

# The genus *Comacupes* Kaup in the Philippines Archipelago, with two new species (Coleoptera, Passalidae)

by

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## Résumé

Une espèce d'Aulacocyclini, *Comacupes* Kaup, 1871, était jusqu'ici connue des Philippines, dans quelques îles ou régions (Luzon central, Mindoro, Samar) : *C. basalis* (Smith, 1852), aussi seule espèce de son propre groupe d'espèces. L'étude de matériaux récents ou anciens – incluant notamment ceux des naturalistes C. Semper et J. Waterstradt, de la seconde moitié du XIX<sup>e</sup> siècle – fournit des données nouvelles et étendues sur *C. basalis*, de Luzon (du Nord au Sud), Babuyan, Marinduque, Leyte, Samar, Dinagat et Mindanao. *C. basalis* occupe finalement une grande partie de l'archipel, entre 0 et 1500 m. Deux autres espèces endémiques sont décrites : *C. palawanicus* n. sp., premier *Comacupes* signalé de Palawan (Région Est satellite), appartient au groupe d'espèces de *C. stoliczkae* Gravely, 1914 ; *C. meridialis* n. sp., de Mindanao (Régions Sud), appartient au groupe d'espèces de *C. cylindraceus* (Perty, 1831), jusqu'ici connu des Grandes Îles de la Sonde et de la péninsule Malaise.

## Abstract

One species of Aulacocyclini, *Comacupes* Kaup, 1871, was known up to now from the Philippines, in a small number of islands or regions (Central Luzon, Mindoro, Samar): *C. basalis* (Smith, 1852), the only one species of its own species group. The study of recent or old collecting – including notably material from naturalists C. Semper and J. Waterstradt, of the second half of the 19<sup>th</sup> century – allows new and extended data on *C. basalis* from Luzon (North to South), Babuyan group, Marinduque, Leyte, Samar, Dinagat and Mindanao. *C. basalis* has finally a wide distribution in the archipelago and from 0 to 1500 m. Two other endemic species are described: *C. palawanicus* n. sp., the first *Comacupes* reported from Palawan (Eastern satellite Region), belongs to the species group of *C. stoliczkae* Gravely, 1914; *C. meridialis* n. sp., from Mindanao (Southern Regions), belongs to the species group of *C. cylindraceus* (Perty, 1831), hitherto reported from the Great Sunda Islands and the Malay Peninsula.

## Keywords

Passalidae, Aulacocyclus, *Comacupes*, new species, The Philippines Archipelago.

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The genus *Comacupes* Kaup, 1871 (Aulacocyclinae, Aulacocyclus, *sensu* Boucher, 2006) comprises less than ten species distributed in South East Asia, mainly in the Great Sunda group, *sensu lato* (Sumatra, Java, Borneo, Sulawesi), the Malay Peninsula and the Philippines. The last species described after Dibb (1937) and Hincks & Dibb (1958) is *C. kaupi* Boucher, 2004, an endemic of the Andaman Archipelago, in the far East of the island arc in the Andaman Sea, from Sumatra. *C. kaupi* occupies an interesting geographical position, as it is one of the most Occidental species in the genus as well as in the subfamily Aulacocyclinae.

In the North Eastern part of the distribution of the genus, in the Philippines, one species was hitherto known, *C. basalis* (Smith, 1852). Smith (1852), Kaup (1868, 1869, 1871), Kuwert (1897) and Gravely (1914) did not give a precise origin for the species except the Philippines. What sometimes means « *Luzon* », as inferred from original labels of specimens seen by Kaup or Kuwert. Same lacking data are found in the catalogues of Baer (1886) and Schultze (1916). However, Casto de Elera (1895) has reported *C. basalis* from Samar Isl., in the Eastern Visayas Region, Center East of the Philippines (Fig. 8). The material cited by this author has probably never been studied by a specialist, but the locality remains plausible for the species (see below). Gravely (1918) indicated, the first one, Mindoro Isl., but also « *other parts of the Philippines islands* », curiously without other comment. Dibb (1933), who studied more specifically Aulacocyclinae, seems to have known very few specimens and without more precise origin than the Philippines, what is also curious. Finally, Doesburg (1966) is probably the only author who cited Passalids from the Balabac group, in the far western of the Palawan Archipelago, and also from Tawi-Tawi Island, in the far western Bayan group (fig. 8), but the author has not reported any Aulacocyclinae.

For the present study, we had the opportunity to examine a number of new specimens of *C. basalis* from various islands and from an altitudinal range between 0-1500 m. In addition, two new species, described hereafter, are inhabiting Mindanao and Palawan, respectively.

Three endemic species of *Comacupes* are thus recognized in the Philippines. With respect to the family Passalidae, the high degree of endemism of the species in the archipelago is enforced with the genus *Comacupes*, the other closely allied genus, *Taeniocerus* Kaup, 1871, being unknown from islands of this part of South-East Asia.

### *Materials and methods*

The studied material gathers 147 specimens of *C. basalis* and 50 for the new species. Specimens come from the Bernice Pauahi Bishop Museum, Honolulu (BPBM), the Institut Royal des Sciences Naturelles, Bruxelles (IRSN), the Muséum National d'Histoire Naturelle, Paris (MNHN) and the author.

The terminology used for the sclerites and other small structures of the head is the one revisited or established by Boucher (2006). Other current terminology is preferably found in Gravely (1914, 1918). The total length of specimens is taken from the apex of elytra to the anterior margin of evaginated labrum.

### ***Comacupes basalis* (Smith, 1852) (Fig. 8)**

This species is relatively well known because it is easily recognizable in the genus, as well as among the Passalidae of the Philippines, by the following characters, among others that are less noticeable: habitus robust and very convex ; body size large (up to 35 mm, reaching 42 mm); first latero-elytral interstriae and striae pubescent ; central tubercle truly tuberculate, with the upper surface horizontal, depressed and the apex pointed forwards ; marginal groove of pronotum pubescent ; sides of metasternum entirely setigerous, the setae often exceeding the limit of the disk. The aedeagus is very near *C. meridialis* n. sp. (see below and Fig. 4), but larger (length: 2.8-3.0 mm).

The material examined extends the distribution of the species to the following other areas or islands (Fig. 8): Babuyan group in offshore Northern Luzon (without precision within the small islands), Luzon Great Isl. (Ilocos, Central, Calabarzón and Nacional Capital Regions), Camarines Sur Peninsula (Southern Luzon: Bicol Region), Marinduque Isl. (Mimaropa Region), Leyte Isl. (Eastern Visayas Region, including Panaon Peninsula), Dinagat Isls. (Caraga Region) and various parts of Mindanao Isl. (Prov. of Misamis Oriental, Agusan Norte and Sur, Bukidnon, Cotabato, and Camiguin Isl. in the Northern Region). The Babuyan group forms the northern limit known for the genus *Comacupes*.

The majority of this material, although newly studied, comes from old collecting of two famous naturalists in the Philippines: the German Carl Semper (1832-1893) and the Danish John Waterstradt (1869-1944). Semper, especially, collected many passalids (some of them have been published only recently; see Boucher, 1992) in a large part of the archipelago (from the Babuyan group in Northern Luzon, to Mindanao), whereas Waterstradt collected passalids mostly on the Apo volcano massif, South-Central Mindanao (for useful biographical and travel data see for example Schuberg, 1895; Barlow, 1969). All the specimens seen here from Semper and Waterstradt's collecting were purchased by R. Oberthür (probably from the naturalists themselves) and are preserved, since 1952, in the Muséum National d'Histoire Naturelle, Paris. It is possible that Oberthür, who appreciated particularly

passalids, gathered a great part, if not all, the Semper and Waterstradt's material from the Philippines.

From then on, *C. basalis* appears as widely distributed in the Philippines. It seems relatively common in wet mountain forests (500-1500 m), although also present since the sea level. The presence/absence of the species in the central islands of Panay, Negros, Cebu and Bohol (Fig. 8) should be explored.

### ***Comacupes meridialis* n. sp.** (Fig. 1-4, 8)

This second species is clearly distinct from *C. basalis* and proved to occur only in the southern part of the Philippines, in Mindanao Isl. Curiously, no specimen has been seen which could have been taken by Semper or Waterstradt, although it appears to be also common and widely distributed on the island, preferably in foothills or mountainous areas at around 500-1000 m. Otherwise, it seems that the species has been collected only the last decades. In the old catalogues (Baer, 1886, Casto de Elera, 1895; Schultze, 1916), most probably no confusion has been made with *C. basalis*. Lately, *C. meridialis* n. sp. has been cited under other names, first as *C. masoni* Stoliczka, 1873, from Mindanao North East, Surigao del Sur Prov. (Maes 2008, unpublished on line). However, the true *C. masoni* is a clearly distinct species (but with similar body size and habitus) and is absent from the Philippines. Then Iwase (2011, 2012, unpublished on line) indicated a "*Comacupes* sp. close to *C. Cyldraceus*" from Mindanao (without precision), but in that case good pictures proved this species to be *C. meridialis* n. sp.

#### *Type material*

HOLOTYPE ♂: Philippines, Mindanao Center-North, Bukidnon Prov., Intavas, > 1000 m, *I. Lumawig & coll.* IX.2013 (*auct.*, MNHN).

PARATYPES (47 ex.): *Idem* holotype, 2 ♂, 8 ♀ (*auct.*, MNHN); Mindanao, II.1990, *ex coll.* Ph. Moretto 2010, 4 ex. (*auct.*); Mindanao Center-South, Davao del Sur Prov., Mt Apo volcano, > 1000 m, *I. Lumawig & coll.*, X.2013, 1 ♂ (*auct.*); Mindanao, Bukidnon Prov., Kalatungan, > 1000 m, *I. Lumawig & coll.*, XI.2013, 1 ♂, 1 ex. (*auct.*); Mindanao, Bukidnon Prov., Kabanglasan, 500 m, *I. Lumawig & coll.*, VIII.2013, 1 ♂ (*auct.*); Mindanao North-East, Agusan del Norte Prov., Esperanza [altitude unknown], *I. Lumawig & coll.*, VIII.2013, 1 ♂, 1 ♀, 2 ex. (*auct.*); Mindanao Center-West, Lanao del Sur Prov. [altitude unknown], *I. Lumawig & coll.*, XI.2013, 2 ♀ (*auct.*); *idem*, Muslim ARMM, Bunbaran, 400-1200 m, *J. García*, VIII.2014, 1 ♂, 1 ♀ (*auct.*); Mindanao North, Misamis Oriental Prov., Minalwang, 1050 m, *H. Torrevillas*, III-IV.1961, 2 ♂, 1 ♀, 17 ex. (BPBM); Mindanao, South Katabato Prov., Lake Sebu / Mt Tasaday, > 1000 m, *P. Lays*, V.1993, 1 ex. (IRSN).

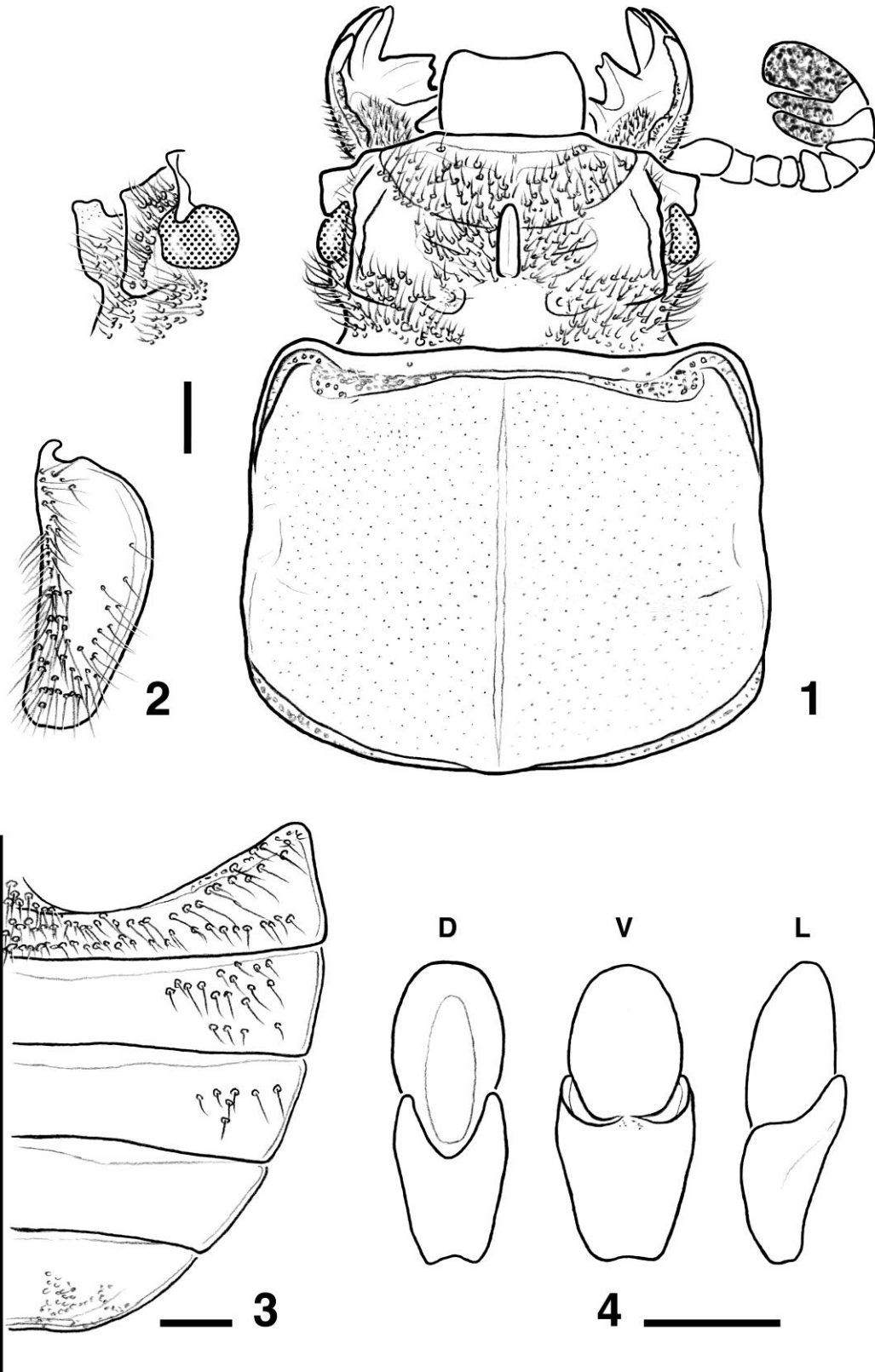


Fig. 1-4: *Comacupes meridialis* n. sp., Mindanao Isl., morphological details. – 1, Head and pronotum (dorsal; infrapronotal setae not shown) and ocular area (with canthus and supra-orbital ridge) and central tubercle (right profile). – 2, Profemur (right, ventral). – 3, Abdomen, urites III-VII (half right, ventral). – 4, Aedeagus (dorsal, ventral, lateral). Scales: 1 mm.

## Description

**Habitus** elongated, convex, setigerous. Macropterous. Dimensions: medium to rather small for the genus. Total length: 23.9-28.6 mm. Greatest width: 8.8-10.2 mm over elytra. These characters close to *C. cylindraceus* (Perty, 1831).

**Head** (Fig. 1) above widely covered with strong setigerous punctures, including the proximal part of ocular canthus, but except the frontoclypeal border, the central point of the mediofrontal area, the mediopostfrontal area and the lateropostfrontal areas close to supra-orbital ridges, which are smooth. Central tubercle elevated, long, narrow, inclined backwards; apex free, vertical and concave in front (sometimes like simple in smaller specimens); superior crest straight or slightly concave, except the apical part which is a few prominent and rounded. Posterofrontal ridges very regressed, conspicuous only close to the central tubercle with a short, straight and weak convexity. Anterofrontal ridges and inner tubercles totally regressed. Epicranial arms well marked, long, reaching the distal part of posterofrontal ridges. Anterior margin of clypeus slightly concave, but thick and rounded. Anterior angles of the head (homologous with anterior angles of clypeus, *sensu* Boucher, 2006) very short, curved inwards, lower than the lateroclypeal margin and than the epicranial incision. Mediofrontal area concave, except in front of the central tubercle, where is a weak convexity. Supra-orbital ridges strong, elevated, nearly straight, inclined backwards; anterior part prominent, the apical angle straight but blunt; posterior angle a few obtuse. Eyes reduced, divided in the middle by the ocular canthus. Ocular canthus large, quadratic, the anterior angle straight or a little obtuse. Tentorial tubercles regressed, or erased among the setigerous punctures. Lateroposterior tubercles marked as short and straight convexities (if not homologous with the true lateroposterior tubercles, these tubercles are therefore secondary structures, which is very possible). Mediopostfrontal area convex and smooth, with on each side a strong and abrupt concavity. Postorbital area covered with setigerous punctuations and other minute marks. Antennal clubs trifolius, moderately long. Anterior margin of labrum slightly concave. Mandibles strong; upper surface covered a half basal with fine and setigerous punctuations; incisor lobe with three well developed teeth; dorsal teeth almost straight or a little curved, the crest being narrow and curved inwards; infra- and supra-internal teeth strong and fused. Mentum, as a whole, regularly punctured and setigerous, except the central and the basal parts smooth and forming a small and incomplete longitudinal crest; lateral pits well marked, large. Laciniae bidentate; basal tooth enlarged, the apex neither pointed nor sharp.

**Thorax.** Pronotum (Fig. 1) above glabrous, smooth except the marginal groove with small punctuations and minute marks throughout; anterior groove, narrow, but deep and just a few enlarged in the median part; median groove thin, reaching both sides of the pronotum; anterior angles very rounded, prominent; lateral pits well marked, smooth. Mesosternum almost all covered with regular, spaced and setigerous punctures, the setae long. Metasternum *idem* on sides, including the marginal pits enlarged, but not clearly delimited; disk and lateroposterior areas smooth, except the posterior margin with a line of very short setae. Elytra: punctuation well marked, but fine, the lateral striae being a few larger; humeral angles with a tuft of long, but spaced, setae; anterior border, proximal part of epipleura and very proximal part of first interstriae with long and spaced setae; elsewhere glabrous. Profemurs (ventral, Fig. 2) with extended setigerous punctuations on both lateral-anterior and posterior margins. Protibia feebly enlarged. Mesotibia with a strong postmedian spine; apical forks strong, wide and acute. Metatibia *idem*, but the postmedian spine shorter.

**Abdomen.** Urites III-VII (Fig. 3) without scars, flattened, very shining; smooth except the III (totally), the external part of the IV and often a smaller external part of the V, where are fine, spaced and moderately long setae; VI smooth and glabrous; VII with apical groove well

marked, deep and smooth, but limited to the apical part, which is straight, somewhat more depressed at the apex, and the sides a few granulous. Aedeagus typical of Aulacocyclus (Fig 4): small (length: 1.7-1.9 mm), well sclerotized, elongated, rounded and smooth; phallobase and parameres fused forming a true phallosome; parameres narrow and pointed, but the apex rounded; basal margin of the phallobase straight; phallus ovoid.

*Derivatio nominis.* – Correlated in the distribution of the species in the South of the Philippines.

### *Polymorphism*

At least three characters are clearly a little polymorphic: body size (total length:  $\pm 4.5$ mm; although females are slightly larger than males); the central tubercle, which is more or less inclined backwards or directed upwards, more or less elongated and straight, and the free apex sometimes almost simple, especially in smaller specimens (but the general shape remains stable in all); the presence and the increasing setae number on urites IV and V.

### *Phylogenetic affinities*

*C. meridialis* belongs to the species group of *C. cylindraceus*, which is characterized as follows: central tubercle narrow to thin, with sides vertical and levelled as a wall; size of the body, average; sternal setae not numerous to rarely absent on the urite IV, often absent on the V, permanently absent on VI and VII (in *C. cylindraceus*: numerous, with strong setigerous punctuations from III to VII). *C. meridialis* is the only one species known from this group in the Philippines.

### *Distribution*

The species is known only from Mindanao Isl., wet mountain forests. Nevertheless, it is likely that it is occurring in neighbouring islands, as well as in Central and Northern Islands.

### *Comacupes palawanicus* n. sp. (Fig. 5-8)

Unlike *C. meridialis* n. sp., this third species has probably never been observed before and is the first *Comacupes* known from Palawan.

### *Type material*

HOLOTYPE ♀: Philippines, Palawan, Eastern Great Island, via A. Chaminade I.1991 / ex coll. Ph. Moretto 2010 (MNHN).

PARATYPE (1♀): idem holotype (*auct.*).

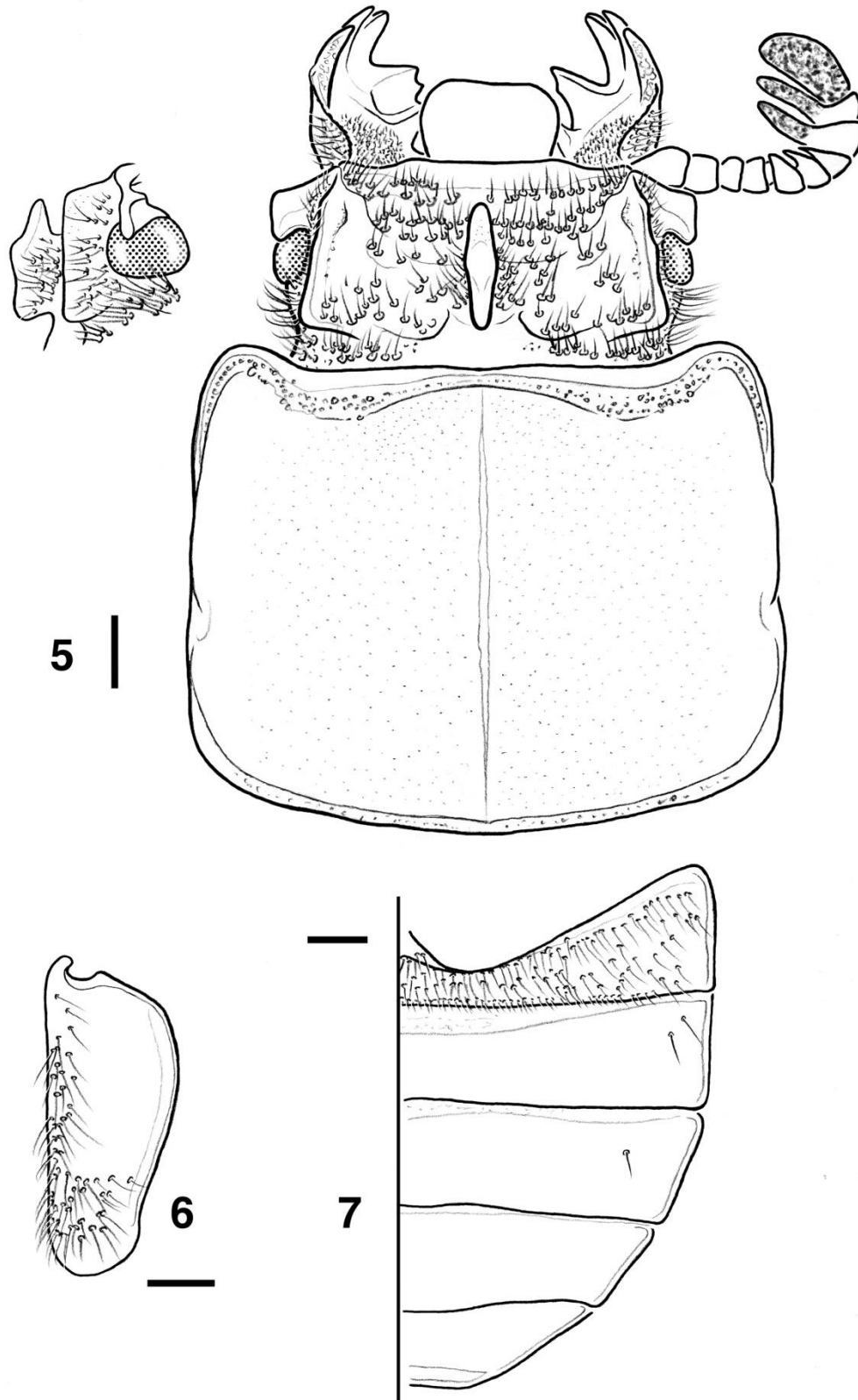


Fig. 5-7: *Comacupes palawanicus* n. sp., Palawan Isl., morphological details. – 5, Head and pronotum (dorsal; infrapronotal setae not shown) and ocular area (with canthus and supra-orbital ridge) and central tubercle (right profile). – 6, Profemur (right, ventral). – 7, Abdomen, urites III-VII (half right, ventral). Scales: 1 mm.



## *Description*

**Habitus** elongated, convex, setigerous. Macropterous. Dimensions: medium for the genus. Total length: 28.5-29.0 mm. Greatest width: 10.2-10.3 mm over elytra.

**Head** (Fig. 5) above widely covered with strong, but spaced, setigerous punctures, including the proximal part of ocular canthus, and except the frontoclypeal border, the central point of the mediofrontal area, the mediopostfrontal area and the lateropostfrontal areas close to supra-orbital ridges, which are smooth. Central tubercle elevated, long, narrow; apex free, pointed forwards; superior crest horizontal and bisinuous, with a postmedian rounded excavation; the proximal part straight and slightly concave, the distal part a few angled before the apex. Posterofrontal ridges almost totally regressed, within the punctuations. Anterofrontal ridges and inner tubercles totally regressed. Epicranial arms well marked, long, reaching the point of the disappeared distal part of the posterofrontal ridges. Anterior margin of clypeus thick and straight. Anterior angles of the head, curved inwards, shorter than the lateroclypeal margin and than the epicranial incision. Mediofrontal area concave, except in front of the central tubercle, where is a small convexity. Supra-orbital ridges strong and thick, nearly straight, inclined backwards; anterior part somewhat prominent, but the apical angle being obtuse; posterior angle straight to prominent. Eyes reduced, divided to the middle by the ocular canthus. Ocular canthus large, but transverse, the anterior angle a few obtuse. Tentorial tubercles and lateroposterior tubercles regressed, the tegument almost without trace of convexity. Mediopostfrontal area convex and smooth, with on each side a strong but smooth concavity. Postorbital area covered with setigerous punctuations and other minute marks. Antennal clubs trifilous, moderately long. Anterior margin of labrum straight. Mandibles strong; upper surface covered a half basal with fine setigerous punctuations; incisor lobe with three and well developed teeth; dorsal teeth distinctly curved, the crest being sharp and curved inwards; infra- and supra-internal teeth strong and fused. Mentum totally and regularly punctured and setigerous, except the central and basal parts smooth and forming a narrow longitudinal crest; lateral pits well marked, large. Laciniae bidentate; basal tooth enlarged, the apex not pointed nor sharp.

**Thorax.** Pronotum (Fig. 5) above glabrous, smooth except the marginal groove with small punctuations and minute marks throughout; anterior groove, narrow, regular and deep; median groove thin, reaching both sides of the pronotum; anterior angles very rounded, prominent; lateral pits well marked and smooth. Mesosternum almost all covered with regular, spaced and setigerous punctures, the setae long. Metasternum *idem* on sides, including the marginal pits enlarged, but poorly delimited; disk and lateroposterior areas smooth, except the posterior margin with a line of very short setae. Elytra: punctuation well marked, but fine to reduced throughout; humeral angles with a tuft of long and spaced setae; anterior border, a third of the proximal part of epipleura and of the first interstriae with long and spaced setae; otherwise glabrous. Profemurs (ventral, Fig. 6) with numerous setigerous punctuations on the posterior margin only. Protibias feebly enlarged. Mesotibias with a strong postmedian spine; apical forks, wide, strong and acute. Metatibias *idem*, but with a reduced postmedian spine.

**Abdomen.** Urites III-VII (Fig. 7) without scars, very shining, flattened; smooth except the III (widely covered with setigerous punctuations), the external part of the IV (only 3-4 setae) and the external part of the V (only 1 seta); VI totally smooth; VII with apical groove well marked, deep and smooth, but limited to the apical part, which is slightly concave, and sides smooth.

### *Polymorphism*

No evidence of polymorphic characters appears in the two known specimens.

### *Phylogenetic affinities*

*C. palawanicus* is closely allied with the species group of *C. stoliczkae* Gravely, 1914. This group is distributed in the Malay Peninsula and in the Great Sunda, including Borneo. Very similar characters are: body size and habitus, pubescence on a part of the first lateral interstriae of elytra, central tubercle narrow and pointed forwards. However, *C. palawanicus* is well distinct by its central tubercle, the convexity of the upper part being situated in the middle of the crest (on the anterior part in other species), and by its lateroposterior areas of the metasternum, which are glabrous and smooth (setigerous in other species).

Compared with *C. basalis*, the species has also the thin elytral punctuation and the sternites IV-VI poorly pubescent to glabrous, smooth and flattened. Otherwise, *C. palawanicus* is clearly separated as follows: total length much smaller (1.0-1.4 cm); habitus much less robust and less pubescent, especially the head (dorsal); elytra (lateral striae I-IV completely setigerous, as well as a half of the interstriae I in *C. basalis*); pronotum (marginal groove and lateral pits setigerous in *C. basalis*); metasternum (sides entirely setigerous in *C. basalis*); external part of urites IV-V (often also the VI, all with the more extended setae in *C. basalis*); central tubercle longer, but narrower; posterior apex of supra-orbital ridges more pronounced and more prominent; mediofrontal area, in front of the central tubercle, much less convex; dorsomandibular teeth sharp (wide and often granulous in *C. basalis*); antennal clubs longer; infra-anterior margin of profemurs glabrous (pubescent in *C. basalis*); infradistal part of mesofemurs with a few setae (numerous and extended in *C. basalis*).

### **Conclusion**

The fauna of Passalidae of the Philippines has been relatively poorly studied. Our knowledge on numerous islands is strongly lacking. However, endemisms being generally neither limited to one island, nor to a group of neighbouring islands, but to a great part of the Archipelago, the genus *Comacupes* is probably not much more diversified than a few species. Palawan remains the less explored island group. As these lands form the natural connection between Borneo and the Philippines, we could very likely find there some new elements, including within the Aulacocylini and especially in the genera *Comacupes* and perhaps *Taeniocerus*. The wet forests and altitudes (higher forested elevations up to 2000 m), extended to a great part of Palawan, are appropriate to receive more than the identified species.

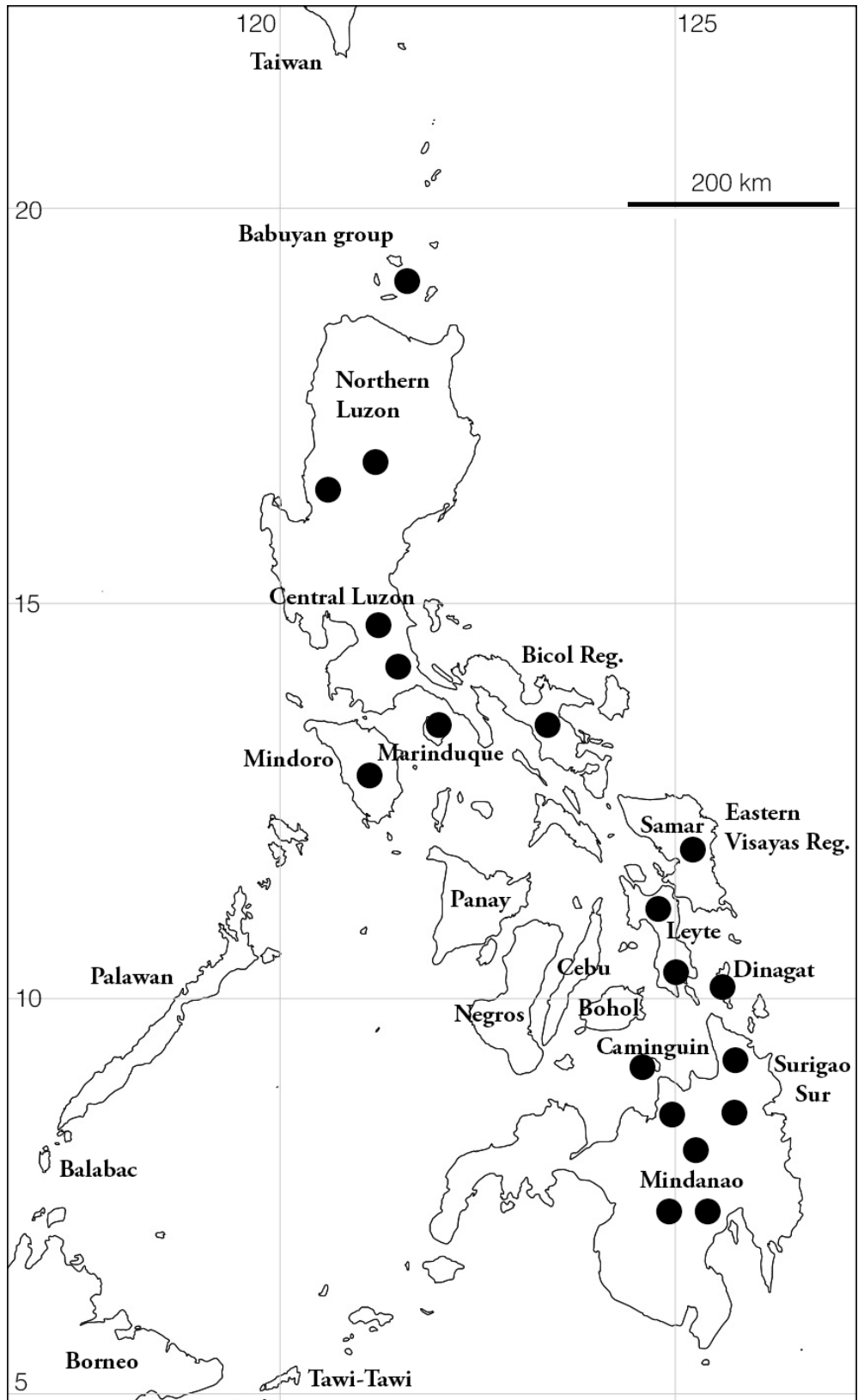


Fig. 8: Distribution data of *Comacupes* in the Philippines. – *C. basalis* (Smith): black points and area around. – *C. palawanicus* n. sp.: Palawan Isl.; *C. meridialis* n.sp.: Mindanao. Geographical names are those used in the text.

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