

ACANTHAPTINUS TRIPLEHORNII, A NEW GENUS AND SPECIES OF SPIDER BEETLE (COLEOPTERA: PTINIDAE) FROM MADAGASCAR

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Abstract.— A new genus and species of flightless spider beetle from southwestern Madagascar, is described. The most notable morphological features are lateral spines on the pronotum and elytral epiplura and a diverse array of setal vestiture. Characteristics differentiating this new genus and species from all others are discussed and illustrated and the probable biology hypothesized.



Key words.— Spider beetle, Ptinidae, Ptininae, Madagascar, new genus, new species.

INTRODUCTION

The spider beetle fauna found in Madagascar is highly endemic and appears to be an interesting mix of lineages in common with those found on western Indian Ocean islands as well as India, Africa, Australia, and southeast Asia.

The first four species of spider beetles known from Madagascar were described as *Ptinus* in 1896 by Maurice Pic. Three years later, Fairmaire (1899) described a species he placed in *Trigonogenius*, and Pic (1903, 1904, 1949, 1953) described five more *Ptinus* and a *Sphaericus*. Bellés (1987) later described one new species of *Xylodes*. Most recently, the Ptinidae of Madagascar and the western Indian Ocean Islands was studied by Bellés (1991). In this work, he covered Madagascar as well as several of the Mascarene islands (Mauritius, Réunion, and Rodriguez) and the Seychelles (Mahé and Silhouette).

On Madagascar and excluding three introduced species (*Gibbium aequinoctiale* Boield., *Sphaericus gibboides* (Boield.) and *Ptinus latro* Fab.), the fauna currently includes a total of 13 endemic species. These are placed in four genera including *Ptinus* Linné (two species), *Paulianoptinus* Bellés (three species), *Sulcoptinus* Bellés (two species), and *Xylodes* Waterhouse (six species). Although the usually widespread *Ptinus* is unknown from the oceanic islands in this region, species of one additional genus found on three of the smaller islands,

Trymolophus Bellés, brings the total number of species in this area to 51 (Bellés 1991).

With the small number of described species on Madagascar, one might expect a great deal of the fauna remains undocumented as evidenced by the diversity of many other groups of insects known from this island "continent." Hence many species likely remain to be discovered. This paper describes one new genus and species of flightless spider beetle and will enable the name to be available for future phylogenetic studies.

TAXONOMY

Acanthaptinus gen. nov.

Type species. *Acanthaptinus triplehornii* sp. nov.

Diagnosis. This genus can be recognized by the globular body shape that is only approached in Madagascar by the introduced *Sphaericus gibboides* (Boieldieu). It is also superficially similar but less so in overall body shape with two other non-native flightless taxa *Gibbium aequinoctiale* (Boieldieu) and *Ptinus latro* Fabricius. From all three of these species, it is readily differentiated by pronotal differences including lateral protuberances on each side visible in lateral or frontal view and the triangular-shaped anterior chitinous projection at the middle above the anterior margin when viewed from the front. The new

genus also has a characteristic dense covering of both recumbent and erect pronotal and elytral setae of several shapes that completely obscure the surface. This setal density is only approached by that of *Sphaericus* which only has small closely appressed scales that largely but not completely obscure the cuticle surface.

All native Madagascar species currently known have an elongate body shape with parallel-sided elytra and all are likely capable of flight. Except for two species of *Sulcoptinus*, none have lateral pronotal protuberances although setal tufts may give one the initial impression that these exist. *Sulcoptinus* also has a transverse pronotal groove at the basal $\frac{1}{4}$ that is absent in *Acanthaptinus*.

Description. Body robust and globular and densely covered with setae that obscure cuticular surface.

Head. Moderately robust; eyes barely visible from above, each approximately rounded; vertex slightly convex; gena lacking groove beneath eye and laterade of antennal insertion, not expanded laterally; interantennal space narrow, sharply carinate, distinctly projecting, convex in lateral view; clypeus triangular, apical margin with three emarginations, middle one slightly projecting opposite labrum; labrum width equal to slightly less than $\frac{1}{2}$ head width below eyes, anterior edge rounded; maxillary palp four segmented, labial palp three segmented, ultimate palpomeres fusiform, sharply pointed; antennae 11 segmented, second antennomere inserted off center of scape near outer lateral edge, antennomeres expanded apically, ninth through 11th successively larger than previous; mandible with acutely pointed apex, lacking distinct second tooth, external margin broadly rounded; mentum equilateral triangle shape, with transverse cavity.

Thorax. Pronotum distinctly wider than head, strongly convex; laterally in dorsal view from anterior margin angled obliquely outwards to distinct chitinous projection approximately at middle, then gradually converging to base; just posterior of anterior edge cuticle extending dorsally at middle $\frac{1}{2}$ in triangular shape, more gradually sloping to posterior margin. Prosternum broad, about as long as wide, extending into mesosternum; mesosternum anteriorly smoothly emarginate, about $\frac{1}{2}$ as long as wide, about $\frac{2}{3}$ the length of metasternum at middle; metasternum transverse, broadly emarginate posteriorly; procoxae strongly projecting ventrally, slightly above surface of mesosternum; mesocoxae less so, approximately even with surface of mesosternum, metacoxae flat, distinct, narrowly obliquely fused to metasternum.

Elytra. Stoutly globular; strongly, smoothly convex, about as long as wide; humeral angle with small projection; surface densely hirsute obscuring surface except at punctures, punctures arranged in longitudinal rows, each with recumbent setae, interpuncture rows with erect setae.

Ventrites. All sutures visible, lengths of 2nd and 4th ventrites even throughout except slightly longer laterally; 2nd and 3rd longest, 4th distinctly shorter than others.

Legs. Short, narrow; femora gradually increasing in diameter to near apex; tibia gradually increasing throughout length, as long as respective femora except metatibia longer than metafemur; 1st through 4th pro-tarsomere subequal, fifth distinctly longer; 2nd through 4th subequal, first and fifth metatarsomere distinctly, moderately longer.

Etymology. The generic name is derived from Greek noun "acantha" for spine or thorn modifying the speciose genus *Ptinus* in reference to the spines found on the sides of the pronotum and the elytral humeral angles of this unique species. Gender: masculine.

Remarks. Chitinous lateral pronotal projections are rare in ptinines; elytral epiplural projections are unknown and the combination of both in a single species is an additional novelty of this new genus. Their function is unclear but may be either for crypsis or protection against predation. External differences between the sexes are not apparent and a male (for dissection) was identified through the exposed apical tips of the parameres and median lobe. No further dissections were done to identify a female due to the small size of the type series.

Relationships. This genus is another of the wide variety of flightless, xeric adapted species found throughout the world. Precise relationships are unclear without a phylogenetic analysis. Based on though, for example, the narrow interantennal ridge, simple elongate legs, short 4th ventrite length, and relatively simple genitalia, *Acanthaptinus* appears to represent a lineage more recently derived from the ancestral "Ptinus" form than many of the other flightless taxa. In contrast, it does exhibit some features of very derived species such as a stout globular body shape, broad and flattened prosternum and assumed flightlessness (see discussion on evolution in Philips, 2000). Interestingly, the pronotal triangular extension near the front is similar to another genus and species recently described from western South Africa, *Cryptopeniculus nigrosetus* (Philips and Foster, 2004), but is most likely due to convergence based on numerous morphological differences and their disjunct distributions. Similarly, the flocculant pronotal setae is known in other ptinids including *Cryptopeniculus*, the West Indian *Lachmoniopus*, and various african gibbiline ptinines such as *Mezium*.

Acanthaptinus triplehorni sp. nov.
(Figs 1–10)

Diagnosis. This species can easily be recognized by the acute lateral pronotal and humeral spines. Additionally, the acutely pointed chitinous triangular pronotal peak arising just posterior of the anterior margin at the middle is also noteworthy. The distinct color pattern of the pronotum and elytra and the form of the male genitalia should also help differentiate this species from other similar taxa, if they exist.

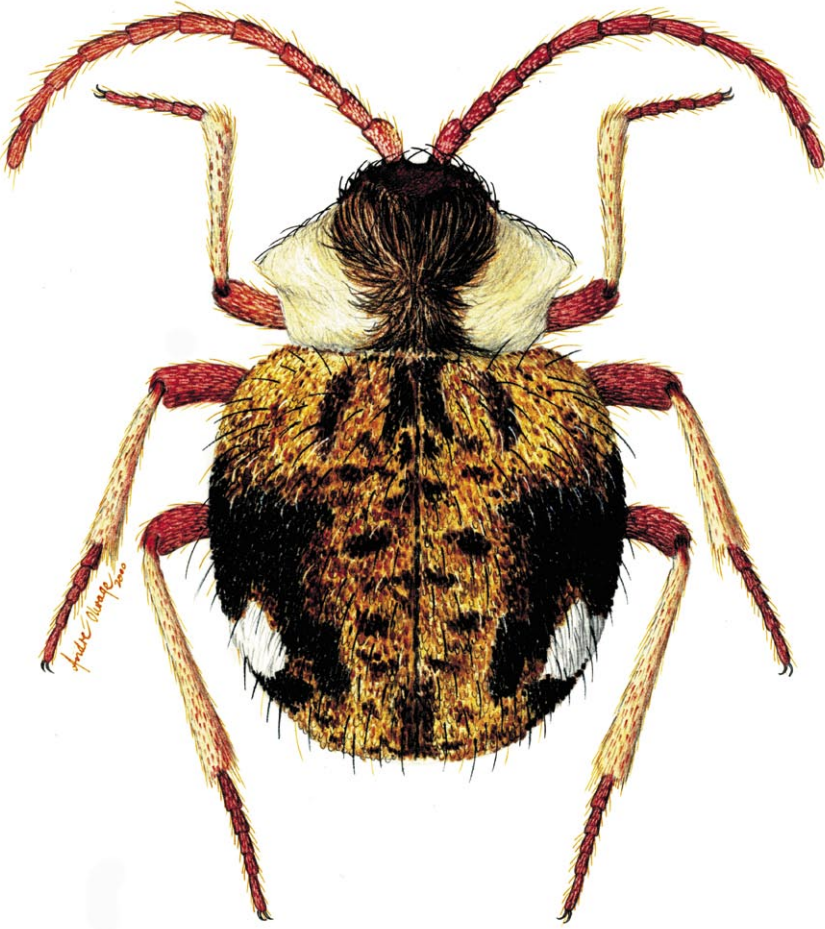


Figure 1. *Acanthaptinus triplehorni*, dorsal habitus.

Pronotum. Densely hirsute except at lateral and frontal margins where cuticular surface is visible; anteriorly with distinct collar or rim, just posterior to this a row of large transverse punctures, remaining surface with similar large more ovoid punctation; between punctures surface tuberculate, tubercles more pronounced posteriorly, each with single dark seta, near ventral margin with patch of short stout white setae; in frontal view medially with broad triangular projection angled at slightly greater than 45 degrees arising just posterior of anterior pronotal collar extending dorsally to a peak that curves posteriorly, nearly as high as elytral surface in lateral view; similar lateral projections arising but extending much more obliquely outwards with very acute tips at about 20 degree angle; in dorsal view posterior of frontal peak surface densely covered with fine interwoven setae consisting of longitudinal band at median $\frac{1}{2}$ of dark setae, sides slightly converging towards posterior, laterally bordered with white setae.

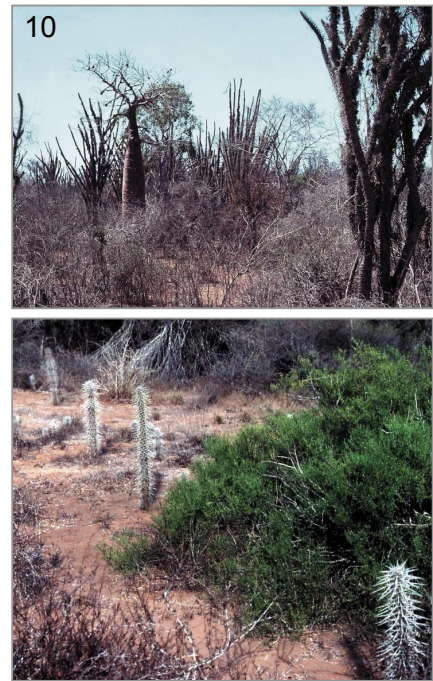
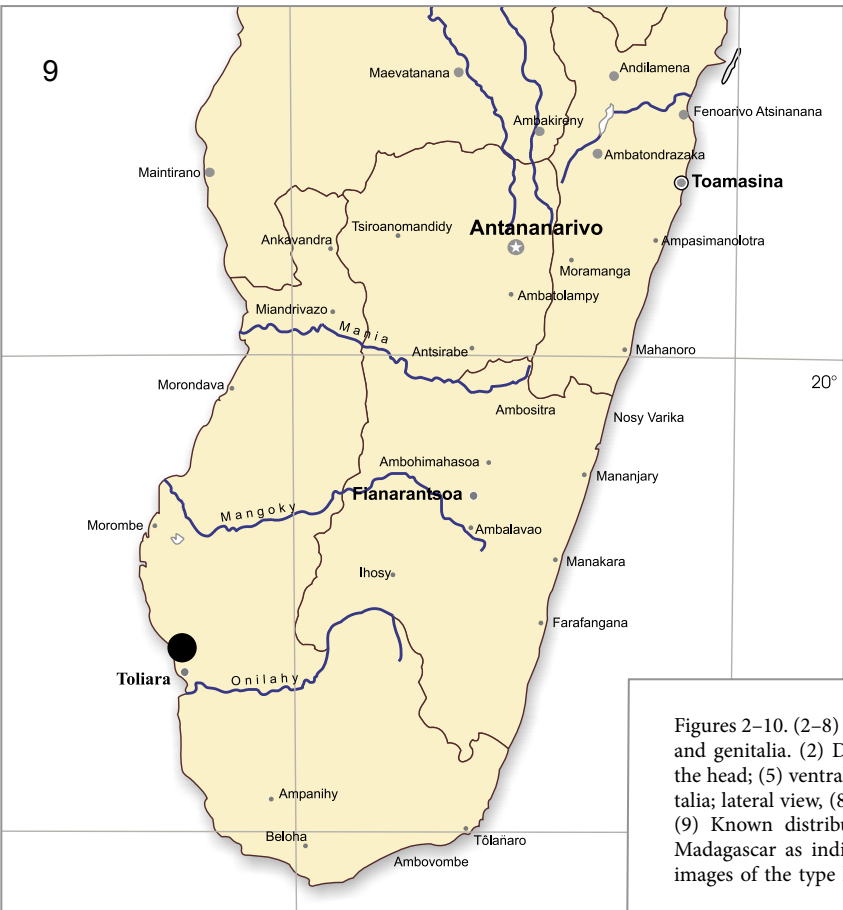
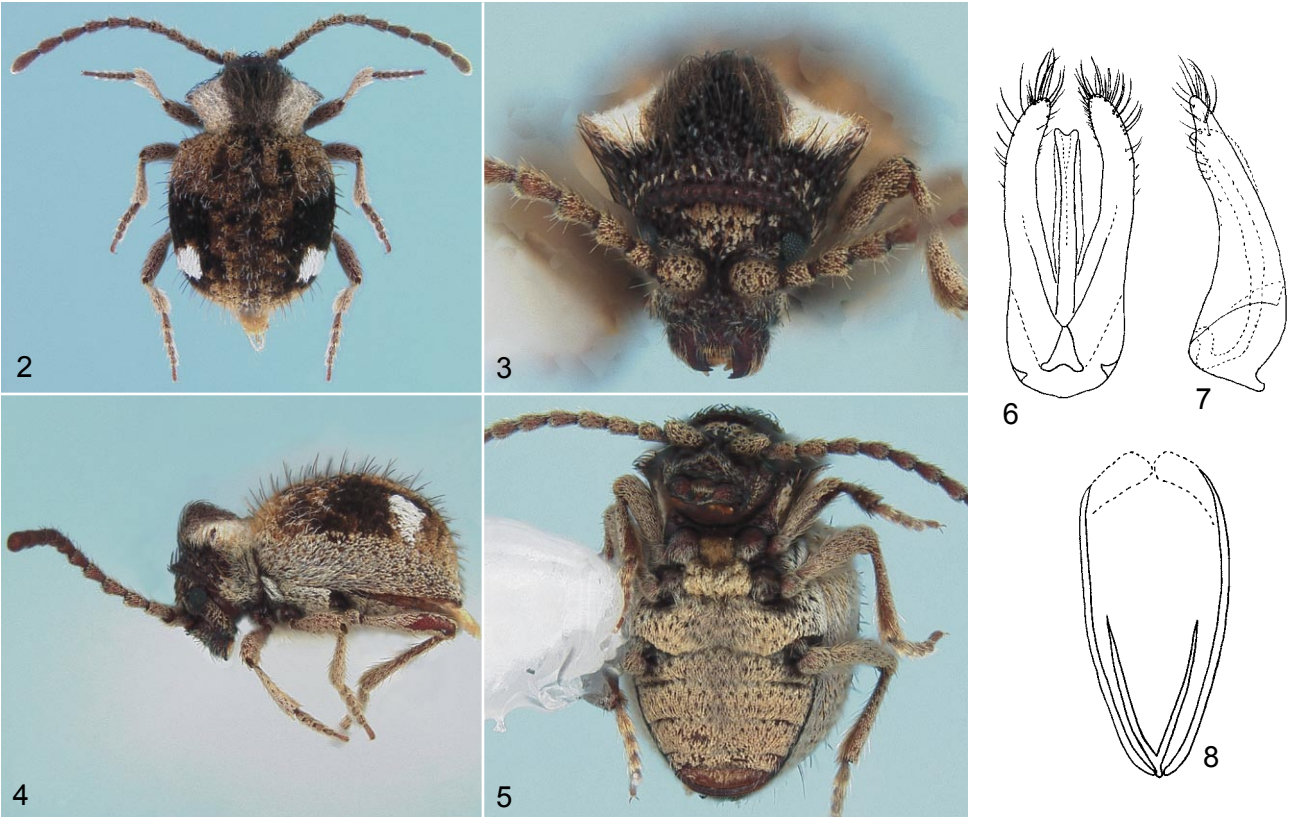
Elytra. Surface densely hirsute with short scale-like setae except for small widely spaced puncture rows most visible at middle of each elytron, each puncture with small, short, recumbent brown setae just extending beyond

Description. Holotype. Length from anterior edge of pronotum to apex of elytra 1.64 mm. Cuticle where visible reddish or brownish black.

Head. Surface deeply coarsely punctate; vertex at middle and on genae below eyes mainly covered with scattered appressed scale-like white setae, interspersed with longer less abundant suberect brown setae; antennal fossae surrounded with fine appressed white setae except adjacent to scale setal patch on vertex; clypeus at middle and anteriorly largely glabrous except for scattered long suberect setae; labrum anterior edge densely covered with long yellow setae, similar setae but less abundant on mandible except apex; eyes small and slightly projecting, maximum diameter about as long as third antennomere, approximately 10 ommatidia at maximum length and width; antennal scape and basal antennomeres covered with white appressed scale-like setae similar to that on vertex except smaller, becoming finer and more hair-like apically, also with scattered suberect brown setae; antennomeres 3 through 8 subequal, 9–11 successively increasing in length and slightly in width, apical about $1.5 \times$ longer than 3rd – 8th.

posterior margin of puncture; interpuncture setal rows consisting of long erect setae of variable length, about equal to the distance between three punctures measured longitudinally; scale-like leaf-shaped setae suberect and slightly overlapping over most of the surface, coloration in dorsal view at anterior $\frac{1}{4}$ yellow, at middle $\frac{1}{2}$ on interstitial rows 4 through 7 an elongate dark brown patch except for white patch posterior of middle on interstitial rows 3 through 7, remaining surface a random small patchwork pattern of yellow, tan, and dark brown setae; anteriorly between anterior yellow band and dark brown patch and broadly along suture scattered white recumbent setae about equal in length to those in punctures; laterally with similar scale-like setae becoming more narrow along margin, erect interstitial setae distinctly shorter than those on dorsal surface.

Ventral surface. Obscured with recumbent scale-like pale yellow setae mainly with truncate tips, branched setae localized mainly on metasternum and first ventrite medially, apical edge at middle of second ventrite, and fifth ventrite; scattered suberect or erect long narrow setae with insertion points lacking scale-like setae; fifth ventrite



Figures 2–10. (2–8) *Acanthoptinus triplehorni* external views of specimens and genitalia. (2) Dorsal habitus; (3) lateral habitus; (4) frontal view of the head; (5) ventral view; (6) male genitalia, ventral view; (7) male genitalia, lateral view; (8) spiculum gastrale. (9–10). Distribution and habitat. (9) Known distribution of *Acanthoptinus triplehorni* in southwestern Madagascar as indicated by the circle; (10) desert scrub forest habitat images of the type locality for *Acanthoptinus triplehorni* in Ifaty, Toliara Province, Madagascar.

distal margin with raised rounded rim; ratio of ventrite lengths at middle starting anteriorly 17:19:19:7:17.

Legs. With scattered white recumbent scale-like pale yellow setae similar to but smaller than those on ventral surface, also with scattered suberect longer narrow setae.

Genitalia. Male parameres relatively short and gradually converging towards the apices, with scattered elongate setae mainly distally; median lobe with an emarginate tip, distinctly shorter than parameres.

Sexual dimorphism. External differences between the sexes are not noted. All specimens in the type series appear similar.

Types. Data on separate labels on the pins is indicated by the "/" and is as follows: Holotype: MADAGASCAR: Prov. Toliara; Ifaty, 23°09'S, 43°37'E, 17-22 Sept. 1993/ Pitfall trap in sand, desert scrub forest; collrs. W. E. Steiner, R. Andriamasimanana. Paratypes (6) with the same data.

The holotype and paratypes are deposited in the United States National Museum, Washington D.C. (USNM). Additional paratypes are deposited in the Natural History Museum, London (NHMC) and the T.K. Philips collection (TKPC).

Variation. Length from anterior edge of pronotum to apex of elytra averages 1.50 ± 0.16 mm ($n = 7$).

Etymology. This species is named after one of my mentors and Ph.D. committee members, Charles Triplehorn. I was fortunate to be the last graduate student committee he participated in during his long and distinguished career at The Ohio State University.

Distribution. Species of this monotypic genus were discovered on the southwest coast in Ifaty located in Toliara Province (Fig. 8). This is a fairly arid region with deserts and various xeric shrublands as well as tropical dry forest (Fig. 9) and is considered a region of very high endemism.

Biology. Like many other flightless ptinines, this species was collected in a desert scrub forest with a sandy substrate. This species probably feeds on organic matter

such as dung of various vertebrates or perhaps other forms of accumulated detritus.

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