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A New Genus and Two New Species of the Tribe Pachyrhynchini (Coleoptera: Curculionidae) from Palawan Island, the Philippines

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Abstract. *Expachyrhynchus* gen. nov. is established in the tribe Pachyrhynchini of the subfamily Entiminae for two new species from Palawan Island, the Philippines: *E. chloromaculatus* sp. nov., the type species, and *E. granulatus* sp. nov. This new genus is similar in general appearance to the genus *Pachyrhynchus* Germar, but differs from it mainly by having the uneven prothorax with irregularly convex interstices between strong punctures and the elytra with weakly arched dorsal contour and more or less granulate intervals. Illustrations of diagnostic characteristics of the genus are provided. *Expachyrhynchus chloromaculatus* possesses a deep subobtriangular rostral concavity and the weakly granulate elytral intervals, whereas in *E. granulatus* the rostral concavity is much shallower and the elytral intervals are more strongly granulate. A key to the species is provided, in addition to a diagnosis, habitus photographs, and illustrations of male genitalia and female terminalia for each species.

Key words: Taxonomy, Pachyrhynchini, new genus, new species, Palawan, *Pachyrhynchus*.

Introduction

The tribe Pachyrhynchini of the subfamily Entiminae is characterized by the following diagnostic characteristics of adults: 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; antennal scrobes lateral, curving downwards in front of eyes at sides of rostrum (Morimoto *et al.*, 2006). Presently, the Pachyrhynchini comprises 14 genera mainly from the Philippines (Alonso-Zarazaga & Lyal, 1999; Yap & Gapud, 2007). However, the generic classification of the tribe is apparently in need of revision, mainly due to the presence of a considerable number of undescribed species, not a few of which are unable to be applied to the current classification system of the tribe at higher levels (Yoshitake, unpublished data).

In the course of my taxonomic and inventory research of the Pachyrhynchini, I had an opportunity to examine specimens of two undetermined, morphologically similar pachyrhynchine species from Palawan Island, the Philippines. After careful examination, I concluded that both species sharing features of generic importance are new to science and cannot be assigned to the classification system of pachyrhynchine genera. In an attempt to improve our knowledge of the Pachyrhynchini, here I describe the two new species and establish a new genus for both of these species.

Materials and methods

This study was based on specimens deposited at the National Institute for Agro-Environmental Sciences, Tsukuba (NIAES). The methods used in this study were the same as those explained in Yoshitake (2011). The holotypes of new species described herein are preserved in the NIAES.

Taxonomy

Expachyrhynchus gen. nov.

Type species: *Expachyrhynchus chloromaculatus* sp. nov. (see description below).

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Diagnosis. Among 14 genera of the Pachyrhynchini, *Expachyrhynchus* shows a close resemblance to *Pachyrhynchus* Germar, 1824 by sharing the following characteristics of generic importance: rostrum bulging dorsally on apical half (Fig. 1), short antennal scape not reaching hind margin of eye (Fig. 4), and distinct metepisternal suture on entire length (Fig. 1). However, *Expachyrhynchus* can be clearly distinguished from *Pachyrhynchus* mainly by the uneven prothorax with transverse rugose sculpture and the weakly convex elytra with more or less deep striate punctures and granulate intervals (Figs. 8–13). In contrast, all species placed in *Pachyrhynchus* possess more or less smooth surface of prothorax and elytra, whose dorsal contour is strongly arched in varying degrees, neither with granules nor rugose sculpture (Schultze, 1923, 1924). Additionally, in *Expachyrhynchus* the upper margin of antennal scrobe is interrupted by a deep oblique groove (Fig. 1) and the suture between the ventrites I and II is entirely distinct (Fig. 7), whereas in *Pachyrhynchus* the antennal scrobe is complete and the ventrites I and II are subconnate on the disc. Furthermore, *Expachyrhynchus* is characterized also by the chaetotaxy of mandibles and prementum (Figs. 2, 3) and structures of legs (Figs. 5, 6).

Description. Body medium-sized. Forehead wider than eye width, flat and simple, lacking distinct groove or depression, neither convex nor sulcate along inner margin of each eye. Eyes hemispherically prominent from outline of head. Rostrum longer than wide; dorsal surface with fine transverse groove at base, with subobtriangular median depression on basal half, weakly bulging on apical half (Fig. 1), with sides gradually widened apicad, not constricted in basal part; dorsolateral edges rounded; dorsal contour of forehead and rostrum more or less discontinuous (Fig. 1); sides widened apically; lateral surface lacking longitudinal depression between eye and upper margin of antennal scrobe in profile; upper margins of antennal scrobes smooth, not carinate, each of which is interrupted in middle by deep oblique groove (Fig. 1); ventral surface with a pair of oblique grooves on median part, simple on sides, not sulcate; grooves approximated basally; interstice between grooves flattened; lower margins of antennal scrobes widely separated in entire length on ventral surface. Each mandible (Fig. 2) with seven to eight lateral setae, in addition to several short and minute hairs. Postmentum weakly declined apically toward prementum. Prementum (Fig. 3) subsided into oral cavity, flattened, with apical declivity, bearing a pair of setal patches on sides of median part, each of which is composed of three to four long setae. Antennae (Fig. 4) with scape short, not reaching hind margin of eye, nearly as long as funicle; club more or less short. Prothorax with basal margin nearly as wide as apical margin; subbasal constriction strong, but becoming thinner and indistinct dorsally (Fig. 1); subapical constriction weak, dorsally indistinct (Fig. 1); pronotum uneven, more or less rugosely punctured; each puncture with short hair; dorsal contour weakly convex (Fig. 1). Elytra oblong-ovate, dorsally weakly convex (Fig. 1), more or less coarsely striate-punctured, simple laterally, not depressed above hind coxae; basal margin subtruncate, more than half as wide as elytra, slightly prominent dorsally; intervals convex, more or less granulate; apical declivity gradual, uniform, lacking projection in both sexes; internal margins of apices simple, not fringed with dense golden hairs. Legs as illustrated (Figs. 5, 6). Procoxae narrowly separated. Mesocoxae moderately separated. Hind femora simple in both sexes, not concave basally on internal surfaces. Tibiae at most finely serrate along internal margins, not denticulate on hind legs, mucronate apically on all legs (Fig. 5). Tarsal segment II simple, not sharply projected at apical corners (Fig. 6). Metepisternal suture distinct in entire length (Fig. 1). Underside of thorax and abdomen as illustrated (Fig. 7). Intercoxal portion of prosternum entirely moderately convex. Apical margin of prosternum gently emarginate, not angulate. Mesosternal process moderately convex, higher than intercoxal portion of metasternum. Metasternum short on disc, nearly as long as mesosternal process; intercoxal portion weakly convex along basal margin. Ventrites I and II simple, not bulging laterally, divided by a distinct suture on entire width. Ventrites III and IV normal, well-separated, and unarmed in both sexes. Ventrite V round at apex in both sexes.

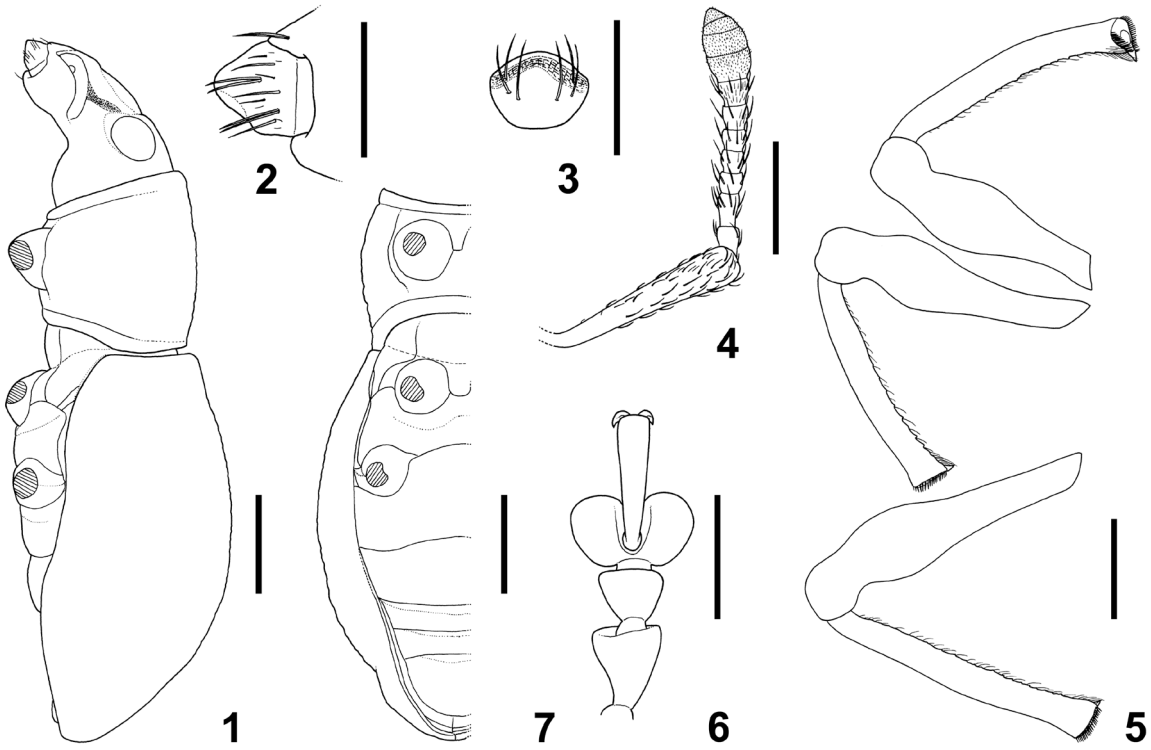
Distribution. Philippines.

Etymology. The generic name, which is masculine in gender, is a combination of the Latin prefix *ex-* meaning "out of" and the name of its allied genus, denoting its similarity to *Pachyrhynchus*.

Expachyrhynchus chloromaculatus sp. nov.
(Figs. 1–11, 14–22)

Diagnosis. Expachyrhynchus chloromaculatus is characterized mainly by the strongly prominent eyes from the outline of head, slender antennae, rostum with a deep subobtriangular concavity on basal half, weakly granulate elytral intervals, and slender legs.

Description. Male. Dimensions: LB: 10.00–11.43 (holotype 10.79; mean 10.66). LR: 1.85–2.05 (holotype 2.05; mean 1.98). WR: 1.65–1.80 (holotype 1.70; mean 1.71). LP: 3.20–3.50 (holotype 3.35; mean 3.33). WP: 3.25–3.55 (holotype 3.50; mean 3.43). LE: 7.00–8.00

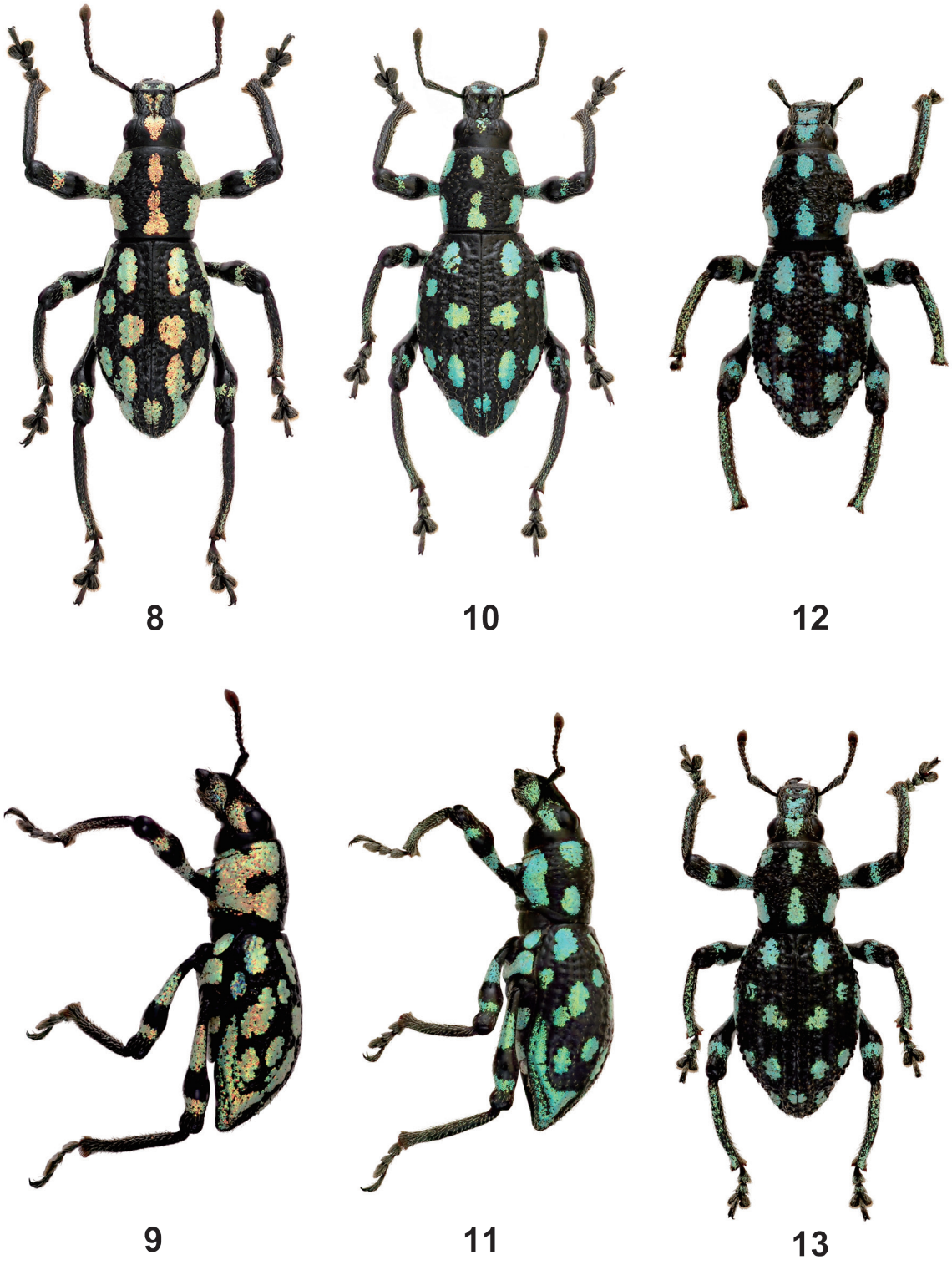


Figs. 1-7. Diagnostic characteristics of *Expachyrhynchus* (*E. chloromaculatus* sp. nov., male). – 1, Body excluding appendages except coxae, in lateral view; 2, left mandible and apex of rostrum, in lateral view; 3, prementum, in ventral view; 4, right antenna, in dorsal view; 5, right legs excluding tarsi, in ventral view; 6, right fore tarsus, in dorsal view; 7, underside excluding head, in ventral view. Scale: 2.00 mm for 1, 5, 7; 1.00 mm for 2–4, 6.

(holotype 7.56; mean 7.44). WE: 4.40–5.30 (holotype 4.45; mean 4.68). N = 4 for all measurements. Dorsal and lateral habitus as shown in Figs. 8, 9.

Integument black. Body surface mostly moderately shiny except head and underside with weaker luster.

Body mostly sparsely clothed with fine short hairs, with glossy pale green markings of recumbent round scales; scaly markings often connected with each other in varying degrees. Forehead with elliptic scaly patch along midline. Antennal scape rather densely covered with hairs. Rostrum minutely pubescent on apical half; basal concavity with a pair of oblique scaly patches along sides; apical bulge with a pair of oblique elliptic scaly patches; lateroventral parts except antennal scrobes densely covered with general scales, mingled with linear to hair-like scales. Prothorax with two trios of elliptic patches, one on basal and another on apical part of pronotum, and with two broad longitudinal stripes, each of which extends from subapical constriction to apical margin of lateroventral part. Each elytron with the following twelve scaly markings: 1) elliptic patch on basal part between striae II and III, 2) oblique elliptic patch on humerus, 3) small circular patch on subbasal part between striae IV and V, 4) small oblique elliptic patch on subbasal part along lateral margin, 5) circular patch on median part between striae I and III, 6) oblique elliptic patch extending from subbasal to median parts between striae V and VIII, 7) small circular patch on postmedian part between striae IV and V, 8) elliptic patch on subbasal part between striae II and III, 9) elliptic patch on subapical part between striae VI and VII, 10) marginal stripe extending from postmedian to subapical parts, 11) short sutural stripe on apical declivity, and 12) subtriangular patch on apical part between striae II and III. Anterior parts of fore coxae covered with general scales, mingled with short light-colored hairs. Fore femora rather densely covered with general scales and short hairs basally along anterior margins, each with scaly bands on subbasal and subapical parts, respectively; subbasal band much wider than subapical one. Mid and hind femora rather densely covered with general scales and short hairs basally along posterior margins, each with scaly bands on subbasal and subapical parts, respectively; subbasal band much wider than subapical one. Tibiae moderately clothed with hairs and hair-like scales; each tibia fringed with



Figs. 8-13. Dorsal and lateral habitus of *Expachyrhynchus* spp. – 8, 9, *Expachyrhynchus chloromaculatus* sp. nov., holotype male; 10, 11, ditto, paratype female; 12, *E. granulatus* sp. nov., holotype male; 13, ditto, paratype female. 8, 10, 12, 13, Dorsal habitus; 9, 11, lateral habitus.

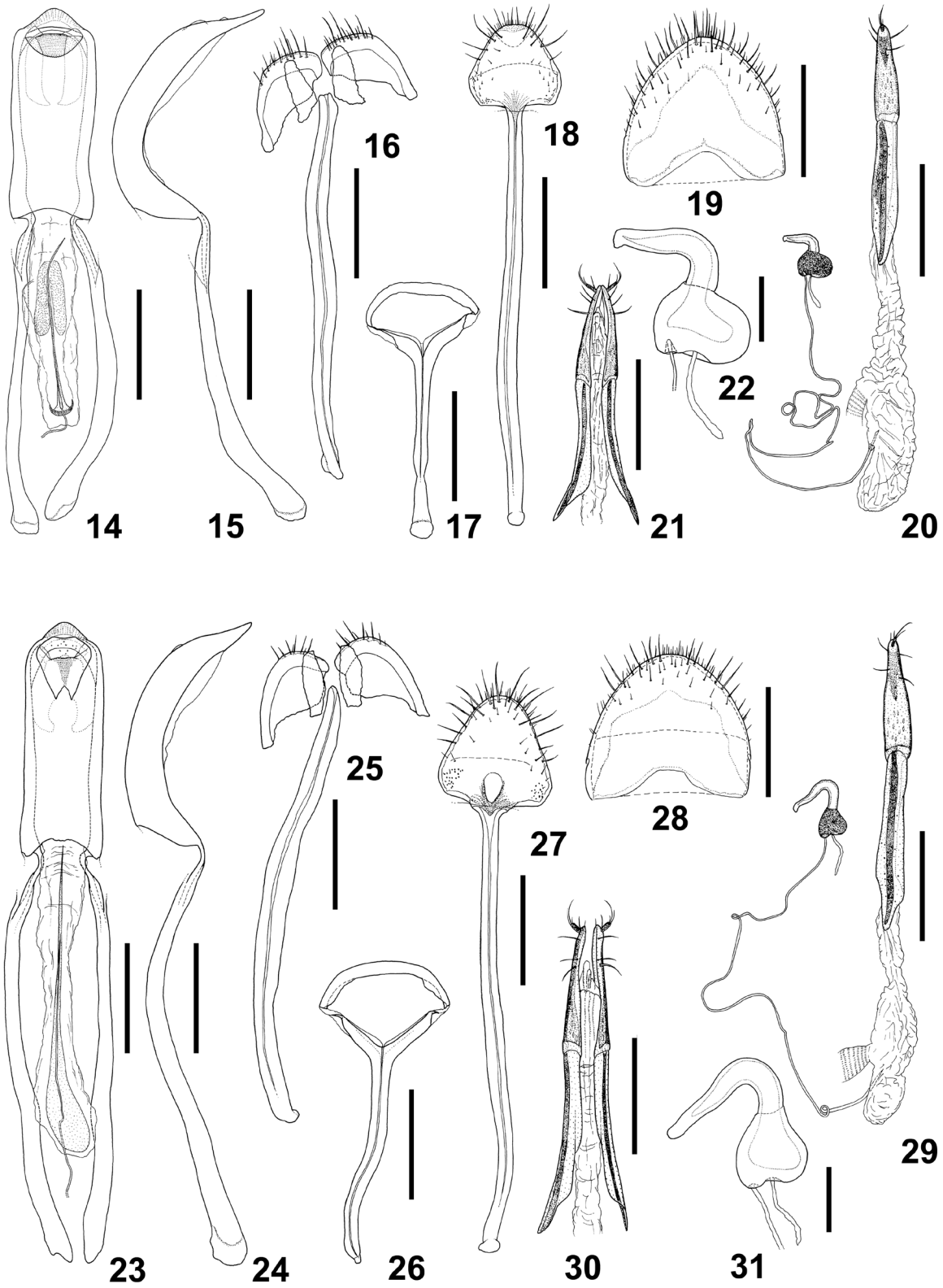
denser hairs along internal margin; vestiture denser on apical parts, mingled with general scales. Prosternum mostly densely covered with general scales. Intercoxal part of mesosternum densely covered with general scales except apex. Metasternum covered with general scales except basal margin; scales become denser on sides. Ventrite I often covered with general scales on intercoxal part, with a pair of large scaly patches on sides along apical margin. Ventrite II with a pair of transverse scaly patches on sides along apical margin. Ventrites III and IV mostly covered with general scales; scales often become sparser. Ventrite V more densely covered with hairs, hair-like scales, and general scales except on lateral depressions.

Head subopaque; forehead weakly punctured, nearly three times as wide as eye width; eyes relatively large, strongly prominent from outline of head. Antennae with scape relatively slender, nearly as long as funicle, moderately clavate; funicular segment I nearly twice as long as wide, slightly longer than II; segment II 1.5 times as long as wide, 1.5 times as long as III; segments III–V subequal in length and width, nearly as long as wide, slightly shorter and narrower than VI; segment VI nearly as long as wide, nearly as long as but slightly narrower than VII; segment VII slightly wider than long; club subellipsoidal, nearly 1.7 times as long as wide, nearly as long as funicular segments V to VII combined. Rostrum slightly longer than wide, LR/WR 1.12–1.21; dorsum subopaque, rugosely shallowly punctured, and with deep subobtriangular concavity on basal half; apical bulge weak, flattish dorsally, with a pair of oblique elliptic depressions on middle, with sparse small punctures, strongly shiny; dorsal contour of forehead and rostrum slightly discontinuous; dorsal contour of rostrum weakly arched in basal half, then weakly raised at basal half, and finally gently declined to apex; sides moderately widened apically. Prothorax subopaque, nearly as long as wide, WP/LP 1.01–1.05; dorsum moderately irregularly punctured, weakly uneven due to rugosely convex interstices between punctures; dorsal contour highest just before middle; sides gradually dilated from subbasal constriction, widest before middle, then gradually convergent apicad; basal and apical margins subtruncate; subbasal groove obscure dorsally. Elytra shiny, subellipsoidal, LE/WE 1.51–1.70, wider than prothorax, WE/WP 1.27–1.49, more than twice as long as prothorax, LE/LP 2.19–2.29; striae composed of moderate punctures in depth; intervals weakly granulate; dorsal contour highest just before middle; sides gradually dilated from base, widest just before middle, then more strongly narrowed to and angulate just behind strong subapical constrictions, and finally strongly straightly convergent to apices. Legs slender; femora strongly clavate; tibiae finely serrate along internal margins, weakly incurved apically. Metasternum and ventrite I shallowly conjointly depressed on disc. Venter opaque, with sparse small punctures; ventrites II to IV flattish on disc; ventrite V more densely punctured, depressed on basal half along lateral margins, widely rounded at apex. Genitalia as illustrated (Figs. 14–17). Spiculum gastrale (Fig. 16) slender, nearly twice as long as aedeagal body, weakly curved leftward. Tegmen (Fig. 17) with slender apodeme, nearly 1.5 times as long as diameter of tegminal ring. Aedeagal body (Figs. 14, 15) stout, in lateral view, strongly curved ventrally in subbasal part and gradually attenuate in apical 1/6; sides clearly bisinuate, with rather strong subbasal constriction, suddenly rapidly narrowed to subapical constriction at apical 1/6, then rather strongly narrowed toward apex, and finally rounded at apex; aedeagal apodemes slender, nearly 1.5 times as long as aedeagal body. Endophallus (Fig. 14) bearing flagellum guide in basal half and longitudinal subdimidiate spiculate field in subbasal part.

Female. Dimensions: LB: 11.11–12.06 (mean 11.61). LR: 1.85–2.10 (mean 2.00). WR: 1.70–1.80 (mean 1.78). LP: 3.35–3.50 (mean 3.40). WP: 3.40–3.65 (mean 3.53). LE: 8.00–8.60 (mean 8.35). WE: 5.25–5.60 (mean 5.41). N = 4 for all measurements. Dorsal and lateral habitus as shown in Figs. 10, 11.

Rostrum LR/WR 1.09–1.17. Prothorax WP/LP 1.01–1.07. Elytra slightly wider, LE/WE 1.52–1.57, much wider than prothorax, WE/WP 1.52–1.56, more strongly elongate apically, LE/LP 2.39–2.50, and more acutely narrowed to apices behind subapical constrictions. Metasternum simple, not depressed on disc. Venterites I and II slightly inflated. Ventrite V more strongly convergent toward apex. Terminalia as illustrated (Figs. 18–22). Spermatheca (Fig. 22) with cornu long, weakly attenuate; collum moderately convex; ramus very strongly convex. Otherwise, essentially as in males.

Type material. Holotype male (NIAES Type Specimen Code No. COL-284), "1989. August / Palawan. Is / «Philippines»" (typed on a white card), "T. Kumazawa / Collection" (typed on a white card), [HOLOTYPE] Male / *Expachyrhynchus chloromaculatus* / Yoshitake, 2013 / Det. Hiraku Yoshitake, 2012" (typed on a red card). Paratypes (8 exs.). PHILIPPINES: PALAWAN ISLAND. 1 male and 3 females, same data as the holotype (Specimen Nos. 24-0474866~24-0474869, NIAES). Brookes Point, S. Palawan: 1 male, ii. 1987, native collector leg. (Specimen No. 24-0474870, NIAES); 1 male, vi. 2001, native collector leg. (Specimen No. 24-0474871, NIAES). 1 female, near Quezon, S. Palawan, 30. v. 1996, native



Figs. 14-31. Male genitalia and female terminalia of *Expachyrhynchus* spp. – 14–17, *Expachyrhynchus chloromaculatus* sp. nov., holotype male; 18–22, ditto, paratype female; 23–26, *E. granulatus* sp. nov., holotype male; 27–31, ditto, paratype female. 14, 23, Aedeagus in dorsal view; 15, 24, aedeagus in lateral view; 16, 25, sternite IX in dorsal view; 17, 26, tegmen in dorsal view; 18, 27, sternite VIII in ventral view; 19, 28, tergite VIII in dorsal view; 20, 29, female genitalia in lateral view; 21, 30, apex of ovipositor in dorsal view; 22, 31, spermatheca. Scale: 1.00 mm for 14-21, 23-30; 0.2 mm for 22, 31.

collector leg. (Specimen No. 24-0474872, NIAES). 1 female, Mt. Mantalingahan, Rizal, S. Palawan, v. 2011, native collector leg. (Specimen No. 24-0474873, NIAES).

Distribution. Philippines (Palawan Island).

Etymology. The new species is named after the remarkable patches of metallic green scales on the body surface.

Expachyrhynchus granulatus sp. nov.
(Figs. 12, 13, 23–31)

Diagnosis. Expachyrhynchus granulatus is very similar in general appearance to *E. chloromaculatus*. However, *E. granulatus* is readily distinguishable from *E. chloromaculatus* by the following features: more weakly convex eyes, distinct transverse groove between forehead and rostrum, wider rostrum with a shallower basal concavity, shorter antennae, more uneven pronotum and elytra, stouter legs, vetrite I with rugose surface, and ventrites III to V with coarser and denser punctures. In addition, the configurations of male aedeagal body and female spermatheca of *E. granulatus* are remarkably different from those of *E. chloromaculatus* (Figs. 23, 24, 31).

Description. Male. Dimensions: LB: 0.98. LR: 1.70. WR: 1.70. LP: 3.30. WP: 3.30. LE: 6.65. WE: 4.35. N = 1 for all measurements. Dorsal habitus as shown in Fig. 12.

Body clothed with stouter hairs. Forehead fringed with short recumbent hairs along upper margin of each eye. Basal concavity of rostrum entirely covered with general scales. Elytra with smaller eleven scaly markings, lacking patch on subbasal part along lateral margin. Tibiae more widely clothed with general scales. Ventrites III to V more sparsely covered with general scales.

Forehead more strongly punctured. Eyes more weakly prominent. Antennae with scape relatively short and stout, much shorter than funicle, strongly clavate; funicle relatively stout; funicular segment I nearly 1.5 times as long as wide; segment II 1.4 times as long as wide; segment VI nearly as long as but narrower than VII; segment VII much wider than long; club subovoid, much shorter, nearly 1.3 times as long as wide, slightly shorter than funicular segments V to VII combined. Rostrum stouter, as long as wide, LR/WR 1.00, entirely subopaque, more strongly punctured; basal groove distinct, shallowly arched posteriad; dorsal contour of forehead and rostrum more strongly discontinuous; dorsal contour flattish in basal half, then more weakly bulging at basal half, and finally more acutely declined to apex. Prothorax as long as wide, WP/LP 1.00; subbasal groove more distinct dorsally. Elytra LE/WE 1.53, WE/WP 1.32, slightly shorter, nearly twice as long as prothorax, LE/LP 2.02; striae composed of deeper punctures; intervals more strongly granulate; sides roundly convergent to apices behind subapical constrictions. Tibiae barely serrate along internal margins. Venterite I rugose. Ventrites III to V with coarser and denser punctures. Lateral depressions on ventrite V smaller and shallower. Genitalia as illustrated (Figs. 23–26). Aedeagal body (Figs. 23, 24) narrower, in lateral view, more weakly curved ventrally and much thicker in apical part; sides barely bisinuate, with weaker subbasal constriction, more gently narrowed to subapical constriction. Aedeagal apodemes slightly longer, more than 1.7 times as long as aedeagal body. Endophallus (Fig. 23) lacking spiculate field; flagellum guide surrounded by indistinct longitudinal laminate sclerite. Otherwise, essentially as in *E. chloromaculatus*.

Female. Dimensions: LB: 11.00–11.75. LR: 1.80–1.90. WR: 1.80–1.99. LP: 3.40–3.65. WP: 3.40–3.70. LE: 7.60–8.20. WE: 5.00–5.20. N = 2 for all measurements. Dorsal habitus as shown in Fig. 13.

Rostrum nearly as long as wide, LR/WR 0.95–1.00. Prothorax nearly as long as wide, WP/LP 1.00–1.01. Elytra wider, LE/WE 1.52–1.58, WE/WP 1.41–1.47, more strongly elongate apically, more than twice as long as prothorax, LE/LP 2.24–2.25. Venterites I and II slightly inflated. Ventrite V with deeper lateral depressions; sides more strongly convergent toward apex. Terminalia as illustrated (Figs. 27–31). Spermatheca (Fig. 31) with cornu much slenderer, more strongly attenuate; ramus less developed. Otherwise, essentially as in males.

Type material. Holotype male (NIAES Type Specimen Code No. COL-285), "Brookes Point / S. Palawan / Philippines / VI. 2001" (typed on a white card); "KAORU SAKAI / COLLECTION" (typed on a white card); "[HOLOTYPE] Male / *Expachyrhynchus* / *granulatus* / Yoshitake, 2013 / Det. Hiraku Yoshitake, 2012" (typed on a red card). Paratypes (2 exs.). PHILIPPINES: PALAWAN ISLAND. 1 female, same data as the holotype (Specimen No. 24-0474874, NIAES). 1 female, viii. 1989, native collector leg. (Specimen No. 24-0474875, NIAES; without further locality data).

Distribution. Philippines (Palawan Island).

Etymology. This new species is named after the strongly granulate elytral intervals.

Note. Judging from the label data of the type series, *E. granulatus* is considered to occur sympatrically with *E. chloromaculatus* at least in Brookes Point, southern Palawan Island.

Key to species

1 (2) Rostrum with deep concavity on basal half. Eyes strongly prominent from outline of head. Antennae

slender, with subellipsoidal club. Elytra moderately striate-punctured, weakly granulate on intervals. Legs slender. ..... *E. chloromaculatus*
2 (1) Rostrum with shallow concavity on basal half. Eyes more weakly prominent from outline of head. Antennae shorter, with subovoid club. Elytra deeply striate-punctured, strongly granulate on intervals. Legs stout. .... *E. granulatus*

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