudapoensis* means false *apoensis*.

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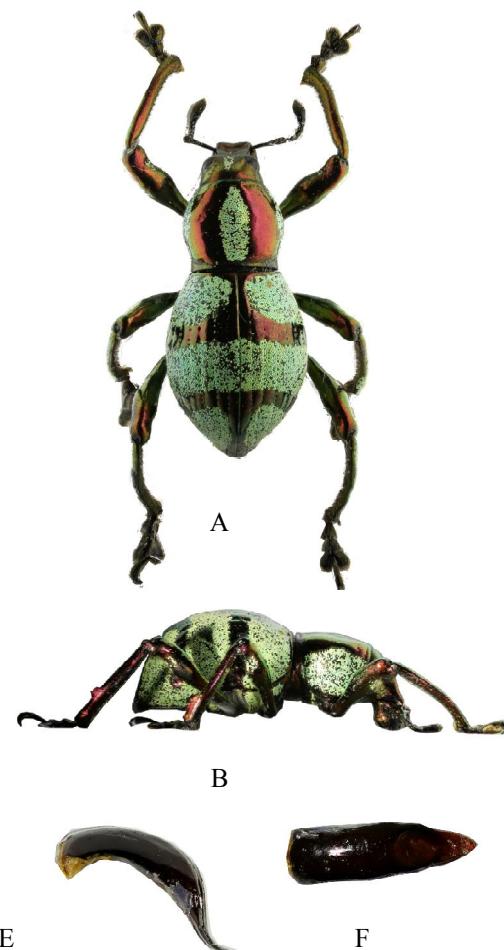


Fig. 12. *Pachyrhynchus speciosus samarensis* Schultze, 1923: A - B - habitus, E - F - aedeagus

Kristīna Aksjuta (all from Daugavpils, Latvia) for the laboratory assistance and mounting of specimens, which are used in the present study. The second author wishes to thank Dr. Olaf Jäger (Dresden, Germany) for help during his visit to the Senckenberg Natural History Collections, Dresden.

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SIX NEW SPECIES OF THE GENUS *PACHYRHYNCHUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE) FROM THE PHILIPPINES

Anita Rukmane

Rukmane A. 2016. Six new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Philippines. *Acta Biol. Univ. Daugavp.*, 16 (1): 81 – 92.

Six new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Philippines are described and illustrated: *P. barsevskisi* sp. n., *P. domino* sp. n., *P. elenae* sp. n., *P. pseudhalconensis* sp. n., *P. rebus* sp. n., *P. tikoi* sp. n. Mimicry from genus *Doliops* Waterhouse, 1841 (Cerambycidae: Lamiinae) is added for species *P. barsevskisi* sp. n., *P. domino* sp. n., *P. pseudhalconensis* sp. n., *P. rebus* sp. n., *P. tikoi* sp. n.

Key words: Coleoptera, Curculionidae, *Pachyrhynchus*, fauna, taxonomy, new species, Philippines

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) belongs to the subfamily Entiminae (Schönherr, 1823) and the tribe Pachyrhynchini (Schönherr, 1826) comprises 14 genera mainly from the Philippines with about 90% of endemics species (Alonso-Zarazaga & Lyal 1999, Yap & Gapud 2007, Yoshitake 2013). Members of the genus *Pachyrhynchus* as some related genera of the tribe Pachyrhynchini (*Metapocyrthus* Heller, 1912, *Expachyrhynchus* Yoshitake, 2013) are wingless, have striking, sometimes bizarre patterns of brightly coloured scales, often with strong intraspecific variation between local populations. Rostral characters such as width, depth of groove and shape of impression are strongly expressed within genus and can be used as morphological characters in species determination. Some described species

have a similar coloration and location of bright spots and scales as the some members of the genus *Doliops* Waterhouse, 1841 (Cerambycidae: Lamiinae); data on the mimicry between species of *Pachyrhynchus*, *Metapocyrthus* and *Doliops* were provided by Starr & Wang (1992), Barševskis (2013, 2014) and Barševskis & Jeager (2014).

The genus *Pachyrhynchus* is represented in the Oriental fauna by more than 100 species, distributed from Japan (Ryukyu Islands) to Australia and it is more common for the Philippine archipelago (Schultze, 1923), which may be regarded as the center of diversity (Starr & Wang, 1992) and a good example of taxa with restricted distributions and great zoogeographical significance (Link & Zettel, 2012). The fauna of the genus has attracted attention of entomologists in recent years: several species were described

from the Philippines (Yoshitake, 2012; Bolino & Sandel, 2015, Rukmane, Barševskis, 2016). Additional faunistic and ecological data were also presented by Cabras et al. (2016), Cabras and Yoshitake (2016).

During the study of large material from the Philippines on genus *Pachyrhynchus* which is deposited in DUBC, six new species of the genus are described: two species from Mindanao, two from Mindoro and two from Luzon islands. This paper presents illustrative descriptions of these species and examples of the mimicry with *Doliops* for five species.

MATERIAL AND METHODS

The studied material is deposited in the following collections:

DUBC – the beetles collection of Daugavpils University, Institute of Life Sciences and Technology, Coleopterological Research Centre, Ilgas, Daugavpils District, Latvia (A. Barševskis); SMTD – Senckenberg Natural History Collections Dresden, Museum of Zoology, Dresden, Germany (O. Jager).

The laboratory research and measurements have been carried out using Nikon AZ100, Nikon SMZ745T and Zeiss Stereo Lumar V12 digital stereomicroscopes, NIS – Elements 6D software. The habitus photographs were obtained with a digital camera Canon EOS 6D with Canon MPE 65 mm macro lens, using Helicon Focus auto montage and subsequently was edited with Photoshop.

The measurement methods follows Yoshitake (2013).

RESULTS

Pachyrhynchus tikoi sp. n.

(Fig. 1A, B, D, E)

Type material. Holotypemale: “Philippines, Mindanao Isl., Bukidnon, Cabanglasan, X. 2015, local collector leg.” (typed on a white card), [ex.

Prof. A. Barševskis coll.] (typed on a white card), “HOLOTYPE / *Pachyrhynchus tikoi* / Rukmane 2016 / Det. Rukmane 2016” (typed on a red card), (DUBC).

Paratypes (14. exs.): Philippines, Mindanao Isl., Bukidnon, Cabanglasan, 1 male., VIII. 2013, local collector leg.; 4 males., VII. 2014., local collector leg.; 2 males., XI. 2015, local collector leg.; 1 male., XII. 2015, local collector leg.; 1 male., V. 2016, local collector leg.; 2 females., VII. 2014, local collector leg.; 1 female., XI. 2014, local collector leg.; 1 female., X. 2015, local collector leg.; 1 female., XI. 2015, local collector leg.[ex. Prof. A. Barševskis coll.] (all in DUBC). All paratypes with additional red rectangular printed label: “PARATYPE / *Pachyrhynchus pseudhalconensis* / Rukmane 2016 / det. Rukmane 2016”.

Distribution: Philippines, Mindanao Island.

Description. Measurements: (n=5; 3 males, 2 females): LB: 12.5 (mean 13.3); LE: 6.5 (mean 7.3); WE: 4.4 (mean 5.0); LP: 3.2 (mean 3.4); WP: 3.0 (mean 3.2); LR: 1.4 (mean 1.6); WR: 1.5 (mean 1.6).

Body and legs copper red to brown; body surface very glossy, with yellow, orange or green scale lines. Eyes, antennae and tarsomeres black. Latereal sides of rostrum covered with small oval scales, apical part of rostrum with elongate orange to yellow scales. Apical and basal margin of pronotum with impressed transverse band of orange scales, connected latteraly and forming frame shaped scale pattern. Transverse band in middle portion of apical margin of pronotum with small longitudinal keel. Apical part of femori with irregular orange to yellow scally spots. Each elytron with nine longitudinal orange, pale yellow and pale green narrow scale lines: 1) from basal margin of interval II till apical margin, not connected with rest of scale lines; 2) till ninth scale line from interval III till lateral sides of elytra, second and ninth, third and eighth scale lines connected at apical margin, fourth and seventh, fifth and sixth scale lines connected from both apical and basal margins. Habitus as in Fig. 1 (dorsally - Fig. 1A and laterally Fig. 1B).

Head with groove-shaped impression between eyes and two scale lines, forming V shaped pattern. Eyes large, strongly prominent if seen dorsally, with band of orange scales on genae. Rostrum with very fine sparse pubescence, covered by brown sparse apical setae, with shallow impression in basal half weakly bulging apically. Apical bulge of rostrum flattened dorsally, with fine impression in middle part; dorsal part of rostrum interrupted by strong transverse groove. Antennal scape short and stout; remaining antennomeres small, with sparse very short pubescence and long setae.

Pronotum subspherical, widest in middle.

Elytra with short pubescence; intervals of elytra flattened, with coarse punctures in slightly impressed rows.

Legs wide, with strongly clavate femori. Female legs more wider than in males. Tibiae serrate along internal margins, weakly curved apically. Middle and hind femori thinly covered with short setae and hair-like scales along posterior margins. Tibiae with sparse pubescence and long setae. Tarsomeres covered by sparse pale pubescence. Aedeagus relatively short, curved in lateral view

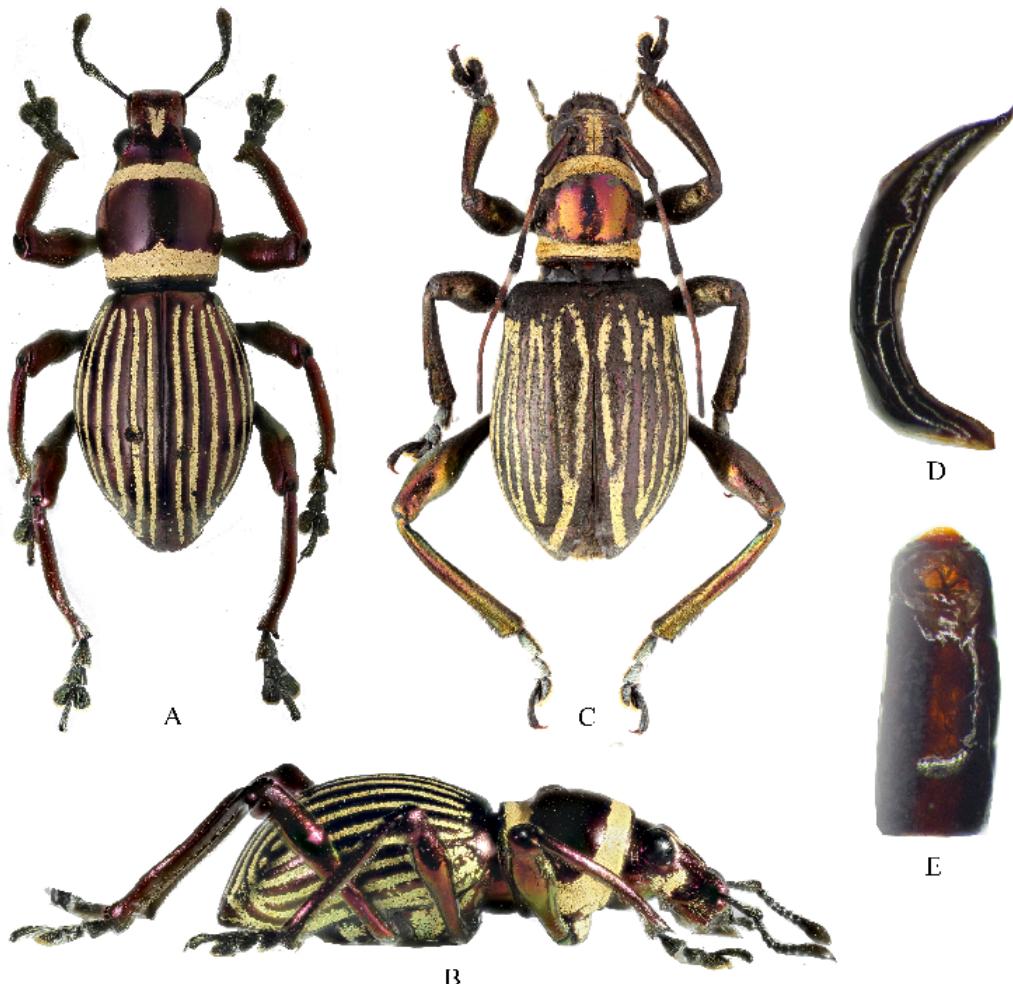


Fig. 1, Habitus of *Pachyrhynchus tikoi* sp. n.: dorsal (A) and lateral (B) view; D, E: aedeagus of *P. tikoi*: lateral (E) and dorsal view; C: habitus of *Doliops valainisi* Barševskis 2013, dorsal view.

(Fig. 1D). Lamella semicircular, rounded apically (Fig. 1E, D).

Mimicry. *Pachyrhynchus tikoi sp. n.* is mimics a longhorn beetle *Doliops valainisi* Barševskis 2013, with which it co-exists (Fig. 1C).

Differential diagnosis. *Pachyrhynchus tikoi sp. n.* resembles *P. eques* Heller, 1912, which was described from Luzon Island, but *Pachyrhynchus tikoi sp. n.* is unable to be confused with *P. eques* by following points: coloure of body which is glossy red; shape of elytra which is narrower.

Etymology. The new species is named after my life partner Marcin Tiko (Warsaw, Poland), in appreciation of support, help and valuable advices during the research.

Pachyrhynchus barsevskisi sp. n.

(Fig. 2A, E-3A, C, D)

Type material. Holotype, male: “Philippines, North Luzon Isl., Aurora, Dingalan, VIII. 2013, local collector leg. (typed on a white card); [ex. Prof. A. Barševskis coll.] (typed on a white card); ‘HOLOTYPE / *Pachyrhynchus barsevskisi* / Rukmane 2016 / Det. Rukmane 2016 (typed on a red card). (DUBC).

Paratypes (4 pcs.): Philippines, North Luzon, Aurora, Dingalan, 1 male., VIII. 2013, local collector leg.; 1 male., III. 2014, local collector leg.; 1 female., VI. 2015, local collector leg.; East Luzon, Sierra Madre, Disimongal, Madela: 1 male., IX. 2015, local collector leg.; North Luzon, Sierra Madre, Quirino: 1 male., V. 2015, local collector leg.; 1 female., V. 2015, local collector leg. [ex. Prof. A. Barševskis coll.] (DUBC). All paratypes with additional red rectangular printed label: “PARATYPE / *Pachyrhynchus pseudhalconensis* / Rukmane 2016 / det. Rukmane 2016”.

Distribution: Philippines, Luzon Island

Description. Measurements (n=5; 3 males, 2 females): LB: 16.7 (mean 17.32); LE: 9.0 (mean 9.28); WE: 6.2 (mean 6.48); LP: 4.6 (mean 4.8); WP: 4.6 (mean 4.64); LR: 2.2 (mean 2.46); WR:

1.9 (mean 2.1).

Habitus dorsally as in Fig 2A, laterally as in Fig 2E.

Body and legs metallic black; body surface glossy, with spots and stripes of blue and orange scales, four paratypes with green and orange to yellow scales. Eyes, antennae and tarsomeres black. Head massive, glossy, under eyes laterally with pale orange scales. Each lateral side of rostum close to mouth with orange elongate hair-like scales, apical curve with fine orange punctuation. Basal margin of pronotum with two ovate scaly spots on each lateral side, apical margin with two triangular markings, connected in middle of apical margin, four paratypes with two elongate scale spots on each side of median part of pronotum. Each latero-basal portion of pronotum with wide orange scaly ovate spot. Apical part of femori with irregular orange and blue scaly spots. Elytra with several scaly spots and two oval spots in middle of median part; basal and apical margins of each elytron with four elongate lines of orange to yellow scales and with blue scales at median part of these lines; apices of first and second line connected, apex of first stripe rounded; median apical margin of elytra with two elongate orange scaly spots.

Rostrum with deep triangular median impression, with orange sparse apical setae, dorsal part with median groove. Lower edge of rostrum extended, clearly visible. Antennal scape long and thin; remaining antennomeres small, with sparse very short pubescense and long setae; apical antennomeres subbellipoidal. Pronotum subspherical, widest in median part gradually narrowing apicad, with very fine and sparse punctuation.

Elytra elongated, gradually narrowing from median part apicad, with fine punctures and pubescence; intervals of elytra smooth, with coarse punctures between impressed rows.

Legs wide, with strongly clavate femori. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femori thinly covered with short setae and hair-like scales along

posterior margins. Tibiae with sparse pubescence and long setae; each tibia fringed with long setae along internal margin, sparsely mingled with stout hairs. Tarsomeres covered by sparse pale pubescence.

Aedeagus elongated, curved in lateral view. Lamella ovate, rounded apically (Fig. 3C, D).

Differential diagnosis. *Pachyrhynchus barsevskisi* sp. n. is similar in general appearance to *P. dohrni* Behrens, 1887 (Fig. 2B, D), which was described from Luzon Island. The new species is easily distinguishable from *P. dohrni* by unique scaly markings on pronotum: basal margin of pronotum (see dorsally) of *P. barsevskisi* sp. n. with two ovate scaly spots on each lateral side, apical margin with two

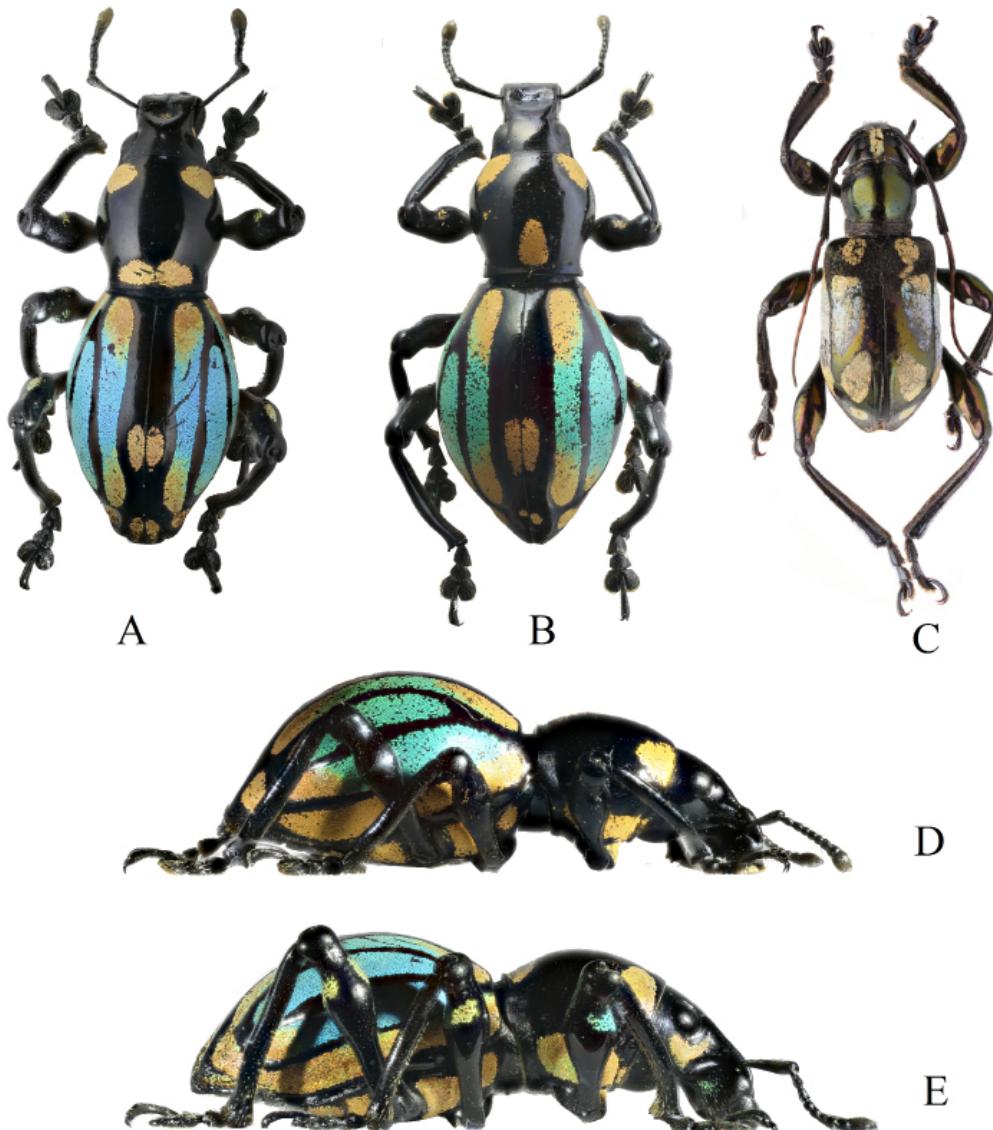


Fig. 2: A, E: *Pachyrhynchus barsevskisi* sp. n. dorsal and lateral view; B, D: *Pachyrhynchus dohrni* Behrens 1887 dorsal and lateral view; C: *Doliops helleri* Vives 2009 dorsal view.

triangular markings, connected in the middle of apical margin, and with ovate spot of orange scales on lateral sides of pronotum, lower edge of rostum of *P. barsevskisi* sp. n. well defined (Fig 3 A, B), different shape impression on median part of rostrum, which is triangular shape, as well as different shape of aedeagus, which is bigger (Fig. 3E, F).

Mimicry. *Pachyrhynchus barsevskisi* sp. n. is mimiced by longhorn beetle *Doliops helleri* Vives, 2009 with which it co-exists (Fig. 2C).

Etymology. The species named after Prof. Dr. Arvīds Barševsīs (Daugavpils, Latvia) in appreciation of contribution in the study of the genus *Pachyrhynchus*, cooperation, and usefull advices.

Pachyrhynchus elenae sp. n. (Fig. 4)

Type material. Holotype, male: "Philippines, Mindanao Isl., Cotabato, Mt. Apo, I. 2015, local collector leg. " (typed on white card); [ex.

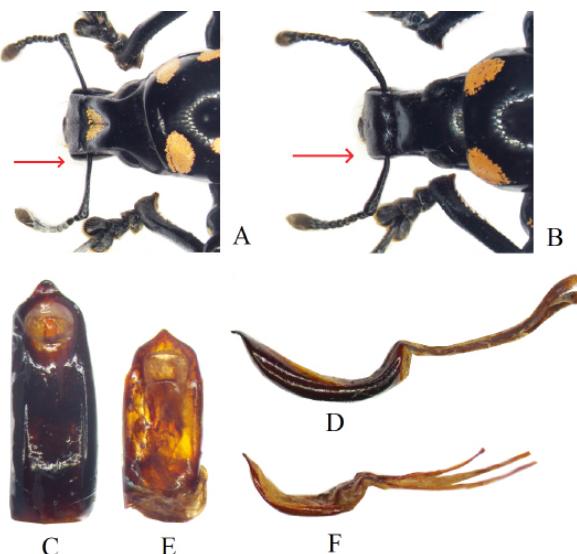


Fig. 3: A: *Pachyrhynchus barsevskisi* sp. n. extended bottom edge of rostum; B: *P. dohrni* unextended bottom edge of rostum and different shape impression in median part of rostrum; C, D: *P. barsevskisi* sp. n. aedeagus dorsal and lateral view; E, F: *P. dohrni* aedeagus dorsal and lateral view.

prof A. Barševskis coll.] (typed on white card); HOLOTYPE / *Pachyrhynchus elenae* / Rukmane 2016 / Det. Rukmane 2016 (typed on red card), (DUBC).

Distribution: Philippines, Mindanao Island.

Description. Measurements: LB: 16.8; LE: 9.0; WE: 7.0; LP: 5.1; WP: 5.3; LR: 2.4; WR: 2.5. Habitus dorsally as in Fig. 4A; laterally as in Fig. 4B.

Body and legs black; body surface with pale greenish, shiny scale spots. Head black, massive, latteraly under eyes, on genae and on lateral side of rostrum with wide green scales. Eyes not convex, black. Rostum with band of transverse scales on apical bulge, with deep transverse medial depression . Antenna black, antennal scape short, remaining antenomeres with short sparse pubescence and long setae, apical antenomere club-shaped.

Pronotum massive, subspherical, widest before middle, with very fine sparse punctuation, in median portion with transverse line which circumscribe latteraly two bare black spots and one longitudinal line of pale scales. Longitudinal line extending straigth to basal margin of pronotum and forming triangular of pale green scales.

Elytra with several longitudinal and median transverse line of pale scales crossing longitudinal lines; basal part of each elytron with two or three short lines and four long lines, extending to apical margin of elytron, four short lines at apical part of each elytron.

Legs wide, with strong clavate femori. Tibiae strongly incurved apically. Middle femori covered with short setae and scales along posterior margins. Tibiae with sparse pubescence and long setae.

Scutellum small, rounded apically.

Aedeagus elongate, in lateral view curved. Lamella strongly elongalte, subtriangular,

slightly rounded apically (Fig. 4E, F).

Male unknown.

Differential diagnosis. *Pachyrhynchus elenae* sp. n. is similar in general appearance to *P. phaleratus* Waterhouse, 1841 (Fig. 4C, D). The new species is easily distinguished from *P. phaleratus* by the shape of aedeagus, which is longer and less curved laterally and by the bigger number of longitudinal lines on each elytron (Fig. 4G, H). Pronotum of *P. elenae* sp. n. widest before the median part (pronotum of *P. phaleratus* widest in the middle).

Etymology. This species is named after my mother, Elena Zubko (Daugavpils, Latvia) in appreciation of support.

***Pachyrhynchus rebus* sp. n.**

(Fig. 5)

Type material. Holotype, Male: "Philippines, East Luzon, Quirino, Nagtipunan, IX. 2014,

local collector leg." (typed on white card); [ex. Prof. A. Barševskis coll.] (typed on white card); HOLOTYPE / *Pachyrhynchus rebus* / Rukmane 2016 / Det. Rukmane 2016 (typed on red card) (DUBC).

Distribution: Philippines: Luzon Island.

Description. Measurements: LB: 10.7; LE: 6.2; WE: 4.5; LP: 3.6; WP: 3.8; LR: 1.3; WR: 1.4. Habitus as in Fig 5A; laterally as in Fig. 5B.

Body and legs black, shiny, body surface with pale green, yellow, orange and blue scales. Head black, with yellow scales under each eye laterally and genae. Eyes slightly convex, black. Head between eyes without spots of pale scales. Apical bulge of rostum convex, without punctuation. Each side of rostrum covered with small, oval and round scales. Basal part of rostrum with oblong depression and indistinct median groove. Antenna black, with small antennomeres. Antennal scape short and stout; remaining antennomeres small,

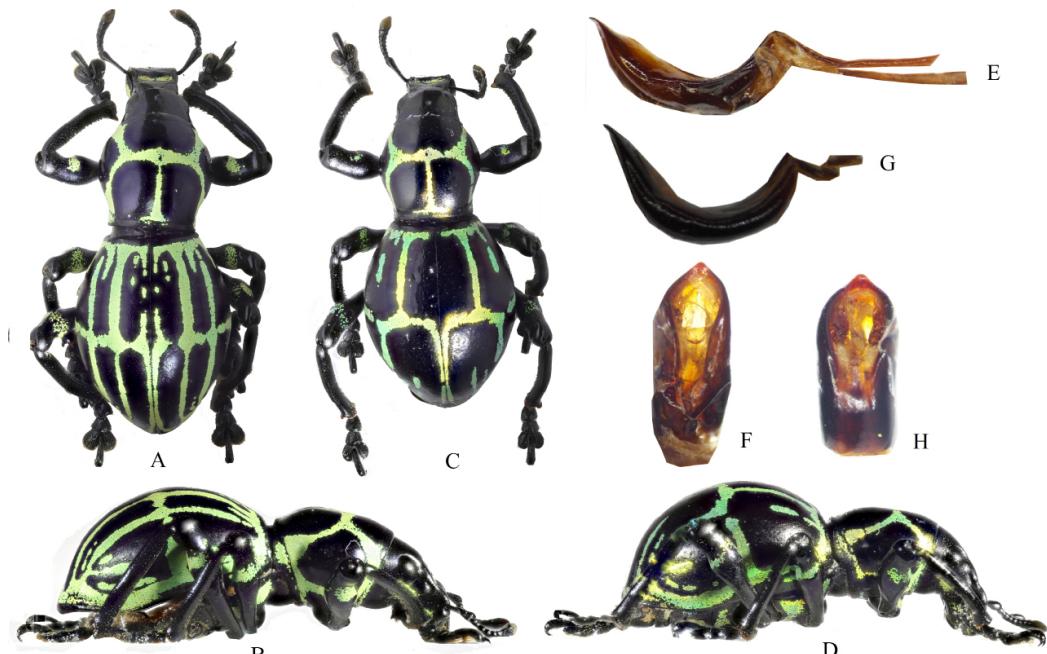


Fig. 4: A, B: *Pachyrhynchus elenae* sp. n. habitus dorsal and lateral view, E, F: aedeagus dorsal and lateral views; C, D: *Pachyrhynchus phaleratus* Waterhouse 1841 habitus dorsal and lateral view, G, H: aedeagus dorsal and lateral views.

with short sparse pubescence and long setae; apical antennomere club-shaped, covered with very fine pubescence.

Pronotum subspherical, slightly flattened, widest in median portion, with very fine, sparse punctuation, in middle with transversal line of pale yellow and golden scales circumscribes two bare black spots laterally. Longitudinal line of pale yellow and golden scales, crossing transverse line in middle and with triangular band of scales in apical margin of pronotum.

Elytra with reticulate net-shaped stripes of pale yellow, golden, green and blue scales, forming seven irregular, isolated, black, bare spots, and eight full scaly spots. Intervals of elytra smooth, with coarse punctures and slightly impressed rows.

Legs massive, wide, with strongly clavate femora. Tibiae serrate along internal margins, strongly incurved apically. Middle and hind femora thinly covered with short setae and hair-like scales along

posterior margins. Tibiae with small pubescence, mingled with long setae.

Scutellum small, apically rounded.

Aedeagus long, in lateral view incurved. Lamella subtriangular, apically rounded (Fig. 5E, F).

Differential diagnosis. *Pachyrhynchus rebus* sp. n. is similar in general appearance to *P. orbifer* Waterhouse, 1841. The new species is easily distinguished from *P. orbifer* by the shape of aedeagus which is longer, narrower and more incurved laterally (Fig. 5G, H) and external morphological characters: 1) pronotum and legs of *P. rebus* sp. n. is more wide and massive; 2) lack of scales on head between eyes 3) different scale margins on pronotum with one narrow transverse and one narrow longitudinal line of scales, while lines on pronotum of *P. orbifer* are more wide and with additional transverse line on apical margin (Fig. 5C, D).

Mimicry: *P. rebus* sp. n. and *P. orbifer*, are



Fig. 5: A, B: *Pachyrhynchus rebus* sp. n. dorsal and lateral views, E, F: aedeagus dorsal and lateral views; C, D: *Pachyrhynchus orbifer* Waterhouse 1841 dorsal and lateral view, G, H: aedeagus dorsal and lateral view.

mimics by *D. magnifica* Heller, 1823 with which they are coexists.

Etymology. The name of new species is derieved from unical scale margins on elytra reminding puzzle.

***Pachyrhynchus pseudhalconensis* sp. n.**
(Fig. 6).

Type material. Holotype, Male: "Philippines, Mindoro Isl., Puerto Galera, IX. 2014, local collector leg. (typed on white card); [ex. Prof. A. Barševskis coll.] (typed on white card); "HOLOTYPE/*Pachyrhynchus pseudhalconensis* / Rukmane 2016 / det. Rukmane 2016 (typed on red card) (DUBC).

Paratypes: Philippines, Mindoro Isl., Mt. Halcon: 1 male., III. 2014, local collector leg.; 1 male., V. 2014, local collector leg.; Philippines, Mindoro Isl., Puerta Galera: 1 female., VIII. 2014, local collector leg.; 1 female., VI. 2016, local collector leg.; [ex. Prof. A. Barševskis coll.] (all in DUBC). All paratypes with additional red rectangular printed label: "PARATYPE / *Pachyrhynchus pseudhalconensis* / Rukmane 2016 / det. Rukmane 2016".

Distribution: Philippines, Mindoro Island.

Description. Measurements (n=5): LB: 16.0 (mean 15.08); LE: 9.5 (mean 8.68); WE: 5.7 (mean 5.96); LP: 4.3 (mean 3.76); WP: 4.3 (mean 4.14); LR: 2.2 (mean 1.82); WR: 2.0 (mean 1.86). Habitus as in Fig. 6A; laterally as in Fig. 6D.

Body and legs black, slightly shiny; body surface with pale green or orange scale spots, two paratypes with yellow scales, two paratypes with orange scales. Head black, between eyes with wide romb-shaped band of pale scales (one paratype without this band). Head under eyes laterally and on lateral sides of rostrum with pale scales and with long green, apical brown setae. Apical bulge of rostrum flattened. Basal part of rostrum with strong impression and median groove, without scales, lower edge of rostrum extended. Antenna black, with small

antennomeres. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse short pubescence and long setae; apical antennomere club-shaped, covered with very fine pubescence.

Pronotum subspherical, slightly flattened, widest in middle, with very fine, sparse punctuation, green, shiny scales splitting on lateral sides of pronotum, circumscribe two bare black spots on lateral sides and one number eight shape bare spot in middle of pronotum.

Elytra with longitudinal and transverse stripes of pale scales. Each elytron with three longitudinal stripes extending from basal margin to median portion: 1) first stripe from interval II to interval III, in basal part with square shape scale margin; 2) second stripe from interval V to interval VI; 3) third stripe on lateral margin of elytra. Two transverse stripes of shiny green scales: 1) on basal margin of elytra; 2) on median portion of elytra. Three longitudinal stripes from median portion of elytra to apical margin: 1) first stripe from interval II to interval IV including; 2) second stripe from interval V to interval VI; 3) third stripe on lateral margin of elytra, second and third stripes are connected in median portion of stripes with band of shiny green scales.

Legs with strongly clavate femori. Tibiae serrate along internal margins, incurved apically. Middle and hind femori covered with short setae and scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae. Tarsomeres black, covered by sparse brown pubescence.

Aedeagus curved in lateral view. Lamella short, slightly rounded apically (Fig. 7G, H).

Differential diagnosis. *Pachyrhynchus pseudhalconensis* sp. n. is similar in general appearance to *P. halconensis* Schultze, 1922 and *P. domino* sp. n., which have different scale pattern (Differences from *P. halconensis*: transverse stripe on basal margin, transverse stripe on median portion of elytra of *P. pseudhalconensis* sp. n. is straight, lack of longitudinal stripe on basal median part of elytra, median portion

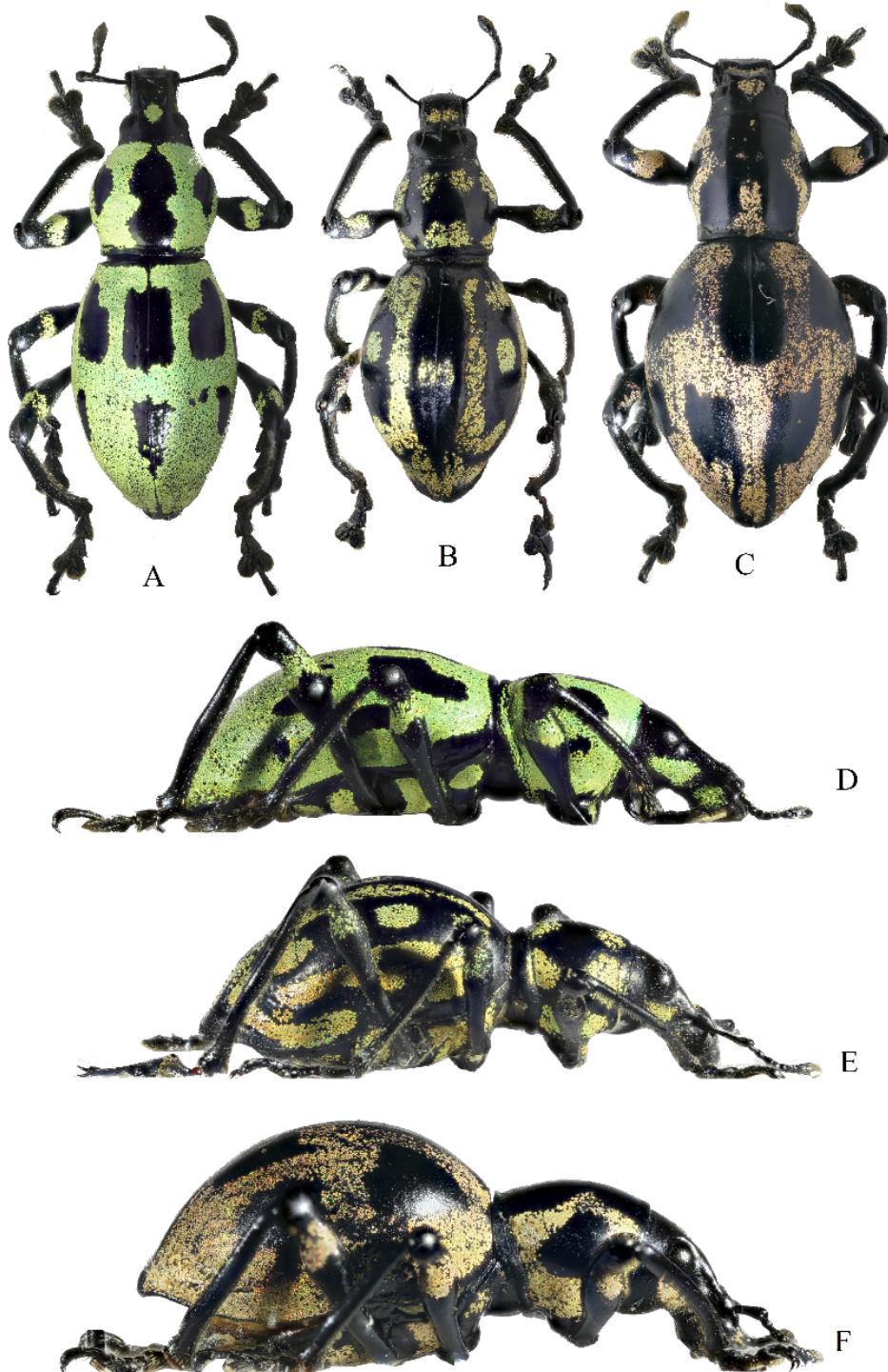


Fig. 6: A, D: *Pachyrhynchus pseudhalconensis* sp. n. dorsal and lateral view; B, E: *Pachyrhynchus domino* sp. n. dorsal and lateral view; C, F: *Pachyrhynchus halconensis* Schultze, 1922 dorsal and lateral view.

number eight shape bare spot; Differences from *P. domino*: lack of apical median portion and basal median portion spots on elyrons, lack of median spot of elytra, pronotum without triangular shape scale spots on basal and apical margins) (Elytral differences appear in Fig. 6B, C, E, F. 1) and shape of aedeagus (according to sheme from Schultze, 1923). The new species differs from compared congeners by the shape of female genitalia (Fig. 7D, E, F), which is longer and narrower than *P. halconensis*, but shorter and wider than *P. domino* sp. n.. Basal impression of rostrum without scales, more narrow than *P. halconensis* and less narrow than *P. domino*, lower edge of rostrum more extended (Fig. 7A, C). Eyes bigger, located closer to forehead. **Mimicry.** *P. pseudhalconensis* sp. n., same as *P. domino* sp. n. and *P. halconensis* is mimics by beetle *D. halconensis* Vives, 2012, with which it coexists.

Etymology. The species name means false *halconensis*.

Pachyrhynchus domino sp. n. (Fig. 6)

Type material. Holotype, female: "Philippines, Mindoro Isl., Mt. Halcon, III. 2014, local collector leg." (typed with a white card); [ex. Prof. A. Barševskis coll.] (typed with a white card); "HOLOTYPE / *Pachyrhynchus domino* / Rukmane 2016 / det. Rukmane 2016" (typed with a red card) (DUBC).

Distribution: Philippines, Mindoro Island.

Description. Measurements: LB: 14.3; LE: 8.4; WE: 5.9; LP: 3.4; WP: 3.6; LR: 1.8; WR: 1.6. Habitus dorsally as in Fig. 6B; laterally as in Fig. 6E.

Body and legs black, shiny; body surface with pale orange and yellow scales. Head black, shiny, with sparse, fine punctuation under each eye. Eyes strongly convex, black. Head between eyes without longitudinal band or spot of pale scales. Lateral sides of rostrum with pale scales, with long apical setae. Apical bulge of rostrum flattened, with fine punctuation. Rostrum in basal half with oblong depression and strong median

groove. Antenna black, with small antennomeres. Pronotum subspherical, slightly flattened, widest in middle, with very fine, sparse punctation, on basal and apical margin of pronotum with six triangular shape spots of yellow to orange pale scales, two median triangular spots of apical margin blended.

Elytra with two blended median spots, each elytron with two transverse and two longitudinal stripes forming frame of pale yellow and orange scales: 1) transverse stripe close to basal margin of elytra; 2) longitudinal stripe from interval II to interval III; 3) flat longitudinal stripe from interval V to lateral margin, with lack of scales at median portion from interval VI to lateral margin; 4) transverse stripe at apical margin. Median part of each elytron with two spots, one more dorsally, one more laterally. Intervals of elytra smooth, with fine punctures between not impressed rows. Legs very thin, with strong clavate femori. Tibiae incurved apically. Middle and hind femori thinly covered with short setae and scales along posterior margins. Tibiae with sparse pubescence, mingled with long setae. Tarsomeres black, covered with sparse brown pubescence.

Scutellum small, apically rounded.

Male unknown.

Differential diagnosis. *Pachyrhynchus domino* sp. n. is similar in general appearance to *P. pseudhalconensis* sp. n. and *P. halconensis*, which has different pattern of elytra and shape of female genitalia which is longest and narrowst. Elytral differences appear in Fig. 6A-F. *P. domino* sp. n. 1) lack of scales on head between eyes; 2) eyes more convex; 3) legs more thin; 4) deeper median groove; 5) more shallow impression on dorsal side of rostrum; 6) rostrum is more narrow and lower edge is less extended.

Etymology. The name of the new species is derived from the unical scale margins forming domino tile with two spots on each elytron.

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A NEW SPECIES OF *PACHYRHYNCHUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE: ENTIMINAE)

Analyn Anzano Cabras, Anita Rukmane

Anzano Cabras A., Rukmane A. 2016. A New Species of *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Entiminae). *Acta Biol. Univ. Daugavp.*, 16 (1): 123 – 127.

Pachyrhynchus miltoni sp.n. from Mindanao Island (Marilog District), Philippines described, illustrated, and bionomics data are provided. The new species belongs to the speciosus group. It is closely related to *P. speciosus* samarensis Schultze, 1923 and *P. kraslavae* Rukmane, Barševskis 2016, but differs on the shape of aedeagus and features of the coloration of the body.

Key words: Curculionidae, *Pachyrhynchus*, Mindanao, endemic, Philippines, taxonomy, new species .

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 (Curculionidae: Pachyrhynchini) was erected for *P. moliferus* described from Luzon Island, Philippines. Currently there is over a hundred species of *Pachyrhynchus* with roughly 90% of endemism in the country. The distribution of *Pachyrhynchus* which is highly related to oceanic islands draws interest not only to taxonomist but also to biogeographers. The genus remain a poorly studied taxon together with most insect groups in the Philippines. For almost a century after Schultze (1917, 1922, 1923, 1934), the study of this taxon remained dormant until new species were described by Yoshitake (2013), Bolino & Sandel (2015) and recently by Rukmane & Barševskis (2016). Additional faunistic and ecological data were published by Cabras et al.

(2016), Cabras & Yoshitake (2016), Tseng et al. (2013) and Ballentes et al. (2006).

The genus *Pachyrhynchus* whose preferred habitats are shrubs near a riverine ecosystem along ridges or mountains with rich tropical vegetation is highly associated with forest habitats. Thus, the current rate of habitat loss in the country due to deforestation among others is a major threat to this beetle group's survival in the wild. The city which has already transformed into an urban area has remaining forest due to the presence of ancestral domains which serves as the home to tribes such as Matigsalug, Jangan, and Obo Manobo. Marilog District with relatively intact secondary forest serves as the suitable habitat to different species of plants such as *Cyathea* sp., *Medinilla* sp., *Melastoma* sp., *Aeschynanthus* s sp., *Nephentes truncata*

among others which are possible host plants for *Pachyrhynchus* species. In the course of exploring the forested habitats in Marilog District, a new species of *Pachyrhynchus* was found. The paper aims to describe this species and present brief notes of its ecology.

MATERIAL AND METHODS

The specimens were collected through beating sheet and handpicking and killed in vials with ethyl acetate. The type material is deposited at Central Mindanao Zoological Museum (CMUZM). External structures were observed under Luxeo 4D stereoscopic microscope. Photographs of the holotype male were taken with a Nikon D5300 digital camera. In examining male terminalia, specimens were dissected under the stereoscopic microscope. The abdominal segments III to V was first removed from the body and then cleaned in hot 10% KOH solution for 10 to 30 minutes. Male terminalia extracted from the abdominal segments were mounted on slides and studied with a Leitz Orthoplan optical microscope and photographed through an attached camera lucida.

Measurements mentioned in this paper are abbreviated as follows: LB – length of body; LE - length of elytra; WE – maximal width of elytra; LP - length of pronotum; WP - maximal width of pronotum; LR - length of rostrum; WR - maximal width of rostrum. All measurements are given in millimeters and follows the measurement methodology of Yoshitake (2013).

RESULTS

Pachyrhynchus miltoni sp.n.

(Fig. 1, 4, 5)

Type Material. Holotype, male: Marilog District, Davao City, Philippines. 08.19.16. local collector leg. Deposited in CMUZM.(...).

Paratype, male: Marilog District, Davao City,

Philippines. 09.29.16.Cabras leg. Deposited in CMUZM.(...).

Distribution: Mindanao Island, Philippines.

Description. Measurements: LB: 11.1 LE: 7.1; WE: 6.5; LP: 4.0; WP: 4.0; LR: 1.9; WR: 1.6. Body coppery brown close to black; pronotum, head and legs coppery brown with weak luster and tinge of metallic red glow; body surface matte with weak luster and with wide spots of pale yellow and light green scales. Eyes, antennae and tarsomeres black. Head with following scales: 1) oblique and elongated stripe under eye on each lateral side of rostrum, 2) elongated median stripe between eyes.

Head with deep groove-shaped impression between eyes and with coarse punctures. Eyes relatively large. Rostrum slightly longer than wide with pale yellow sparse setae laterally from genae to apical part of rostrum with few sparse setae. Dorso- apical part of rostrum flattened. Antennal scape short and stout, strongly clavate; remaining antennomeres small, with sparse pale short pubescence and long setae; apical antennomeres club-shaped, subellipsoidal covered with yellow setae. Funicular segment I longer than wide, slightly longer than II; segments III - VII slightly wider than long; club subellipsoidal, nearly 1.5 times as long as wide, nearly as long as antennal segments V to VII combined.

Pronotum subglobular, widest at middle, with equal length and width, weakly convex and almost flattened dorsally, mostly glabrous, without pubescence and punctures. Pronotum with following spots of pale yellow : 1) median longitudinal band widened medially, extending from basalto apical margin, 2) thick bands on lateral sides of pronotum almost entirely covering lateral sides; with few sparse weak punctures dorsally. Apical part of tinner sides of femori with irregular yellow scaly spots.

Elytra short, ovate, with regular intervals, weakly striate-punctate and strongly convex, with only few sparse short apical pubescence; Each elytron

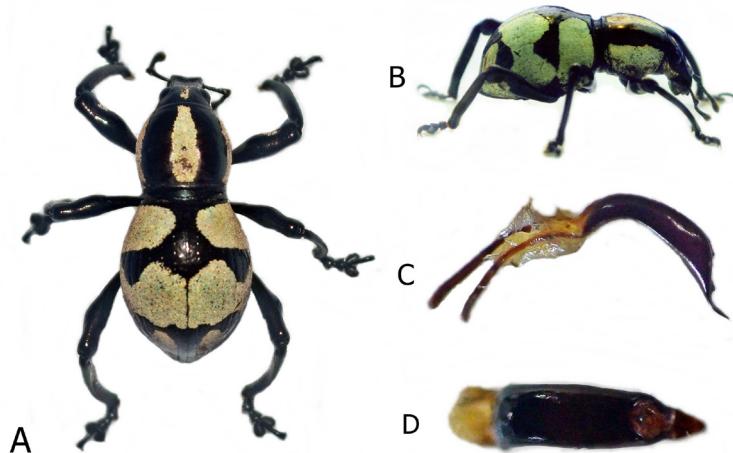


Fig. 1. *Pachyrhynchus miltoni* sp.n. (holotype): A - dorsal view, B - lateral view, C – aedeagus (lateral view), D - aedeagus (dorsal view).

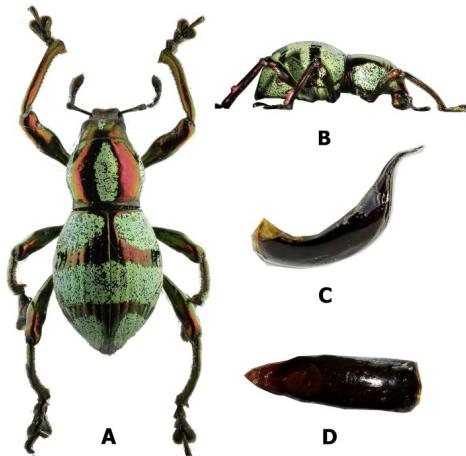


Fig. 2. *Pachyrhynchus speciosus samarensis* Schultze 1923: A - dorsal view, B - lateral view, C – aedeagus (lateral view), D - aedeagus (dorsal view).

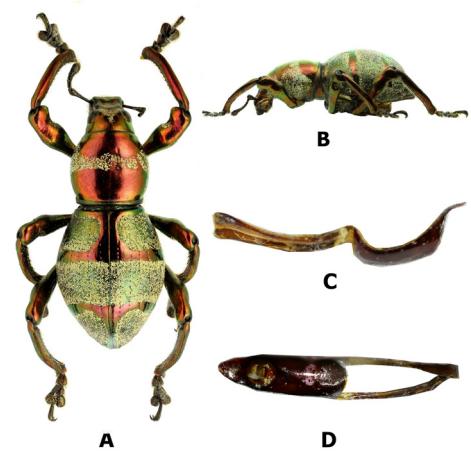


Fig. 3. *Pachyrhynchus kraslavae* Rukmane & Barševskis 2016 (holotype): A - dorsal view, B - lateral view, C – aedeagus (lateral view), D - aedeagus (dorsal view).



Fig. 4. Habitat of *P. miltoni* sp.n. in Davao City.



Fig. 5. Slash and burn farming near the habitat of *P. miltoni* sp.n.

with three bands: 1) broad band on basal part of each elytron transversely extending from interval II to lateral margin; 2) broad transverse band in middle part of elytra constricted medially, hourglass-shaped; 3) apical triangular marking, with pointed ends, extending from apex of each elytron to apical third of elytra and laterally connected with median marking by lateral stripe. Scutellum medium sized, rounded apically.

Underside weakly lustrous covered with metallic red and sparse pale yellow scales.

Legs wide, with strongly clavate femori and irregular punctures. Tibiae serrate along internal margins. Middle and hind femori covered with short hairs and sparse scales along posterior margins. Each tibia fringed with pubescent along internal margin, sparsely mixed with short hairs. Tarsomeres covered by sparse pubescence.

Aedeagus relatively short but not stout, curved in lateral view (Fig. 1C); lamella subtriangular, pointed apically (Fig. 1D)

Differential diagnosis. *Pachyrhynchus miltoni* sp. n. is similar in general appearance to *P. speciosus samarensis* Schultze, 1923 and *P. kraslavae* Rukmane & Barsevskis, 2016 which were described from Samar and Mindanao islands respectively. The new species differs from *P. speciosus samarensis* (Samar Island) by: 1) shape of more curved aedeagus (Fig. 2C, D); 2) shorter length of elytra; 3) the hourglass shaped median marking; 4) deeper longitudinal groove on rostum. *Pachyrhynchus miltoni* sp. n. clearly differs from *P. kraslavae* by shapes of the markings of the pronotum; *P. miltoni* sp. n. has longitudinal band, *P. kraslavae* has transverse band. The shape of aedeagus between the two species are clearly different also (Fig. 3C, D).

Etymology: This species is named after Professor Milton Norman Medina, the director of Biodiversity and Qualitative Research of the University of Mindanao for his contribution in the study and conservation of Philippine biodiversity.

He is a respected colleague and mentor who submitted the material described herein.

Ecology. Specimens of *P. miltoni* sp.n. were found in the elevation of 1234 m a.s.l. in Barangay. Baganihan, Marilog District, Davao City ($7^{\circ}28'03''$ N, $125^{\circ}15'02''$ E). The beetles were found crawling on the shrubs of *Piper aduncum* which was very abundant along the road going to the forested area of Barangay. Baganihan (Fig.4). But whether specimens feeds on the *Piper aduncum*, it is not certain since they were not found feeding on its leaves and there are adjacent plants which may also be the food plant of this species. As mentioned by Schultze (1923) *Pachyrhynchus* prefers open areas along mountain ridges or mixed forests with dense undergrowth along rivers. A lush secondary forest is still present within the area. However, slash and burn farming is currently done on the area by the local villagers to be planted with certain crops such as *Theobroma cacao*. This can be considered a threat to this species type locality as few meters from the habitat of *P. miltoni* sp.n. slash and burn farming is on-going (Fig.5).

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Diversity of Pachyrychini (Coleoptera: Curculionidae: Entiminae) in Mt. Kiamo, Malaybalay, Bukidnon, Mindanao, Philippines

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Abstract

A field survey of weevils of the tribe Pachyrychini (Coleoptera: Curculionidae: Entiminae) was conducted in Mt. Kiamo, Malaybalay, Bukidnon last December of 2015 to December, 2016. Field sampling was performed using a combination of belt transect, opportunistic and random sampling techniques. Field investigations were done in two vegetation types with elevation from 750-1,500 meters above sea level (masl), which include the lower montane (750-1,000 masl) and upper montane (1,000-1,500 masl) forests. Baseline data on species richness and local distribution were documented. A total of 239 individuals belonging to 20 species and 3 genera viz., *Pachyrhynchus*, *Homalocyrthus* and *Metapocyrthus* were collected from the two vegetation types. The upper montane forest had higher species richness with 12 species as compared to the lower montane forest with 10 species. Only 2 species were shared between the lower and upper montane. Species composition of Pachyrychini in Mt. Kiamo is unique from that of Mt. Apo and Mt. Malindang. In addition, recent distribution records of the Pachyrychini found in Mt. Kiamo identified to the species level were provided. This is the only update on distributional record of these species since Schultze monograph in 1923. The results of the survey show that the richness of Pachyrychini in Mt. Kiamo is high despite the anthropogenic disturbances it experiences. It is recommended that this mountain ecosystem be declared as protected area in order to conserve the endemic and threatened species and ecosystem as a whole.

Keywords: Species richness, new record, endemic, Mindanao, Mt. Kiamo

1. Introduction

Pachyrychini (Coleoptera: Curculionidae: Entiminae) is one of the tribes of weevils with a Philippine centered distribution. It has an estimated of more than 400 species with more than 90% of endemism for species [1, 2]. For nearly a century knowledge about this tribe has been unchanged until European, Japanese and Filipino entomologists recently took an interest on this tribe and described new species from unexplored islands and mountain ecosystems like Lubang Island, Zamboanga, Palawan, Mt. Kalatungan, Marilog Davao City and Mt. Apo Natural Park [1,3-7]. The tribe's unique distribution and their high level of endemism in every mountain ecosystem also make them a good candidate for biogeographic analysis.

Pachyrychini's general diagnostic characteristics include mandibles without a scar or lasting appendage on exterior surface evenly arcuate at sides, elytra with humeri rounded, hind coxae broadly contiguous with elytra at sides, and antennae scrobes lateral curving downwards in front of eyes at sides of rostrum [8]. Majority of its species have restricted distribution in various mountainous regions with an elevation of 500-2000 meters above sea level and between 16 and 18 north latitude and are endemic to a single mountain region, isolated island or dormant volcano [9]. Recent collections which led to the discovery of new species indicate that more species of Pachyrychini are still unknown to science and their distribution is wider than previously believed. Starr and Wang believed that the number of Pachyrychini species in the Philippines can reach around 500 as more entomological expeditions are conducted [10].

Mindanao which is the second biggest island in the Philippines is divided into four sub-regions based on its flora and fauna distribution namely Zamboanga, Eastern Mindanao, Bukidnon highlands and Cotabato [11]. Mt. Kiamo in Malaybalay, Bukidnon is one of the mountains along Pantaron range belonging to Bukidnon highlands which is believed to be one of the centers of distribution for the tribe Pachyrychini. This mountain hosts unique flora of which five new species were described recently. Mt. Kiamo has three (3) vegetation types which is

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more or less the same with that of Mt. Kitanglad. It is also one of the mountain ecosystems in Bukidnon which has the presence of forest over ultramafic soil resembling that of Mt. Pantaron. It has the presence of a mossy-pygmy forest similar that of Mt. Hamiguitan. This paper presents the first faunistic data of Pachyrhynchini in Mt. Kiamo, Malaybalay, Bukidnon.

Materials and Methods

Sampling method

Field sampling was performed using a combination of belt transect, opportunistic and random sampling techniques in Mt. Kiamo, Malaybalay, Bukidnon (Fig.1) last December, 2015 to December, 2016. Samples were mostly obtained from shrubs and collected through handpicking and bush beating and killed in vials with ethyl acetate. Specimens were later air dried and card-mounted for longer storage. Specimens for DNA analysis were soaked in 95% ethanol.

Description of sampling sites

A. Vegetation types

a. Lower montane forest- (08°15'27 N, 125°10'08 E) It has an altitude ranging from 750-1,000 masl and dominated by different agricultural crops such as; *Zea mays* L., *Lycopersicum esculentum* Mill., and *Sechium edule* Sw. Some economic fruit trees; *Artocarpus heterophyllus* Lamk., *Psidium guajava* L., and *Lansium domesticum* Corr. Serr. This area is dominated also by different invasive alien species such as, *Lantana camara* L., *Piper arborescens* Roxb. and *Gmelina arborea* Roxb. Grasses- highly dominated followed by the *Pteridium aquilinum*. The agro-ecosystem is located meters away from the Barangay Kibalabag.

b. Upper montane forest- located at 08°15'11 N, 125°09'28 E with altitude ranging from 1,000-1,500 masl. Characterized by taller trees with bigger dbh (diameter at breast height) ranging from 11-47 diameter, with height ranging 16-45 m. Dominated by *Lithocarpus* spp., *Agathis philippinensis* Warb, *Phyllocladus hypophyllus* Hook. f. *Syzygium* spp. and many other trees. Trees were also covered with some mosses.

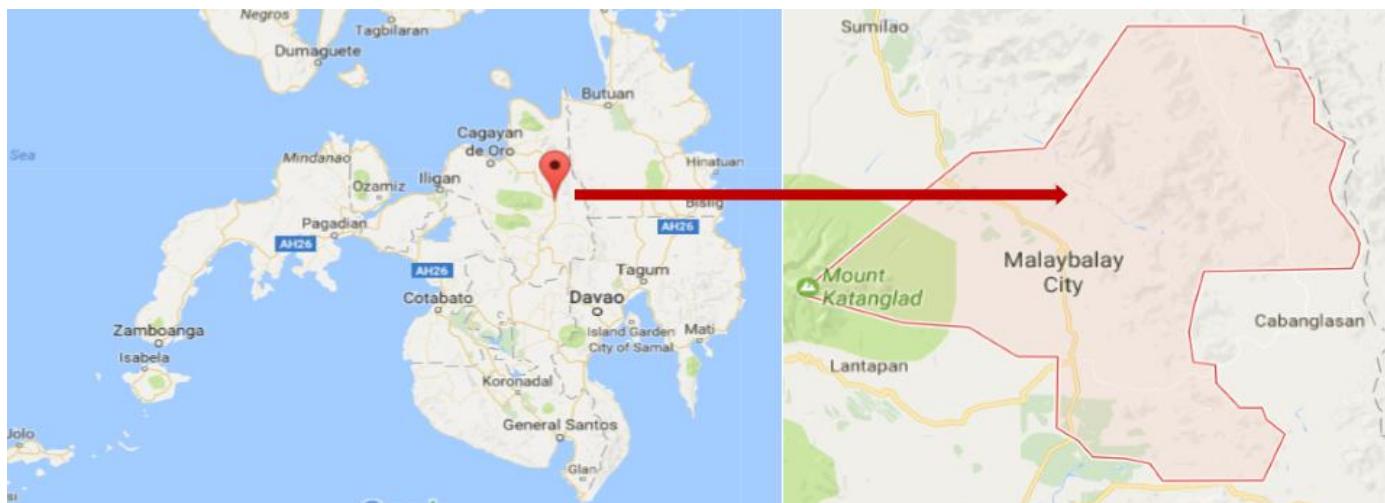


Fig 1. a) Map of Mindanao, **b)** map of Mt. Kiamo, Malaybalay, Bukidnon

Identification and Analysis

Identification was done using taxonomic keys and monograph comparison and descriptions provided by Schultze [9], Yoshitake [1] and Rukname & Barsevkis [3]. Confirmation of species was conducted by the third author. Shannon-Weiner diversity index and species distribution were determined using Bio Pro software version 2.0.

Additional distributional records were provided by the 1st and 3rd authors' collection. Previous records were provided by extensive literature review.

Results and Discussion

A total of 239 individuals belonging to 20 species and three genera were recorded from the lower montane and upper montane forest of Mt. Kiamo. Seven (7) species belong to the genus *Pachyrhynchus*, twelve (12) species belong to *Metapocyrtus* and one (1) species belongs to the genus *Homalocrytus*. *Pachyrhynchus* species include *P. brasiliensis* which is a new record in the Pantaron range, *P. cumingi*, *P. anitchshenkoi*, *P. postpubescens*, *P. regius*, *P. sulphureomaculatus* and *P. erichsoni*. Some *Metapocyrtus* species include *Metapocyrtus (Metapocyrtus) adaptatus* Schultze 1925, *M. (Trachycyrtus) cf. adspersus* (Waterhouse) 1843, *M. (Sclerocyrtus) chaminsoi* Schultze 1925, *M. (Trachycyrtus) cf. crassipinosus*, *M. (Orthocrytus) lanusinus* Schultze 1922 and *M. (Sphenomorphoidea) transversarius*

Schultze 1925 among others.

High species richness and abundance of members of the genus *Metapocyrtus* was observed which is consistent in most mountains explored. Members of the genus *Metapocyrtus* is already reported as a pest to some crops and ornamental plant especially in lowland ecosystems [12]. Some reports show that there are *Pachyrhynchus* species observed to be serious pest to some fruit trees such as cacao (*Theobroma cacao*) and mango (*Mangifera indica*) [13]. However, in Mindanao they are observed to be rarer and more specific compared to *Metapocyrtus* on their elevation and food preference since member of this genus have only been reported in forested ecosystems or forest ridges. Currently, we have more than a hundred described species of *Pachyrhynchus*, more than 200 described species of *Metapocyrtus* and 6 species record for *Homalocrytus* [2, 3, 4, 5, 6, 7]. The higher species richness and abundance of *Metapocyrtus* can be attributed to its high adaptability to environmental changes and lower preference for specific food plants. *Metapocyrtus* are abundant especially in the lower elevation with encroaching agricultural and invasive alien species such as *Lantana camara* L., *Piper arborescens* Roxb. and *Impatiens balsamina* Elm. Many of the members of the genus *Metapocyrtus* are found feeding on these plants.

Table 1: Species richness and distribution of Pachyrychnini in Mt. Kiamo

No.	Species	Lower Montane forest	Upper Montane forest
1	<i>P. anichtchenkoi</i> Rukname & Barsevskis, 2016		1
2	<i>P. cabrasae</i> Rukname & Barsevskis, 2016		2
3	<i>P. cumingi</i> Waterhouse, 1841		3
4	<i>P. postpubescens</i> Schultze, 1922		2
5	<i>P. regius</i> Schultze, 1922		1
6	<i>P. erichsoni</i> Waterhouse, 1841		3
7	<i>P. sulphureomaculatus</i> Schultze, 1922		10
8	<i>M. (Metapocyrthus) adaptatus</i> Schultze, 1925	90	
9	<i>M. (Trachycyrtus) cf. adspersus</i> Waterhouse, 1843	7	
10	<i>M. (Sclerocyrtus) chamissoi</i> Schultze, 1925	7	
11	<i>M. (Trachycyrtus) cf. crassipinosus</i>	9	
12	<i>M. (Orthocyrtus) lanusinus</i> Schultze, 1922	13	20
13	<i>M. (Sphenomorphoidea) metallicus</i> Heller, 1912		3
14	<i>M. (Dolichocephalocyrtus) bituberosus</i> Heller, 1912	2	
15	<i>M. (Sphenomorphoidea) Transversarius</i> Schultze, 1925		2
16	<i>M. (Dolichocephalocyrtus) ruficollis</i> Waterhouse, 1842	5	
17	<i>Metapocyrthus</i> sp.1	25	20
18	<i>Metapocyrthus</i> sp.2	8	
19	<i>Metapocyrthus</i> sp.3	5	
20	<i>Homalocyrtus</i> sp.		1
	Total	171	68

A low abundance of *Pachyrhynchus* species and high abundance of *Metapocyrthus* was observed in Mt. Kiamo. Only several individuals of *Pachyrhynchus* species were found with no more than 5 individuals except for *P. sulphureomaculatus* with 10 individuals recorded. The rarity of some *Pachyrhynchus* species was also noted by Yoshitake [1]. On the other hand, a high abundance of *M. lanusinus*, *M. adaptatus* and *M. sp. 1* was observed with 33, 90 and 45 individuals recorded. They specially dominate the lower montane forest. The most abundant species of *Metapocyrthus* in Mt. Kiamo thriving in the lower montane is *M. adaptatus* which was previously recorded in Surigao while *M. lanusinus* is the most dominant *Metapocyrthus* found in the upper montane often found in shrubs and trees [2, 9]. *M. lanusinus* was collected in Mt. Malindang as well as along the secondary forests in Marilog District, Davao City. Marilog District is the junction between Bukidnon and Davao City which indicates this species has a wider distribution. Previous records of *M. lanusinus* were only in Lindabon and Impalutao, Bukidnon. The other two most abundant *Metapocyrthus* species were not observed from other mountain ecosystems including Mt. Apo Natural Park and Mt. Candalaga, Compostela Valley although more field surveys will confirm the species' actual geographic distribution in Mindanao.

High species richness was observed in the upper montane forest with 12 recorded species while less species richness was observed in the lower montane with 10 species record. All *Pachyrhynchus* species were collected in the upper montane forest while species from the genus *Metapocyrthus* were observed from the lower montane to upper montane forest. The elevational distribution of Pachyrychnini in Mt. Kiamo is similar to the records in Mt. Apo Natural Park where *Pachyrhynchus* species were restricted to higher elevation while *Metapocyrthus* were found in all elevation gradients [14]. *Pachyrhynchus* seem to be more restricted to higher elevation as observed in Mt. Kiamo, Mt. Malindang, Mt. Apo and Mt. Candalaga. However, in museum collection, records show that *Pachyrhynchus* are also found in much lower elevation as low as 300 masl. *Metapocyrthus* on the other hand have no preference on elevation or food plants. Studying the habitat requirement, actual distribution of each species, life history and food plants of *Pachyrhynchus* would

be very valuable in conserving these species which are mostly threatened by habitat degradation and deforestation. Schultzeb[9] mentioned that most species from this genus feed on Philippine native species and the loss of their food and host plants which remains unknown is a big threat to them. Their ability to withstand environmental changes should also be studied.

Table 2: Biodiversity Indices of the lower montane and upper montane forest of Mt. Kiamo, Malaybalay, Bukidnon

Indices	Lower montane	Montane
Species abundance	171	68
Species richness	10	12
No. of endemic species	10	12
Shannon diversity index	0.709	0.83
Shannon Hmax Log Base 10 (Richness)	1	1.079
Shannon J' (Evenness)	0.709	0.769

All Pachyrychnini recorded in Mt. Kiamo are endemic. *Metapocyrthus* is believed to be endemic to the Philippines although a new species was recently described in Japan but is believed to have migrated to Japan through the English ivy plant [15]. The high level of endemism of Pachyrychnini is not astonishing since they are flightless beetles and the unique geologic history of the country and the island and mountain isolations made these species to speciate over time. Further field works would confirm the actual distribution of every Pachyrychnini species. The Pachyrychnini species recorded in Mt. Kiamo differs in composition compared to the Pachyrychnini of Mt. Apo Natural Park as well as Pachyrychnini of Mt. Malindang [13, 16]. This indicates the restricted distribution of the Pachyrychnini species with several species being highly restricted in distribution especially members of the genus *Pachyrhynchus*. Future biogeographic analysis would also tell if these species follow a certain biogeographic affinities in Mindanao as proposed by Dickerson [11].

Since this is the first faunistic paper done on Mt. Kiamo, all are new records. However, there are some noteworthy records such as *P. regius* which was previously recorded only in Leyte but was recently found in Mt. Kiamo and other

localities in Mindanao such as Agusan del Norte and localities in Bukidnon. Additional materials were also collected in Samar which indicates that this species has a Greater Mindanao distribution. *M. (Sclerocyrtus) chamissoi* and *M. (Trachycyrtus) cf. adspersus* were previously recorded only in Bohol, Samar and Leyte but were recently found in Mt. Kiamo which also signifies how the last Pleistocene epoch provided interconnectivity through land bridges for these

species to reach further dispersal^[17, 18]. The other species found in Mt. Kiamo are also found in nearby localities such as Agusan and Surigao. As for *P. sulphureomaculatus*, this is the first record for Pantaron Range however this species has been recorded in neighboring localities in Bukidnon and also in Samar and Leyte indicating that this species has a Greater Mindanao distribution. The species *P. erichsoni* have the widest range of distribution from Luzon to Mindanao.

Table 3: Pachyryynchini of Mt. Kiamo's previous and current records

No.	Species name	Previous record	Updated Record
1	<i>P. anichtchenkoi</i> Rukname & Barsevskis, 2016	Bukidnon (Mt. Kalatungan, Intavas, Cabanglasan)	Bukidnon (Mt. Kiamo)
2	<i>P. cabrasae</i> Rukname & Barsevskis, 2016	Bukidnon (Mt. Kalatungan, Cabanglasan)	Bukidnon (Mt. Kiamo,)
3	<i>P. cumingi</i> Waterhouse, 1841		Bukidnon (Mt. Kiamo, Cabanglasan, Intavas, Mt. Kalatungan) Panamokan, Bohol, Samar (Hinabangan, Marabut), Sarangani (Kiamba)
4	<i>P. postpubescens</i> Schultze, 1922	Bukidnon (Lindabon)	Bukidnon (Mt. Kiamo Cabanglasan, Intavas, Kalatungan, Panamokan, San Fernando)
5	<i>P. regius</i> Schultze, 1922	Leyte (Cabalian)	Agusan del Norte, (Sibagat); Bukidnon (Mt. Kiamo, Cabanglasan, San Fernando); Leyte, Sogod; Samar, Marabot,
6	<i>P. erichsoni</i> Waterhouse, 1841	Leyte, Surigao, Dinagat Island	Luzon: Cagayan; Ifugao, (Banaue); Nueva Vizcaya (Belanse); Marinduque (Boac, Buenavista; Mindoro, (Baco); Sierra Madre, (Aurora, Dingalan, Labulo); Quirino, (Disimungal, Madela; Mindanao: Bukidnon (Mt. Kiamo, Cabanglasan, Intavas, Panamokan); Cotobato (Kidapawan, Mt. Apo); Surigao del Sur (Esperanza); Visayas; Leyte (Sogod); Samar, Hinabangan)
7	<i>P. sulphureomaculatus</i> Schultze, 1922		Bukidnon (Mt. Kiamo); Agusan del Sur,; Cotabato, Kidapawan, Mt. Apo, Mt. Parker; Sarrangani, Kiamba, ; Surigao del Sur, Esperanza, San Miguel, Tandag, Leyte; Samar, Hinabangan, Sogod
8	<i>M. (Metapocytus) adaptatus</i> Schultze 1925	Mindanao (Surigao)	Bukidnon (Mt. Kiamo)
9	<i>M. (Trachycyrtus)cf. adspersus</i> Waterhouse, 1843	Bohol (Bilar), Biliran, Samar, Leyte (Palompon)	Bukidnon (Mt. Kiamo)
10	<i>M. (Sclerocyrtus) chamissoi</i> Schultze 1925	Samar (Loquilocon, Wright)	Bukidnon (Mt. Kiamo)
11	<i>M. (Trachycyrtus) cf. crassipinosus</i>	Surigao	Bukidnon (Mt. Kiamo)
12	<i>M. (Orthocytus) lanusinus</i> Schultze 1922	Bukidnon (Lindabon)	Bukidnon (Mt. Kiamo, Impasug-ong) Davao City (Marilog)
13	<i>M. (Sphenomorphoidea) metallicus</i> var. <i>sphenomorphoides</i> Heller, 1912	Bukidnon (Tangcolan)	Bukidnon (Mt. Kiamo)
14	<i>M. (Dolichocephalocytus) bituberosus</i> Heller, 1912	Mindanao (Davao, Dolicaon)	Bukidnon (Mt. Kiamo,)
15	<i>M. (Sphenomorphoidea) Transversarius</i> Schultze, 1925	Bucas Grande, Siargao	Bukidnon (Mt. Kiamo,)
16	<i>M. (Dolichocephalocytus) ruficollis</i> Waterhouse, 1842	Cagayan, Bukidnon (Tangkulan, Lindaban)	Bukidnon (Mt. Kiamo,Mt. Musuan)

Conclusion and Recommendation

High species richness and abundance of Pachyryynchini was observed in the lower and upper montane forests of Mt. Kiamo, Malaybalay, Bukidnon with a record of 239 individuals belonging to 20 species and 3 genera. New records were also established for the Pachyryynchini fauna of Bukidnon and Mindanao. The species composition of Pachyryynchini differs greatly from Mt. Apo Natural Park and

Mt. Malindang which indicates the uniqueness of this mountain ecosystem and the restricted distribution of the Pachyryynchini species. Several species are shared with neighboring localities such as Surigao and Agusan while some species seems to be confined only to different localities in Bukidnon. The high endemism and unique Pachyryynchini fauna of this mountain ecosystem requires immediate attention especially that several anthropogenic disturbances

are encroaching in this mountain. It is recommended that this mountain be declared as protected area in order to conserve the endemic and threatened species and ecosystem as a whole.

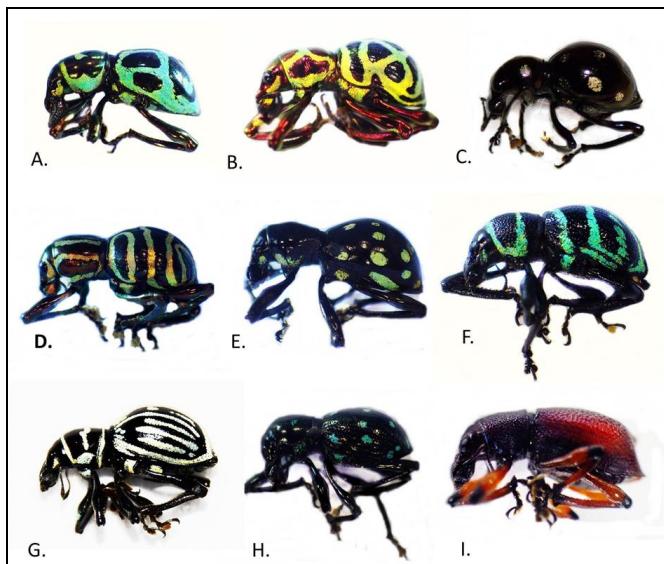


Fig 2: A. *P. anichtchenkoi* Rukname & Barsevskis, 2016; B. *P. brasae* Rukname & Barsevskis, 2016; C. *P. erichsoni* Waterhouse 1841; D. *P. postpubescens* Schultze 1922; E. *P. sulphureomaculatus* Schultze, 1922 ; F. *M. (Sclerocyrtus) chamissoi* Schultze 1925; G. *M. (Orthocyrtus) lanusinus* Schultze 1922; H. *M. (Sphenomorphoidea) metallicus* Heller 1912; I. *Homalocyrtus* sp.

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NEW SPECIES OF THE GENUS *PACHYRHYNCHUS* GERMAR (COLEOPTERA, CURCULIONIDAE, ENTIMINAE) FROM THE GREATER MINDANAO PLEISTOCENE AGGREGATE ISLAND COMPLEX (PHILIPPINES)

Anita Rukmane

Rukmane A. 2017. New species of the genus *Pachyrhynchus* Germar (Coleoptera, Curculionidae, Entiminae) from the greater Mindanao Pleistocene Aggregate island complex (Philippines). *Acta Biol. Univ. Daugavp.*, 17 (1): 85 – 95.

Four new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the greater Mindanao Pleistocene Aggregate Island Complex (PAIC), Philippines, are described: *P. ilgas* sp. n. (Samar), *P. orientalis* sp. n. (N Mindanao), *P. occidentalis* sp. n. (W Samar), *P. neoabsurdus* sp. n. Illustrations of habitus in dorsal and lateral view with male and female genitalia are included. Distribution map is provided.

Key words: Coleoptera, Curculionidae, *Pachyrhynchus*, fauna, taxonomy, new species, Philippines, PAIC.

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INTRODUCTION

On account of the great diversity of superficially apparently heterogeneous forms within species, may appear many difficulties connected with describing a satisfactory arrangement of the new species of genus *Pachyrhynchus*. Nevertheless, almost century after first described species, many native and foreign taxonomists tend to describe new taxa (Bollino & Sandel 2015, Rukmane & Barševskis 2016, Cabras & Rukmane 2016). However, fauna of *Pachyrhynchus* still requires for all-inclusive investigation which may reveal new for science species and subspecies.

There are many species described from Luzon Island, yet, from Mindanao and close located Visayas region new species tend to occur. In this

paper I propose four new close related species from greater Mindanao Pleistocene Aggregate Island Complex (PAIC).

MATERIAL AND METHODS

The studied material is deposited in the following collections:

DUBC – the beetles collection of Daugavpils University, Institute of Life Sciences and Technology, Coleopterological Research Centre, Ilgas, Daugavpils District, Latvia (A. Barševskis); SMTD – Senckenberg Natural History Collections, Dresden, Germany (K. Klass).

The laboratory research and measurements have been carried out using Nikon AZ100, Nikon

SMZ745T and Zeiss Stereo Lumar V12 digital stereomicroscopes, NIS – Elements 6D software. The habitus photographs were obtained with a digital camera Canon EOS 6D with Canon MPE 65 mm macro lens, using Helicon Focus auto montage and subsequently were edited with Photoshop.

Measurement method as explained in Rukmane & Barševskis (2016).

RESULTS

Pachyrhynchus ilgas sp. nov. (Figs. 1C, 2, 7)

Type material. Holotype: Male (DUBC) “PHILIPPINES, Visayas, Samar Island, Lope De Vega, II. 2017, / local collector leg. /” (typed on white card); “ex. Prof. A. Barševskis coll.” (typed on white card); “HOLOTYPE / Male / *Pachyrhynchus ilgas* / Rukmane, 2017 / det. Rukmane Anita, 2017” (typed on red card).

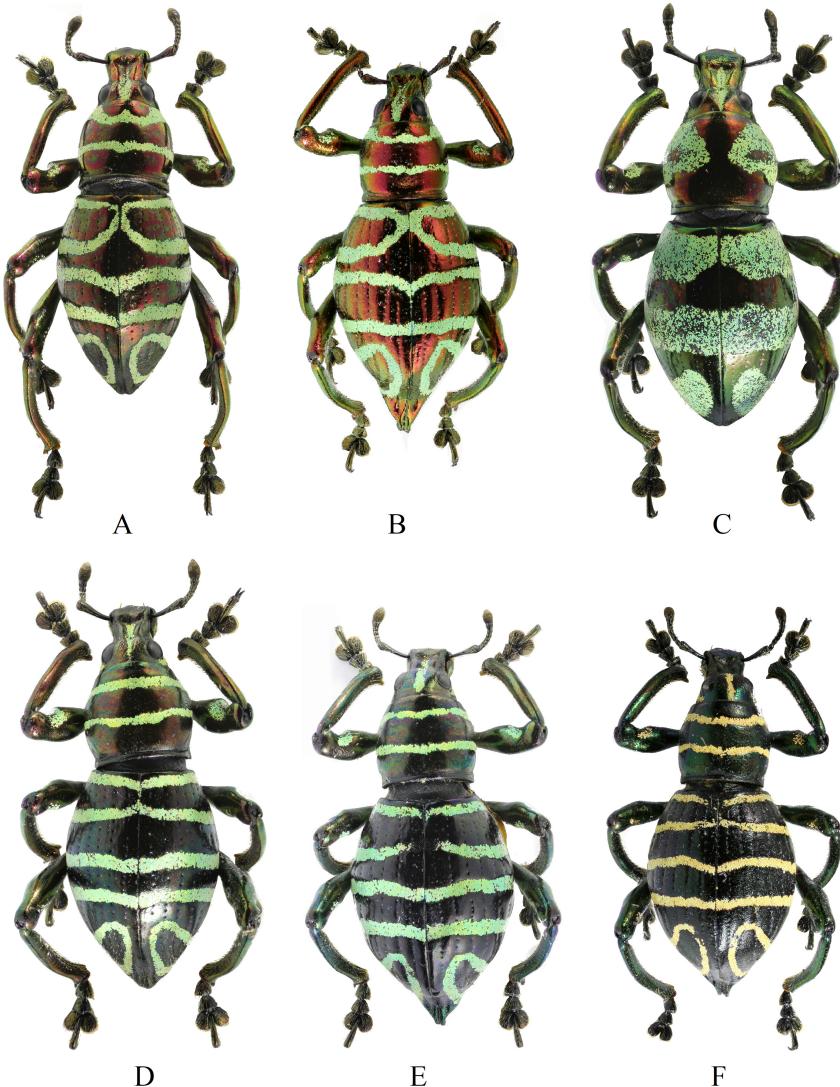


Fig. 1. Dorsal habitus of A- *P. occidentalis*, male; B – female; C – *P. ilgas*, male; D – *P. orientalis*, male; E – female; F – *P. neoabsurdus*, female.

Distribution: Philippines (Eastern Visayas region: Samar Island) (Fig. 7).

Description. Male. Dimensions: LB: 15.6. LR: 2.4. WR: 2.05. LP: 4.3. WP: 4.95. LE: 9.3. WE: 6.25. N = 1 for all measurements. Dorsal habitus as shown in Fig. 1C.

Integument glossy, coppery brown; antennae black; tarsi coppery brown with green tinge. Body surface mostly strongly shiny, except antennae and underside with weaker luster.

Rostrum, pronotum, elytra and profemur with shiny pale green markings of round recumbent scales, depending on light exceptive scales have blue luster.

Head dorsaly subglabrous, minutely pubescent; eyes relatively large, moderately prominent from outline of head; outline of each eye highest behind middle; antennae short and stout, scape shorter than funicle, strongly clavate; funicle with segment I more than twice as long as wide, 1.3 times as long as II; segment II 1.5 times as long as wide, twice as long as III; segments III-V subequal in length, slightly wider than long, narrower than segment VI, segment VI slightly

wider than long, segment VII 1.8 times as long as wide, club shaped; forehead with narrow linear scaly patch on middle; lateroventral parts below eyes densely covered with pale green markings of round and elliptic scales and short pale hair-like scales. Rostrum minutely pubescent, longer than wide (length/wide 1.17) with profound triangular concavity on basal half, weakly bulging on apical half; linear scaly patch on middle of basal half, connected basally with patch on forehead; lateroventral parts behind antennal scrobes minutely covered with pale green scales and long golden hairs.

Prothorax subglabrous, wider than long (wide/length 1.15), maximum transverse diameter in middle, finely punctured, with the following two scaly markings: from base of each lateral side of pronotum to median part of disc, sharply interrupting on apex and gradually interrupting on base; anterolateral and posterolateral angles without scaly markings; weak basal impression. Elytra short ovate, striate-punctate, widest just before middle, convex dorsally, wider than prothorax (elytral/pronotal width 1.26), more than twice longer than prothorax (elytral/pronotal length 2.16); two following scaly markings: 1) from lateral margin of each elytron huge transverse band in parallel to base connecting in median part, with triangular imprint without scaly markings on interval I and II reaching half width of transverse band, 2) large band from median part of elytra to apex, with T shaped area without scales from apical 3/5 till apex, one horizontal line from middle of interval VIII of each elytron and second vertical line at interval I, extending gradually to interval II at apical part. Coxae densely covered with pale scales on anterior parts. Profemur minutely pubescent, with roundish scales on basal parts along posterior margins forming irregular patch on subapical part. Tibiae with moderate fine hairs and darker setae on interomarginal and apical parts, hairs become longer apically.

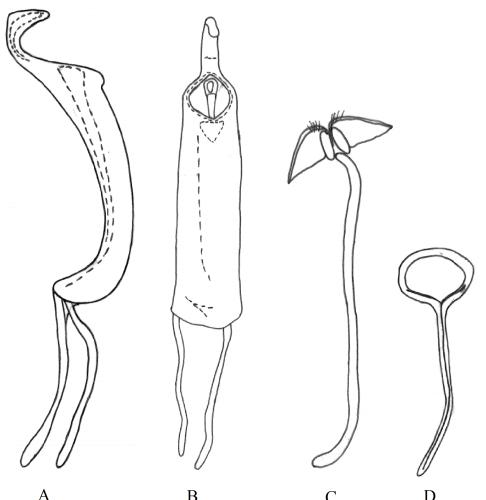


Fig. 2. Male genitalia of *P. ilgas*. A – aedegal body in lateral view; B – aedegal body in frontal view; C – sternite IX; D – tegmine. Scale 1mm.

Genitalia as illustrated in Fig. 2. Sternite IX slender, nearly 1.5 times as long as aedegal body, slightly curved leftward. Aedegal body stretched out, in lateral view moderately curved ventrally

in the subbasal part, and gradually attenuated in the apical part, apex with angle-shaped ventral margin, curvature raised dorsally and sharply incurved ventrally at middle; two prominent bulges near base of ostium. In frontal vision widest at base, gradually narrowed at apical plate. Aedegal apodemes slender, neatly 2.4 times shorter than aedegal body. Tegmen with slender apodeme, nearly twice as long as diameter of tegminal ring.

Female unknown.

Diagnosis. *Pachyrhynchus ilgas* is related to *P. absurdus* Schultze, 1919 known from Mindanao, but *P. ilgas* is distinguishable from it by its wider pronotum and elytra with characteristic scaly markings (Fig. 1C). Sutural apex is rounded, less peaked. Superior 1st and 2nd metatarsomere. Clypeus without slight dent in central part. Characteristic shape of male genitalia (Fig. 2). Species also shows similarity in body pattern and shape of male genitalia to *P. orientalis* sp. nov. described from Mindanao Island, but is distinguishable by characteristic scaly markings, shape of male genitalia, brighter body color, rostrum with weaker apical bulge. Species might be confused with *P. samarensis* Schultze, 1923 by its similarities of scaly markings and distribution, but according to unique shape of male genitalia, species is more closely related to “*absurdus*” group.

Etymology. Species is named after Daugavpils University study and research center “Ilgas”, where is located one of the biggest collections of genus *Pachyrhynchus*, accumulating more than two thousands of specimens with over one hundred of detected species. Place keeps its mystery and is overwhelmed with peace and good atmosphere, calling any friendly company for visit.

Taxonomical notes

Pachyrhynchus ilgas sp. nov. shows morphological relationships with a small group of *Pachyrhynchus* species distributed within the greater Mindanao Pleistocene Aggregate Island Complex (PAIC),

which includes Samar, Leyte, Bucas Grande and mainland Mindanao (Fig. 7). This group is called “*absurdus*” species group. Initially *P. absurdus* belonged to “*speciosus*” species group created by Schultze (Schultze 1923), but on the basis of highly divergent morphological characters, new division is required. The species of this group share the following combination of morphological characters:

1. Integument glowing red, coppery or black, marked with pale green to orange scale stripes and bands;
2. Eyes weakly convex from outline of head;
3. Rostrum in basal half with an oblong triangular shallow depression;
4. Two curves in apical part of rostrum, size of curves species specific;
5. Linear scaly patch from forehead to median part of rostrum;
6. Elytra elongated, with strongly extended apex;
7. Phallobase of aedeagus increased and curved following: curvature raised dorsally and sharply incurved ventrally at the middle.

Annotated checklist

1. *Pachyrhynchus absurdus* Schultze, 1919

TL: Philippines, Bucas

Type in MTD, examined

Holotypes of *P. absurdus* are collected from the Bucas Island and described by Schultze with one male and one female specimen (SMTD), so far those are only known representatives of this species among collections. Species is considered to be endemic for Bucas Island as close related species from PAIC show high morphological differences.

2. *Pachyrhynchus ilgas* sp. nov.

TL: Philippines, Samar

Type in DUBC, examined

Only one specimen of this taxon were recently

obtained from Northern Samar, thus species is considered to be distributed in northern and central parts of island as other *Pachyrhynchus* species from this region. For majority of *Pachyrhynchus* that occurs from Samar Island scale pattern with full bands is characteristic. As example: *P. samarensis*, *P. eos*, *P. kraslavae*. This indication might be linked to inherent environmental factors of island as morphs of male and female genitalia of those species show very distant relation.

3. *Pachyrhynchus orientalis* sp. nov.

TL: Philippines, Northern part of Mindanao
Type in DUBC, examined

4. *Pachyrhynchs occidentalis* sp. nov.

TL: Philippines, Western part of Mindanao
Type in DUBC, examined

During exporation of both *P. orientalis* and *P. occidentalis* were established, that each taxon inhabits species specific part of Mindanao Island.

5. *Pachyrhynchus neoabsurdus* sp. nov.

TL: Philippines, Mindanao Island

Type in DUBC, examined

Pachyrhynchus orientalis sp. nov.

(Figs. 1D, E; 3, 4, 6B, 7)

Type material. Holotype: Male (DUBC) "PHILIPPINES, Mindanao Island, Bukidnon, Cabanglasan, VII. 2014, / local collector leg. /" (typed on white card); "ex. Prof. A. Barševskis coll." (typed on white card); "HOLOTYPE / Male / *Pachyrhynchus orientalis* / Rukmane, 2017 / det. Rukmane Anita, 2017" (typed on red card). Paratypes: 5 males and 1 female from Mindanao Island, Bukidnon, Cabanglasan (VIII. 2013; I. 2014; VI. 2014; VII. 2014 (2)), 2 males and 2 females from Mindanao Island, Surigao Del Sur, San Miguel (VIII. 2013, VI. 2014 (2), VIII. 2014). All in DUBC.

Distribution: Philippines, Mindanao Island, Eastern part (Fig. 7).

Description. M a 1 e. Dimensions: LB: 13.9-15.7 (holotype 15.6; mean 15.09); LR: 1.6-1.8 (holotype 1.7; mean 1.73); WR: 1.5-1.8 (holotype 1.8; mean 1.7); LP: 3.3-3.95 (holotype 3.9; mean

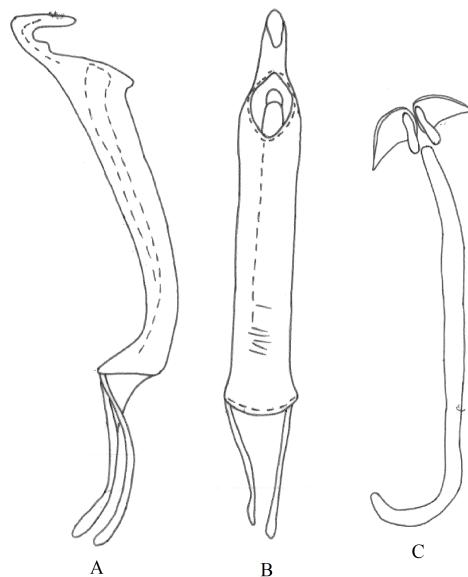


Fig. 3. Male genitalia of *P. orientalis*; A – aedegal body in lateral view; B – aedegal body in frontal view; C – sternite IX; D – tegmen. Scale 1mm.

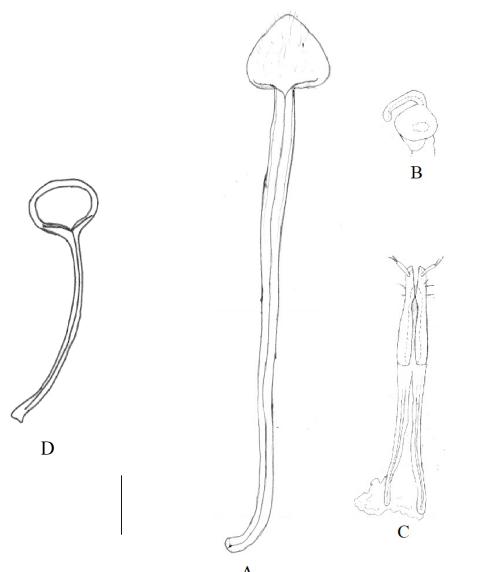


Fig. 4. Female genitalia of *P. orientalis*. Scale 1mm.

3.73); WP: 3.95-4.8 (holotype 4.7; mean 4.47); LE: 8.8-10.2 (holotype 9.75; mean 9.49); WE: 5.4-6.25 (holotype 6.25; mean 6.0). N = 8 for all measurements. Dorsal habitus as shown in Fig. 1D.

Integument dark coppery red to brown, some paratypes almost black; antennae and mandibles darker. Body surface strongly shiny except underside which has a weaker luster.

Body with weak pubescence, with glossy nacreous green to goldish markings of recumbent round scales.

Head dorsally subglabrous, moderately finely punctured, with linear scaly patch along midline from vertex to middle of rostrum; lateroventral parts below eyes with irregular shape scaly patch. Forehead almost without depression along midline. Eyes relatively large, moderately prominent from lateral contour of head. Antennae short and stout, with scape a bit of shorter than funicle; funicle with segment I 1.8 times longer than wide, proximately same length as II; segment II 1.5 times as long as wide, 1.7 times as long as III; segments III-V subequal in length and width, slightly wider than long, narrower than VI; segment VI slightly wider than long, strongly narrower than VII; segment VII club subellipsoidal, 1.8 times as long as wide.

Rostrum minutely pubescent; lateroventral parts except antennal scrobes covered with round to oval nacreous green scales, densely furnished with long golden setae near apex. Rostrum slightly wider than long, WR/LR 1.06; Deep obcordate concavity on basal half, two strong bulges at each side on apical half; apical bulge with peak on middle of apical half, flattish dorsally; dorsal contour of rostrum flattish in basal half, with weak declining at median part, weakly raised from middle to apical third and gradually declined to apex; ventral surface convex along midline.

Prothorax with a two longitudinal scale stripes dorsally in the middle; Stripes convergent toward and confluent near anterior margin.

Lateral margins circumscribed by scale stripes that in overall forms a large oval shaped figure; shape subspherical, wider than long, WP/LP 1.21, widest at middle; subapical groove weak, almost entirely distinct; subbasal groove thick, expressed. Lateral contour: bulge in basal part which straighten up at basal 1/3, smooth to dorsal part with very weak bulge in subapical part.

Elytra subovate, LE/WE 1.56, two and half times longer than prothorax, LE/LP 2.5, moderately striate-punctured, intervals even; contour widest just before middle. Each elytron with long hairs, located on apical half; following scaly markings: 1) transverse oval figure circumscribed by a narrow scale band in basal third, reaching from interval I to lateral margin; 2) two narrow parallel transverse bands confluent at margin with a marginal stripe in the middle, latter of which circumscribes in apical third a triangular figure. Legs stout; femora strongly clavate; Coxae covered with general scales on anterior parts, mingled with short light brown hairs. Hind femora with oval patch of scales along posterior margins, mingled with rare short hairs. Tibiae sparsely pubescent, furnished with long dense hairs along internal margin. Tarsus and claws thickly furnished with long golden hairs.

Genitalia as illustrated in Fig. 3. Sternite IX slender, nearly 1.4 times as long as aedegal body, strongly incurved leftward. Aedegal body stretched out, in lateral view moderately curved ventrally in the basal third, and gradually attenuated in the apical part, apex with angle-shaped ventral margin, curvature raised dorsally and sharply incurved ventrally at middle, with pyramidal bulge at basal middle; two prominent bulges near base of ostium with pyramidal shape on lateral view. In frontal vision widest at base, narrowed at basal third and gradually extended at apical part. Aedegal apodemes slender, neatly 2.25 times shorter than aedegal body. Tegmen with slender apodeme, nearly twice as long as diameter of tegminal ring.

F e m a l e. Dimensions: LB: 15.3-16.2 (holotype 15.3; mean 15.87); LR: 1.45-1.6 (holotype 1.45; mean 1.53); WR: 1.9-2.05 (holotype 1.9; mean

1.95); LP: 3.75-4.2 (holotype 3.75; mean 4.02); WP: 4.1-4.85 (holotype 4.1; mean 4.57); LE: 9.5-9.5 (holotype 9.3; mean 9.43); WE: 6.85-7.0 (holotype 6.85; mean 6.92). Dorsal habitus as shown in Fig. 1E, lateral as shown in Fig. 6B. N = 3 for all measurements.

Rostrum much wider than in males WR/LR 1.30. Prothorax WP/LP 1.1; Elytra LE/WE 1.36, WE/WP 1.68, LE/LP 2.48.

Diagnosis. *Pachyrhynchus orientalis* sp. nov. according to scale pattern and shape of male genitalia is similar to all species from "absurdus" group, but is easily distinguishable by specific characters: huge apical bulge on rostrum, thick subbasal groove on pronotum, bulge on basal part of pronotum, smaller interval between eyes, differences in male aedeagal body (Fig. 3), apical half or each elytron with intense short hairs.

Etymology. *Pachyrhynchus orientalis* sp. nov. is called based on its distribution which is northern

part of Mindanao Island. Northern – oriental.

***Pachyrhynchus occidentalis* sp. Nov.**
(Figs. 1A, B; 5, 6, 7)

Type material. Holotype: Male (DUBC) "PHILIPPINES, Mindanao Island, Davao Del Sur, Kapatagan, IX. 2016, / local collector leg. /" (typed on white card); "ex. Prof. A. Barševskis coll." (typed on white card); "HOLOTYPE / Male / *Pachyrhynchus occidentalis* / Rukmane 2017 / det. Rukmane Anita, 2017" (typed on red card). Paratypes: 7 males and 6 females from Mindanao Island, Cotabato, Mt. Parker (IV. 2014 (2); VI. 2014; VII. 2014; VIII. 2014 (3); IX. 2014 (5)); 2 males from Mindanao Island, Sarrangani, Kiamba (XII. 2015 (2)); 1 male from Mindanao Island, Mt. Apo (VIII. 2013). All in DUBC.

Distribution: Philippines, Mindanao Island, Western part (Fig. 7).

Description. M a l e. Dimensions: LB: 13.95-15.95 (holotype 14.35; mean 14.62); LR: 1.5-1.75 (holotype 1.7; mean 1.64); WR: 1.7-1.95 (holotype

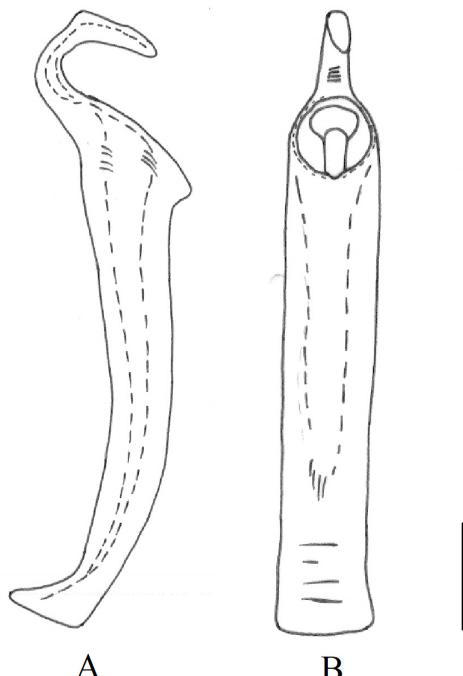


Fig. 5. Aedegal body of *P. occidentalis*; A – lateral view; B – frontal view. Scale 1mm.



Fig. 6. Lateral view of habitus; A – *P. absurdus*; B – *P. orientalis*; C – *P. occidentalis*; D – *P. neoabsurdus*. All females.

1.95; mean 1.84); LP: 3.05-3.75 (holotype 3.5; mean 3.32); WP: 3.45-4.15 (holotype 3.95; mean 3.87); LE: 8.45-9.3 (holotype 8.95; mean 8.94); WE: 4.95-5.45 (holotype 5.35; mean 5.17). N = 11 for all measurements.

Integument glowing red, with strong luster, in some paratypes coppery, antennae and mandibles darker.

Body with nacreous pale green to yellow markings of round recumbent scales.

Head glabrous, minutely punctured, forehead slightly impressed among midline, with linear line of scales from apex to basal half of rostrum, line narrows closer to rostrum. Eyes large, prominent from lateral contour of head; each eye highest at middle. Antennal scape shorter than funicle, moderately clavate, with long light hairs at distal side; funicle with segment I more than twice as long as wide, 1.4 times as long as II; segment II 1.25 times longer than wide, 1.3 times as long as III; segments III-VI equal in length, nearly as long as wide, slightly narrower than

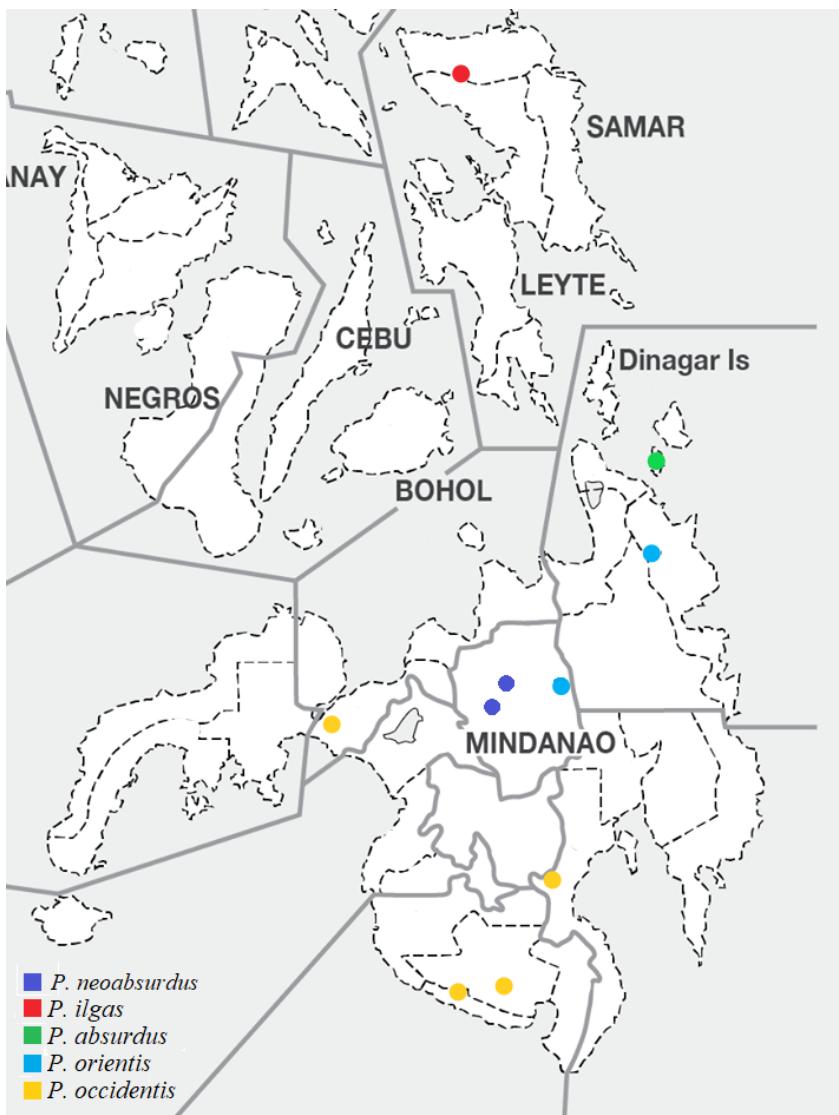


Fig. 7. Distribution map of *Pachyrhynchus* "absurdus" group.

VII; segment VII nearly twice as long as wide, well furnished with short brown hairs.

Rostrum subglabrous, except with few general scales on basal half; lateroventral parts just behind antennal scrobes with irregular scaly patch on each side; patch fringed with hair-like scales along margins; long golden hairs near apex. Rostrum wider than long, WR/LR 1.15. Dorsum well punctured, with triangular concavity on basal half, bulging apically; apical bulge dorsally flatish; dorsal contour of forehead and rostrum convergent, narrow near eyes, bulging apically with peak at basal 1/3, concavity before antennal scapes and weak bulge at apical part with peak at apical 3/4; ventral surface weakly convex along midline.

Prothorax subspherical, wider than long, WP/LP 1.13; weak convex near base; with the following three scaly markings: 1) transverse confluent line of scales at disc; 2) transverse convergent line of scales close to anterior angle, at anteriolateral angles line reach apical margin, at central part line is closer to disc with triangular peak almost reaching anterior margin in middle; 3) band of scales at lateral base, which connect both lines and circumscribes long oval shape. Dorsal contour confluent high from middle to basal 2/3, then narrow and gradually extends to basal margin.

Each elytron subglabrous, finely punctured, intervals smooth, well pronounced; almost no hairs near apex and at apical half; Following markings of scales: 1) transverse suboval figure circumscribed by a narrow scale band in basal third, reaching from interval I to lateral margin; 2) two narrow convergent parallel transverse lines confluent at margin with a marginal stripe in the middle, latter of which circumscribes in apical third a triangular figure. LE/WE 1.67, WE/WP 1.35, LE/LP 2.56. Dorsal contour highest before middle, gradually narrowed to apices.

Coxae minutely pubescent, mingled with short golden hair-like scales; fore coxae densely covered with general scales on anterior parts. Femora weakly covered with small pubescence

and hair-like scales; oval patch of scales; oval scaly patch on subapical part except anterior margin, rather densely covered with long golden green hairs and hair-like scales on basal half among posterior margin. Tibiae partially furnished with light hairs which become longer apically at interomarginal parts.

Genitalia as illustrated in Fig. 5. Aedegal body stretched out, in lateral view sharply curved ventrally at the basal fifth, and gradually attenuated in the apical part, apex with angle-shaped, rounded ventral margin, curvature raised dorsally and sharply incurved ventrally at middle; two prominent bulges near base of ostium, on lateral view bulge pyramidal. In frontal vision moderately even all along.

Female. Dimensions: LB: 14.7-16.45 (holotype 16.25; mean 15.7; LR: 1.65-1.8 (holotype 1.7; mean 1.73); WR: 1.7-1.9 (holotype 1.9; mean 1.8); LP: 3.05-3.4 (holotype 3.3; mean 3.2); WP: 3.3-3.9 (holotype 3.9; mean 3.67); LE: 9.35-11.75 (holotype 11.75; mean 10.29); WE: 6.05-6.45 (holotype 6.35; mean 6.22). N = 6 for all measurements.

Rostrum WR/LR 1.04. Prothorax WP/LP 1.15; Elytra LE/WE 1.65, WE/WP 1.69; LE/LP 3.22.

Diagnosis. *Pachyrhynchus occidentalis* sp. nov. is similar to members of "absurdus" group. Species specific characters: 1) shape of male genitalia (Fig. 5); 2) slender elytra with most stretched out apex; 3) eyes bigger, closer to margin; other specific characters visible from lateral view (Fig. 6C).

Etymology. *Pachyrhynchus occidentalis* sp. nov. is called based on its distribution which is Western part of Mindanao Island. Western – occidental.

Pachyrhynchus neoabsurdus sp. nov.
(Figs. 1F, 7D, 8)

Type material. Holotype: Female (DUBC)
"PHILIPPINES, Mindanao Island, Bukidnon,
Kalatungan Mountain, IX. 2014. / local collector

leg. /" (typed on white card); "ex. Prof. A. Barševskis coll." (typed on white card); "HOLOTYPE / Female / *Pachyrhynchus neoabsurdus* / Rukmane 2017 / det. Rukmane Anita, 2017" (typed on red card). Paratype: 1 female from Mindanao Island, Bukidnon, Intavas (VIII. 2014) (DUBC).

Distribution: Mindanao Island (Fig. 8).

Description. Female. Dimensions: LB: 13.15-13.75 (holotype 13.15; mean 13.45); LR: 1.4-1.45 (holotype 1.4; mean 1.43); WR: 1.65-1.8 (holotype 1.65; mean 1.73); LP: 2.8-2.95 (holotype 2.8; mean 2.88); WP: 3.35-3.75 (holotype 3.35; mean 3.55); LE: 8.25-8.75 (holotype 8.25; mean 8.5); WE: 5.25-5.85 (holotype 5.25; mean 5.55). N=2 for all measurements. Dorsal habitus as shown in Fig. 1F.

Integument black, with green luster, elytra darker, with weaker luster. Antennae, mandibles black. Body surface mostly shiny except underside.

Body with nacreous orange markings of round recumbent scales.

Head glabrous, moderately punctured, with transverse line of orange scales from apex to beginning of rostrum. Forehead almost without medial depression. Eyes large, weakly prominent from contour of head. Rostrum without scales on dorsal view; wider than long, WR/LR 1.18; subtriangular concavity on basal half and weak bulge on apical half; shallow transverse groove before horsehead; lateroventral parts just behind antennal scrobes with few ellipsoidal scales on each side; scales fringed with short hairs and hair-like scales along margins. Antennal scape proximately 1.5 times shorter than funicle, moderately mingled with long light hairs; funicle with segment I little less than twice as long as wide, 1.25 times as long as II; segment II 1.5 times longer than wide, 1.3 times as long as III; segments III-VI equal in length, nearly as long as wide but narrower than VII; segment VII 1.5 times as long as wide.

Prothorax glabrous, longer than wide, WP/LP 1.17; weak convex at disc; except with the following scaly markings: 1) transverse confluent scale line on disc; 2) transverse confluent scale line along anterior margin; 3) oval patch of scales at each lateral base, which connects both transverse lines and circumscribes oval extended figure. Dorsal contour continuous, widest from apical 2/3 to subbasal part where it narrows before extension at posterolateral margin.

Elytra glabrous. LE/WE 1.57, WE/WP 1.57; LE/LP 2.95. Each elytron with the following markings: 1) transverse suboval figure circumscribed by a narrow scale band in basal third, reaching from interval I to lateral margin; 2) two narrow convergent parallel transverse lines confluent at margin with a marginal stripe in the middle, latter of which circumscribes in apical third more of less triangular figure. Dorsal contour highest in middle.

Coxae very minutely pubescent, mingled with light brown hairs; fore coxae densely covered with general scales on anterior parts. Femur sparsely pubescent, with short light-brown hairs closer to base; large oval scaly patch on subapical part except anterior margin. Tibiae well furnished with light-coloured hairs which become more long and dense apically, sparsely mingled with slightly darker setae; ventral surface with hairs on interomarginal parts. Tarsus ans claws mingled with long light-brown hairs.

Male unknown.

Diagnosis. *Pachyrhynchus neoabsurdus* sp. nov. in general appearance is similar to all members of "absurdus" group, but is easily distinguishable by: 1) unique pattern of body and scale color (Fig. 1F); 2) smaller body; 3) less extent apex; 4) lateral contour of elytra peak from middle to subapical part, with more gradual sinuation; 5) forehead with weaker impression; 6) shallow transverse groove before forehead.

Etymology. From first view this new species seems most distant member of “absurdus” group, with characteristic for this group marking of scales as mayor sign of belonging. Reason for “neo” before “absurdus” in species name is new and unique general pattern for member of “absurdus” group.

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New species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from Mindanao, Philippines

Maurizio Bollino, Franco Sandel, Anita Rukmane

Bollino M., Sandel F., Rukmane A. 2017. New species of the genus *Pachyrhynchus* Germar, 1823 (Coleoptera: Curculionidae) from Mindanao, Philippines. *Baltic J. Coleopterol.*, 17(2): 189 - 204.

Pachyrhynchus banglas sp. nov. and *P. esperanza* sp. nov., two new species of the Entiminae Pachyrhynchini genus *Pachyrhynchus* Germar, 1823 (Curculionidae) from the Philippines, Mindanao Island, are described. Diagnosis of each taxon is provided, and habitus photographs and illustrations of male and female genitalia are given. The authors also propose a new taxonomical arrangement of two species groups: *Pachyrhynchus amabilis* species group and *Pachyrhynchus schoenherri* species group. The new synonymy: *Pachyrhynchus elegans* Waterhouse, 1842 (= *P. eos* Heller, 1924, **syn. n.**) is also established.

Key words: taxonomy, Pachyrhynchini, new species, new synonymy, Mindanao, broad-nosed weevils, genital morphology, taxonomical arrangement.

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INTRODUCTION

Even if the Philippine fauna of Curculionidae Pachyrhynchini was studied by several authors till the beginning of the 20th century, it is still poorly known, the works by Heller and Schultze being yet the reference texts to the taxonomy of the tribe, and this is especially true for some of the less sampled areas like the interior of the island of Mindanao. In recent years the

Pachyrhynchus fauna of the island has attracted the attention of entomologists bringing to the description of new species (Yoshitake, 2012; Rukmane & Barðevskis, 2016; Rukmane, 2016; Cabras & Rukmane, 2016).

Following the study of material belonging to the genus *Pachyrhynchus*, two new species were identified, and they are described herein.

MATERIAL AND METHODS

This study was based on specimens deposited in the following collections:

CFS - private collection of Franco Sandel, Miane, Italy

DUBC - Daugavpils University Beetle Collection, Daugavpils, Latvia

KUM - the Kyushu University Museum, Fukuoka, Japan

MBLI - private collection of Maurizio Bollino, Lecce, Italy

NIAES - National Institute for Agro-Environmental Sciences, Tsukuba, Japan

SMTD - Senckenberg Natural History Collections, Dresden, Germany

The laboratory research and measurements have been carried out using Nikon AZ100, Nikon SMZ745T, Zeiss Stereo Lumar V12 digital stereomicroscopes, and NIS - Elements 6D software. The illustrations, as well as the treatment of the genitals, were identical to those described in Bollino and Sandel (2017).

Label data are cited *verbatim*. In the text we used the following symbols and abbreviations:

/ = different lines

// = different labels

LB = body length, from the apical margin of pronotum to the apex of elytra

LE = elytral length, from the level of the basal margins to the apex of elytra

LP = pronotal length, from the base to apex along the midline

LR = length of the rostrum

WE = maximum width across the elytra

WP = maximum width across the pronotum

WR = maximum width across the rostrum

RESULTS

Pachyrhynchus banglas sp. nov. (figs. 1a-1d)

Diagnosis. *Pachyrhynchus banglas* belongs to the *Pachyrhynchys amabilis* species group (see taxonomical notes below), and differs from all

other species of the group for its elytral ornamentation.

Type material. Holotype, Male (figs. 1a-1b): Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan : XI-2014 / Coll. Franco Sandel (typed on white card); HOLOTYPE / *Pachyrhynchus esperanza* / Bollino, Sandel & Rukmane 2017 (typed on red card) presently in CFS, will be deposited in SMTD.

Paratypes (37 males, 26 females): 3 males, Philippines - Mindanao / Cabanglasan - Bukidnon / III-IV.2013 / m 800-1000 - Lg. local people / coll. M. Bollino; 2 males, Philippines - Mindanao / Cabanglasan - Bukidnon / XII.2014-I.2015 / lg. local people - coll. Bollino; 2 males, Philippines - Mindanao / Cabanglasan - Bukidnon / XI.2014 / coll. Bollino; 1 male, Philippines - Mindanao / San Fernando - Bukidnon / X.2013 / lg. local people - coll. Bollino; 1 male, Philippines - Mindanao / Cabanglasan / (Bukidnon) / IX-XI.2016 / coll. M. Bollino; 4 females, Philippines - Mindanao / San Fernando - Bukidnon / X.2013 / lg. local people - coll. Bollino; 1 male, Philippines - Mindanao / Cabanglasan / (Bukidnon) / IX-XI.2016 / coll. M. Bollino, all in MBLI; 1 male, Philippines, Mindanao, Bukidnon, Intavas, VII. 2014; 2 males, Philippines, Mindanao, Bukidnon, Cabanglasan, VI. 2014; 2 males, 1 female, same data, but VII. 2014; 2 males, same data, but VIII. 2014; 1 male, same data, but XI. 2014; 1 male, same data, but VII. 2015; 1 male, same data, but VIII. 2015; 3 females, same data, but X. 2015; 2 males, 1 female, same data, but XI. 2015; 1 male, 1 female, same data, but VIII. 2016; 1 male, same data, but IX. 2016, all in DUBC; 3 males, 2 females, [PHILIPPINES: Mindanao], Northern Mindanao region, Bukidnon, Malaybalay / Cabanglasan, Summit Mountain, X. 2013, native collector leg. (Hiraku Yoshitake Collection), all in NIAES; 1 female, Philippines, Mindanao/Bukidnon, San Fernando, / III. 2014, / Local collector, (Munetoshi Maruyama Collection); 1 male, Philippines, Mindanao,/Bukidnon, Cabanglasan,/V 2014/ Local collector, (Munetoshi Maruyama Collection); 2 females,

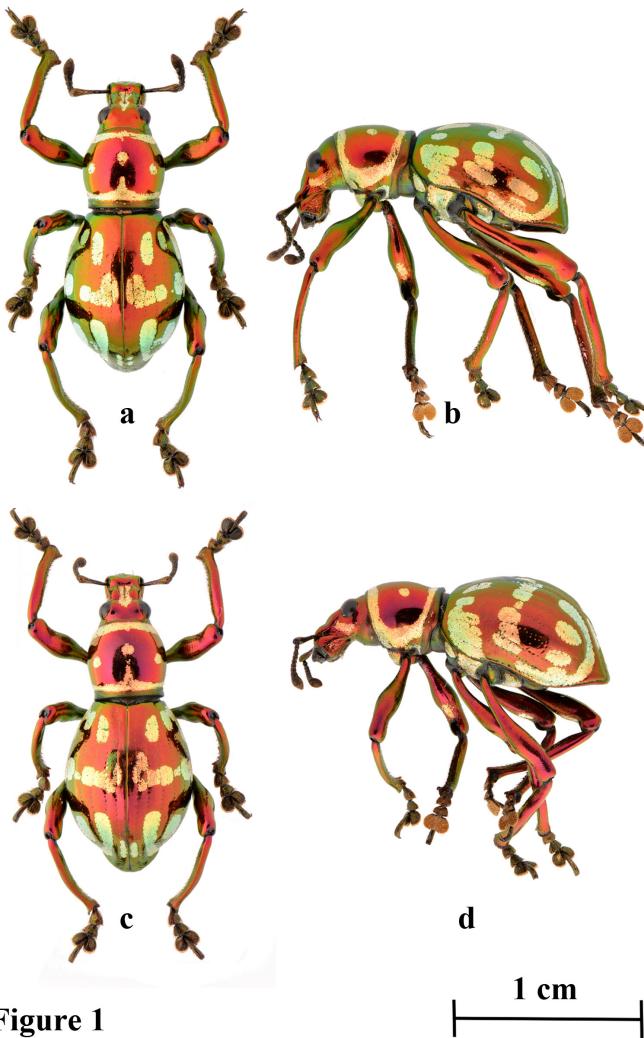


Figure 1

Figure 1- a: *Pachyrhynchus banglas* Holotype dorsal view; b: idem, lateral view, c: *Pachyrhynchus banglas* female dorsal view; d: idem, lateral view

Philippines, Mindanao,/ Bukidnon, Cabanglasan,/ VIII 2014/ Local collector, (Munetoshi Maruyama Collection), all in KUM; 2 males, 1 female, Philippines - Mindanao / Bukidnon: Kabanglasan / 800/1000 mt.- 03-VI-2013 / Coll. Franco Sandel; 2 males, Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan: XII-2013 / Coll. Franco Sandel; 1 male, 1 female, Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan: I-2015 / Coll.

Franco Sandel; 2 males, 3 females, Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan: IX-2014 / Coll. Franco Sandel; 1 male, Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan: IX-2014 / Coll. Franco Sandel; 1 male, 1 female, Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan: X-2014 / Coll. Franco Sandel; 1 male, 4 females, Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan: XI-2014 / Coll. Franco Sandel; 1 male,

Philippines Islands / Mindanao - Bukidnon Pr. / Kabanglasan: XII-2015 / Coll. Franco Sandel, all in CFS.

Description

Male. Measurements (holotype): LB: 11.6; LE: 7.3; WE: 5.5; LP: 3.8; WP: 3.9; LR: 2.0; WR: 1.7.

Integument dark shiny red. Body surface strongly shiny, except underside with weaker luster; markings formed by glossy golden green to golden yellow round recumbent scales.

Rostrum longer than wide (LR/WR 1.17) without pubescence on dorsum, weakly bulging on apical half, with deep triangular impression on basal half extending to frons; lateral parts covered with golden yellow scales and golden long hairs before antennal scrobes, and golden hair-like scales after antennal scrobes, with long golden hairs near apex. Scape clavate, covered with setae; first antennomere longer than wide, other antennomeres subspherical and with long brown setae and short pubescence. Head glabrous, finely punctured; eyes relatively large, strongly prominent from outline of head.

Prothorax subspherical, approximately the same width and length (WP/LP 1.06), widest just basal of middle; minutely punctured; golden green and yellow continuous scale line on basal, lateral and apical margins; longitudinal patch of round scales in middle near base merged with basal line along margin; on median transverse line one dorso-lateral round spot on each side and one larger spot in the middle of pronotal discus.

Legs stout; femora strongly clavate, with scale-type hairs and golden green and yellow scales on anterior subapical part; tibiae incurved apically, with mucrones on all legs, sparsely minutely pubescent and fringed with long brown setae along internal margin; tarsus with long, light brown setae.

Elytra subovate (LE/WE: 1.62) glabrous, coarsely punctate-striate. Each elytron with the following thirteen scaly markings of golden green/yellow round scales: 1) subapical spot on interval I, 2) large antemedian spot on intervals I-II, 3) sub-basal and antimedian spots on interval III, 5) an arched spot with apical convexity starting postmedially at interval III and reaching the postmedian portion of marginal area; 6) antimedian spot on interval IV, 7) large postmedian spot on intervals IV-V, 8) antimedian spot on interval VI, 9-11) sub-basal, antimedian and postmedian spots on interval VII, 12) long stripe all along interval VIII, 13) large spot covering humeral area and extended to sub-basal portion of marginal area.

Elytra wider than prothorax (WE/WP 1.4), nearly twice as long as prothorax (LE/LP 1.9); widest in the middle, then strongly narrowed to faint subapical constrictions and rounded at apices.

Sterna and venter sparsely covered with fine light-coloured hairs in addition to minute pubescence, with markings of glossy yellow-gold round scales; intercoxal parts of prosternum covered with yellow scales; metasternum nearly totally covered of round yellow scales with gold shining; smaller scaly patches on ventrites I and II. Median portion of ventrite I with several small tubercles.

Genitalia as illustrated (figs. 3a-3d)

The everted endophallus (figs. 5b and 6b) of *P. banglas* has the same structure of that of other species belonging to the same species group, *P. zamboanganus* being unique in differing in the shape of basal medio-ventral diverticulum. Whether the shape of the basal medio-ventral diverticulum in *P. zamboanganus* is a plesiomorphic or apomorphic character state remains to be determined, but it is not unlike that *P. zamboanganus* and other species included under the same group share an immediate common ancestor. The extreme morphological similarity between the reproductive apparatus of different species

belonging to the same group allow to presume that it does not constitute a reproductive barrier, even if we can assume that other barriers to gene flow (geographic isolation or changes in chromosomes, within others) are active. Anyway, lacking evidences of the existence of barriers to gene flow, we prefer to use the phylogenetic species concept (Wheeler and Platnick, 2000), which defines species as „the smallest aggregation of populations diagnosable by a unique combination of character states”. This concept is less restrictive than the biological species concept because eventual breeding between individuals of different species does not pose a problem.

Female. Dimensions: LB:12.5; LE: 8.9; WE: 5.5; LP: 3.6; WP: 3.8; LR: 2.1; WR: 1.8. Larger than male. Elytra more strongly elongate apically. Ventrites I and II slightly inflated. Otherwise, essentially as in males.

Genitalia as illustrated (figs. 3e-3g).

Distribution

The new species is apparently restricted to central Bukidnon.

Etymology

The new species is named after the Banglas tree, an endemic tree species that inhabits and grows abundantly and distinctively only around Cabanglasan, which literally means „place that has plenty of Banglas”.

Taxonomical notes

The species of the genus *Pachyrhynchus* were tentatively arranged in groups by both Heller (1912) and Schultze (1923 and 1924). Even if grouping by Schultze is far more acceptable than that by Heller, we consider both groupments as artificial, each group including an

heterogeneous set of species. Thus we here start to introduce groups including a more homogeneous set of taxa, all sharing the same morphological characters.

Pachyrhynchus banglas n. sp. appears to belong to a group of related species that we here name the *amabilis* species group, and which, at best of our knowledge, is restricted to mainland Mindanao. The species of this presumably monophyletic group share the following combination of morphological characters:

1. Integument dark glowing red, with more or less marked green tinge.
2. Eyes strongly convex from outline of head.
3. Prothorax subspherical, with sides straightly dilated from constricted base.
4. Prothorax with a scale band along anterior margin and another along posterior margin united at lateral margins, the latter discally somewhat denticulated.
5. Endophallus with the same shape.

To this newly defined group are assigned the following species, in order of the year of description.

1. *Pachyrhynchus amabilis* Schultze, 1922
TL: Mindanao Isl., Prov. Bukidnon, Lindaban. Type in SMTD, examined.
2. *Pachyrhynchus chamissoi* Schultze, 1922
TL: Mindanao Isl., Prov. Bukidnon, Lindaban. Type in SMTD, examined.
3. *Pachyrhynchus pseudamabilis* Yoshitake, 2012
TL: Philippines, Mindanao Isl., Mt. Apo. Type in NIAES.
4. *Pachyrhynchus subamabilis* Yoshitake, 2012
TL: Mt. Apo, S. Mindanao Isl., Philippines. Type in NIAES.

Note. The type locality is most probably wrong, and derived by a mislabelling of the type specimen. As underlined by Yoshitake (2016), "not a

few of the [*Pachyrhynchus*] specimens distributed have been provided insufficient or even incorrect data by local collectors and dealers". Even if the Apo Range has been intensively sampled by local collectors in recent years, we never studied a single example of *Pachyrhynchus subamabilis* from that area, thus we may assume the species is absent. On the contrary, we examined long series of specimens belonging to this species and collected near Wao, Lanao del Sur. Moreover, we had the opportunity to examine a couple of specimens perfectly matching the holotype and collected at S. Vicente, 20 km S of Cagayan de Oro (Bukidnon).

5. *Pachyrhynchus zamboanganus* Yoshitake, 2012

TL: Philippines, West Mindanao Isl., Zamboanga del Norte Province. Type in NIAES.

Note. The holotype has no more data than "Zamboanga del Norte Province", while the series in our reference collections were collected near Tampilisan and Labuan (Zamboanga del Norte Province).

6. *Pachyrhynchus tikoi* Rukmane, 2016

TL: Philippines, Mindanao Isl., Bukidnon, Cabanglasan. Type in DUBC, examined.

7. *Pachyrhynchus banglas* sp. nov.

TL: Philippines, Mindanao Isl., Bukidnon, Kabanglasan.

Pachyrhynchus esperanza sp. nov. (figs. 2a-2d)

Diagnosis. *Pachyrhynchus esperanza* belongs to the *Pachyrhynchys schoenherri* species group (see taxonomical notes below), differing from all other species of the group for its elytral

ornamentation. The most similar species belonging to the same group is *Pachyrhynchus nitcisi* Rukmane & Barsevskis, 2016, from which the new species differs in having an average smaller size, a different endophallus, a small round spot on each side of median portion of prothorax (the same spot is elongate in *P. nitcisi*), an elytral axially elongate postmedian parasutural spot which apparently lacks in *P. nitcisi*, being it in the latter always merged with the nearby postmedian lateral one.

Type material. Holotype, Male (figs. 2a-2b): Philippines - Mindanao / Esperanza - Agusan del Sur / August 2012 / legit local people - coll. Bollino; (typed on white card); HOLOTYPE / *Pachyrhynchus esperanza* / Bollino, Sandel & Rukmane 2017 (typed on red card) presently in MBLI, will be deposited in SMTD.

Paratypes (42 males, 41 females): 8 males, 11 females, same data as holotype; 2 males, 5 females, Philippines - Mindanao / Esperanza - Agusan del Sur / I. 2013 / legit local people - coll. Bollino; 1 female, Mindanao / Agusan del Sur - Esperanza / XII.14-I.15 / coll. Bollino; 1 male, 1 female, Philippines - Mindanao / San Miguel - Surigao del Sur / XII.2014-I.2015 / lg. local people - coll. Bollino; 1 female, Philippines - Mindanao / Sibagat / (Agusan del Sur) / IX-XI.2016 / coll. Bollino, all in MBLI; 1 male, 4 females, Philippines, Mindanao, Agusan Del Sur, Sibagat, XI. 2015; 1 male, 1 female, idem, XII. 2015; 1 female, idem, I. 2016; 1 male, idem, V. 2016; 2 male, idem, VIII. 2016; 1 male, idem, IX. 2016; 1 male, Bukidnon, Cabanglasan, XI. 2015; 1 female, Bukidnon, Valencia, I. 2016; 1 male, 1 female, Surigao Del Sur, Esperanza, VII. 2014; 1 male, 1 female, idem, VIII. 2014; 1 male, idem, VIII. 2016; 1 male, idem, IX. 2016, all in DUBC; 3 males, 2 females, [PHILIPPINES: Mindanao], Caraga region, Agusan del Sur, Talacogon, X. 2013, native collector leg. (Hiraku Yoshitake Collection), all in NIAES; 1 female, Philippines: Mindanao, Agusan del Sur, VIII. 2012, / Local collector (Munetoshi Maruyama Collection); 2

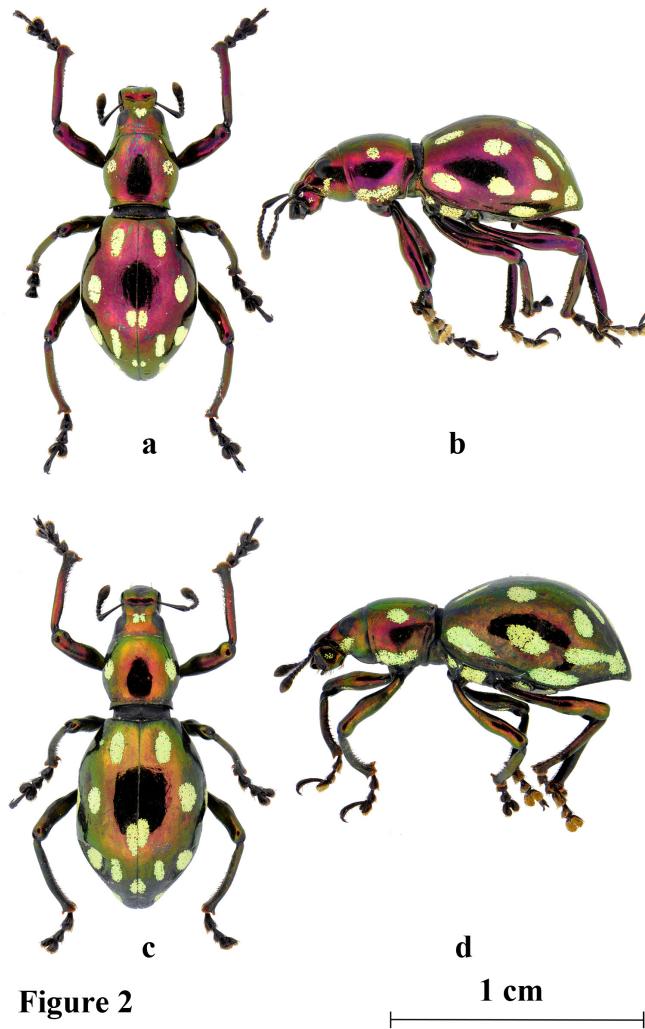


Figure 2 - a: *Pachyrhynchus esperanza* Holotype dorsal view; b: idem, lateral view, c: *Pachyrhynchus esperanza* female dorsal view; d: idem, lateral view

males, Philippines: Mindanao,/ Agusan del Norte, Esperanza, V. 2014,/ Local collector, (Munetoshi Maruyama Collection); 1 female, Philippines / Esperanza, Agusan, Del / Norte Mindanao / X. 2015, Local collector, (Munetoshi Maruyama Collection); 1 female, Philippines: Mindanao, / Esperanza, Agusan, Del / Norte, X. 2015, / Local collector, (Munetoshi Maruyama Collection), all in KUM; 9 males, 5 females, Philippines - Mindanao / Agusan del

Norte Prov. / Esperanza: VII-2012 / Coll. Franco Sandel; 4 males, 3 females, Philippines - Mindanao / Agusan del Norte Prov. / Esperanza: I-2013 / Coll. Franco Sandel; 1 male, Philippines - Mindanao / Agusan del Norte Prov. / Esperanza: XI-2014 / Coll. Franco Sandel; 1 female, Philippines - Mindanao / Agusan del Norte Prov. / Sibagat: XII-2012 / Coll. Franco Sandel, all in CFS

Description

Male. Measurements: (holotype) LB: 10.0; LE: 6.5; WE: 4.5; LP: 3.0; WP: 3.0; LR: 1.7; WR: 1.5.

Integument carmine. Body surface strongly shiny, except underside. Light yellow markings of round scales on elytra, pronotum and head.

Rostrum nearly as wide as long (wide/length 1.1) without pubescence on dorsum, with deep ovate impression on basal half, weakly bulging on apical half; each side of rostrum with very few hair-like scales and setae, long, rare setae

on labrum; pale yellow ovate scale margins on lateral sides of rostrum and genae. Antennal scape longer than wide, apically widest, strongly latero-laterally flattened; antennal segment 1 elongate, nearly twice long as wide, with the basal third restricted and the remaining two thirds dilated; other segments subspherical, with sparse short setae and pubescence; apical antennomere club-shaped, nearly twice long as wide. Head glabrous, minutely punctured; forehead with shallow impression and a median spot of round, pale greenish yellow scales; eyes relatively small, not prominent from outline of head.

Prothorax elliptical, maximum transverse diameter basal of middle, narrowest before apical margin, as wide as long, shiny, minutely punctured, with pale green scale spot on each side of median portion of prothorax; patch of pale green round scales on anterior portion of lateral margin.

Legs stout; femora clavate, with rare pubescence near base and posterior margins, minutely punctured; tibiae laterally flattened, serrate along internal margins, incurved apically, mucronate at apices, with long hairs along internal margin and minutely pubescent; tarsus with elongate, narrow claws, approximately 0.8 times its length, with brown long setae on all dorsal parts, and light brown hairs on ventral side.

Elytra elongate (LE/LB: 0.7), longer than wide (LE/WE: 1.26), wider than prothorax (WE/WP: 1.5), more than two times longer than prothorax (LE/LP: 2.15); widest in the middle, then strongly narrowed and rounded at apex; elytra with smooth intervals and sparse puncture; dorsal convexity highest in the middle. Each elytron with eleven round or elongate pale green scale spots: 1) two elongate basal spots, one median, one lateral; 2) two round spots on median portion, one median, one lateral; 3) elongate spot before lateral margin, between median and apical portion; 4) one round and two elongate subapical spots; 5) triangular spot on apical

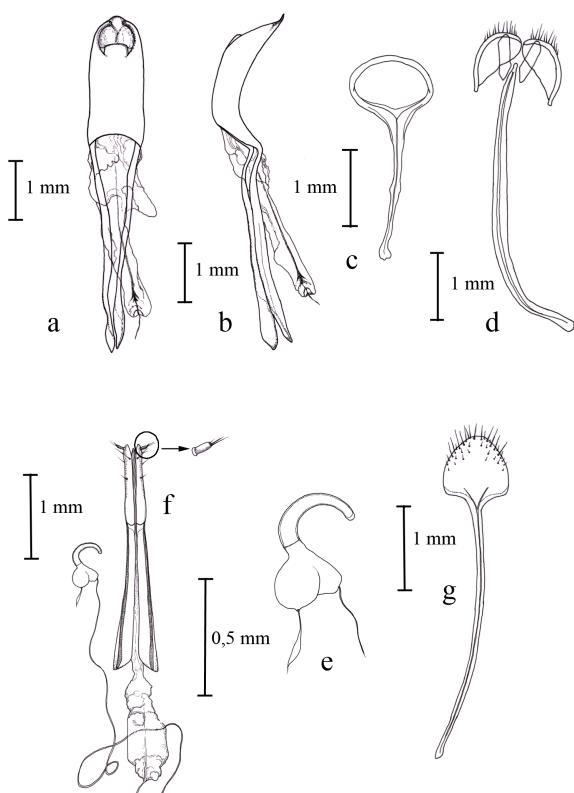


Fig 3. Male genitalia and female terminalia of *Pachyrhynchus banglas* sp. nov. a: penis in dorsal view; b: idem in lateral view; c: sternite IX in dorsal view; d: tegmen in dorsal view; e: spermatheca; f: ovipositor in dorsal view; g: sternite VIII in ventral view

margin; 6) two small round parasutural spots, one postmedian and one subapical.

Sterna and venter sparsely covered with fine light-coloured hairs in addition to minute pubescence, with markings of glossy green-yellow round scales; intercoxal parts of prosternum with yellow scales; metasternum with lateral spots of round yellow scales with golden shining; small scaly patches on ventrites I and II. Ventrite I with wrinkled central portion.

Genitalia as illustrated (figs. 4a-4d).

All species of the *Pachyrhynchys schoenherri* species group (see taxonomical notes here below) have the same pattern of the endophallus either in lateral and in ventral view, with a bulbous baso-ventral diverticulum and a large dilatation along the flagellar diverticulum. *Pachyrhynchus esperanza* is the only species which differs from other taxa of the group as it does not have the bulbous baso-ventral

diverticulum, and has only a small dilatation along the flagellar diverticulum. We can not state if this difference is a primitive or derived character state, but it seems that the involved species all derive from a common ancestor.

Female. Dimensions: LB: 12.6; LE: 7.3; WE: 5.8; LP: 2.9; WP: 3.3; LR: 1.4; WR: 1.6.

Larger than male; elytra wider and less tapered. Ventrites I and II slightly inflated. Ventrite V widely shallowly depressed along margins, with obtuse triangular laminate projection in middle of apex. Otherwise, essentially as in males.

Genitalia as illustrated (figs. 4e-4g).

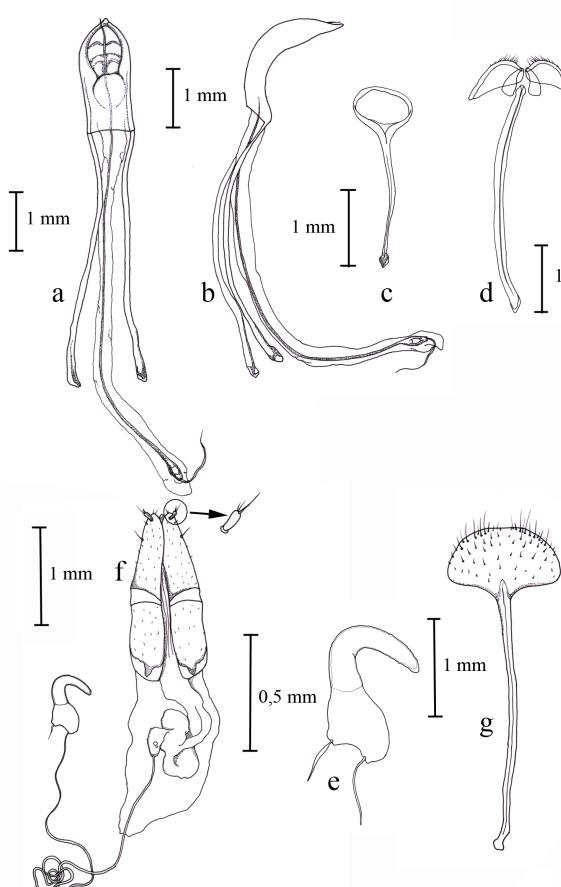


Fig 4. Male genitalia and female terminalia of *Pachyrhynchus esperanza* sp. nov. a: penis in dorsal view; b: idem in lateral view; c: sternite IX in dorsal view; d: tegmen in dorsal view; e: spermatheca; f: ovipositor in dorsal view; g: sternite VIII in ventral view

Distribution

At best of our knowledge, the new species is distributed from Bukidnon northeastward to Surigao del Sur.

Etymology

The new species is called after Esperanza (Agusan del Sur) from where a nice series was examined. Moreover, the term "Esperanza" is of Spanish origin and means "hope" for peace and serenity to return throughout the island of Mindanao.

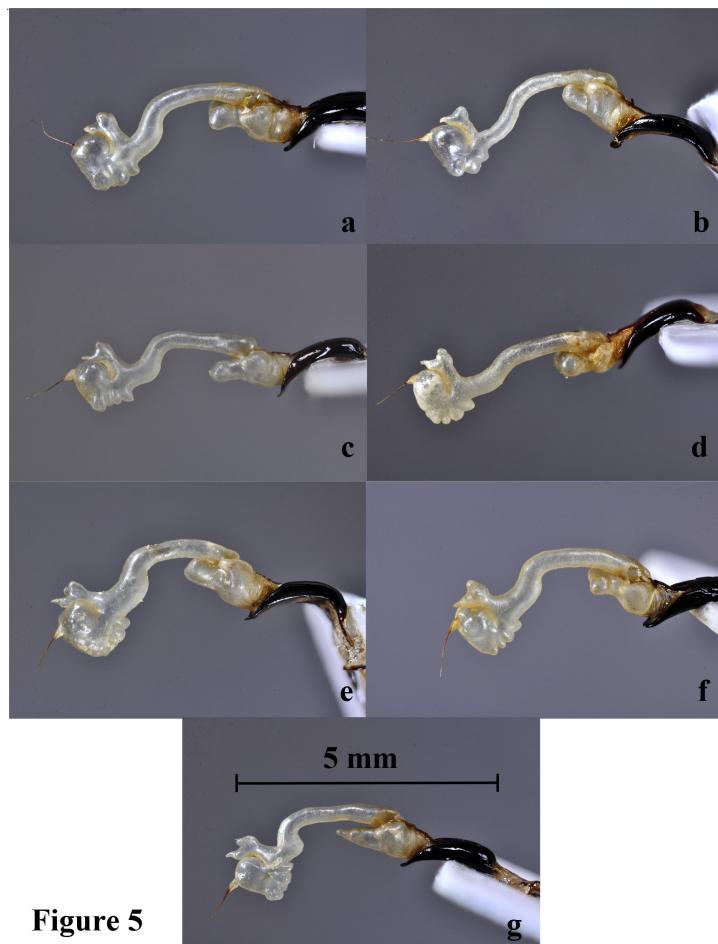


Figure 5

Fig. 5 - endophallus in lateral view. a: *Pachyrhynchus amabilis*; b: *P. banglas*; c: *P. chamissoi*; d: *P. pseudoamabilis*; e: *P. subamabilis*; f: *P. tikoi*; g: *P. zamboanganus*

Taxonomical notes

Pachyrhynchus esperanza sp. nov. shows morphological relationships with a small group of species distributed within the greater Mindanao Pleistocene Aggregate Island Complex (PAIC), which includes Samar, Leyte, Bohol, Siargao, Bucas Grande, Dinagat, Basilan and mainland Mindanao. We define here it as the *schoenherri* species group. Species of this group share the following combination of morphological characters:

1. Integument dark glowing red, with few green tinge.
2. Eyes weakly convex from outline of head.
3. Prothorax subspherical, with sides strongly straightly dilated from very strongly constricted base.
4. Prothorax with a pair of scaly patches on both sides of middle of pronotum.
5. Each elytron with at least the following scaly markings: two basal spots (one median, one lateral); two spots on median portion (one median, one lateral); one postmedian and

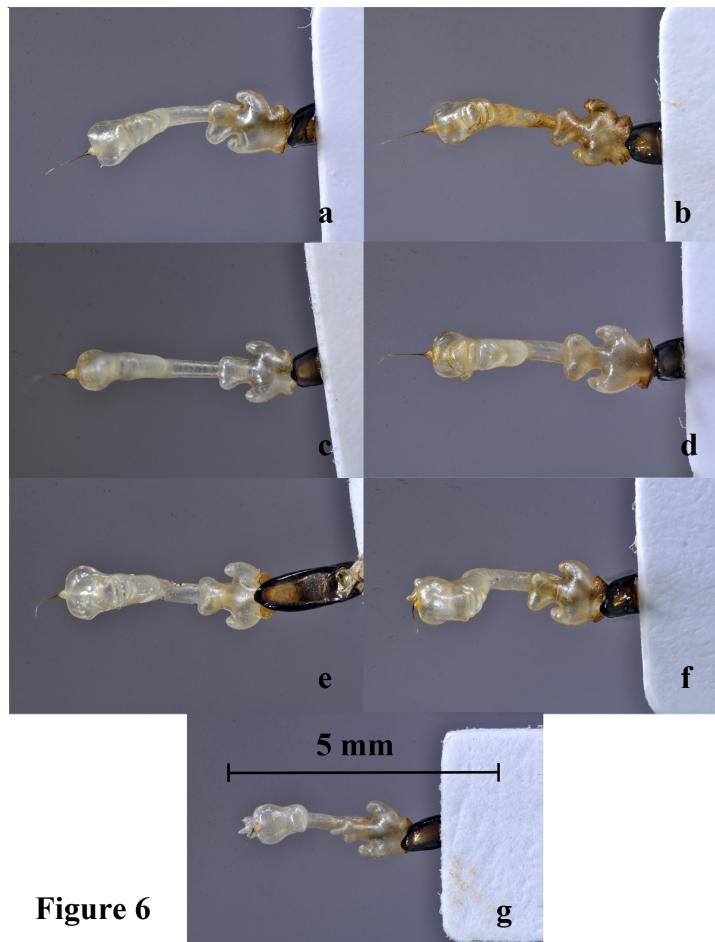


Figure 6

Fig. 6 - endophallus in ventral view. a: *Pachyrhynchus amabilis*; b: *P. banglas*; c: *P. chamissoi*; d: *P. pseudoamabilis*; e: *P. subamabilis*; f: *P. tikoi*; g: *P. zamboanganus*

one subapical spot; one postmedian and one subapical parasutural spot.

To this newly defined group are assigned the following species, in order of the year of description:

1. *Pachyrhynchus schoenherri* Waterhouse, 1841

TL: Philippines, [Leyte]. Type in BMNH, examined.

Note. Recently collected specimens from the island of Leyte perfectly match the holotype of *P. schoenherri*,

except the colour of the spots, which in the holotype are green, whereas in our specimens spots are greenish yellow. Specimens with either yellow or green spots usually occur in related species like *P. apoensis*, *P. corpulentus*, *P. nitcisi* and *P. esperanza*, so we can assume that it happens also in *P. schoenherri*.

2. *Pachyrhynchus elegans* Waterhouse, 1842

TL: Philippines, [Northern Samar]. Type in BMNH, examined.

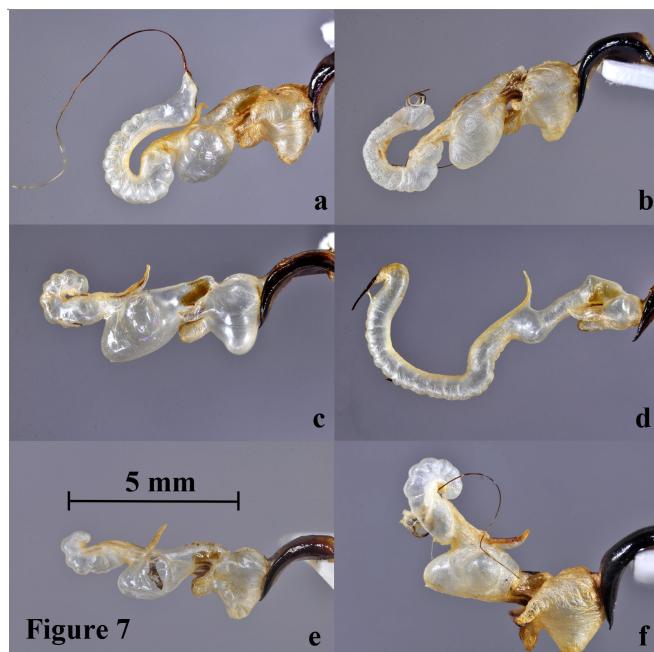


Fig. 7 - endophallus in lateral view. a: *Pachyrhynchus apoensis*; b: *P. corpulentus*; c: *P. elegans*; d: *P. esperanza*; e: *P. nitcisi*; f: *P. schoenherri*

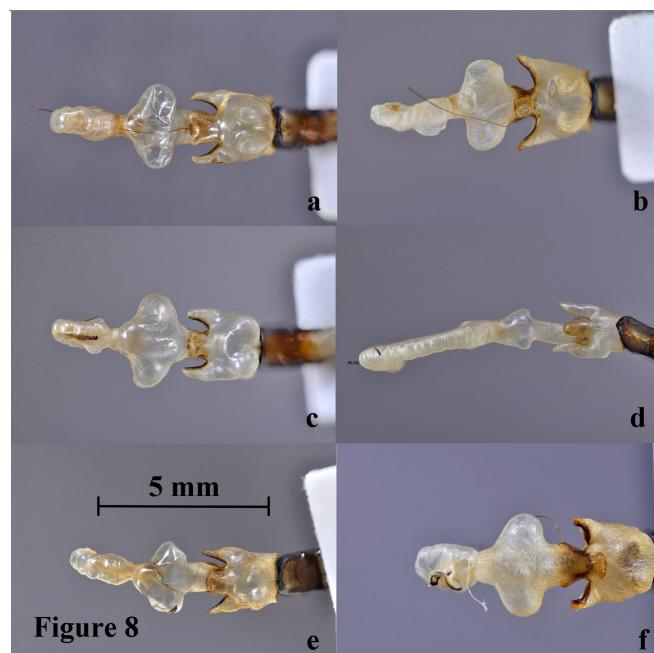


Fig. 8 - endophallus in ventral view. a: *Pachyrhynchus apoensis*; b: *P. corpulentus*; c: *P. elegans*; d: *P. esperanza*; e: *P. nitcisi*; f: *P. schoenherri*

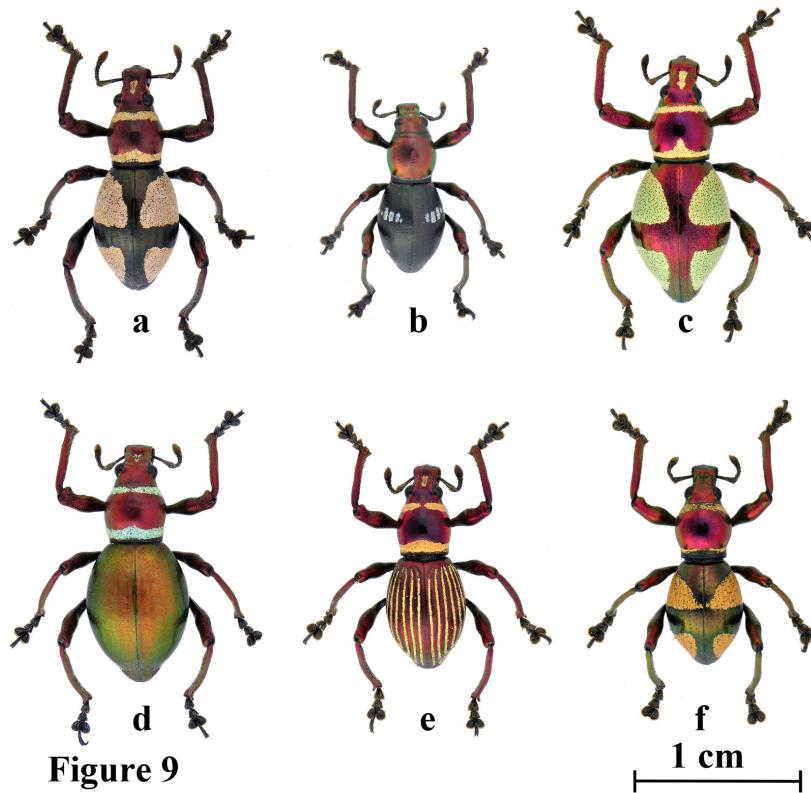


Figure 9

Fig. 9- Other species of the *Pachyrhynchus amabilis* species group. a: *P. amabilis*; b: *P. chamissoi*; c: *P. pseudoamabilis*; d: *P. subamabilis*; e: *P. ticoi*; f: *P. zamboanganus*

= *Pachyrhynchus eos* Heller, 1924 n.

syn.

TL: Insula Samar. Type in SMTD, examined.

Note. Many specimens of this taxon were recently obtained from Northern Samar, thus we restrict the type locality to the northern part of this island. In Central Samar all specimens match the pattern of *P. eos* Heller, 1924, while in Northern Samar rare specimens matching in various degree the pattern of *P. eos* coexists with much more frequent *P. elegans* typical specimens. Having found no more differences between both taxa than the pattern of elytral spots, we consider them as

conspecific. We justify the presence of the two "forms" (so called only for dialectical convenience) because *P. elegans* appears involved in a Müllerian mimicry with other *Pachyrhynchus* species, within others. In fact, *P. elegans* coexists with *P. samarensis* Schultze, 1923 and *P. latifasciatus* Waterhouse, 1842 in Northern Samar, while the *P. eos* form shares the same habitat with *P. cf. speciosus* and *P. regius boronganus* Schultze, 1934 in Central Samar. Finally, it is worth noting that both *P. elegans* and *P. latifasciatus* have been recently collected in the same Northern Samar locality, and both taxa were

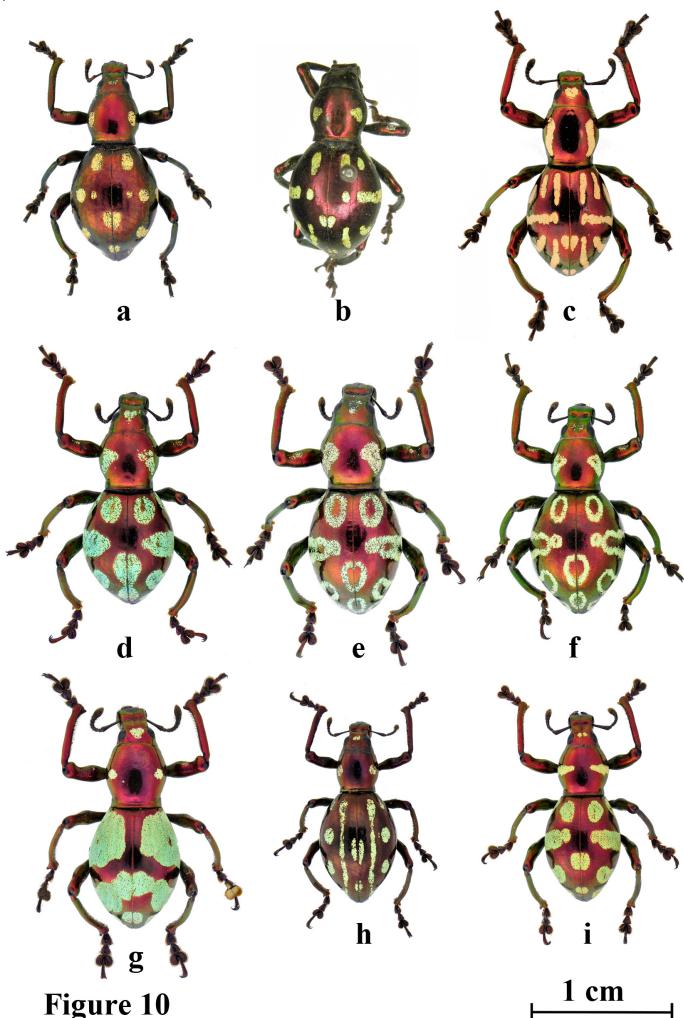


Figure 10

Fig. 10- Other species of the *Pachyrhynchus schoenherri* species group. a: *P. schoenherri*; b: *P. ardentius* (HT, in SMTD); c: *P. corpulentus*; d: *P. elegans* (Northern Samar); e: *P. elegans* (Northern Samar); f: *P. elegans* (Central Samar); g: *P. apoensis*; h: *P. esperanza* (individual form); i: *P. nitcisi*

described by Waterhouse based on Cuming's material supposedly collected in the same locality.

3. *Pachyrhynchus ardentius* Schultze, 1919
TL: Siargao Island. Type in SMTD, examined.

4. *Pachyrhynchus corpulentus* Schultze, 1922
TL: Mindano, Bukidnon, Lindaban [sic!]. Type in SMTD, examined.

Note. This taxon was described by Schultze (1922) as a subspecies of *P. ardentius*, but Yoshitake (2012: 32) upgraded it to species level, and we agree with his opinion.

5. *Pachyrhynchus apoensis* Yoshitake, 2012
TL: Mindanao, Mt. Apo. Type in NIAES.
= *Pachyrhynchus pseudoapoensis*
Rukmane & Barðevskis, 2016
TL: Luzon Isl., North Luzon.
Type in DUBC, examined.
6. *Pachyrhynchus nitcisi* Rukmane &
Barsevskis, 2016
TL: Mindanao, Sarangani, Malungon.
Type in DUBC, examined.
7. *Pachyrhynchus esperanza* sp. nov.
TL: Mindanao, Agusan del Sur,
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New and additional notes on the distribution of *Pachyrhynchus möllendorffi* Heller, 1899 (Coleoptera, Curculionidae), with description of a new subspecies from the Marinduque Island (Philippines)

Anita Rukmane, Analyn Anzano Cabras

Rukmane A., Cabras A. 2018. New and additional notes on the distribution of *Pachyrhynchus möllendorffi* Heller, 1899 (Coleoptera, Curculionidae), with description of new taxon from the Marinduque Island (Philippines). *Baltic J. Coleopterol.*, 18(2): 57 - 63.

A new data on the distribution of *Pachyrhynchus möllendorffi* Heller, 1899, originally described from "Philippines" (type locality) are given. A new subspecies, *P. möllendorffi marinduquanus* subsp.nov. (Marinduque Island, Philippines) is described. The diagnosis, photographs of habitus and aedeagi, and faunistic notes both for *P. möllendorffi möllendorffi* Heller, 1899 and *P. möllendorffi marinduquanus* subsp.nov. are provided.

Key words: Coleoptera, Curculionidae, *Pachyrhynchus*, fauna, distribution, Philippines

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INTRODUCTION

The genus *Pachyrhynchus* has been extensively studied in the past years after a dormancy of nearly a century after the last publication of Schultze (1934). The new wave of enthusiasm on this genus paved way for the discovery of several new species, especially from unexplored islands and mountain ecosystems (Bollino & Sandel 2015; Barševskis 2016; Cabras & Rukmane 2016; Rukmane & Barševskis 2016; Bollino et al., 2017), together with many new species from different tribes and families of Coleoptera (Barševskis 2013, 2014, 2017a, 2017b;

Barševskis & Jager 2014). The Philippines is an archipelago with complex geological history dating back during the Mesozoic era (Siler et al., 2010) and comprises of 7641 islands. In the nearest future, a lot number of new species are expected to be discovered on these isolated islands, especially for flightless taxa such as *Pachyrhynchus*.

Heller (1899) described *Pachyrhynchus möllendorffi* with the type locality labeled as "Philippines" with no exact geographic data. Schultze (1923) doubtlessly labeled *P. möllendorffi* from South Luzon. This assumption could be

based on the close elytral marking of this species to *P. moniliferous* whose range of distribution at that time is in Luzon. Recent collections from Panay Island provided specimens which are similar to the type specimen of *P. möllendorffi* deposited in SNTD (Dresden). In this paper, new distribution data for *P. möllendorffi* are provided, as well as the description of a new subspecies from Marinduque Island is given.

MATERIAL AND METHODS

The studied material is deposited in the following collections:

DUBC – the beetles collection of Daugavpils University, Institute of Life Sciences and Technology, Coleopterological Research Centre, Ilgas, Daugavpils District, Latvia (A. Barševskis);

SNTD – Senckenberg Naturhistorische Sammlungen Dresden, Germany, Dresden, Germany (K. Klass).

The laboratory research and measurements follows previous works of the senior author (Rukmane & Barševskis, 2016; Rukmane, 2016).

RESULTS

Pachyrhynchus möllendorffi möllendorffi Heller, 1899

(Fig. 1A, 1B, 2, 3B, 4B, 5)

Pachyrhynchus möllendorffi Heller, 1899 (type locality: "Philippines"; type depository: SNTD).

Type material studied: Holotype by monotype ("Type in SNTD") 'Typus' <red rectangular label with black margin>, 'Phillipinen' <white rectangular printed label with black margin>

Specimens examined: Philippines, Panay Island, Antique, Madajas, XII. 2017 (7 males, 6 females), I. 2018 (1 male, 1 female); Culasi, IV. 2018 (1 male, 2 females). All deposited in DUBC.

Diagnosis. See Heller (1899).

Distribution. According to the original work of Heller (1899), author pointed out species distribution as "Philippines". After examination and comparison of the type specimen located in SMTD (Fig. 2) and new material from Panay Island (Fig. 1A, 1B) we found no morphological differences in specimens and assume, that original distribution of current species is Panay Island.

Pachyrhynchus möllendorffi marinduquanus subsp. nov.

(Fig. 1E, 1F, 3A, 4A)

Type material. Holotype, male: "PHILIPPINES, Marinduque Island, Buenavista, III. 2013, local collector leg." (white rectangular card, printed); "HOLOTYPE, Male, *Pachyrhynchus möllendorffi marinduquanus*, Rukmane & Cabras 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (DUBC).

Paratypes: one female: Marinduque Island, Buenavista, IV. 2017; two females: Marinduque Island, Mt. Malinding, IX. 2017. (DUBC).

Distribution: Marinduque Island.

Description. Male. Measurements (n=1): LB: 11.80; LR: 1.70; WR: 1.55; LP: 3.40; WP: 4.05; LE: 6.80; WE: 4.75. Dorsal habitus as in Fig. 1E.

Integument black, body surface very shiny except elytra and underside with weaker lustre.

Body with metallic pale orange, yellow or pink markings of recumbent round scales. Head subglabrous. Rostrum in dorsal contour straight, narrowing in apical side and weakly bulging in base; slightly longer than wide, LR/WR: 1.1; finely punctured, with short light hairs on apical ½; triangular shape impression on median part of rostrum from medial line to subbasal part of rostrum; lateroventral parts thickly covered with general scales and long golden hairs from

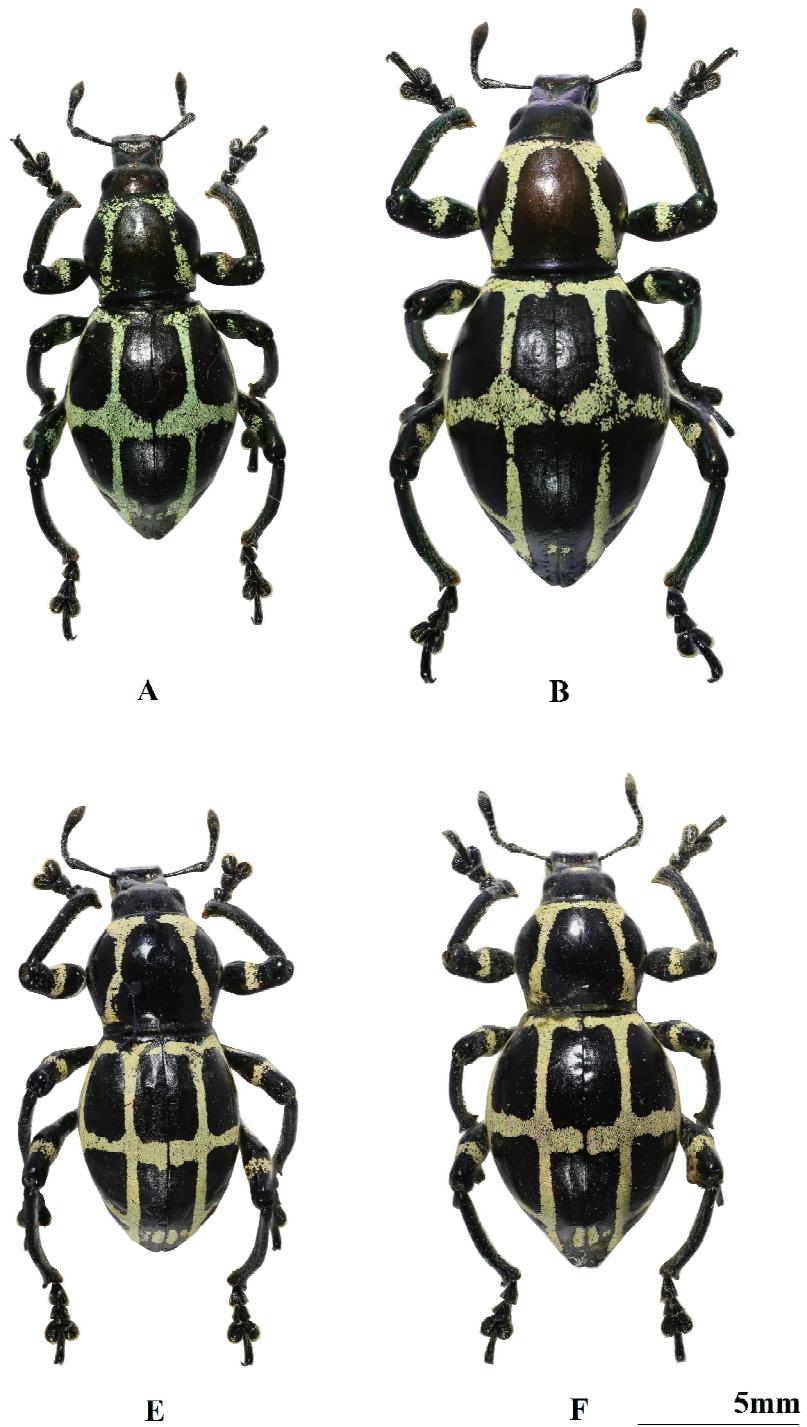


Fig. 1: Dorsal habitus of A – *P. mollendorffi* (male); B - *P. mollendorffi* (female); C – *P. mollendorffi marinduquanus* (male); D - *P. mollendorffi marinduquanus* (female).

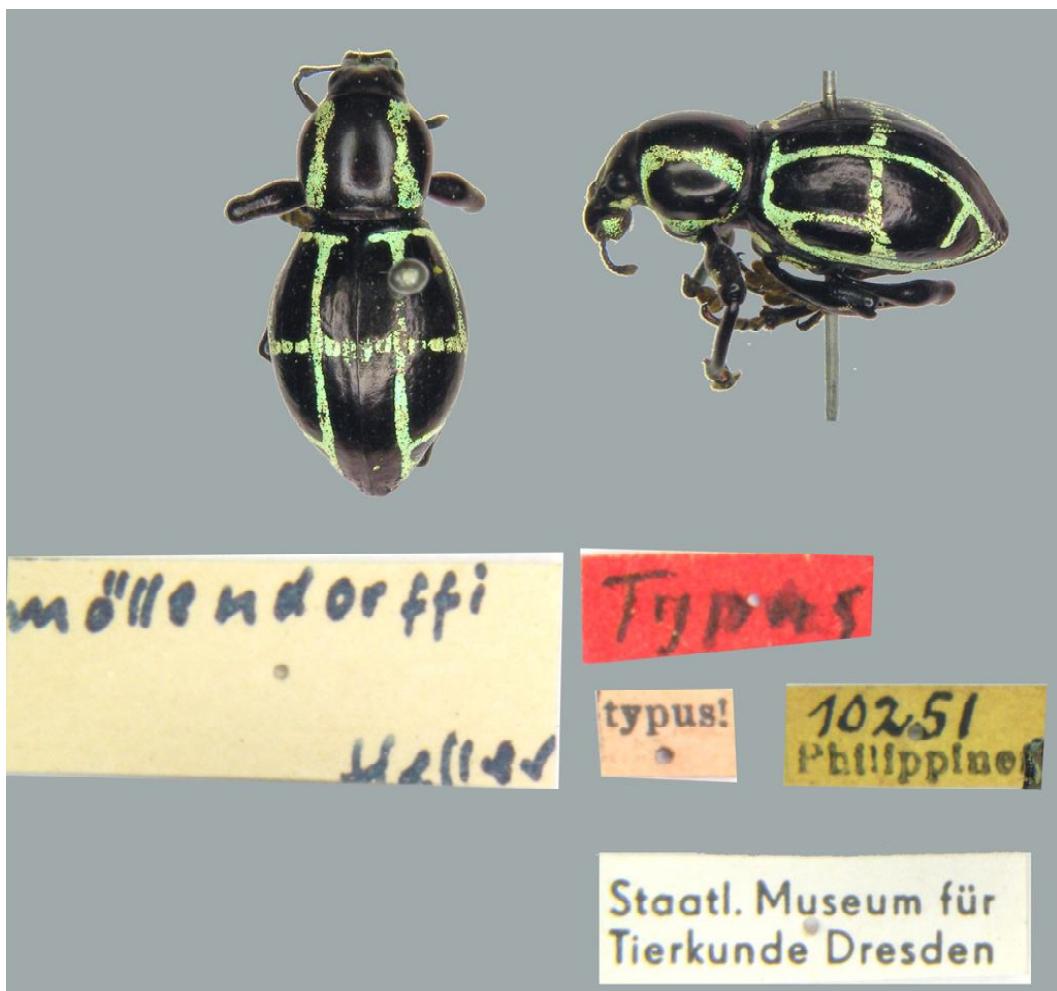


Fig.2. Dorsal and latteral habitus of *P. mollendorffi* type specimen from SMTD

antennal scrobes to apex; large, irregularly shaped patch of metallic pale orange scales on genae. Head with fine punctuation; forehead flat, more than two times as wide as width of eye; eyes relatively large, moderately convex from the dorsal contour of head. Prothorax wider than long, WP/LP: 1.19; widest just before middle; with following markings of recumbent scales: 1) two longitudinal lines on disc, from lateral side of basal margin, to middle of apical margin, lines expands in apical part, forming triangle; 2) continuous transverse line along apical, lateroventral and basal margins of pronotum, from middle of apical

margin to lateral side of basal margin, transverse line connects with longitudinal line on disc; elytra suboval, LE/WE: 1.43, almost same width as prothorax, WE/WP: 1.17, as twice as long as prothorax, LE/LP: 2; intervals very weakly pronounced; scutellum large, extruded; elytra widest just in the middle; each elytron with the following markings: 1) continuous line along basal and lateral margin, from middle of basal margin to interval III on apex; 2) longitudinal line along interval III from base to apex; 3) longitudinal line along interval VII from base to midline of elytron, after which line incurves and connects with line

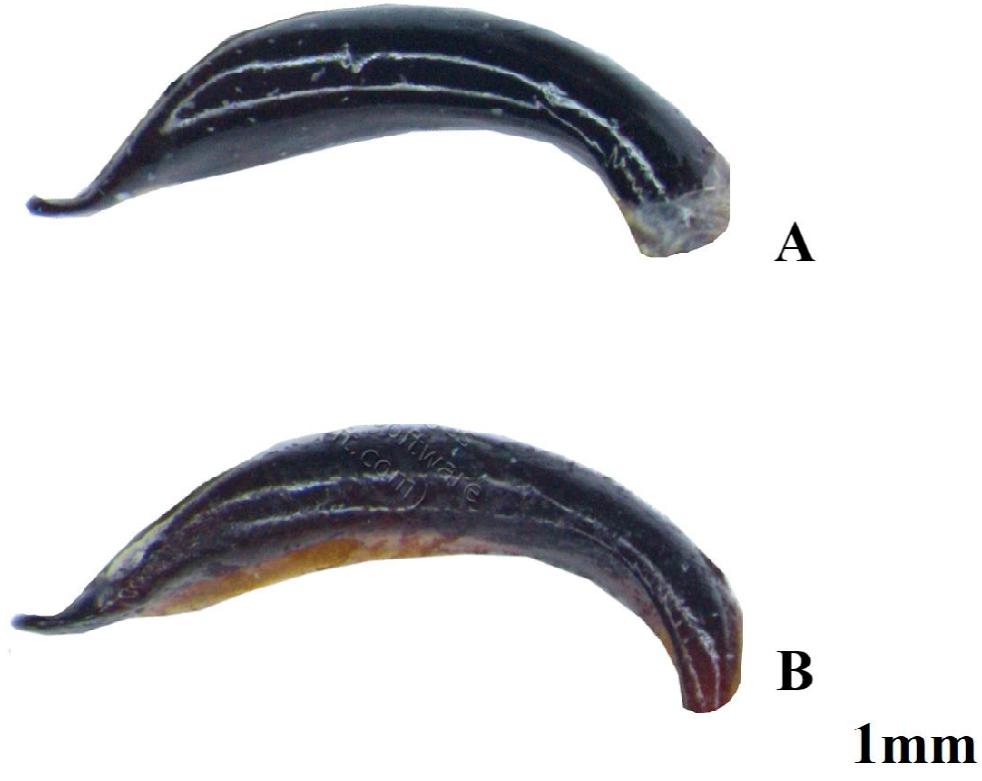


Fig.3. Lateral view of male aedegal body, A - *P. möllendorffi marinduquensis*; B - *P. möllendorffi möllendorffi*

along interval III in apical 1/3; 4) transverse line medially from middle to lateral margin; 5) two short longitudinal lines in subapical part on interval I and II; profemur covered with general scales near apex, meso and meta femur covered with general scales both near apex and in basal part. Aedeagus as in Fig. 3A, 4A.

Female: Measurements (n=3): LB: 12.3 – 12.8 (mean 12.5). LR: 1.6 – 1.8 (mean 1.7). WR: 1.55 – 1.6 (mean 1.58). LP: 3.15 – 3.25 (mean 3.2). WP: 3.75 – 3.9 (mean 3.82). LE: 7.0 – 7.3 (mean 7.17). WE: 5.35 – 5.7 (mean 5.52). Habitus as in Fig. 1F.

Differential diagnosis. *Pachyrhynchus möllendorffi marinduquensis* subsp.n. differs

from *P. möllendorffi möllendorffi* by wider forehead, smaller eyes, shape of rostrum (rostrum of *P. möllendorffi möllendorffi* expands from midline to basal 1/3 in dorsal view, in *P. möllendorffi marinduquensis* it is straight, narrow on apex and expands on base), wider pronotum, with apical margin folded in middle (pronotum of *P. möllendorffi möllendorffi* is more narrow, apical margin straight).

Etymology. The subspecific epithet is an adjective from the name of the island (Marinduque), where the subspecies was discovered..

Discussion. Marinduque and Panay are two separate islands belonging to two PAICs. While

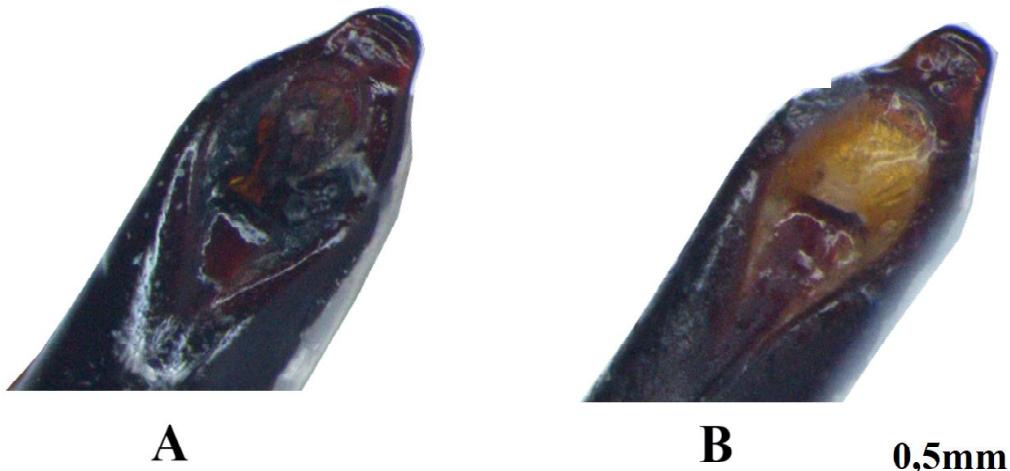


Fig.4. Dorsal view of male aedeagal body, A - *P. möllendorffi marinduquanus*; B - *P. möllendorffi möllendorffi*

Marinduque is a part of the Greater Luzon PAIC, Panay is a part of Greater Negros-Panay PAIC. These two islands were not connected by land bridges during the fluctuations of the seal level (Siler et al., 2010) which could have given rise to the speciation of the *P. möllendorffi* when these two islands became isolated. The isolation of these two islands could have caused biological isolation which led to subtle morphological differences between the population coming from the two islands. The morphological differences together with their geographical isolation as mentioned by Wallin et al. (2017) are valid evidence to consider *P. möllendorffi marinduquanus* as a new subspecies.

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Three new species of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from Panay Island, Philippines

Anita Rukmane, Analyn Cabras

Rukmane A. & Cabras A. 2018. Three new species of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from Panay Island, Philippines. *Baltic J. Coleopterol.*, 18(1): 65 – 76.

Three new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) from the Panay Island (Philippines) are described and illustrated: *P.felipeae* sp. n., *P.franciscoi* sp. n. and *P.layroni* sp. n.. The distribution of all species is mapped. The case of mimicry between *P.layroni* sp.n. and *Metapocyrtus* sp. from Panay Island are provided and illustrated.

Key words: Coleoptera, Curculionidae, *Pachyrhynchus*, fauna, taxonomy, new species, Panay Island, Philippines, mimicry, *Metapocyrtus*

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INTRODUCTION

In recent years, many new species of genus *Pachyrhynchus* Germar has been described (Bollino & Sandel 2015; Rukmane & Barševskis 2016; Cabras & Rukmane 2016; Bollino et al 2017) with majority of described taxa from Mindanao PAIC, comprising number of species within the genus to as much as 143 species. Yet, many small islands of Philippines remain entomologically unexplored, such as Panay Island. After careful examination of a new material from this island,

three new *Pachyrhynchus* were found, which are described in the present study.

Among the interesting features of the genus *Pachyrhynchus* is its mimicry with several weevil genera such as *Metapocyrtus*, *Macrocyrtus*, *Eupyrgops*, and *Polycatus* as well as *Doliops* (Cerambycidae) which has been continuously mentioned by several Philippine beetle fauna researchers (Anichtchenko 2016, 2017; Barševskis 2013, 2014, 2016, 2017a, 2017b; Barševskis & Jager 2014). Part of the authors' current

project includes documenting mimicry complex of *Pachyrhynchus* which seems to be well represented in almost every island and mountain ecosystems. Upon examination of a new material from Panay Island, interesting examples of mimicry between *Pachyrhynchus* and *Metapocyrtus* sp. were found which are presented in this article.

MATERIAL AND METHODS

The studied material is deposited in DUBC, Daugavpils University beetle collection; Institute of Life Sciences and Technology, Coleopterological Research Centre, Ilgas, Daugavpils District, Latvia (A. Barševskis)

The laboratory research and measurements have been carried out using Nikon AZ100, Nikon SMZ745T and Zeiss Stereo Lumar V12 digital stereomicroscopes, NIS-Elements 6D software. The habitus photograph was obtained with a digital camera Canon EOS 6D with Canon MP-E 65 mm macro lens, using Helicon Focus auto montage and subsequently was edited with Photoshop.

The maps of the Philippine archipelago have been drawn using the software ArcGis 10.

The following measurements are used in this paper and abbreviated as follows: LB – length of body; LE - length of elytra; WE – maximal width of elytra; LP - length of pronotum; WP - maximal width of pronotum; LR - length of rostrum; WR - maximal width of rostrum. All measurements are given in millimeters.

RESULTS

Pachyrhynchus felipeae sp. n.

(Fig. 1C, 1D, 3B, 4)

Type material. Holotype, male: "PHILIPPINES, Panay Island, Antique, Culasi, IV. 2018, local collector leg." (white rectangular card, printed); "HOLOTYPE, Male, *Pachyrhynchus felipeae*, Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (DUBC).

Paratypes: one male and two females: Panay Island, Antique, Culasi, IV. 2018. (DUBC).

Distribution: Panay Island (Fig. 2).

Description. Male. Measurements (n=2): LB: 12.10–12.75 (holotype: 12.10); LR: 1.20–1.35 (holotype: 1.20); WR: 1.30–1.45 (holotype: 1.30); LP: 2.75–2.95 (holotype: 2.75); WP: 3.05–3.45 (holotype 3.05); LE: 7.15–7.4 (holotype: 7.15). WE: 4.70–4.85 (holotype: 4.70). Dorsal habitus as in Fig. 1C.

Integument black, body surface very shiny except underside with weaker lustre.

Body subglabrous, with dull pale orange markings of recumbent round scales. Head subglabrous. Rostrum in dorsal contour straight, weakly incurved near antennal scrobe, slightly wider than long, WR/LR: 1.08, with fine punctuation, with irregular shape impression on medial part of rostrum and pronounced longitudinal groove from medial part of rostrum to forehead; lateroventral parts without or with several general scales and sparse short golden hairs from antennal scrobes to apex; patch of round pale orange scales on genae. Head minutely punctured; forehead squeezed out dorsally, with weak apical impression; eyes relatively large, moderately convex (if see dorsally). Antennae slender; scape weakly incurved ventrally, apical part fur-

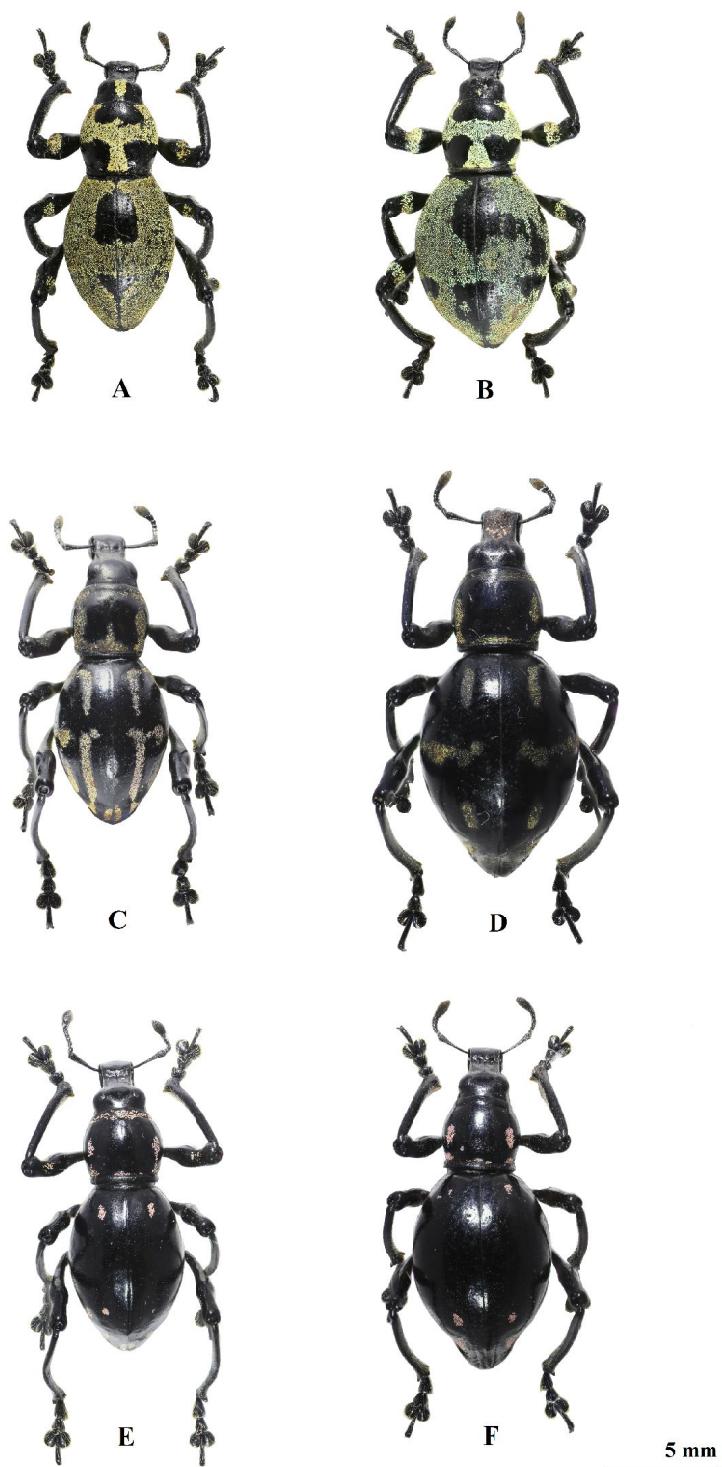


Fig.1.: Dorsal habitus of *P. layroni* (male - A, female - B), *P. felipeae* (male - C, female - D), *P. franciscoi* (male - E, female - F)



Fig2: Distribution of *P. layroni* sp. n. (marked with red), *P. felipeae* sp. n. & *P. franciscoi* sp. n. (marked with green)

nished with long light golden hairs along anterior margin; pedicel slightly longer than segment I; segment I 1.5 times longer than wide, longer than segment II; segments II-V subequal in length, slightly wider than long, nearly twice as short as segment VI. Prothorax nearly as long as wide, WP/LP 1.11; widest slightly before middle; with following markings of recumbent scales: 1) transverse line of scales along apical margin from one lateroventral margin to other; 2) transverse line of scales along basal margin

from one lateroventral margin to other; 3) irregular patch of scales on each of lateroventral parts of pronotum; 4) two longitudinal lines on disc each redirected laterally; 5) triangularly shaped patch on median part of basal margin; disc weakly impressed medially. Elytra subellipsoidal, LE/WE: 1.52, wider than prothorax, WE/WP 1.54, more than twice as long as prothorax, LE/LP: 2.6; intervals weakly pronounced; widest in middle; each elytron with the following markings: 1) longitudinal line on

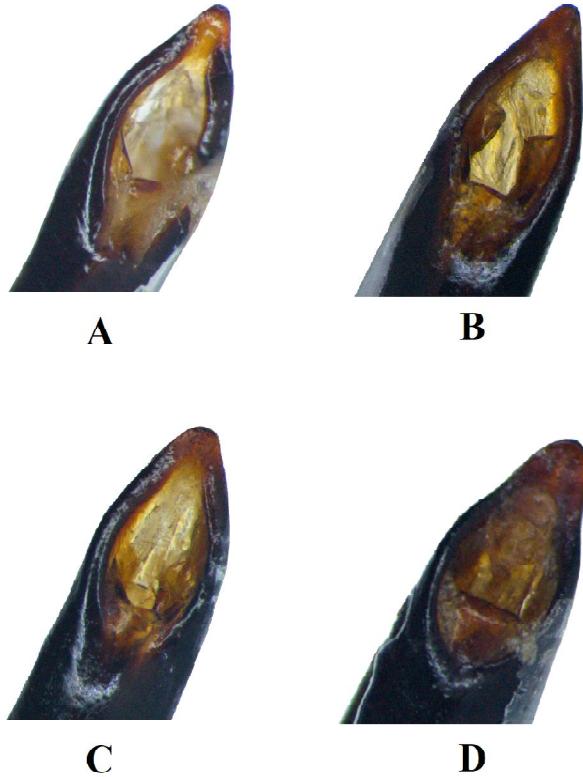


Fig 3: Ostium of *P. negrosensis* (A), *P. felipeae* sp. n. (B), *P. franciscoi* sp. n. (C), *P. layroni* sp. n. (D)

interval III from sub-basal part to just before middle; 2) longitudinal line along lateral margin from sub-basal part to apex; 3) line on interval III and line along lateral margin connected with transverse line on sub-basal part; 4) transverse line on median part from interval II to lateral margin; 5) longitudinal line on interval III from middle of elytron to apex; 6) short longitudinal line on suture near apex; 7) two short longitudinal lines on apical part of interval V and VII. Aedeagus as in Fig. 3B, 4.

Female: Measurements (n=2): LB: 15.25–15.65 (mean 15.45); LR: 1.30–1.40 (mean 1.35); WR: 1.55–1.70 (mean 1.625); LP: 3.05–3.10 (mean 3.075);

WP: 3.80–3.95 (mean 3.875); LE: 9.70–9.9 (mean 9.80). WE: 6.10–6.50 (mean 6.30). Habitus as in Fig. 1D.

Differential diagnosis. Based on the general appearance, *P. felipeae* sp.n. is very similar to *P. franciscoi* sp.n. from the same island and *P. negrosensis* Schultze, 1924 from Negros Island. From *P. franciscoi* it differs by long light golden hairs on apical part of antennal scape along anterior margin in males (males of *P. franciscoi* without these hairs), by the shape of the forehead bulged dorsally (forehead of *P. franciscoi* is impressed in medial part), by wider forehead of females (Fig. 1E, 1F), by the different shape of the

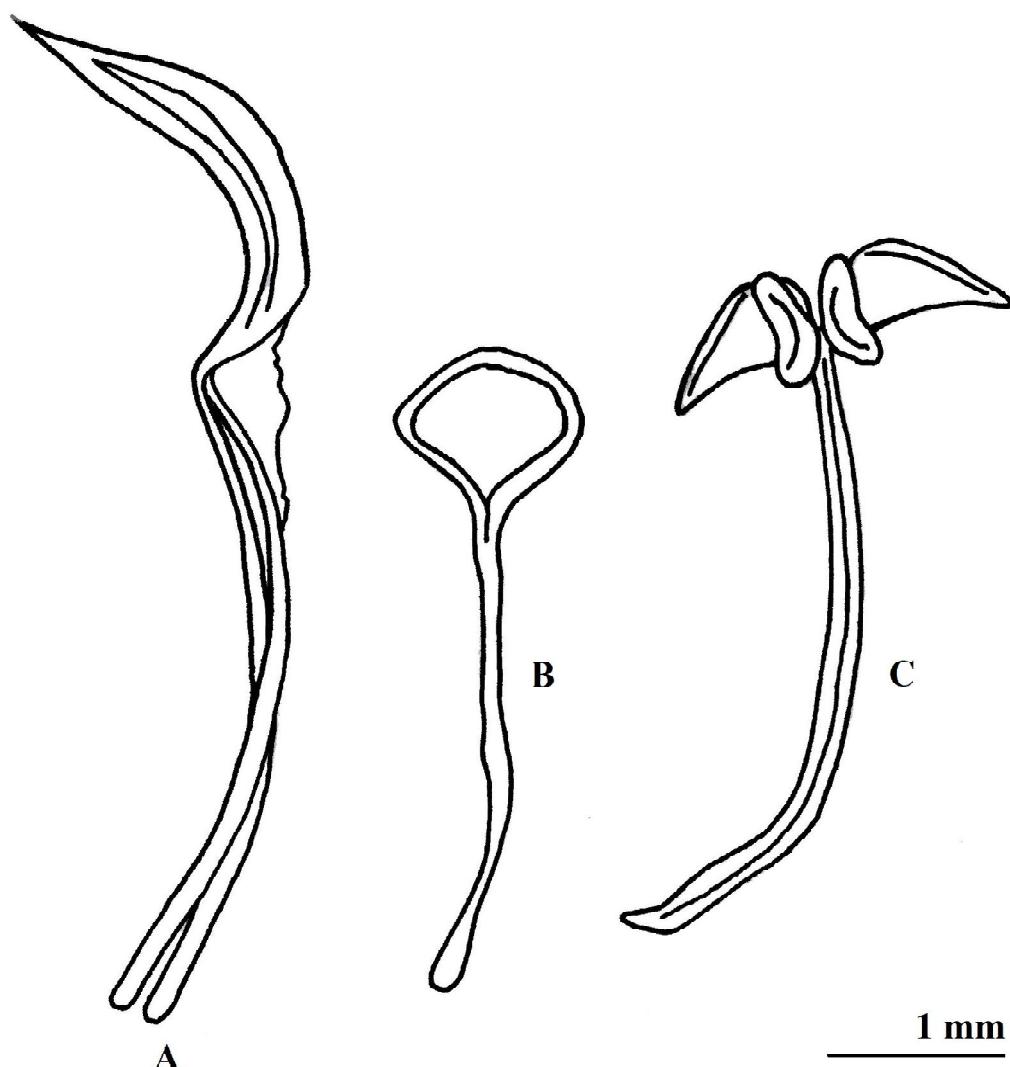


Fig. 4. Dorsal view of aedeagal body (A), segment IX (B) and segment IX (C) of *P. felipeae* sp. n.

aedeagus and differences of scally markings on elytra (Fig. 3).

***Pachyrhynchus franciscoi* sp. n.**

(Fig. 1E, 1F, 3C, 5)

Etymology. This species is named after Mari Grace Felipe in appreciation of great support and possibility to process material from Panay Island.

Type material. Holotype, male: "PHILIPPINES, Panay Island, Antique, Culasi, IV. 2018, local collector leg." (white rectangular card, printed); "HOLOTYPE, Male, *Pachyrhynchus franciscoi*, Rukmane 2018, det.

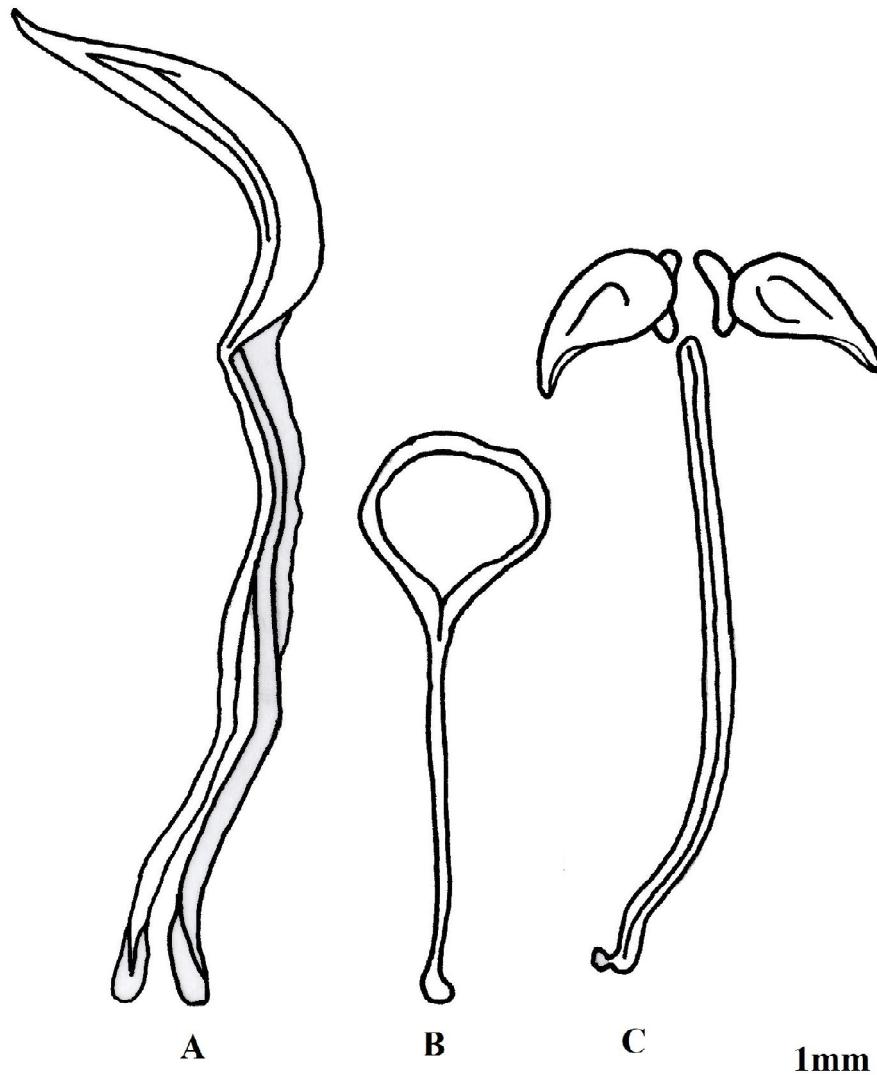


Fig. 5. Dorsal view of aedegal body (A), segment (B) and segment IX (C) of *P. franciscoi* sp. n.

Anita Rukmane, 2018" (red rectangular card, printed) (DUBC).

Paratypes: one male and two females: Panay Island, Antique, Culasi, IV. 2018. (DUBC).

Distribution: Panay Island (Fig. 2).

Description. Male. Measurements (n=2): LB: 12.35–12.55 (holotype 12.55); LR: 1.7–1.75

(holotype 1.75); WR: 1.50–1.60 (holotype 1.60); LP: 2.90–2.95 (holotype 2.95); WP: 3.40–3.50 (holotype 3.50); LE: 7.65–7.80 (holotype 7.80); WE: 4.75– 4.90 (holotype 4.90). Habitus as in Fig. 1E.

Integument black, very shiny. Body subglabrous, with dull pale orange to purple markings or round recumbent scales. Rostrum in dorsal

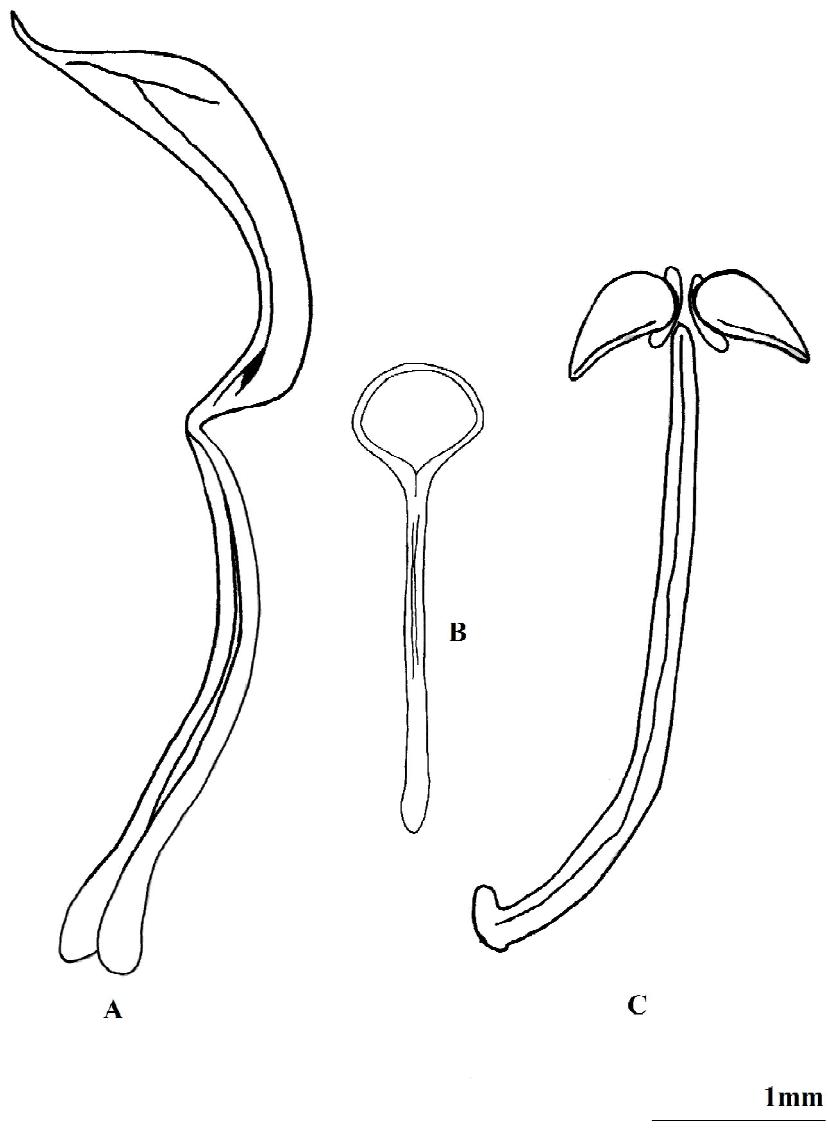


Fig. 6. Dorsal view of aedeagal body (A), segment (B) and segment IX (C) of *P. layroni* sp. n.

contour weakly bulging in apical 1/3, narrowing in median part and straight in basal part; slightly longer than wide, LR/WR: 1.09, with sparse punctuation, with subovate impression in medial part and weak longitudinal groove from medial part of rostrum to medial part of forehead; lateroventral parts with oval pale orange scales

near antennal scrobe and sparse short golden hairs from antennal scrobe to apex; patch of pale orange scales on genae, scales mingled with hair-like scales. Head more weakly punctured than rostrum; forehead slightly impressed on medial part, not squeezed out dorsally; eyes relatively large, weakly convex (if see dorsally). Antennal

scape flattened in basal part and expanded apically, with very short or almost without hairs in apical part along anterior margin; pedicel nearly as twice as long as wide, 1.5 times longer than segment I; segment I slightly longer than wide, longer than segment II; segments II–V subequal in length, club-shaped; segment VI wider than long. Prothorax wider than long, WP/LP: 1.15, widest before middle; transverse basal groove expanded, thick; markings on prothorax equal to those of *P. felipeae*, but without triangular-shaped patch on medial part of basal margin. Elytra subovate, LE/WE 1.59, wider than prothorax, WE/WP: 1.4, more than twice as long as prothorax, LE/LP: 2.64; smooth; intervals very weakly pronounced; widest just before middle; weak pubescence near apex; each elytron with the following scally markings: 1) round spot of pale orange to purple scales on sub-basal part of interval III; 2) short line of scales along lateral margin from sub-basal part

to basal $\frac{1}{2}$; 3) short transverse line on median portion of each elytron, from interval VII to lateral margin; 4) long longitudinal line of scales from median part to subapical part along lateral margin, in subapical part line weakly incurves from lateral margin to interval IV; 5) scally patch on suture near apex; 6) two small round patches in apical 1/3 on interval III and VI. Genitalia as illustrated in Fig. 5.

Female: Measurements (n=2): LB: 13.70–13.90 (mean 13.80). LR: 1.15–1.25 (mean 1.20). WR: 1.45–1.60 (mean 1.525); LP: 2.90–3.00 (mean 2.95); WP: 3.15–3.25 (mean 3.20); LE: 8.60–8.70 (mean 8.65); WE: 5.70–5.80 (mean 5.75). Habitus as in Fig. 1F.

Differential diagnosis. In general appearance, *P. franciscoi* is similar to *P. felipeae* and *P. negrosensis*, differences between species as described above.



Fig. 7. Habitus of *Metapocyrtus* sp. that mimics *P. felipeae* sp. n.

Etymology. Species is named after Marino Francisco in appreciation of great support and possibility to process material from Panay Island.

***Pachyrhynchus layroni* sp. n.**

(Fig. 1A, 1B, 3D, 6)

Type material. Holotype, male:

“PHILIPPINES, Panay Island, Antique, Madajaas, XII. 2017, local collector leg.” (white rectangular card, printed); “HOLOTYPE, Male, *Pachyrhynchus layroni*, Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed).

Paratypes: two females from same locality: XII. 2017; two females and one male: from same locality, I. 2018 (DUBC).

Distribution: Panay Island (Fig. 2).

Description. Male. Measurements (n=2): LB: 11.90–12.30 (holotype: 11.90); LR: 1.30–1.50 (holotype: 1.30); WR: 1.25–1.40 (holotype 1.25); LP: 3.10–3.25 (holotype: 3.10); WP: 3.35–3.55 (holotype 3.35); LE: 7.05–7.25 (holotype: 7.05); WE: 4.70–4.75 (holotype 4.70). Habitus as in Fig. 1A.

Integument black, very shiny except for elytra and underside with weaker luster. Body with dull pale orange or yellow markings of round recumbent scales. Rostrum in dorsal contour expanded in apical 3/5 and narrowed to base, almost same length as width, LR/WR: 1.04, with sparse punctuation and shallow impression from median part to base; lateroventral parts densely covered with oval shape scales and long golden hairs from antennal scrobe to apex; irregular patch of scales on genae and under eyes; patch mingled with short golden hairs. Head roughly punctured;

forehead slightly bulging dorsally, width more than two times as wide as width of eye; longitudinal patch of scales along medial line of forehead, patch not reaching base of forehead; eyes relatively small, very weakly convex from outline of head. Antennal scape densely covered with long light hairs in apical part; pedicel slightly longer than wide, slightly longer than segment I; segment I slightly longer than segment II, nearly 1/5 as long as wide; segments II–V subequal in length, club-shaped. Prothorax wider than long, WP/LP: 1.08, widest in middle, with very weak transverse basal groove; with following markings of pale orange or yellow scales: 1) thick transverse line of scales on medial portion of pronotum, on lateral sides line expands and cover lateroventral parts; 2) two patches of scales on apical part of pronotum, each patch redirected laterally, patches covering transverse medial line; 3) longitudinal line on midline of pronotum from basal margin to medial transverse line. Elytra elongated, less than two times as long as wide LE/WE: 1.5, wider than prothorax, WE/WP: 1.4, more than twice as long as prothorax, LE/LP: 2.27; intervals I and II well pronounced, remaining intervals unspoken as they are densely covered with pale recumbent scales; widest just in the middle; with sparse short light hairs from apical 1/3 to apex; nearly all elytra covered with pale orange or yellow scales except: 1) uncovered field from sub-basal part to middle of each elytron on intervals I and II; 2) triangular uncovered field just after midline on intervals I and II. Aedeagus as in Fig. 6, 3D.

Female: Measurements (n=4): LB: 13.45–13.95 (mean 13.75) LR: 1.15–1.30 (mean 1.21); WR: 1.40–1.70 (mean 1.55); LP: 3.00–3.50 (mean 3.21); WP: 3.30–3.80 (mean 3.50); LE: 8.00–8.50 (mean 8.25); WE: 5.70–5.90 (mean 5.80). Habitus as in Fig. 1B.

Differential diagnosis. In general appearance, *P. layroni* sp.n. is similar to *P. orbifer* Waterhouse, 1841 from Luzon Island, but differs by elongated elytra (elytra of *P. orbifer*: rounded), by the presence of longitudinal patches of medial scales on forehead (lacking in *P. orbifer*), by the shorter and less rounded pronotum, , by the more stout legs of *P. layroni*, narrower forehead, less convex eyes, as well as by the different shape of the aedeagus.

Etymology. Species is named after sir Nelson Layron in appreciation of cooperation and possibility to process material from Panay Island.

Mimicry. During observation of new materials from Panay Island, new records of Mullerian mimicry between *P. layroni* sp.n. and *Metapocyrtus* sp. were found. Both species inhabit same locality and shows very similar pattern of scales on pronotum and elytra (Fig. 7).

DISCUSSION

Panay is sixth largest island in the Philippines, with a total land area of 12,011 km². It is a triangular island, located in the western part of the Visayas. It is located southeast of the Island of Mindoro and northwest of Negros across the Guimaras Strait (Hogan 2011). As sea level dropped during the Pleistocene, species from closely located Mindoro and Negros became isolated. So far, nearly no entomological data were available from Panay Island, but after observation of a new material from this island we can conclude that species that inhabit Negros Island (*P. negrosensis*) are very closely related to species from Panay Island, yet, geographical isolation caused the emergence of new species which were described herein.

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AN ANNOTATED CHECKLIST OF GENUS *PACHYRHYNCHUS* (COLEOPTERA: CURCULIONIDAE: PACHYRHYNCHINI)

Anita Rukmane

Rukmane A. 2018. An annotated checklist of genus *Pachyrhynchus* (Coleoptera: Curculionidae: Pachyrhynchini). *Acta Biol. Univ. Daugavp.*, 18 (1): 63 – 68.

Pachyrhynchus is a genus from subfamily entiminae of which 145 species are known so far. Checklist prepared including it's synonyms and different subspecies indicate that this genus is predominantly tropical with most of the species known from the Oriental region: Philippines (135 species or 93%), Indonesia (6 species or 4%), Japan (3 species) and Taiwan (1 species and two subspecies).

Key words: *Pachyrhynchus*, checklist, synonyms, distribution, Philippines.

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INTRODUCTION

Subfamily Entiminae or broad nosed weevils are one of the largest groups of the family Curculionidae and are distributed throughout the world mostly in tropics with 55 tribes, 1340 genera (Nikolai et al. 2006) and more than 12,000 species (Alonso-Zarazaga & Lyal 1999), in addition, number of new taxon increases rapidly.

During past seven years, number of species from genus *Pachyrhynchus* has increased from 104 to 145 (41 new species) new species described by several local and foreign scientists (Cabras & Rukmane 2016, Rukmane & Barševskis 2016, Barševskis 2016, Bollino et al. 2017, Chen & Lin 2017), which is almost 1/3 of number of all species in genus. Taxonomic studies are imminent and as a prelude to such studies an annotated checklist had been prepared. The checklist reveals that it is well known in Oriental region, with predomination in Philippines (93%) and

few species distributed in Indonesia (4%) and Japan (3%).

Review of literature reveals lapses in the descriptions justifying a substantial taxonomic study. The present contribution enlists the 19 species with type locality "Philippines" with no more details. As species from genus *Pachyrhynchus* are highly endemic, and tend to inhabit one particular island, it is necessary to evaluate such cases with ample ecological studies.

RESULTS

Genus *Pachyrhynchus* Germar, 1824

- = *Sphaerogaster* Latreile, 1825
- = *Somatodes* Schoenherr, 1823
- = *Sphoerogaster* Latreile, 1825
- = *Sphaerogaster* Sturm, 1826
- = *Sphaenogaster* Berthold, 1827

- = *Pachirhinus* Latreile, 1828
 = *Pochyrhynchus* Laporte, 1840
 = *Pachyrhinchus* Desmarest, 1842
 = *Pachyrhincus* Desmarest, 1842
 = *Pachyrrhynchus* Gemminger & Harold, 1871

Type species – *Pachyrhynchus moniliferus*
Germar, 1824

1. *P. absurdus* Schultze, 1919 [Philippines, Bucas]
2. *P. amabilis* Schultze, 1922 [Philippines, Mindanao]
3. *P. anitchchenkoi* Rukmane & Barševskis, 2016 [Philippines, Mindanao]
4. *P. annelifer* Heller, 1912 [Philippines, Luzon]
5. *P. annulatus* Chevrolat, 1881 [Philippines, Luzon]
 = *annulatus* Behrens, 1887
6. *P. antonkozlovi* Rukmane & Barševskis, 2016 [Philippines, Mindanao]
7. *P. apicatus* Schultze, 1922 [Philippines, Polillo]
8. *P. apocytroides* Schultze, 1922 [Philippines, Mindanao]
9. *P. apoensis* Yoshitake, 2012 [Philippines, Mindanao]
 = *pseudoapoensis* Rukmane & Barševskis, 2016
10. *P. ardentius* Schultze, 1919 [Philippines, Siargao]
11. *P. argus* Pascoe, 1873 [Philippines, Luzon]
12. *P. atrocyaneus* Schultze, 1922 [Philippines, Mindanao]
13. *P. banglas* Bollino, Sandel & Rukmane, 2017 [Philippines, Mindanao]
14. *P. baluganus* Schultze, 1924 [Philippines, Luzon]
15. *P. barsevkisii* Rukmane, 2016 [Philippines, Luzon]
16. *P. basilanus* Heller, 1923 [Philippines, Basilan]
17. *P. benguetanus* Schultze, 1924 [Philippines, Luzon]
18. *P. bucasanus* Schultze, 1922 [Philippines, Bucas]
 ssp. *ornatus* Schultze, 1934 [Philippines, Samar]
19. *P. cabrasae* Rukmane & Barševskis, 2016 [Philippines, Mindanao]
20. *P. caeruleovittatus* Yoshitake, 2012

- [Philippines, Mindanao]
 21. *P. cagayanus* Heller, 1929 [Philippines, Luzon]
 22. *P. chamissoi* Schultze, 1922 [Philippines, Mindanao]
 23. *P. chlorites* Chevrolat, 1881 [Philippines]
 = *rutilans* Behrens, 1887
 ssp. *insularis* Kano, 1929 [Philippines]
 24. *P. cingulatus* Pascoe, 1873 [Indonesia, Morotai]
 25. *P. circulatus* Heller, 1912 [Philippines, Catanduanes]
 26. *P. conformis* Yoshitake, 2017 [Philippines, Samar]
 27. *P. confusus* Schultze, 1923 [Philippines]
 28. *P. congestus* Pascoe, 1873 [Philippines, Luzon]
 = *luteoguttatus* Chevrolat, 1841
 ssp. *caeruleans* Kraatz, 1888 [Philippines, Luzon]
 ssp. *immarginatus* Kraatz, 1888 [Philippines, Luzon]
 ssp. *ocellatus* Schultze, 1924 [Philippines, Luzon]
 ssp. *pavonius* Heller, 1921 [Philippines, Luzon]
 29. *P. consobrinus* Schultze, 1922 [Philippines, Luzon]
 30. *P. corpulentus* Schultze, 1922 [Philippines, Mindanao]
 31. *P. croesus* Oberthür, 1879 [Indonesia, Sanghir]
 32. *P. cruciatus* Schultze, 1923 [Philippines, Luzon]
 33. *P. cumingi* Waterhouse, 1841 [Philippines]
 ssp. *boholensis* Schultze, 1924 [Philippines, Bohol]
 34. *P. davaoensis* Schultze, 1934 [Philippines, Mindanao]
 35. *P. decussatus* Waterhouse, 1841 [Philippines, Catanduanes]
 36. *P. digestus* Heller, 1929 [Philippines, Luzon]
 37. *P. dohrni* Behrens, 1887 [Philippines, Luzon]
 38. *P. domino* Rukmane, 2016 [Philippines, Mindoro]
 39. *P. dubiosus* Schultze, 1922 [Philippines, Luzon]
 40. *P. elegans* Waterhouse, 1842 [Philippines, Samar]
 = *eos* Heller, 1924
 41. *P. elenae* Rukmane, 2016 [Philippines,

- Mindanao]
42. *P. esperanza* Bollino, Sandel & Rukmane, 2017 [Philippines, Mindanao]
43. *P. eques* Heller, 1912 [Philippines, Luzon]
44. *P. equester* Heller, 1929 [Philippines, Luzon]
45. *P. erichsoni* Waterhouse, 1841 [Philippines] = *chrysocompus* Heller, 1912
- ssp. *eschscholtzi* Waterhouse, 1841 [Philippines, Luzon]
46. *P. erosus* Schultze, 1920 [Philippines, Luzon]
47. *P. felipeae* Rukmane & Cabras, 2018 [Philippines, Panay]
48. *P. forsteni* Snellen van Vollenhoven, 1864 [Indonesia, Molucas]
49. *P. franciscoi* Rukmane & Cabras, 2018 [Philippines, Panay]
50. *P. galeraensis* Schultze, 1934 [Philippines, Mindoro]
51. *P. gemmatus* Waterhouse, 1841 [Philippines] = *atratus* Heller, 1912
- ssp. *purpureus* Kraatz, 1888 [Philippines, Luzon]
52. *P. gilvomaculatus* Yoshitake, 2017 [Philippines, Mindanao]
53. *P. gloriosus* Faust, 1895 [Philippines, Luzon]
- ssp. *abbreviatus* Schultze, 1922 [Philippines, Luzon]
54. *P. halconensis* Schultze, 1922 [Philippines, Mindoro]
55. *P. helleri* Kuntzen, 1914 [Philippines, Luzon]
56. *P. hirokii* Yoshitake, 2012 [Philippines, Mindanao]
57. *P. igorota* Schultze, 1917 [Philippines, Luzon]
58. *P. inclytus* Schultze, 1924 [Philippines, Luzon] = *apicalis* Kraatz, 1888
- = *modestior* Behrens, 1887
- = *transversatus* Heller, 1921
59. *P. infernalis* Fairmaire, 1897 [Japan, Ryukyu] = *niger* Sakaguchi, 1927
60. *P. ilgas* Rukmane, 2017 [Philippines, Samar]
61. *P. jitanasaius* Chen & Lin, 2017 [Taiwan, Green]
62. *P. jugifer* Waterhouse, 1841 [Philippines]
63. *P. kraslavae* Rukmane & Barševskis, 2016 [Philippines, Mindanao]
64. *P. lacunosus* Heller, 1912 [Philippines]
65. *P. latifasciatus* Waterhouse, 1842 [Philippines, Samar]
66. *P. layroni* Rukmane & Cabras [Philippines, Panay]
67. *P. libucanus* Schultze, 1923 [Philippines, Libucan]
68. *P. loheri* Schultze, 1917 [Philippines, Luzon]
69. *P. lorquini* Chevrolat, 1881 [Philippines] = *flavomaculatus* Kraatz, 1888
- = *flavopunctatus* Kraatz, 1888
70. *P. lubanganus* Bollino & Sandel, 2015 [Philippines, Lubang]
71. *P. marinduquensis* Rukmane & Barševskis, 2016 [Philippines, Marinduque]
72. *P. masatoshii* Yoshitake et Yap, 2018 [Philippines, Luzon]
73. *P. miltoni* Cabras & Rukmane, 2016 [Philippines, Mindanao]
74. *P. mohagani* Bollino & Sandel, 2015 [Philippines, Lubang]
75. *P. mollendorffi* Heller, 1898 [Philippines, Panay]
- ssp. *marinduquanus* Rukmane & Cabras, 2018 [Philippines, Marinduque]
76. *P. moniliferus* Germar, 1824 [Philippines, Luzon] = *confinis* Chevrolat, 1841
- = *monilifer* Germar, 1871
- ssp. *abranus* Heller, 1934 [Philippines, Luzon]
- ssp. *chevrolati* Eydoux & Souleyet, 1839 [Philippines]
- ssp. *stelluliuer* Heller, 1912 [Philippines]
77. *P. morio* Heller, 1912 [Philippines, Luzon]
78. *P. morotainensis* Snellen van Vollenhoven, 1864 [Indonesia, Morotai] = *waterhousei* Faust, 1895
79. *P. multipunctatus* Waterhouse, 1841 [Philippines]
- = *auroguttatus* Chevrolat, 1881
80. *P. naokii* Yoshitake, 2012 [Philippines, Mindanao]
81. *P. negrosensis* Schultze, 1924 [Philippines, Negros]
82. *P. neoabsurdus* Rukmane, 2017 [Philippines, Mindanao]
83. *P. niisatoi* Yoshitake, 2017 [Philippines, Luzon]
84. *P. nitcisi* Rukmane & Barševskis, 2016 [Philippines, Mindanao]
85. *P. nobilis* Heller, 1912 [Philippines]
- ssp. *yamianus* Kano, 1929 [Taiwan]
86. *P. notocruciatus* Yoshitake, 2017 [Philippines,

- Mindanao]
87. *P. ohbayashii* Yoshitake, 2017 [Indonesia, Biak]
88. *P. occidentalis* Rukmane, 2017 [Philippines, Mindanao]
89. *P. ochroplagiatus* Heller, 1912 [Philippines, Luzon]
- ssp. *multiplagiatus* Schultze, 1924 [Philippines, Luzon]
90. *P. orbifer* Waterhouse, 1841 [Philippines, Luzon]
- = *alboguttatus* Chevrolat, 1841
- = *chlorilineatus* Waterhouse, 1841
- = *fahrei* Schoenherr, 1845
- = *fimbriatus* Chevrolat, 1841
- = *globulipennis* Chevrolat, 1841
- = *pretiosus* Chevrolat, 1841
- = *scintilans* Chevrolat, 1841
- ssp. *ardens* Chevrolat, 1841 [Philippines, Luzon]
- ssp. *azureus* Schultze, 1922 [Philippines, Luzon]
- ssp. *circulifer* Chevrolat, 1841 [Philippines]
- ssp. *gemmans* Chevrolat, 1841 [Philippines, Luzon]
- ssp. *inornatus* Waterhouse, 1841 [Philippines]
- ssp. *murinus* Heller, 1934 [Philippines, Luzon]
- ssp. *striatomaculatus* Yoshitake, 2017 [Philippines, Luzon]
91. *P. orientalis* Rukmane, 2017 [Philippines, Mindanao]
92. *P. perpulcher* Waterhouse, 1841 [Philippines]
93. *P. phaleratus* Waterhouse, 1841 [Philippines]
94. *P. pinorum* Pascoe, 1873 [Philippines, Luzon]
- = *dimidiatus* Heller, 1912
- ssp. *transversalis* Heller, 1912 [Philippines]
95. *P. postpubescens* Schultze, 1922 [Philippines, Mindanao]
- ssp. *confluens* Janczyk, 1959 [Philippines, Mindanao]
96. *P. pseudamabilis* Yoshitake, 2012 [Philippines, Mindanao]
97. *P. pseudhalconensis* Rukmane, 2016 [Philippines, Mindoro]
98. *P. pseudoproteus* Schultze, 1922 [Philippines, Luzon]
99. *P. psittacinus* Heller, 1912 [Philippines, Luzon]
100. *P. psitaculus* Heller, 1921 [Philippines, Luzon]
101. *P. pulchellus* Behrens, 1887 [Philippines]
- = *bakeri* Heller, 1921
- = *modestioroides* Schultze, 1922
102. *P. rebus* Rukmane, 2016 [Philippines, Luzon]
103. *P. regius* Schultze, 1922 [Philippines, Leyte]
- ssp. *boronganus* Schultze, 1934 [Philippines, Samar]
104. *P. reichertii* Schultze, 1929 [Philippines, Mindanao]
105. *P. reticulatus* Waterhouse, 1841 [Philippines, Luzon]
106. *P. rizali* Schultze, 1934 [Philippines, Luzon]
107. *P. roseomaculatus* Waterhouse, 1841 [Philippines]
108. *P. rufopunctatus* Waterhouse, 1842 [Philippines]
109. *P. rugicollis* Waterhouse, 1841 [Philippines]
- ssp. *aurinius* Heller, 1921 [Philippines, Luzon]
110. *P. rukmanaeae* Barševskis, 2016 [Philippines, Marinduque]
- = *takakuwai* Yoshitake, 2016
- ssp. *paucisignatus* Yoshitake, 2018 [Philippines, Marinduque]
111. *P. sakaii* Yoshitake, 2017 [Philippines, Samar]
112. *P. samarensis* Schultze, 1923 [Philippines, Samar]
113. *P. sanchezi* Heller, 1912 [Philippines, Luzon]
114. *P. sarcitis* Behrens, 1887 [Philippines]
- ssp. *kotoensis* Kano, 1930 [Japan, Lanyu]
115. *P. schoenherri* Waterhouse, 1841 [Philippines]
116. *P. schultzei* Schultze, 1917 [Philippines, Luzon]
117. *P. semiignitus* Schultze, 1922 [Philippines, Luzon]
118. *P. semperi* Heller, 1912 [Philippines]
119. *P. septentrionalis* Yoshitake, 2017 [Philippines, Luzon]
120. *P. shavrinii* Rukmane & Barševskis, 2016 [Philippines, Samar]
121. *P. signaticollis* Schultze, 1922 [Philippines, Mindanao]
- = *transversarius* Heller, 1923
122. *P. signatus* Schultze, 1919 [Philippines, Siargao]
123. *P. smaragdinus* Behrens, 1887 [Philippines]
- = *carnosus* Kraatz, 1888

- = *purpurascens* Kraatz, 1888
124. *P. sonani* Kano, 1930 [Japan, Lanyu]
125. *P. speciosus* Waterhouse, 1841 [Philippines, Mindanao]
126. *P. sphaericollaris* Schultze, 1923 [Philippines, Luzon]
127. *P. sphenomorphoides* Yoshitake, 2012 [Philippines, Basilan]
128. *P. stellio* Heller, 1912 [Philippines, Luzon]
129. *P. striatus* Waterhouse, 1841 [Philippines]
130. *P. subamabilis* Yoshitake, 2012 [Philippines, Mindanao]
131. *P. sulphureomaculatus* Schultze, 1922 [Philippines, Mindanao]
132. *P. sumptuosus* Schultze, 1917 [Philippines, Luzon]
133. *P. sumptuosoides* Yoshitake, 2017 [Philippines, Luzon]
134. *P. tadauchii* Yoshitake, 2012 [Philippines, Mindanao]
135. *P. taylori* Schultze, 1922 [Philippines, Luzon]
ssp. *metalescens* Schultze, 1924 [Philippines, Luzon]
136. *P. tikoi* Rukmane, 2016 [Philippines, Mindanao]
137. *P. tilikinesis* Bollino & Sandel, 2015 [Philippines, Lubang]
138. *P. tobafolius* Kano, 1929 [Japan, Lanyu]
139. *P. tristis* Heller, 1912 [Philippines, Luzon]
140. *P. valainisii* Rukmane & Barševskis, 2016 [Philippines, Mindoro]
141. *P. venustus* Waterhouse, 1841 [Philippines]
= *aureomaculatus* Kraatz, 1888
= *virgatus* Schultze, 1919
ssp. *insulanus* Schultze, 1919 [Philippines, Siargao, Bucas]
142. *P. viridans* Heller, 1912 [Philippines, Calayan]
143. *P. viridis* Chevrolat, 1879 [Indonesia, Dorey]
144. *P. zamboanganus* Yoshitake, 2012 [Philippines, Mindanao]
145. *P. zebra* Schultze, 1917 [Philippines, Luzon]

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CHECKLIST OF *PACHYRHYNCHUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE: PACHYRHYNCHINI) SPECIES OF ZMUC (NATURAL HISTORY MUSEUM OF DENMARK, UNIVERSITY OF COPENHAGEN)

Anita Rukmane

Rukmane A. 2018. Checklist of *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species of ZMUC (Natural History Museum of Denmark, University of Copenhagen). *Acta Biol. Univ. Daugavp.*, 18 (2): 225 – 228.

Presented here is a checklist for the *Pachyrhynchus* species available in Natural History Museum of Denmark, University of Copenhagen (ZMUC). A total of 25 valid species and two subspecies was listed, encompasses of 17% the total *Pachyrhynchus* species number known to genus *Pachyrhynchus*, respectively.

Key words: *Pachyrhynchus*, museum material, taxonomy, determination, Philippines.

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INTRODUCTION

Currently genus *Pachyrhynchus* comprises 145 described species (Rukmane 2018). Early monographs and scientific papers described genus *Pachyrhynchus* in detail (Schultze 1923, Barševskis 2016).

On account of observable aspect of weevils of genus *Pachyrhynchus*, they are favourable material for beetle collection collectors all over the globe, and presents in majority of world's biggest museum coleopterological collections, with total of 43.5% of type species located in SMTD, 16.5% in NHML and 13% in DUBC.

Although such collections as SMTD and NHML are continuously observed by several foreign experts of this genus, collections with smaller number of specimens and lack of type species

remain unexplored. Estimated number of coleoptera specimens stored in ZMUC compiles 4000000 specimens.

This report provides a reference point for those wishing to identify weevils of genus *Pachyrhynchus* and is additional source for a future systematic revision. It is based on a checklist of genus *Pachyrhynchus* (Rukmane 2018), and includes 25 species and two subspecies available in ZMUC. Although the family is well – defined, there is some uncertainty regarding to distribution of some species. For example, according to material from ZMUC, most of species distribution is labelled as "Luzon Island, Manilla", even for those species where type species distribution is Mindanao island. This leads to doubts of truthfulness of such labels. In this paper, specimens with such labels are noted as "label doubtful".

MATERIALS AND METHODS

Species were identified by using species description and taxonomic keys for genus *Pachyrhynchus* (Rukmane 2016, Chen & Lin 2017, Bollino et al. 2017) and examination of type specimens from SMTD – Senckenberg Natural History Collections of Dresden (Germany) and NHML – Natural History Museum of London (United Kingdom).

All species included herein were eventually deposited in the ZMUC – Natural History Museum of Denmark, University of Copenhagen. Fig.s with pictures of dorsal habitus and attached labels are added for each of herein recorded species, Fig. nr. 1, 2, and 3 respectively.

RESULTS

1. *Pachyrhynchus argus* Pascoe, 1873 (Fig. nr. 1A)

Material: Philippines, Luzon Island (1 ♂, 1 ♀), Manilla (1 ♀). Total: 3 ex.

2. *Pachyrhynchus chlorites* Chevrolat, 1881 (Fig. nr. 1B)

Material: Philippines, Luzon Island (1 ♂, 3 ♀). Total: 4 ex.

3. *Pachyrhynchus congestus* Pascoe, 1873 (Fig. nr. 1C)

Material: Philippines (2 ♂, 1 ♀), Luzon Island, Manilla (1 ♂). Total: 4 ex.

4. *Pachyrhynchus congestus* ssp. *ocellatus* Schultze, 1924 (Fig. nr. 1D)

Material: Philippines, Luzon Island (1 ♂, 1 ♀). Total: 2 ex.

5. *Pachyrhynchus cruciatus* Schultze, 1923 (Fig. nr. 2A)

Material: Philippines, Luzon Island (2 ♂), Manilla (1 ♂). Total: 3 ex.

6. *Pachyrhynchus dohrni* Behrens, 1887 (Fig. nr. 1E)

Material: Philippines, Luzon Island (1 ♂, 2 ♀). Total: 3 ex.

7. *Pachyrhynchus gemmatus* Waterhouse, 1841 (Fig. nr. 1G)

Material: Philippines, Luzon Island (1 ♂, 2 ♀), Manilla (1 ♀). Total: 4 ex.

8. *Pachyrhynchus inlytus* Schultze, 1924 (Fig. nr. 1H)

Material: Philippines, Luzon Island (1 ♂, 1 ♀). Total: 2 ex.

9. *Pachyrhynchus jugifer* Waterhouse, 1841 (Fig. nr. 1J)

Material: Luzon Island, Manilla (1 ♂, 3 ♀). Total: 4 ex.

10. *Pachyrhynchus lorquini* Chevrolat, 1881 (Fig. nr. 1K)

Material: Philippines, Luzon Island (1 ♂, 1 ♀). Total: 2 ex.

11. *Pachyrhynchus moniliferus* Germar, 1824 (Fig. nr. 1L)

Material: Philippines (2 ♂, 2 ♀), Luzon Island (3 ♀), Manilla (13 ♂, 13 ♀); China (2 ♀, label doubtful); Palaos (1 ♂, label doubtful). Total: 36 ex.

12. *Pachyrhynchus morotaiensis* Snellen van Vollenhoven, 1864 (Fig. nr. 1F)

Material: Indonesia, Molucas (1 ♂); 2 ♀ without label. Total: 3 ex.

13. *Pachyrhynchus multipunctatus* Waterhouse, 1841 (Fig. nr. 2B)

Material: Philippines (1 ♂, 2 ♀). Total: 3 ex.

14. *Pachyrhynchus nobilis* Heller, 1912 (Fig. nr. 2C, D)

Material: Philippines, Luzon Island (2 ♂). Total: 2 ex.

15. *Pachyrhynchus ochroplagiatus* Heller, 1912 (Fig. nr. 2E)

Material: Philippines (1 ♀). Total: 1 ex.

16. *Pachyrhynchus orbifer* Waterhouse, 1841 (Fig. nr. 2F)

Material: Philippines (1 ♀), Luzon Island (1 ♂, 1 ♀), Manilla (3 ♂, 3 ♀); Indonesia, Molucas (1 ♂, label doubtful). Total: 10 ex.

16.1. *Pachyrhynchus orbifer* ssp. *gemmaans* Chevrolat, 1841 (Fig. nr. 2G)

Material: Philippines, Luzon Island (1 ♂, 2 ♀), Manilla (4 ♂, 3 ♀); New Guinea (2 ♀, label doubtful); 1 ♀ without label. Total: 13 ex.

17. *Pachyrhynchus pinorum* Pascoe, 1873 (Fig. nr. 2H)

Material: Philippines (2 ♂, 3 ♀). Total: 5 ex.

18. *Pachyrhynchus pulchellus* Behrens, 1887 (Fig. nr. 2I)

Material: Philippines, Luzon Island (1 ♂); Indonesia, Molucas (1 ♂, label doubtful). Total:

2 ex.

19. *Pachyrhynchus reticulatus* Waterhouse, 1841 (Fig. nr. 2J)

Material: Philippines (2 ♂), Luzon Island, Manilla (1 ♂, 1 ♀). Total: 4 ex.

20. *Pachyrhynchus rufopunctatus* Waterhouse, 1841 (Fig. nr. 2K)

Material: Philippines, Luzon Island, Manilla (1 ♂, 2 ♀). Total: 3 ex.

21. *Pachyrhynchus rugicollis* Waterhouse, 1841 (Fig. nr. 2L)

Material: Philippines (2 ♂), Luzon Island (1 ♀), Manilla (1 ♀); 1 ♀ unlabelled. Total: 5 ex.

22. *Pachyrhynchus smaragdinus* Behrens, 1887 (Fig. nr. 3A)

Material: Philippines, Luzon Island (2 ♂, 1 ♀), Manilla (1 ♂). Total: 3 ex.

23. *Pachyrhynchus speciosus* Waterhouse, 1841 (Fig. nr. 3B)

Material: Philippines, Luzon Island, Manilla (1 ♂, label doubtful). Total: 1 ex.

24. *Pachyrhynchus tobafolius* Kano, 1929 (Fig. nr. 3C)

Material: Formosa, 1963 (2 ♂, 2 ♀). Total: 4 ex.

25. *Pachyrhynchus zamboanganus* Yoshitake, 2012 (Fig. nr. 3D)

Material: Philippines, Mindanao Island, Zamboanga del Norte, 25. II. 1998 (3 ♂, 5 ♀). Total: 8 ex.

26. *Pachyrhynchus yamianus* Kano, 1929 (Fig. nr. 1I)

Material: Formosa, 1963 (1 ♀). Total: 1 ex.

Total: 25 species, 135 specimens.

DISSCUSION

According to original type species localities (type specimens observed by author in SMTD and NHML museum collections), original distribution of *Pachyrhynchus moniliferus* is Luzon, while



Fig. 1: A – *P. argus*; B – *P. chlorites*; C – *P. congestus*; D – *P. congestus* ssp. *ocellatus*; E – *P. dohrni*; F – *P. morotaiensis*; G – *P. gemmatus*; H – *P. inclutus*; I – *P. yamianus*; J – *P. jugifer*; K – *P. lorquini*; L – *P. moniliferus*.



Fig. 3. A – *P. smaragdinus*; B – *P. speciosus*; C – *P. tobafolius*; D – *P. zamboanganus*.



Fig. 2. A – *P. cruciatus*; B – *P. multipunctatus*; C, D – *P. nobilis*; E – *P. ochroplagiatus*; F – *P. orbifer* ssp. *gemma*; G – *P. orbifer*; H – *P. pinorum*; I – *P. pulchellus*; J – *P. reticulatus*; K – *P. rufopunctatus*; L – *P. rugicollis*.

part of material from ZMUC is labelled as China (2 ♀) and Palaos (1 ♂) which is clearly doubtful as weevils from genus *Pachyrhynchus* show high level of endemism and one particular species tend to inhabit single island. Part of *Pachyrhynchus orbifer* specimens are labelled as Molucas (1 ♂) and New Guinea (2 ♀) for *P. orbifer* ssp. *gemmae*, respectively, which also is questionable as originally this species is distributed on Luzon. Similarly with *P. pulchellus* which is originally distributed on Luzon island, and part of material from ZMUC is labelled as Molucas (1 ♂), in order with *P. speciosus* which is distributed on Mindanao Island, with subspecies distributed on Mindanao PAIC, while one specimen from ZMUC is labelled as Luzon, Manilla (1 ♂). Three species were labelled with distribution range of Philippines (*P. multipunctatus*, *P. ochroplagiatus*, *P. pinorum*), those species, according to literature and observed material from SMTD, NHML and DUBC are distributed only on Luzon island.

Related to increasing anthropogenic impact and climate change, faunistic research is essential for analysing biodiversity of Philippines and also for compassionating processes occurring in nature. Data from faunistic research are important as to fundamental sciences, either to applied sciences such as agriculture, ecology, forestry and environmental protection. Such data and making a checklist are the most crucial steps to evaluate the data available and suitable for use by general public and scientists.

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TO THE KNOWLEDGE OF *PACHYRHYNCHUS CROESUS* OBERTHRUR, 1879 (COLEOPTERA: CURCULIONIDAE) SPECIES DISTRIBUTION AND BIOGEOGRAPHY

Anita Rukmane

Rukmane A. 2018. To the knowledge of *Pachyrhynchus croesus* Oberthur, 1879 (Coleoptera: Curculionidae) species distribution and biogeography. *Acta Biol. Univ. Daugavp.*, 18 (2): 229 – 232.

This article presents new distribution and faunistic data for *Pachyrhynchus croesus* Oberthur, 1879 species. New distribution data are compared with previous records. The habitus photographs and distribution maps are included.

Key words: *Pachyrhynchus*, Curculionidae, Philippines, distribution, biogeography, fauna.

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INTRODUCTION

Pachyrhynchus croesus Oberthur, 1879 is one of the six species distributed in Indonesia (*P. cingulatus* Pascoe, 1873; *P. forsteni* Snellen van Vollenhoven, 1864; *P. morotainensis* Snellen van Vollenhoven, 1864; *P. obhayashii* Yoshitake, 2017; *P. viridis* Chevrolat, 1879). Species is briefly described by R. Obenhur (Obenhur 1879), where author gives description of species in order with note, that current species is unique and differs from any other species of genus *Pachyrhynchus*. Yet, there is neither distribution data nor any further studies of this species.

Number of specimens available for studies in museums like SMTD and MNHN are limited, but after careful examination of material from various museums and private collections (see material and method part), new and additional information about distribution and appearance are provided herein.

MATERIAL AND METHODS

The material from following collections has been examined:

DUBC – Beetles Collection of Coleopterological Research Center, Institute of Life Sciences and Technology, Daugavpils University (Daugavpils, Latvia);

MNHN – National Museum of Natural History, (Paris, France);

SMTD - Senckenberg Natural History Collections of Dresden, (Dresden, Germany).

The laboratory research and measurements have been performed using Nikon AZ100, Nikon SMZ745T and Zeiss Stereo Lumar V12 digital stereomicroscopes, NIS-Elements 6D software, and Canon 60D and Canon 1Ds Mark II cameras. The map of Philippine archipelago have been drawn using the software ArcGis 10.

RESULTS

Pachyrhynchus croesus (Oberthur, 1879)

(Fig. 1A, B)

Material examined: DUBC – Indonesia, Kepulauan Talaud Regency, Pulau Kabaruang, Kabaruang Island, 16. VII. 1981 (2 ♂); Talaud Island, NE coast, X. 2014 (1 ♀); Lurung, Musi, II. 2018 (5♂, 4 ♀);

MNHN - Indonesia, Sangihe Island (3 ♂, 2 ♀); SMTD – Indonesia, Sangihe Island (1 ♂, 1 ♀);

Specimens examined: 19 specimens (11 ♂, 8 ♀).

Distribution: Indonesia, Sangihe and Talaud Islands (Fig. 2). New material from DUBC revealed wider distribution range, as previously, according to material available in MNHN and SMTD, species was abundant only on Sangihe Island.

DISCUSSION

With main distribution range of Philippine archipelago, species distributed beside the archipelago remain under studied, with exception on species from Taiwan (Chen & Lin 2017), and while new ecological and faunistic data about species from Philippine archipelago are published every year (Cabras, Cortico, Mohaga & Rukmane 2017), there is almost no new data on species from Indonesia, respectively.

Up to now, tribe Pachyrhynchini comprises 15 genera with more than 400 species described mainly in 19th and 20th century with majority of species abundant in Philippine archipelago. As for tribe Pachyrhynchini, 74 species from genus *Pantorhytes* Faust, 1892 and 13 species of *Sphenomorpha* Behrens, 1887 tend to occur in the Indonesia (Setliff 2007), for comparison, only six species of genus *Pachyrhynchus* are recorded from same region.

According to Oberthur (Oberthur 1879) *P. croesus* is not similar to any other species of genus *Pachyrhynchus*, but after careful examination of various material of genus *Pachyrhynchus* it is eventual to conclude, that

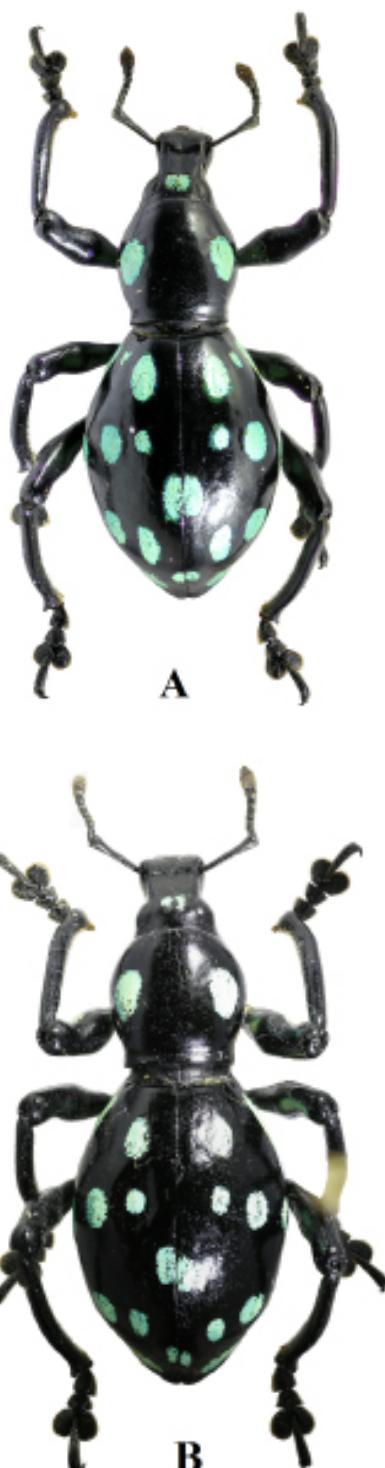


Fig.1. Dorsal habitus of: A – Male of *P. croesus*; B – Female of *P. croesus*.

P. croesus show high similarity of appearance and shape of male aedeagus to *P. smaragdinus* Behrens, 1871 which is distributed in Mindanao PAIC – Mindanao, Samar and Leyte Islands, respectively. Nevertheless, only cautious genetic analyses such as DNA barcoding can reveal direct lineage, relationship and predict distribution pathways.

According to appearance of *P. croesus* abundant in Sangihe Island, new material from Talaud shows insufficient morphological differences such as: 1) colour of spots – spots of *P. croesus* from Sangihe are navy blue and spots of *P. croesus* from Talaud are rather emerald colour; 2) size and position of spots on prothorax – *P. croesus* from Sangihe have bigger, elongated spots while spots on prothorax of *P. croesus* from Talaud are smaller, roundish, deployed at medial part of pronotum. It is possible to embrace, that both populations of *P. croesus* from Sangihe and Talaud are isolated, as many authors admitted in their previous studies, that beetles from genus

Pachyrhynchus are highly endemic and with extremely low distribution capacity which is because of their flightless ability and attraction to mountain ecosystems. It is possible, that *P. croesus* from Talaud will form new species in future.

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Fig.2. Distribution map of *P. croesus*.

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TO THE KNOWLEDGE OF *PACHYRHYNCHUS MONILIFERUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE) SPECIES DISTRIBUTION AND BIOGEOGRAPHY WITH DESCRIPTION OF TWO NEW SUBSPECIES FROM PHILIPPINES

Anita Rukmane

Rukmane A. 2018. To the knowledge of *Pachyrhynchus moniliferus* Germar, 1824 (Coleoptera: Curculionidae) species distribution and biogeography with description of two new subspecies from Philippines. *Acta Biol. Univ. Daugavp.*, 18 (2): 233 – 242.

This article presents new distribution and faunistic data for *Pachyrhynchus moniliferus* Germar, 1824 species with all subspecies included. New distribution data are compared with previous records from various museum collections. The habitus photographs and distribution maps are included. Two new subspecies are described: *P. moniliferus* ssp. *babuyanensis* Rukmane, 2018 subsp. n. and *P. moniliferus* ssp. *herbidus* Rukmane, 2018 subsp. n.

Key words: *Pachyrhynchus moniliferus*, Curculionidae, Philippines, distribution, biogeography, fauna, new subspecies.

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INTRODUCTION

Pachyrhynchus moniliferus Germar, 1824 is one of the most diverse species in genus *Pachyrhynchus*, including five subspecies distributed on various islands of Philippine archipelago: *P. moniliferus chevrolati* Eydoux & Souleyet, 1839, *P. moniliferus eburnus* Heller, 1934, *P. moniliferus jagori* Heller, 1912, *P. moniliferus moniliferus* Germar, 1824, *P. moniliferus stellulifer* Heller, 1912 respectively. Schultze (Schultze 1923) in his early monographs gave detailed information about species distribution and pointed on similarity between *P. moniliferus* and *P. orbifer* Waterhouse, 1841. Author outlines, that *P. moniliferus* is found in

the typical form and several very pronounced varieties in Luzon and has subspecies in Mindoro, Polillo, and the Catanduanes, such distribution for one species is really rare and exceptional for current group of weevils. Current study reveals new distribution data for *P. moniliferus* and shows, that species distribution range is even wider. Careful examination of *P. moniliferus* material from various museums (see material and method part) compared with subjectively new material of *P. moniliferus* available in DUBC allows analysing distribution of *P. moniliferus* in full.

Currently genus *Pachyrhynchus* comprises 145 species (Rukmane 2018). Scientists from all over

the globe have already made effort in studies of current genus (Chen & Lin 2017, Barševskis 2016, Bollino, Sandel & Rukmane 2017, Cabras & Rukmane 2016, Rukmane & Cabras 2018).

This article provides a reference point for those wishing to identify weevils of genus *Pachyrhynchus* and is additional source for a future systematic revision. Systematic part is based on a checklist of genus *Pachyrhynchus* (Rukmane 2018) and world catalogue of weevils provided by Alonso – Zarazaga (Alonso – Zarazaga 1999) in order with early records of Schultze (Schultze 1923).

MATERIAL AND METHODS

The material from following collections has been examined:

BNHM – British Natural History Museum (London, United Kingdom);

DUBC – Beetles Collection of Coleopterological Research Center, Institute of Life Sciences and Technology, Daugavpils University (Daugavpils, Latvia);

MNHN – National Museum of Natural History, (Paris, France);

SNTD - Senckenberg Natural History Collections of Dresden, (Dresden, Germany);

ZMUC – Natural History Museum of Denmark, University of Copenhagen (Copenhagen, Denmark).

The laboratory research and measurements have been performed using 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

Pachyrhynchus moniliferus ssp. *babuyanensis* subsp. n. (Fig. 1A, B)

Type material. Holotype, male:

“PHILIPPINES, Babuyan Island, IV. 2017, local collector leg.” (white rectangular card, printed); “HOLOTYPE, Male, *Pachyrhynchus moniliferus* ssp. *babuyanensis* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed) (DUBC).

Paratypes: 8 males, 2 females; “PHILIPPINES, Babuyan Island, VIII. 2014, local collector leg.” (white rectangular card, printed);

“PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *babuyanensis* Rukmane 2018, det. Anita



Fig.1. Dorsal habitus of *P. monilifureus* ssp. *babuyanensis* subsp. n. and *P. moniliferus* ssp. *herbidus* subsp. n. A – Male of *P. monilifureus* ssp. *babuyanensis* subsp. n.; B – Female of *P. monilifureus* ssp. *babuyanensis* subsp. n.; C – Male of *P. moniliferus* ssp. *herbidus* subsp. n..

Rukmane, 2018" (red rectangular card, printed) (2 specimens); "PHILIPPINES, Babuyan Island, III. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *babuyanensis* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed); "PHILIPPINES, Babuyan Island, III. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Female, *Pachyrhynchus moniliferus* ssp. *babuyanensis* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed); "PHILIPPINES, Babuyan Island, IV. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *babuyanensis* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (4 specimens); "PHILIPPINES, Babuyan Island, IV. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Female, *Pachyrhynchus moniliferus* ssp. *babuyanensis* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed); "PHILIPPINES, Babuyan Island, V. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *babuyanensis* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed).

Distribution: Babuyan Island (Fig. 2).

Description. Male. Measurements (n=9): LB: 12.9 – 14.1 (holotype 13.8, mean 13.59); LR: 1.7 – 1.8 (holotype 1.8, mean 1.8); WR: 1.7 – 1.8 (holotype 1.8, mean 1.74); LP: 4.1 – 4.7 (holotype 4.1, mean 4.33); WP: 4.2 – 5.2 (holotype 4.5, mean 4.59); LE: 7.2 – 7.9 (holotype 7.8, mean 7.7); WE: 5.1 – 5.9 (holotype 5.9, mean 5.52). Dorsal habitus as in Fig. 1A.

Body black, shiny, with markings of glossy green to blue recumbent round or lanceolate scales; rostrum in dorsal contour narrowing in apical part and bulging in basal part, length and width equal, LR/WR: 1; with shallow median impression and longitudinal groove on basal part from middle to base; each side of rostrum with patch of pale blue

to green lanceolate scales on lateroventral part near antennal scrobe and on genae; long golden hairs on each lateral part near apex; forehead with longitudinal groove from midline to base; eyes small, not convex; prothorax with the following markings of glossy blue to green scales: 1) transverse stripe on scales along apical margin from one lateroventral part to other; 2) patch of scales on each lateroventral part; 3) transverse stripe of scales along midline of pronotum from one lateroventral margin to other; 4) dorsum with longitudinal stripe on median part of disc from basal margin to minutely above midline of disc; wider than long, WP/LP: 1.1; widest just in the



Fig.2. Distribution of *P. monilifereus* ssp. - *P. moniliferus* ssp. *babuyanensis* subsp. n. (marked with red); *P. moniliferus* ssp. *chevrolati* (marked with purple); *P. moniliferus* ssp. *eburnus* (marked with yellow); *P. moniliferus* ssp. *herbidus* subsp. n. (marked with green); *P. moniliferus* ssp. *jagori* (marked with blue); *P. moniliferus* ssp. *moniliferus* (marked with orange); *P. moniliferus* ssp. *stellulifer* (marked with brown).

middle; elytra widest in middle, LE/WE: 1.32; wider than prothorax, WE/WP: 1.31; nearly as twice as long as prothorax, LE/LP: 1.9; intervals well pronounced; each elytron with the following glossy blue to green scale stripes: 1) transverse stripe on sub-basal part along basal margin, from middle of interval I to lateroventral margin where stripe incurves and goes all long the lateral margin of elytron, another incurve near apex on interval III, where stripe incurves and goes up to apical 1/5 along interval III; 2) transverse stripe along midline of elytron, from middle of interval I to lateral margin; 3) longitudinal stripe along interval III from sub – basal part to basal 4/5; prosternum and procoxa densely covered with roundish glossy green to blue scales; prosternal process without scales; mesocoxa with few general scales; metacoxa without scales; metasternum densely covered with glossy blue to green scales; lateral parts of ventrites I and II covered with glossy scales; ventrites III to V without glossy scales; trochanter without glossy scales; each profemur, mesofemur and metafemur with few glossy scales on basal part and patch of glossy blue to green scales on subapical part. Male aedeagal body as shown in Fig. 3A, B.

Female. Measurements (n=2): LB: 12.8 – 15.5 (mean 14.15); LR: 1.8 – 1.9 (mean 1.85); WR: 1.7 – 1.8 (mean 1.75); LP: 3.7 – 4.6 (mean 4.15); WP: 3.9 – 4.8 (mean 4.35); LE: 7.6 – 9.3 (mean 8.45); WE: 5.6 – 6.7 (mean 6.15). Dorsal habitus as in Fig. 1B.

Differential diagnosis. This new subspecies clearly differs from the other subspecies with the following unique features: pronotum wider than in other subspecies; unique blue to green colour scally patches on body; according on available data, subspecies distribution restricted to Babuyan Island; eyes smaller, not convex from outline of the head.

Etymology. This new subspecies is named after Babuyan Island which is original site where this subspecies is distributed and abundant.

***Pachyrhynchus moniliferus* ssp. *herbidus* subsp. n. (Fig. 1C)**

Type material. Holotype, male: "PHILIPPINES, Samar Island, Lope De Vega, IX. 2017, local collector leg." (white rectangular card, printed); "HOLOTYPE, Male, *Pachyrhynchus moniliferus* ssp. *herbidus* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (DUBC).

Paratypes: 4 males, 3 females; "PHILIPPINES, Samar Island, Lope De Vega, VII. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *herbidus* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (2 specimens);

"PHILIPPINES, Samar Island, Lope De Vega, VII. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Female, *Pachyrhynchus moniliferus* ssp. *herbidus* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (3 specimens);

"PHILIPPINES, Samar Island, Lope De Vega, VIII. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *herbidus* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (1 specimen);

"PHILIPPINES, Samar Island, Lope De Vega, X. 2017, local collector leg." (white rectangular card, printed); "PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *herbidus* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (1 specimen);

11 specimens (8 males and 3 females) are stored in SMTD with the distribution of Philippines, Samar Island. Specimens were wrongly identified as *P. moniliferus* var. *concinnus*, this variation originally belong to *P. moniliferus* ssp. *eburnus* which is distributed on Mindoro Island. After carefull examination of type material of *P. moniliferus* var. *concinnus* from BNHM, it is clear, that specimens from SNTD belongs to *P. moniliferus* ssp. *herbidus* subsp. n. Red rectangular cards with the following text: "PARATYPE, Male, *Pachyrhynchus moniliferus* ssp. *herbidus* Rukmane 2018, det. Anita Rukmane, 2018" are added to all male specimens and "PARATYPE, Female, *Pachyrhynchus moniliferus* ssp. *herbidus* Rukmane 2018, det.

Anita Rukmane, 2018” to all female specimens.

Distribution: Samar Island (Fig. 2).

Description. Male. Measurements (n=5): LB: 12.3 – 14.0 (holotype 14.0, mean 13.06); LR: 1.7 – 1.9 (holotype 1.9, mean 1.8); WR: 1.7 – 1.9 (holotype 1.9, mean 1.76); LP: 3.3 – 3.8 (holotype 3.8, mean 3.56); WP: 3.7 – 4.1 (holotype 4.1, mean 3.88); LE: 6.8 – 7.9 (holotype 7.9, mean 7.22); WE: 4.9 – 5.6 (holotype 5.6, mean 5.14). Dorsal habitus as in Fig. 1C.

Body black, shiny, underside and elytra with weaker lustre, with markings of metallic green recumbent round scales; rostrum in dorsal contour straight, weakly bulging in basal ½, length and width sub equal, LR/WR: 1; two oval shape impressions on apical part, bulge in submedian part and triangular impression in basal part, without longitudinal groove; each side of rostrum densely covered with metallic green scales; long golden hairs on each lateral part near apex; forehead wide, bulging medially, with longitudinal stripe of metallic green scales; eyes big, redirected laterally, convex from the outline of the head; antennal scape incurved ventrally, furnished with long light hairs on apical part dorsally; prothorax with the following markings of metallic green scapes: 1) transverse line of scales along apical margin from one lateroventral part to other, stripe interrupts in the middle; 2) patch of scales on each lateroventral part; 3) transverse line along middle of pronotum from one lateroventral margin to other; 4) dorsum with longitudinal line on median part of disc from basal margin to middle of disc; wider than long, WP/LP: 1.08; widest slightly above middle; with shallow impression on disc dorsally; elytra widest in middle; LE/WE: 1.41; wider than prothorax, WE/WP: 1.37; more than twice as long as prothorax, LE/LP: 2.08; intervals well pronounced; each elytron with the following metallic green scale lines: 1) transverse line on sub – basal part along basal margin, line slightly interrupts on suture and goes to lateroventral margin where line incurves and goes all long the lateral margin of elytron, another incurve near apex on middle of interval II; 2) transverse

line along midline of elytron, line slightly interrupts on suture and goes to lateral margin; 3) longitudinal line along interval III from sub – basal part to apex, near apex line extends from middle of interval II to middle of interval IV.

Male aedegal body as shown in Fig. 3C, D.

Female. Measurements (n=3): LB: 12.2 – 13.6 (mean 12.9); LR: 1.8 – 1.9 (mean 1.83); WR: 1.7 – 1.8 (mean 1.73); LP: 3.1 – 3.4 (mean 3.2); WP: 3.4 – 3.8 (mean 3.63); LE: 6.2 – 7.8 (mean 7.23); WE: 5.2 – 5.8 (mean 5.5).

Differential diagnosis. This new subspecies clearly differs from the other subspecies by following features: rostrum without longitudinal groove; longitudinal scaly patch of scales on forehead; eyes bigger than in other subspecies, convex from outline of the head; long, light hairs on apical part of antennal scape; pronotum widest slightly above middle; in order with restricted distribution of new subspecies which is Samar Island, none of *P. moniliferus* subspecies were recorded from this island previously.

Etymology. This new subspecies is named after

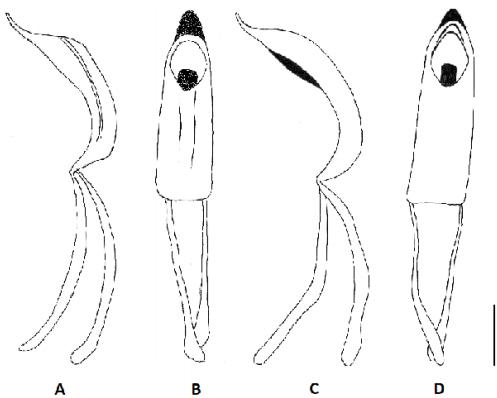


Fig.3. Male aedegal body of *P. moniliferus* ssp. *babuyanensis* subsp. n. and *P. moniliferus* ssp. *herbidus* subsp. n. A – lateral view of *P. moniliferus* ssp. *babuyanensis* subsp. n., B – dorsal view of *P. moniliferus* ssp. *babuyanensis* subsp. n., C – Lateral view of *P. moniliferus* ssp. *herbidus* subsp. n., D – dorsal view of *P. moniliferus* ssp. *herbidus* subsp. n.

its metallic green scally markings, which remind grassy green colour. One of translations from Latin for green colour is Hebridus. Herbidus – green.

Pachyrhynchus moniliferus moniliferus
Germar, 1824 (Fig. 4A, B)

= *Pachyrhynchus confinis* Chevrolat, 1841

= *Pachyrhynchus monilifer* Germar, 1871

Material examined: Philippines, 4 spec. (ZUMC); Luzon Island, 3 spec. (ZUMC), 290 spec. (SNTD), 155 spec. (BNHM); Aurora, IV. 2014, 1 spec. (DUBC); Banaue, IX. 2014, 1 spec. (DUBC); Cagayan, VII. 2014, 1 spec., XI. 2015, 1 spec. (DUBC); Dingalan, VII. 2016, 1 spec. (DUBC); Manilla, 26 spec. (ZUMC), 148 spec. (MNHN); Quirino, III. 2014, 1 spec., IV. 2014, 3 spec., V. 2015, 2 spec. (DUBC).

Specimens examined: 640 specimens.

Distribution: Philippines, Luzon Island (Fig. 2).

Pachyrhynchus moniliferus* ssp. *chevrolati
Eydoux & Souleyet, 1839 (Fig. 5A, B)

= *Pachyrhynchus concinnus* Waterhouse, 1841

= *Pachyrhynchus chlorolineatus* Waterhouse, 1841

= *Pachyrhynchus mandarinus* Chevrolat, 1841

Material examined: Philippines, 101 spec. (MNHN); Luzon Island, 36 spec. (SNTD); Aurora, III. 2012, 1 spec., VIII. 2013, 1 spec., VIII. 2014, 2 spec. (DUBC); Dingalan, XI. 2015, 1 spec., IX. 2016, 3 spec. (DUBC); Isabela, VII. 2013, 1 spec. (DUBC); Labuyo, XI. 2014, 1 spec. (DUBC); Quirino, VIII. 2013, 2 spec., IV. 2014, 1 spec., V. 2015, 1 spec. (DUBC).

Specimens from BNHM marked as *Pachyrhynchus moniliferus* var. *chlorolineatus* belong to these subspecies.

Specimens examined: 151 specimens.

Distribution: Philippines, Luzon Island (Fig. 2).

Pachyrhynchus moniliferus* ssp. *eburnus
Heller, 1934 (Fig. 4C, D)

Material examined: Philippines, 17 spec. (MNHN); Mindoro Island, 42 spec. (BNHM), 4 spec. (SNTD); Baco, IX. 2017, 4 spec., X. 2017, 1 spec. (DUBC); Mt. Halcon, XI. 2017, 3 spec., II. 2018, 2 spec. (DUBC).

Specimens from SNTD marked as *Pachyrhynchus moniliferus* var. *neojugifer* belong to these subspecies.

Specimens from BNHM marked as *Pachyrhynchus moniliferus* var. *concinnus* belong to these subspecies.

Specimens examined: 73 specimens.

Distribution: Philippines, Mindoro Island (Fig. 2).

Pachyrhynchus moniliferus* ssp. *jagori
Heller, 1912

Material examined: Philippines, Catanduanes Island, 1 spec. (SNTD).

Specimens examined: 1 specimen.

Distribution: Philippines, Catanduanes Island (Fig. 2).

Pachyrhynchus moniliferus* ssp. *stellulifer
Heller, 1912 (Fig. 5C, D)

Material examined: Philippines, Luzon Island, 162 spec. (SNTD); Aurora, IX. 2017, 1 spec. (DUBC); Barlig, XI. 2015, 1 spec. (DUBC); Belance, VIII. 2013, 2 spec., V. 2014, 1 spec., VI. 2014, 1 spec., VII. 2014, 1 spec. (DUBC); Cabagan, VIII. 2017, 9 spec., X. 2017, 1 spec. (DUBC); Isabela, VIII. 2013, 2 spec., III. 2014, 1 spec., XII. 2014, 1 spec., XI. 2015, 1 spec., II. 2016, 1 spec. (DUBC); Manilla, 142 spec. (MNHN); Pinukpok, VIII. 2017, 1 spec. (DUBC); Rizal, VI. 2017, 1 spec. (DUBC); San Pablo, IX. 2014, 1 spec., VIII. 2015, 1 spec., IX. 2015, 1 spec., XI. 2015, 1 spec. (DUBC); San Guillermo, VII. 2017, 1 spec. (DUBC).

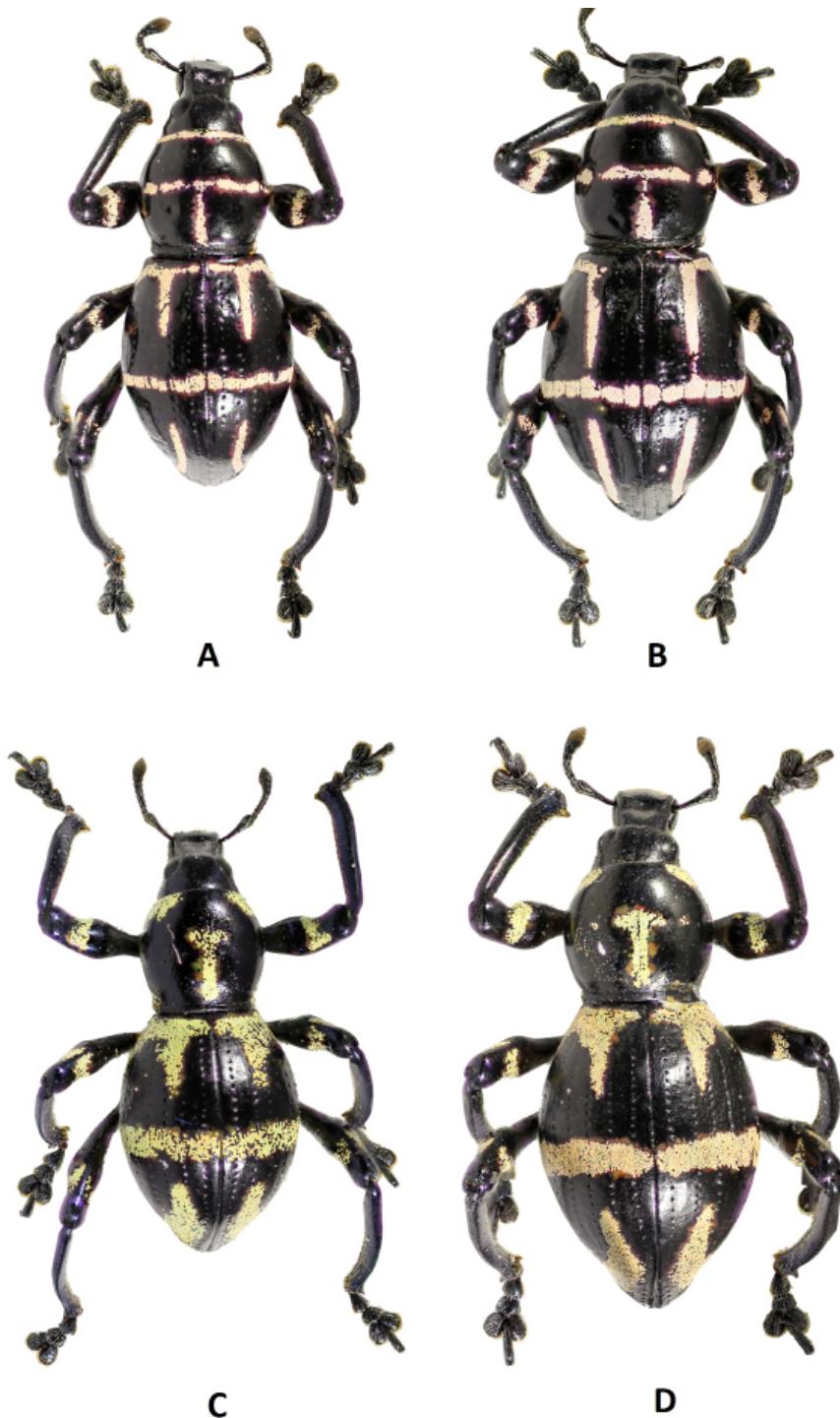


Fig. 4. Dorsal habitus of *P. moniliferus* ssp. – A – Male of *P. moniliferus* ssp. *moniliferus*; B – Female of *P. moniliferus* ssp. *moniliferus*; C – Male of *P. moniliferus* ssp. *eburnus*; D – Female of *P. moniliferus* ssp. *eburnus*.

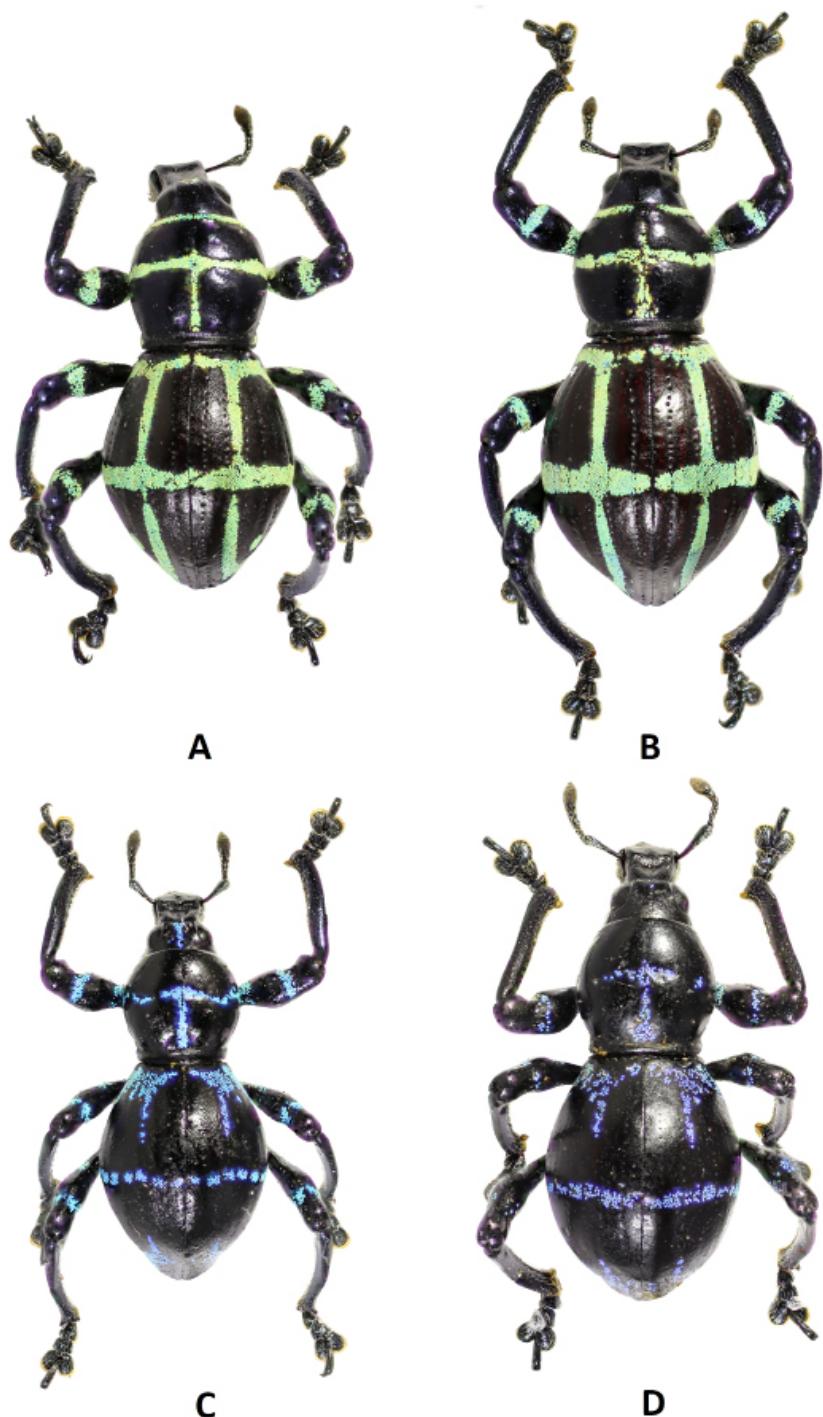


Fig. 5. Dorsal habitus of *P. moniliferus* ssp. – A – Male of *P. moniliferus* ssp. *chevrolati*; B – Female of *P. moniliferus* ssp. *chevrolati*; C – Male of *P. moniliferus* ssp. *stellulifer*; D – Female of *P. moniliferus* ssp. *stellulifer*.

Specimens from SNTD marked as *Pachyrhynchus moniliferus* var. *inornatus* belong to these subspecies.

Specimens examined: 334 specimens.

Distribution: Luzon Island (Fig. 2). This subspecies show high similarity to *Pachyrhynchus stellio* Heller, 1912, which is also known from Luzon Island.

DISCUTION

Big part of material of BNHM (38 spec.) and SNTD (224 spec.) from Catanduanes Island were wrongly identified and confused with *P. decussatus* Waterhouse, 1841.

P. moniliferus is variable in size, line markings and coloration on prothorax and elytra. Markings on prothorax and elytra may be present as a few dots (*P. moniliferus* ssp. *stellulifer* etc.), or complete lines (*P. moniliferus* ssp. *chevrolati* etc.). Typical *P. moniliferus moniliferus* represents in series of local forms with most of such forms having intermediate forms.

According to previous records, general distribution of *P. moniliferus* is in central and southern Luzon, Polillo, Mindoro, and Catanduanes and reaches in a southeasterly direction to Samar. According to new data, *P. moniliferus* have wider distribution range which is from northern part of Luzon, including Babuyan Island (*P. moniliferus babuyanensis*), central and southern parts of Luzon, where distribution of three subspecies overlap (*P. moniliferus* ssp. *moniliferus*, *P. moniliferus* ssp. *stellulifer*, *P. moniliferus* ssp. *chevrolati*), Catanduanes (*P. moniliferus* ssp. *jagori*), Mindoro (*P. moniliferus* ssp. *eburnus*) and Samar (*P. moniliferus* ssp. *herbidus*). *P. moniliferus* ssp. *stellulifer* previously were recorded from Mindoro, Naujan; Mangaran; San Jose; Mount Halcon, while new records reveals that species is represented by various forms on Luzon Island.

As firstly reported by Charles Darwin and Alfred Wallace in the papers ‘‘On the Tendency of

Species to form Varieties’’ and ‘‘Perpetuation of Varieties and Species by Natural Means’’ individuals within a species will have likewise genes but will be different in phenotypic features and behaviour caused by fairy differences in the genotype and response to environmental conditions. Such is the case with *P. moniliferus* with numerous local forms. For more detailed analyse of species relation and distribution paths it is necessary to investigate genetic research methods such as DNA barcoding.

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One new species of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Philippines

Anita Rukmane

Rukmane A. 2018. One new species of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Philippines. *Baltic J. Coleopterol.*, 18(2): 193 - 198.

One newspecies of genus *Pachyrhynchus* Germar from Philippines has been described herein: *Pachyrhynchus helenperrinae* sp. n. Rukmane, 2018. Species has been found during carefull examination of MNHN (Paris, France) coleoptera collection. Pictures and description of habbitus are added, together with illustrated male genitalia.

Keywords: Coleoptera, Curculionidae, *Pachyrhynchus*, fauna, taxonomy, new species, Philippines

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INTRODUCTION

Among the genera in the tribe Pachyrhynchini with a good number of representative species and wider distribution is *Pachyrhynchus* with 145 described species (Rukmane 2018). Since the main study of genus *Pachyrhynchus* took place almost century ago, an updates on fauna, distribution, biogeography and ecology are published every year (Bollino & Sandel 2015; Rukmane 2016; Rukmane 2017; Cabras & Rukmane 2016; Barševskis 2016). Recent updates on Philippine archipelago Coleoptera systematic indicate the vogue of the topic, with dozens of new species described annually (Anitchenko 2016, 2017; Barševskis 2017a, 2017b, 2018; Hava 2018; Ling & Zettel 2012). While local collectors and beetle dealers provide researchers and entomology enthusiasts with novel beetle material from all over the

archipelago, material from various museum collections such as MNHN remain poorly studied, and in perspective can provide new distribution and taxonomical records. Such is the case, during careful study of *Pachyrhynchus* material available in MNHN, new species of genus *Pachyrhynchus* were found.

The present paper provides a new data on previously unknown taxon of genus *Pachyrhynchus* from Philippines where only know specimens are known alone from MNHN.

MATERIALS AND METHODS

The studied material is deposited in the collection MNHN - National Museum of Natural History (Paris, France).

Material has been loaned and currently is deposited in DUBC (Daugavpils University Beetle Collection, Daugavpils, Latvia), but will be transported back to MNHN after article is published.

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

RESULTS

Pachyrhynchus helenperrinae sp. n. (Fig. 1A, B)

Type material. Holotype, male: “Philippines Ch. Semper” (white rectangular card, printed); “Museum Paris ex. Coll. R. Oberthur” (white rectangular card, printed); “HOLOTYPE, Male, *Pachyrhynchus helenperrinae* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed) (MNHN).

Paratypes: 1 male, 2 females; “Philippines Ch. Semper” (white rectangular card, printed); “Museum Paris ex. Coll. R. Oberthur” (white rectangular card, printed); “PARATYPE, Male, *Pachyrhynchus helenperrinae* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed);

“Philippines” (white rectangular card, printed); “Museum Paris ex. Coll. R. Oberthur” (white rectangular card, printed); “PARATYPE, Female, *Pachyrhynchus helenperrinae* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed);

“Ex. Musaeo Thorey” (white rectangular card, printed); “Philippines” (white rectangular card, printed); “Museum Paris ex. Coll. R. Oberthur” (white rectangular card, printed); “PARATYPE, Female, *Pachyrhynchus helenperrinae* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed); all in MNHN.

Distribution: Philippines.

Description. Male. Measurements (n = 2): LB: 11.3 - 12.2 (holotype 12.2); LR: 1.8 - 1.9 (holotype 1.9); WR: 1.6 - 1.7 (holotype 1.7); LP: 3.1 - 3.3 (holotype 3.3); WP: 2.9 - 3.7 (holotype 3.7); LE: 6.7 - 7.1 (holotype 7.1); WE: 4.7 - 5.1 (holotype 5.1). Dorsal habitus as in Fig. 1B.

Integument coppery, body surface very shiny with metallic lustre. Body subovate, with pale yellow or orange markings of recumbent scales. Head subglabrous. Rostrum in dorsal contour nearly straight, with weak impression in median part, narrowing on base, longer than wide, LR/WR: 1.06, finely punctured; triangular shape impression on apical part dorsally; two bulges on basal part dorsally; weak longitudinal groove medially from apical 2/3 to base dorsally; lateral contour of rostrum bulging from apex to apical 2/3, narrowing down in medial part and straight from middle to base; lateroventral parts finely covered with general scales; short scale □ like hairs from genae to apex, where they are replaced by long golden hairs. Head minutely punctured; forehead with impression on medial part, with longitudinal patch of pale yellow or orange scales between eyes; eyes relatively small, pretty much convex from outline of the head (if seen dorsally). Antennae slender, flattened, antennal scape expanding apically, finely furnished with long golden hairs from middle to apex along anterior margin; pedicel more than twice as long as wide, longer than segment I; segment I nearly twice as long as wide, 2 times longer than segment II; segments II □ V subequal in length, same length as width; segment VI slightly wider than long, covered with short golden hairs and long hairs, all of the rest segments evenly covered with long light brown hairs; club elongated, 2.5 times longer than wide. Prothorax wider than long, WP/LP: 1.12; widest just in the middle; with the following markings of pale yellow or orange recumbent scales: 1) transverse line of scales along midline of prothorax dorsally, medially on the disc line slightly interrupts; 2) somewhat round shape patch of scales on each of lateroventral margins of pronotum; disc with

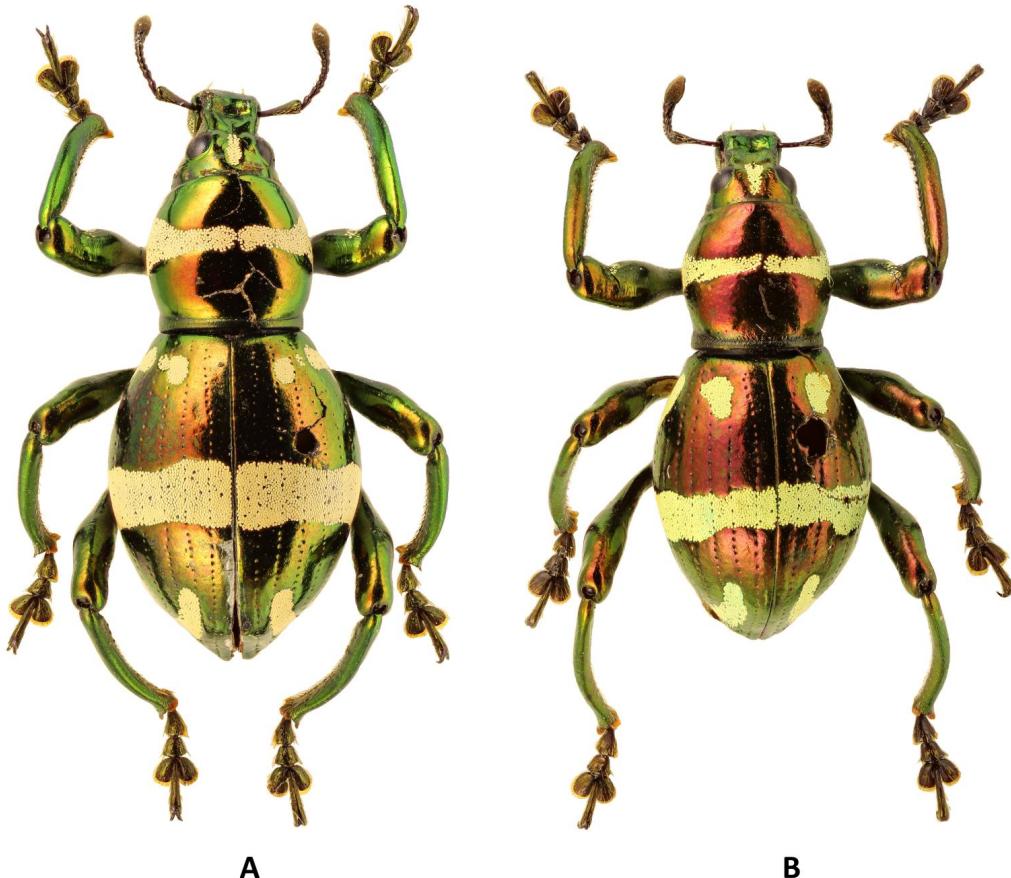


Fig. 1. Dorsal habitus of *Pachyrhynchus helenperrinae* sp. n.: A - female; B - male

weak impression on medial part; thorax covered with general scales; coxa with irregular yellow or orange scales along inner margin, mingled with short light hairs; trochanter without scale patches; femur with few general scales near base, scales mingled with short light hairs; apical part of femur with patch of yellow or orange scales near base along inner margin; mucrones small; tarsus densely covered with long hairs, tarsite I with two long extended dark brown hairs on each of lateral margins. Elytra subovate, LE/WE: 1.39, eider than prothorax, WE/WP: 1.38; widest slightly before middle; each elytron with the following markings: 1) oval patch of scales on basal 1/3 of interval III to IV; 2) transverse line of scales along midline of elytra, from one

lateroventral margin to other, line slightly interrupts on suture; 3) oval shape patch of scales on basal 1/3 from interval VII to lateroventral margin, patch can vary in size and be slightly connected with patch on interval IV; 4) longitudinal line along lateroventral margin from midline of elytron to apex of interval III where line incurves and goes up straight to apical 1/2; few short light hairs on apex; ventrites 1 and 2 covered with pale yellow scales laterally, mingled with very short, light scale-like hairs; ventrite 5 covered with long light golden hairs near apex and short light hairs near base; Genitalia as in Fig. 2A-D.

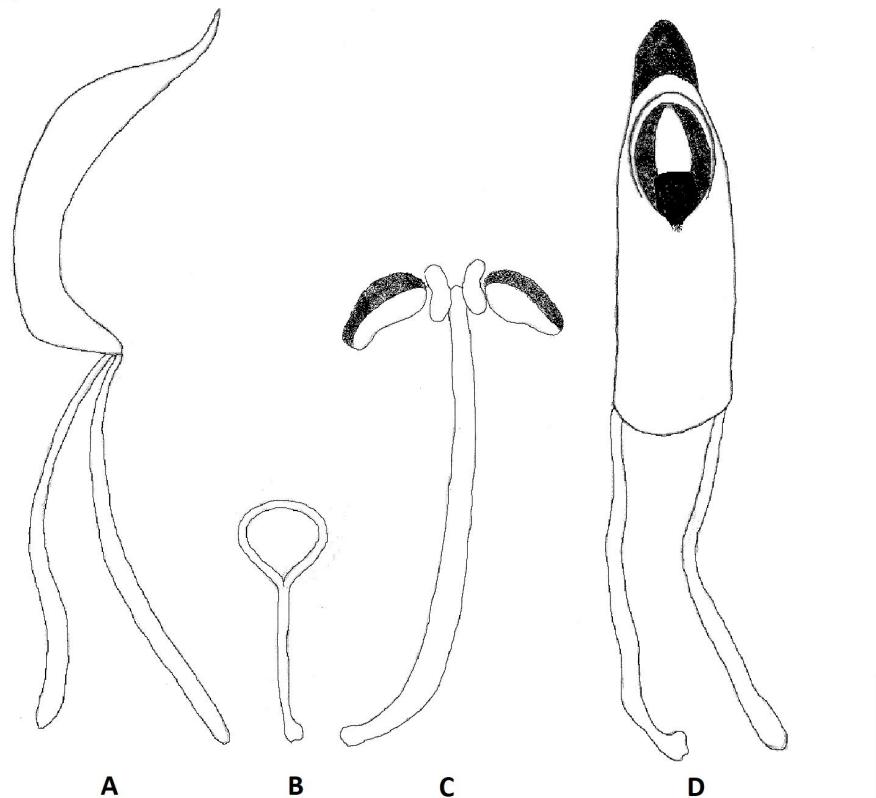


Fig. 2. Male genitalia of *Pachyrhynchus helenperrinae* sp. n.: A - penis in dorsal view; B - tegmen in dorsal view; C - sternite IX in dorsal view; D - penis in lateral view.

Female: Measurements (n=2): LB: 13.3 - 13.9 (mean 13.6); LR: 1.8 - 2.0 (mean 1.9); WR: 1.7 - 1.8 (mean 1.75); LP: 3.4 - 3.9 (mean 3.65); WP: 3.8 - 4.0 (mean 3.9); LE: 7.8 - 8.6 (mean 8.2); WE: 5.9 - 6.2 (mean 6.05). Lateral parts of ventrite 1 and 2 with few or without pale scales; apex of elytra without light hairs. Habitus as in Fig. 1A.

Differential diagnosis. *P. helenperrinae* sp. n. is similar to *P. antonkozlovi* Rukmane & Bardeevskis 2016 from Mindanao Island, but clearly differs by following features: 1) shape of male aedegal body (Fig. 2; aedegal body of *P. antonkozlovi* as shown in Rukmane & Bardeevskis, 2016); 2) longitudinal line of scales on forehead of *P. Helenperrinae* sp. n. which lacks in *P. antonkozlovi*; 3) elytra of *P. antonkozlovi* is narrowed on base, subspherical,

on the other hand, elytra of *P. Helenperrinae* sp. n. on base is wider, subovate shape; 4) transverse groove on rostrum of *P. antonkozlovi* is deeper, better pronounced, while the one on rostrum of *P. Helenperrinae* sp. n. is shallow, weakly pronounced; 5) two bulges on basal part of rostrum of *P. Helenperrinae* sp. n. which lacks *P. antonkozlovi*.

Etymology. This species is named after Helen Perrin (Paris, France), curator of curculionidae collection of MNHN in appreciation of cooperation, responsiveness and help during visit of museum.

DISCUSSION

A common problem while you work with old material from various museum collections as MNHN is that specimens have too few information on distribution. This is the case. For the moment, specimens described in this article are the only known *P. Helenperrinae* sp. n. species representatives.

After careful analysis of various species from different islands of Philippine archipelago it is possible to safely assert that species abundant on one particular island share common features which, at the same time, are clearly different than features that have species from another island. Such are, for example, *P. congestus* Pascoe, 1871 and *P. orbifer* Waterhouse, 1841 species groups distributed on Luzon Island (Schultze 1923) and, on the contrary, *P. atrocyaneus* Schultze, 1922 and *P. amabilis* Schultze, 1922 species groups distributed on Mindanao Island (Bollino, Sandel & Rukmane 2017). According on general appearance of *P. Helenperrinae* sp. n. this species is distributed on Mindanao or Mindanao PAIC.

The high endemism of the species of Philippine *Pachyrhynchus*, limited geographic distribution and habitat preference which is highly associated with forested mountain ecosystems and mountain ridges makes this group one of the best candidate for extinction with current rate of habitat degradation (Cabras et al., 2016). On account of rapid deforestation rates in Philippine archipelago, it is impossible to state that new species still inhabits the archipelago and is not extinct due the habitat loss as only known species finding is registered from now almost century ago. According to Diesmos et al. (2002), clearance and habitat fragmentation especially of the montane forest and lowland dipterocarps affect 85% of the fauna. *Pachyrhynchus* which seem to prefer higher elevation of the forests are clearly highly at risk of extinction.

ACKNOWLEDGEMENTS

I wish to express my gratitude to Erasmus+ staff mobility programme which provided material support for visit of MNHN. Also I want to thank you Helen Perrin (Paris, France) for access and possibility to work with *Pachyrhynchus* stored at MNHN.

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Two new species of the genus *Pachyrhynchus* (Coleoptera: Curculionidae: Pachyrhynchini) from Mindanao, Philippines

Anita Rukmane

Rukmane A. 2018. Two new species of genus *Pachyrhynchus* (Coleoptera: Curculionidae: Pachyrhynchini) from Mindanao, Philippines. *Baltic J. Coleopterol.*, 18(2): 283 - 290.

Two new species belonging to genus *Pachyrhynchus* are described from Mindanao Island: *P. sergejevae* sp. n. Rukmane, 2018; *P. torresi* sp. n. Rukmane, 2018. Pictures and description of habitus are added, together with distribution maps for both of species. Male genitalia and female terminalia are illustrated.

Key words: Coleoptera, Curculionidae, *Pachyrhynchus*, fauna, taxonomy, new species, Mindanao Island, Philippines

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae) belongs to the subfamily Entiminae, tribe Pachyrhynchini that comprises 15 genera mainly from the Philippines (Alonso-Zarazaga & Lyal 1999). Members of the genus *Pachyrhynchus* are wingless, have conspicuous, sometimes peculiar patterns of brightly colored scales, often with strong intraspecific variation between local populations. Some described species have similar coloration and setting of bright spots and scales similar as the some members of the genus *Doliops* Waterhouse, 1841 (Cerambycidae: Lamiinae); data about mimicry between species of *Pachyrhynchus*, *Metapocyrthus* and *Doliops* were provided by Starr & Wang (1992), Barševskis (2013, 2014, 2016, 2017) and Barševskis & Jaeger (2014).

The genus *Pachyrhynchus* is represented in the Oriental fauna by 145 species (Rukmane 2018),

distributed mainly in Oriental region, and is a good example of taxa with restricted distributions and great zoogeographical significance (Link & Zettel 2012). The genus has attracted attention of entomologists, and many new species has been described recently: Bollino & Sandel (2015), Rukmane & Barševskis (2016), Cabras & Rukmane (2016), Chen & Lin (2017).

During the study of large material from the Philippines on the genus *Pachyrhynchus* which is deposited in Daugavpils University institutional collection (DUBC), two new species were found from Mindanao Island. Previous studies on genus *Pachyrhynchus* showed that several species shows morphological relationships with different group of insects and share particular combination of morphological characters (Bollino, Sandel & Rukmane 2017). Species described herein show high resemblance to *P. atrocyanus* Schultze, 1922, in order with other

species: *P. caeruleovittatus* Yoshitake, 2012, *P. gilvomaculatus* Yoshitake, 2017, *P. hirokii* Yoshitake, 2012, *P. naokii* Yoshitake, 2012. The goal of this paper is to give descriptions of these two species.

MATERIALS AND METHODS

The studied material is deposited in the following collections:

DUBC - the beetles collection of Daugavpils University, Institute of Life Sciences and Technology, Coleopterological Research Centre, Ilgas, Daugavpils District, Latvia (A. Barševskis);

SMTD - Senckenberg Naturhistorische Sammlungen Dresden, Germany, Dresden, Germany (K. Klass).

The laboratory research and measurements follows previous works of the author (Rukmane & Barševskis 2016; Rukmane 2016).

RESULTS

Pachyrhynchus sergejevae sp. n. (Fig. 1C, F)

Type material. Holotype, male: "PHILIPPINES, Mindanao Island, Bukidnon, Cabangasan, VIII. 2014, local collector leg." (white rectangular card, printed); "HOLOTYPE, Male, *Pachyrhynchus sergejevae* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed) (DUBC).

Paratypes: 1 male, 3 females; "PHILIPPINES, Mindanao Island, Bukidnon, Cabangasan, IX. 2016, local collector leg." (white rectangular card, printed); "PARATYPE, Male, *Pachyrhynchus sergejevae* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed);

"PHILIPPINES, Mindanao Island, Bukidnon, Mt. Kalatungan, VII.2014, local collector leg." (white rectangular card, printed); "PARATYPE, Female, *Pachyrhynchus sergejevae* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed);
 "PHILIPPINES, Mindanao Island, Bukidnon, Intavas, VII.2014, local collector leg." (white rectangular card, printed); "PARATYPE, Female, *Pachyrhynchus sergejevae* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed);
 "PHILIPPINES, Mindanao Island, Bukidnon, Mt. Intavas, VIII.2014, local collector leg." (white rectangular card, printed); "PARATYPE, Female, *Pachyrhynchus sergejevae* Rukmane 2018, det. Anita Rukmane, 2018" (red rectangular card, printed); all in DUBC.

Distribution: Mindanao Island (Fig. 2).

Description. Male. Measurements (n = 2): LB: 13.9 - 14.2 (holotype 13.9); LR: 1.9 - 2.1 (holotype 2.1); WR: 1.5 - 1.8 (holotype 1.8); LP: 3.5 - 3.9 (holotype 3.5); WP: 3.4 - 3.6 (holotype 3.4); LE: 7.6 - 7.9 (holotype 7.6); WE: 5.1 - 5.3 (holotype 5.1). Dorsal habitus as in Fig. 1F.

Integument dark brown, coppery, or almost black, body surface including underside very shiny. Body subglabrous, with dull pale green markings of recumbent scales. Head subglabrous. Rostrum in dorsal contour nearly straight, with weak bulge in apical part, slightly incurved in median part, longer than wide, LR/WR: 1.16, minutely punctured, weak bulge in apical ½, impression from apical ½ with peak on the midline, extending to basal ¾; longitudinal groove along midline of rostrum from apical ½ to basal ¾, transverse groove in median part of rostrum; lateroventral parts with few general scales from antennalscrobis to apex; short scale □ like hairs near antennal scrobe and long golden hairs near apex; patch of round pale green scales along with short, golden hairs on genae. Head minutely punctured; forehead weakly bulging dorsally, with patch of scales between eyes; eyes small, weakly convex (if see

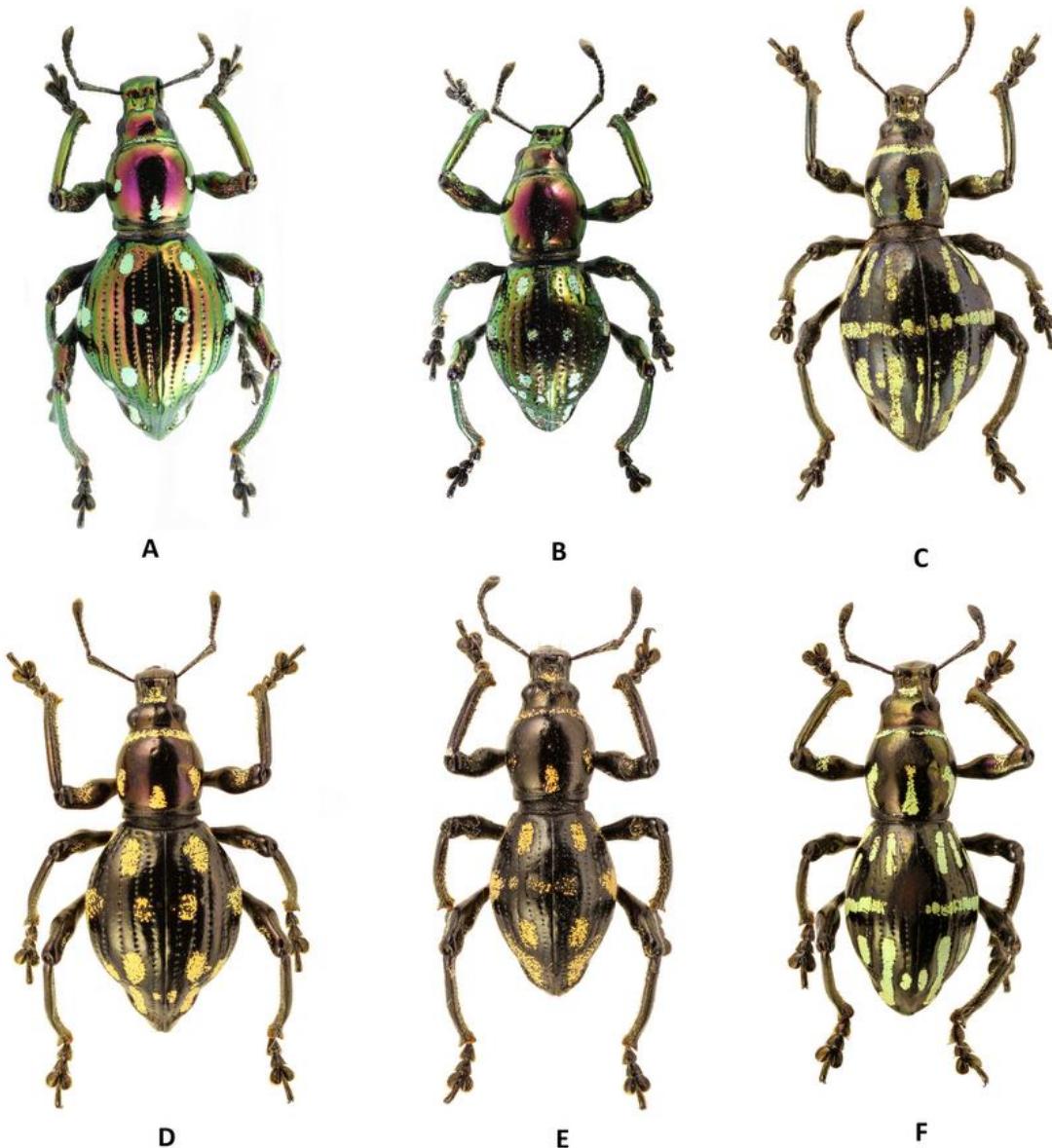


Fig. 1. Dorsal habitus of *Pachyrhynchus* species: A - female of *P. atrocyaneus* Schultze, 1922; B - male of *P. atrocyaneus* Schultze, 1922; C - female of *P. sergejevae* sp. n.; D - female of *P. torresi* sp. n.; E - male of *P. torresi* sp. n.; F - male of *P. sergejevae* sp. n.

dorsally). Antennae slender, scape straight, bulging apically, apical part furnished with long lighthairs from medial part to anterior margin; pedicel same length as segment I, nearly twice as long as wide; segment I twice as long as wide, 2.5 times longer than segment II; segments II - V gradually increasing in length, segment II

nearly 4 times shorter than segment VI, segment V nearly 3 times shorter than segment VI. Prothorax nearly as wide as long, LP/WP: 1.03; widest slightly before midline; with following markings of recumbent scales: 1) transverse line of scales along apical margin from one lateroventral margin to other; 2) longitudinal line

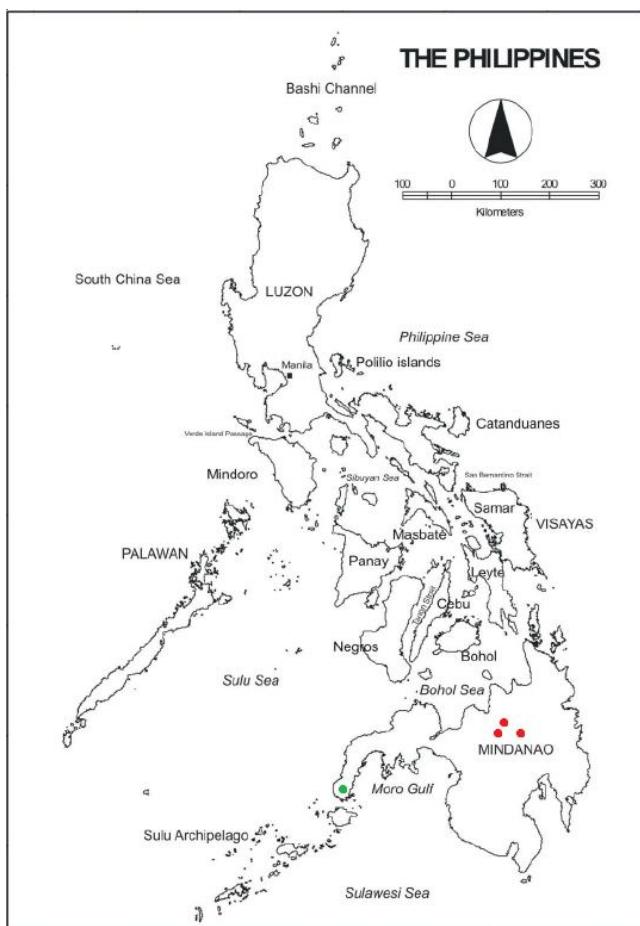


Fig. 2. Distributionmap of *P. sergejevae* sp. n. (marked with red) and *P. torresi* sp. n. (marked with green).

in median part from basal margin to middle of prothorax; 3) two longitudinal lines from basal margin to middle of pronotum, each laterally from medial line of scales; patch of scales on each of latero - ventral margins; disc with weak impression on medial part. Elyrtasub ellipsoidal, LE/WE: 1.49, wider than prothorax, WE/WP: 1.5, more than twice as long as prothorax, LE/LP: 2.17; intervals well pronounced; widest in middle, with bulge in sub-apical part before apex; each elytron with the following markings: 1) three longitudinal lines from base to basal $\frac{1}{2}$ of interval 3, 5 and 7; 2) longitudinal line along lateral margin from base to apex; 3) transverse line in median part from lateral margin to suture; 4) longitudinal line on middle of basal part of interval I; 5) longitudinal line along interval III from apical 1/5 to apex; 6) longitudinal line along interval V; 7) longitudinal line along interval VII. Genitalia as in Fig. 3A-D.

Female: Measurements (n = 3): LB: 13.2 - 14.3 (mean 13.63); LR: 1.7 - 1.9 (mean 1.8); WR: 1.4 - 1.6 (mean 1.5); LP: 3.2 - 3.6 (mean 3.37); WP: 3.2 - 3.5 (mean 3.4); LE: 7.2 - 8.1 (mean 7.53); WE: 5.5 - 6.3 (mean 5.93). Sternite IV and V densely covered with general scales. Habitus as in Fig. 1C. Terminalia as in Fig. 3E-G.

Differential diagnosis. According to general appearance and pattern of scale lines on body, *P. sergejevae* sp. n. is similar to *P. cumingi* Waterhouse, 1841, *P. shavrini* Rukmane & Barševskis, 2016 and *P. anichtchenkoi* Rukmane & Barševskis, 2016, but after careful morphological analyses and comparison of male genitalia, it is clear that *P. sergejevae* sp. n. is more closely related to *P. atrocyaneus*. *P. sergejevae* sp. n. clearly differs from *P. atrocyaneus* with following features: shape of male aedeagal body (see Fig. 4); elytra of *P. sergejevae* sp. n. is more extended and slender, on other hand, elytra of *P. atrocyaneus* is shorter and more rounded; different pattern of scale lines (see Fig. 1A, B); pronotum of *P. atrocyaneus* more rounded, widest in middle, pronotum of *P. sergejevae* sp. n. widest before midline.

Etymology. This species is named after Agnese Sergejeva (Latvia), great friend of author, in appreciation of support, trust and loyalty through many years of friendship.

***Pachyrhynchus torresi* sp. n.**
(Fig. 1D, E)

Type material. Holotype, male:
“PHILIPPINES, Mindanao Island,

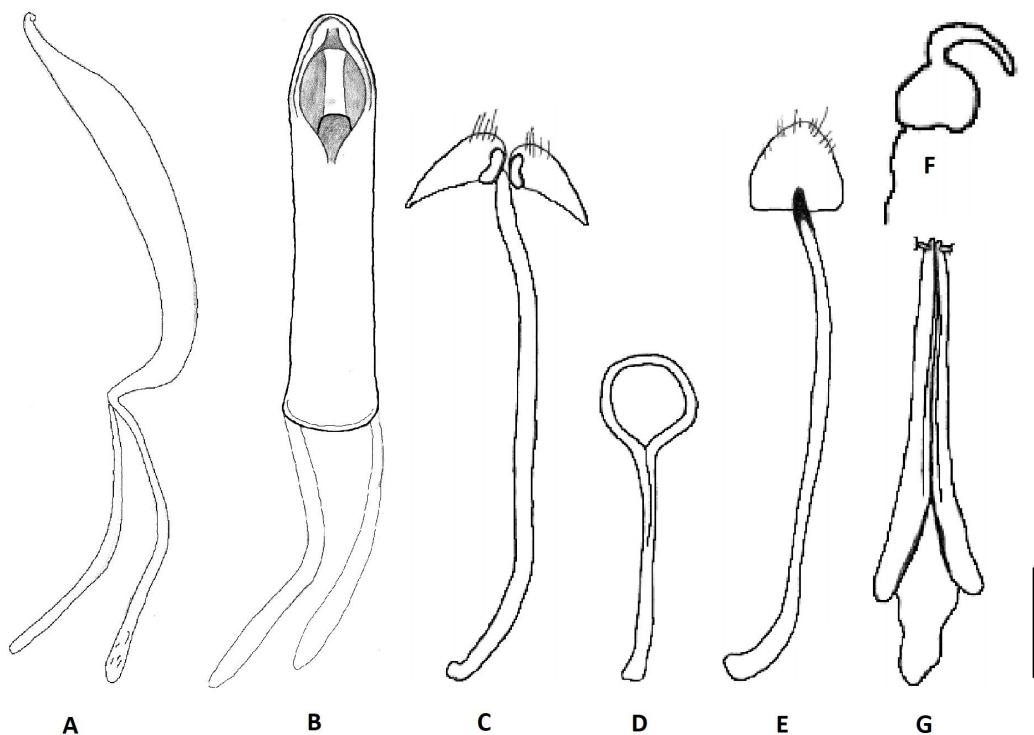


Fig. 3. Male genitalia and female terminalia of *P. sergejevae* sp. n.: A - penis indorsalview; B - penis inlateralview; C - sternite IX in dorsal view; D - tegmen in dorsal view; E - sternite VIII inventralview; F - spermatheca; G - ovipositor in dorsal view

Zamboanga, Labuan, I. 2018, local collector leg.” (typed on white card, printed); “HOLOTYPE, Male, *Pachyrhynchus torresi* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed) (DUBC).

Paratypes: 8 males, 5 females; “PHILIPPINES, Mindanao, Zamboanga, Labuan, I. 2018, local collector leg.” (white rectangular card, printed); “PARATYPE, Male, *Pachyrhynchus torresi* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed) (5 pcs.); “PHILIPPINES, Mindanao Island, Zamboanga, Labuan, II. 2018, local collector leg.” (white rectangular card, printed); “PARATYPE, Male, *Pachyrhynchus torresi* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed) (3 pcs.); “PHILIPPINES, Mindanao, Zamboanga, Labuan, I. 2018, local collector leg.” (white rectangular card, printed); “PARATYPE, Female, *Pachyrhynchus torresi* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed) (2 pcs.).

card, printed); “PARATYPE, Female, *Pachyrhynchus torresi* Rukmane 2018, det. Anita Rukmane, 2018” (red rectangular card, printed) (3 pcs.);

“PHILIPPINES, Mindanao Island, Zamboanga, Labuan, II. 2018, local collector leg.” (white rectangular card, printed); 287 PARATYPE, Female, *Pachyrhynchus torresi* Rukmane 2018, det. Anita Rukmane, 2018 (red rectangular card, printed) (2 pcs.).

Distribution: Mindanao Island (Fig. 2).

Description. Male. Measurements (n=9): LB: 12.1 - 13.3 (holotype 13.3, mean 12.5); LR: 1.7 - 1.9 (holotype 1.8, mean 1.79); WR: 1.4 - 1.5 (holotype 1.5, mean 1.47); LP: 2.9 - 3.4 (holotype 3.4, mean 3.16); WP: 2.9 - 3.4 (holotype 3.4, mean 3.12); LE: 6.5 - 7.3 (holotype 6.9, mean 6.82); WE: 4.3 - 5.0

(holotype 4.8, mean 4.69). Dorsal habitus as in Fig. 1F.

Integument black, body surface shiny, underside with weaker lustre. Body subglabrous, with dull pale orange markings of recumbent round scales. Head subglabrous. Rostrum in dorsal contour nearly straight, narrow on apex, weakly extending to middle, in the middle weakly incurved, bulging to basal part and narrows at the base, wider than long, LR/WR: 1.2; longitudinal medial groove from apical $\frac{1}{2}$ to middle of forehead; deep oval shape impression on basal part; oval shape patch of round pale orange scales on the basal part of the rostrum; lateroventral parts densely covered with general scales all long, with most on genae; on genae and near antennal scrobes short golden hairs, long golden hairs near apex. Head minutely

punctured; forehead moderately squeezed out; eyes relatively large, rather strongly convex from the outline of the head. Antennae slender; scape furnished with long, light hairs from medial part to apex, with most near apex along anterior margin; pedicel same length as segment I, nearly twice as long as wide; segment I nearly twice as long as wide, 2.5 times longer than segment II; segments II - V sub equal in length, as long as wide, segment VI 1.5 times longer than segment V, slightly longer than wide. Prothorax with equal length and width, LP/WP: 1; widest slightly before middle; with following markings of recumbent scales: 1) transverse line or pale orange scales along apical margin from one lateral margin to other; 2) spot in the middle of basal margin on disc; 3) two spots on medial part of disc, each redirected laterally; 4) oblong patch along each lateroventral margin. Elytra subelipsoidal, widest slightly before middle, LE/WE: 1.44, wider than prothorax, WE/WP 1.41, as twice as long as prothorax, LE/LP: 2.03; intervals well pronounced; each elytron with the following markings: 1) patch of scales in sub basal part of interval III; 2) patch of scales on the medial part from suture to interval II; 3) patch of scales on the medial part of interval IV to VI; 4) patch of scales on apical $\frac{1}{2}$ of interval III; 5) longitudinal line along lateral margin all long; 6) triangular shape patch of scales near apex. Genitalia as in Fig. 5A-D.

Female: Measurements (n=5): LB: 12.9 - 13.6 (mean 13.16); LR: 1.7 - 1.9 (mean 1.8); WR: 1.4 - 1.6 (mean 1.52); LP: 2.9 - 3.1 (mean 3.02); WP: 3.1 - 3.2 (mean 3.14); LE: 7.3 - 8.1 (mean 7.78); WE: 5.2 - 5.7 (mean 5.4). Habitus as in Fig. 1D. Terminalia as in Fig. 5E-G.

Differential diagnosis. *P. torresi* sp. n. in general appearance is similar to *P. atrocyaneus*, but clearly differs by the following features: 1) shape of male aedeagal bogy (Fig. 4); 2) prothorax of *P. torresi* sp. n. less rounded up, widest just before middle, prothorax of *P. atrocyaneus* widest in the middle; 3) rostrum of *P. torresi* sp. n. without transverse groove in medial part; 4) eyes of *P. torresi* sp. n. bigger, more convex of the outline of the head.

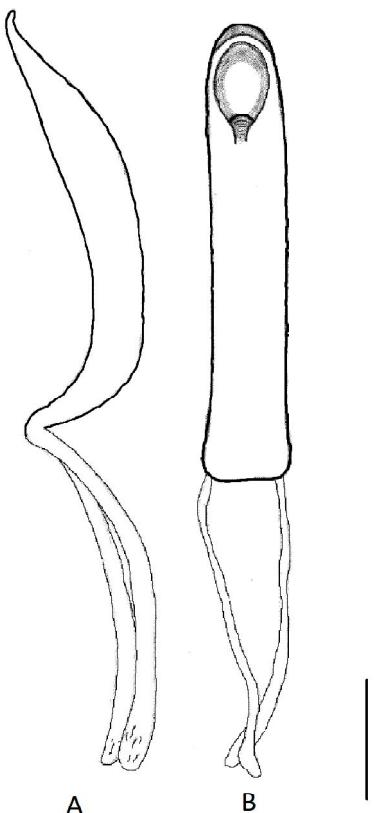


Fig. 4. Male genitalia of *P. atrocyaneus* Schultze, 1922: A - penis in dorsal view; B - penis in lateral view

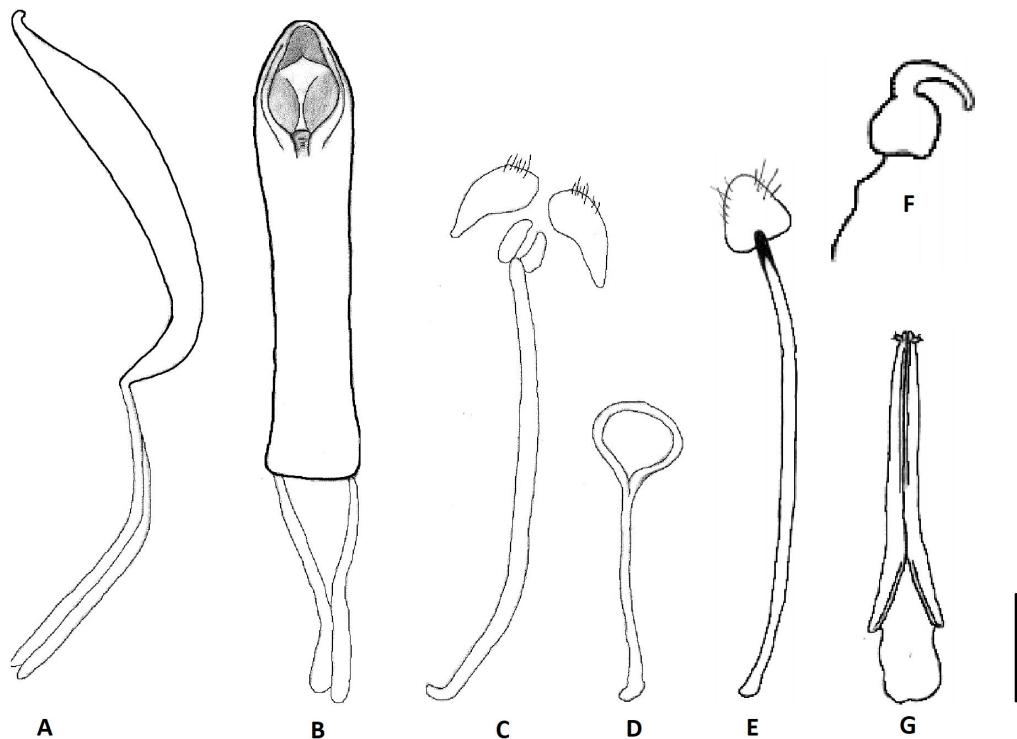


Fig. 5. Male genitalia and female terminalia of *P. torresi* sp. n.: A - penis indorsalview; B - penis in lateral view; C - sternite IX in dorsal view; D - tegmen in dorsal view; E - sternite VIII in ventral view; F - spermatheca; G - ovipositor in dorsal view

Etymology. This species is named after president of University of Mindanao Dr. Guillermo P. Torres Jr in appreciation of support and organisation of warm welcome during Daugavpils University entomologists delegation visit to University of Mindanao.

habitus of *P. mollendorffi* type specimen from SMTD. I would like to add reference to following picture, and note that picture is taken from Dr. Maurizio Bollino (Italy) private collection, and also I would like to express my deepest apology for making such mistake.

NOTE

In the following paper author would like to add some changes to one of her previous papers: 289 New and additional notes on the distribution of *Pachyrhynchus mollendorffi* Heller, 1899 (Coleoptera: Curculionidae), with a description of a new subspecies from the Marinduque Island (Philippines) which relieson figure 2: 289 Dorsal and lateral

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To the knowledge of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species from SMNH (Stockholm, Sweden), with description of a new species from the Sibuyan Island (Philippines)

Anita Rukmane

Rukmane A. 2019. To the knowledge of genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species from SMNH (Stockholm, Sweden), with description of a new species from the Sibuyan Island (Philippines). *Baltic. J. Coleopterol.*, 19(1): 41 - 50.

A new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Sibuyan Island (Philippines) is described and illustrated: *P. sibuyanensis* sp. nov. This new species is similar in general appearance to *P. moniliferus* Germar, 1824, but differs from it by several morphological characteristics (see differential diagnosis). Additionally to the description of the new species data of the *Pachyrhynchus* species from the Swedish Museum of the Natural History, Stockholm, Sweden (SMNH) is provided and listed. Diagnosis, description, and photographs of the male and female habitus as well as illustrations of male and female genitalia together with a distribution map of the new species is included.

Key words: Pachyrhynchini, *Pachyrhynchus*, Sibuyan, Philippines, new species, taxonomy.

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824, with distribution centre at the Philippine Archipelago, has already been well studied in the previous past years (Bollino et al 2017; Rukmane & Cabras 2018). With more than 150 species (Rukmane 2018), taxonomy of the genus has gone far away from establishments done in the past century (Schultze 1923). Yet, as beetles of the genus *Pachyrhynchus* remain commercial, 21st century collections are created mainly from the material bought from the local collectors. As for the past century, majority of the museum material was collected by H. Cuming, such as the collections

from Senckenberg Natural History Collections (SMTD) and the Swedish Museum of the Natural History, Stockholm, Sweden (SMNH). If we look back, Chevrolat was the one who revised the SMNH Pachyrhynchini material. Even if Chevrolat described several new taxa of the genus *Pachyrhynchus*, a big part of them has been synonymised by Schultze who worked with the same material collected by H. Cuming. During my visit to the SMNH I had the opportunity to study the Pachyrhynchini collection and determine all *Pachyrhynchus* species stored there. Here I provide a list of the species from the SMNH, big part of which is the type material earlier described by Chevrolat and later synonymised

by Schultze. Such data can serve as useful information for further taxonomical and biogeographical studies of the genus *Pachyrhynchus*.

Sibuyan is the second largest island in an archipelago comprising Romblon Province, Philippines. According to geological data, the island has never been connected with any part of the Philippine archipelago, which makes its beetle fauna especially interesting. Surrounded by the Sibuyan Sea, the Island has two major peaks – Mt. Guiting-Guiting (2,058 metres), which also has a National Park status and Mt. Nailog (789 metres). Because of predominance of steep slopes on the Island, much of the original forest remained untouched, covering 33% or 140 square kilometres of the land area. However, plenty of the lower altitude forest has been logged or burn-farmed for industrial needs (Olsson & Knudsen 2004). The forest area of Mt. Guiting-Guiting National Park is generally intact, and includes the entire elevational gradient from lowland dipterocarp forest and mangroves, through montane forest to mossy forest, which is the favourable habitat for beetles of the genus *Pachyrhynchus* and other members of the tribe Pachyrhynchini (Cabras et al. 2017). As for previous studies, no species of the genus *Pachyrhynchus* has ever been recorded from Sibuyan Island or Romblon Province. During the examination of *Pachyrhynchus* material from the SMNH, four specimens were labelled with distribution on Sibuyan Island, Romblon Province. This article presents the first record of Pachyrhynchini from Sibuyan Island, Romblon Province, which, obviously, is new for science.

MATERIAL AND METHODS

The study was based on specimens deposited at the Swedish Museum of the Natural History, Stockholm, Sweden (SMNH). The methods and equipment used in this study were the same as explained in Rukmane (2018). The type specimens of the new species described in this paper are temporarily preserved in the Daugavpils University, Study and Research Center “Ilgas” (DUBC),

but after publishing of this paper they will be returned to the SMNH.

Label data are cited *verbatim*. In the text the following symbols and abbreviations were used:

/ = different lines

// = different labels

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

RESULTS

Pachyrhynchus sibuyanensis sp. nov.

(Fig. 1A, 1B, 2)

Type material. Holotype: Male (Fig. 1A) “PHILIPPINES / ROMBLON / 1984” (white rectangular card, written by hand); “NHRS-JLKB / 000065431” (white rectangular card, printed); “HOLOTYPE / Male / *Pachyrhynchus sibuyanensis* Rukmane, 2019 / det. Rukmane A. 2019” (red rectangular card, printed)

Paratypes (2 males, 1 female): “PHILIPPINES / ROMBLON / 1984” (white rectangular card, written by hand); “NHRS-JLKB / 000065432” (white rectangular card, printed); “PARATYPE / Male / *Pachyrhynchus sibuyanensis* Rukmane, 2019 / det. Rukmane A. 2019” (red rectangular card, printed). “C. PHILIPP. / SIBUYAN / L. ROMBLON 1982” (white rectangular card, written by hand); “NHRS-JLKB / 000065434” (white rectangular card, printed); “PARATYPE / Male / *Pachyrhynchus sibuyanensis* Rukmane, 2019 / det. Rukmane A. 2019” (red rectangular card, printed). “C. PHILIPP. / SIBUYAN / L. ROMBLON 1982” (white rectangular card, written by hand); “NHRS-JLKB / 000065433” (white rectangular card, printed); “PARATYPE / Female / *Pachyrhynchus sibuyanensis* Rukmane, 2019 / det. Rukmane A. 2019” (red rectangular card, printed).

Distribution: Philippines, Romblon province, Sibuyan Island (Fig. 3).

Description. Male. LB: 10.6 – 11.2 (holotype 11.2; mean 10.87); LP: 3.3 – 3.5 (holotype 3.5; mean 3.4); WP: 3.3 – 3.8 (holotype 3.8; mean 3.57); LE: 7.4 – 8.2 (holotype 8.2; mean 7.8); WE: 4.6 – 5.0 (holotype 5.0; mean 4.8); LR: 1.9 (holotype 1.9; mean 1.9); WR: 1.8 – 1.9 (holotype 1.8; mean 1.83). N = 3 for all measurements. Dorsal habitus as shown in Fig. 1A.

Integument black. Body surface strongly shiny, underside with weaker lustre. Different markings of the round recumbent iridescent pale yellow scales on elytra, prothorax, rostrum and femur. Head sub glabrous; forehead weakly punctured, less than two times as wide as eye width; eyes relatively small, weakly prominent from the outline of the head. Antennae with glossy surface, mingled with long, light hairs in all length; scape relatively slender, shorter than funicle; funicular segment I more than twice as long as wide, 1.5 times longer than II; segment II 1.5 times/ as long as wide, nearly 2 times as long as III; segments III – V sub equal in length and width, equal in length and width, slightly shorter than segment VI; segment VI bigger, slightly longer than wide, shorter and smaller than segment VII; segment VII slightly longer than wide; club sub ellipsoidal, 1.5 times as long as wide, nearly as long as funicular segments V to VII combined. Forehead without scally markings, weakly punctured, very weakly expressed. Rostrum longer than wide (LR/WR: 1.06); basal part of the rostrum minutely pubescent; dorsum weakly punctured, with moderately deep triangular concavity on basal part and shallow longitudinal medial groove from the middle of the rostrum to middle of the forehead; shallow transverse groove along midline of the rostrum; two triangular shape scally patches inside concavity, patches interrupted by longitudi-

dinal groove; weak apical bulge that flattish dorsally, with a pair of oblique elliptic shallow depressions on the middle; dorsal contour of forehead and rostrum moderately arched in basal half, generally declined to midline and weakly rising to apical 2/3 after gradually declined to apex; patch of scally markings on genae.

Prothorax with the following markings: 1) transverse line along sub apical margin in all length; 2) big patch of scales along each of the lateroventral parts; 3) two elongated scally patches from the medial part of the pronotum to base, reaching basal 3/4, patches redirected laterally; Sub globular, wider than long, WP/LP: 1.09; weakly punctured; dorsal contour highest slightly before middle apically; sides gradually rounded; basal margin expressed, weakly arched basally. Each elytron with the following scally markings: 1) elongated scally patch along interval III, from basal 1/5 to basal 4/5; 2) thick transverse line along midline, from lateral margin to suture; 3) longitudinal line along interval III to IV from the midline to apex where line arches along lateral margin of elytra from apex to midline, where line connects with the transverse line; 4) longitudinal patch of scales along interval IX to lateral margin, from basal 1/5 to basal 4/5; scutellum expressed; elytra strongly shiny, sub ellipsoidal, LE/WE: 1.64, wider than prothorax, WE/WP: 1.32, more than twice as long as prothorax, LE/LP: 2.34; moderately punctured with even intervals; dorsal contour highest just in the middle; sides gradually extending from base, widest just in the middle, then gradually narrowed to apex.

Legs slender, strongly shiny; femur near apical end with few general scales along internal margin; Genitalia as illustrated (Fig. 2).

Female. LB: 13.0; LP: 3.8; WP: 4.0; LE: 9.1; WE: 6.0; LR: 2.0; WR: 1.9. N = 1. Dorsal habitus as shown in Fig. 1B.

Rostrum slightly longer than wide; LR/WR: 1.05; prothorax wider than long; WP/LP: 1.05; elytra wider than in male; LE/WE: 1.52, wider than prothorax; WE/WP: 1.5.

Differential diagnosis. In the general appearance the new species is similar to *P. moniliferus* Germar, 1824 but differs by various morphological features: 1) prothorax less rounded than in *P. moniliferus*; 2) different scally markings on the prothorax; 3) scutellum of the new species expressed; 4) femur near apical end without stripe

of scally markings; 5) base of elytra of the new species narrower as compared to highest width of elytra; 6) rostrum of the new species wider, with two scally patches on apical depression; together with unique distribution of the new species that, according to available data, is limited to Sibuyan Island.

Etymology. This new species is named after Sibuyan Island which is the only known locality of this new species.

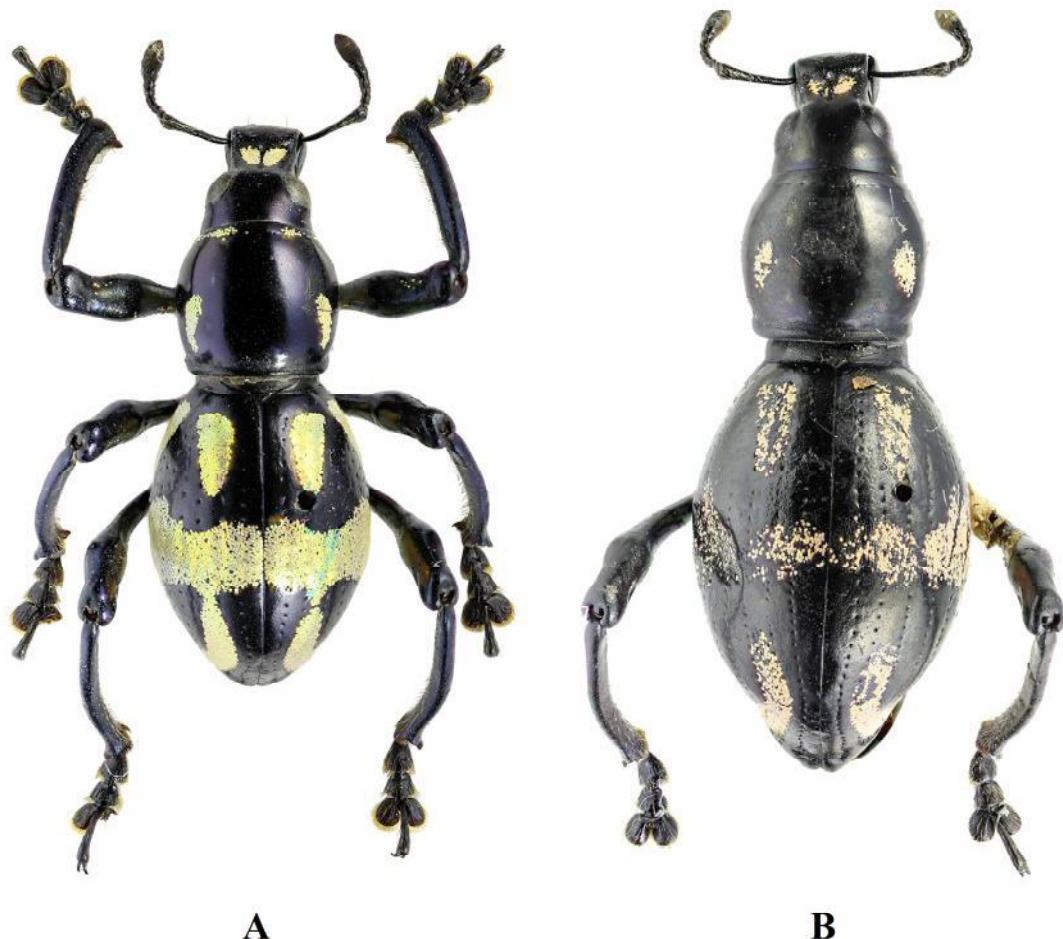


Fig. 1. Dorsal habitus of *P. sibuyanensis* sp. nov.; A – male; B – female.

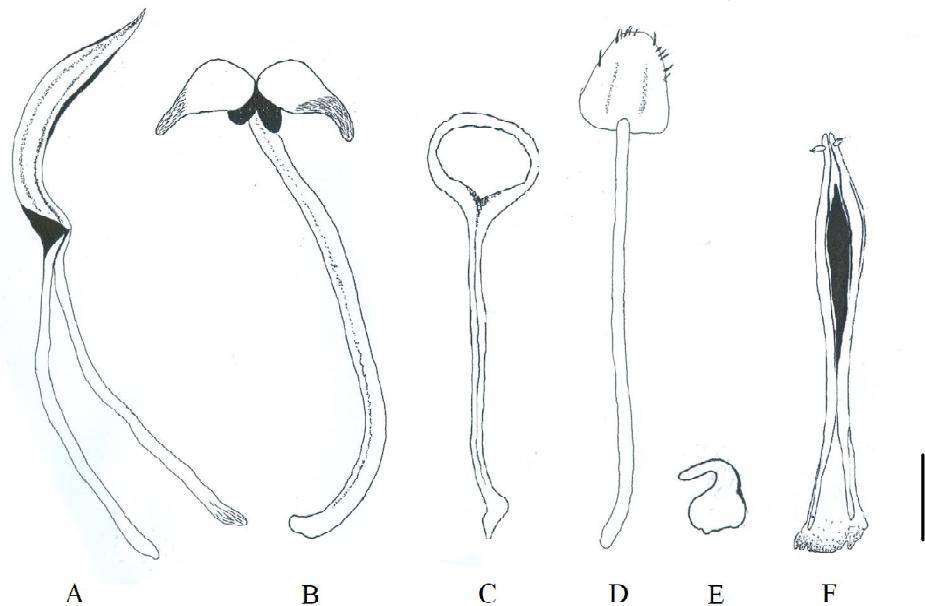


Fig. 2. Male genitalia and female terminalia of *P. sibuyanensis* sp. nov., holotype, male: A–C; paratype, female: D–F; A – aedeagus in lateral view; B – sternite IX in dorsal view; C – tegmen in dorsal view; D – sternite VIII in ventral view; E – spermatheca; F – apex of ovipositor in dorsal view. Scale: 1.00 mm.



Fig. 3. Distribution map of the *P. sibuyanensis* sp. nov. (marked with red)

SMNH *Pachyrhynchus* species list

1. *Pachyrhynchus amabilis* Schultze, 1922

Philippines / Mindanao / 1977 / (1); Philippines / Mindanao, Zamboanga / 04. 1989 / (1)

2. *Pachyrhynchus anitchchenkoi* Rukmane & Barševskis, 2016

Philippines / Mindanao, Zamboanga / 1991 / (1)

3. *Pachyrhynchus annelifer* Heller, 1912

Philippines / Luzon, Baguio / 07. 1986 / (5)

4. *Pachyrhynchus annulatus* Chevrolat, 1881

Philippines / Luzon, Mt. Province / 1987 / (1)

5. *Pachyrhynchus apicatus* Schultze, 1922

Philippines / Marinduque / 1974 / (1); Philippines / Luzon / 1975 / (1)

6. *Pachyrhynchus ardentius* Schultze, 1919

Philippines / Mindanao, Mt. Apo / 02. 1976 / (2)

7. *Pachyrhynchus argus* Pascoe, 1873

Philippines / Luzon, Manilla / (3); Philippines / Luzon, Baguio / 1986 / (4)

8. *Pachyrhynchus chlorites* Chevrolat, 1881

TYPE / Philippines / (1); Philippines / Luzon, Manilla / (4)

9. *Pachyrhynchus circulatus* Pascoe, 1873

Philippines / Catanduanes / (2)

10. *Pachyrhynchus congestus* Pascoe, 1873

= *luteoguttatus* Chevrolat, 1841; TYPE / Philippines / (1)

Philippines / Luzon, Manilla / (5); Philippines / Luzon, Baguio / 1957 / (1); Philippines / Luzon, Mt. Province / 1986 / (4)

11. *Pachyrhynchus corpulentus* Schultze, 1922

Philippines / Mindanao, Zamboanga / 1991 / (1)

12. *Pachyrhynchus croesus* Oberthür, 1879

TYPE / Sangir / (1)

13. *Pachyrhynchus dohrni* Behrens, 1887

Philippines / Luzon, Manilla / (1)

14. *Pachyrhynchus digestus* Heller, 1929

Philippines / Luzon, Mt. Province / 1986 / (2)

15. *Pachyrhynchus dubiosus* Schultze, 1922

Philippines / Luzon, Mt. Banahao / (1); Philippines / Luzon, Mt. Province / 1987 / (3)

16. *Pachyrhynchus erichsoni* Waterhouse, 1841

Philippines / Mindanao, Surigao / 1983 / (7)

17. *Pachyrhynchus forsteni* Snellen van Vollenhoven, 1864

Tirnate / (2)

18. *Pachyrhynchus gemmatus* Waterhouse, 1841

Philippines / (1); Philippines / Luzon, Manilla / (4); Philippines / Luzon, Mt. Province / 06. 1990 / (2)

19. *Pachyrhynchus gloriosus* Faust, 1895

Philippines / Negros Island / 07. 05. 1984 / (1)

20. *Pachyrhynchus halconensis* Schultze, 1922

Philippines / Mindoro, Mt. Halcon / 1987 / (1)

21. *Pachyrhynchus hirokii* Yoshitake, 2012

Philippines / Mindanao / 1976 / (2)

22. *Pachyrhynchus inclitus* Schultze, 1924

= *ignipes* Chevrolat, 1841; TYPE / Philippines / (2)

Philippines / (2); Philippines / Luzon, Manilla / (3); Philippines / Luzon, Mt. Province / (3)

23. *Pachyrhynchus jugifer* Waterhouse, 1841

Philippines / Luzon, Manilla / (8); Philippines / Panay, Capiz / 03.08.1986 / (1)

24. *Pachyrhynchus lorquini* Chevrolat, 1881

TYPE / Philippines / (2); Philippines / Marinduque, Mt. Malindig / 1991 / (2)

25. *Pachyrhynchus moniliferus* Germar, 1824

= *mandarinus* Chevrolat, 1841; TYPE / Philippines / Luzon / (2); TYPE / Ind. or China / (3); Philippines / (6); Philippines / Luzon / (2), Philippines / (14); Philippines / Luzon / (1); Philippines / Luzon, Manilla / (40); Philippines / Luzon / Laguna / Mt. Makiling / 06. 1981 / (1); Philippines / Marinduque / 12. 1972 / (3); Philippines / Marinduque / 03. 1973 / (2); Philippines / Marinduque / 03. 1974 / (2); Philippines / Bohol Island / 1985 / (2); Philippines / Negros Island / 1984 / (4)

26. *Pachyrhynchus multipunctatus* Waterhouse, 1841

= *auroguttatus* Chevrolat, 1841; TYPE / Philippines / Luzon / (1)

TYPE / Philippines / (1); TYPE / Philippines / Luzon, Manilla / (1); Philippines / Luzon, Manilla / (3); Philippines / Bohol Island / 27. 06. 1984 / (2)

27. *Pachyrhynchus negrosensis* Schultze, 1924

Philippines / Negros Island / 06. 1990 / (1)

28. *Pachyrhynchus nobilis* Heller, 1912

Philippines / Luzon, Mt. Prov. / 1987 / (9)

28.1. *Pachyrhynchus nobilis yamianus* Kano, 1929

Formosa / 1965 / (3)

29. *Pachyrhynchus occidentalis* Rukmane, 2017

Philippines / Mindanao / 03. 1985 / (1)

30. *Pachyrhynchus orbifer* Waterhouse, 1841

= *pretiosus* Chevrolat, 1841; / TYPE / Philippines / (10); TYPE / Philippines / Luzon, Manilla / (1); Philippines / (2)

= *fahraei* Chevrolat, 1841; TYPE / Philippines / (7)

TYPE / Philippines / (3); Philippines / (30); Philippines / Luzon / (4); Philippines / Luzon, Manilla / (8); Philippines / Luzon / 1975 / (3); Philippines / Luzon / 1979 / (3); Philippines / Luzon, Mt. Province / 1986 / (2); Philippines / Mindanao, Surigao / 1983 / (6)

30.1. *Pachyrhynchus orbifer* ssp. *gemmae* Chevrolat, 1841

TYPE / Philippines / Luzon, Manilla / (7); Philippines / (9)

31. *Pachyrhynchus perpulcher* Waterhouse, 1841

Philippines / Batanes / 07. 1984 / (2)

32. *Pachyrhynchus pinorum* Pascoe, 1871

= *subversatus* Chevrolat, 1841; TYPE / Philippines

Philippines / Luzon / (4); Philippines / Luzon, Mt. Makiling / 05. 1957 / (3)

33. *Pachyrhynchus postpubescens* Schultze, 1922

Philippines / Bohol Island / 27. 06. 1984 / (4); Philippines / Mindanao, Mt. Apo / 02. 1976 / (2)

34. *Pachyrhynchus pulchellus* Behrens, 1879

Philippines / Luzon / 12. 1987 / (1); Philippines / Luzon, Manilla / (1)

35. *Pachyrhynchus reicherti* Schultze, 1929

Philippines / Mindoro / 1981 / (1)

36. *Pachyrhynchus reticulatus* Waterhouse, 1841

TYPE / Philippines / (1); Philippines / (3); Philippines / Luzon, Manilla / (4); Philippines / Marinduque, Boac / 1972 / (4)

37. *Pachyrhynchus rufopunctatus* Waterhouse, 1842

Philippines / (2)

38. *Pachyrhynchus rukmaneae* Rarševskis, 2016

Philippines / Marinduque / 05. 1985 / (1)

39. *Pachyrhynchus sanchezi* Heller, 1912

Philippines / Mindanao, Surigao / 1983 / (2)

40. *Pachyrhynchus sarcitis* Behrens, 1887

Philippines / (1); Philippines / Batanes / 07. 1984 / (2)

41. *Pachyrhynchus semperi* Heller, 1912

Philippines / Batanes / 07. 1984 / (1)

42. *Pachyrhynchus shavrinii* Rukmane & Barševskis, 2016

Philippines / Luzon / 1989 / (1)

43. *Pachyrhynchus smaragdinus* Behrens, 1887

Philippines / Mindanao, Misamis / 05. 1957 / (1); Philippines / Mindanao, Surigao / 1983 / (4); Philippines / Mindanao, Surigao / 1989 / (1)

44. *Pachyrhynchus sonani* Kano, 1930

Formosa / 1965 / (3)

45. *Pachyrhynchus speciosus* Waterhouse, 1841

TYPE / Philippines / (1); Philippines / Samar Island / (1); Philippines / Mindanao / 02. 1977 / (4); Philippines / Mindanao, Surigao / 06. 1983 / (4); Philippines / Mindanao, Surigao / 11. 1983 / (4)

46. *Pachyrhynchus subamabilis* Yoshitake, 2012

Philippines / Mindanao / 1977 / (2)

47. *Pachyrhynchus tobafolius* Kano, 1929

Japan / (2); Formosa / (1)

48. *Pachyrhynchus torresi* Rukmane, 2018

Philippines / Mindanao, Zamboanga / 1989 / (1)

49. *Pachyrhynchus tristis* Heller, 1912

Philippines / Luzon, Mt. Province / 1985 / (1)

50. *Pachyrhynchus venustus* Waterhouse, 1841

Philippines / (3); Philippines / Luzon, Manilla / (6)

51. *Pachyrhynchus viridans* Heller, 1912

Philippines / Negros Island / 12.07. 1984 / (2); Philippines / Sibuyan Island / 1982 / (3)

52. *Pachyrhynchus zebra* Schultze, 1917

Philippines / Luzon, Baguio / (4)

DISCSSION

A total of 52 species had been identified from the SMNH *Pachyrhynchus* material, 7 species are synonyms described by Chevrolat, 6 species belong to type series material of the valid species. The majority of the material belongs to species described in the past century, with only 7 out of 52 determined species that are described from 2012 to 2018. This is the result of discoveries of new *Pachyrhynchus* localities on various sites of the Philippine archipelago in the recent

years. Big part of the material is labelled with the distribution at Manilla, which give no distribution information as previously the locality of Manilla had the meaning of the entire Philippine archipelago. For example, *P. jugifer* Waterhouse, 1841 that is known to be endemic of the Panay Island (as proven by various records from new collection material) is labelled with distribution at Manilla. The fact, that one species described from the old museum material is new to science only proofs that it is very important to review material stored in old Pachyrhynchini collections.

Such data is complimentary and necessary for a complete revision of the genus *Pachyrhynchus*.

ACKNOWLEDGEMENTS

I wish to express my gratitude to Johannes Bergsten for hospitality during my visit to the SMNH, possibility to work with *Pachyrhynchus* material and loan of the specimens that are described as new species herein.

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TO THE KNOWLEDGE ON THE GENUS *PACHYRHYNCHUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE: *PACHYRHYNCHINI*), CORRECTIONS AND ADDITIONS ON THE *PACHYRHYNCHUS SPECIOSUS* SPECIES GROUP

Anita Rukmane

Rukmane A. 2019. To the knowledge on the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: *Pachyrhynchini*), corrections and additions on the *Pachyrhynchus speciosus* species group. *Acta Biol. Univ. Daugavp.*, 19 (2): 253 – 260.

This short paper comprises additional data on *Pachyrhynchus speciosus* species group early described by W. Schultze. Current study revealed, that *Pachyrhynchus speciosus* group includes 13 species instead of 6 listed by Schultze. Those species are: *P. cabrasae* Rukmane & Barševskis; *P. circulimaculatus* Yoshitake; *P. davaoensis* Schultze; *P. kraslavae* Rukmane & Barševskis; *P. miltoni* Cabras & Rukmane; *P. notocruciatus* Yoshitake; *P. octoannulatus* Yoshitake, Bollino, Sandel; *P. postpubescens* Schultze; *P. regius* Schultze; *P. samarensis* Schultze; *P. speciosus* Waterhouse; *P. tadauchii* Yoshitake; *P. yoshitakeorum* Yoshitake, Bollino, Sandel. *P. absurdus* Schultze and *P. latifasciatus* has been excluded from the *P. speciosus* species group. Faunistic data, as well as comments and photographs of all species within speciosus group are provided. Key for the speciosus species group is included. In addition, male of *P. circulimaculatus* Yoshitake, 2019 is described for a first time.

Key words: *Pachyrhynchini*, *Pachyrhynchus*, Taxonomy, Philippines, Biodiversity.

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 currently comprises 155 known species (Rukmane 2018) distributed mainly on the Philippine islands, with few species distributed on Taiwan and Indonesia (Tseng et al. 2018). Many new species and subspecies has been described within past few years (Rukmane & Barševskis 2016; Barševskis 2016; Cabras & Rukmane 2016; Bollino, Sandel & Rukmane 2017), yet, due the polymorphism and complexity of the current genus, many taxa still require additional study. To facilitate

understanding of the current genus, Heller were the first to divide species into species groups (Heller, 1912) and Schultze continued (Schultze, 1923), nevertheless, in weight of the new species described and additional distributional data available, some of the species groups require a revision with corrections and additions. Such is the speciosus species group early described by Schultze.

In his early monograph, Schultze described *Pachyrhynchus speciosus* group, which included following species: *P. postpubescens* Schultze.,

P. speciosus Waterh., *P. samarensis* Schultze., *P. regius* Schultze., *P. absurdus* Schultze., *P. latifasciatus* Waterh.. Author listed general characters and a key to the species of the *P. speciosus* species group. In current paper, I also included general characters and key for the species, mainly based on those given by Schultze, yet, with some general corrections and additions. *Pachyrhynchus speciosus* species group include species that are hard to identify, yet, those species are rather frequently present along different mountain habitats of the Mindanao PAIC. Nerveless such grouping of the particular species with homogenous set of same morphological characters is artificial, key for the species, as well as explanation on each particular member of the current group will help to improve understanding and clarify identification process not only for the experts of the current group, but also for all interests on the regular basis.

As some of the authors still continue on describing species based on single male or female exemplar, it is sometimes necessary to compile their work and add additional information on opposite sex. Such is the case with *P. circulimaculatus* Yoshitake, 2019 that was described recently, based on a single female exemplar. Nerveless this species was found by me back in 2016, when I sent photos of female to honorable Dr. Hiraku Yoshitake, author decided to ignore the fact, that DUBC has number of specimens of current species (see description part) and described it without any references. After this act of ignorance, I decided to compile his work with lacking data that is included in the current paper as complete description of male of *P. circulimaculatus*.

MATERIALS AND METHODS

Abbreviations of the museum collections used in current study:

BMNH – British Museum of the Natural History, London, England.

CMUZM – Central Mindanao Zoological Museum, Davao, Philippines.

DUBC – Daugavpils University Beetle Collection,

Daugavpils, Latvia.

NIAES – National Institute for Agro-Environmental Sciences, Japan.

SMTD – Staatliches Museum für Tierkunde, Dresden, Germany.

All material from DUBC listed in current paper is collected by local collectors, with exception of *P. miltoni* Cabras & Rukmane, 2016 collected by A. Rukmane and A. Barševskis.

Current species group is named in order of the year of description, respectively, first described species within this species group was *P. speciosus*.

RESULTS

The *speciosus* species group, according to available referral data, is restricted to Mindanao PAIC (Mindanao, Samar, Leyte, Bohol Islands). The species of this group share the following combination of morphological characters:

1. Integument dark glowing red, coppery or black, shiny, with golden or greenish tinge.
2. Eyes relatively small, moderately convex from outline of head.
3. Elytra subspherical, widest at the middle, gradually rounded towards apex.
4. Elytra with at least three cross bands, first and third interrupted at the suture.
5. Prothorax with at least one longitudinal or transverse line on disc and big roundish patch of scales at each of the lateral sides.
6. Male aedeagal body with very similar or same shape.

In his early monograph Schultze included two species that does not correspond to the characters listed upwards, those are *P. latifasciatus* Waterhouse, that is rather closely related to *P. erichsoni* species and *P. absurdus*, which belong to *absurdus* group, sharing distinctive characters of male genitalia and shape of elytra. Species assigned to *speciosus* group are listed in alphabetical order:

1. *Pachyrhynchus cabrasae* Rukmane & Barševskis, 2016

Fig. 1A.

Type locality: Mindanao Island, Bukidnon, Mt. Kalatungan. Type in DUBC, examined.

Material examined: [PHILIPPINES] Mindanao, Bukidnon, Cabanglasan / I. 2014 (1) / II. 2014 (1), VI. 2014 (2) / VII. 2014 (1) / VIII. 2014 (2) / IX. 2014 (1) / VIII. 2015 (6) / XI. 2015 (1) / IV. 2016 (2) / V. 2016 (4) / VI. 2016 (1) / VIII. 2016 (7) / IX. 2016 (2) / I. 2017 (1) / II. 2017 (3); Valencia / V. 2016 (1); Mt. Kalatungan / VI. 2014 (1). Total: 37 ex.

Note. According to my observations, because of the reticular-shape lines on the elytra, this species is frequently confused with *P. reticulatus* Waterhouse. Genital structures reveals, that this species is more closely related to *speciosus* group.

2. *Pachyrhynchus circulimaculatus* Yoshitake, 2019

Fig.3, 4.

Type locality: North Mindanao region. Type in NIAES.

Description. Male. Dimensions: LB: 11,90; LR: 2,00; WR: 1,80; LP: 3,70; WP: 3,90; LE: 8,10; WE: 4,80. N=1 for all measurements. Dorsal habitus as shown in Fig.A,B.

Integument dark coppery to reddish, elytra darker or same colour, strongly shiny; legs with green or coppery metallic lustre.

Body with markings of golden round to recumbent scales; head with lanceolate patch of narrow longitudinal scale line from vertex to base of forehead or sub basal part of rostrum; lateroventral parts each with scally patch on genae, mingled with hair-like scales; prothorax with fine longitudinal scally stripe from subbasal to subapical part, stripe extends in the middle; another dorso-lateral scally stipe on each side, stripe arcuate dorsally in lateral view across entire length; lateroventral part with big scally patch each; elytra with the same markings as in female (Yoshitake, 2019), except semi-circular marking on middle between intervals I and III, this marking varies depending on specimen,

marking can extend from interval I to II, from I to III or from I to IV, it can be dull inside or fulfilled with golden scales.

Rostrum slightly longer than wide, LR/WR 1,11; prothorax nearly same width and length, WP/ LP 1,05; elytra significantly longer than wide, LE/WE 1,60; wider than prothorax, WE/WP 1,2; much longer than prothorax, LE/LP 2,18, narrower than in females. Rest same as in female. Genitalia as shown in Fig. 4.

Material examined: [PHILIPPINES] / Mindanao, Agusan / VI.2016 (1♀); Mindanao, Agusan, Rosario / VIII.2018 (1♂) / IX.2018 (1♂) / X.2018 (2♂). Total: 5 ex.

3. *Pachyrhynchus davaoensis* Schultze, 1934

Fig.1B.

Type locality: Mindanao Island, Prov. Bukidnon, Mt. Apo. Type in SNTD, examined.

Material examined: [PHILIPPINES] / Mindanao, Agusan, Sibagat / VI. 2015 (1) / X. 2015 (1) / VI. 2016 (1); Bukidnon, Cabanglasan / I. 2014 (1) / VI. 2014 (2); Cotabato, Tboli / II. 2014 (2); Davao, Kapatagan / V. 2016 (1); Mt. Apo / VI. 2014 (1) / IX. 2014 (1); Surigao, Esperanza / VI. 2013 (1) / V. 2014 (3) / VI. 2014 (3) / VIII. 2014 (1) / IX. 2014 (1) / X. 2015 (2); San Miguel / VI. 2014 (2) / VIII. 2016 (1); Tandag / V. 2014 (1) / VIII. 2016 (2) / X. 2017 (1). Total: 27 ex.

4. *Pachyrhynchus kraslavae* Rukmane & Barševskis, 2016

Fig.1C.

Type locality: Mindanao Island, Compostela Valley, Mabini. Type in DUBC, examined.

Material examined: [PHILIPPINES] / Mindanao, Agusan, Borbon / IX. 2018 (3) / X. 2018 (2); Mindanao, Agusan, San Francisco / X. 2017 (2); Compostella Valley, Mabini / II. 2014 (1); New Albay / VIII. 2013 (2); Lanao, Kapatagan / VII. 2018 (1); Surigao, Tandag / X. 2017 (1). Total: 12 ex.

5. *Pachyrhynchus miltoni* Carbas & Rukmane, 2016

Fig.1D.

Type locality: Mindanao Island, Marilog District, Davao City. Type in CMUZM, examined.

Material examined: [PHILIPPINES] / Mindanao, Davao, Marilog Distr., Baganihan / 26.-27. III. 2018 / A. Barševskis leg. / 28. III. 2018 / A. Rukmane leg. Total: 2 ex.

6. *Pachyrhynchus notocruciatus* Yoshitake, 2017

Type locality: Mindanao, Mt. Apo. Type in NIAES.

7. *Pachyrhynchus octoannulatus* Yoshitake, Bollino, Sandel, 2019

Fig.1E-F.

Type locality: Mindanao Island, Lanao Del Sur, Wao. Type in NIAES.

Material examined: [PHILIPPINES] / Mindanao, Lanao, Wao / VII. 2016 (4) / VIII. 2016 (1) / IX. 2016 (2) / X. 2016 (4) / XI. 2016 (4) / I. 2017 (11) / II. 2017 (6) / V. 2017 (3) / X. 2017 (1) / XI.

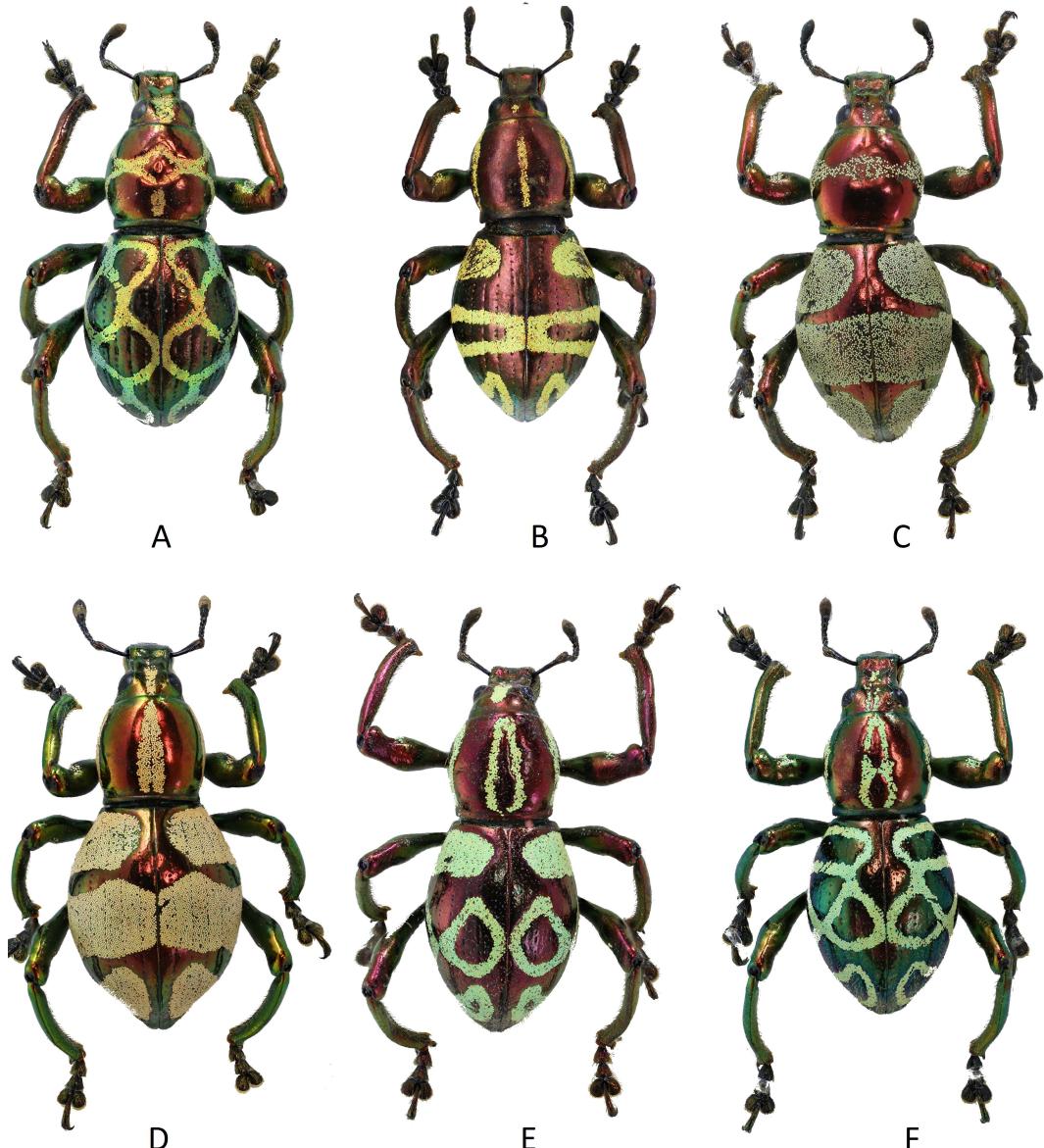


Fig. 1. Dorsal habitus of the *Pachyrhynchus* species, all males. A – *P. cabrasae*; B – *P. davaoensis*; C – *P. kraslavae*; D – *P. miltoni*; E – *P. ocromaculatus*; F – *P. ocromaculatus*.

2017 (3) / III. 2018 (4) / XI. 2018 (2). Total: 45 ex.

8. *Pachyrhynchus postpubescens* Schultze, 1922

Fig.2A.

Type locality: Mindanao Island, Prov. Bukidnon, Lindabon. Type in SNTD, examined.

Material examined: [PHILIPPINES] / Mindanao, Bukidnon, Cabanglasan / V. 2014 (1) / VI. 2014 (1) / VIII. 2014 (4) / X. 2015 (1) / V. 2016 (4); Intavas / VII. 2014 (6) / VIII. 2014 (3) / VIII. 2015 (4) / X. 2015 (1) / XII. 2015 (2); Kalatungan / VI. 2014 (1) / VII. 2014 (1); Mt. Dulang / VII. 2016 (1); Panamokan / VII. 2015 (3); San Fernando / II. 2014 (1). Total: 34 ex.

9. *Pachyrhynchus regius* Schultze, 1922

Fig.2B-C.

Type locality: Leyte Island, mountains near Cabalian. Type in SNTD, examined.

Material examined: [PHILIPPINES] / Mindanao, Agusan, Sibagat / XI. 2015 (1); San Fernando / II. 2014 (1); Leyte, Mahaplag, Hilusig / V. 2015 (1); Sogod / II. 2015 (3); Samar, Lope De Vega / VIII. 2016 (1); Marabot / IX. 2014 (1) / I. 2015 (1). Total: 9 ex.

Note. Faunistic data reveals, that this species, same as *P.speciosus*, is distributed not only on Mindanao Island, but also on close Samar and Leyte Islands.

10. *Pachyrhynchus samarensis* Schultze, 1924

Fig.2D.

Type locality: Samar Island, Catarman. Type in SNTD, examined.

Material examined: [PHILIPPINES] / Samar, Lope De Vega / II. 2016 (1) / III. 2016 (1) / IV. 2016 (16) / V. 2016 (7) / VI. 2016 (3) / VII (5) / VIII. 2016 (6) / IX. 2016 (5) / X. 2016 (6) / XI. 2016 (6) / XII. 2016 (2) / I. 2017 (8) / II. 2017 (4) / III. 2017 (3) / VI. 2017 (1) / VII. 2017 (1) / X. 2017 (3). Total: 78 ex.

11. *Pachyrhynchus speciosus* Waterhouse, 1841

Fig.2E.

Type locality: Mindanao Island. Type in BMNH, examined.

Material examined: [PHILIPPINES] / Mindanao, Bukidnon, Cabanglasan / VI. 2014 (3) / I. 2016 (1) / II. 2016 (1) / V. 2016 (3) / IX. 2017 (1);

Davao, Mt. Apo / VI. 2014 (1); Sarrangani, Kiamba / XII. 2015 (1); Surigao, Tandag / V. 2014 (1); Visayas / V. 2014 (2); Samar, Hinabangan / V. 2013 (1) / VIII. 2013 (1) / X. 2015 (2) / II. 2016 (1) / V. 2016 (1) / VI. 2016 (1) / X. 2017 (2); Leyte, Sogod / II. 2015 (8) / V. 2016 (3); Mahaplag / X. 2017 (3). Total: 35 ex.

12. *Pachyrhynchus tadauchii* Yoshitake, 2012

Fig.2F.

Type locality: Mindanao Island, Prov. Surigao, Bislig. Type in NIAES.

Material examined: [PHILIPPINES] / Mindanao, Agusan, San Francisco / VII. 2014 (3) / VI. 2017 (4) / IX. 2017 (1); Bukidnon, Cabanglasan / III. 2014 (1) / IV. 2014 (1) / VIII. 2014 (1); Davao, Mt. Apo / VII. 2014 (3) / VIII. 2014 (2) / V. 2015 (1) / IX. 2015 (1); Mt. Matutum / VIII. 2017 (2); Sarrangani, Kiamba / X. 2015 (1) / XI. 2015 (1) / XII. 2015 (1) / I. 2016 (1) / VII. 2016 (2); Malungon / V. 2014 (1); Maitum / X. 2017 (1); Surigao, San Miguel / IV. 2016 (1); Tandag / VIII. 2013 (1) / X. 2017 (1); Davao, Kapatagan / XII. 2015 (1) / V. 2016 (1). Total: 33 ex.

13. *Pachyrhynchus yoshitakeorum* Yoshitake, Bollino, Sandel, 2019

Fig.2G.

Type locality: Central Visayas region, Bohol Island, Duero, Brgy., Payao, Sitio Pangpang. Type in NIAES.

Material examined: [PHILIPPINES] / Central Visayas, Bohol Island / 400-700m / VI. 2014 (2) / VIII. 2014 (1); Dinagat Island / Dinagat / 2. 2019 (3). Total: 6 ex.

Note. During my study, I found three specimens of presumably *P.yoshitakeorum* from Siargao Island, which is located on the east from the Bohol Island. Strange is the fact, that between those two islands is located Leyte Island, where species, for my best knowledge, is not present. As those specimens are collected by local collectors, I do not exclude possibility, that they are mislabelled, yet, it also might be new locality for the current species, this particular fact need more faunistic data to be approved.

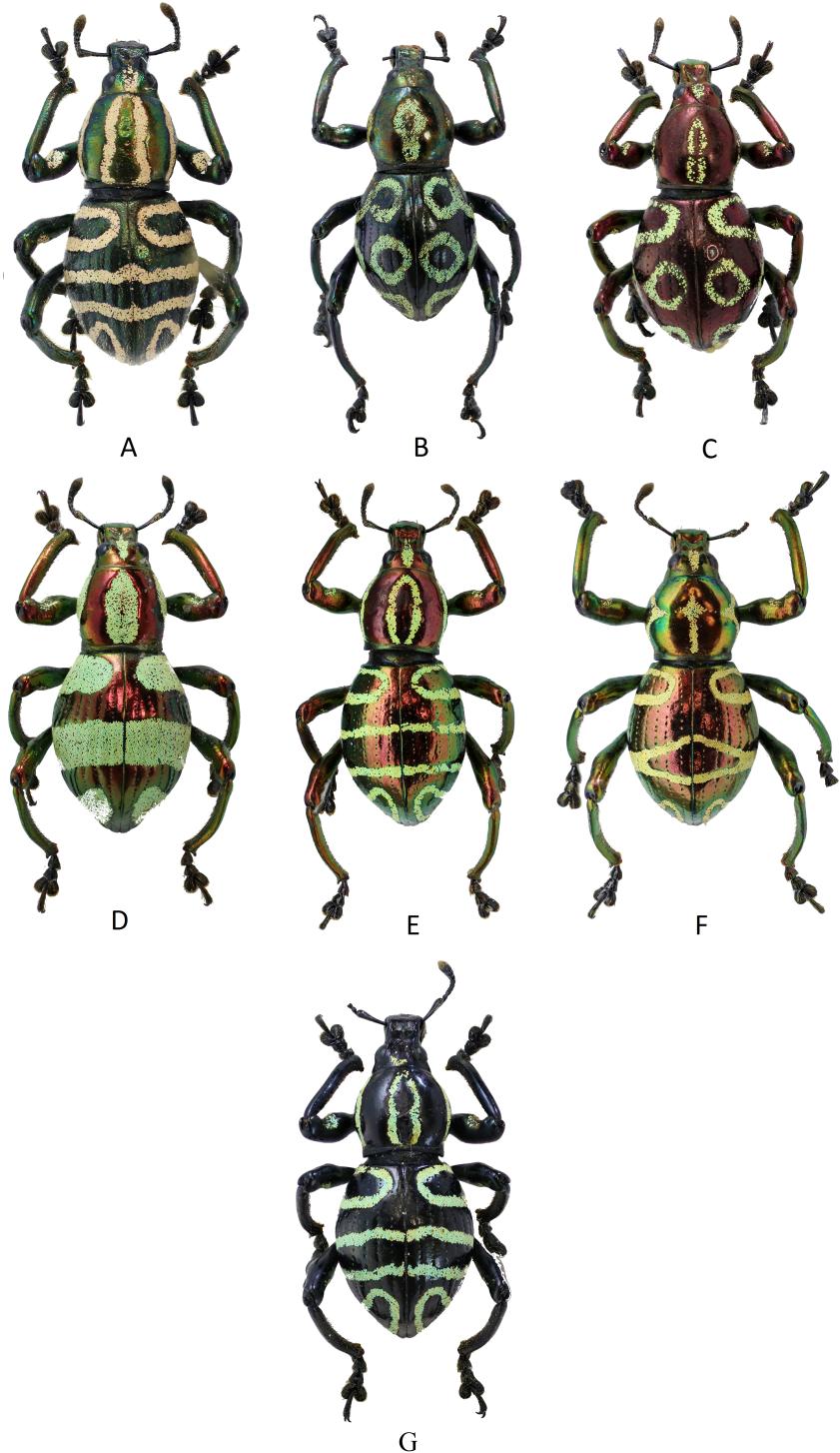


Fig. 2. Dorsal habitus of the *Pachyrhynchus* species, all males. A – *P. postpubescens*; B – *P. regius* (Mindanao); C – *P. regius* (Samar); D – *P. samarensis*; E – *P. speciosus*; F – *P. tadauchii*; G – *P. tadauchii*; H – *P. yoshitakeorum*.

Key to species of the *Pachyrhynchus speciosus* group:

1. General colour dark glowing red, coppery. Prothorax and elytra very strikingly marked with narrow scale stripes, bands or ring figures.....2

General colour black, body surface shiny. Prothorax and elytra marked with narrow scale stripes of greenish colour.....
.....***P.yoshitakeorum* Yoshitake, Bollino, Sandel**

2. Prothorax dorsally with transverse scale line medially on disc.....3
Prothorax dorsally with two cross bands, one transverse, one longitudinal4
Prothorax dorsally with one longitudinal scale line6

Prothorax dorsally with two longitudinal scale lines, divergent at base, convergent toward and confluent at anterior margin9
Prothorax dorsally with an arrow-shaped figure10

3. Prothorax dorsally with one thick transverse line on medial portion of the disc. Line connected with big roundish patches laterally on each side.....***P.kraslavae* Rukmane & Barševskis**

4. Elytra with three cross bands, first and third interrupted at suture.....5
Elytra with reticulate net-shaped lines of pale metallic scales. Each elytron divided in nine irregular, isolated, metallic dark, bare spots, and two additional sutural spots on each elytron
.....***P.cabrasae* Rukmane & Barševskis**

5. Second cross band on the medial portion of elytra small, triangular or pyramid-shape, wary in size from first two intervals up to lateral margins
.....***P.tadauchi* Yoshitake**

Second cross band on the medial portion of elytra big, forming of two parallel transverse lines that connects on lateral margin of each elytron
.....***P.notocruciatus* Yoshitake**

6. Line thick, wider on base and narrowing toward apical margin.....7
Line slender, continuous from basal to apical margin of prothorax.....8

7. Elytra with three cross bands, second cross band on the median portion of the disc hour-glass shaped
.....***P.miltoni* Cabras & Rukmane**

8. Elytra with three cross bands, all cross bands interrupted on suture or second crossband can

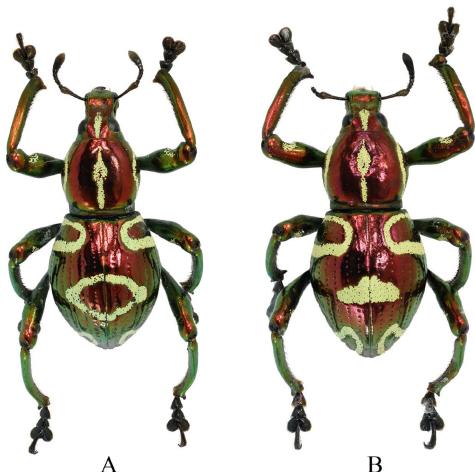


Fig. 3: Dorsal habitus of two different forms of *P. circulimaculatus* Yoshitake, 2019.



Fig. 4: Male genitalia of *P. circulimaculatus*, A – aedaegal body in lateral view; B – aedegal body in ventral view; C – sternite IX in dorsal view; D – tegmen.

- be connected on suture by longitudinal stripe.....*P.davaoensis* Schultze
- Elytra with cross band on basal and apical part and a circular-shaped patch on disc medially...
.....*P.circulimaculatus* Yoshitake
9. Elytra with three cross bands of narrow scale lines.....*P.postpubescens* Schultze
Elytra with eight cross bands of scally markings, each marking often enlarged and merged in varying degrees.....
....*P.octomaculatus* Yoshitake, Bollino, Sandel
10. Elytra with two large irregular ring figures on medial portion of the disc...*P.regius* Schultze
Elytra with three narrow or very broad band markings.....11
11. Elytra with very narrow crossbands
.....*P.speciosus* Waterhouse
Elytra with three very broad crossbands
.....*P.samarensis* Schultze

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TO THE KNOWLEDGE OF THE GENUS *PACHYRHYNCHUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE: PACHYRHYNCHINI) SPECIES FROM HUF (BUDAPEST, HUNGARY), WITH DESCRIPTION OF A NEW SPECIES FROM THE MINDANAO ISLAND (PHILIPPINES)

Anita Rukmane

Rukmane A. 2019. To the knowledge of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species from huf (Budapest, Hungary), with description of a new species from the Mindanao island (Philippines). *Acta Biol. Univ. Daugavp.*, 19 (2): 267 – 272.

Checklist of the *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) species, available from HUF collections (Hungarian Museum of the Natural History) is presented. Collection comprises a total of 31 *Pachyrhynchus* species and 5 subspecies. One new species from the Mindanao Island was found during the observation, species in general appearance is similar to *P. amabilis* Schultze, 1922 (see differential analyses), this new species is described herein. Photos of the habitus, as well as pictures of male and female genitalia are presented.

Key words: HUF, Pachyrhynchini, *Pachyrhynchus*, Mindanao, taxonomy, new species.

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INTRODUCTION

Knowledge on the genus *Pachyrhynchus* Germar, 1824 has went far beyond in past few years, as many foreign and local scientists has contributed to taxonomy, ecology and distribution (Cabras & Rukmane 2016, Rukmane & Barševskis 2016). As this particular genus is admitted to be highly commercial, it is widely present among various museum collections. Observation of the old museum collections can reveal new data on taxonomy and biogeography of the current genus, such example are some previous works of the author, which presents few new species and

additional distributional information of various species (Rukmane 2019). As for *Pachyrhynchus* species collection of the Hungarian Museum of the Natural History, 31 species was determined and are listed herein, moreover, one species were identified as new to science. Here I provide a list of the species from the HUF.

Pachyrhynchus amabilis species group currently comprises 7 species, distributed on various parts of the Mindanao Island: *P. amabilis* Schultze, 1922; *P. banglas* Bollino, Sandel & Rukmane, 2018; *P. chamissoi* Schultze, 1922; *P. pseudamabilis* Yoshitake, 2012; *P. subamabilis*

Yoshitake, 2012; *P. zamboanganus* Yoshitake, 2012; *P. tikoi* Rukmane, 2016. Members of this group share common morphological features (Bollino, Sandel & Rukmane, 2017). During the study of the HUF *Pachyrhynchus* material, one new species was found, after careful examination it was clear, that this new species belongs to *Pachyrhynchus amabilis* species group, yet, is easily distinguishable from any of the species by various morphological features (see differential analyses). According to the labelled distribution data, this new species is distributed on the Northern part of the Mindanao Island, Bukidnon province, Maluko, which is part of the Mount Kitanglad range, 4th highest peak of the Philippine Islands.

MATERIAL AND METHODS

The study was based on specimens deposited at the Hungarian Museum of the Natural History, Budapest, Hungary (HUF), species were compared to morphologically similar species from Daugavpils University Beetle Collection material (DUBC). The methods and equipment used in this study were the same as explained in Rukmane (2019). The type specimens of the new species described in this paper are temporary preserved in the Daugavpils University, Study and Research Center "Ilgas" (DUBC), but after publishing of this paper they will be returned to the HUF.

Label data are cited *verbatim*. In the text the following symbols and abbreviations were used:

/ = different lines

// = different labels

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

RESULTS

Pachyrhynchus ottomerkli sp. nov.

(Fig. 1A, 1B, 2A-G)

Type material. Holotype: Male (Fig. 1A)

"Mindanao, P. I. / Bukidnon Prov. / Maluko" (white rectangular card, printed); "Coll. W.

Schultze / Ankauf 1942" (white rectangular card, printed); "HOLOTYPE / Male / *Pachyrhynchus ottomerkli* / Rukmane, 2019 / det. Rukmane A. 2019; (red rectangular card, printed).

Paratype (1 female): "Mindanao, P. I. / Bukidnon Prov. / Maluko" (white rectangular card, printed); "Coll. W. Schultze / Ankauf 1942" (white rectangular card, printed); "PARATYPE / Female / *Pachyrhynchus ottomerkli* / Rukmane 2019 / det. Rukmane A. 2019; (red rectangular card, printed).

Distribution: Philippines, Mindanao Island, Bukidnon Province.

Description. Dimensions (holotype): LB: 11.3; LE: 6.9; WE: 5.3; LP: 3.6; WP: 3.6; LR: 2.0; WR: 1.8.

Integument black, elytra matte or slightly shiny, pronotum, head, legs strongly shiny, underside with weaker luster; body nearly without markings, with few pale blue to green round recumbent scales on pronotum, laterally and dorsally on rostrum and along underside. Rostrum longer than wide (LR/WR 1.11), rostrum covered with pubescence, bulging on apical part, with peak slightly before middle, deep triangular impression on basal half, longitudinal stripe of pale blue to green round scales from midline of the rostrum to base of the forehead, where interrupts by deep transverse groove; lateral parts covered with white hairs before antennal scrobes and long light hairs after antennal scrobes, with even longer hairs near apex, oval shape pale blue to green scales on genae; antennomeres evenly covered with long light hairs, scape covered with pubescence on basal part and long light hairs on apical part; pedicel and first antennomer sub equal in length, longer than wide, antennomeres II-V subspherical, sub equal in length. Head glabrous, finely punctured; eyes large, very strongly prominent from the outline of the head. Forehead with finely expressed dorsal bulge, slightly wrinkled.

Prothorax sub spherical, same length as width (LP/WP 1), widest just in the middle; weakly

punctured; pale blue to green continuous scale line on basal, lateral and apical margins, line strongly pronounced on lateral margins and very weak or almost absent on apical margin dorsally. Legs stout; coxa with few blue roundish scales and pubescence; femur without hairs or scales; tibiae incurved apically, covered with short light hairs on all length and long light hairs on internal margin, with mucrones on all legs; tarsus with long, golden setae.

Elytra sub ovate (LE/WE 1.3), with weakly pronounced intervals, nearly smooth; elytrons without scaly markings; widest just before middle; on dorsal dimension narrow at the base, where gradually increases to middle, were widest just before the middle, then roundish and gradually decreases to base up to basal 1/3 where narrows more strongly in direction to apex; apex rounded, with weak pubescence.

Elytra wider than prothorax (WE/WP 1.47), nearly twice as long as prothorax (LE/LP 1.92). Ventrates densely covered with blue to green round scales, minutely pubescent, mingled with few longer light color hairs. Genitalia as shown in Fig. 2A-D.

Female. Dimensions: LB: 12.1; LE: 8.6; WE: 5.3; LP: 3.7; WP: 3.7; LR: 2.0; WR: 1.8. Larger than male. Elytra more wide and more strongly rounded, as well as more strongly elongate apically. Genitalia as shown in Fig. 2E-G.

Differential diagnosis. According to body



Fig. 1. Dorsal habitus of *Pachyrhynchus ottomerkli* sp. nov. A – Male (Holotype); B – Female (Paratype).



Fig. 2. Male and female genitalia of *Pachyrhynchus ottomerkli* sp. nov. A – aegegal body in lateral view; B – aegegal body in ventral view; C – sternites in dorsal view; D – tegmen in dorsal view; E – sternite VIII in ventral view; F – ovipositor in dorsal view; G – spermatheca. Scale bar 1.00 mm.

characters and shape of male genitalia, *Pachyrhynchus ottomerkli* sp. nov. obviously belong to *Pachyrhynchus amabilis* species group, yet, it is easily distinguishable from any of the species involved by following characters: 1) coloration of the body - members of *Pachyrhynchus amabilis* group are usually with dark red to copper body color, shiny (except *P. subamabilis* Yoshitake, 2012 with mate elytra), some exceptions with very dark body color pattern may be found only in Wao region (DUBC collection data). This new species show unique color pattern which yet has not been presented along current species group; 2) deep transverse groove on rostrum, which is present only in *P. ottomerkli* sp. nov.; 3) different scally markings, such scale pattern is not present in any of the species involved within the group; 4) shape of male aedeagal body, which is slightly longer than in other species; 5) different shape of female sphaeromatheca.

Etymology. This new species is named after Otto Merkl, the curator of the HUF coleoptera collection, in appreciation of the help and support during my visit to HUF.

HUF *Pachyrhynchus* species material:

1. *Pachyrhynchus annelifer* Heller, 1912

Luzon, Benguet / Mt. Santo Tomas (3); (2♂, 1♀)

2. *Pachyrhynchus apicatus* Schultze, 1922

Pollilo Island / Pollilo; Luzon / Mt. Banabao (4); (1♂, 3♀)

3. *Pachyrhynchus argus* Pascoe, 1873

Luzon, Benguet / Baguio 800m (1); Luzon, Benguet / Mt. Santo Tomas (2); (2♂, 1♀)

4. *Pachyrhynchus chamissoi* Schultze, 1922

Mindanao, P.I. / Bukidnon, Lindabon (3); Pollilo (2); (3♂, 2♀)

5. *Pachyrhynchus chlorites* Chevrolat, 1881

Philippines (3); Philippines / Luzon (2); (2♂, 3♀)

6. *Pachyrhynchus circulatus* Pascoe, 1873

Catanduanes / Virac (5); Luzon / S.O. Vivac (1);

(5♂, 1♀)

7. *Pachyrhynchus confusus* Schultze, 1923

Luzon, Laguna / Los Banos (3); Luzon / Mt. Banahao (1); Luzon, Prov. Benguet / S.P. Mt. Makiling (1); (2♂, 3♀)

8. *Pachyrhynchus congestus* Pascoe, 1873

Luzon, Benguet / Atoc (1); Luzon, Benguet / Baguio 1500m (1); Luzon, Benguet / Mt. Santo Tomas (1); Luzon, Benguet / Baguio 1600m (1); Luzon, Benguet / Mt. Trail (1); Luzon, Benguet / P.I. Atok (2); Luzon, Benguet / Mt. Pawai, 2400m (1); Luzon / Baguio (1); Philippines (4); (6♂, 7♀)

ssp. *coeruleans* Kraatz, 1888

Luzon, Bontoc / Mt. Polis (3); (1♂, 2♀)

9. *Pachyrhynchus croesus* Oberthur, 1879

Talaue Insel. (1♂)

10. *Pachyrhynchus dubiosus* Schultze, 1922

Luzon, P.I. / Mt. Pulogloko 1921 (1); Luzon, Benguet / Loo, 2000m (2); Philippines (1); (2♂, 2♀)

11. *Pachyrhynchus erosus* Schultze, 1920

Luzon, P.I. / Benguet (1♂)

12. *Pachyrhynchus gemmatus* Waterhouse, 1841

Philippines (1♀)

13. *Pachyrhyncus igorota* Schultze, 1917

Luzon, Isabela / Mt. Moises (1); Luzon / Benguet (1); Luzon, Benguet / Mt. Pawai, 2400m (2); Luzon, P.I. / Benguet (1); Luzon, Bontoc / Mt. Polis (1); (3♂, 3♀)

14. *Pachyrhynchus inclitus* Schultze, 1924

Luzon, Benguet / Mt. Trail, km. 88 (2); Ins. Luzon (2); (2♂, 2♀)

15. *Pachyrhynchus moniliferus* Germar, 1824

Luzon, P.I. / Kauayan (1); Luzon, Laguna / Mt. Banahao (1); Luzon, Rizal / Montalban (3); Luzon, Benguet / Baguio, 600m (1); Luzon, Laguna / Los Banos (1); Luzon, Rizal / Bosoboso (1); Luzon (1); Manilla (1); Philippines (5); (6♂, 9♀)

ssp. *chevrolati* Eydoux & Solayet, 1839

Catanduanes / Virac (5); Philippines (2); Philippines / Manilla (2); (4♂, 5♀)
ssp. *stellulifer* Heller, 1912
Luzon, Benguet / Trinidad (1); Luzon, S.L. / Benguet Subprov. (3); Luzon, Isabela / Pinablanca (1); (1♂, 4♀)

16. *Pachyrhynchus multipunctatus* Waterhouse, 1841
Philippines (1♀)

17. *Pachyrhynchus orbifer* Waterhouse, 1841
Luzon, Ilocos N. / Bangui (3); Luzon, Benguet / Trinidad (2); Luzon, P.I. / Ilocos Norte Prov., Mt. Nagaoatan (1); (3♂, 3♀)
ssp. *gemmans* Chevrolat, 1841
Luzon, Isabela / Mt. Moises (8); Philippines (8); Philippines / Luzon (2); (12♂, 9♀)

18. *Pachyrhynchus pinorum* Pascoe, 1871
Luzon, Benguet / Baguio, 1600m (2); Luzon, Benguet / Atoc (1); Luzon, P.I. / Benguet (2); Luzon, Benguet / Baguio, 1800m (3); Philippines (3); (7♂, 4♀)

19. *Pachyrhynchus pseudoproteus* Schultze, 1922
Leyte / Baybey (1); Leyte (1); (2♀)

20. *Pachyrhynchus pulchellus* Behrens, 1879
Luzon, Benguet / Mt. Trail km 59 (3); Luzon / Benguet (4); Philippines (1); Luzon, Benguet / Atoc (3); Luzon, Benguet / Baguio 1600m (2); Luzon, P.I. / Benguet Subprov. (1); Luzon / St. Thomas (1); Luzon / Prov. Bulacan, Guinnisan (1); (7♂, 9♀)

21. *Pachyrhynchus regius* Schultze, 1922
Samar / Borongan (3); (1♂, 2♀)

22. *Pachyrhynchus reticulatus* Waterhouse, 1841
Luzon, Laguna / Mt. Bonahao (1); Luzon, Laguna / Lilio (1); (3♂)

23. *Pachyrhynchus crucuiatus* Schultze, 1923
Philippines (1♂, 1♀)

24. *Pachyrhynchus rugicollis* Waterhouse, 1841
Luzon / Zambaes, Yba (5); (3♂, 2♀)

25. *Pachyrhynchus sarcitis* Behrens, 1887

Philippines (2♀)

ssp. *kotoensis* Kano, 1930

Taiwan / Taitung, Hsien, Lanyu Isl. / Hongtou will., Hongtor river. / 14.09.2006 (3♂)

26. *Pachyrhynchus schultzei* Schultze, 1917

Luzon, Benguet / Loo, 2000m (1); Luzon, Benguet / Mt. Pawai, 2400m (2); (1♂, 2♀)

27. *Pachyrhynchus speciosus* Waterhouse, 1841

Cabuntug / Sargao (1♀)

28. *Pachyrhynchus sphaericollaris* Schultze, 1923

Luzon, Isabela / Pinablanca (2); Luzon, P.I. / Kauayan (2); (2♂, 2♀)

29. *Pachyrhynchus sumptuosus* Schultze, 1917

Luzon / Cabagao (3); (2♂, 1♀)

30. *Pachyrhynchus venustus* Waterhouse, 1841

Mindanao, Surig. / Surigao (3); (2♂, 1♀)

31. *Pachyrhynchus sonani* Kano, 1930

Taiwan / Taitung, Hsien, Lanyu Isl. / Hongtou will., Hongtor river. / 14.09.2006 (1♂)

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Four new species and two subspecies of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Luzon Island, Philippines

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Rukmane A. 2019. Four new species and two subspecies of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Luzon Island, Philippines. *Baltic J. Coleopterol.*, 19(2): 141 - 150.

Four new species and one new subspecies of the genus *Pachyrhynchus* Germar, 1824 from the Luzon Island are described and illustrated: *P. sagittatus* sp. nov.; *P. tetramaculatus* sp. nov.; *P. kirklayroni* sp. nov.; *P. disargus* sp. nov.; *P. phaleratus* ssp. *dannylayroni* subsp. nov.; *P. congestus* ssp. *aedamlayroni* subsp. nov..

Key words: Coleoptera, Curculionidae, Pachyrhynchini, *Pachyrhynchus*, Luzon, taxonomy, new species

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 (Entiminae: Pachyrhynchini) currently contains 154 species, with fair part of them described in past few years (Bollino, Sandel & Rukmane 2017; Rukmane 2018; Cabras & Rukmane 2018). Luzon is believed to be the center of the species distribution (Schultze 1924) with majority of the species coming from this Island. During the following study of the genus *Pachyrhynchus*, four new species and two subspecies were found, all included taxon's, on my best knowledge, are distributed on Luzon Island.

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

Pachyrhynchus sagittatus sp. nov.

Fig. 1C, 4J-K.

Type material. Holotype. Male. "PHILIPPINES / Luzon, Sierra Madre, Quirino / V. 2015 / local collector leg." (white rectangular label, printed); "HOLOTYPE / Male / *Pachyrhynchus sagittatus* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Distribution: Luzon Island, Quirino Province.

Description. Dimensions (holotype): LB: 12.1; LE: 7.7; WE: 5.5; LP: 4.1; WP: 4.0; LR: 1.9; WR: 1.8. Integument coppery red, body strongly shiny, underside with weaker luster; body with markings of pale green round to recumbent scales. Dorsal habitus as shown in Fig. 1C.

Rostrum longer than wide (LR/WR 1.06), pubescent, finely punctured, bulging on apical part, with peak slightly before middle, deep triangular impression on basal half, longitudinal groove from midline to base of forehead, shallow transverse groove at base of forehead; forehead with lanceolate patch of scales medially, strongly wrinkled, nearly two times as wide as eye; lateral parts of rostrum covered with round to oval scales and hair-like scales, most intense along genae; few white hairs before antennal scrobes and long light hairs after antennal scrobes, with longer hairs

near apex; antennomeres evenly covered with long light hairs, scape covered with pubescence on basal part and long light hairs on apical part; pedicel 1.5 times as long as first antennomer, longer than wide, antennomeres II-V subspherical, sub equal in length. Head glabrous, finely punctured; eyes small, slightly prominent from outline of the head.

Prothorax subspherical, nearly same length as width (LP/WP 1.03), widest just in the middle; weakly punctured; dorsal contour slightly incurved at apical 1/3, gradually increased to middle, rounded, gradually decreased to subbasal part, straightened to base; with the following markings of pale green scales: 1) arrow-shaped patch medially on disc from subbasal part to slightly after midline; 2) two small spots on disc medially, each redirected laterally; 3) subovate shape patch on each latero-ventral part.

Legs stout; coxa with pale green roundish scales and hair-like scales; femur with short light hairs on basal part, pubescent in all length and with round pale green scales on apical part; tarsus with long, rare, golden setae.

Elytra sub ovate (LE/WE 1.4), intervals slightly pronounced, nearly smooth; each elytron with the following markings: 1) elongated patch at subbasal part along interval III and one along lateral margin; 2) transverse medial stripe from one lateral margin to other, stipe interrupted at interval V and VII forming small round spot; 3) longitudinal line from apical 1/2 to apex along interval III; 4) longitudinal line along lateral margin from apical 1/3 to basal 1/2; widest just in the middle; on dorsal dimension narrow at the base, gradually increased to middle, widest just in the middle, rounded and gradually decreased to apex up to apical 1/2, narrowed more strongly in direction to apex; apex sharpened, with weak pubescence.

Elytra wider than prothorax (WE/WP 1.38), nearly twice as long as prothorax (LE/LP 1.88). Aedeagus as shown in Fig. 4J-K.

Female. Unknown.

Differential analyses. This new species according to its body characteristics and scaly markings on the body is unique enough to be different from any other known species of the genus *Pachyrhynchus* that comes from the Luzon Island. Nerveless, *P. sagittatus* sp. nov. is similar to newly described *P. kirklayroni* sp. nov., but differs by the following characters: 1) Prothorax of *P. kirklayroni* sp. nov. wider, more strongly rounded, dorsal contour at apical $\frac{1}{2}$ without depression; 2) rostrum of *P. kirklayroni* sp. nov. wider, with weaker depression on basal part; 3) elytra of *P. sagittatus* sp. nov. shorter, with unique scaly markings; 4) male aedeagus of different shape.

Etymology. This species was named based on its typical marking on the pronotum – arrow shape spot dorsally on disc. Latin word of the arrow is *sagitta*.

***Pachyrhynchus tetramaculatus* sp. nov.**

Fig. 1A-B, 4L-M.

Type material. Holotype. Male. "PHILIPPINES / Luzon, Nueva Vizcaya, Quezon / VI. 2018 / local collector leg." (white rectangular label, printed); "HOLOTYPE / *Pachyrhynchus tetramaculatus* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Female. Paratype. Same label as holotype. "PARATYPE / *Pachyrhynchus tetramaculatus* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Distribution: Luzon Island, Nueva Vizcaya Province.

Description. Dimensions (holotype): LB: 13.9; LE: 8.8; WE: 5.3; LP: 3.9; WP: 3.7; LR: 2.0; WR: 1.9.

Integument black, strongly shiny, pronotum, head and legs shiny, underside with weaker luster; body with pale orange to yellow round recumbent scales; genae, coxa and femori with pale orange, yellow and shimmery green scales. Dorsal habitus as shown in Fig. 1A-B.

Rostrum slightly wider than long (LR/WR 1.05), slightly pubescent, bulging on apical part, with peak slightly before middle, ovate-triangular impression on basal half, weak longitudinal groove from middle to base of the forehead, two bulges on basal $\frac{1}{3}$ and weak transverse impression on base; laterally with patch of round scaled on genae; few pubescence before antennal scrobes and long light hairs after antennal scrobes, with longer hairs near apex; antennomeres mingled with long light hairs, scape covered with pubescence on basal part and few light hairs on apical part dorsally; pedicel and first antennomer sub equal in length, longer than wide, antennomeres II-V subspherical, sub equal in length. Head glabrous, finely punctured; eyes moderate, weakly prominent from the outline of the head. Forehead flat, more than two times as wide as eye width.

Prothorax sub spherical, longer than wide (LP/WP 1.05), widest at apical $\frac{1}{2}$; weakly punctured; with the following markings of pale orange to yellow scales: 1) two roundish patches on disc laterally along apical margin; two ovate patches on basal part of the disc, redirected laterally; ovate patch on each latero-dorsal part; dorsal contour increased from moderate apex to peak at apical $\frac{1}{2}$, then firmly rounded and decreased to just after the midline; then decreased strongly, with curve, sub basal margin slightly widened.

Legs stout; coxa patch of orange and shimmery green round scales; femur mingled with sparse pubescence and patch of scales on apical part along internal margin; tibiae incurved apically, covered with pubescence on all length and long light hairs on internal margin, with mucrones on all legs; tarsus with long, golden setae.

Elytra sub ovate (LE/WE 1.66), with weakly pronounced intervals, nearly smooth; each elytron with the following scaly markings: 1) two ovate patches on basal $\frac{1}{2}$; 2) four ovate spots on medial part; 3) two sutural patches – one sub medial, one near apex; 4) three ovate patches on apical part 5) triangular apical patch along apex; widest just in the middle; on dorsal dimension narrow at the base, gradually increases to middle, widest just in the middle, then roundish and

gradually decreases to apex up to apical 1/3 where narrows more strongly in direction to apex; apex rounded, with weak pubescence.

Elytra wider than prothorax (WE/WP 1.43), more than twice as long as prothorax (LE/LP 2.26). Genitalia as shown in Fig. 4L-M.

Female. Dimensions: LB: 15.3; LE: 10.3; WE: 7.4; LP: 4.7; WP: 4.3; LR: 2.1; WR: 2.4. Larger than male. Elytra more wide and more strongly rounded, as well as more strongly elongate apically.

Differential analyses. *Pachyrhynchus tetramaculatus* sp. nov. according to shape of pronotum and elytra belong to *P. pinorum* Pascoe species group, with such species as *P. loheri* Schultze, *P. barsevskisi* Rukmane, 2016 etc. The new species differs from all species within the group by its pronotum, which is widest at apical 1/2, unique scaly markings on pronotum and elytra and shape of male eadeagus.

Etymology. This species was named after its characteristically markings on the pronotum – four round shape spots on the disc dorsally.

Pachyrhynchus kirklayroni sp. nov.

Fig. 1D, 4H-I.

Type material. Holotype. Male. “PHILIPPINES / Luzon, Ilocos, Adams / VII. 2019 / local collector leg.” (white rectangular card, printed); “HOLOTYPE / *Pachyrhynchus kirklayroni* / Rukmane, 2019 / det. Rukmane A. 2019” (red rectangular card, printed).

Distribution: Luzon Island, Ilocos Province.

Description. Dimensions (holotype): LB: 13.7; LE: 8.9; WE: 5.8; LP: 4.5; WP: 4.9; LR: 1.9; WR: 2.0. Integument coppery brown, body strongly shiny except underside with weaker luster; body marked with pale green round to recumbent scales. Dorsal habitus as shown in Fig. 1D.

Rostrum wider than long (LR/WR 1.05), covered with pubescence, bulging on apical part, with peak slightly before middle, moderate subtriangular impression on basal half, two weak bulges on basal 1/2, longitudinal groove from middle of the rostrum to middle of forehead; lateral parts with few round scales on genae and after antennal scape; short light hairs laterally near apex mingled with few long golden hairs; antennomeres rather rarely covered with long light hairs, scape covered with pubescence on basal part and few long light hairs on apical part. Head glabrous, finely punctured; eyes small, slightly prominent from the outline of the head. Forehead with weak medial impression, moderately wrinkled, nearly two times as wide as eye width.

Prothorax subspherical, wider than long (LP/WP 1.09), widest just before the middle; weakly punctured; scaly markings same as in *P. sagittatus* sp. nov. (see description part).

Legs thick; coxa with patch of pale green roundish scales and pubescence; femur with short light hairs on basal part and patch of round scales on apical part; hairs or scales.

Elytra subovate (LE/WE 1.53), with weakly pronounced intervals, nearly smooth; each elytron with the following scaly markings: 1) rectangular patch of scales at subbasal part from interval I to lateral margin; 2) thick transverse medial line from one lateral margin to another; 3) narrow longitudinal line at basal part before middle along interval III and one more along interval VII, lines connect rectangular patch and medial line; 4) longitudinal line along lateral margin in all length; 5) subtriangular patch at apical part from apex to apical 1/2 along interval II to lateral margin; widest just in the middle; on dorsal dimension narrow at the base, where gradually increased to middle, widest just in the middle, then rounded and decreased to apex.

Elytra wider than prothorax (WE/WP 1.23), nearly twice as long as prothorax (LE/LP 1.93). Genitalia as shown in Fig. 4H-I.

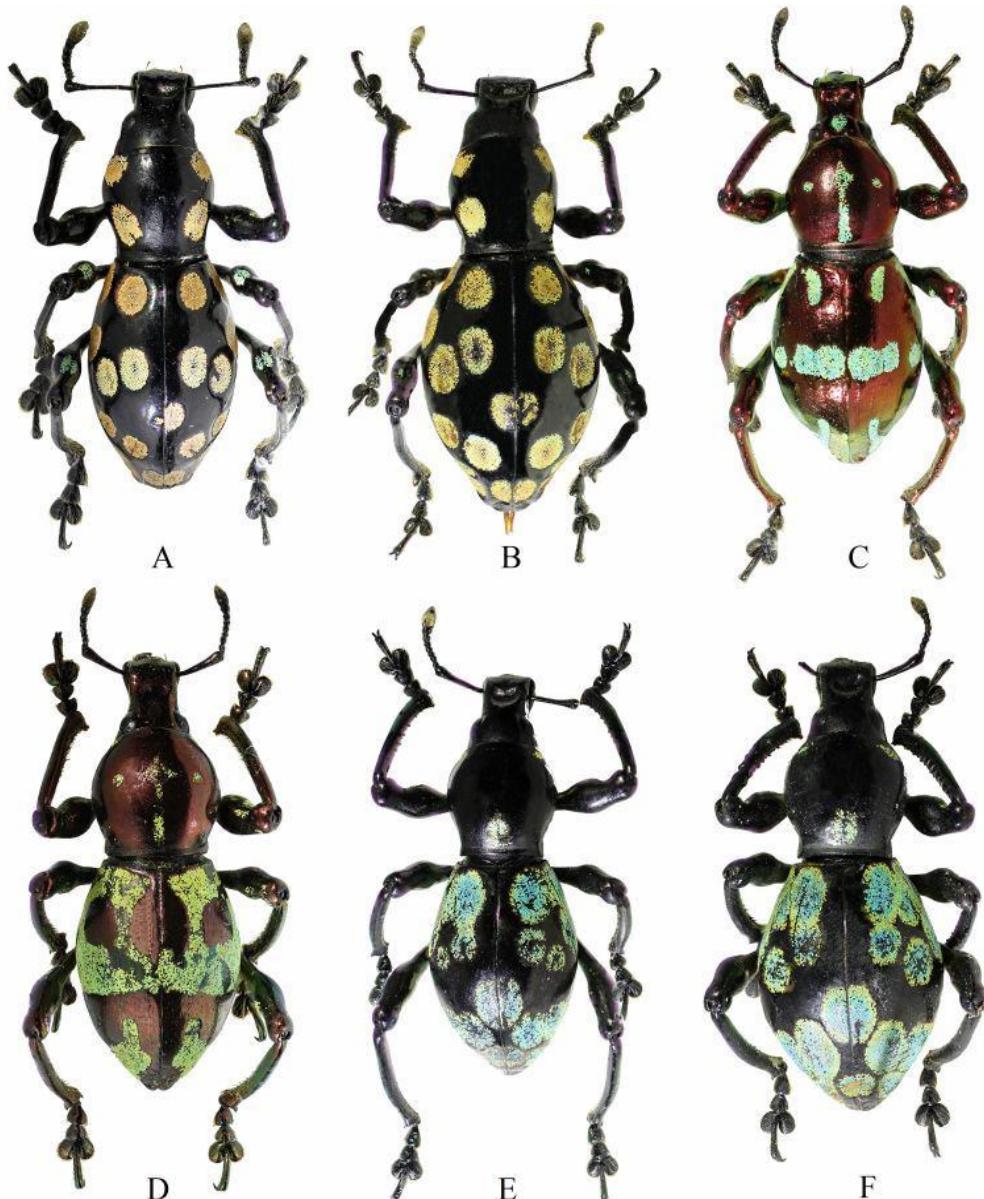


Fig. 1. Dorsal habitus of the following species: A – *P. tetramaculatus* sp. nov. male; B – *P. tetramaculatus* sp. nov. female; C – *P. sagittatus* sp. nov. male; D – *P. kirklayroni* sp. nov. male; *P. congestus* ssp. *aedamlayroni* subsp. nov. male; E - *P. congestus* ssp. *aedamlayroni* subsp. nov. female



Fig. 2. A - Dorsal habitus of *P. disargus* sp. nov. male; B - Lateral habitus of *P. disargus* sp. nov. male

Female. Unknown.

Differential analyses. This newly described species is similar on general appearance to *P. sagittatus* sp. nov. (find differential analyses at description of *P. sagittatus* sp. nov.).

Etymology. This species was named after Kirk Lane Layron in appreciation of cooperation and possibility to study current material.

***Pachyrhynchus disargus* sp. nov.**

Fig. 2, 4A-B.

Type material. Holotype. Male. "PHILIPPINES / Luzon, Nueva Vizcaya, Kasibu / V. 2015 / local collector leg." (white rectangular label, printed); "HOLOTYPE / *Pachyrhynchus disargus* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Paratypes. Two males. "PHILIPPINES / Luzon, Nueva Vizcaya, Kayapa / VIII. 2013 / local collector leg." (white rectangular label, printed); "PARATYPE / *Pachyrhynchus disargus* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Distribution: Luzon Island, Nueva Vizcaya Province.

Description. Dimensions: LB: 10.3-10.9 (Holotype 10.5, mean 10.57); LE: 7.1-7.8 (Holotype 7.1, mean 7.37); WE: 4.2-4.6 (Holotype 4.2, mean 4.4); LP: 2.9-3.3 (Holotype 3.1, mean 3.1); WP: 2.7-2.9 (Holotype 2.7, mean 2.77); LR: 1.6-1.8 (Holotype 1.7, mean 1.7); WR: 1.5-1.7 (Holotype 1.5, mean 1.57). N=3 for all measurements.



Fig. 3. Dorsal habitus of *P. phaleratus* ssp. *dannylayroni* subsp. nov. female

Integument black, body shiny, underside with weaker luster; body with markings of pale orange and blue round to recumbent scales. Dorsal and lateral habitus as shown in Fig. 2A-B.

Rostrum longer than wide (LR/WR 1.13), slight impression on apical $\frac{1}{2}$, bulging on apical 2/2; triangular impression on basal part, shallow longitudinal groove from middle of rostrum to base of forehead; lateral parts covered with rare short white hairs, patch of scales on genae. Head glabrous, finely punctured; eyes small, slightly prominent from the outline of the head. Forehead slightly bulging, smooth, nearly 1.8 times as wide as eye width.

Prothorax subspherical, longer than wide (LP/WP 1.15), widest just before the middle; weakly punctured; with the following markings: 1) two subtriangular patches of pale orange scales on dorso-lateral part near apical margin; subovate patch on each lateroventral part; in dorsal contour increased from apical margin, widest just before the middle, firmly rounded, then decreased to basal 1/3 where slightly incurved and increased to basal margin; subbasal groove strongly pronounced, subapical groove interrupted on disc.

Legs stout; coxa without scaly markings; femur without hairs, patch of scales on apical part; tibiae incurved apically, covered with sparse pubescence on all length and long light hairs along internal margin; tarsus with long, golden setae. Elytra sub ovate (LE/WE 1.69), with weakly pronounced intervals, nearly smooth; each elytron with the following markings: 1) two subovate pale orange patches on basal part; 2) four pale blue subovate patches on medial; 3) two sutural patches, one just before midline, one close to apex; 4) three subovate patches on apical $\frac{1}{2}$; 4) one triangular patch near apex laterally; widest just at the middle; on dorsal dimension narrow at the base, gradually increased to middle, widest just in the middle, then roundish and gradually decreased to apex; apex rounded, with weak pubescence.

Elytra wider than prothorax (WE/WP 1.56), more than twice as long as prothorax (LE/LP 2.29). Ventrites densely covered with blue to green round scales, minutely pubescent, mingled with few longer light color hairs. Genitalia as shown in Fig. 4A-B.

Female. Unknown.

Differential analyses. *P. disargus* sp. nov. is similar on general appearance to *P. argus* Pascoe by its shape of pronotum and elytra, yet, it is easily distinguishable by the following features: 1) narrower pronotum, that is widest just before middle, increased at subbasal part; 2) unique markings on pronotum and elytra of *P. disargus* sp. nov.

Etymology. This species was named after its similarity to *P. argus*.

***Pachyrhynchus phaleratus* ssp. *dannylayroni* subsp. nov.**

Fig. 3, 4E,FG

Type material. Female. Holotype. "PHILIPPINES / Luzon, Dingalan, Aurora / I. 2019 / local collector leg." (white rectangular label, printed); "HOLOTYPE / *Pachyrhynchus phaleratus* ssp. *dannylayroni* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Distribution: Luzon Island, Aurora Province.

Description. Female. Measurements (Holotype): LB: 13.1; LR: 1.9; WR: 1.8; LP: 4.0; WP: 3.7; LE: 8.9; WE: 6.2. Rostrum wider than long, LR/WR 1.05; pronotum slightly longer than wide, LP/WP 1.08; elytra nearly 1.5 times longer than wide, LE/WE 1.44; elytra more than two times as long as prothorax, LE/LP 2.23; elytra wider than prothorax, WE/WP 1.66. Body surface black, shiny, with pale green markings of round to recumbent scales. Dorsal habitus as shown in Fig. 3. Prothorax with same markings as in *P. phaleratus* ssp. *phaleratus*. Each elytron with the following markings: 1) three longitudinal stripes at basal



Fig. 4. A, C, H, J, L – aedeagus in lateral view; B, D, I, K, M – aedeagus in ventral view; A, B – *P. disargus* sp. nov.; C, D – *P. congestus* ssp. *aedamlayroni* subsp. nov.; H, I – *P. kirklayroni* sp. nov.; J, K – *P. sagittatus* sp. nov.; L, M – *P. tetramaculatus* sp. nov.; E, F, G – female genitalia of *P. phaleratus* ssp. *dannylayroni* subsp. nov.; E – sternite VIII in ventral view; F – ovipositor in dorsal view; G – spermatheca. Scale bar 1.00 mm

part, from base to submedial part; 2) longitudinal line along lateral margin in all length; 3) two elongated sutural patches at apical part; 4) two roundish patches medially, two roundish patches at apical ½; 5) longitudinal stripe from the middle to apical 1/2 along interval IV; 6) triangular patch near apex laterally; elytra widest just in the middle, apex firmly rounded. Metasternum covered

with round pale green scales; two patches on ventrite I, each redirected laterally; round patch of scales on each side of ventrite II. Genitalia as illustrated in Fig. 4E-G

Male unknown.

Differential analyses. This new subspecies is delimitated from *P. phaleratus* ssp. *phaleratus*

mainly by its unique markings on elytra, which are much more thick than in *P. phaleartus* ssp. *phaleratus*.

Etymology. This subspecies was named after Danny Layron in appreciation of cooperation and possibility to study current material.

***Pachyrhynchus congestus* ssp. *aedamlayroni*
subsp. nov.**

Fig. 1E-F, 4C-D.

Type material. Male Holotype. "PHILIPPINES / Luzon, Ilocos, Adams / VIII. 2019 / local collector leg." (white rectangular label, printed); "HOLOTYPE / *Pachyrhynchys congestus* ssp. *aedamlayroni* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Female. Paratype. "PHILIPPINES / Luzon, Ilocos, Adams / VII. 2019 / local collector leg." (white rectangular label, printed); "PARATYPE / *Pachyrhynchys congestus* ssp. *aedamlayroni* / Rukmane, 2019 / det. Rukmane A. 2019" (red rectangular label, printed).

Distribution: Luzon Island, Ilocos Province.

Description. Male. Measurements (Holotype): LB: 13.3; LR: 1.9; WR: 2.0; LP: 4.8; WP: 3.9; LE: 8.7; WE: 5.9. Rostrum wider than long, LR/WR 1.05; pronotum longer than wide, LP/WP 1.23; elytra nearly 1.5 times longer than wide, LE/WE 1.47; elytra nearly two times as long as prothorax, LE/LP 1.81; elytra wider than prothorax, WE/WP 1.51. Body surface black, shiny, with pale green, orange and yellow markings. Dorsal habitus as shown in Fig. 1E. Prothorax with the following markings of round scales: 1) suboval dorso-lateral patch on each side; 2) basal subtriangular patch on middle of subbasal part; 3) two small round patches along apical margin, each redirected laterally. Each elytron with twelve ovate to elliptic patches of pale green round scales, each patch covered with line of orange, yellow or golden scales; patches may be isolated or confluent: 1) six patches on basal half, two smaller, redirected medially, four bigger, confluent, along

basal ½ from interval I to lateral margin; 2) two sutural patches, one slightly after midline, one on apical ½; 3) three oval patches on apical ½, from interval II to lateral margin, confluent; 4) triangular patch near apex. Metasternum covered with round pale green to golden round scales; two patches on ventrite I, each redirected laterally; round patch of scales on each side of ventrite II. Aedeagus as illustrated in Fig. 4C-D.

Female. Measurements: LB: 14.7; LR: 2.1; WR: 2.2; LP: 4.9; WP: 4.4; LE: 9.9; WE: 7.0. Elytra wider than in male, more strongly convex. Dorsal habitus as shown in Fig. 1F.

Differential analyses. This species is delimited from *P. congestus* ssp. *congestus* mainly by its unusual coloration and geographical isolation. Due to my research on genus *Pachyrhynchus*, such form of the current species is familiar only for Ilocos, Adams, and can't be found on any other part of the Luzon Island.

Etymology. This species was named after Aedam Stephen Layron in appreciation of cooperation and possibility to study current material.

ACKNOWLEDGEMENTS

I wish to express my gratitude to Marie Felipe who kindly provided material for the current research.

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Two new *Pachyrhynchus* (Curculionidae: Entiminae: Pachyrhynchini) from Misamis Occidental (Mindanao, The Philippines)

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Abstract

Two new species belonging to the genus *Pachyrhynchus* Germar, 1824 (Curculionidae: Entiminae: Pachyrhynchini Schoenherr, 1826) from Northern Mindanao are described: *Pachyrhynchus yoshitakei* sp. nov. and *Pachyrhynchus imitans* sp. nov. The endophallus of *Pachyrhynchus zamboanganus* Yoshitake, 2012 is illustrated as well.

Key words: broad nose, endophallus, taxonomy, *amabilis* species group

Introduction

The genus *Pachyrhynchus* Germar, 1824 (Entiminae: Pachyrhynchini; Alonso-Zarazaga & Lyal, 1999) is a megadiverse genus with its center of diversity in the Philippines, a country that holds about 95% of the known species; the rest are, to the north, endemic to the islands of oceanic origin east of Taiwan (7 species) and the Japanese island of Ishigaki (1 species) and, to the south, the Indonesian islands Talaud, Moluccas, New Guinea and Biak (5 species). Depending on the opinion of different authors about the taxonomical status of some taxa, the genus to date includes about 148–157 species.

Mindanao, along with the small islands that surround it (Basilan, Camiguin, Dinagat, Siargao, Bucas Grande), is probably among the least studied areas; until 2012, only 28 species of *Pachyrhynchus* were known. In the past 8 years, however, several authors (Yoshitake, 2012, 2017; Yoshitake *et al.*, 2019; Rukmane, 2016, 2017, 2019; Bollino *et al.*, 2017; Rukmane & Barševskis, 2016; Cabras & Rukmane, 2016) have contributed to the large number of species now known for the island, a total of 48–53 taxa described to date, depending on different taxonomic opinions. Despite this, the sampling of areas of Mindanao still partially or totally unexplored from an entomological point of view is highlighting a significant number of taxa not yet described. This is the case of the Malindang Range (Misamis Occidental), from where no material of Pachyrhynchini had yet been made available for taxonomic studies. The only available faunal data are provided by Ballentes *et al.* (2006), who report 14 *Metapocyrtus* spp. and 6 *Pachyrhynchus* spp. as being present in the area; ecological data on the food plants are also provided for some taxa.

The possibility of studying a discrete sampling of Pachyrhynchini recently collected in the area, containing several new taxa that will be the subject of this and other communications, was therefore particularly welcome.

Materials and methods

Morphological characters were observed under a Nikon SMZ745T stereomicroscope. Stacked digital images were taken as indicated in Bollino *et al.* (2020). In the text we used the following symbols and abbreviations:

/ = different lines

// = different labels

â: = arithmetic mean rounded to one decimal place

LB = length of the body in dorsal view, from the apical margin of the pronotum to the apices of the elytra

LE = length of the elytra in dorsal view, from the level of the basal margins to the apices of the elytra

LP = length of the pronotum, from the base to apex along the midline

LR = length of the rostrum (including mandibles, though these are minute)

WE = maximum width across the elytra

WP = maximum width across the pronotum

WR = maximum width across the rostrum

All measurements are in millimeters, and follow the methodology suggested by Yoshitake (2012). Label data are given verbatim.

Codens of the collections:

DUBC—Daugavpils University Beetle Collection, Daugavpils, Latvia

MBLI—Maurizio Bollino private collection, Lecce, Italy

MZZC—Ming-Zhi Zhao private collection, Zhuhai, China

NIAES—National Institute for Agro-Environmental Sciences, Tsukuba, Japan

SMTD—Senckenberg Natural History Collections, Dresden, Germany

Results

Pachyrhynchus yoshitakei sp. nov. Bollino & Rukmane

(Figs. 1A–D)

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Type material. Holotype, male (Figs. 1A–B): Philippines—Mindanao I. / Mt. Capole—Sebucal / Mt. Malindang Range / Oroquieta City—(Misamis Occidental) / 4–8.II.2020—m. 900–1100 / Lgt. D. Mohagan—coll. M. Bollino (typed on white card) // HOLOTYPE / *Pachyrhynchus yoshitakei* / BOLLINO & RUKMANE, 2020 (typed on red card), presently in MBLI, will be deposited in SMTD.

Paratypes (7♂♂, 12♀♀): 2♂♂, 2♀♀ same data of the holotype; 2♂♂, 4♀♀ Philippines—Mindanao I. / Lake Duminagat—Mt. Ginlajan / Mt. Malindang Range / Brgy. Gandawan-(Misamis Occidental) / 3–6.II.2020—m. 1700–1900 / Lgt. D. Mohagan—coll. M. Bollino; 1♂ Philippines—Mindanao I. / Mt. Malindang Range / Brgy. Mansawan (Misamis Occidental) / 9–10.II.2020—m. 800–900 / Lgt. D. Mohagan—coll. M. Bollino; 2♂♂, 6♀♀ Philippines—Mindanao I. / Lake Duminagat—Mt. Ginlajan / Mt. Malindang Range / Brgy. Gandawan-(Misamis Occidental) / 3–6.II.2020—m. 1300–1500 / Lgt. N. Mohagan—coll. M. Bollino, (all in MBLI).

All paratypes with additional red card: PARATYPE / *Pachyrhynchus yoshitakei* / BOLLINO & RUKMANE, 2020.

Diagnosis. *Pachyrhynchus yoshitakei* belongs to the *Pachyrhynchus amabilis* species group (see taxonomical notes below), and differs from all other species of the group by its elytral ornamentation.

Description. Male. Dimensions: LB: 8.85–10.05 (holotype 10.05; â: 9.7). LR: 1.6–1.8 (1.8; 1.7). WR: 1.45–1.6 (1.5; 1.5). LP: 2.9–3.5 (3.25; 3.2). WP: 2.95–3.5 (3.2; 3.2). LE: 5.7–6.5 (6.4; 6.25). WE: 4.1–4.5 (4.5; 4.3). N=6 specimens.

Integument of head and pronotum dark glowing red; antennae and tarsi slightly darker; integument of elytra glowing bottle green. Body surface mostly strongly shiny, except elytra subopaque and underside with weaker luster. Body mostly subglabrous, with slightly pinkish yellow glossy markings of round to elliptic recumbent scales. Head sparsely very minutely pubescent, with narrow elliptic scaly patch along midline; each side of rostrum densely covered with elongated to short hair-like scales on lateroventral part behind antennal scrobe, and covered with pinkish yellow linear scales and golden long hair-like scales on lateral part in front of scrobe. Elytra slightly pubescent, with small whitish hairs scattered along the parasutural area and the apex.

Prothorax with the following five scaly markings: 1) broad transverse band along basal margin, with a small median denticulation, 2) broad lateroventral stripe on each side, 3) a pair of transverse lateral patches along basal margin, 4) a pair of small circular scaly patches on both sides of middle of pronotum and 5) thin transverse band along apical margin.

Each elytron with the following six scaly markings: 1) small subbasal spot on interval III, 2) antimedian transverse band on entire width, 3) small postmedian spot on interval V, 4) long wide strip extending on interval III from behind the middle to just before the apex, turning slightly forward towards the outer edge, and joining with the streak of the outer margin, 5) postmedian round patch on interval VII, 6) long strip along postmedian outer margin joined with marking #4.

Fore femora with some fine hairs, and light-colored elliptic to hair-like scales along proximal anterior margin; scales become sparse and minute medially. Mid and hind femora covered with similar scales to those on front pair along proximal posterior margins. Tibiae fringed with long hairs along internal margins, sparsely mingled with stout hairs. Prosternum mostly covered with dense general scales; intercoxal part of mesosternum entirely densely covered with general scales; metasternum mostly covered with general scales, which become denser on sides; ventrite 1 with a pair of large lateral patches of general scales along apical margin. Head moderately minutely punctured.

Forehead flattish, nearly three times as wide as eye width; eyes relatively large, strongly prominent from outline of head; outline of each eye highest behind middle.

Rostrum slightly longer than wide (LR/WR 1.15–1.2); dorsum moderately finely punctured, with deep obtiangular concavity on basal half, weakly bulging on apical half; apical bulge dorsally flattish, with shallow indistinct sulcus along midline from apical half to 1/4; dorsal contour of forehead and rostrum separated by shallow, wide, ill-defined transverse furrow; dorsal contour of rostrum weakly arched in basal half, then gradually raised at apical half, and finally gradually declined to apex; sides slightly widened apically; ventral surface simple, not convex along midline.

Antennae with scape slender, nearly as long as funicle, moderately clavate; funicular segments I–II less than twice as long as wide; segments III–VII subequal in length, nearly as long as wide; club subovoid, nearly twice as long as wide.

Prothorax subspherical, nearly as long as or barely longer than wide (WP/LP 0.98–1.02); dorsum smooth, moderately finely punctured, weakly convex; dorsal contour highest at middle; sides gently dilated from moderately constricted base, widest at middle, then gently convergent apicad, and finally slightly constricted behind apex; basal and apical margins subtruncate; subbasal and subapical grooves entirely distinct.

Elytra subobovoid (LE/WE 1.38–1.48), moderately wider than prothorax (WE/WP 1.36–1.45), about one and three quarters as long as prothorax (LE/LP 1.70–1.88), weakly striate-punctured, with intervals evenly flattish; dorsum moderately convex; dorsal contour highest at middle; sides weakly, gradually dilated from base, widest slightly before middle, then gently narrowed to weak subapical constrictions, and finally gently rounded at apices. Metasternum flat on disc. Ventrite 1 widely depressed on disc; apex of discal depression reaching apical margin of ventrite 1. Ventrite 5 widely truncate at apex. Legs slender; femora rather strongly clavate; tibiae weakly incurved apically, sharply minutely serrate along internal margins, mucronate at apices; tibial mucrones vestigial on hind legs.

Genitalia as illustrated (Fig. 2A–E).

Female (Figs. 1C–D). Dimensions: LB: 10.5–13.2 (â: 11.8). LR: 1.6–2.1 (1.9). WR: 1.6–2.05 (1.8). LP: 3.2–4.1 (3.6). WP: 3.3–4.05 (3.6). LE: 7.2–8.6 (7.9). WE: 5.3–6.4 (5.8). N=6 specimens.

Elytra more strongly convex dorsally, much wider than prothorax (WE/WP 1.58–1.63), with stronger subapical constrictions, elongate apically, and more acutely rounded at apices. Ventrite 1 flattish or slightly inflated on disc. Ventrite 5 very widely depressed along lateral margins, with adpressed light hairs turned apically. Otherwise, essentially as in males.

Genitalia: since female genitalia are of little or no use in identifying and characterizing the different species of Pachyrhynchini (Bollino *et al.*, 2020), we do not illustrate them.

Notes on variability. The series is fairly stable as far as the pattern is concerned. The only slight variation is observed in the freshest specimens, in which the bottle green color of the elytral integuments is lighter and brighter.

Etymology. The new species is dedicated to Hiraku Yoshitake (Tsukuba, Japan) for his contribution to a better knowledge of both the taxonomy and systematics of Pachyrhynchini.

Distribution. As far as we know, the new species is endemic to the Malindang Mountain Range. The mossy forest prevails in the area where it was collected.

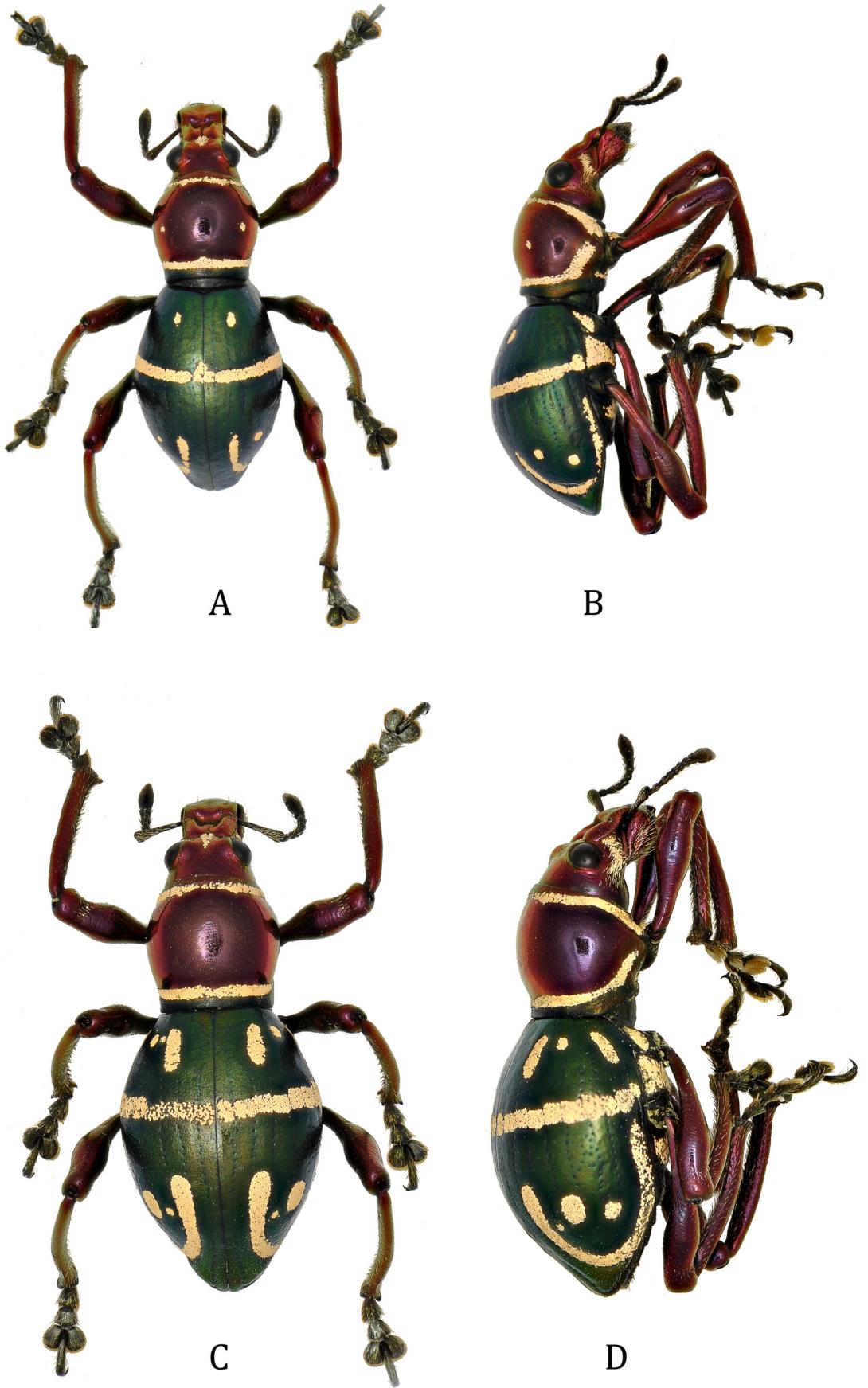


FIGURE 1. *Pachyrhynchus yoshitakei* sp. nov. Holotype. A: dorsal view; B: *idem*, lateral view; *Pachyrhynchus yoshitakei* sp. nov. female. C: dorsal view; D: *idem*, lateral view.

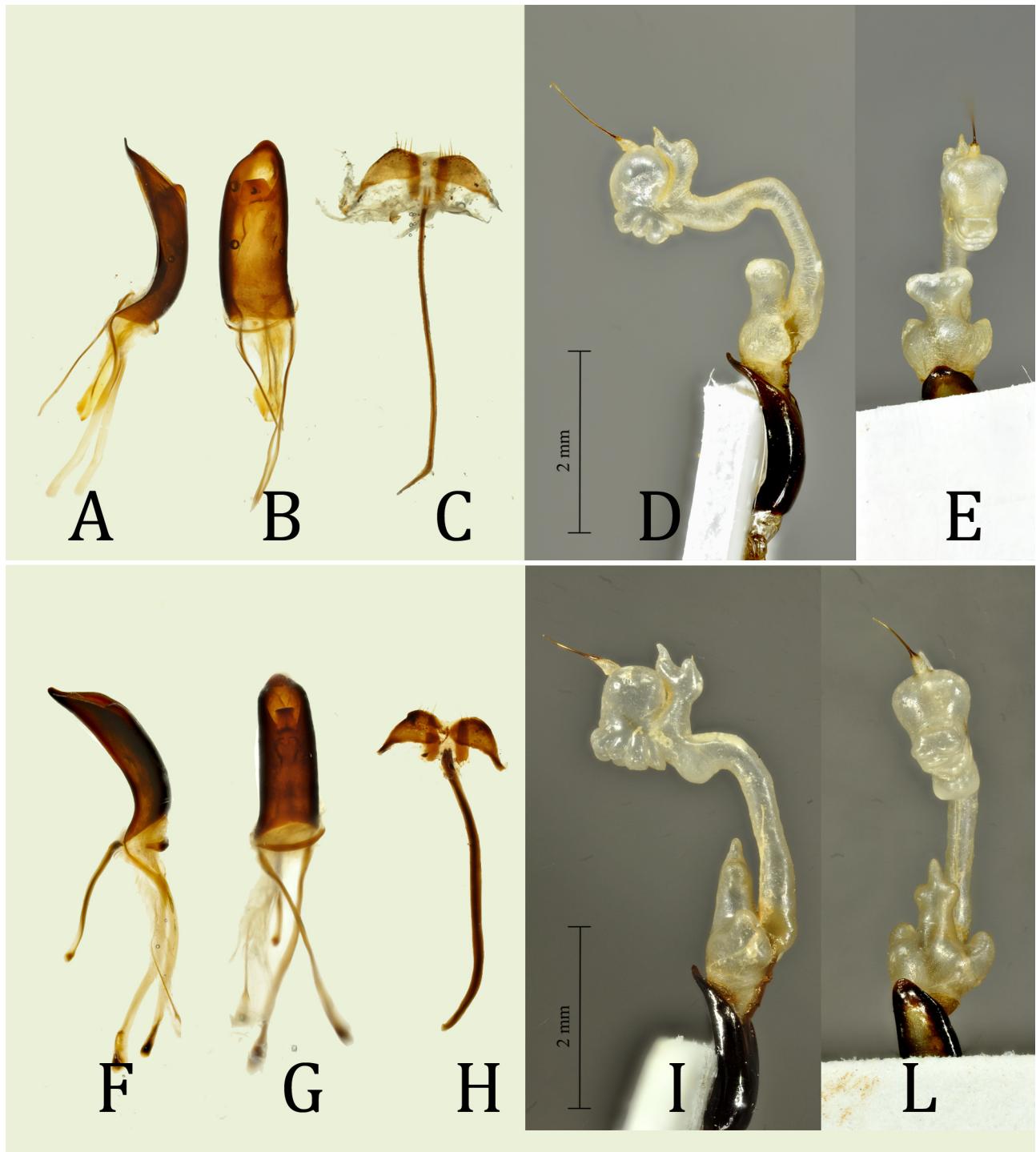


FIGURE 2. Male genitalia of *Pachyrhynchus yoshitakei* sp. nov. A: penis in lateral view; B: *idem* in dorsal view; C: sternite IX in dorsal view; D: endophallus in lateral view; E: *idem* in ventral view. Male genitalia of *Pachyrhynchus imitans* sp. nov. F: penis in lateral view; G: *idem* in dorsal view; H: sternite IX in dorsal view; I: endophallus in lateral view; L: *idem* in ventral view.



FIGURE 3. *Pachyrhynchus zamboanganus* A: male; B: endophallus in lateral view; C: *idem* in ventral view.

***Pachyrhynchus imitans* sp. nov. Rukmane & Bollino**

(Fig. 4A–D)
 urn:lsid:zoobank.org:act:6197CA4A-A6BC-4A96-B9B1-CBF9DDED913B

Type material. Holotype, male (Fig. 4A–B): Philippines—Mindanao / Labuan (Zamboanga City) / October–November 2014 / ex. N. Mohagan—coll. Bollino (typed on white card) // HOLOTYPE male / *Pachyrhynchus imitans*/ RUKMANE & BOLLINO, 2020 (typed on red card), presently in MBLI, will be deposited in SMTD.

Paratypes (12♂♂, 19♀♀): 1♂ PHILIPPINES / Mindanao, Zamboanga, Siocon / IV. 2019 / local collector leg.; 1♂ PHILIPPINES / Mindanao, Zamboanga, Siocon / II. 2019 / local collector leg.; 1♀ PHILIPPINES / Mindanao, Zamboanga, Labuan / II. 2018 / local collector leg.; 1♀ PHILIPPINES / Mindanao, Zamboanga / Sandayong / XII. 2018 / local collector leg.; 2♀ PHILIPPINES / Mindanao, Mt. Gampoy / II. 2016 / local collector leg.; 1♀ PHILIPPINES / Mindanao, Zamboanga, Mt. / Gampoy, 600–1200m / I. 2016 / local collector leg.; 2♂♂, 1♀ PHILIPPINES, Mindanao / Zamboanga del. Norte / Gutalac. VIII. 2014 / local collector leg.; 1♀ PHILIPPINES, Mindanao / Zamboanga del. Norte / Gutalac. I. 2015 / local collector leg. (all in DUBC); 1♂ Philippines: / Mindanao / Zamboanga del Norte / Gutalac V. 2019 / via. I. Lumawig (in MZZC); 3♂♂, 5♀♀ same data as Holotype; 2♂♂, 3♀♀ Philippines—Mindanao Is. / Tampilisan / (Zamboanga del Norte) / XI. 2014 / ex Noel Mohagan—coll. Bollino; 2♂♂, 4♀♀ Philippines—Mindanao / Gutalac (Zamboanga) / September 2014 / ex I. Lumawig—coll. M. Bollino; (all in MBLI).

All paratypes with additional red card: PARATYPE / *Pachyrhynchus imitans*/ RUKMANE & BOLLINO, 2020.

Diagnosis. *Pachyrhynchus imitans* sp. nov. belongs to the *Pachyrhynchus amabilis* species group, but can be easily distinguished from *P. zamboanganus* for its glowing red body with darker, coppery to nearly black elytra instead of black integuments with bluish tinge, and similar species *P. amabilis* Schultze, 1922 and *P. pseudoamabilis* Yoshitake, 2012 for its elytral markings combined with the trilobed basal medio-ventral diverticulum of the endophallus instead of bilobed diverticulum.

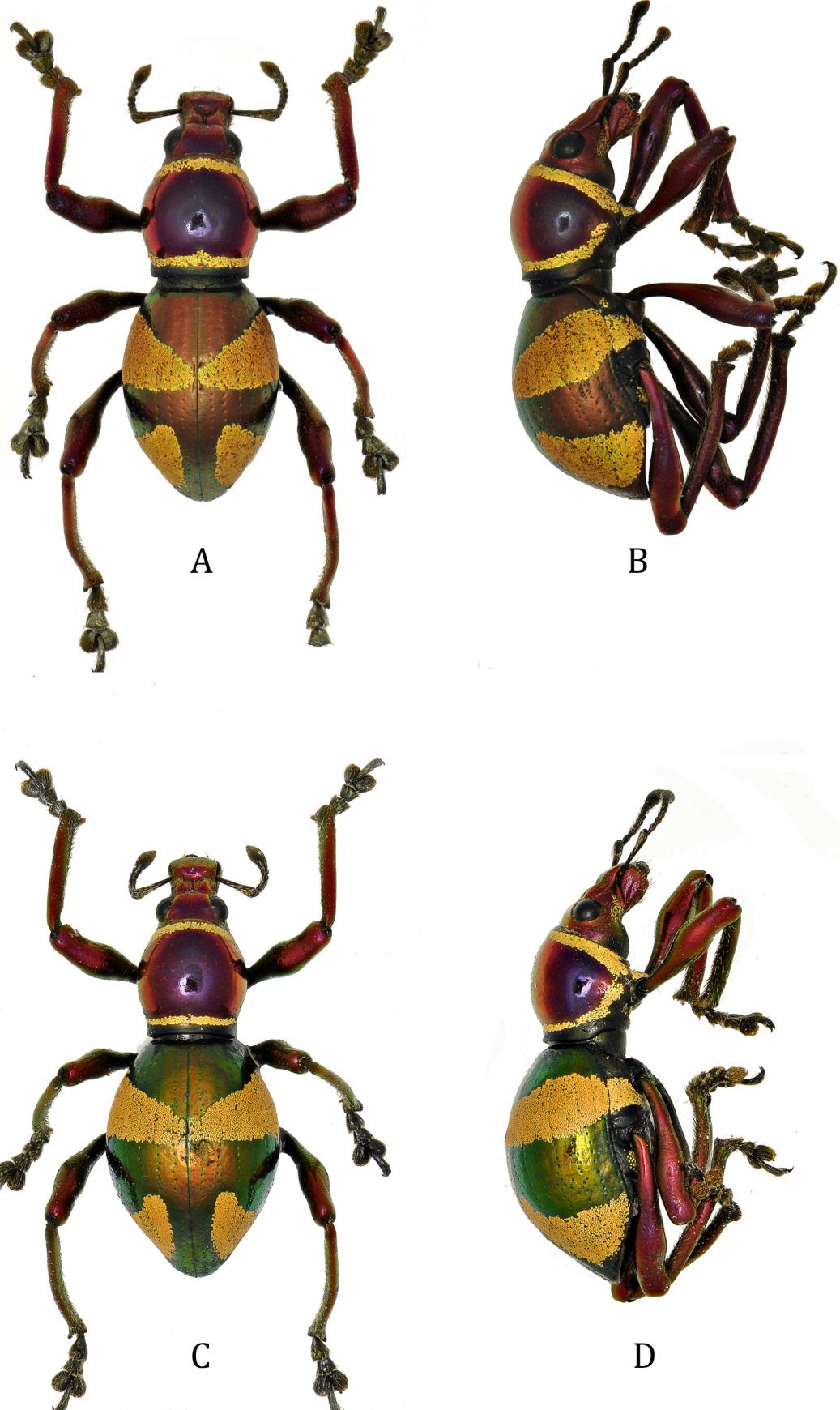


FIGURE 4. *Pachyrhynchus imitans* sp. nov. Holotype. A: dorsal view; B: *idem*, lateral view; *Pachyrhynchus imitans* sp. nov. female. C: dorsal view; D: *idem*, lateral view.

Description. Male. Dimensions: LB: 9.3–10.1 (holotype 9.8; \hat{a} : 9.7). LR: 1.8–1.9 (1.9; 1.8). WR: 1.5–1.6 (1.6; 1.5). LP: 2.7–3.1 (3.1; 2.9). WP: 2.9–3.2 (3.2; 3.0). LE: 6.2–6.6 (6.4; 6.4). WE: 3.8–4.7 (4.3; 4.1). N=4 specimens.

Head, pronotum, femur and tibia dark glowing red; antennae and tarsi nearly black; integument of elytra dark coppery with green to reddish tinge. Body surface strongly shiny, except underside of elytra with weaker luster. Body with dark orange scaly markings of subovate recumbent scales. Head minutely pubescent, finely punctured throughout length, without scaly markings; lateroventral parts of the rostrum before and behind antennal scrobe covered with long hair-like scales, with very few elongated scales before it.

Prothorax mostly glabrous dorsally, with the following three scaly markings: 1) a transverse band along basal margin, slightly protruding apically in middle, 2) a broad lateroventral stripe on each side that partially extends along the basal margin, and 3) a broad transverse band along apical margin.

Each elytron subglabrous with two large scaly patches, one on basal half and another on apical half; basal patch obliquely depressed obovate, extending from suture to external margin of elytron, gradually widened toward elytral margin; apical patch subtriangular, extending from interval II to external margin of elytron, with basal margin arched posteriorly.

Femora and tibiae subglabrous, the latter fringed with long hairs along internal margins, sparsely mingled with stout hairs. Prosternum and mesosternum mostly without scales, metasternum connected with transverse band of elytra, forming additional triangular patch on lateral sides. Ventrite 1 with few roundish scales along apical margin.

Head sparsely punctured. Forehead flattish dorsally, slightly bulging near median edge of the eyes, nearly twice as wide as eye width; eyes large, bulging from outline of the head, with highest point just behind the middle.

Rostrum slightly longer than wide (LR/WR 1.19–1.2); dorsum finely punctured, with deep triangular impression on basal part, bulging on apical part, with deep longitudinal medial groove from apical half to base of the forehead; dorsal contour of rostrum arched at basal half just before the middle, then raised up to apical half and straightened to apex.

Scape densely covered with long golden hairs from just before the middle to the apex along outer margin. Antennal funicular segments I and II sub-equal in length, 1.5 times as long as wide; segments III–V subequal in length, slightly wider than long; segments VI–VII subequal, slightly larger than segments III–V; club suboval, more than twice as long as wide.

Prothorax subspherical, nearly as long as wide (WP/LP 1.03–1.07); dorsum smooth, weakly punctured on apical half, moderately convex; dorsal contour highest slightly before the middle.

Elytra subovate (LE/WE 1.4–1.63), wider than prothorax (WE/WP 1.31–1.47), more than twice length of prothorax (LE/LP 2.13–2.29), with smooth surface; intervals only marked by punctures; dorsal contour widest just at the middle.

Genitalia as illustrated (Figs. 2F–L).

Female (Figs. 4C–D). Dimensions: LB: 10.4–11.7 (\hat{a} : 11.2). LR: 1.8–2.0 (1.9). WR: 1.5–1.7 (1.6). LP: 2.9–3.4 (3.2). WP: 3.1–3.5 (3.4). LE: 7.2–7.7 (7.4). WE: 5.1–5.4 (5.2). N=6 specimens.

Slightly larger than males (\hat{a} LB ♂/ \hat{a} LB ♀: 0.86), with more convex and wider elytra (LE/WE 1.41–1.43). Otherwise, essentially as in males.

Notes on variability. The typical series is fairly stable as far as the pattern is concerned. The only obvious variation concerns the color of the elytral integument, which tends to become black in the old specimens.

Etymology. The new species is named *imitans* (Latin *imitans* = imitating) for its resemblance to other *Pachyrhynchus* species of the *amabilis* species group, i.e., *P. zamboanganus*, *amabilis* and *pseudoamabilis*.

Distribution. To the best of our knowledge the new species is restricted to Zamboanga Peninsula, where it appears to have scattered and low-density populations.

Taxonomical notes. *Pachyrhynchus yoshitakei* sp. nov. and *Pachyrhynchus imitans* sp. nov. belong to the *Pachyrhynchus amabilis* species group introduced by Bollino *et al.* (2017) because they share the same combination of morphological characters:

- 1) integument dark glowing red, with more-or-less marked green tinge.
- 2) eyes strongly convex from outline of head.
- 3) prothorax subspherical, with sides straightly dilated from constricted base.
- 4) prothorax with a scale band along anterior margin and another along posterior margin united at lateral margins, the latter discally somewhat denticulated.

- 5) endophallus having the same shape, with basal medio-ventral diverticulum bilobed in most species, but trilobed in two species (see below).

The updated list of species assigned to the *Pachyrhynchus amabilis* species group, indicated in order of the year of description, is as follows:

Pachyrhynchus amabilis Schultze, 1922

Type locality: Mindanao Isl., Prov. Bukidnon, Lindaban. Type in SMTD.

Pachyrhynchus chamissoi Schultze, 1922

Type locality: Mindanao Isl., Prov. Bukidnon, Lindaban. Type in SMTD.

Pachyrhynchus pseudamabilis Yoshitake, 2012

Type locality: Philippines, Mindanao Isl., Mt. Apo. Type in NIAES.

Pachyrhynchus subamabilis Yoshitake, 2012

Type locality: Mt. Apo, S. Mindanao Isl., Philippines. Type in NIAES.

Pachyrhynchus zamboanganus Yoshitake, 2012

Type locality: Philippines, West Mindanao Isl., Zamboanga del Norte Province. Type in NIAES.

Pachyrhynchus tikoi Rukmane, 2016

Type locality: Philippines, Mindanao Isl., Bukidnon, Cabanglasan. Type in DUBC.

Pachyrhynchus banglas Bollino, Sandel & Rukmane, 2017

Type locality: Philippines, Mindanao Isl., Bukidnon, Kabanglasan, Type in SMTD

Pachyrhynchus yoshitakei Bollino & Rukmane, *hoc opus*

Type locality: Philippines, Mindanao Isl., Mt. Capole, Sebucal, Mt. Malindang Range, Misamis Occidental.

Type in SMTD

Pachyrhynchus imitans Rukmane & Bollino, *hoc opus*

Type locality: Philippines, Mindanao Isl., Labuan, Zamboanga City. Type in SMTD

We take advantage of the opportunity to correct an identification error committed by us (Bollino *et al.* 2017): the specimen identified as *Pachyrhynchus zamboanganus* Yoshitake, 2012 (op. cit.: figs. 5g, 6g, 9f) does not belong to this taxon, but to *Pachyrhynchus imitans* described here above. We therefore illustrate here the true *P. zamboanganus* (fig. 3A) and its endophallus (figs. 3B–C). *Pachyrhynchus zamboanganus* and *P. imitans* sp. nov. are very similar to each other in having the basal medio-ventral diverticulum of the endophallus trilobed rather than bilobed, thus the considerations made by Bollino *et al.* (2017: 192) apply to both.

Acknowledgments

We wish to express our gratitude to Adam Cotton for revision of the English text, Dave J. Clarke for revision of the English text and the editing and two anonymous reviewers for constructive comments on the manuscript. The third author wishes to thank his brother Danilo Mohagan for having been a perfect field companion, and Mr. Bagio Mario, captain of Barangay Lake Duminagat, for his exquisite hospitality and assistance during the stay of the third author and his brother in the area.

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A NEW SYNONYM OF *PACHYRHYNCHUS SPECIOSUS* WATERHOUSE, 1841 (COLEOPTERA: CURCULIONIDAE) FROM THE PHILIPPINES

Anita Rukmane-Bārbale

Rukmane-Bārbale A. 2020. A new synonym of *Pachyrhynchus speciosus* Waterhouse, 1841 (Coleoptera: Curculionidae) from the Philippines. *Acta Biol. Univ. Daugavp.*, 20 (1): 35 – 38.

The following new synonymy is proposed: *Pachyrhynchus speciosus* Waterhouse, 1841 = *P. absurdus* Schultze, 1919, syn. nov. Photographs of type specimens of *P. absurdus* are presented. The lectotype for *P. absurdus* Schultze, 1919 is designated.

Key words: Coleoptera, Pachyrhynchini, *Pachyrhynchus*, taxonomy, new synonymy, lectotype, Philippines.

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 belongs to the tribe Pachyrhynchini Schoenherr, 1826 of Entiminae Schoenherr, 1826. There are as much as 157 valid species in this genus so far (Yoshitake 2012, Rukmane & Barševskis 2016, Bollino et al. 2017, Rukmane 2017). All represented species are known from the Oriental Region, with 144 species distributed on islands of Philippine archipelago, seven species endemic of Taiwan, one of Ishigaki and five of Indonesian islands.

During the observation of type material from SMTD of both *P. speciosus* and *P. absurdus*, and additional study on both taxa available in DUBC and NHML, I concluded, that holotype of *P. absurdus* completely correspond features of *P. speciosus*. Consequently, main aim of this short contribution is to clarify taxonomic status of both taxa, and introduce new synonymy.

MATERIAL AND METHODS

The study was based on specimens deposited at the following collections:

DUBC – Daugavpils University Beetle Collection, Daugavpils, Latvia

BMNH – The Natural History Museum, London, UK (M. Barclay)

SMTD – Senckenberg Natural History Collections, Dresden, Germany (O. Jager)

The laboratory research follows Rukmane (2017).

Label data are cited *verbatim*. In the text the following symbols and abbreviations were used:

/ = different lines

// = different labels

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

RESULTS

***Pachyrhynchus speciosus* Waterhouse, 1841**
(Fig. 1)

Pachyrhynchus speciosus Waterhouse, 1841: 314
Pachyrhynchus absurdus Schultze, 1919: 550
syn. nov.

Type material examined: Holotype of *Pachyrhynchus speciosus* Waterhouse, 1841, female: Type (round white label, circumscribed by red circle) // 75. / 36. (round white label) // *Pachyrhynchus / speciosus* W. (white rectangular label) (BMNH).

Lectotype of *Pachyrhynchus absurdus* Schultze, 1919, male: Bucas Island / G. Boettcher (white rectangular label, printed) // *Pachyrrhynchus / absurdus* ♂ / Det. W. Schultze. Schultze / Type (white rectangular label) // Coll. W. Schultze / Ankauf 1942 (yellow rectangular label) // Staatl. Museum fur / Tierkunde Dresden (white rectangular card, printed) // HOLOTYPE (red rectangular card, printed); left antenna missing (SMTD) (Fig. 2)

Diagnosis. Body coppery red, old specimens almost black. Scally markings pale green, with metallic luster. Impression on head between eyes broad and deep, continuous with excavation on base of rostrum. Head with three longitudinal markings; one median, and one under each eye. Thorax indistinctly punctured, with three elongated longitudinal scally markings, one oval on each side and one dorsal arrow-shaped marking, slightly longer than broad. Elytra short ovate, striate-punctate, at the basal portion of each elytron with transverse area, enclosed by a narrow band of scales, and extending from outer margin nearly to the suture; apical portion with curved area, with two narrow transverse bands, that become confluent near outer margin of each elytron and run backwards to the apical curved marks; in some cases two dorsal bands are combined at suture of elytra. Line of scales on prosternum nearly encircles base of anterior legs. Femora with scally markings on subapical part, more or less interrupted on the upper surface of each femur. Habitus of male is illustrated in (Fig. 1).

Remarks. *Pachyrhynchus speciosus* Waterhouse, 1841

Waterhouse (1841) described this species from one female specimen, without exact location of the species. Never less, together with Type specimen available in BMNH, collection include number of specimens that morphologically correspond type, collected from Mindanao Island. Schultze (1919) described and figured *Pachyrhynchus absurdus* based on one male and one female specimen. According to the original description, the type specimens were deposited in Schultze private collection (Schultze, 1919), but actually the types are now deposited in SMTD. The type series contain two males and one female. Later, the same author (Schultze 1922) added note,



Fig.1. Appearance of *P. speciosus* Waterhouse, 1841, male.



Fig. 2. Lectotype of *P. absurdus* Schultze, 1919.

that male of *P. absurdus* is a form of *P. speciosus* Waterh. and the true *P. absurdus* is a female from the original description. Schultze, consequently, considered the male of *P. absurdus* as a synonym of *P. speciosus* (but the formal synonymization was not provided by him), and the female as *P. absurdus* (Schultze, 1923). Despite this, the male of *P. absurdus* was never described, despite the fact, that one male corresponding features of the female from this type serie.

Type material, considered as *P. absurdus*: Bucas Island / G. Boettcher (white rectangular label, printed) // Coll. W. Schultze / Ankauf 1942 (yellow rectangular label) // Staatl. Museum für

Tierkunde Dresden (white rectangular card, printed) // *Pachyrrhynchus / absurdus ♂* / Det. W. Schultze. Schultze / Type (white rectangular label) (1♂, 1♀) (Fig. 3).

All three specimens has type labels, and one male have additional red label "HOLOTYPE", which apparently was pinned after the original description. According to regalement of International Commission on Zoological Nomenclature, holotype is a single specimen expressly designated as the name-bearing "type" by the original author of the species. We can't ignore the fact, that there is always a possibility, that this additional label was added to type

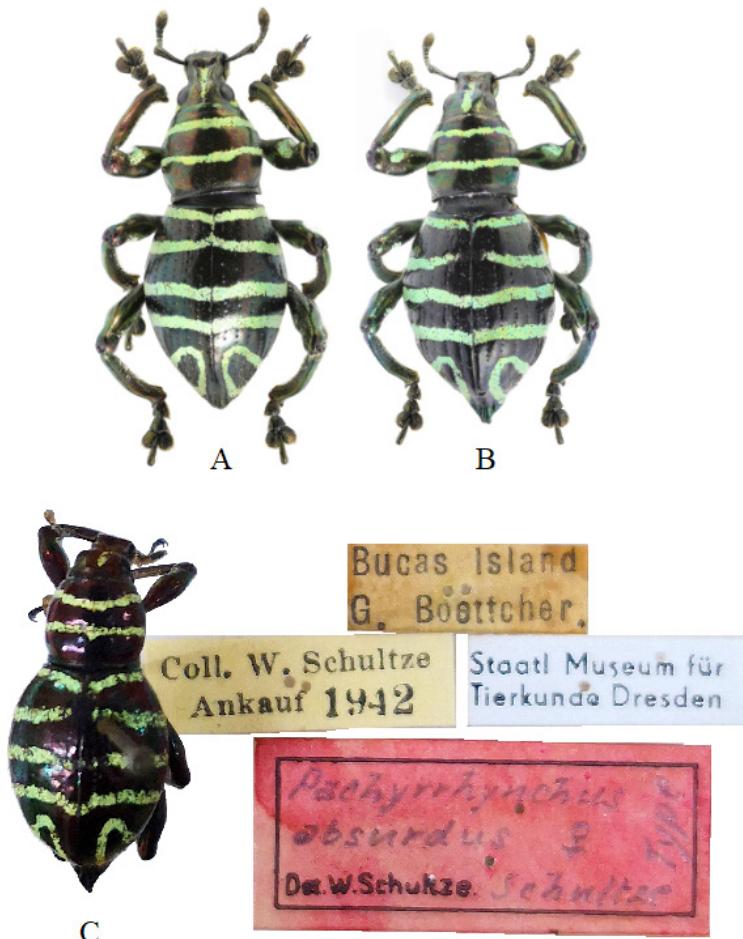


Fig. 3. A, B – Male (A) and female (B) of *P. orientalis* Rukmane, 2017; C – Type of *P. absurdus* Schultze, 1919, female.

specimen after the original description, with my own considerations, it was done by Schultze during his later revision of the genus. As we can't prove this fact, there is a need in establishing a new lectotype, as the single type specimen for species originally described from a set of syntypes. According to the gender preference and considering the presence of "HOLOTYPE" label, I considered this specimen as a lectotype in order to fix the identity of the name. An additional red rectangular label "LECTOTYPE" was added by me on the same pin with specimen. A comparison of *P. speciosus* of several museums (DUBC, SMTD, BMNH) from Mindanao, Samar, Siargao and Bucas islands with the lectotype of *P. absurdus* revealed that they are morphologically conspecific. Thus, I synonymized *P. absurdus* with *P. speciosus*. Two other specimens, based on shapes of the rostrum with similar impression, elytra with markedly elongate apex in female, and characteristic scally markings of the body, are conspecific with *P. orientalis* Rukmane, 2017. This species has extending distribution range from Mindanao to Bucas islands (Rukmane 2017).

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Short contribution to distribution and appearance of *Pachyrhynchus decussatus* Waterhouse, 1841 (Entimine: Pachyrhynchini) with description of one new taxon from Catanduanes Island, Philippines

Anita Rukmane-Bārbale

Rukmane-Bārbale A. 2020. Short contribution to distribution and appearance of *Pachyrhynchus decussatus* Waterhouse, 1841 (Entimine: Pachyrhynchini) with description of one new taxon from Catanduanes Island, Philippines. *Baltic J. Coleopterol.*, 20(1): 81 - 85.

One new subspecies of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Entimine: Pachyrhynchini) from the Catanduanes Island (Philippines) is described and illustrated: *P. decussatus catanduanensis* subsp. nov.. Distribution and appearance of *P. decussatus decussatus* Waterhouse, as well as *Pachyrhynchus* fauna of Catanduanes Island is presented.

Key words: Coleoptera, Curculionidae, Pachyrhynchini, *Pachyrhynchus*, fauna, taxonomy, new subspecies, Catanduanes, Philippines

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INTRODUCTION

Pachyrhynchus decussatus Waterhouse, 1841 is a typical representative of the genus *Pachyrhynchus* Germar, 1824, tribe Pachyrhynchini Schönherr, 1826, subfamily Entimine Schönherr, 1826. In original description species was described from The Philippine Islands, and Schultze was the first to report on species distribution from Catanduanes Island (Schultze, 1923). Recently, I had an opportunity to examine number of specimens of this species from South Luzon, and, after careful comparison with type specimen, as well as series of this species from NHML (London, UK) and MTD (Dresden, Germany) I concluded, that Schultze was wrong in his considerations, and actual distribu-

tion of *P. decussatus decussatus* is related to South Luzon. Population from Catanduanes Island, however, form a distinct subspecies *P. decussatus catanduanensis* subsp. nov. and it is described herein.

Currently there are four species of the genus *Pachyrhynchus* reported from Catanduanes Island: *P. circulatus* Heller, 1912, *P. decussatus* Waterhouse, 1841, *P. moniliferus* Germar, 1824 and *P. phalareatus* Waterhouse. All listed species share confluent colour pattern of orange scally markings. For the listed species such colour pattern, according to my own observations of number of specimens of various collections, is characteristic only for populations from Catanduanes Island.

MATERIAL AND METHODS

The study was based on specimens deposited at the following collections:

DUBC – Daugavpils University Beetle Collection (Daugavpils, Latvia)

NHML – Natural History Museum (London, UK)

MTD – Senckenberg Natural History Collections, Dresden, Germany (O. Jäger)

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.

Abbreviations and measurement technology follow Bollino et. al. (2017).

RESULTS

***Poachyrhynchus decussatus* ssp. *decussatus* Waterhouse, 1841**
(Fig. 2)

Type locality: Philippine Islands.

Type in NHML, examined.

Male. Type (white round label, marked with red circle); 75 / 36 (white round label); *decussatus* (white label).

Material examined. 1 male, 1 female. S. Luzon; 1 male, 1 female. Philippines / S. Luzon; 1 female without geographical label (NHML). 1 male, 1 female PHILIPPINES / Luzon, Mt. Bulusan / VI. 2018 / local collector leg. (DUBC).

Note. In original description, Waterhouse did not indicate exact distribution of the species, and Schultze was the one to report it from Catanduanes Island. However, part of the material from NHML together with new, reliable data from DUBC, that corresponds morphological features of the Type specimen, suggests, that real distribution of the species is S Luzon. With this I propose, that the exact locality of the *P.*

decussatus ssp. *decussatus* Waterhouse is S Luzon.

***Pachyrhynchus phaleratus* ssp. *catanduanensis* subsp. nov.**

(Fig. 1, 4)

Type material. Holotype: Male: (Fig. 1.1-3, 1.6): PHILIPPINES / Catanduanes Isl., Pandan / July 2016 / local collector leg. (white label); “HOLOTYPE / *Pachyrhynchus decussatus* ssp. *catanduanensis* / Rukmane, 2020” (red label) (DUBC).

Paratype: 1 female. PHILIPPINES / Catanduanes Isl., Pandan / July 2016 / local collector leg. (white label); “PARATYPE / *Pachyrhynchus decussatus* ssp. *catanduanensis* / Rukmane, 2020” (red label) (DUBC).

Distribution. Catanduanes Island.

Description. Measurements (n=1): LB: 12.5; LR: 2.0; WR: 2.1; LP: 4.3; WP: 4.8; LE: 7.7; WE: 5.5. Body black, with markings of pale orange round to recumbent scales on body. Head with fine puncture. Eyes small, very minutely prominent from outline of head, with peak just in the middle. Forehead with small dorsal bulge from base of forehead to base of rostrum, two times as wide as eye width, with longitudinal medial scale line in all length. Rostrum slightly wider than long (WR/LR 1.05), dorsally with longitudinal groove from base of rostrum to medial portion of rostrum; rostrum with small, subtriangular impression on basal part, transverse patch of scales along impression; bulge on apical part; rostrum pubescent dorsally; in dorsal contour nearly straight, slightly widened along medial portion; laterally with two scale patches, one on genae and one on apical part; long, light golden hairs on latero-ventral part and near mouth. Antennal scrobe incurved ventrally, mingled with short, light golden hairs. Antenna without general scales; scape strongly widened at apical part, with long, light hairs from medial portion to apex; basal antennomere two times as long as wide, longer than antennomere II; antennomere II 1.5



Fig. 1. Male of *P. decussatus* ssp. *catanduanensis* ssp. nov.. 1-3 - dorsal view, 4 - aedeagus (lateral view), 5 – aedeagus (ventral view), 6 – lateral view

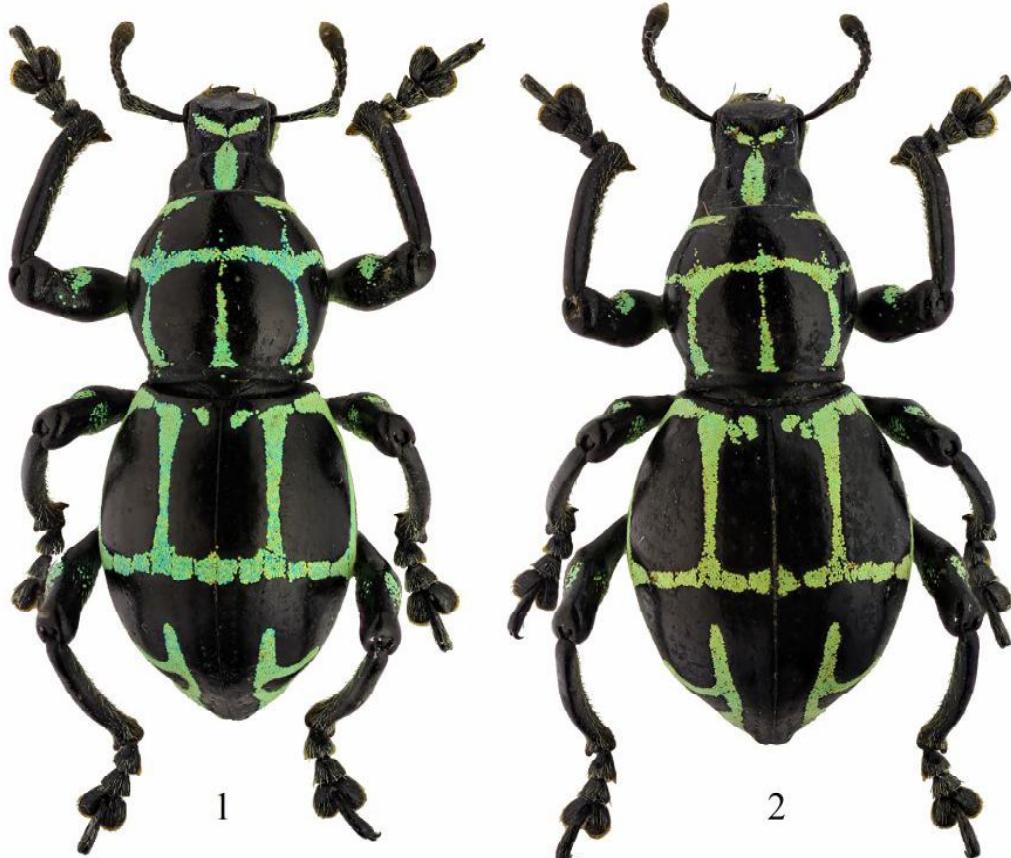


Fig. 2. *P. decussatus* ssp. *decussatus* Waterhouse, 1841. 1 - male, 2 - female

times as long as wide, longer than antennomeres III-V; antennomeres III-V sub-equal in size, shorter than antennomere VI-VII; club short, strongly curved, nearly 1.5 times as long as wide. Prothorax nearly without puncture, with small pubescence at subapical part; wider than long (WP/LP 1.12), posterior edge straight, anterior edge curved; markings correspond description given by Waterhouse (Waterhouse, 1841). Elytra distinctly rounded, LE/WE 1.4, smooth, with weakly expressed intervals of punctured rows, minutely pubescent near apex; each elytron with the following scaly markings: 1) three longitudinal lines in all length, one along interval III, line curved laterally at apical 1/3, one along interval VII, one along lateral margin; 2) two short longi-

tudinal lines at subbasal part, one along interval II, one along interval IV; 3) transverse medial line at medial portion of elytron; 4) short, transverse line at apical 1/3, line connector with first longitudinal line; 5) two small patches near apex; elytra in dorsal contour widest just before the middle; LE/LP 1.71, WE/WP 1.15. Scutellum very small, triangular. Aedeagus as in Fig. 1.4-5.

Female. Measurements (n=1): LB: 11.8; LR: 1.9; WR: 2.0; LP: 3.9; WP: 3.8; LE: 7.0; WE: 5.7. No specific size difference from males. Pronotum significantly narrower than elytra (WP/WE 0.69), elytra more strongly curved. Otherwise as in males.



Fig. 3. 1 - *P. moniliferus* Germar, 1824 (male), 2 - *P. phaleratus* Waterhouse, 1841 (female), 3 - *P. circulatus* Waterhouse, 1841 (male)

Differential analyses. The new species may be easily distinguished from *P. decussatus* ssp. *desuccatus* by the following features: 1) markings on the body of pale orange color in *P. decussatus* ssp. *catanduanensis* ssp. nov., markings of green color, with metallic tinge in *P. decussatus* ssp. *decussatus*; 2) short, longitudinal lines on subbasal part of elytra in *P. decussatus* ssp. *catanduanensis* ssp. nov. that lack in *P. decussatus* ssp. *decussatus*; 3) smooth prothorax in *P. decussatus* ssp. *catanduanensis* ssp. nov. and punctured prothorax in *P. decussatus* ssp. *decussatus*. Together with distinct distribution of both taxons.

Etymology. The specific epithet is the latinized adjective derived from the area the specimens were collected from.

Note. The new subspecies tend to appear continuously together with *P. circulatus*, *P. phaleratus*, *P. moniliferus*, all species share same color pattern of scaly markings (Fig. 3).

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TO THE KNOWLEDGE OF SOME CLOSELY RELATED SPECIES OF THE GENUS *PACHYRHYNCHUS* GERMAR, 1824 (COLEOPTERA: CURCULIONIDAE: PACHYRHYNCHINI) FROM LUZON ISLAND (PHILIPPINES), WITH USAGE OF EVERSION OF ENDOPHALLUS

Anita Rukmane-Bārbale

Rukmane-Bārbale A. 2020. To the knowledge of some closely related species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from Luzon island (Philippines), with usage of eversion of endophallus. *Acta Biol. Univ. Daugavp.*, 20 (2): 133 – 139.

Pachyrhynchus pinorum Pascoe, 1871 species group is established. Characteristic feature set, as well as list of members is provided. Faunistic data for each species is included. Eversion of endophallus is used as a main method for species delimitation. Photos of habitus (male) as well as drawings and photos of eversions are compiled. Distribution maps are added.

Key words: *Pachyrhynchini*, *Pachyrhynchus pinorum*, taxonomy, fauna, eversion, endophallus, Luzon Island, Philippines

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 (Entiminae: Pachyrhynchini) is Oriental genus, distributed mainly in the Philippine Islands, with its centre of distribution believed to be Luzon Island. More than a half of species within the genus origin from the Luzon Island, never less, relation of some closely related species variations is uncertain. That is the case for megadiverse members of *Pachyrhynchus pinorum* Pacsoe, 1871 species group. In the current study I have observed several different forms and variations for each species within the species group, as a main method for species delimitation using eversion of

endophallus. Study revealed, that current method is very useful for species delimitation, yet, if can be effective only with combination of set of morphological and biogeographical features.

MATERIAL AND METHODS

The study was based on specimens deposited at the Daugavpils University Beetle Collection. Abbreviations of museums and collections used: DUBC – Daugavpils University Beetle Collection, Daugavpils, Latvia (A. Barševskis).

MTD - Senckenberg Natural History Collections

(Dresden, Germany) (O. Jager).
NIAES - Institute of Agro-Environmental Sciences, NARO, Tskuba.
KUM - Kyushu University Museum, Fukuoka.

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.

Technology for eversion of endophallus follow Janovska et. al. (2013).

RESULTS

Taxonomical notes

Such artificial method for species groupment is consequently and successfully used by many authors in the past (Schultze 1924, Bollino et. all. 2017). To continue, I provide set of morphological features for *Pachyrhynchus pinorum* Pascoe, 1871 species group. Group is restricted to mainland of Luzon Island, the name is given according to first species described. Members of the species group are mainly as provided by Schultze (Schultze 1924) with some minor changes on account of new species described in the recent past years. Additionally, some members of initial *Pachyrhynchus inclitus* Pascoe species group are transferred, on account of descriptive morphological characters listed below.

All species within the group share the following combination of morphological characters:

1. Integument black, surface of prothorax strongly shiny.
2. Eyes small, at least three times as wide as forehead.
3. Apical part of prothorax from apical 1/3 to apical margin straight or slightly widened.
4. Prothorax dorsally with marking at sub-apical part medially.
5. Elytra with extended apices, apex transverse straight.

List of the included species according to year of description, compiled with additional faunistic data:

1. *Pachyrhynchus pinorum* Pascoe, 1871

(Fig. 1.1., 6.1)

TL: Luzon, Benguet Subprovince, Baguio. Type in MTD.

Material examined (42 males, 13 females):

Philippines / Luzon, Nueva Vizcaya, Kayapa / VI. 2014 (1); VIII. 2014 (5); VI. 2015 (1); X. 2015 (1); XI. 2015 (2) // Philippines / Luzon, Nueva Vizcaya, Sta. Fe. / III. 2016 (1); III. 2018 (1) // Philippines / Luzon, Nueva Vizcaya, Dupax / VIII. 2013 (1); III. 2014 (1); V. 2014 (2); VI. 2014 (1) // Philippines / Luzon, Benguet, Tublay / XI. 2017 (17); XII. 2017 (3); I. 2018 (2) // Philippines / Luzon, Benguet, Atoc / VII. 2014 (1); VIII. 2014 (1) // Philippines / Luzon, Benguet, La Trinidad / XI. 2017 (5); XII. 2017 (1) // Philippines / Luzon, Ifugao, Banaue / VII. 2016 (1); VIII. 2016 (1) // Philippines / Luzon, Ifugao, Hungduan / X. 2017 (1); VII. 2018 (1) // Philippines / Luzon, Mt. Province, Barlig / XI. 2015 (7); XII. 2015 (1); I. 2016 (1). All by local collectors.

2. *Pachyrhynchus tristis* Heller, 1912

(Fig. 6.3)

TL: Luzon, Benguet Subprovince. Type in MTD.

3. *Pachyrhynchus lacunosus* Heller, 1912

(Fig. 2.1 – 4, 6.2)

TL: Luzon, Benguet Subprovince, Mount Pulogloko. Type in MTD.

Material examined (124 males, 19

females): Philippines / Luzon, Nueva Vizcaya, Ambaguio / VIII. 2013 (1); VIII. 2015 (1) // Philippines / Luzon, Nueva Vizcaya, Belance / IX. 2016 (1); X. 2016 (3); VIII. 2018 (1) // Philippines / Luzon, Nueva Vizcaya, Dupax Del Sur / X. 2012 (1); V. 2014 (1) // Philippines

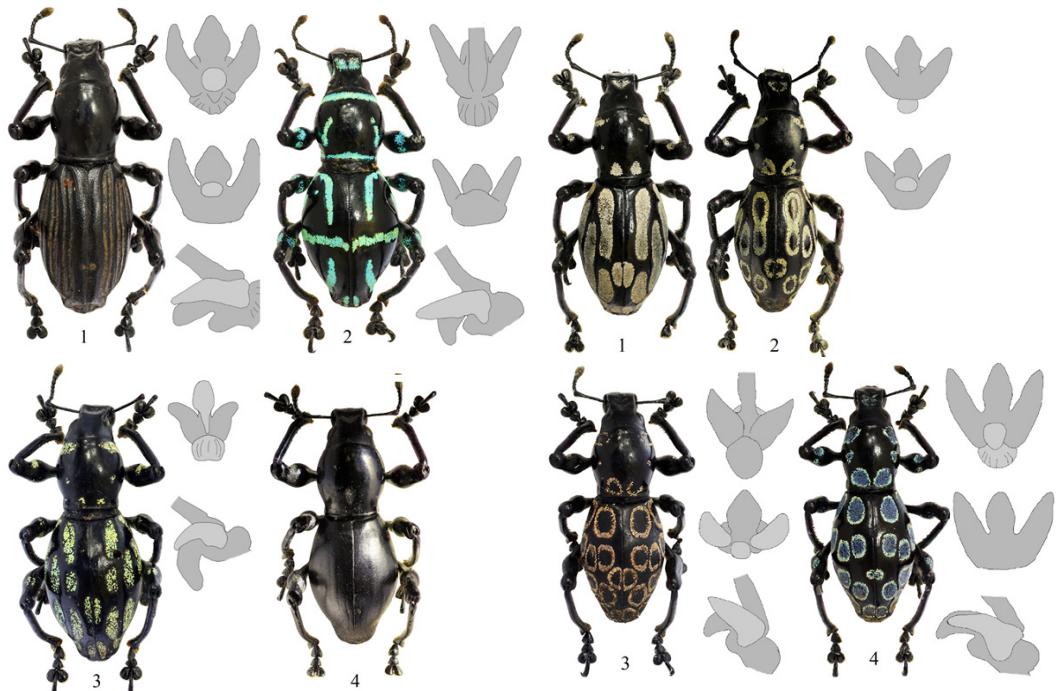


Fig. 1. Dorsal habitus with inflated base of endophallus of certain *Pachyrhynchus* species.
1 – *P. pinorum* Pascoe, 1871; 2 – *P. semperi* Heller, 1912; 3 – *P. loheri* Schultze, 1917; 4 – *P. sumptuosoides* Yoshitake, 2017.

Fig. 2. Different colour variants of *P. lacunosus* Heller, 1912.

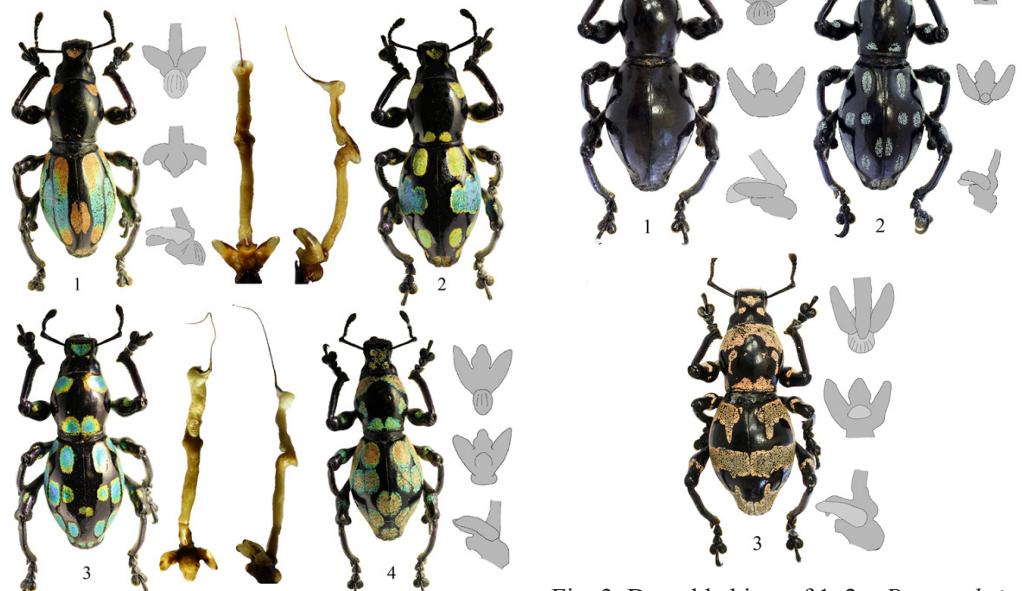


Fig. 4. Different colour variants of *P. barsevskisi* Rukmane, 2016.

Fig. 5. Dorsal habitus of 1, 2 – *P. consobrinus* Schultze, 1922; 3 – *P. septentrionalis* Yoshitake, 2017.

/ Luzon, Nueva Vizcaya, Kasibu / VII. 2013 (1); VIII. 2013 (2); III. 2014 (1); VI. 2014 (1); VII. 2014 (1) // Philippines / Luzon, Nueva Vizcaya, Kayapa / VII. 2013 (1); VIII. 2013 (1); IX. 2013 (1); III. 2014 (1); V. 2014 (2); VI. 2014 (2); VIII. 2014 (3); IX. 2014 (2); XI. 2014 (4); XII. 2014 (1); II. 2016 (4); VI. 2016 (1); VII. 2016 (1); VIII. 2016 (1); IX. 2016 (4); X. 2016 (6); IV. 2017 (1); VII. 2017 (1) // Philippines / Luzon, Nueva Vizcaya, Malico / VII. 2014 (1) // Philippines / Luzon, Nueva Vizcaya, Sta. Fe. / III. 2016 (1); VII. 2017 (1); III. 2018 (1) // Philippines / Luzon, Nueva Vizcaya, Quezon / X. 2018 (1); I. 2019 (1) // Philippines / Luzon, Nueva Vizcaya, Ifugao / X. 2013 (1) // Philippines / Luzon, Ifugao, Asipulo / VIII. 2017 (3); IX. 2017 (1); VIII. 2018 (9) // Philippines / Luzon, Ifugao, Banaue / VII. 2013 (1); VIII. 2013 (4); III. 2014 (3); V. 2014 (7); VI. 2014 (1); VII. 2014 (3); XI. 2014 (2); II. 2015 (4); V. 2015 (6); VI. 2015 (1); XI. 2015 (1); VII. 2016 (6); VIII. 2016 (3); IX. 2016 (3);

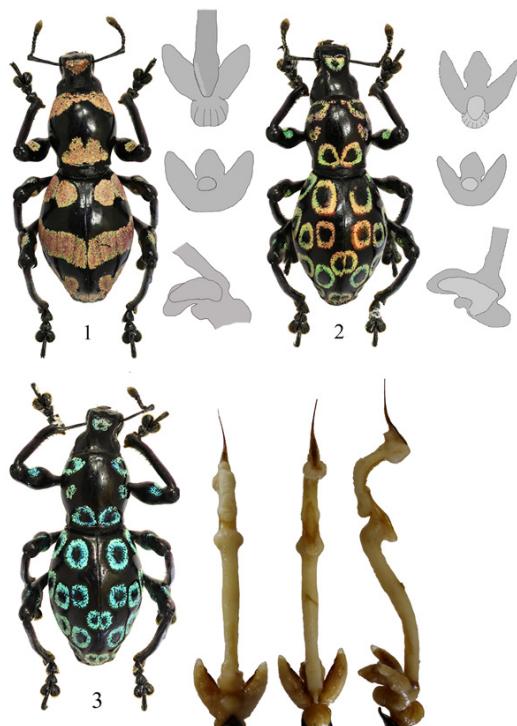


Fig. 5. Different colour variations of *P. niisatoi* Yoshitake, 2017.

XI. 2016 (6); I. 2017 (1) // Philippines / Luzon, Ifugao, Hungduan / X. 2017 (2); VII. 2018 (2) // Philippines / Luzon, Ifugao, Tinok / VIII. 2017 (5) // Philippines / Luzon, Isabela / V. 2014 (10). All by local collectors.

4. *Pachyrhynchus semperi* Heller, 1912

(Fig. 1.2.)

TL: Philippines, exact locality unknown. Type in MTD.

Material examined (17 males, 7 females):

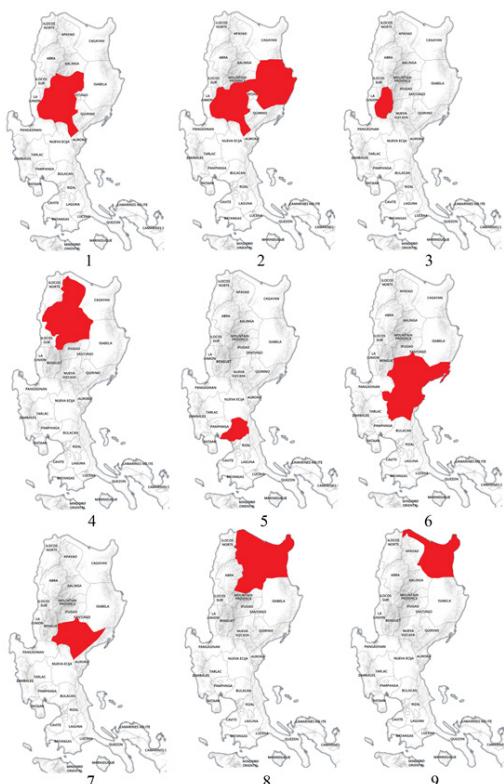


Fig. 6. Distribution of various *Pachyrhynchus* species. 1 – *P. pinorum* Pascoe, 1871; 2 – *P. lacunosus* Heller, 1912; 3 – *P. tristis* Heller, 1912; *P. dubiosus* Schultze, 1922; 4 – *P. consobrinus* Schultze, 1922; 5 – *P. loheri* Schultze, 1917; 6 – *P. barsevskisi* Rukmane, 2016; 7 – *P. niisatoi* Yoshitake, 2017; 8 – *P. sumptuosoides* Yoshitake, 2017; 9 – *P. callainimaculatus* Yoshitake, 2017; *P. septentrionalis* Yoshitake, 2017.

Philippines / Babuyan Island / III. 2014 (1); VII. 2014 (3); VIII. 2014 (2); XII. 2014 (2); IX. 2015 (1); XI. 2015 (4); VIII. 2016 (5); IX. 2016 (2); XI. 2016 (2); IV. 2017 (1); VIII. 2018 (1). All by local collectors.

5. *Pachyrhynchus loheri* Schultze, 1917
(Fig. 1.3; 6.5)

TL: Luzon, Bulacan Province, Mount Guinisan. Type in MTD.

6. *Pachyrhynchus dubiosus* Schultze, 1922
(Fig. 6.3)

TL: Luzon, Benguet Subprovince, Mount Santo Tomas. Type in MTD.

7. *Pachyrhynchus consobrinus* Schultze, 1922
(Fig. 4)

TL: Luzon, Bontoc Subprovince, Mount Polis. Type in MTD.

Material examined (36 males, 22 females):
Philippines / Luzon, Abra, Malibcong / IV. 2016 (3); IX. 2016 (2); V. 2017 (1) // Philippines / Luzon, Abra, Tineg / IX. 2017 (2); X. 2017 (7); XI. 2017 (3); VII. 2018 (9) // Philippines / Luzon, Apayao, Conner / IX. 2015 (1) // Philippines / Luzon, Kalinga, Pinukpuk / VI. 2014 (2); VII. 2014 (1); VI. 2015 (1); VII. 2016 (1); VIII. 2017 (2) // Philippines / Luzon, Mt. Province, Barlig / XI. 2014 (1); I. 2015 (1); XI. 2015 (10); XII. 2015 (1); I. 2016 (2); II. 2016 (2); IV. 2016 (1); VI. 2016 (1); VIII. 2016 (1); IV. 2017 (1); X. 2017 (1); IX. 2017 (2); XI. 2017 (1); XII. 2017 (1) // Philippines / Luzon, Mt. Province, Barlig, Bontoc / IV. 2017 (1). All by local collectors.

8. *Pachyrhynchus barsevskisi* Rukmane, 2016
(Fig. 4.1 – 4, 6.6)

TL: Luzon Isl., Aurora, Dingalan. Type in DUBC.

Material examined (79 males, 32 females):
Philippines / Luzon, Quirino / V. 2015 (1); IX. 2016 (1); VIII. 2018 (3) // Philippines / Luzon, Quirino, Madela / IX. 2015 (1); VII. 2016 (2); X. 2017 (1); XI. 2017 (2); IX. 2018 (1); X. 2018 (1); XI. 2018 (2); XII. 2018 (2) // Philippines / Luzon, Quirino, Madela, San Martin / VIII. 2019 (1) // Philippines / Luzon, Aurora, Dingalan / VIII. 2013 (2); III. 2014 (1); VI. 2015 (1); VIII. 2015 (1); XII. 2015 (2); III. 2016 (1); IV. 2016 (3); IV. 2017 (2); VIII. 2017 (6); IX. 2017 (1); X. 2017 (2); XI. 2017 (2); IV. 2018 (6); VI. 2018 (1); IX. 2018 (3); XI. 2018 (5); I. 2019 (1); II. 2019 (2); IV. 2019 (2) // Philippines / Luzon, Aurora, Ditumabao / VIII. 2017 (3); X. 2017 (1); XI. 2017 (1); I. 2018 (2); VI. 2019 (1) // Philippines / Luzon, Aurora, Casiguran / XI. 2018 (1) // Philippines / Luzon, Nueva Ecija, Caranglan / VIII. 2017 (4); IX. 2017 (11); X. 2017 (4); XI. 2017 (6); II. 2018 (1); III. 2018 (2); IX. 2018 (2) // Philippines / Luzon, Nueva Vizcaya, Alfonso Castaneda / VIII. 2017 (4) // Philippines / Nueva Vizcaya, Belance / VIII. 2015 (5). All by local collectors.

9. *Pachyrhynchus callainimaculatus* Yoshitake, 2017
(Fig. 6.9)

TL: Luzon, Cagayan, Sierra Madre. Type in NIAES.

10. *Pachyrhynchus niisatoi* Yoshitake, 2017
(Fig. 5.1 – 5.3, 6.7)

TL: Luzon, Quirino. Type in NIAES.

Material examined (30 males, 14 females):
Philippines / Luzon, Quirino, Madela / IX. 2015 (2); X. 2016 (1); IV. 2017 (1); X. 2017 (1); IV. 2019 (1) // Philippines / Luzon, Quirino, Nagtipunan / VIII. 2014 (1); I. 2017 (3); III. 2017 (2); IV. 2017 (4); V. 2017 (1); VI. 2017 (5); X. 2017 (1); II. 2018 (1); IX. 2019 (2). All collected by local collectors.

Philippines / Luzon, Nueva Vizcaya, Kayapa /

IX. 2013 (1); V. 2014 (3); VI. 2014 (1); V. 2015 (4); X. 2016 (2) // Philippines / Luzon, Nueva Vizcaya, Kasibu / X. 2012 (1); IX. 2013 (1); VII. 2014 (1); VIII. 2017 (1) // Philippines / Luzon, Nueva Vizcaya, Dupax Del Sur / VI. 2014 (1) // Philippines / Luzon, Isabela, Aurora / V. 2014 (2). All by local collectors.

11. *Pachyrhynchus septentrionalis* Yoshitake, 2017

(Fig. 3.3, 6.9)

TL: Luzon, Cagayan Valley. Type in NIAES.

Material examined (19 males, 7 females):

Philippines / Luzon, Cagayan / VII. 2015 (1); IX. 2015 (1); XI. 2015 (3); XII. 2015 (1); IV. 2018 (3); V. 2018 (1); VIII. 2018 (5); IX. 2018 (6); X. 2018 (1); XI. 2018 (2); VII. 2019 (2). All collected by local collectors.

12. *Pachyrhynchus sumptuosoides* Yoshitake, 2017

(Fig. 1.4, 6.8)

TL: Luzon, Cordillera Administrative Region. Type in KUM.

Material examined (2 males, 2 females):

Philippines / Luzon, Apayao, Conner / VII. 2016 (2) // Philippines / Luzon, Kalinga, Pinukpuk / IX. 2014 (1) // Philippines / Luzon, Cagayan, Santa Ana / XI. 2014 (1).

DISCUSSION

Twelve species within *Pachyrhynchus pinorum* Pascoe, 1871 species complex were observed. A total number of 465 specimens from DUBC were identified, collection comprises eight of twelve species, rest of the four species were analysed from Museum type material (*P. tristis*, *P. dubiosus*, *P. loheri*) or from bibliographic data (*P. callainimaculatus*). Faunistic data revealed, that some of the species are more widely distributed than recorded in original descriptions. Such are: *P. pinorum* Pascoe, 1871 and *P. lacunosus*

Heller, 1912 that originally was recorded only from Baguio (Benguet Province), but new faunistic data revealed, that *P. pinorum* is also present at nearly located Nueva Vizcaya, Ifugao and Mountain Provinces while *P. lacunosus* appear also from Nueva Vizcaya, Ifugao and Isabela Privences; *P. consobrinus* Schultze, 1922 originally from Bontoc (Mt. Province) is present also at northern Abra, Apayao and Kalinga provinces; *P. barsevskisi* Rukmane, 2016 originally from Aurora, is also present at Quirino, Nueva Vizcaya and Nueva Ecija provinces; *P. niisatoi* Yoshitake, 2017 additionally to Quirino is present also at Nueva Vizcaya; *P. sumptuosoides* Yoshitake, 2017 is present also at western Apayao and Kallinga Provinces. Descriptive faunistic data also show set of species present for a certain province. In this way, three species are present at Cagayan: *P. callainimaculatus*, *P. septentrionalis* and *P. sumptuosoides*; four species are present at Benguet: *P. pinorum*, *P. tristis*, *P. lacunosus* and *P. dubiosus*; four species are present at Nueva Vizcaya: *P. pinorum*, *P. lacunosus*, *P. barsevskisi* and *P. niisatoi*; two species are present at Quirino: *P. barsevskisi* and *P. niisatoi*. Data also showed, that some of the observed species are single to appear in certain province: *P. loheri* for Bulacan, *P. lacunosus* for Isabela, *P. consobrinus* for Abra, *P. barsevskisi* for Nueva Ecija. One species appears from Babuyan Island, part of the greater Luzon: *P. semperi* Heller, 1912, this species originally was described from a single specimen without exact locality. Original type is with markings of pinkish scale lines and tend to differ in colour from specimens available in DUBC, but morphological analyses revealed, that both specimens from MTD and DUBC don't show species significant differences.

Endophallus inflation method revealed, that shape is species specific and can help to define boundaries within closely related species, as well as complete understanding on species variations. Endophallus of *P. lacunosus* Heller, 1912 is with small, evenly rounded first ventral growth, second growth is big, narrowed to apex and slightly curved downwards, two lateral growths are rather big, narrowed to apex and curved downwards; endophallus of *P. consobrinus* Schultze, 1922 is

characterised by narrow, straight lateral growths, second ventral growth thick, very slightly curved downwards; same as *P. consobrinus*, endophallus of *P. septentrionalis* Yoshitake, 2017 is with narrow, but slightly curved downwards lateral growths, first ventral growth is not rounded, with two edges, while second ventral growth is narrow, straight to middle and strongly curved downwards to apex. Three colour variations of *P. barsevkisi* showed same shape as original colour variant, as well as method showed, that additionally to already known form with empty patches, *P. niisatoi* Yoshitake, 2017 also has form with mint blue empty patches. Endophallus of *P. semperi* and *P. loheri* both are characterised by very big, strongly curved downwards second ventral growth, but in *P. semperi* lateral growths are straight, but in *P. loheri* smaller, more narrow and curved.

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Yoshitake H., 2017. Six new taxa and a new synonym of the genus *Pachyrhynchus* GERMAR (Coleoptera, Curculionidae, Entiminae) from the Philippines. *Elytra*, 7(1): 247 – 263.

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Two new species of the genus *Pachyrhynchus* Germar, 1824 (Curculionidae: Entiminae: Pachyrhynchini) from the Luzon Island, Philippines

Anita Rukmane-Bārbale

Rukmane-Bārbale A. 2020. Two new species of the genus *Pachyrhynchus* Germar, 1824 (Curculionidae: Entiminae: Pachyrhynchini) from the Luzon Island, Philippines. *Baltic J. Coleopterol.*, 20(2): 179-184.

Two new species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Entiminae: Pachyrhynchini) from the Luzon Island (Philippines) are described and illustrated: *P. bollinoi* sp. nov. and *P. cinereomaculatus* sp. nov.. Photos of habitus for both sexes as well as eversion of endophallus is provided.

Key words: Coleoptera, Curculionidae, Pachyrhynchini, *Pachyrhynchus*, fauna, taxonomy, new species, Luzon, Philippines

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 (Entiminae: Pachyrhynchini) is widely studied in recent past (Yoshitake, 2012; Rukmane, 2019; Bollino *et. al.*, 2017, 2020) as a result more than 50 new taxa are described, new data on host plants as well as new distributional, ecologic and faunistic records are compiled.

To date, genus currently includes 160 species about 100 of which are distributed at Greater Luzon (Luzon, Catanduanes, Marinduque, Polillo, and several small islands). In the current study method of eversion of endophallus was used to compare several closely related species from central part of the Luzon Island. Study revealed, that two species differ from previously known, those species are described and illustrated herein.

MATERIAL AND METHODS

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

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. The maps of the Philippine archipelago have been drawn using ArcGis 10 software.

All measurements are in millimetres, abbreviations and measurement technology follow Bollino et. al. (2017).

Technology for eversion of endophallus follow Janovska et. al. (2013).

RESULTS

Pachyrhynchus bollinoi sp. nov.

Fig. 1A-B, 2A-E, 3A-C

Type material. Holotype: Male: "PHILIPPINES / Luzon, Mt. Province, Barlig / VII. 2018 / local collector leg." (white rectangular label); "HOLOTYPE / *Pachyrhynchus bollinoi* / Rukmane-Bārbale, 2020 / (red rectangular label).

Paratypes (16 males, 5 females): 1 male: "PHILIPPINES / N Luzon, Mt. Province, Barlig / IX. 2015 / local collector leg."; 1 male, 2 female, same label, but XI. 2015; 3 male, 1 female, same label, but VII. 2016; 3 male, same label, but IV. 2017; 1 male, same label, but VII. 2017; 1 male, same label, but X. 2017; 1 male, same label, but VII. 2018; 1 male: "PHILIPPINES / N Luzon, Nueva Vizcaya, Kayapa / XI. 2015 / local collector leg.; 1 male: "PHILIPPINES / N Luzon, Ifugao, Banaue / VI. 2016 / local collector leg.; 2 female, same label, but VII. 2016; 1 male, 1 female, same label, but IX. 2016; 1 male, same label, but X. 2017. All on white rectangular labels, with additional red label: "PARATYPE / *Pachyrhynchus bollinoi* / Rukmane-Bārbale, 2020/.

Distribution. Luzon Island.

Description. Male. Measurements (n=6): LB: 12.7-13.8 (holotype 12.7, mean 13.12); LR: 1.8-2 (holotype 1.9, mean 1.9); WR: 2-2.2 (holotype 2.1, mean 2.1); LP: 3.8-4.5 (holotype 4.4, mean 4.15); WP: 3.8-4.2 (holotype 4.2, mean 4.03); LE: 8.5-9 (holotype 8.5, mean 8.75); WE: 5.1-5.8 (holotype 5.3, mean 5.53).

Body black, surface strongly shiny, except underside with weaker luster. Body elongated, with

opaque blue markings of round to elliptic recumbent scales.

Head sparsely very minutely pubescent, without scally markings, minutely punctured; each side laterally covered with short blue to silver hair-like scales on genea and behind antennal scrobe, and covered with silver long hair-like scales before the scrobe. Forehead flattish, nearly three times as wide as eye width; eyes relatively small, slightly prominent from outline of the head; outline of each eye highest just in the middle. Rostrum slightly wider than long (WR/LR 1.1); dorsum with fine puncture, with deep sub-triangular impression on basal part, weakly bulging on apical part; dorsal contour of rostrum nearly straight in basal part, weakly increased to apical part. Antennae slender, mingled with long silver hairs on all antennomers and apical half of scrobe; antennomers I-II slightly longer than wide, longer than III-VII; III-VII subequal in length, nearly as long as wide; club sub-oval, nearly twice as long as wide.

Prothorax with the following six scally markings: 1) two spots on disc from behind the middle to apical ½ each redirected laterally; 2) one roundish spot at each latero-basal edge of disc; 3) broad lateroventral stripe on each side. Prothorax nearl same longht and width (LP/WP 1.03); dorsum minutely punctured; dorsal contour highest at the basal ½; sides gently raised from constricted base, widest at basal ½ then gently convergent apicad to apical ½, then slightly widened to apex; apical margin straight, basal margin curved.

Each elytron with the following ten scaly markings: 1) two big ovate patches on basal ½; 2) big ovate patch just before the middle, redirected laterally; 3) two small round patches on median part; 3) two sutural patches – one sub-medial, one near apex; 4) two big ovate patches on apical part; 5) subtriangular patch near apex redirected laterally. Elytra without pubescence in general, with short rare hairs along the apex. LE/WE 1.58, wider than prothorax (WE/WP 1.37), more than twice as long as prothorax (LE/LP 2.11), smooth, without puncture intervals; dorsum moderately con-

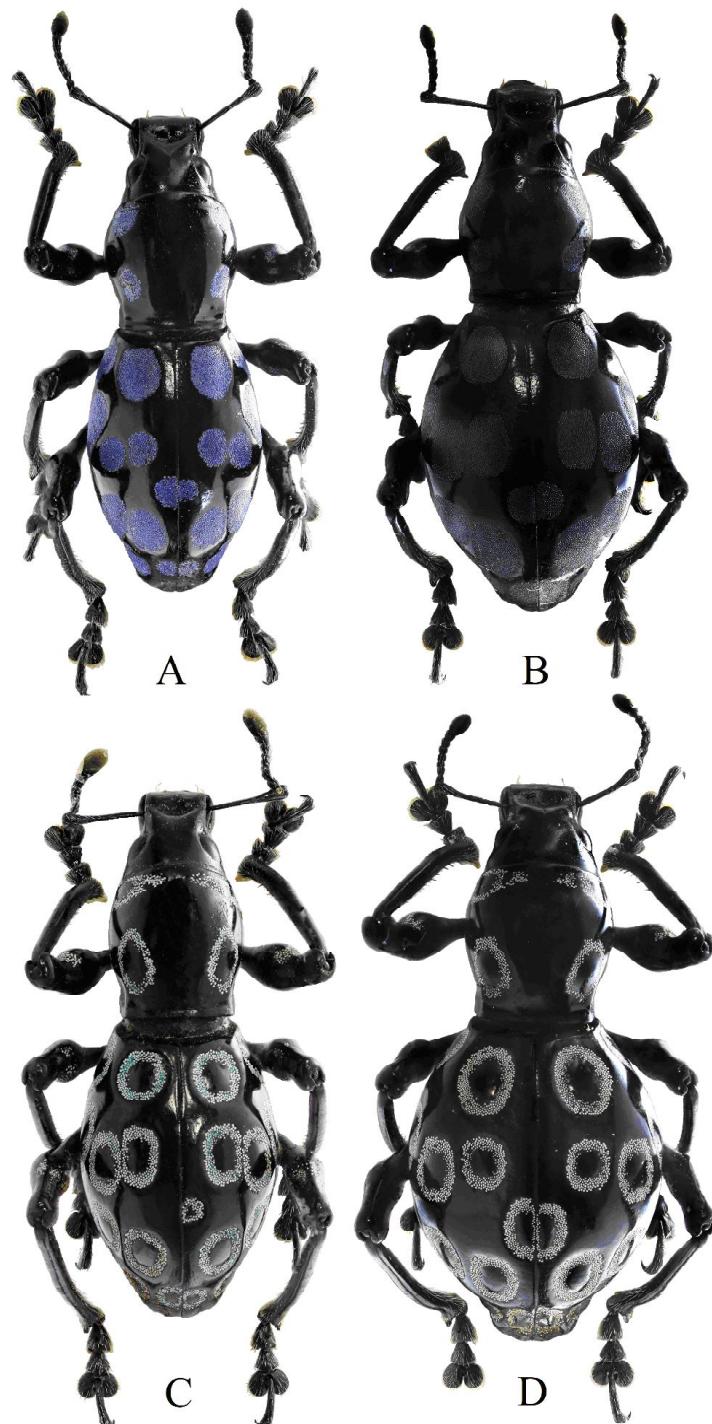


Fig. 1. Habitus of *P. bollinoi* sp. nov. (A – male, B – female); Habitus of *P. cinereomaculatus* sp. nov. (C – male, D – female)

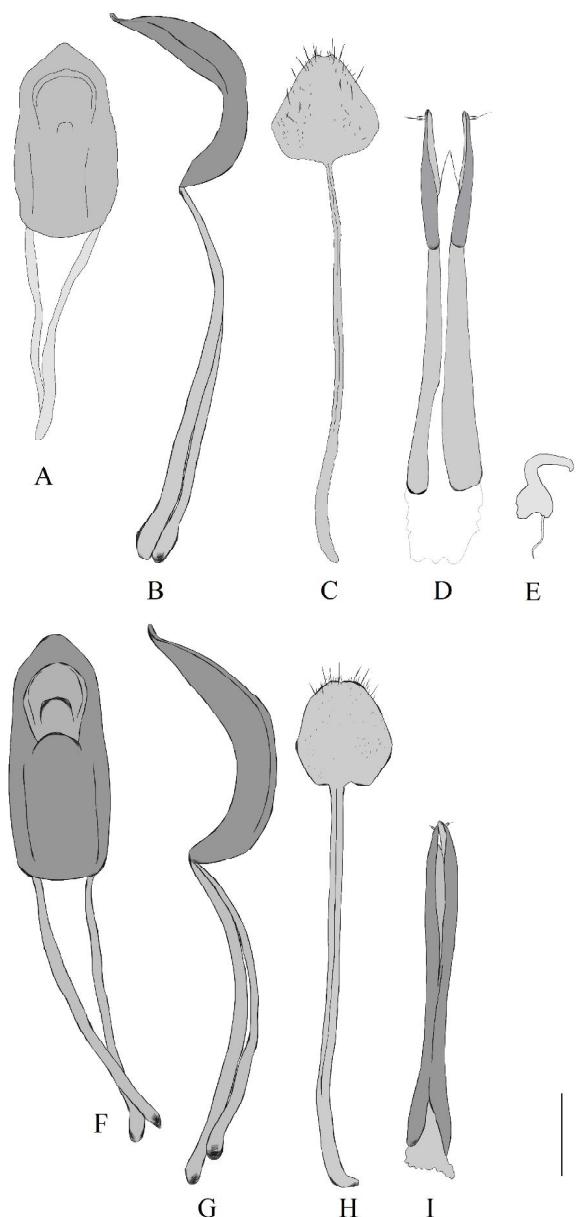


Fig. 2. A – E genitalia of *P. bollinoi* sp. nov.; A – aedeagus in ventral view; B – aedeagus in lateral view; C – sternite VIII; D – ovipositor; E – spermathecal; F – I genitalia of *P. cinereomaculatus* sp. nov.; F – aedeagus in ventral view; G – aedeagus in lateral view; H – sternite VIII; I – ovipositor

vex; dorsal contour highest at the middle; sides gradually raised from base, widest just in the middle, then narrowed to apical area and nearly straight to apex.

Hind femora with opaque blue roundish scale line along inner margin. Mid and fore femora with roundish patch of scales along apical impression. Tibiae with long hairs at base and internal margins, mingled with short hairs in all length.

Genitalia as illustrated (2A-E), endophallus as illustrated (3A-C).

Female. Measurements (n=5): LB: 14.9-16.1 (mean 15.58); LR: 2.1-2.3 (mean 2.2); WR: 2.2-2.4 (mean 2.3); LP: 4.3-4.8 (mean 4.48); WP: 4.4-4.9 (mean 4.66); LE: 10.5-11.5 (mean 11.02); WE: 7-7.9 (mean 7.42). Elytra more strongly convex dorsally, much wider than in males.

Differential analyses. *Pachyrhynchus bollinoi* sp. nov. from the first view might be confused with *Pachyrhynchus pinorum* species complex by elytral scally markings and shape of apiocal area, but judging by the shape of everted endophallus species are distinct: in lateral view first and second ventral growth as well as two lateral growths are much smaller in *P. bollinoi* sp. nov. (Fig. 3.1-3.2). Additionally, species within *Pachyrhynchus pinorum* species complex have markings at apical part of the disc medially, while *P. bollinoi* sp. nov. lack any scally markings on apical part of the disc, but have four scally spots on disc, two just after the middle each redirected laterally and one along each latero-basal part of the disc. This feature is common for two more species: *P. tetramaculatus* Rukmane, 2019 and *P. cinereomaculatus* sp. nov.. Together with different eltral ornamentation, *P. tetramaculatus* Rukmane, 2019 have narrower apiocal area in both sexes, as well as widened elytra along apical 1/3 to 1/2; on contrary elytra of *P. cinereomaculatus* sp. nov. is strongly widened along the middle, feature is more strongly expressed in females

(*P. bollinoi* sp. nov. LE/WE 1.49; *P. cinereomaculatus* sp. nov. LE/WE 1.27).

Etymology. The new species was dedicated to brilliant specialist in the field of entomology, person who was first to use eversion technology for the genus *Pachyrhynchus*, also to amazing colleague and friend Dr. Maurizio Bollino (Lecce, Italy), as an appreciation of his immeasurable contribution to study of the genus.

***Pachyrhynchus cinereomaculatus* sp. nov.**

Fig. 1C-D, 2F-I

Type material. Holotype: Male: "PHILIPPINES / N Luzon, Ifugao, Banaue / VIII. 2016 / local collector leg." (white rectangular label); "HOLOTYPE / *Pachyrhynchus cinereomaculatus* / Rukmane-Bārbale, 2020 / (red rectangular label).

Paratypes (2 females): 1 female: "PHILIPPINES, Luzon / Nueva Vizcaya, Kasibu / X. 2012 / local collector leg.>"; 1 female: "PHILIPPINES, Luzon / Aurora, V. 2014 / local collector leg." (both on

white rectangular labels). With additional red label: "PARATYPE / *Pachyrhynchus cinereomaculatus* / Rukmane-Bārbale, 2020 /

Distribution. Luzon Island.

Description. Male. Measurements (n=1): LB: 13.0; LR: 1.9; WR: 2.2; LP: 4.5; WP: 4.0; LE: 8.6; WE: 6.5.

Body black, shiny, with light grey to silver markings of round to elliptic recumbent scales.

Head nearly without pubescence, dorsally without markings. Forehead more than three times as wide as eye width; eyes small, nearly not prominent from outline of the head; outline of each eye highest just before the middle. Rostrum slightly wider than long (WR/LR 1.16); dorsum nearly without puncture, with sub-atriangular impression on basal half, apical half flattish; dorsal contour of rostrum nearly straight in basal half, slightly decreased to apical half. Antennae mingled with rare silver hairs; antennomer I longer than II, 2 times as long as wide; antennomer II 1.5 times as long as wide, longer than III-VII;

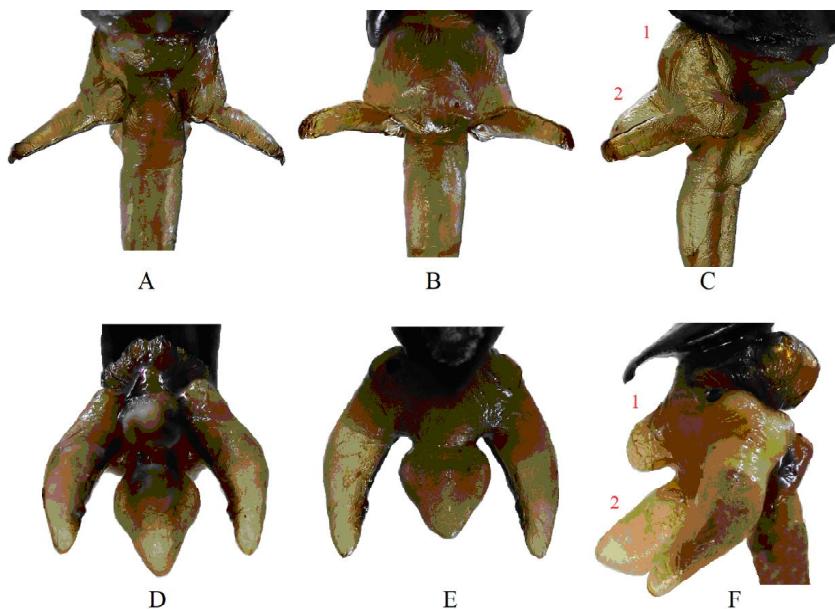


Fig. 3. A-C basal part of everted endophallus of *P. bollinoi* sp. nov.; 1 – 2 first two ventral growths; D – F basal part of everted endophallus of *P. pinorum* Pascoe, 1873

antennomeres III-VII subequal in length, slightly wider than long; club nearly 2.5 times as long as wide.

Prothorax with the following six scally markings: 1) two elongated empty spots on disc at median part, each redirected laterally; 2) one triangular empty spot at each latero-basal edge of disc; 3) broad lateroventral stripe on each side. LP/WP 1.13; dorsal contour highest just before the middle; sides minutely raised from constricted base, then widest just before the middle, then gently convergent apicad to apical 1/3, then slightly widened to apex.

Each elytron with the following empty scale patches: 1) two round patches on basal ½; 2) three ovate patches at median part, displayed in transverse row from just after the suture to lateral margin; 3) two round patches on apical part; 4) two sutural patches, one just after the middle, one just before the apex; 5) one more patch laterally near apex; All patches of proximately same size except smaller sutural patches. Elytra very smooth, without punctured intervals. LE/WE 1.32, wider than prothorax (WE/WP 1.63), LE/LP 1.91; dorsal contour highest at the middle; sides gradually raised from base, widest just in the middle, then narrowed to apical area and rounded to apex.

Genitalia as illustrated (2F-I).

Female. Measurements (n=2): LB: 15.2-15.7 (mean 15.45); LR: 2.1-2.3 (mean 2.2); WR: 2.2-2.3 (mean 2.25); LP: 4.5-4.7 (mean 4.6); WP: 4.6-4.8 (mean 4.7); LE: 11.5-11.9 (mean 11.7); WE: 9.1-9.3 (mean 9.2). Elytra very strongly convex in dorsal contour, otherwise essentially as in males.

Differential analyses. *P. cinereomaculatus* sp. nov. is similar to *P. bollinoi* sp. nov. (see differential analyses upwards) and *P. tetramaculatus* Rukmane, 2019. From both species *P. cinereomaculatus* sp. nov. is easily distinguishable by very wide elytra together with characteristic markings on both elytra and pronotum.

Etymology. Species name is Latinised adjective of grey circles on body.

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Updated Distribution Records of *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Entiminae) from the Philippines with Biogeographic Affinities

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Rukmane-Bārbale A., Cabras A. A. 2021. Updated Distribution Records of *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Entiminae) from the Philippines with Biogeographic Affinities. *Baltic J. Coleopterol.*, 21(2): 199 - 211.

A total number of 4245 specimens (2405 males and 1840 females) of the genus *Pachyrhynchus* Germar, 1824 from DUBC were examined. The current number includes 147 species and 21 subspecies out of known 171 species and 27 subspecies. Overall, 160 species and 27 subspecies are recorded from the Philippines (except Palawan and Sulu), 8 species from Taiwan, and 4 species from Indonesia. New distribution records are provided and geographical data were compared with extensive literature records, type species localities, and data from various museum collections, concluding a massive dataset of biogeographical affinities of the genus *Pachyrhynchus*.

Key words: *Pachyrhynchus*, biogeography, endemism, PAIC, conservation.

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INTRODUCTION

Pachyrhynchus Germar, 1824, a genus coveted by both entomologists and hobbyists for its bright iridescent elytral markings and coloration is a member of the tribe Pachyryynchini with a Philippine centered distribution. The tribe Pachyryynchini is one of the most conspicuous beetles in the world which belongs to the hyperdiverse family Curculionidae with approximately 51,000 species (Oberprieler et al. 2007).

The tribe currently has 17 genera with the latest addition of the genus *Enoplocyrtus* Yoshitake 2017 and *Trichomacrocyrtus* Yoshitake 2018 from Luzon Island (Yoshitake 2017; 2018). The unique geographic distribution of the *Pachyrhynchus* which is limited to the oceanic islands of the Philippines, Taiwan, Japan, and Moluccas is of great interest to biogeographers (Starr, Wang 1992). Owing to its fused elytra and lack of flight ability, long-distance dispersal of this genus is unlikely. However, recent collections reveal a much wider

distribution of this genus as additional materials were obtained.

The unique biogeographical origin of the Philippines together with its favorable habitats is one of the reasons for its very high level of endemism. The Philippines is considered as one of the 18 megadiverse countries in the world with one of the highest levels of endemism despite contributing only 0.2% of the world's land area. The more than 7,000 islands of the Philippines which are mostly oceanic contribute to 5% of the total biodiversity of the world. The islands which are now politically called Philippines are the result of a series of subduction and the movement of the Sunda, Sahul Shelf, and the Philippine plates, strike-slip fault formation, and a series of volcanic activities (Yumul 2009). The collision which resulted in subduction dating back to the Miocene period had led to the formation of various island arc systems in the country including that of the island fringes in Luzon which extends to Orchid and Green Island which now belongs to Taiwan and the Moluccas serving as a pathway for species exchange.

Since the country's islands are volcanic in origin except for the Palawan micro continental block which is believed to have drifted towards the Philippines with the birth of the West Philippine Sea, islands emerged at different times with several islands being considered as rather old such as Luzon and other islands are new such as Bicol, Camiguin and Sibuyan, and the Sulu islands which surfaced only much later (Telnov 2011; Heaney and Regalado 1998). The unique geologic activities starting from the Mesozoic and the recurring coalescence and fragmentation of several islands which gave rise to aggregate islands connected by land bridges in the last Pleistocene epoch explains the majority of the species distribution and demarcation in the country although some taxa do not follow the said Pleistocene Aggregate Island Complex model (PAIC) (Siler et al. 2010).

ir biogeographic affinities. Because the study of the genus *Pachyrhynchus* is still in the docu-

mentation phase, efforts for conservation priorities of this genus have been compromised. The present paper provides an updated distribution of species from the Philippines based on recent collections with inputs on biogeographic affinities of the species and its implication on conservation efforts for this taxon.

MATERIAL AND METHODS

The list and distribution of species are obtained by an extensive literature review (Schultze 1923, 1925, 1934; Yoshitake 2012; Bollino, Sandel 2015; Rukmane, Barsevskis 2016; Rukmane 2018) and examination of collection:

DUBC - Daugavpils University Beetle Collection (Daugavpils, Latvia) (Table 2).

Identification was conducted using a stereo microscope Zeiss Stemi 1000 and comparing morphological characters using the taxonomic keys and examining type materials in MTD (Dresden, Germany) and NHML (London, Great Britain).

Model for biogeographic distribution makes use of the Pleistocene Aggregate Island Complex (PAIC) wherein islands were grouped on the possible aggregation based on the last Pleistocene epoch. In the last Pleistocene epoch, islands separated by 120 meters deep were connected by land bridges which eventually disappeared as the water began to rise to its current state giving rise to separate islands. However, faunal exchanges were evident that certain groups of islands share similar species of flora and fauna. The following four large PAICs namely Greater Luzon (Luzon, Polillo, Catanduanes, Marinduque, and adjacent small islands), Greater Mindanao (Mindanao, Samar, Leyte, Bohol, Maripipi, Biliran, Dinagat, Siargao, Basilan, and adjacent small islands), Greater Negros-Panay (Panay, Guimaras, Negros, Cebu, Masbate, and adjacent small islands) and Greater Palawan (Palawan, Busuanga, Calamian, Culion, Balabac, and adjacent small islands) are consistently recognized as faunal demarcation in the country. Luzon is further divided in administrative regions: Cordillera Administrative Re-

gion (Abra, Apayao, Benguet, Ifugao, Kalinga, Mt. Province), Ilocos Region (Ilocos Norte, Olocos Sur, La Union, Pangasinan), Cagayan Valley (Bataanes, Cagayan, Isabela, Nueva Vizcaya, Quirino), Central Luzon (Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, Tarlac, Zambales), Calabarzon (Batangas, Cavite, Laguna, Quezon, Rizal), Bicol Region (Albay, Camarines Norte, Camarines Sur, Catanduanes, Masbate, Sorsogon); Marinduque Island; Mindoro Island; Panay Island; Sibuyan Island; Visayas: Western Visayas (Aklan, Antique, Capiz, Guimaras, Iloilo, Negros Occidental), Central Visayas (Biliran, Eastern Samar, Leyte, Northern Samar, Samar, Northern Leyte); Libucan Island; Cebu Island; Bohol Island; Mindanao: Zamboanga Peninsula (Zamboanga del Norte, Zamboanga del Sur, Zamboanga Sibugay), Northern Mindanao (Bukidnon, Camiguin, Lanao del Norte, Misamis Occidental, Misamis Oriental), Davao Region (Davao de Oro, Davao del Norte, Davao del Sur, Davao Occidental, Davao Oriental), Soccskargen (Cotabato, Sarangani, South Cotabato, Sultan Kudrat), Caraga Region (Agusan del Norte, Agusan del Sur, Dinagat Islands, Surigao del Norte, Surigao del Sur), Bangsamoro (Basilan, Lanao del Sur, Maguindanao, Sulu, Tawi-Tawi). Additionally for biogeographical analyses are added Taiwan, Japan, Indonesia.

RESULTS

Distribution of *Pachyrhynchus* in the Philippines

In the monograph of Schultze (1923), he has listed 85 species and 13 subspecies. In the succeeding years until his last publication in 1934, he described numerous more species of *Pachyrhynchus* such as *P. davaoensis* and *P. reichertii* among others. Since Schultze's last publication, the study on this genus remained dormant for nearly a century until recent discoveries of Yoshitake, Bollino, Sandel, Rukmane, Barševskis, Cabras, Medina described a significant number of new species and subspecies. An

increase in the number of species was obtained for less explored islands such as Samar, Leyte, and Mindanao. A significant increase in the number of species was recorded for Mindanao which has an increase of 14 to 50 species as more species were described from Mt. Apo Natural Park and Bukidnon highlands and new distributional records emerged. Schultze considers Mt. Apo Natural Park and Bukidnon as the center of diversity of this genus in Mindanao. A fair number of species was added to the data of Luzon whose number of species rose from 55 to 79. Still, the island with the most number of species in the country is Luzon followed by Mindanao, Samar, and Leyte (Fig. 1).

From 85 species, the number of *Pachyrhynchus* species now in the Philippines is 160 and more species will probably be added in the succeeding years although more studies should be conducted in species delineation as there are intraspecific variations among the population. Of the 160 species, 79 or 46% are from Luzon, 50 or 29% are from Mindanao while the rest are from other major islands such as Samar and Visayas with 19 species (11%), Mindoro with 9 species (5%), and 8 species (5%) from Panay and Lubang. A significant rise in the number of species was recorded from Mindanao (14 to 50) with the recent discovery of several species from Mt. Apo Natural Park and Bukidnon highlands. The biogeographic distribution of the genus is clearly oceanic in origin which explains why islands like Palawan and Sulu are devoid of representative species. There are no representative species from Palawan whose flora and fauna are more similar to mainland China than the Philippines and Sulu PAIC which also have unique species from mainland Mindanao. The absence of representative species in Palawan PAIC and Sulu PAIC is not astonishing since *Pachyrhynchus* has no population in Borneo or mainland Asia and seems to have a purely oceanic distribution. The Pleistocene Aggregate Island Complex (PAIC) is also evident in the distribution of many species in this taxon. The restricted distribution of this group can be attributed to its fused elytra making them flightless, their specific habitat prefer-

ence in forested mountain ecosystems, or mountain ridges giving them a high level of endemicity. All the Philippine species of *Pachyrhynchus* are endemic with some species showing a much-restricted distribution to a single island or locality.

In the monograph of Schultze, out of the 85 species, 80 or 94% are exclusive to a single island whereas only five namely *P. erichsoni*, *P. moniliferus*, *P. signatus*, *P. speciosus*, and *P. venustus* are widely distributed. An updated distributional record shows that 13 species have a wider distribution and are not restricted to a single island. Of the 13 species, three have a Philippine-wide distribution: *P. moniliferus* from Luzon PAIC (Islands of Cagayan Valley), Mindoro and Samar; *P. multipunctatus* from Luzon and its subspecies from Samar; *P. erichsoni* from various islands of the Philippines. The rest are restricted within the PAIC regions such as Greater Mindanao (*P. speciosus*, *P. regius*, *P. venustus*, *P. signatus*) and Greater Luzon (*P. orbifer*, *P. phaleratus*, *P. decussatus*, *P. apicatus*, *P.*

moellendorfi, *P. rukmaneae*). The rest of the 147 species has a restricted distribution to a single island. The species with Philippine wide distribution is astonishing since long-distance dispersal of this group seems impossible with their flightless ability and restriction to mountain ecosystems. These species should be further studied with molecular data in order to know if the species from the various islands are conspecific. Species with Philippine wide distribution may have possibly originated at a much older time scale in the Miocene-Pliocene epoch and have dispersed through vicariance and diversified to islands as far as the Ryukyu and Mollucas. A further phylogenetic analysis would confirm this. It is also possible that these species may have crossed short-distance oceanic barriers during the Miocene-Pliocene epoch and have drifted to nearby islands together with some plants as Schultze (1923) mentioned that these beetles can survive floating in water for a longer period of time. Su et al. (2014) also mentioned the drifting of host plants as one of the possible mechanisms of cross-island dispersal to facilitate passive

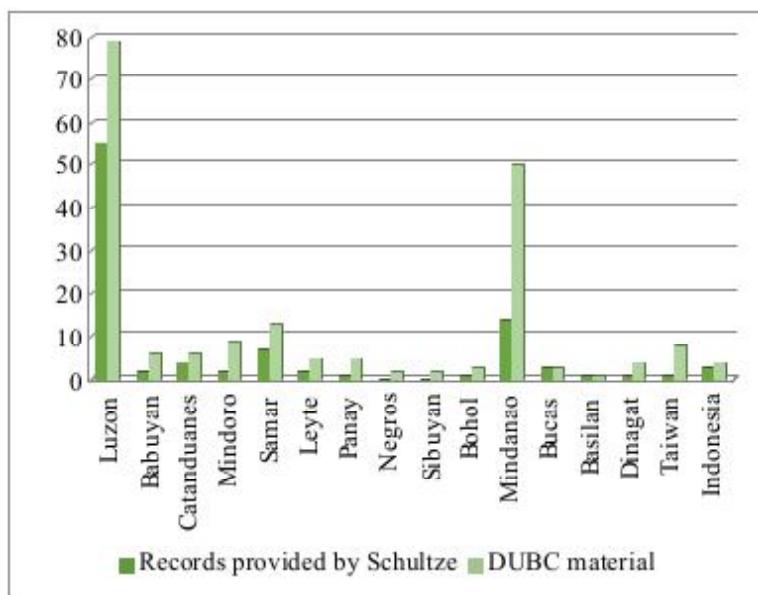


Fig. 1. Comparison of species richness by largest Philippine Islands

Table 1. Comparison of species richness by largest Philippine Islands

Greater Luzon PAIC	Cordillera	<i>P. orbifer</i> ; <i>P. orbifer</i> ssp. <i>gemma</i> s; <i>P. orbifer</i> ssp. <i>azureus</i> ; <i>P. orbifer</i> ssp. <i>murinus</i> ; <i>P. moniliferus</i> ssp. <i>stellulifer</i> ; <i>P. zebra</i> ; <i>P. sellio</i> ; <i>P. rugicollis</i> ; <i>P. sphaericollaris</i> ; <i>P. reticulatus</i> ; <i>P. cruciatus</i> ; <i>P. annelifer</i> ; <i>P. annulatus</i> ; <i>P. schultzei</i> ; <i>P. erosus</i> ; <i>P. congestus</i> ; ssp. <i>caerulans</i> ; ssp. <i>pavonius</i> ; ssp. <i>ocellatus</i> ; ssp. <i>mirabilis</i> ; <i>P. morio</i> ; <i>P. taylori</i> ; ssp. <i>metalescens</i> ; <i>P. sanchezi</i> ; <i>P. benguetanus</i> ; <i>P. sumptuosus</i> ; <i>P. pulchellus</i> ; <i>P. inclytus</i> ; <i>P. igorota</i> ; <i>P. glorirosus</i> ; ssp. <i>abbreviatus</i> ; <i>P. nobilis</i> ; <i>P. pinorum</i> ; ssp. <i>transversalis</i> ; <i>P. tristis</i> ; <i>P. lacunosus</i> ; <i>P. dubiosus</i> ; <i>P. consobrinus</i> ; <i>P. argus</i> ; <i>P. ochroplagiatus</i> ; <i>P. perpulcher</i> ; <i>P. digestus</i> ; <i>P. cagayanus</i> ; <i>P. equester</i> ; <i>P. bollinoi</i> ; <i>P. cinereomaculatus</i> ; <i>P. sumptuosoides</i> ; <i>P. atronitens</i> ; <i>P. abranus</i>
	Ilocos	<i>P. orbifer</i> ; <i>P. orbifer</i> ssp. <i>gemma</i> s; <i>P. orbifer</i> ssp. <i>murinus</i> ; <i>P. congestus</i> ssp. <i>aedamlayroni</i> ; <i>P. chlorites</i> ; <i>P. sumptuosus</i> ; <i>P. perpulcher</i> ; <i>P. barsevskisi</i> ; <i>P. kirklayroni</i> ; <i>P. florulentus</i>
	Cagayan Valley	<i>P. orbifer</i> ; <i>P. orbifer</i> ssp. <i>gemma</i> s; <i>P. orbifer</i> ssp. <i>azureus</i> ; <i>P. orbifer</i> ssp. <i>murinus</i> ; <i>P. orbifer</i> ssp. <i>striatomaculatus</i> ; <i>P. orbifer</i> ssp. <i>callainus</i> ; <i>P. moniliferus</i> ; <i>P. moniliferus</i> ssp. <i>stellulifer</i> ; <i>P. moniliferus</i> ssp. <i>babuyanensis</i> ; <i>P. phaleratus</i> ; <i>P. sellio</i> ; <i>P. rugicollis</i> ; <i>P. sphaericollaris</i> ; <i>P. erichsoni</i> ssp. <i>eschscholtzii</i> ; <i>P. multipunctatus</i> ; <i>P. annelifer</i> ; <i>P. schultzei</i> ; <i>P. baluganus</i> ; <i>P. congestus</i> ; ssp. <i>caerulans</i> ; ssp. <i>pavonius</i> ; ssp. <i>mirabilis</i> ; <i>P. viridans</i> ; <i>P. chlorites</i> ; <i>P. gemmatus</i> ; ssp. <i>purpureus</i> ; <i>P. taylori</i> ; <i>P. sanchezi</i> ; <i>P. sarcitis</i> ; <i>P. dohrni</i> ; <i>P. eques</i> ; <i>P. sumptuosus</i> ; <i>P. pulchellus</i> ; <i>P. inclytus</i> ; <i>P. igorota</i> ; <i>P. semperi</i> ; <i>P. glorirosus</i> ; <i>P. nobilis</i> ; <i>P. pinorum</i> ; ssp. <i>transversallis</i> ; <i>P. lacunosus</i> ; <i>P. ochroplagiatus</i> ; <i>P. perpulcher</i> ; <i>P. rizali</i> ; <i>P. digestus</i> ; <i>P. cagayanus</i> ; <i>P. barsevskisi</i> ; <i>P. rebus</i> ; <i>P. sagittatus</i> ; <i>P. tetramaculatus</i> ; <i>P. disargus</i> ; <i>P. bollinoi</i> ; <i>P. cinnereomaculatus</i> ; <i>P. callainimaculatus</i> ; <i>P. sumptuosoides</i> ; <i>P. florulentus</i> ; <i>P. niisatoi</i> ; <i>P. septentrionalis</i> ; <i>P. abranus</i>
	Central Luzon	<i>P. orbifer</i> ; <i>P. moniliferus</i> ; <i>P. zebra</i> ; <i>P. phaleratus</i> ; <i>P. phaleratus</i> ssp. <i>dannylayroni</i> ; <i>P. sellio</i> ; <i>P. rugicollis</i> ; <i>P. reticulatus</i> ; <i>P. cruciatus</i> ; <i>P. erichsoni</i> ssp. <i>eschscholtzii</i> ; <i>P. apicatus</i> ; <i>P. congestus</i> ssp. <i>pavonius</i> ; ssp. <i>mirabilis</i> ; <i>P. chlorites</i> ; <i>P. gemmatus</i> ; <i>P. sanchezi</i> ; <i>P. dohrni</i> ; <i>P. psittacus</i> ; <i>P. psittacinus</i> ; <i>P. glorirosus</i> ; <i>P. ochroplagiatus</i> ; <i>P. cagayanus</i> ; <i>P. barsevskisi</i> ; <i>P. cinereomaculatus</i> ; <i>P. yuukae</i> ; <i>P. caeruleus</i> ; <i>P. septentrionalis</i>
	Calabarzon	<i>P. orbifer</i> ; <i>P. moniliferus</i> ; ssp. <i>chevrolati</i> ; ssp. <i>stellulifer</i> ; <i>P. zebra</i> ; <i>P. sellio</i> ; <i>P. reticulatus</i> ; <i>P. cruciatus</i> ; <i>P. erichsoni</i> ssp. <i>eschscholtzii</i> ; <i>P. confusus</i> ; <i>P. rufopunctatus</i> ; <i>P. apicatus</i> ; <i>P. pseudoproteus</i> ; <i>P. baluganus</i> ; <i>P. lorquini</i> ; <i>P. psittacus</i> ; <i>P. glorirosus</i> ; <i>P. rizali</i> ; <i>P. masatoshii</i> ; <i>P. rochaorum</i> ; <i>P. niisatoi</i> ; <i>P. yukae</i>
	Bicol	<i>P. moniliferus</i> ; <i>P. moniliferus</i> ssp. <i>chevrolati</i> ; <i>P. phaleratus</i> ; <i>P. decussatus</i> ; <i>P. decussatus</i> ssp. <i>catanduanensis</i> ; <i>P. rugicollis</i> ; <i>P. reticulatus</i> ; <i>P. circulatus</i> ; <i>P. erichsoni</i> ssp. <i>eschscholtzii</i> ; <i>P. septentrionalis</i>
	Marinduque	<i>P. moniliferus</i> ; <i>P. phaleratus</i> ssp. <i>badiovittatus</i> ; <i>P. erichsoni</i> ssp. <i>eschscholtzii</i> ; <i>P. moellendorffii</i> ssp. <i>marinduquamus</i> ; <i>P. marinduquensis</i> ; <i>P. rukmaneae</i> ; <i>P. rukmaneae</i> ssp. <i>paucisignatus</i>
Mindoro PAIC		<i>P. moniliferus</i> ssp. <i>stellulifer</i> ; <i>P. halconensis</i> ; <i>P. rufopunctatus</i> ; <i>P. apicatus</i> ; <i>P. galeraensis</i> ; <i>P. pseudhalconensis</i> ; <i>P. domino</i> ; <i>P. valainisi</i> ; <i>P. mindoroensis</i>
Lubang		<i>P. mohagani</i> ; <i>P. tilikinesis</i> ; <i>P. lubanganus</i>
Romblon Island Group- Sibuyan		<i>P. noeli</i> ; <i>P. naokae</i>
Negros-Panay PAIC	Negros	<i>P. negrosensis</i>
	Panay	<i>P. moniliferus</i> ssp. <i>chevrolati</i> ; ssp. <i>herbidus</i> ; <i>P. jugifer</i> ; <i>P. moellendorffii</i> ; <i>P. felipeae</i> ; <i>P. franciscoi</i> ; <i>P. layroni</i>
	Cebu	<i>P. multipunctatus</i> ssp. <i>endoi</i>

Table 1. Continuation

Greater Mindanao PAIC	Samar	<i>P. libucanus</i> ; <i>P. speciosus</i> ; <i>P. regius</i> ; <i>P. samarensis</i> ; <i>P. latifasciatus</i> ; <i>P. erichsoni</i> ; <i>P. bucasanus</i> ssp. <i>ornatus</i> ; <i>P. venustus</i> ; <i>P. smaragdinus</i> ; <i>P. elegans</i> ; <i>P. shavrini</i> ; <i>P. ilgas</i> ; <i>P. conformis</i> ; <i>P. sakaii</i> ; <i>P. moniliferus</i> ; <i>P. speciosus</i> ; <i>P. regius</i> ; <i>P. schoenherri</i> ; <i>P. erichsoni</i> ; <i>P. speciosus</i> ; <i>P. multipunctatus</i> ; <i>P. yoshitakeorum</i>
	Leyte	<i>P. speciosus</i> ; <i>P. regius</i> ; <i>P. schoenherri</i> ; <i>P. erichsoni</i>
	Bohol	<i>P. speciosus</i> ; <i>P. multipunctatus</i> ; <i>P. yoshitakeorum</i>
	Zamboanga Peninsula	<i>P. atrocyaneus</i> ; <i>P. zamboanganus</i> ; <i>P. torresi</i> ; <i>P. imitans</i> ; <i>Pachyrhynchus yoshitakei</i>
	Northern Mindanao	<i>P. speciosus</i> ; <i>P. regius</i> ; <i>P. postpubescens</i> ; <i>P. erichsoni</i> ; <i>P. apocyrtoides</i> ; <i>P. sulphureomaculatus</i> ; <i>P. smaragdinus</i> ; <i>P. ardentius</i> ; <i>P. corpulentus</i> ; <i>P. amabilis</i> ; <i>P. chamissoi</i> ; <i>P. davaoenensis</i> ; <i>P. tadauchii</i> ; <i>P. hirokii</i> ; <i>P. naokii</i> ; <i>P. pseudamabilis</i> ; <i>P. subamabilis</i> ; <i>P. tikoi</i> ; <i>P. cabrasae</i> ; <i>P. nitcisi</i> ; <i>P. anichtchenkoi</i> ; <i>P. orientalis</i> ; <i>P. neoabsurdus</i> ; <i>P. banglas</i> ; <i>P. esperanza</i> ; <i>P. sergejevae</i> ; <i>P. ottomerkli</i> ; <i>P. circulimaculatus</i> ; <i>P. octoannulatus</i> ; <i>P. reichertii</i>
	Davao	<i>P. speciosus</i> ; <i>P. erichsoni</i> ; <i>P. signaticollis</i> ; <i>P. apocyrtoides</i> ; <i>P. ardentius</i> ; <i>P. amabilis</i> ; <i>P. davaoenensis</i> ; <i>P. tadauchii</i> ; <i>P. hirokii</i> ; <i>P. pseudamabilis</i> ; <i>P. apoensis</i> ; <i>P. kraslavae</i> ; <i>P. cabrasae</i> ; <i>P. anichtchenkoi</i> ; <i>P. miltoni</i> ; <i>P. occidentalis</i> ; <i>P. notocruciatus</i> ; <i>P. reichertii</i>
	Soccskargen	<i>P. speciosus</i> ; <i>P. apocyrtoides</i> ; <i>P. semiignitus</i> ; <i>P. venustus</i> ; <i>P. sulphureomaculatus</i> ; <i>P. ardentius</i> ; <i>P. amabilis</i> ; <i>P. davaoenensis</i> ; <i>P. tadauchii</i> ; <i>P. hirokii</i> ; <i>P. naokii</i> ; <i>P. pseudamabilis</i> ; <i>P. subamabilis</i> ; <i>P. caeruleovittatus</i> ; <i>P. apoensis</i> ; <i>P. tikoi</i> ; <i>P. nitcisi</i> ; <i>P. antonkozlovi</i> ; <i>P. anichtchenkoi</i> ; <i>P. occidentalis</i> ; <i>P. notocruciatus</i> ; <i>P. octoannulatus</i> ; <i>P. reichertii</i>
	Caraga	<i>P. speciosus</i> ; <i>P. regius</i> ; <i>P. erichsoni</i> ; <i>P. signatus</i> ; <i>P. bucasanus</i> ; <i>P. signaticollis</i> ; <i>P. apocyrtoides</i> ; <i>P. venustus</i> ; ssp. <i>insulanus</i> ; <i>P. sulphureomaculatus</i> ; <i>P. ardentius</i> ; <i>P. davaoenensis</i> ; <i>P. tadauchii</i> ; <i>P. pseudamabilis</i> ; <i>P. kraslavae</i> ; <i>P. cabrasae</i> ; <i>P. nitcisi</i> ; <i>P. antonkozlovi</i> ; <i>P. anichtchenkoi</i> ; <i>P. orientalis</i> ; <i>P. esperanza</i> ; <i>P. riculimaculatus</i> ; <i>P. yoshitakeorum</i>
	Bangsamoro	<i>P. infernalis</i> ; <i>P. hirokii</i> ; <i>P. naokii</i> ; <i>P. subamabilis</i> ; <i>P. basilanus</i> ; <i>P. sphemonorphoides</i>

transport of eggs, larvae, and adults in the case of Philippine planthoppers. Furthermore, some species may have been transferred from one place to another through the cultivation of plants as observed in the genus *Metapocyrtus*.

Based on the selected division in administrative regions, some of the species seems to appear in more than one region (Table 1). While regions like Zamboanga Peninsula and Bangsamoro remain rather isolated with individual, unique species, in Caraga, Soccskargen, Davao, and Northern Mindanao species flow are possible and part of the species overlap. For example, *P. anichtchenkoi* is present at all four regions of Mindanao with exception of Zamboanga and Bangsamoro. Overall Zamboanga Peninsula is represented by three species, Northern Mindanao by 30 species, Davao by 18 species,

Soccskargen by 23 species, Caraga by 22 species and Bangsamoro by six species making Northern Mindanao species richest region. In Luzon situation is similar as part of the species are present at more than one region. Conditionally those regions in most cases are connected by land borders allowing species to spread and exchange. Species richest region of the Greater is Cagayan Valley with 47 species, followed by Cordillera with 39 species, Central Luzon with 25 species, Calabarzon with 20 species, Ilocos and Bicol with 8 species each and Marinduque with 6 species.

Table 2. DUBC material of *Pachyrhynchus* representing species presence at various localities (Individuals examined: m - male, f - female)

Species	Individuals examined	Localities
<i>P. abranus</i> Heller, 1912	1m, 1f	Nueva Vizcaya, Abra
<i>P. amabilis</i> Schultze, 1922	65m, 36f	Bukidnon, Davao, Lanao, Mt. Kalatungan, Intavas, Alamada, Cotabato, Mt. Apo
<i>P. anitchtchenkoi</i> Rukmane & Barševskis, 2016	42m, 18f	Lanao, Agusan, Compostela, Sarrangani, Bukidnon
<i>P. annelifer</i> Heller, 1912	9m, 4f	Ifugao, Compostela, Benguet, Nueva Vizcaya
<i>P. antonkozlovi</i> Rukmane & Barševskis, 2016	6m, 7f	Cotabato, Surigao, Sarrangani
<i>P. apicatus</i> Schultze, 1922	6m, 12f	Aurora, Mt. Halcon
<i>P. apocyrtoides</i> Schultze, 1922	5m, 7f	Surigao, Agusan, Cotabato, Davao
<i>P. apoensis</i> Yoshitake, 2012	37m, 31f	Cotabato, Bukidnon, Davao, Sarrangani
<i>P. ardentius</i> Schultze, 1919	6m, 7f	Bukidnon, Davao, Sarrngani
<i>P. atronites</i> Yoshitake, 2019	5m, 6f	Kallinga, Abra
<i>P. atrocyaneus</i> Schultze, 1922	8m, 9f	Zamboanga
<i>P. banglas</i> Bollino, Sandel & Rukmane, 2017	11m, 6f	Cabanglasan, Bukidnon
<i>P. barsevskisi</i> Rukmane, 2016	77m, 29f	Aurora, Quirino, Dingalan, Madela, Nueva Ecija, Ilocos
<i>P. baluganus</i> Schultze, 1924	3m, 3f	Quirino, Nagtipunan, Tapsoy
<i>P. benguetanus</i> Schultze, 1923	1f	Ifugao
<i>P. bollinoi</i> Rukmane-Bärbale, 2020	16m, 7f	Ifugao, Nueva Vizcaya, Mt. Province, Barlig
<i>P. cabrasae</i> Rukmane & Barševskis, 2016	19m, 31f	Bukidnon, Agusan, Davao
<i>P. cagayanus</i> Heller, 1929	14m, 17f	Cagayan, Kallinga, Quirino, Isabela, Dingalan
<i>P. caeruleovittatus</i> Yoshitake, 2012	4m, 6f	Sarrangani, Cotabato
<i>P. chlorites</i> Chevrolat, 1881	23m, 17f	Quirino, Calayan, Babuyan, Banaue, Ilocos, Nueva Vizcaya, Cagayan, Aurora, Isabela
<i>P. cinereumaculatus</i> Rukmane-Bärbale, 2020	1m, 2f	Ifugao, Nueva Vizcaya, Aurora
<i>P. circulatus</i> Heller, 1912	2m, 3f	Catanduanes, Pandan
<i>P. circulimaculatus</i> Yoshitake, 2019	4m, 1f	Agusan, Rosario
<i>P. conformis</i> Yoshitake, 2017	4m, 2f	Hinabangan, Samar
<i>P. congestus</i> Pascoe, 1871	97m, 57f	Aurora, Benguet, Nueva Vizcaya, Kasibu, Ifugao, Mt. Province, Bontoc, Cadaclan, Quirino, Kallinga
<i>P. consobrinus</i> Schultze, 1922	35m, 12f	Mt. Province, Tineg (Abra)
<i>P. corpulentus</i> Schultze, 1922	16m, 16f	Bukidnon, Cabanglasan, Intavas
<i>P. cruciatus</i> Schultze, 1923	24m, 42f	Aurora, Abra, Banaue
<i>P. cumingi</i> Waterhouse, 1841	1m, 1f	Bohol Island
<i>P. davaoenensis</i> Schultze, 1934	13m, 14f	Agusan, Bukidnon, Cotabato, Davao, Surigao
<i>P. decussatus</i> Waterhouse, 1841	2m	Catanduanes, Pandan
<i>P. digestus</i> Heller, 1912	8m, 9f	Ifugao, Nueva Vizcaya
<i>P. disargus</i> Rukmane, 2019	3m	Nueva Vizcaya: Kasibu, Kayapa
<i>P. domino</i> Rukmane, 2016	1m, 1f	Baco, Mt. Halcon
<i>P. elegans</i> Waterhouse, 1841	29m, 20f	Samar Island: Hinabangan, Lope De Vega
<i>P. erichsoni</i> cf.	28m, 26f	Hinabangan, Marabot, Sogod, Cabanglasan, Surigao, Dinagat, Davao, Agusan, Bukidnon,

Table 2. Continuation

<i>P. erichsoni</i> Waterhouse, 1841	26m, 19f	Marinduque, Aurora, Cagayan, Sorsogon, Quirino, Nueva Vizcaya
<i>P. erosus</i> Schultze, 1920	2m, 5f	Benguet, La Trinidad, Abatan
<i>P. esperanza</i> Bollino, Sandel & Rukmane, 2017	12m, 12f	Agusan, Surigao
<i>P. franciscoi</i> Rukmane & Cabras, 2018	4m, 10f	Panay: Aklan, Antique, Culasi
<i>P. felipeae</i> Rukmane & Cabras, 2018	11m, 24f	Panay: Aklan, Antique, Culasi
<i>P. florulentus</i> Yoshitake, 2019	3m, 2f	Nueva Vizcaya, Cagayan, Ilocos
<i>P. galeraensis</i> Schultze, 1934	7m, 10f	Mindoro
<i>P. gemmatus</i> Waterhouse, 1841	26m, 24f	Aurora, Cagayan, Santa Ana., Nueva Vizcaya, Isabela, Quirino
<i>P. gloriosus</i> Faust, 1895	42m, 54f	Isabela, Rizal, Ifugao, Nueva Vizcaya, Kallinga, Aurora
<i>P. halconensis</i> Schultze, 1922	2f	Mt. Halcon
<i>P. hirokii</i> Yoshitake, 2012	27m, 20f	Bukidnon, Cotabato, Lanao, Davao
<i>P. igorota</i> Schultze, 1917	8m, 4f	Ifugao, Mt. Province, Nueva Vizcaya
<i>P. ilgas</i> Rukmane, 2017	1m	Lope De Vega
<i>P. inclitus</i> Pascoe, 1871	23m, 18f	Ifugao, Mt. Province, Bontoc
<i>P. jugifer</i> Waterhouse, 1841	1m, 3f	Panay, Aklan
<i>P. kraslavae</i> Rukmane & Barševskis, 2016	7m, 6f	Compostella, Agusan, Davao, Surigao
<i>P. kirklayroni</i> Rukmane, 2019	1m	Ilocos, Adams
<i>P. lacunosus</i> Heller, 1912	127m, 18f	Nueva Vizcaya, Ifugao, Benguet
<i>P. layroni</i> Rukmane & Cabras, 2018	3m, 6f	Panay, Antique
<i>P. latifasciatus</i> Waterhouse, 1841	28m, 20f	Lope De Vega, Samar
<i>P. marinduquensis</i> Rukmane & Barševskis, 2016	27m, 12f	Marinduque, Camarined, Mt. Malindig, Buenavista
<i>P. miltoni</i> Cabras & Rukmane, 2016	2f	Davao, Marilog
<i>P. mindoroensis</i> Rukmane & Hava, 2020	6m, 4f	Puerta Galera, Mt. Halcon
<i>P. moellendorffi</i> Heller, 1899	22m, 29f	Antique, Marinduque
<i>P. moniliferus</i> Germar, 1824	71m, 55f	Babuyan, Quirino, Cagayan, Aurora, Marinduque, Camiguin, Calayan, Catanduanes, Belance, Rizal, Isabela, Mt. Province, Pinukpuk, Nueva Vizcaya, Benguet, Mt. Halcon, Baco, Camarines, Batangas, Lope De Vega
<i>P. multipunctatus</i> Waterhouse, 1841	3m, 2f	Nueva Vizcaya
<i>P. naokii</i> Yoshitake, 2012	10m, 15f	Cotabao, Lanao
<i>P. negrosensis</i> Schultze, 1924	3m, 5f	Negros: Mt. Canlaon, Benedicto
<i>P. neoabsurdus</i> Rukmane, 2017	2f	Bukidnon
<i>P. niisatoi</i> Yoshitake, 2017	31m, 13f	Nueva Vizcaya, Quirino, Tapsoy, Quirino, Rizal
<i>P. nitcisi</i> Rukmane & Barševskis, 2016	30m, 27f	Sarrangani, Cotabato, Agusan, Bukidnon
<i>P. nobilis</i> Heller, 1912	31m, 31f	Quirino, Nueva Vizcaya, Isabela, Ifugao, Mt. Province
<i>P. notocruciatus</i> Yoshitake, 2017	f	Cotabato, Alamada
<i>P. occidentalis</i> Rukmane, 2017	19m, 21f	Sarrangani, Cotabato, Davao
<i>P. ochroplagiatus</i> Heller, 1912	10m, 7f	Aurora, Nueva Vizcaya
<i>P. octoannulatus</i> Yoshitake, Bollino & Sandel, 2019	33m, 18f	Lanao, Wao

Table 2. Continuation

<i>P. orbifer</i> Waterhouse, 1841	148m, 133f	Nueva Vizcaya, Aurora, Quirino, Madela, Tapsoy, Dinapigue, Isabela, Ifugao, Mt. Province, Benguet, Apayao, Cagayan, Isabela, Sta. Ana, Laguna, Mt. Polis, Kallinga, Nagtipunan, Ambaguio, Dupax
<i>P. orientalis</i> Rukmane, 2017	4m, 6f	Bukidnon, Surigao
<i>P. phaleratus</i> Waterhouse, 1841	26m, 40f	Quirino, Isabela, Aurora
<i>P. perpulcher</i> Waterhouse, 1841	17m, 28f	Isabela, Babuyan, Camiguin, Quirino, Ilocos, Nueva Vizcaya, Cagayan
<i>P. pinorum</i> Pascoe, 1871	25m, 6f	Nueva Vizcaya, Benguet, Ifugao, Mt. Province
<i>P. postpubescens</i> Schultze, 1922	11m, 27f	Bukidnon, Intavas, San Fernando, Panamokan
<i>P. pseudamabilis</i> Yoshitake, 2012	44m, 42f	Bukidnon, Cotabato, Davao, Mt. Apo, Agusan
<i>P. pseudhalconensis</i> Rukmane, 2016	16m, 11f	Baco, Puerta Galera, Mt. Halcon
<i>P. psittacinus</i> Heller, 1912	1f	Marivales - Bataan
<i>P. pulchellus</i> Behrens, 1887	18m, 12f	Nueva Vizcaya, Ifugao, Mt. Province
<i>P. rebus</i> Rukmane, 2016	m	Quirino
<i>P. regius</i> Schultze, 1922	4m, 4f	Agusan, San Fernando, Leyte, Samar
<i>P. reichertii</i> Schultze, 1929	46m, 14f	Cotabato, Davao, Bukidnon
<i>P. reticulatus</i> Waterhouse, 1841	30m, 35f	Camarines Bicol, Catanduanes, Aurora, Abra
<i>P. rizali</i> Schultze, 1934	11m, 15f	Cagayan: Sta. Ana, Gonzaga; Quirino
<i>P. rufopunctatus</i> Waterhouse, 1841	2f	Mt. Halcon
<i>P. rugicollis</i> Waterhouse, 1841	11m, 10f	Sorosogon, Bulusan, Ifugao, Bataan, Zambales, Aurora, Nueva Vizcaya
<i>P. rukmanae</i> Barševskis, 2016	16m, 18f	Marinduque, Boac
<i>P. sagittatus</i> Rukmane, 2019	1m	Quirino
<i>P. samarensis</i> Schultze, 1923	48m, 46f	Samar, Lope De Vega
<i>P. sanchezi</i> Heller, 1912	60m, 18f	Ifugao, Nueva Vizcaya, Mt. Province, Aurora, Isabela
<i>P. sarcitis</i> Behrens, 1887	18m, 15f	Cagayan, Babuyan, Quirino, Camiguin, Isabela
<i>P. schoenherri</i> Waterhouse, 1841	1m, 1f	Leyte: Mahaplag
<i>P. schultzei</i> Schultze, 1917	25m, 20f	Mt. Province, Ifugao, Nueva Vizcaya
<i>P. semperi</i> Heller, 1912	18m, 6f	Babuyan Island
<i>P. septentrionalis</i> Yoshitake, 2017	15m, 11f	Cagayan, Aurora
<i>P. sergejevae</i> Rukmane, 2018	2m, 1f	Bukidnon
<i>P. shavrini</i> Rukmane & Barševskis, 2016	47m, 47f	Lope De Vega, Hinabangan
<i>P. signaticollis</i>	17m, 11f	Compostella, Agusan, Surigao
<i>P. smaragdinus</i> Behrens, 1887	27m, 30f	Bukidnon, Marabot, Lope De Vega, Hinabangan
<i>P. speciosus</i> Waterhouse, 1841	32m, 16f	Bukidnon, Davao, Sarangani, Surigao, Visayas, Samar, Leyte, Dinagat
<i>P. sphaericollaris</i> Schultze, 1923	2m, 5f	Callinga, Cagayan
<i>P. sphenomorphoides</i> Yoshitake, 2012	19m, 4f	Zamboanga
<i>P. stellio</i> Heller, 1912	20m, 24f	Nueva Vizcaya, Benguet, Rizal, Rodriguez, Mt. Province, Barlig, Aurora, Isabela
<i>P. subamabilis</i> Yoshitake, 2012	78m, 36f	Cotabato, Bukidnon, Lanao
<i>P. sulphureomaculatus</i> Schultze, 1922	3m, 1f	Agusan, Bukidnon, Surigao
<i>P. sumptuosus</i> Schultze, 1917	38m, 24f	Apayao, Bontoc, Kallinga, Nueva Vizcaya, Ilocos
<i>P. sumptuosoides</i> Yoshitake, 2017	2m, 2f	Cagayan, Kallinga, Luisiana, Apayao

Table 2. *Continuation*

<i>P. shavrini</i> Rukmane & Barševskis, 2016	47m, 47f	Lope De Vega, Hinabangan
<i>P. tadauchii</i> Yoshitake, 2012	53m, 36f	Agusan, Bukidnon, Sarrangani, Surigao, Davao, Compostella
<i>P. taylori</i> Schultze, 1922	2m, 5f	Nueva Vizcaya, Kallinga, Ifugao
<i>P. tetramaculatus</i> Rukmane, 2019	1m, 1f	Nueva Vizcaya
<i>P. tikoi</i> Rukmane, 2016	14m, 15f	Mt. Apo, Bukidnon
<i>P. torresi</i> Rukmane, 2018	5m, 6f	Zamboanga
<i>P. valainisi</i> Rukmane & Barševskis, 2016	1f	Mt. Halcon
<i>P. venustus</i> Waterhouse, 1841	38m, 38f	Cotabato, Surigao, Sarrangani, Hinabangan, Lope De Vega, Sogod, Marabot
<i>P. yoshitakeorum</i> Yoshitake, Bollino & Sandel, 2019	4m, 2f	Bohol, Dinagat
<i>P. zamboanganus</i> Yoshitake, 2012	7m, 9f	Zamboanga
<i>P. zebra</i> Schultze, 1917	5m, 4f	Aurora, Runruro, Rizal

Biogeographic Affinities of *Pachyrhynchus*

The distribution of Pachyrhynchini has always baffled early entomologists such as Heller and Schultze. The unique distribution of the tribe which has its center of diversity in the Philippines especially Luzon and has some representative species in island fringes of Taiwan, Mollucas and Papua New Guinea led Heller to believe that the pachyrhynchinids reached the Philippines in the most recent period through the south via the Celebes Sea which was contested by Schultze as no highly modified or specialized forms of pachyrhynchinids are widely distributed in Borneo, Celebes, Java or Sumatra (Dickerson et al. 1928). Rather, Schultze believed that since Luzon is the apparent center of diversity for this group, it is where they have originated and from there species of pachyrhynchinids have reached other islands. However, during that time, knowledge on the distribution was only based on dispersal and extinction and land bridges since it was only in 1924 that Wegener published his work in tectonic plates (Wegener 1924). Without knowledge on plate tectonics it is difficult to fully account for the distribution of life based on geological history.

As for the genus *Pachyrhynchus*, although it has the most widespread distribution as compared to other genera of the tribe Pachyrhynchini,

its distribution is uniquely limited to the Philippines with more than a hundred species, Taiwan with eight species and Indonesia with four species. Due to the inability for flight, *Pachyrhynchus* species has very limited dispersal ability. Another factor preventing long distance dispersal is the ecologic preference of *Pachyrhynchus* which favors higher elevation in forested mountainous ecosystems or mountain ridges as compared to its counterpart *Metapocytus* (Cabras et. al 2016). This further enables the species in this group to have a limited geographic distribution. More studies is needed to understand the ecological preferences of this group.

Based on the updated distribution of the *Pachyrhynchus* species, Schultze seem right in his idea that *Pachyrhynchus* have originated from Luzon owing to the high diversity and species richness in Luzon. This agrees with the findings of Van Dam et al. (2021) that “the subsequent radiations of lineages on Mindanao all descended from Luzon lineages” and that there was no back colonization that took place.

Conservation

The endemism of the species of Philippine *Pachyrhynchus*, limited geographic distribution and habitat preference which is highly associated with forested mountain ecosystems and mountain ridges makes this group one of the best candidate for extinction with current rate of habitat degradation. Currently, the country is already considered as one of the hottest of hotspots due to the alarming habitat loss. Because the study of the genus is still at the documentation phase, efforts for conservation priorities have been compromised. The mountain ecosystems of the Philippines which are the habitat of the species from this genus are experiencing one of the highest levels of habitat degradation with only less than 20% remaining forested mountain ecosystems. According to Diesmos et al. (2002), clearance and habitat fragmentation especially of the mountainous forest and lowland dipterocarps affect 85% of the fauna. *Pachyrhynchus* which seem to prefer higher elevation of the forests are clearly highly at risk of extinction.

Habitat degradation especially in the mountain ecosystems serve as one of the greatest threats to the survival of the *Pachyrhynchus* species in the wild. For example in one area in Marilog District where a new species *P. miltoni* was discovered, the area where the species was found experiences slash and burn farming which basically replaces old growth trees with crops such as *Zea mays*, *Theobroma cacao*, coffee and other economically valuable crops. This is alarming since *Pachyrhynchus* are more restricted with their diet compared to *Metapocyrtus*. There is no data yet on how these species can adapt to habitat degradation.

As for any protection status, there is no protection status for this group. Among the roughly 22,000 insects described in the Philippines today, only 2 orders have members which are considered as threatened. This includes members of the order Lepidoptera such as *Delias magsadana*, *Graphium megaera*, *Idea electra*

and order Odonata such as *Risiocnemis antonieae*, *Risiocnemis seidenschwarzi* and *Coelicia exoleta* among others. However, in the case of the coleoptera, there are only a handful assessed speciesdespite the high level of endemism, restricted geographic distribution of most species, high association with forested mountain ecosystems, alarming level of habitat degradation, illegal poaching of these species and other obvious anthropogenic threats it experiences in the wild. This calls for scientific workers to provide an assessment of the distribution and threats on the species of beetles especially the highly endemic ones so that it can be considered as threatened even just on the local level.

On the other hand, although members of the beetle group including *Pachyrhynchus* are not considered as threatened, their habitats in the montane ecosystems are protected by some laws such as the National Integrated Protected Area System (NIPAS) which declares several mountains in the Philippines to be of considerable value to conservation. This NIPAS system declares several mountains as Protected Area thus preserving and protecting biodiversity as a whole. However as observed in other countries, protected areas in other countries when analysed based on its effectiveness in biodiversity conservation is considered inadequate.

Future Research Direction

Phylogenetic analysis would verify the hypothesis presented in this paper. More researches on the ecology, biology and distribution of this genus will be very helpful in explaining its unique distribution. More conservation efforts especially in the assessment of its population is necessary to pass local laws and conduct conservation activities for the conservation and protection of these species and their habitats including their food plants.

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Annotated list of Pachyrhynchini (Coleoptera, Curculionidae, Entiminae) in Davao City, Mindanao, Philippines

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Abstract

Pachyrhynchini are flightless plant-feeding weevils known for their complex and iridescent body ornamentation. This tribe of Curculionidae has its center of diversity in the Philippines, and we present the first comprehensive account of the pachyrhynchine fauna in Davao City, Mindanao, Philippines. Data gathering was conducted using a combination of belt transects, photographic documentation, and opportunistic sampling. Materials were collected between 2016 and 2019 from trees and shrubs in 12 selected green spaces in Davao City using handpicking and bush beating techniques. We document a total of 1103 individuals belonging to 31 species and two genera, *Pachyrhynchus* Germar, 1824 and *Metapocyrtus* Heller, 1912. Twenty-nine species (93.55%) are endemic to Mindanao; 13 species (41.93%) are Vulnerable according to the Philippines Department of Environment and Natural Resources Administrative Order No. 2019-09. The high endemism and the presence of rare species associated with the remaining forest patches call for immediate conservation actions.

Keywords

Beetles, conservation, diversity, endemic, jewel weevils

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Introduction

Weevils (superfamily Curculionoidea) are one of the most speciose and diverse groups in the order Coleoptera, with approximately 62,000 species accounting for

15.5% of the over 400,000 known beetle species worldwide (Oberprieler et al. 2007). They are generally phytophagous and highly associated with angiosperms, but

some are wood borers, wood-boring frugivores, and a few feed on dung of macropods (Hespenheide 2001; Hangay and Zborowski 2010). Due to their high adaptation and general feeding habits, they are found in almost every terrestrial ecosystem. Weevil diversity is highest in tropical rainforests like those in the Philippines, which can still be considered a taxonomic blank spot due to the limited knowledge and scarcity of weevil studies in these areas. Among the fascinating weevils is the tribe *Pachyrhynchini* in the subfamily Entiminae. This subfamily is one of the largest groups of weevils, with more than 14,000 described species (Yunakov 2021). The characteristics of Entimine weevils include: "short, broad rostrum with adelognathous mouthparts (the prementum closing the buccal cavity from beneath), mandibles bearing deciduous cusps that assist the ten-er weevil to escape from its earthen pupal cell but then break off, and, in the larva, a cushion-like antennal sensorium" (Oberprieler et al. 2007: 506).

The tribe *Pachyrhynchini* is known primarily for its iridescent and unique elytral patterns. It is characterized by mandibles without a scar or long-lasting appendage on the outer surface and that are uniformly arcuate on the edges, elytra with rounded humeri, hind coxae narrowly parallel with elytra on the sides, and antennal funicle laterally curving out in front of the eyes at the sides of the rostrum (Schultze 1923; Morimoto et al. 2015). Members of this tribe are flightless. They are distributed in the Old World, ranging across Papua New Guinea, Taiwan, Japan, and Australia (Alonso-Zaraga and Lyal 1999; Schultze 1923). The majority of Philippine *Pachyrhynchini* occur at a wide range of elevations, but most endemic and rare species are associated with high-elevation, forested habitats (Cabras et al. 2016). The combination of a strong preference for forested habitats, limited geographic range, food plant specificity, and the unabated loss of the Philippine forest has made most of the endemic and rare pachyrhynchine species to be categorized as Vulnerable according to the Department of Environment and Natural Resources (DENR) Administrative Order No. 2019-09 Philippine Assessment. Knowledge of this tribe has progressed tremen-dously in the last decade with the description of several species (Yoshitake 2011, 2012, 2013; Yoshitake and Tsuji 2019; Rukmane 2016, 2017, 2018; Cabras and Rukmane 2016; Cabras and Medina 2018, 2019, 2021; Cabras et al.

2018, 2019, 2021a, 2021b; Bollino et al. 2017, 2020; Bol-lino and Bordoni 2021). The tribe comprises of 18 genera and about 600 species, of which just under 500 (about 83%) are endemic to the Philippines. Of the 18 genera, only three, *Pachyrhynchus* Germar, 1824, *Homalocyr-tus* Heller, 1912, and *Metapocyrtus* Heller, 1912 (*s.l.*), are present in Mindanao. In the past few years, the University of Mindanao Coleoptera Research Center (UMCRC) has conducted expeditions in the remaining green spaces of Davao City in Mindanao and documented a diverse pachyrhynchine fauna which is presented here.

Study Area

Davao City is a first-class, highly urbanized city with a land area of 2,443.61 km². It is geographically situated in the southeastern part of Mindanao. It is bor-dered by mountainous topography on the western side (the Marilog district) and slopes down to the southeast-ern shore of Davao Gulf leading to the Pacific Ocean on the eastern side. In the city's southwestern tip lies Mount Apo National Park, the highest mountain in the Philippines, a protected area inaugurated by President Manuel L. Quezon in Proclamation 59 of May 8, 1936, to conserve its flora and fauna. Out of the 244,361 ha, 44,000 ha belong to the urban area and the larger portion is forest land. Davao City enjoys a mild tropical climate with distinct hot and wet seasons. The city is outside the typhoon belt and lacks major seasonal variations. Its average monthly temperatures are always above 26 °C, and average monthly rainfall is above 77 mm.

The areas where collections were made are given in Table 1 and shown in Figure 1.

Methods

The data presented here is the results of field surveys con ducted between December 2017 and April 2020 and literature reviews. Collecting permits were obtained from the Philippines Department of Environment and Na-tural Resources. Collection was done on trees and shrubs using handpicking and bush beating techniques through a combination of belt transects and opportunistic sam-pling in the green spaces of Davao City and its surround-ing environs. Specimens were collected and stored in vials with 70% ethyl alcohol. Photographs of individual

Table 1. Sampling sites in Davao City, Philippines; see also Figure 1.

Site	Location	Latitude (°N)	Longitude (°E)	Elevation (m)
A	Sicao Village, Tamayong, Calinan	07.0231	125.2021	1600
B	Marilog District, Eagle's Ridge forest (Dologon-Busco-Quezon Road, Datu Salumay)	07.1686	125.1941	532
C	Epol Falls forest	07.2713	125.1415	1152
D	LawiLawi Adventure Park and Cottages forest (km 77, Davao-BUDA Highway, Epol)	07.2718	125.1425	1239
E	Highway 81 forest	07.2912	125.1456	1174
F	Catigan, Toril	07.0047	125.2407	1000
G	Baguio District Davao City	07.1104	125.2210	800
H	Barangay Dominga, Calinan	07.1352	125.2851	900
I	Shrine Hills, Matina Davao City	07.0353	125.3449	400 m a.s.l.

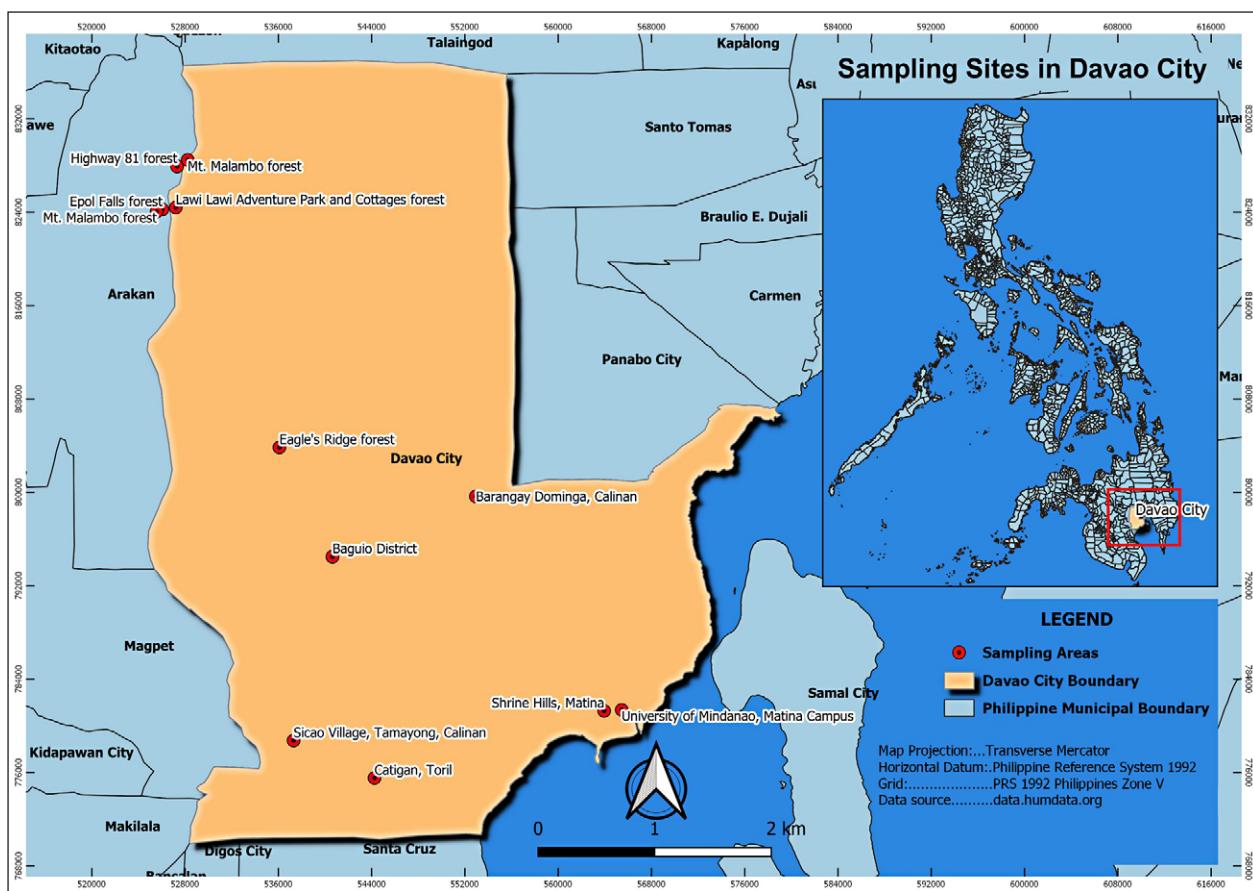


Figure 1. Sampling sites in Davao City, Philippines; see also Table 1.

habitus were taken using Canon EOS 6D camera and Canon MP-E 65mm macro lens and equipped with Helicon Focus auto montage for photo stacking and subsequently edited in Photoshop CS6 Extended. Specimens were examined and identified under Nikon SMZ745T binocular stereomicroscope and compared with the type materials. Specimens were labeled with species name, date and place of collection, collector, and a separate label for the name of the identifier, and the museum collection code. Specimens examined for comparison are deposited in the following collections:

- DUBC** Daugavpils University, Institute of Life Sciences and Technology, Coleopterological Research Centre, Daugavpils, Latvia
SMTD Senckenberg Natural History Collections, Dresden, Germany
UMCRC University of Mindanao Coleoptera Research Center, Davao City, Philippines

Results

We collected 1103 individuals representing 31 species from two genera, *Pachyrhynchus* Germar 1824 and *Metapocyrtus* Heller, 1912 (*s.l.*) from the 12 sampling sites in Davao City (Fig. 1). Twenty-two species belong to the genus *Metapocyrtus* *s.l.*, and nine belong to the genus *Pachyrhynchus*. Of the 31 species documented, 29 (93.55%) are endemic to Mindanao, and the

other two species, *P. erichsoni* Waterhouse, 1842 and *M. (Trachycyrtus) adspersus* (Waterhouse, 1843), are widely distributed throughout the Philippines. *Metapocyrtus (T.) adspersus* has been introduced in Malaysia, Singapore, and Japan through the plant trade (Yoshitake and Tsuji 2019). Based on DENR Administrative Order No. 2019-09 Updated List of Threatened Philippine Fauna and their Categories, 13 pachyrhynchine species (41.93%) in Davao City are Vulnerable while the remaining 18 species (58.06%) are Data Deficient. The most abundant species are *M. (Dolicocephalocyrinus) bituberosus* Heller, 1912 with 168 total specimens (15.23% of the total catch), *M. (D.) linneaticolis* Schultze, 1925 with 107 specimens (9.7%), *M. (D.) ruficollis* (Waterhouse, 1842) with 87 specimens (7.88%), and *M. clemensi* Schultze, 1925 with 60 specimens (5.44%); the least abundant are the *Pachyrhynchus* species. Among the 31 species, seven are new to science, six were recently described (Bollino et al. 2020; Cabras et al. 2021), and one is under description. The recently published new species from Davao City are *P. obumanuvu* Cabras, Medina, Donato & Van Dam, 2021, *M. tagabawa* Cabras, Medina, & Bollino, 2020, *M. (Orthocyrinus) davaoensis* Cabras, Medina, & Bollino, 2021, *M. (Metapocyrtus) ged* Cabras & Medina, 2021, *M. (M.) flavomaculatus* Cabras & Medina, 2021, and *M. um* Cabras & Van Dam, 2021 discovered in Catigan, Toril, Marilog District, Baguio District, and Calinan, Davao

City, respectively. The discovery of new species in even a highly urbanized area such as Davao City is a testament to the great diversity and how little studied this tribe is in the country.

ANNOTATED LIST

Genus *Metapocyrtus* Heller, 1912

The genus *Metapocyrtus* is predominantly endemic to the Philippines but with a few species endemic to Japan and Orchid Island. It currently is represented by over 250 species in seven subgenera. The general diagnostic characteristic of this genus includes “rostrum apically not swollen, basally with a more or less strongly pronounced transverse groove; scape of antenna reaching at least to or beyond hind margin of eye.” (Schultze 1925: 135).

Subgenus *Artapocyrtus* Heller, 1912

The subgenus *Artapocyrtus* is currently comprised of 25 species (Yap 2008; Yoshitake 2011; Bollino et al. 2019) and is characterized mainly by the short rostrum which is as long as wide and bears distinct dorso-lateral edges (Schultze 1925; Yap and Gapud 2007).

Metapocyrtus (Artapocyrtus) sp.

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 3.v.2019; local collector leg.; opportunistic; 4♂, 2♀, UMCRCMD1–6 • Shrine Hills, Matina Davao City; 07.0353N, 125.3449°E; 400 m a.s.l.; 5.i.2019; local collector; opportunistic; 4♂, 4♀, UMCRCMD7–15 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 3.v.2019; local collector; opportunistic; 5♂, 6♀, UMCRCMD16–26 • Baguio District Davao City; 07.1104°N, 125.2210°E; 800 m a.s.l.; 3.v.2019; local collector; opportunistic; 6♂, 12♀, UMCRCMD27–44 • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 3.v.2019; local collector leg.; opportunistic; 4♂, 2♀, UMCRCMD45–50 • Shrine Hills, Matina Davao City; 07.0353°N, 125.3449°E; 400 m a.s.l.; 5.i.2019; local collector; opportunistic; 5♂, 4♀, UMCRCMD51–59 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 3.v.2019; local collector; opportunistic; 5♂, 6♀, UMCRCMD60–70 • Baguio District Davao City; 07.1104°N, 125.2210°E; 800 m a.s.l.; 10.v.2019; local collector; opportunistic; 6♂, 6♀, UMCRCMD71–82.

Identification. This species bears a close resemblance to *M. (A.) bifasciatus* (Waterhouse, 1842), *M. (A.) comes* (Tachenberg in Heyne & Taschenberg 1908), *M. (A.) ruficrus* van Emden, 1932, *M. (A.) violaceus* Schultze, 1919, and *M. (A.) sakaii* Yoshitake, 2011 in having similar basal and apical stripes. However, *M. (A.)* sp. from Davao City has fainter pale blue basal and subapical scaly stripes.

Endemism and distribution. Mindanao endemic distributed in Davao City.

Remarks. The species was collected along with *M. (D.) ruficollis* in open grassland areas in Marilog at an elevation of 1200–1343 m a.s.l. adjacent to the secondary forests. It is abundant in the forested habitats in Marilog and Sicao Village. This is possibly an undescribed species. This species group needs revision.

Subgenus *Dolichocephalocyrtus* Schultze, 1925

The subgenus *Dolichocephalocyrtus*, which is currently represented by 22 extant species (Yap 2008; Cabras et al. 2020), is characterized by having a long, slender rostrum 0.60–0.76 times as long as wide, with a V-shaped ridge on basal half in males and protuberance on its basal half in females; male elytra with a rounded apex and steep apical declivity, and female elytra with a sharp,

triangular projection at the apex (Schultze 1925; Yap and Gapud 2007).

Metapocyrtus (Dolichocephalocyrtus) bituberosus Heller, 1912

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 3.v.2019; local collector leg.; opportunistic; 4♂, 2♀, UMCRCMD1–6 • Shrine Hills, Matina Davao City; 07.0353N, 125.3449°E; 400 m a.s.l.; 5.i.2019; local collector; opportunistic; 4♂, 4♀, UMCRCMD7–15 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 3.v.2019; local collector; opportunistic; 5♂, 6♀, UMCRCMD16–26 • Baguio District Davao City; 07.1104°N, 125.2210°E; 800 m a.s.l.; 3.v.2019; local collector; opportunistic; 6♂, 12♀, UMCRCMD27–44 • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 3.v.2019; local collector leg.; opportunistic; 4♂, 2♀, UMCRCMD45–50 • Shrine Hills, Matina Davao City; 07.0353°N, 125.3449°E; 400 m a.s.l.; 5.i.2019; local collector; opportunistic; 5♂, 4♀, UMCRCMD51–59 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 3.v.2019; local collector; opportunistic; 5♂, 6♀, UMCRCMD60–70 • Baguio District Davao City; 07.1104°N, 125.2210°E; 800 m a.s.l.; 10.v.2019; local collector; opportunistic; 6♂, 6♀, UMCRCMD71–82.

Identification. *Metapocyrtus (D.) bituberosus* is easily recognized by its pronotum and elytra densely covered with green scales, although some specimens have bluish and golden-yellow scales. Some variations of the species have three transverse scaly stripes on the basal, median, and subapical parts.

Endemism and distribution. A Mindanao endemic. Davao; Dolicaon, Bukidnon (Yap 2008).

Remarks. Schultze (1925) treated *M. (D.) bituberosus* as a variety, which was later treated as a subspecies by Yap (2008). However, we agree with Schultze (1923) in considering it is only a variety following Article 45.6 stating that “the rank denoted by a species-group name following a binomen is subspecific, except that (45.6.1) it is infrasubspecific if its author expressly gave it infrasubspecific rank, or if the content of the work unambiguously reveals that the name was proposed for an infrasubspecific entity”. Schultze gave var. *davaoensis* its infrasubspecific rank by explicitly assigning another *M. (D.) bituberosus samalensis* which is in the same paper into a subspecific rank (Schultze 1925). Morphologically, *M. (D.) bituberosus* var. *davaoensis* and *M. (D.) bituberosus* are very similar except for the three transverse scaly stripes in the elytra of *M. (D.) bituberosus* var. *davaoensis*. The species is widely distributed in the secondary and fragmented green spaces in Davao City. Although this species is more abundant in habitats with more lush secondary forests, it seems to thrive in highly degraded habitats such as in Shrine Hills Matina, a fragmented green space in a highly urbanized area.

Metapocyrtus (Doliocephalocyrtus) clemensi**Schultze, 1925**

Figure 2D

Materials examined. PHILIPPINES – Davao City • Baguio District Davao City; 07.1104°N, 125.2210°E; 800 m a.s.l.; 3.v.2019; local collector leg.; opportunistic; 5♂, 11♀, UMCRCMD83–98 • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; 15.iii.2018; local collector; opportunistic; 2♂, 3♀, UMCRCMD99–103 Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N; 125.2021°E; 1600 m a.s.l.; 3.v.2019; local collector; opportunistic; 11♂, 3♀, UMCRCMD104–117.

Identification. This species is easily distinguished from other *Doliocephalocyrtus* species by its three transverse bands on the elytra and rostrum with deep, elongate medial depression and rounded dorsolateral edge. The other *Doliocephalocyrtus* species have plain rugose rostrums with a V-shape ridge (Schultze 1925).

Endemism and distribution. A Mindanao endemic. Mount Apo, Davao (Yap 2008).

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species is one of the most abundant species in Davao City and is found in almost every remaining patch of disturbed secondary forests.

Metapocyrtus (Doliocephalocyrtus) lineaticollis**Schultze, 1925**

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 12.iii.2019; local collector; opportunistic; 14♂, 9♀, UMCRCMD118–140 • Baguio District; 07.1104°N, 125.2210°E; 800 m a.s.l.; 12.iii.2017; local collector; opportunistic; 6♂, 1♀, UMCRCMD142–147 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 29.v.2019; A. Rukmane leg.; opportunistic; 1♂, UMCRCMD148.

Identification. Body, pronotum, and rostrum black, legs red. Pronotum with a longitudinal scaly stripe along midline, narrow scaly stripe on apical margin, and two longitudinal scaly stripes on each side of the disc; elytra with three narrow, transverse, scaly bands confluent at the lateral margin.

Endemism and distribution. A Mindanao endemic. Mumungan, Lanao (Schultze 1925); Davao City.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species is one of the most abundant in the mid-elevation areas sampled in Davao City.

Metapocyrtus (Doliocephalocyrtus) ruficollis**Waterhouse, 1842**

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; 28–29.iii.2018; local collector; opportunistic; 9♂, 6♀, UMCRCMD149–163 • 3ex.- Philippines, Mindanao,

/ Davao, Marilog distr., / Baganahan, 27–28.iii.2018. / A. Barševskis. leg.

Identification. Elytra and rostrum black, pronotum and legs burnished red. This species can be distinguished from its congeners for having burnished red pronotum and strongly subglobular prothorax equal to or slightly broader than the elytra (Schultze 1925).

Endemism and distribution. Mindanao Endemic: Cagayan; Lindaban, Bukidnon (Schultze 1925).

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This is one of the most abundant species in Marilog District in open areas that are adjacent to secondary forests. It is often found copulating on Cogon Grass, *Imperata cylindrica* (L.) P.Beauv. (Poaceae) as well as other weeds abundant in the area.

Subgenus *Metapocyrtus* Heller, 1912 (s.s.)

This subgenus with 88 known species has the “rostrum with rounded dorsolateral edges, elytra laterally elliptical or dorsally ovate, anterior margin of pronotum truncate and strongly pronounced” (Yap and Gapud 2007; Bollino and Bordoni 2021).

***Metapocyrtus (Metapocyrtus) lindabonus* Schultze, 1922**

Figure 2E

Materials examined. PHILIPPINES – Davao City • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 14–15.iv.2019; local collector; opportunistic; 10♂, 9♀, UMCRCMM1–19 • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; 5.iv.2017; local collector; opportunistic; 2♂, 1♀, UMCRCMM20–22.

Identification. Integuments black, pronotum with two elliptical scaly patches on both sides of the disc near the basal margin, and elytra narrow ovate with three transverse bands or stripes.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City; Lindaban, Bukidnon (Yap 2008).

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species is abundant from Bukidnon down to Marilog District. In Marilog it is usually found on shrubs and trees in the secondary forests. It is a highly polymorphic species, but it can still be distinguished by the general shape of body, rostrum, and pronotum, as well as the consistent pronotal markings. Its elytral pattern ranges from full broad bands to stripes. The variation in the elytra can easily lead to the belief that there are different species.

***Metapocyrtus (Metapocyrtus) flavomaculatus* Cabras & Medina, 2021**

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m

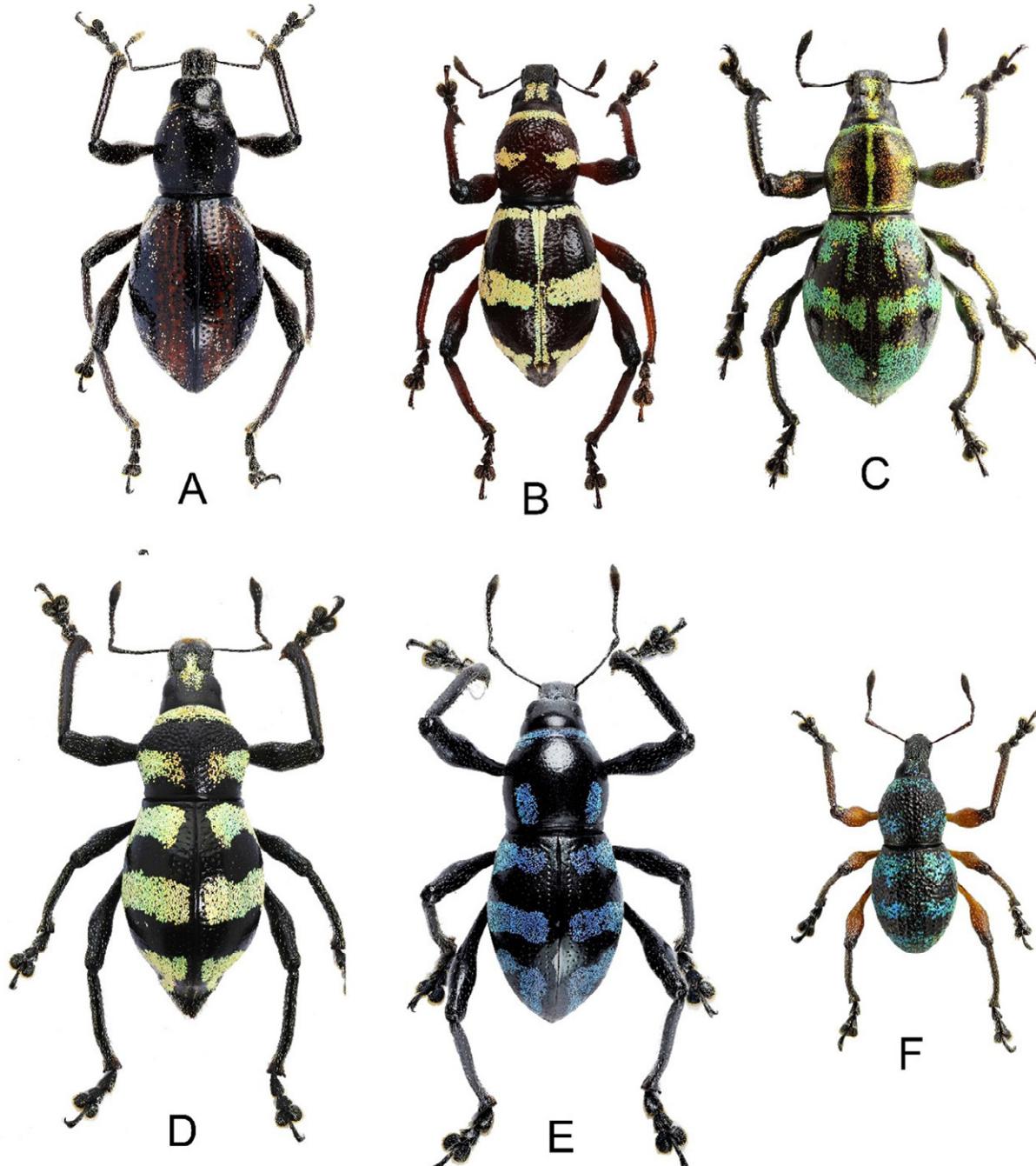


Figure 2. *Metapocyrtus* spp. in Davao City. **A.** *M. um*. **B.** *M. ged*. **C.** *M. kitangladensis*. **D.** *M. clemensi*. **E.** *M. lindabonus*. **F.** *M. apoensis*.

a.s.l.; 5–7.iii.2017; local collector; opportunistic; 1♂, 5♀, UMCRCMM23–28.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City.

Identification. Black integuments. Dorsal surface of rostrum weakly convex with faint, V-shaped ridge; prothorax subglobular; pronotum with two elongate subbasal and subapical spots on dorsum, and stripes before the coxa; elytra strongly ovate, broader and longer than prothorax and with eight spots on each elytron of which two are positioned basally, three medially, and another three apically.

Taxonomic note. In the original description (Cabras and Medina 2021), the feminine gender of the species-group name did not agree with the masculine gender of *Metapocyrtus* and, thus, was not in accordance with the ICBN (Article 31.2). We correct the gender to *M. flavomaculatus*.

Remarks. This species was abundantly collected in the leaves of *Impatiens* sp. (Balsaminaceae) in the under-story of secondary forests.

***Metapocyrtus (Metapocyrtus) ged* Cabras & Medina, 2021**

Figure 2B

Materials examined. PHILIPPINES – Davao City • Catigan, Toril; 07.0047°N, 125.2407°E; 800–1000 m a.s.l.; 5–7.iii.2018; local collector; opportunistic; 3♂, 8♀, UMCRCMM29–39.

Identification. Integument black; pronotum, antennae, and legs dark ferruginous. Dorsal surface of rostrum bearing a V-shape ridge; rostrum with a rounded dorso-lateral edge; pronotum with a narrow, scaly stripe at the anterior margin, narrow transverse stripe across entire width at mid-length, and lateroventral stripe before the coxa confluent with the anterior margin and transverse stripe at the middle. Elytra subelliptical with a subbasal, narrow, transverse, scaly stripe from suture to lateral margin, a narrow median transverse scaly band across entire width, subtriangular scaly patch on the apical fourth, scaly stripe along lateral margin confluent with subbasal band, medial band, and triangular stripe at apex, and a faint scaly stripe along the suture.

Endemism and distribution. A Mindanao endemic. Catigan, Toril, Davao City.

Remarks. We collected this species on the slope at the foot of Mount Apo in Catigan, Toril, at around 1300 m in elevation. The specimens were collected using a beating sheet on pandan *Pandanus* sp. (Pandanaceae) leaves.

Subgenus *Orthocyrtus* Heller, 1912

The subgenus *Orthocyrtus* has 42 known species (Cabras et al. 2022), which are characterized by their large size (10.0–17.0 mm), a common feature of this subgenus, medium length rostrum (0.60–0.70 times as long as wide), which is dorsally straight, mostly in a plane with frons, and at the base, the sides are rectangularly declined (Schulze 1925; Yap and Gapud 2007; Cabras et al. 2018).

Metapocyrtus (Orthocyrtus) lanusinus Schultze, 1922

Materials examined. PHILIPPINES – Davao City • Baganihan, Lawi Lawi Adventure Park and Cottages (Davao-BUDA Highway, Epol); 07.2718°N, 125.1425°E; 1239 m a.s.l.; 5–7.iii.2018; local collector; opportunistic; 5♂, 10♀, UMCRCMO1–15.

Identification. This is a large species with black integument. The pronotum has posterior and anterior narrow, scaly stripes. It has a transverse medial scaly stripe on pronotum, and the elytra have scaly stripes along the suture and around three or four longitudinal, but interrupted, scaly stripes from base to apex.

Endemism and distribution. A Mindanao endemic. Lindaban, Bukidnon (Schultze 1922, 1925); Marilog, Davao City.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species is abundant from Bukidnon to Marilog District but is no longer recorded in the urban areas of Davao City. Many *O. lanusinus* specimens were collected on *Swietenia macrophylla* King (Meliaceae) and introduced *Pinus* sp. (Pinaceae) trees in Marilog.

Metapocyrtus (Orthocyrtus) davaoensis Cabras, Medina & Bollino, 2021

Materials examined. PHILIPPINES – Davao City • Calinan, Dominga; 07.1352°N, 125.2851°E; 900 m a.s.l.; 5–7.iii.2018; A. Cabras leg.; opportunistic; 5♂, 6♀, UMCRCMO16–26.

Identification. Integument black; prothorax subglobular, with a narrow, scaly stripe at the anterior and posterior margins, a transverse stripe across the entire width at mid-length, and lateroventral scaly stripe before coxa; elytra subovate with short scaly stripes from behind base to before middle, median, transverse stripe, subtriangular scaly patch on apical third, a small dot on interval V at the apical quarter, and long scaly stripe along the lateral margin from behind base to apex, confluent with basal, median, and apical stripes (Cabras et al. 2021).

Endemism and distribution. A Mindanao endemic. Baguio District, Calinan, Davao City; Gumitan, Davao del Sur; Cabanglasan, Bukidnon.

Remarks. This species has been collected on the leaves of *Sandoricum koetjape* (Burm.f.) Merr. (Meliaceae) and *Swietenia macrophylla* (Meliaceae).

Metapocyrtus (Orthocyrtus) cf. schoenherri Waterhouse, 1842

Materials examined. PHILIPPINES – Davao City • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 14–15.iv.2019; local collector; opportunistic; 9♂, 12♀, UMCRCMO27–47 • Marilog District: Eagle's Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; 5.i.2018; local collector; opportunistic; 1♂, UMCRCMO48.

Identification. Black integument; prothorax subglobular with two small scaly spots on each side of the disc and each elytron with seven scaly spots: two basal spots, two spots on median portion, and three subapical spots, and an elongated stripe on apical margin.

Endemism and distribution. A Mindanao endemic. Catigan, Toril, Davao City; Surigao (Schultze 1925).

Remarks. This species was collected along with *M. lindabonus*, another spotted species, in Catigan, Toril. However, *M. schoenherri* can be easily distinguished from *M. lindabonus* by its larger size and the shape of its rostrum.

Metapocyrtus (Orthocyrtus) sp.

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 14.iv.2018; local collector; opportunistic; 1♂, 5♀, UMCRCMO27–32 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 14.iv.2019; local collector; opportunistic; 1♂, UMCRCMO33 • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 28–29.iv.2019; A. Rukmane leg.; opportunistic; UMCRCMO34.

Identification. This species is morphologically similar to *M. (O.) schoenherri* but is totally black and without spots.

Endemism and distribution. A Mindanao endemic. Tamayong, Calinan, Davao City.

Remarks. The species was collected on the slope of Tamayong, Calinan, with lush vegetation at approximately 1300 m a.s.l.

Subgenus *Sphenomorphoidea* Heller, 1912

The subgenus *Sphenomorphoidea*, which currently is represented by 10 species, is characterized by having the “rostrum longer than broad (0.75–0.85 times) toward apex slightly divergent, dorsally convex, separated from front by a deep transverse basal groove. Front slightly curved. Anterior margin of prothorax ventrally slightly emarginate; prothorax furthermore with a distinct anterior submarginal groove” (Schultze 1925: 150) – copied verbatim.

Metapocyrtus (Sphenomorphoidea) cf. metallicus Heller, 1912

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; 12.iii.2018; local collector; opportunistic; 9♂, 4♀, UMCRCMS1–13 • Baguio District; 07.1104°N; 125.2210°E; 800 m a.s.l.; 5.iii.2017; local collector; opportunistic; 3♂, 1♀, UMCRCMS14–17.

Identification. Integuments black; prothorax globular, with narrow scaly stripes along anterior and posterior margins, two scaly spots on either side of disc, and a longitudinal scaly stripe along the midline. Elytra with the following scaly markings: two basal spots, a transverse stripe along the median portion, a subapical spot, and a stripe on the apical margin.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City*.

Remarks. This species is quite prevalent in the secondary forests of Marilog District.

Metapocyrtus (Sphenomorphoidea) sp.

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; 12.iii.2018; local collector; opportunistic; 2♂, UMCRCMS18–19.

Identification. This species is very similar in morphology to *M. (S.) metallicus* but it is totally black, without pronotal or elytral scaly marks, and has a more pronounced hump on the dorsum of the prothorax.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City.

Remarks. This species is quite prevalent in the secondary forests of Marilog District.

Subgenus *Trachycyrtus* Heller, 1912

The subgenus *Trachycyrtus* currently is represented by 47 species (Yap 2008; Genka and Yoshitake 2018). It is distinguished from the other subgenera in being mostly

small (<4.5 mm), although some are medium-sized (4.5–10.2 mm) and in having a granulate prothorax and punctured, subtuberculate, or granulate elytra (Schultze 1925).

Metapocyrtus (Trachycyrtus) adspersus Waterhouse, 1843

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 5.v.2019; local collector; opportunistic; 6♂, 4♀, UMCRCMT1–10 • Barangay Dominga, Calinan; 07.1352°N, 125.2851°E; 900 m a.s.l.; 12.iii.2018; local collector; opportunistic; 8♂, 10♀, UMCRCMT11–28 • Marilog District: Eagle’s Ridge forest (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; 12.iii.2018; local collector; opportunistic; 10♂, 10♀, UMCRCMT29–48 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 5.v.2019; local collector; opportunistic; 15♂, 8♀, UMCRCMT49–71.

Identification. This species has black integument except for the legs, which are reddish-brown. The prothorax and the elytra are densely covered in greenish and pale-yellow round scales.

Endemism and distribution. A Philippine endemic. Bohol, Biliran, Leyte and Samar (Yap 2008); Marilog District, Baguio District Calinan, Tamayong, Calinan, Shrine Hills, Davao City; Bilar, Bohol; Biliran, Palompon, Leyte; Samar (Yap 2008).

Remarks. This is by far one of the most widespread species. Although it was originally known from central and eastern Visayas, it is now recorded and found in abundance in Mindanao. Recently, the species has also been recorded in Malaysia, Japan, and Singapore (Yoshitake and Tsuji 2019).

Metapocyrtus (Trachycyrtus) apoensis Schultze, 1925

Figure 2F

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; 5.v.2019; local collector; opportunistic; 8♂, 2♀, UMCRCMT72–81 • Baguio District; 07.1104°N, 125.2210°E; 800 m a.s.l.; iii.2018; local collector; opportunistic; 8♂, 10♀, UMCRCMT82–99 • Marilog District: Eagle’s Ridge forest (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; iii.2018; local collector; opportunistic; 10♂, 10♀, UMCRCMT100–199 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; v.2019; local collector; opportunistic; 15♂, 8♀, UMCRCMT120–142.

Identification. Integument black except for reddish-brown legs. Prothorax and elytra granulate. Prothorax with a narrow, greenish, scaly stripe at anterior margin and a thick transverse band across entire width. Elytra with three transverse bands of green to golden, round scales.

Endemism and distribution. A Mindanao endemic. Sta. Cruz, Davao del Sur.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species is quite common, especially in areas with anthropogenic disturbances.

***Metapocyrtus (Trachycyrtus) pinya* Genka & Yoshitake, 2018**

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; iii.2019; local collector; opportunistic; 5♂, 6♀, UMCRCMT143–153.

Identification. This species bears a very close resemblance to *M. (T.) apoensis* but differs by having scattered round scales in between the three scaly bands and a pair of subconical projections of sparse tufts of piliform scales along suture at the beginning of the elytral declivity.

Endemism and distribution. A Mindanao endemic. Calinan, Davao City.

***Metapocyrtus kitangladensis* Cabras, Medina & Zhang, 2019**

Figure 2C

Materials examined. PHILIPPINES – Davao City • Baguio District Davao City; 07.1104°N, 125.2210°E; 800 m a.s.l.; iii.2019; local collector; opportunistic; 2♂, 1♀, UMCRCMk1–3 • Highway 81 forest; 07.2912°N, 125.1456°E; 1174 m a.s.l.; vi.2018; M. van Dam leg.; opportunistic; 1♂, UMCRCMk4 • Epol Falls forest; 07.2713°N, 125.1415°E; 1152 m a.s.l.; vi.2018; local collector; opportunistic; 1♂, UMCRCMk5.

Identification. Body black; pronotum, head, and legs coppery black, weakly lustrous with sparse pale yellow, green, and violet scales; body surface weakly lustrous with golden-yellow, orange, greenish, turquoise, and bluish scales. Pronotum subglobular with narrow stripes at the anterior, posterior, and latero-ventral margins, and three narrow longitudinal stripes on disc. Each elytron with three longitudinal basal stripes, a narrow transverse medial stripe, a narrow longitudinal stripe between interval I and II extending from middle to apex, confluent with stripe along lateral margin, and a triangular stripe extending from apical third to apex, laterally connected with marginal stripe.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City; Barangay Buda, Davao Del Sur; Mount Kitanglad, Mount Dulang-dulang, Mount Kiamo, Bukidnon (Cabras et al. 2019).

Remarks. This species is distributed from Bukidnon towards Davao City. It was found predominantly on the fronds of *Angiopteris evecta* (G.Forst.) Hoffm (Marattiaceae) and was collected in the closed canopy. It was mostly found in the less disturbed secondary forests of Bukidnon, Marilog, and Calinan, Davao City, which can be an indication that it prefers intact forests.

***Metapocyrtus tagabawa* Cabras, Medina & Bollino, 2020**

Figure 7

Materials examined. PHILIPPINES – Davao City • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; iii.2017; A. Cabras leg.; opportunistic; 1♂, UMCRCMt1 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; iv.2019; M. Medina leg.; opportunistic; 10♂, 10♀, UMCRCMt2–21.

Identification. Integument weakly lustrous black, with green and turquoise scales. Pronotum subglobular, with a stripe at anterior margin and transverse stripe slightly behind mid-length. Elytra coarsely punctate, with three transverse, scaly stripes: narrow subbasal stripe, narrow transverse stripe at highest point of elytra, and subtriangular stripe at apical third.

Endemism and distribution. A Mindanao endemic. Catigan Toril, Davao City; Wao, Lanao del Sur (Bollino et al. 2020).

Remarks. This species is found in the secondary forest on the southeastern slope of Mount Apo. It was in a very narrow area of not more than 500 m² along the trail and in a closed canopy. It was found abundantly, feeding, copulating, and perching on *Melastoma* sp. (Melastomaceae) and some unknown dipterocarp trees.

***Metapocyrtus um* Cabras & Van Dam, 2021**

Figure 2A

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; iii.2017; local collector; opportunistic; 1♀, UMCRCM1.

Identification. Body and legs dark ferruginous with sparse, light yellow-ochre scales.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City.

Remarks. Only a few specimens were found, particularly in the remaining semi-pristine forest in Marilog District. The small mountain where the species occurs has been isolated due to the presence of resorts and human habitation.

***Metapocyrtus* sp. 1**

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; iii.2017; local collector; opportunistic.

Identification. Integument black. Prothorax with a narrow, scaly stripe at the anterior margin and two elongate spots on each side near posterior margin. Each elytron with seven or eight scaly spots: two subbasal spots, three median spots, and two or three spots near apex. We were unable to fully identify this species based on the available specimens.

Endemism and distribution. A Mindanao endemic.

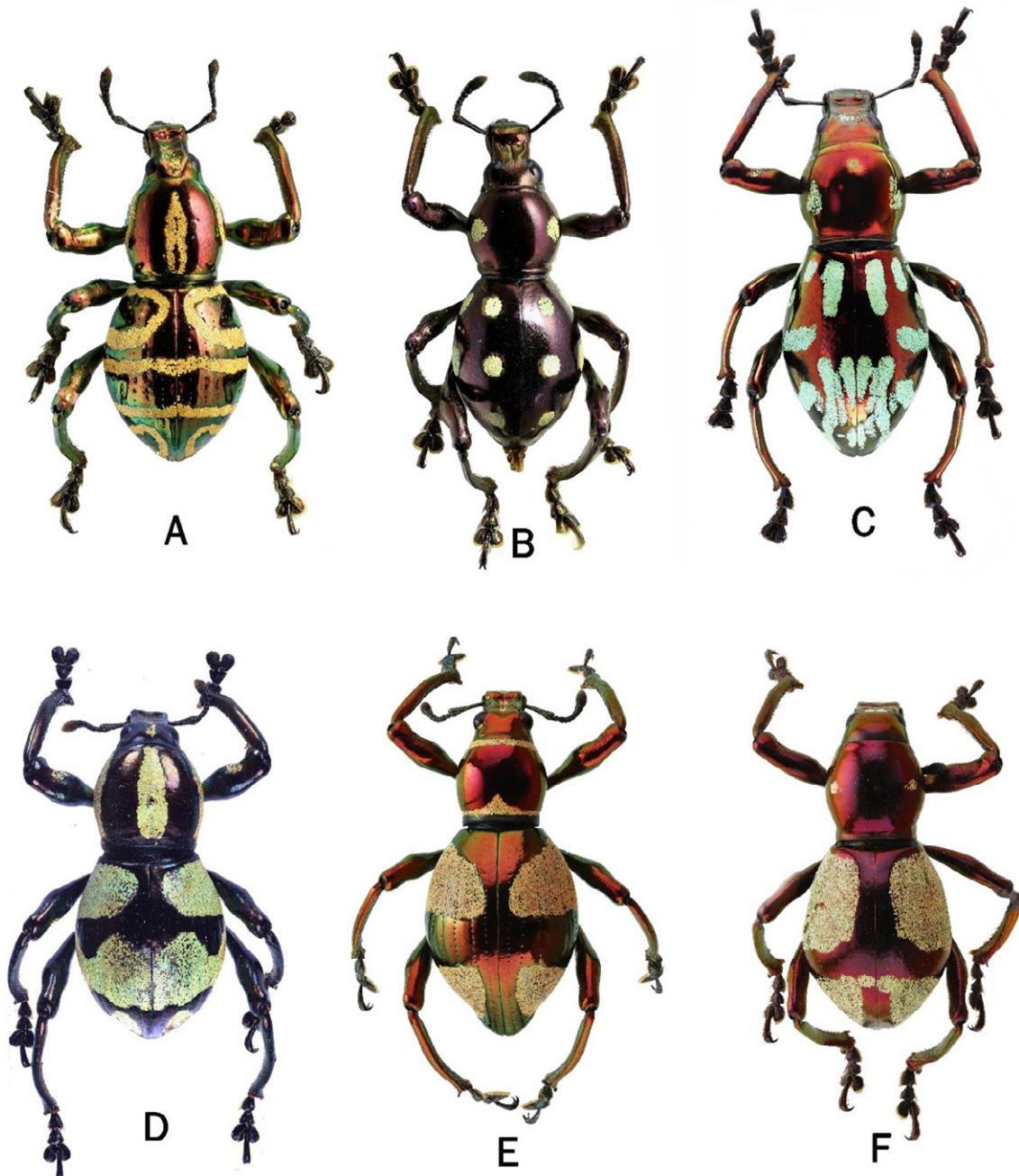


Figure 3. *Pachyrhynchus* spp. in Davao City. **A.** *P. speciosus*. **B.** *P. erichsoni*. **C.** *P. obumanuvu*. **D.** *P. miltoni*. **E.** *P. pseudamabilis*. **F.** *P. apoensis*.

Catigan, Toril, Davao City.

Remarks. This species is very prevalent in the foot-hills of Catigan Toril, which is the southeastern slope of Mount Apo. It co-exists with *Orthocyrthus* cf. *schoenherri*, which is a new record of mimicry for this species (Yoshitake 2017). *Metapocyrtus* sp. 1 is abundant in the Cogon Grass and shrubs.

Metapocyrtus sp. 2

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle's Ridge (Dologon-Busco-Zu-
zon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532
m a.s.l.; iii.2017; local collector; opportunistic; 1♂,
UMCRCM2.

Identification. Integument black. Prothorax subglobular, with narrow, scaly stripes across anterior and posterior margins and a transverse, scaly stripe on median part. Elytra with longitudinal basal and subapical scaly stripes. We were unable to fully identify this species based on the available specimens.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City.

Genus *Pachyrhynchus* Germar, 1824

The genus *Pachyrhynchus* is represented by over 165 species, of which the majority are endemic to the Philippines, while other species occur in Indonesia, Taiwan, and Japan. The genus is mainly characterized by the lack

of a distinct transverse groove on the head between the forehead and rostrum, the dorsally swollen apical half of the rostrum, simple antennal scrobes, the antennal scape not reaching posterior margin of the eye, and the entire episternal suture (Schultze 1923).

Pachyrhynchus amabilis Schultze, 1922

Materials examined. PHILIPPINES – Davao City • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; xi.2019; local coll.; opportunistic; 1♂, 1♀, UMCRPC1–4.

Identification. Rostrum and pronotum dark red; body dark coppery brown. Prothorax with narrow stripes along anterior and posterior margins, and with broad lateroventral patch on each side. Each elytron with two golden-yellow, scaly patches, one basally and another on apical half.

Endemism and distribution. A Mindanao endemic. Lindaban, Bukidnon (Schultze 1922); Davao City*.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species was collected on the fronds of the Bracken Fern, *Pteridium aquilinum* (L.) Kuhn (Dennstaedtiaceae).

Pachyrhynchus apoensis Yoshitake, 2012

Figure 3F

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; xi.2019; local collector; opportunistic; 3♂, 2♀, UMCRPC5–9.

Identification. Integument glossy red. Pronotum with two small spots on each side of disc. Each elytron with elongate, postmedian spot along suture, a small elongate subapical spot along suture, a large basal patch, and a large apical patch.

Endemism and distribution. A Mindanao endemic. Mount Apo.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. The species seems to occurs throughout Mount Apo, such as along Kidapawan trail on the western side, as well in Calinan, and Sicao Village, Davao City, on the eastern side.

Pachyrhynchus davaoensis Schultze, 1934

Materials examined. PHILIPPINES – Davao City • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; xi.2019; local collector; opportunistic; 1♂, 1♀, UMCRPC32–33.

Identification. Integument red. Pronotum with subcircular, scaly marks on latero-ventral parts and longitudinal stripe at middle. Each elytron with three transverse, narrow, elliptical scaly rings, with the basal and subapical not reaching sutures.

Endemism and distribution. A Mindanao endemic. Bukidnon; Mount Apo (Schultze 1934); Tamayong, Calinan, Davao City.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species was collected at an elevation

of 1000 m a.s.l. at the edge of the forest in Tamayong, Calinan.

Pachyrhynchus erichsoni (Waterhouse, 1842)

Figure 3B

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; xi.2019; local collector; opportunistic; 3♂, 4♀, UMCRPC34–40 • Marilog District: Eagle's Ridge forest (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; iii.2017; local collector; opportunistic; 2♂, 3♀, UMCRPC41–45 • Catigan, Toril; 07.0047°N, 125.2407°E; 1000 m a.s.l.; 29.iv–1.v.2019; A. Shavrin; 1♂, UMCRPC46.

Identification. Integument coppery brown. Prothorax with two spots on each side of disc and two spots on each lateral margin. Each elytron with eight spots: two on basal parts, two in median portion, three subapical, and one on apical margin.

Endemism and distribution. A Mindanao endemic. Surigao, Dinagat, Leyte (Schultze 1923), Marilog District, Catigan, Toril, and Tamayong, Calinan, Davao City.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species has a Philippine-wide distribution, although future studies may prove otherwise. Among *Pachyrhynchus* species, this is the most widespread at higher elevations above 1000 m a.s.l. *Pachyrhynchus erichsoni* are usually collected at the edge of forests or within secondary forests. Collected specimens were active during the day and perching on the abaxial fronds of a fern at night. The *P. erichsoni* complex has been documented on the following plants: *Melastoma malabathricum* L. (Melastomataceae), *Lithocarpus boholensis* (Merr.) Rehder (Fagaceae), *Dendrocnide* sp. (Urticaceae), *Callicarpa* sp. (Lamiaceae), *Philodendron* sp. (Araceae), and *Amaranthus* sp. (Amaranthaceae).

Pachyrhynchus miltoni Cabras & Rukmane, 2016

Figure 3D

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; xi.2019; local collector; opportunistic; 6♂, 5♀, UMCRPC47–57 • Baganihan, Lawi Lawi Adventure Park and Cottages (km 77, Davao-BUDA Highway, Epol); 07.2718°N, 125.1425°E; 1239 m a.s.l.; 28.iii.2018; A. Rukmane; opportunistic; 1♂, UMCRPC58.

Identification. Integument glossy dark red to coppery brown. Prothorax with a longitudinal band on median portion and large scaly patch on sides. Each elytron with three broad transverse bands; median band constricted in middle portion.

Endemism and distribution. A Mindanao endemic. Marilog District, Davao City.

Remarks. This species was found at 1600 m a.s.l. in semi-open forests in Marilog District or in areas adjacent to secondary forests. It was found perching on ferns and shrubs, or a few were collected while copulating on

the stem of Cacao, *Theobroma cacao* L. (Malvaceae). Whether this species is infesting Cacao fruits is yet unknown. *Pachyrhynchus miltoni* has been documented on *Melastoma malabathricum* (Melastomastaceae), *Piper aduncum* L. (Piperaceae), *Lithocarpus boholensis* (Fagaceae), *Theobroma cacao* (Malvaceae), *Atuna racemosa* Raf. (Chrysobalanaceae), and *Helianthus* sp. (Asteraceae).

Pachyrhynchus pseudamabilis Yoshitake, 2012

Figure 3E

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; xi.2019; local collector; opportunistic; 2♂, 1♀, UMCRC59–61 • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; iii.2017; local collector; opportunistic; 3♂, 4♀, UMCRC62–71.

Identification. Integument red. Prothorax with narrow stripes along anterior and posterior margins, and broad lateroventral patch on each side. Each elytron with two large, scaly patches, one basally and another on apical half. Color and elytral marks highly variable.

Endemism and distribution. A Mindanao endemic. Mount Apo (Yoshitake 2012), Marilog District, Davao City.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species was abundant in the forests of Marilog District and Tamayong, Toril. It was most abundant in *Theobroma cacao* (Malvaceae) but has also been collected from *Croton leiophyllus* Müll.Arg. (Euphorbiaceae), *Piper aduncum* (Piperaceae), and *Lithocarpus boholensis* (Fagaceae).

Pachyrhynchus speciosus (Waterhouse, 1841)

Figure 3A

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; xi.2019; local collector; opportunistic; 5♂, 10♀, UMCRC72–86 • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; iii.2017; local collector; opportunistic; 2♂, 3♀, UMCRC87–91.

Identification. Integument red. Pronotum with subcircular, scaly rings on latero-ventral parts, and two longitudinal stripes in the middle, narrowly separated but confluent at both ends. Each elytron with three transverse, narrow, elliptical rings, with basal and subapical rings not reaching sutures.

Endemism and distribution. A Mindanao endemic. Surigao Province, Surigao; Siargao; Bucas Grande; Dinagat; Saob, Cotabato Province; Bilar, Bohol (Schultze 1923); Marilog District, Catigan, Toril, Davao City.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. *Pachyrhynchus speciosus* was collected within or at the edge of the secondary forests at an elevation

of not below 1100 m a.s.l. It was collected on the leaves of *Melastoma malabathricum* (Melastomastaceae), and *Medinilla cumingii* Naudin (Melastomastaceae).

Pachyrhynchus sulphureomaculatus (Schultze, 1922)

Materials examined. PHILIPPINES – Davao City • Marilog District: Eagle’s Ridge (Dologon-Busco-Quezon Road, Datu Salumay); 07.1686°N, 125.1941°E; 532 m a.s.l.; iii.2017; local collector; opportunistic; 3♂, 2♀, UMCRC92–96.

Identification. Integument black. Prothorax with two spots on each side of disc and broad patch on lateroventral parts. Each elytron with two basal spots, two spots in middle, and three subapical spots, one postmedian spot along suture, one basal elliptical patch along lateral margin, one long elliptical patch in middle along side, one long elliptical patch in middle along lateral margin, and one elongated spot at apical margin.

Endemism and distribution. A Mindanao endemic. Cotabato (Schultze 1922); Marilog District, Davao City.

Conservation status. Vulnerable (DENR-DAO 2019).

Remarks. This species was collected in secondary forests of Marilog and was on *Lithocarpus boholensis* (Fagaceae).

Pachyrhynchus obumanuvu Cabras, Medina, Donato & Van Dam, 2021

Figure 3C

Materials examined. PHILIPPINES – Davao City • Sicao Village, Tamayong, Calinan; 07.0231°N, 125.2021°E; 1600 m a.s.l.; xi.2019; local collector; opportunistic; 7♂, 5♀, UMCRCPxcl–12.

Identification. Integument dark burnished red, with a weak greenish sheen. Prothorax with narrow band towards side of anterior margin, two elongated spots on both sides of middle of disc, and thick patches in lateroventral sides. Each elytron with three subbasal patches, one small subcircular patch just below or, at times, in between middle subbasal patch and lateral patch, median transverse band, antemedian stripe on lateral margin, postmedian subsutural stripe, lateral margin stripe, narrow elliptical stripe between subsutural and sutural patches, postmedian elliptical patch along suture, subapical elliptical patch along suture, oblique reniform subapical patch, and a narrow elliptical subapical spot near lateral margin.

Endemism and distribution. A Mindanao endemic. Davao City.

Remarks. This species was collected in mixed secondary forests and found on leaves and stems of *Procris urdanetensis* Elmer (Urticaceae), a Philippine endemic, and *Elatostema* sp. (Urticaceae).

Discussion

Among our sampling sites, Marilog District was found to have the most species-rich and diverse pachyrhynchine

fauna, with 288 specimens collected belonging to 23 species, including six *Pachyrhynchus* species and 17 *Metapocyrtus*. This is followed by Catigan, Toril, with 233 specimens and 17 species (five *Pachyrhynchus* and 12 *Metapocyrtus*). The third richest site was Sicao Village, where 181 specimens were collected belonging to 15 species (five *Pachyrhynchus*, and 10 *Metapocyrtus*). The duration of the sampling, as well as the woodland habitats at Marilog, Catigan and Sicao Village are factors favoring the greater presence of species. Among the areas sampled, UM Matina and Shrine Hills Matina had the fewest species at one each. Since *Pachyrhynchini* are generally associated with forested habitats, the continuous conversion of forests in Davao City to farmland, resorts, and human habitation is a threat to their populations.

Among the two genera, *Metapocyrtus* species seem to have higher adaptability and can thrive in anthropized areas, while *Pachyrhynchus* are restricted to forested habitats. Among the *Metapocyrtus* species, *M. adspersus*, *M. apoensis*, and *M. bituberosus* can thrive in green pockets in the downtown area of Davao City, such as the University of Mindanao, Matina campus, and in Shrine Hills Matina. Other species that can withstand anthropogenic disturbances are several other *Metapocyrtus* species, such as *M. lineaticollis* and *M. clemensi*. These species were documented in secondary forests of Baguio District, Calinan, and Matina. Except for UM Matina, the areas in Baguio District and Calinan are adjacent to mountainous ecosystems. The rest of the species of the genus *Pachyrhynchus* were documented only in intact and semi-intact secondary forest as well as along forest edges. Despite the conversion of many forest habitats into banana plantations, resorts, and human habitation, the presence of green pockets enabled some species to thrive. This is especially emphasized with the discovery of *M. (Orthocyrtus) davaoensis*, *M. (Metapocyrtus) ged*, and *P. obumanuvu* in a unique habitat in Carmen Baguio District, a bottleneck between agricultural land and secondary forests.

Other than anthropization, elevation is an important factor in *Pachyrhynchini* species richness, abundance, and distribution. *Metapocyrtus* species documented in lowlands at approximately 20–100 m a.s.l. include *M. adspersus*, *M. apoensis*, and *M. bituberosos*. All other species were documented at much higher elevations ranging from 450 m a.s.l. in Calinan to 1,330 m a.s.l. in Marilog District. *Metapocyrtus lineaticollis* and *M. clemensi* were recorded at around 500m a.s.l. while *Pachyrhynchus* species were collected above 800 m a.s.l. This is consistent with the findings of Cabras et al. (2017), who noted that the higher-elevation preference of *Pachyrhynchus* species on Mount Apo, S. Cotabato, and Mount Kiamo, Bukidnon. *Pachyrhynchini* thrive in good forest habitats at higher elevations. In Davao City, we note that species richness and diversity increase with increased elevation; there is a positive linear relationship between elevation and species richness (Figs. 4, 5). However, as

we did not sample above 1400 m a.s.l., we cannot extend this trend of species richness and abundance above that elevation.

The species of *Pachyrhynchini* documented in Davao City were collected from various macrohabitats such as shrubs and tree trunks near the creeks, streams, forest edges, mountain ridge, and along human trails inside closed and semi-open forests. Although several *Pachyrhynchus* species such as *P. speciosus* and *P. pseudamabilis* were documented in areas adjacent to farms and resorts, these areas usually had thick vegetation nearby. Of note, we did not find *Pachyrhynchus* species in areas with high anthropization, which is in contrast to *Metapocyrtus* species. Generally, the collection of *Pachyrhynchini* is better in open areas such as on forest edges and along ridges. Only a few of the *Pachyrhynchus* species were collected in shrubs in the understory of forests. This may be attributed to the preference of pachyrhynchines to bask in the sun, which make them difficult to find in the dense forest understory.

Many of the *Pachyrhynchini* species were collected on leaves, branches, and trunks of the plants from the families Melastomataceae, Asteraceae, Malvaceae, Apocynaceae, Fagaceae, Balsaminaceae, Piperaceae, Rutaceae, and Urticaceae, among others. *Metapocyrtus* are more versatile in their plant associations and seem not to be plant specific. As for *Pachyrhynchus*, a strong association has been observed with plants from the families Fagaceae and Melastomatacea, such as *Medinilla* spp. and *Melastoma* spp. Among the plants with the greatest number of *Pachyrhynchus* associations are *Melastoma malabathricum* (Melastomataceae), *Medinilla cumingii* (Melastomataceae), and *Lithocarpus boholensis* (Fagaceae), which all are native to the Philippines, and *Medinilla cumingii* and *Lithocarpus boholensis*, which are endemic to the country. The association of endemic weevils to endemic and native plants was previously noted by Schultze (1923). However, several species of *Pachyrhynchus*, such as *P. miltoni*, *P. speciosus*, and *P. pseudamabilis* were also found on *Theobroma cacao* (Malvaceae) which is a species introduced to the Philippines. Previous observations have also noted the feeding preferences of *Pachyrhynchus* species (Cabras 2021; Cabras et al. 2021c). Cacao has been associated with other *Pachyrhynchini*, such as *Pachyrhynchus moniliferus* Germar, 1824, whose larvae feed on its fruit (Kayashima 1940), and *Pantorhytes* spp. who bore into Cacao trunks, causing its eventual demise (Gressitt 1966), as well as *Pachyrhynchus reticulatus*, whose specimens were collected on cacao plants (Cabras 2021). Whether *Pachyrhynchus* feed on the plants is still to be determined.

Pachyrhynchus species were often not found feeding in the wild and were only documented copulating, perching, and climbing the branches and trunks of plants. *Metapocyrtus*, on the other hand, were mostly loose and documented on any plant; however, some species such as *M. adspersus*, *M. apoensis*, and *M. bituberosus* were particularly found to be feeding on the flowers of

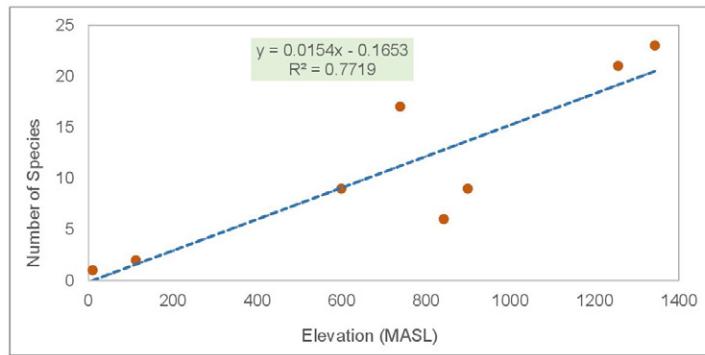


Figure 4. Linear relationship between elevation and number of species.

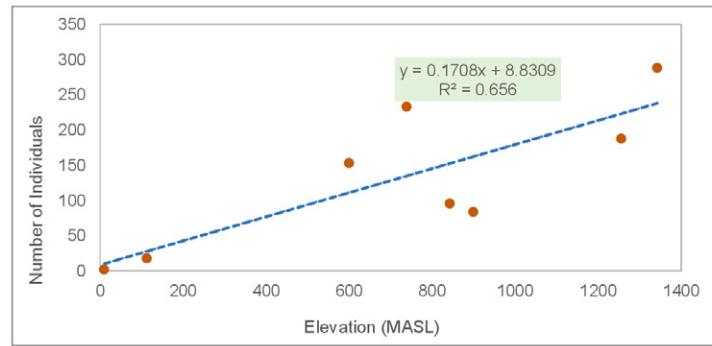


Figure 5. Linear relationship between elevation and number of individuals.

Melastoma malabathricum. It is noteworthy that *Pachyrhynchus* species, especially *P. miltoni* and *P. pseudamabilis*, were documented on the invasive *Piper aduncum* (Piperaceae).

Although several species of Pachyrhynchini are considered pests, little is known on the mode of infestation of these species especially for the island-endemic species in Mindanao. The only records so far of *Pachyrhynchus* infestation are the larvae of *P. moniliferus* which feed on the fruit of *Theobroma cacao* (Kayashima 1940), and larvae of *P. infernalis* Fairmaire, 1879 which feed on the xylem of *Mangifera indica* L. (Anacardiaceae), causing the tree to weaken and even wither (Ōshiro 1991). In Papua New Guinea, *Pantorhytes*, which are also members of the same tribe and native to the Papuan region, are already considered as serious pests to *T. cacao* (Gressitt 1966). However, in the Philippines, there is still scarcity of studies on *Pachyrhynchus* and *Metapocyrtus* as serious pests in agriculture.

Most of the land area of Davao City and other cities in the Philippines is still entomologically unexplored. With the discovery of ten new species of Pachyrhynchini in Davao City in the last five years, the opportunity for discovering new species not only in Pachyrhynchini in Davao City is very high. Endemic and rare pachyrhynchine species of thrive in high-elevation areas with good remaining vegetation; thus, the continuous conversion of forests for human habitation and agricultural purposes poses a threat to their continued existence. The high species richness, diversity, and endemism in selected areas in Davao City, particularly in the remaining forest

patches, call for immediate conservation measures of these priceless species.

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Authors' Contributions

Conceptualization: AAC, MNDM. Data curation: ELP, MJP, CT. Formal analysis: AAC, MNDM, RC. Methodology: MJP, CT, ELP. Resources: CT, TS. Software: TS, CT, ELP, RC. Supervision: AAC, MNDM, AR. Validation: AR. Writing – original draft: AAC. Writing – review and editing: MNDM.

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New species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from the Luzon Island, Philippines

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Rukmane-Bārbale A. 2022. New species of the genus *Pachyrhynchus* Germar, 1824 (Coleoptera: Curculionidae: Pachyrhynchini) from the Luzon Island, Philippines. *Baltic J. Coleopterol.*, 22(2): 433–436.

A new species of the genus *Pachyrhynchus* Germar, 1824 from the Luzon Island, Barlig, Bontoc, Philippines is described and illustrated: *P. subpalidius* sp. nov.

Key words: Coleoptera, Curculionidae, Pachyrhynchini, *Pachyrhynchus*, taxonomy, Philippines, fauna, Luzon Island.

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INTRODUCTION

The genus *Pachyrhynchus* Germar, 1824 is currently represented in Oriental region by 171 species, with 94% distributed on Philippines (Rukmane-Bārbale & Cabras, 2021). Considering recent descriptions of new taxons (Yoshitake, 2019a, 2019b), Luzon Island is inhabitet by 79 species which is 46% of all species number within the genus *Pachyrhynchus*.

During my research on genus *Pachyrhynchus*, I had an oportunity to observe new weevil material from Barlig, Bontoc which is part of Mountain Province on the North of the Luzon Island. The specimens were similar to *P. inclitus* Pascoe, 1871, but after carefull examination I concluded, that species is new to science. Description, photos and detailed differential analyses is 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, subesquently 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.

***Pachyrhynchus subpalidius* sp. nov.**

(Fig. 1, 2)

Type material. Holotype, male: “PHILIPPI-NES / Luzon, Barlig, Bontoc / IV. 2019 / local collector leg.” (white rectangular label, printed); “HOLOTYPE / male / *Pachyrhynchus subpalidius* / Rukmane-Bārbale 2022 / det. Rukmane-Bārbale 2022” (red rectangular label, printed) (DUBC).

Paratypes (1♂, 2♀): “PHILIPPINES / Luzon, Barlig, Bontoc / IV. 2019 / local collector leg.” (1♂, 1♀) // “PHILIPPINES / Luzon, Barlig, Bontoc / V. 2020 / local collector leg.” (white rectangular label, printed); all with the following red printed label: “PARATYPE / *Pachyrhynchus subpalidius* / Rukmane-Bārbale 2022 / det. Rukmane-Bārbale 2022” (DUBC).

Description. Male. Measurements: LB: 13.2-14.1 (holotype 13.2, mean 13.65); LP: 4.2-4.3 (holotype 4.2, mean 4.25); LE: 9.0-9.6 (holotype 9.0, mean 9.3); LR: 2.3 (holotype 2.3, mean 2.3); WP: 4.7-4.9 (holotype 4.7, mean 4.8); WE: 6.1-6.2 (holotype 6.1, mean 6.15); WR: 2.2 (holotype 2.2, mean 2.2). N=2 for all measurements. Dorsal habitus as shown in Fig.1A.

Body smaragd green, strongly shiny on most except elytra and underside with weaker lustre; markings of pale green round to recumbent scales on elytra, pronotum, rostrum, femur and underside.

Head subovate, nearly smooth, with light pubescence, without puncture; forehead bulged dorsally, 2.5 times as wide as eye width; eyes small, slightly prominent from the outline of the head, peak just in the middle; genae with patch of pale green scales; rostrum with pubescence at apical half, nearly straight in dorsal contour, with moderate rectangular impression at apical part, slightly bulging at basal part; patch of scale dorsally from the middle of rostrum to base of fore-

head; lateral part with triangular patch of scales at apical part; antennal scape with long light hairs at apical half, without hairs at basal half; segment I 1.5 times longer than II, segments II to VII subequal, gradually increasing in length in apical direction; nearly same length and width, LR/WR: 1.05.

Prothorax subspherical, wider than long, WP/LP 1.12, nearly smooth, with the following markings of pale green scales: 1) transverse line just before the middle from one latero-ventral part to other; 2) large, irregular ventral patch; in dorsal contour widest just before the middle, in lateral contour slightly bulged just before the middle.

Elytra sub-lanceolate, smooth, without expressed intervals of puncture rows, with slight pubescence in all length; very slightly punctured; widest in the middle; LE/WE 1.48, each elytron with the following scaly markings: 1) transverse line of scales at medial part from one lateral margin to other; 2) two longitudinal patches from subbasal part to basal 1/2, each patch wide at base and narrows in apical direction, first patch near suture, second at dorso-lateral part; 3) solid longitudinal line along lateral margin; 4) longitudinal line from apical 1/2 to apex along interval III; wider than prothorax, WE/WP: 1.3; more than two times as long as prothorax, LE/LP: 2.14.

Each femora with fine patch of scales at apical part just before the middle, patch circumscribes femora as a solid line; femora smooth, without pubescence, without pubescence, tibia with long light hairs along internal margin.

Male genitalia as shown in Fig. 2A-D.

Female. Measurements: LB: 13.6-14.2 (mean 13.9); LP: 3.7-3.9 (mean 3.8); LE: 9.9-10.1 (mean 10.0); LR: 2.0-2.1 (mean 2.05); WP: 4.1-4.7 (mean 4.4); WE: 7.0-7.1 (mean 7.05); WR: 2.3 (mean 2.3). N=2 for all measurements. Elytra significantly wider, apex more strongly extended, prothorax narrower, otherwise as in male; LE/WE 1.41, LE/LP: 2.63, WE/WP: 1.6. Dorsal habitus as shown in Fig. 1B. Genitalia as shown in Fig. 2E-F.

Differential analyses. By the body colour *P. subpalidius* sp. nov. is similar to *P. inclytus* Pascoe, 1871 from the Luzon Island. The new species can be easily distinguished by the following characters: 1) shape of elytra: elytra of *P. subpalidius* sp. nov. wider at base but narrower at widest point than in *P. inclytus*, 2) suture in *P. inclytus* with furrow while smooth in *P.*

subpalidius sp. nov.; 3) elytra of *P. subpalidius* sp. nov. matt, while shiny in *P. inclytus*; 4) different pronotal and elytral markings for both species.

Distribution. Luzon Island, Mountain Province.

Etymology. The new species is named after its pale green markings on the body.



Figure 1. *Pachyrhynchus subpalidius* sp. nov. **A** – Holotype male, dorsal view. **B** – paratype female, dorsal view.



Figure 2. **A–D.** Male genitalia of *Pachyrhynchus subpalidius* sp. nov. **A** – aedeagus in lateral view, **B** – aedeagus in dorsal view, **C** – sternite IX in dorsal view, **D** – tegmen; **E–F.** Female genitalia of *Pachyrhynchus subpalidius* sp. nov. **E** – sternite VIII in ventral view, **F** – ovipositor in dorsal view; scale bar 1mm.

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***Pachyrhynchus cebrem* sp. nov.: A New Species of Easter Egg Weevil (Curculionidae: Entiminae: Pachyrhynchini) from Davao De Oro, the Philippines**

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Abstract

A new Philippine weevil species of the genus *Pachyrhynchus* Germar, 1824 is described and illustrated from Mount Candalaga, Davao de Oro as *P. cebrem* sp. nov. Its habitat, ecology, and threats are also discussed.

Keywords: Coleoptera, curculionid, genitalia, Mount Candalaga, new species

Introduction

The genus *Pachyrhynchus* Germar, 1824 is composed of over 170 species with more or less 94% endemism in the Philippines (Yoshitake 2012; Bollino *et al.* 2017, 2020; Rukmane 2018; Cabras *et al.* 2021, 2022). With the recent discoveries, the total number of species discovered from Mindanao and the surrounding islands has reached 54 (Bollino 2022; Cabras *et al.* 2022). The genus belongs to the tribe Pachyrhynchini, which are flightless and colorful weevils mostly found in rich tropical vegetation and mountainous regions between 500 to 2000 m above sea level (Schultze 1923; Yap & Gapud 2007). Weevils of the tribe Pachyrhynchini can be easily distinguished by having an antennal scape not reaching the posterior margin of the eye, as well as having complete episternal sutures (Schultze 1923). Some species of the genus *Pachyrhynchus* are site endemics or restricted only in a certain mountain ecosystem, mostly dwelling in tropical rainforests having shrubby vegetation (Cabras *et al.* 2021, 2022). Several studies on the genus by local and international coleopterologists have discovered many new species including *P. obumanuvu* Cabras, Donato, Medina & Van Dam and *P. panumanon* Cabras & Medina from Mindanao (Rukmane 2017; Yoshitake 2019; Rukmane-Bārbale 2020; Bollino *et al.* 2020; Bollino 2022; Cabras *et al.* 2021, 2022).

Despite several explorations in the different forest and mountain ecosystems in the Philippines, there are still

several mountainous areas left to be explored and inhabited by many new *Pachyrhynchus* species. Our recent survey on Mount Candalaga, Davao de Oro revealed a new species, *Pachyrhynchus cebrem* sp. nov., that is described herein. Some aspects of its habitat, ecology, and threats of the new species are also discussed.

Materials and Methods

The new species was collected in the lowland montane secondary forest of Mount Candalaga, Davao de Oro, Philippines (1,220 masl; 01-02 May 2021) (Fig. 1). The mountain was sampled from the foot to the peak using transect, opportunistic and random sampling methods. The new species was collected along an established trail, mostly near the riverine ecosystem. Specimens of the new species were collected by handpicking whenever encountered during the diurnal (07:00 - 15:00H) period. Collected specimens were killed with ethyl acetate and then put in vials filled with 95% ethyl-alcohol for preservation.

Specimens were air-dried, mounted, and then examined and photographed using a DSLR Canon camera combined with a Labomed stereomicroscope. All images were processed using the Photoshop CS6 Portable software. Specimens and their genitalia were measured and extracted, respectively, following the methodology of Yoshitake (2011).

Abbreviations used in the measurements: **BL**- Body length (from the apical margin of pronotum to the apex of the elytra), **EL**- elytral length (from the level of the basal margins to the apex of the elytra), **WE**- maximum width across elytra, **PL**- pronotal length (from the base to apex along the midline), **WP**- maximum width across pronotum, **RL**- rostrum length and **WR**- maximum width of the rostrum. All measurements are shown in millimeters.

The type specimens were deposited in Central Mindanao University, University Museum (CMU-MZ), Zoological Section, Curculionidae collection.

Taxonomy

***Pachyrhynchus cebrem* Patano & Rukmane-Bārbale sp. nov.** (Figs. 2-3)

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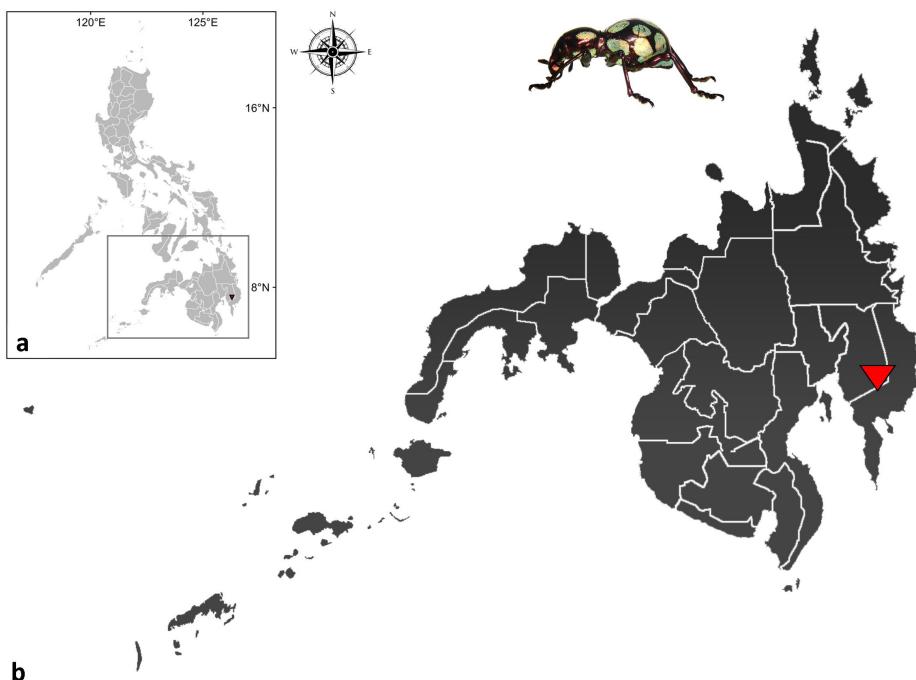


Figure 1. Map of the (a) Philippines and (b) Mindanao showing Mount Candalaga, Davao de Oro ($7^{\circ}18'55''\text{N}$, $126^{\circ}11'40''\text{E}$; 1,220 masl) where the specimens of the new species were collected (red triangle).

Material examined. Holotype, male (Figs. 2 A–B): PHILIPPINES: Mindanao, Mount Candalaga, Davao de Oro, 1,220 masl., 01–02 May 2021, coll. R.R. Patano Jr. and V.B. Amoroso (Central Mindanao University, University Museum, Zoological Section). Paratypes: 2 females, same data as the holotype (Central Mindanao University, University Museum, Zoological Section).

Diagnosis. *Pachyrhynchus cebrem* sp. nov. belongs to the *schoenherri* species group having the following morphological characters: glowing red integument; eyes weakly convex from outline of head; weakly convex, subglobular prothorax with strongly constricted base; patch of scales on both sides of pronotum medially; corresponding elytral patches (Bollino *et al.* 2017). As well, the new species shares the distribution range of the *schoenherri* species group which is the greater Mindanao Pleistocene Aggregate Island Complex (PAIC). *Pachyrhynchus schoenherri* species group includes the following species: *P. schoenherri* Waterhouse, 1841, *P. elegans* Waterhouse, 1842, *P. ardentius* Schultze, 1919, *P. corpulentus* Schultze, 1922, *P. apoensis* Yoshitake, 2012, *P. nitcisi* Rukmane & Barsevskis, 2016, *P. esperanza* Bollino, Sandel & Rukmane, 2017. The new species differs from rest of the *schoenherri* species group by having a unique pair of elongated, big patches on both sides of the pronotum, that are significantly bigger, from just before the middle to the subbasal part of the pronotum, as well as corresponding elytral patches that are significantly bigger and thicker compared to rest of the species.

Description. Measurements (n=3): BL: 16.1–16.5 (16.3), 16.5 (holotype). EL: 9.4–10.0 (9.7), (9.4 holotype). WE: 7.1–7.5 (7.4), (7.1 holotype). PL: 4.4–4.9 (4.7), (4.9 holotype). WP: 4.3–5.0 (4.7), (5.0 holotype). RL: 2.4–2.6 (2.5), (2.4 holotype). WR: 2.3–2.5 (2.4), (2.5 holotype).

Integument dark glowing red, body strongly shiny

except underside with weaker luster.

Body mostly finely punctured, more or less mingled with small hairs, with markings of glossy recumbent round to oval scales of gold, turquoise, and light-yellow color.

Head slightly glabrous, with minute hairs on ventral side and scaly markings of turquoise and gold, recumbent, and round to elliptic scales forming small spot in middle of forehead, and subelliptic patch on lateroventral parts behind eyes; forehead between eyes weakly depressed.

Rostrum slightly wider than long (WR/LR: 1.04), weakly depressed on basal half, apical half weakly bulging with nearly obscure sulcus towards margin, dorsum with very minute pubescence, lateral surface with patch of dense, shiny gold and turquoise recumbent scales, and long brown hairs at anterolateral margin.

Eyes small and weakly convex. Antenna strongly clavate, scape shorter than funicle, with fine minute brown hairs towards apex. Antennal scape smaller compared to funicle plus club. Funicle composed of seven segments. Segments I and II subequal (W: 0.55 mm), three times as long as wide. Last five segments subequal in size, three times as short as I and II (0.23 mm). Club of antennae almost one mm in length and 0.43 mm in width, subellipsoidal in shape, and almost covered with brown setae.

Pronotum subglobular, wider than long (LP/WP: 0.98) and widest at middle, weakly convex, and with gold, yellow, and turquoise recumbent round scales. Pronotum with following scaly markings of light yellow to gold and turquoise round scales: a) two big, elongated patches on both sides of middle of the disc, from just before middle to subbasal part of pronotum and b) patch of scales on lateral ventral stripe before coxa from subapical to subbasal part. Elytra suboval, with markings of gold, yellow, and turquoise recumbent round scales.

Each elytron with nine large elongated subequal patches of scales: 1) two patches at basal part, one from lateral margin

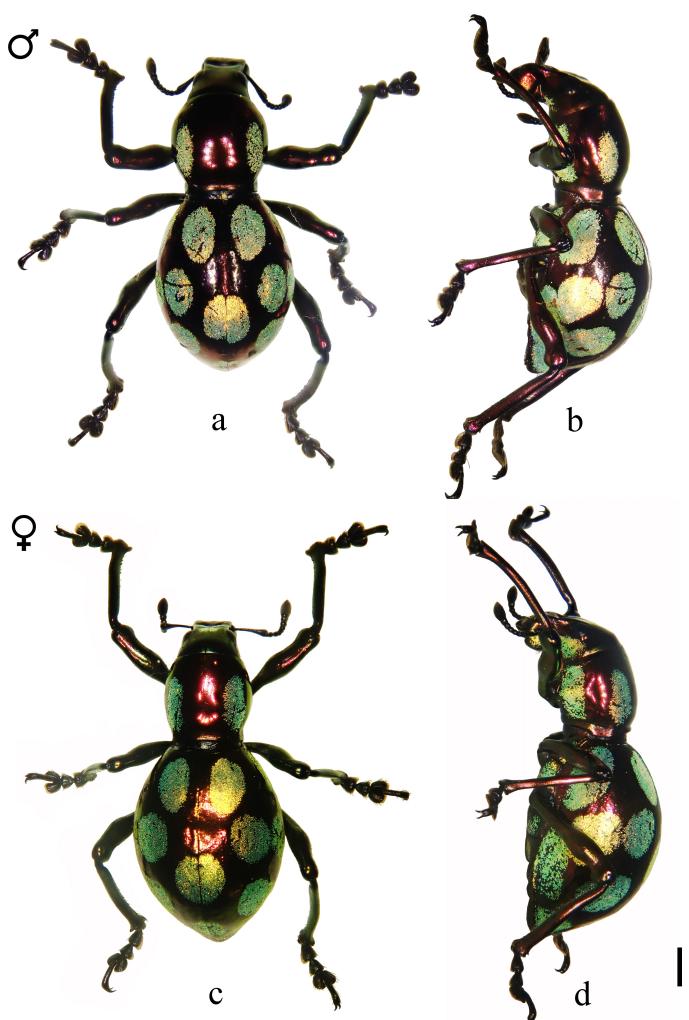


Figure 2. *Pachyrhynchus cebrem* sp. nov. habitus holotype male (a, b), female (c, d), dorsal (a, c) and lateral (b, d) views. Scale bar: 2 mm.



Figure 3. *Pachyrhynchus cebrem* sp. nov. male aedeagus in lateral (a), ventral (b), dorsal view (c).

to just before the middle, one from just after middle to middle of interval I; 2) three medial patches from lateral margin to interval II; 3) three colliding patches at apical part, from lateral margin to interval II; 4) sutural patch just after middle at apical part. Intervals of elytra smooth, with small punctures.

Legs coppery black with short white hairs strongly clavate femora. Tibiae armed with small serrated projections along internal margins with short setae. Fore and mid femora almost five mm long and 1.5 mm in width and thinly covered with short setae and hair-like scales along posterior margins. Tarsomeres coppery black.

Aedeagus short and curved in lateral view. Lamella short and wide, clearly pointed apically (Fig. 3).

Etymology. The new species is the product of a research project initiated and implemented by the CEBREM, or the Center for Biodiversity Research and Extension in Mindanao, after which the new species is named.

Habitat, Ecology, and Threats. The species was collected along the riverine ecosystems of Mount Candalaga characterized as a tropical lower montane forest. All specimens were observed in their natural habitat perching on stones covered with mosses that might have fallen from its food plant (*Piper aduncum* L.) (Fig. 4). Mt. Candalaga soars 2,100 masl and is characterized by three vegetation types namely: tropical lowland evergreen rainforest, tropical lower montane rainforest where the new species is collected, and tropical upper montane rainforest. Other than the new species described herein, the area is also a home for some endemic plants such as pitcher plants (*Nepenthes nebularum* G. Mansell & W. Suarez and *Nepenthes* sp.), tree ferns (*Sphaeropteris* spp.), *Amylotheca cleofei* Tandang, Galindon & Rob., *Medinilla* spp., *Oleandra* spp. and *Begonia* spp., and animals such as the Philippine Eagle (*Pithecophaga jefferyi* Ogilvie-Grant, 1896 – pers. comm.), Philippine Warty Pig (*Sus philippensis* Nehring, 1886), Asian Palm Civet Cat (*Paradoxurus hermaphroditus* Pallas, 1777) and some species of pygmy grasshoppers (*Platygavialidium krausii* Bolivar, 1887, *Scelimena spiculata* Stål, 1887, *Hirrius punctatus* Stål, 1877 and *Arulenus validispinus* Stål, 1877).

Unfortunately, Mount Candalaga is now under threat due to destructive anthropogenic activities in the area such as infrastructure development, timber poaching, and agricultural activities giving way to high-value crops. Conservation and protection initiatives of this rich mountain ecosystem must be of great priority by designating it as a component of the National Integrated Protected Area System (NIPAS) or any other effective measures.

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Figure 4. Habitat of *Pachyrhynchus cebrem* sp. nov., a tropical lower montane rainforest of Mount Candalaga, Davao de Oro (a) specifically along a riverine ecosystem (b). Photographed on May 1st 2021 by Ms. Analou T. Monajan of the Department of Environment and Natural Resources – Regional Strategic Communications and Initiatives Group (RSCIG-XI) and reproduced with permission.

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