THREE NEW SPECIES OF THE GENUS *PACHYRHYNCHUS* GERMAR, 1824 FROM LUBANG ISLAND (PHILIPPINES) (CURCULIONIDAE: ENTIMINAE: PACHYRHYNCHINI)

Maurizio Bollino* and Franco Sandel**

* c/o Museo di Storia naturale del Salento, 73021 Calimera (Lecce), ITALY. E-mail: m.bollino@tin.it
** Via Fontanelle 30, 31050 Miane (Treviso), ITALY. E-mail: francosandel@libero.it

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ABSTRACT**:** In the present paper three new species of Pachyrhynchini Schoenherr, 1826 (Curculionidae: Entiminae) *Pachyrhynchus mohagani* n. sp., *P. tilikensis* n. sp., and *P. lubanganus* n. sp. from Lubang Island (Philippines) are described and habitus and genitalia are illustrated.

KEY WORDS: Philippines, Lubang I., *Pachyrhynchus*, PIAP.

After the contributes by Heller (1934) and Schultze (1934), our knowledge about Philippine members of the tribe Pachyrhynchini (Curculionidae: Entiminae) remained unchanged for nearly eighty years, except for few contributions given by Janczyk (1957; 1959). In the last few years only few more taxa have been described (Yoshitake, 2011, 2012). These new species all came from previously entomologically almost unexplored areas of Mindanao, confirming our own belief that several new taxa will be discovered as soon as new areas and new habitats will be sampled. No members of the tribe Pachyrhynchini have ever been recorded from Lubang island, so, when we received a small assortment of such beetles collected there, we were not surprised to find three new *Pachyrhynchus* that will be described hereinafter.

MATERIAL AND METHODS

This study was based on specimens deposited in the Museum für Tierkunde, Dresden, Germany (MTD), and in private collections of Maurizio Bollino, Lecce, Italy (MBLI) and Franco Sandel, Miane, Italy (CFS). Holotypes will be deposited in MTD.

External structures were observed under a Nikon SMZ745T stereoscopic microscope. Stacked digital habitus images were taken with a Nikon D90 digital camera and AF-S DX Micro NIKKOR 85mm f/3.5G ED VR lens, and processed using a licensed version of software Zerene Stacker 1.04. Images of anatomical details/genitalia were drawn by tracing photographic images of the single parts, and adding details by observation under stereomicroscope. All measurements are in mm. Label data are given verbatim, with slash sign parting lines.

Abbreviations

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

LE = length of the elytra, from the level of the basal margins to the apices of the clothed elytra

LP = length of the pronotum, 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

Taxonomy

Pachyrhynchus mohagani sp. nov.
(Figs. 1a-d, 2-8)

Holotype (male): Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, presently in MBLI, will be deposited in MTD.

Paratypes (1 male, 4 females): 3 females, Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, all in MBLI; 1 male, 1 female, Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, all in CFS.

Description.

Male. Holotype: LB: 11.25; LR: 1,55; WR: 1.50; LP: 3.65; WP: 4.15; LE: 7.10; WE: 5.60. Dorsal habitus as shown in Fig. 1, lateral habitus as shown in Fig. 2.

Integument of head, scape and funicular segments, prothorax, all femora, tibiae and tarsi black; elytra dark chestnut-brown. Very few scattered small, cobalt-blue recumbent scales on elytra, mostly along striae. Body surface strongly shiny except elytra and underside. Body subglabrous, with few glossy cobalt-blue recumbent round to elliptic scales. Rostrum nearly as long as wide (length/wide 1.1) very minutely pubescent on dorsum, with shallow obovate concavity on basal half, weakly bulging on apical half; apical bulge flattish dorsally, but faintly depressed in middle of basal half; dorsal contour of forehead and rostrum interrupted by a weak transverse groove; each side of rostrum covered with short hair-like scales on lateroventral part basad of antennal scrobe, covered with pale blue linear long hair-like scales on lateral part apicad of it, and furnished with long golden hairs near apex. Antennal scape short and stout, strongly clavate, slightly shorter than funicle; funicle relatively stout; club subellipsoidal, nearly twice as long as wide. Head glabrous, minutely and sparsely punctured; forehead with trace of furrow along midline, furrow deeper at base of rostrum; eyes relatively large, moderately prominent from outline of head. Prothorax subspherical (width/length 1.1), maximum transverse diameter just basad of middle, shiny, finely and sparsely punctured, without scales on disc; a patch of scattered cobalt-blue recumbent round scales on anterior portion of lateral edge. Elytra glabrous, each elytron with few scattered cobalt-blue round scales along lateral margin, mostly on anterior and median portions (Fig. 1d). Elytra broadly subobovate, convex dorsally, wider than prothorax (elytral/pronotal width 1.4), nearly twice as long as prothorax (elytral/pronotal length 1.9), dull due to irregular leathery wrinkles (Fig. 1c); dorsal convexity highest at posterior 3/5; sides gradually dilated from base, widest just before middle, then strongly narrowed to faint subapical constrictions, and then gently rounded at apices. Legs stout; femora rather strongly clavate; tibiae strongly latero-laterally flattened, serrate along internal margins, incurved apically, mucronate at apices; tibial mucrones well-developed on all legs. Anterior part of coxae with short light-coloured hairs. Femora with short light-coloured hairs near base, thinly covered by scattered short hairs, with hair-like scales along posterior margins, and a patch of pale blue hairs on anterior subapical part. Tibiae sparsely minutely pubescent;

each tibia fringed with long hairs along internal margin. Basisternum with few elliptical scales, and sternellum with a large scaly patch. Intercoxal part of mesosternum with few elliptical cobalt-blue scales. Venter subglabrous. Ventrite V truncate at apex. A large circular depression on disc of posterior half of metasternum and anterior half of ventrite I.

Genitalia as illustrated in Figs. 2-8. Spiculum gastrale (Fig. 4) slender, nearly twice as long as aedeagal body, strongly curved leftward. Aedeagal body (Figs. 2-3) stout, in lateral view moderately curved ventrally in the subbasal part, and gradually attenuated in the apical sixth in a narrow plate. In frontal vision (Fig. 2) little or barely sinuate in subbasal part, apical sixth moderately narrowed and then gradually so toward the conical apical plate. Aedeagal apodemes slender, nearly 1.6 times as long as aedeagal body. Tegmen (Fig. 5) with very slender apodeme, nearly 1.9 times as long as diameter of tegminal ring.

Female. Sternite VIII in ventral view (Fig. 7): body of sternite with a longitudinal impression, and with many hairs, more dense and long near the apex, apodeme slender, curved leftward at apical quarter, nearly 4,5 times as long as body of sternite.

Diagnosis. *Pachyrhynchus mohagani* shows an unusual pattern, being easily distinguishable from nearly all other *Pachyrhynchus* species by the shiny integument of head, pronotum and legs in contrast with the weaker luster of integument of elytra. This quite unconventional combination of character within the genus is shared with few species, all belonging to the *orbifer* species group, namely *P. rugicollis* Waterhouse, 1841, *P. infernalis* Fairmaire, 1897, and another yet undescribed taxon (Bollino & Sandel, in prep.). *Pachyrhynchus mohagani* can be distinguished from similar species also for the strongly flattened meta and mesotibiae.

Distribution. Lubang Island.

Etymology. The new species is named after Noel Mohagan (Del Pilar, Naujan, Or. Mindoro) for his contribution to a better knowledge of this interesting group of weevils.

***Pachyrhynchus tilikensis* sp. nov.**

(Figs. 1e-f, 9-15)

Holotype (male): Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, presently in MBLI, will be deposited in MTD.

Paratypes (7 males, 9 females): 6 males, 5 female, Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, all in MBLI; 1 male, 4 females, Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, all in CFS.

Description.

Male. Holotype: LB: 14.25; LR: 2.05; WR: 2.05; LP: 4.85; WP: 5.10; LE: 9.40; WE: 7.05. Dorsal habitus as shown in Fig. 7, lateral habitus as shown in Fig. 8.

Integument black. Body surface weakly shiny except underside which has a weaker luster, subglabrous, with glossy sea-green markings of recumbent round to elliptic scales. Rostrum as long as wide (length/width 1.00), dorsum very

minutely pubescent; basal half with a subtriangular depression with apical base , roughly bulging on apical half, and two small admedian patches of scales on base of apical half; apical bulge flattish dorsally; dorsal contour of forehead and rostrum interrupted by a weak transverse depression; lateral side of rostrum with a deep furrow just below the margin and in front of antennal scrobe; long hair-like scales and a scaly patch in front of antennal scrobe, and a scaly patch with short hair-like scales behind it; rostrum with long golden hairs near apex and scaly patches on sides of basal subtriangular depression. Antennal scape short and stout, strongly clavate and slightly shorter than funicle; funicle relatively stout; club subellipsoidal, nearly twice as long as wide. Head glabrous, minutely and sparsely punctured; forehead with triangular patch of loose scales; eyes relatively large, moderately prominent from outline of head. Prothorax subspherical (width/length 1.1), maximum transverse diameter just behind the middle, finely and sparsely punctured; dorsally a basal linear scaly patch along midline; a central small scaly spot in the middle of pronotum; two scaly patches below middle of pronotum, one before the anterior edge, and one behind posterior edge; a broad scaly patch on lateroventral part above fore coxa. Elytra obovate, moderately convex dorsally, wider than prothorax (elytral/pronotal width 1.4), nearly twice as long as prothorax (elytral/pronotal length 1.9), weakly shiny with thick irregular leathery wrinkles; dorsal convexity highest at central 1/3; sides gradually dilated from base, widest just before middle, then moderately narrowed to faint subapical constrictions, and then gently rounded at apices. Elytra glabrous, each elytron with the following eleven scaly markings: an elliptic postmedian patch along suture, an small elliptic subapical patch along suture, a subbasal para-sutural elliptic patch, a median para-sutural round small patch, a median and a postmedian discal round patches, an elliptic subbasal, round median patch, and a small postmedian lateral patches, a postmedian and a subapical marginal stripes. Legs stout; femora rather strongly clavate; tibiae serrate along internal margins, incurved apically, mucronate at apices; tibial mucrones well developed on all legs. Anterior parts of fore coxae covered with few scales. Femora very minutely pubescent, each with a subapical subanular scaly patch which is dorsally interrupted. Tibiae sparsely minutely pubescent; each tibia fringed with long hairs along internal margin. Prosternum with very few scales on the sternellum, and a large scaly patch nearly covering proepisternum. A scaly patch on posterior part of metepisternum. Venter sparsely minutely pubescent; ventrite I and II with a pair of scaly patches on sides along posterior margin; ventrites III and IV subglabrous; ventrite V with suberect hairs on apical third, and truncate at apex. A circular depression on anterior two-thirds of disc of ventrite I, extended to posterior edge of metasternum.

Genitalia as illustrated in Figs. 9-15. Spiculum gastrale (Fig. 11) slender, nearly 1.5 times as long as aedeagal body, regulary curved leftward. Aedeagal body (Figs. 9-10) very short and stout, strongly curved ventrally, subparallel-sided in dorsal view, then gradually convergent to apex. Aedeagal apodemes very long, nearly 2.4 times as long as aedeagal body, strongly flattened laterally and regulary curved leftward. Tegmen (Fig. 12) with slender apodeme curved leftward at apical quarter, nearly 1.7 times as long as diameter of tegminal ring.

Female. Sternite VIII in ventral view (Fig. 13) with a large central depression at the truncated apex, somewhat bilobed, apodeme very slightly curved leftward, nearly 3,3 times as long as body of sternite.

Diagnosis. *Pachyrhynchus tilikensis* is similar in general appearance to *P. smaragdinus* Behrens, 1887 and related species, but differs at first glance by

having a basal linear scaly patch along midline of pronotum, thus approaching to the *congestus* species group *sensu* Schultze (1924).

Distribution. Lubang Island.

Etymology. The name is derived from the village of Tilik (~ 13°48'N 120°12'E), near which the type series was collected.

Pachyrhynchus lubanganus sp. nov.

(Figs. 1g-h, 16-22)

Holotype (male): Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, presently in MBLI, will be deposited in MTD.

Paratypes (3 males, 1 female): 3 males, Philippines – Lubang Is. / South-West of Tilik / (MIMARO - Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, all in MBLI; 1 female, Philippines – Lubang Is. / South-West of Tilik / (MIMARO – Occidental Mindoro) / IV 2014 / Ex Noel Mohagan, in CFS.

Description.

Male. Holotype: LB: 14.00; LR: 2.05; WR: 1.95; LP: 4.65; WP: 4.80; LE: 8.90; WE: 6.10. Dorsal habitus as shown in Fig. 5, lateral habitus as shown in Fig. 6.

Integument black. Body surface shiny except underside which has a weaker luster, subglabrous, with glossy pale blue markings of recumbent round to elliptic scales. Rostrum nearly as long as wide (length/width 1.1) very minutely pubescent on dorsum, with shallow obovate concavity on basal half, weakly bulging on apical half, and a sagittal groove along midline, apical bulge flattish dorsally, but faintly depressed in middle of basal half; dorsal contour of forehead and rostrum subcontinous; lateral side of rostrum with long hair-like scales and a scaly patch in front of antennal scrobe, and a scaly patch with short hair-like scales behind it; rostrum with long golden hairs near apex. Antennal scape short and stout, strongly clavate, slightly shorter than funicle; funicle relatively stout; club subellipsoidal, nearly twice as long as wide. Head glabrous, minutely and sparsely punctured, with elliptic scaly patch along midline which extends from vertex to apex of forehead; eyes relatively large, moderately prominent from outline of head. Prothorax subspherical (width/length 1.00), with maximum transverse diameter just behind the middle, shiny, finely and sparsely punctured; dorsally a basal elongated triangular scaly patch along midline; a pair of ovate scaly spots on both sides of middle of pronotum; two small dots on each side, below middle of pronotum, one before the anterior edge, and one behind posterior edge; each side with broad scaly patch on lateroventral part above fore coxa. Elytra obovate, moderately convex dorsally, wider than prothorax (elytral/pronotal width 1.3), nearly twice as long as prothorax (elytral/pronotal length 1.9), moderately striate-punctured, with intervals evenly flattish; dorsal convexity highest at central 1/3; sides gradually dilated from base, widest just before middle, then moderately narrowed to faint subapical constrictions, and then gently rounded at apices. Elytra glabrous, each elytron with the ten following scaly markings: a median round patch on interval II united with the median patch on interval III, a subbasal elliptic patch, a median round patch, a postmedian round patch and an apical round spot on interval III, a median and a postmedian round patches on interval V, a subbasal and a median elongate patches on interval VII, a postmedian

marginal stripe. Legs stout; femora rather strongly clavate; tibiae serrate along internal margins, incurved apically, mucronate at apices; tibial mucrones well developed on all legs. Anterior parts of fore coxae covered with scales, mingled with short light-coloured hairs. Profemora covered with short hairs, each with scaly patch on ventral subapical part; meso and metafemora with short hairs, and on subapical part with a larger ventral scaly patch, and a smaller dorsolateral one. Tibiae sparsely minutely pubescent; each tibia fringed with long hairs along internal margin. Both basisternum and sternellum with a patch of scales, and a large scaly patch nearly covering proepisternum. Intercoxal part of mesosternum with a patch of scales. Metasternum with a scaly patch in the middle, behind the posterior edge, and another large patch on metepisternum. Venter sparsely minutely pubescent; ventrite I and II with a pair of scaly patches on sides along posterior margin, that on ventrite II being larger than that on ventrite I; ventrites III and IV subglabrous; ventrite V with suberect hairs on apical third and truncate at apex. A large circular depression on disc of posterior half of metasternum and anterior third of ventrite I.

Genitalia as illustrated in Figs. 16-22. Spiculum gastrale (Fig. 18) slender, nearly 1.5 times as long as aedeagal body, strongly curved leftward. Aedeagal body (Figs. 16-17) stout, in lateral view moderately curved ventrally in the subbasal part, and gradually attenuated to form a keel before the ventral apical blade. In frontal vision (Fig. 16) sides sinuate, rather strongly narrowed from base to basal half, then subparallel to subapical part, and then strongly convergent to conical apex. Aedeagal apodemes slender, of the same length as aedeagal body, in lateral view strongly laterally flattened and curved leftward to apical 1/3. Tegmen (Fig. 19) with slender apodeme, nearly 1,7 times as long as diameter of tegminal ring.

Female. Sternite VIII in ventral view (Fig. 21): body of sternite without impression, with some sparse hairs more long at apex, apodeme slender, not curved, nearly 3,2 times as long as body.

Diagnosis. *Pachyrhynchus lubanganus* is similar in general appearance to *P. tilikensis* n.sp., but it is easily distinguishable from the latter by the unique scaly markings.

Distribution. Lubang Island.

Etymology. The name is derived from that of the island of Lubang.

DISCUSSION

Lubang (Map 1) is an oceanic island about 40 km off the southwestern coast of Luzon. The island, with several smaller nearby islands, is well isolated from Luzon and Mindoro by depths exceeding the levels to which sea level dropped during the Pleistocene (Heaney et al., 2014). As consequence, even if small, being about 125 square kilometres (48 sq mi), it is considered by biogeographers as a Pleistocene Aggregate Island Complex (PAIC), i.e. the Lubang PAIC (Heaney, 2004), thus a major center of biodiversity and endemism, with distinctive flora and fauna (Ong et al., 2002; Gaulke et al., 2007; Brown & Diesmos, 2009; Diesmos & Brown, 2011).

At best of our knowledge, nearly no data are available about the entomological fauna of the Island but a list of Papilionidae (Lepidoptera) given by Page & Treadaway (2011 , which includes the description of two endemic taxa from the island. Some researches were recently carried out about its mammalian fauna,

leading to the description of one endemic species of Philippine forest mice of the genus *Apomys* Mearns, 1905 (Muridae, Rodentia) (Heaney et al., 2014). It is quite interesting to note that such *Apomys* species has strict phylogenetic relationships with two species endemic to Zambales Range (Zambales and Bataan Provinces, Western Central Luzon), demonstrating a faunal affinity between Lubang and Luzon, and matching the similar pattern observed in either *Pachyrhynchus rugicollis*, which is apparently restricted to Zambales Range, and *P. mohagani* n. sp. Moreover the, although tentative, attribution of *P. tilikensis* n. sp. to the *congestus* species group *sensu* Schultze (which is restricted to central and northern Luzon) further confirms the faunal affinity between Lubang and Luzon.

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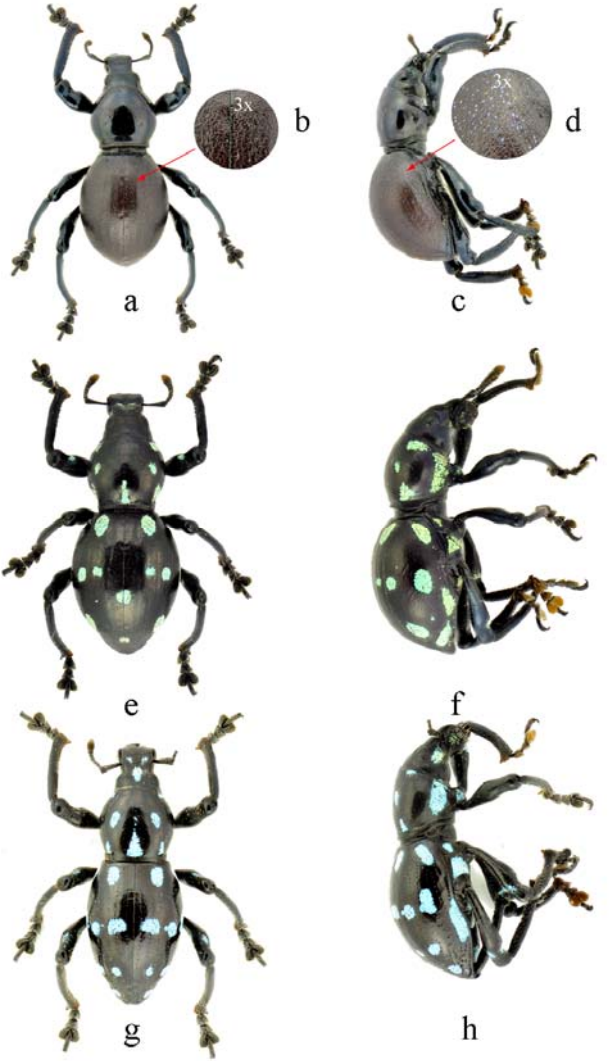
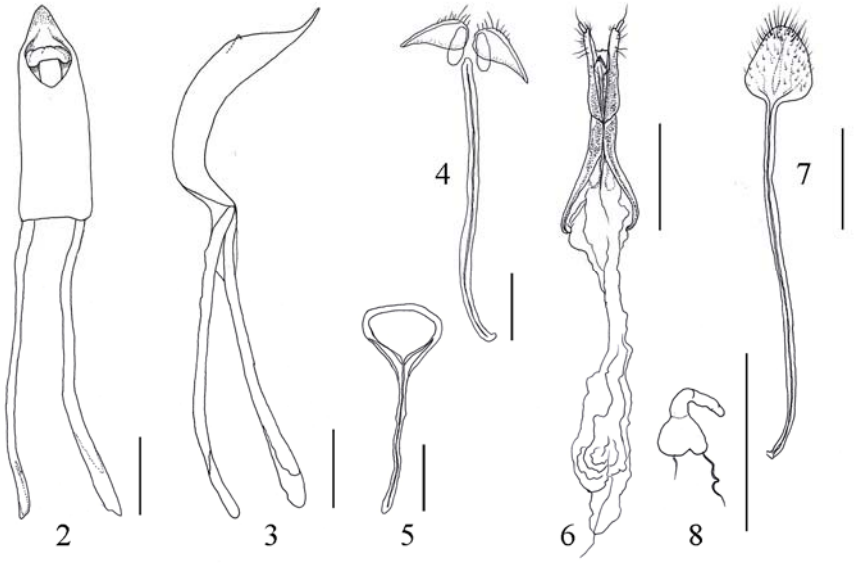
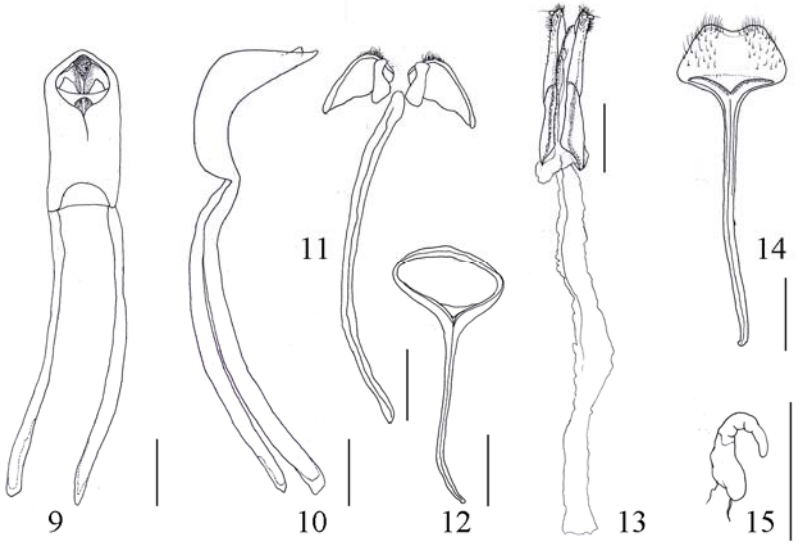


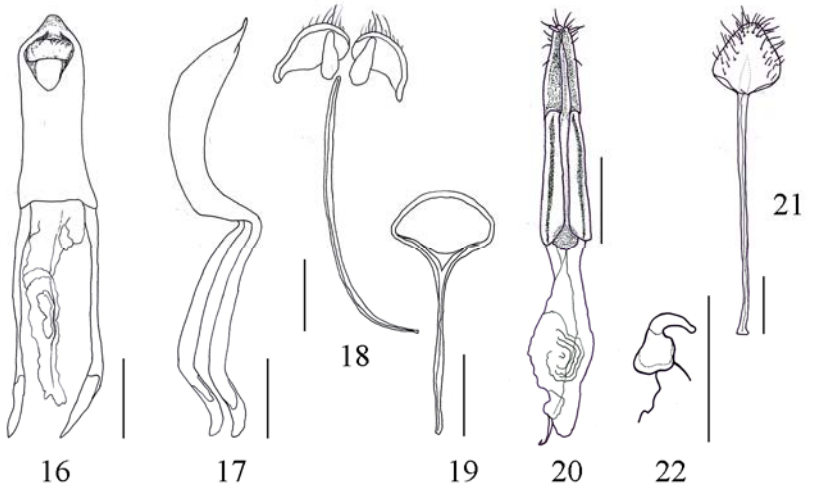
Figures 1a-h. *Pachyrhynchus mohagani* n. sp. holotype- a: dorsal habltus; Ь: magnification 3x of dorsal integument of elytra; c: lateral habltus; d: magnification 3x of lateral integument of elytra; *Pachyrhynchus tilikensis* n.sp. holotype – e: dorsal habltus; f: lateral habltus; *Pachyrhynchus lubanganus* n.sp. holotype – g: dorsal habltus; h: lateral habltus.



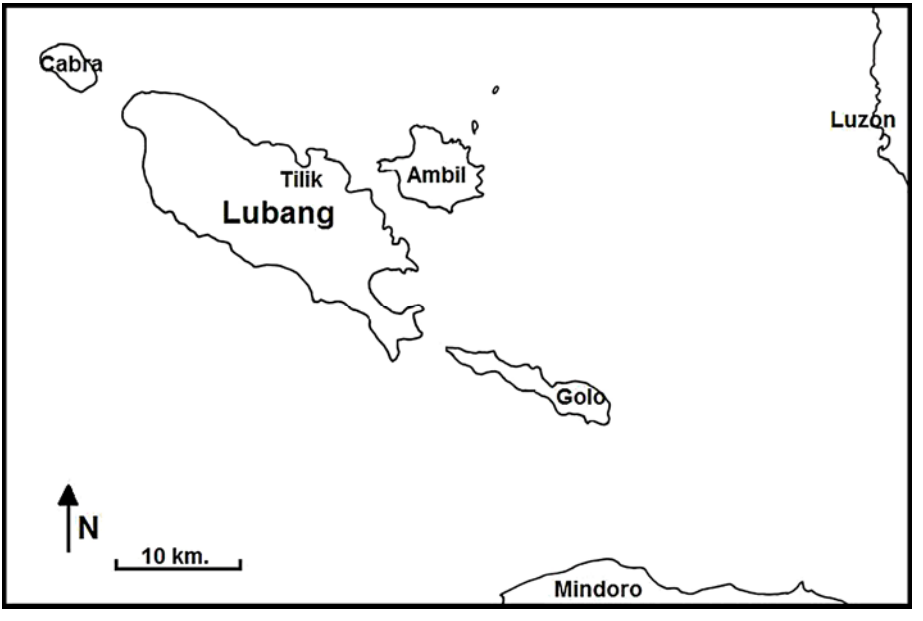
Figures 2-8. Male and female genitalia of *Pachyrhynchus mohagani* n. sp. 2: aedeagus in dorsal view; 3: aedeagus in lateral view; 4: sternite IX in dorsal view; 5: tegmen in dorsal view; 6: ovipositor in dorsal view; 7: sternite VIII in ventral view; 8: spermatheca. Scale: 1 mm.



Figures 9-15. Male and female genitalia of *Pachyrhynchus tilikensis* n. sp. 9: aedeagus in dorsal view; 10: aedeagus in lateral view; 11: sternite IX in dorsal view; 12: tegmen in dorsal view; 13: ovipositor in dorsal view; 14: sternite VIII in ventral view; 15: spermatheca. Scale: 1 mm.



Figures 16-22. Male and female genitalia of *Pachyrhynchus lubanganus* n. sp. 16: aedeagus in dorsal view; 17: aedeagus in lateral view; 18: sternite IX in dorsal view; 19: tegmen in dorsal view; 20: ovipositor in dorsal view; 21: sternite VIII in ventral view.



Map 1. Map of Lubang archipelago, and neighbouring islands.