

## **A Second Species of *Batesiana* Chalumeau, 1983 (Coleoptera: Scarabaeidae: Aphodiinae: Eupariini)**

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## A SECOND SPECIES OF *BATESIANA* CHALUMEAU, 1983 (COLEOPTERA: SCARABAEIDAE: APHODIINAE: EUPARIINI)

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### ABSTRACT

The genus *Batesiana* Chalumeau, 1983 (Coleoptera: Scarabaeidae: Aphodiinae: Eupariini) previously contained only the type species, *Batesiana tuberculata* (Bates, 1887), of which little is known. This paper describes *Batesiana chamorro*i Skelley and Vaz-de-Mello, **new species** and presents new natural history and distributional observations on *B. tuberculata*.

### RESUMO

O gênero *Batesiana* Chalumeau, 1983 (Coleoptera: Scarabaeidae: Aphodiinae: Eupariini) anteriormente continha apenas a espécie-tipo, *Batesiana tuberculata* (Bates, 1887), com pouca informação disponível. O presente trabalho descreve *Batesiana chamorro*i Skelley e Vaz-de-Mello, **nova espécie**, e apresenta aobserações sobre história natural.

Keywords: scarab beetle, taxonomy, Neotropical, palm debris association, arboreal

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### INTRODUCTION

*Batesiana tuberculata* (Bates) is a widespread Neotropical species noted for its unusual morphology and was the species chosen for the cover of Stebnicka's (2009) *Iconography of the New World Eupariini*. While occasionally attracted to lights, it remains uncommonly collected, and nothing has been published on its natural history. Recent field work yielded insights into its habits and larvae, and the discovery of a new species in the genus. The purpose of this paper is to review the genus and report these life history discoveries.

### MATERIAL AND METHODS

The descriptions for the genus and *B. tuberculata* are based on those in Stebnicka (2009). These are

repeated and modified as needed and acted as a template for the new species description. General terminology follows Stebnicka (2007, 2009). Material studied is deposited in the following collections:

- CEMT** – Setor de Entomologia da Coleção Zoológica, Universidade Federal de Mato Grosso, Cuiabá, MT, Brazil
- CMNC** – Canadian Museum of Nature, Ottawa, Ontario, Canada [F. Geniér, A. Smith]
- FMNH** – Field Museum of Natural History, Chicago, IL, USA [C. Maier]
- FSCA** – Florida State Collection of Arthropods, Gainesville, FL, USA
- MNKM** – Museo de Historia Natural, Noel Kempff Mercado, Santa Cruz de la Sierra, Bolivia [J. Ledezma]
- NHML** – Natural History Museum, London, UK [M. Barclay, B. Garner]

**SEMC** – Snow Entomological Museum, University of Kansas, Lawrence, KS, USA [Z. Falin]  
**UNSM** – University of Nebraska State Museum, Lincoln, NE, USA [M. Paulsen]

Label data from examined types are presented verbatim within quote marks “ ”, with a forward slash “/” separating lines on a label. Data from other specimens are not verbatim and may be slightly modified to fill in data gaps and be presented in a standardized format.

Photographs of specimens were taken with a Syncroscopy Automontage system at the FSCA. Measurements were taken with an ocular micrometer on a Leica MS5 dissecting microscope. Specimens were studied under the same microscope. The imaged larva was preserved in alcohol and dried with a critical point drier before photography.

Matt Moore (FDACS Division of Plant Industry) analyzed specimens for COI barcodes from the traditional “Folmer region”. Derived sequences are deposited in GenBank as follows using a “collection specimen number = GenBank sequence number” format: adult *B. tuberculata* from Suriname, FSCA 00033331 = GenBank MZ851996, FSCA 00033332 = GenBank MZ851997; larval *B. tuberculata* from Suriname, FSCA 00033356 = GenBank MZ851998; holotype *Batesiana chamorro*i, new species, FSCA 00033335 = GenBank MZ851999.

## TAXONOMY

### *Batesiana* Chalumeau, 1983

*Batesiana* Chalumeau 1983: 143–144. Stebnicka 2009: 22.

**Type Species.** *Euparia tuberculata* Bates, 1887 (by original designation).

**Diagnosis.** Eupariini, body elongate-oval, robust. Head medially gibbous; ventral clypeal and prothoracic indentations form cavity to hold appendages and prothoracic legs when retracted. Pronotum strongly transverse; lateral margin short, straight, crenate; broadly explanate laterally, lacking fringe of setae; posterior margin lacking marginal line. Elytral humeral angle distinctly dentate, not prolonged anteriorly; intervals irregularly tuberculate laterally, some with minute orifices. Protibia with small teeth in apical quarter. Tarsomeres with dense ventral pads of setae in addition to those on margin. Apical meso- and metatibial spurs short, reduced.

**Distribution.** Central America and northern South America.

**Remarks.** *Batesiana*, *Odontolytes* Kozhantshikov, 1916, and *Napoa* Stebnicka, 1999 form a group of genera readily distinguished from all other New

World Eupariini by the basal meso- and metatarsomeres being broadened and distinctly longer than the associated spurs. In addition, the ventral surfaces of these tarsomeres are usually covered with a dense pad of setae (other genera have a marginal fringe of setae only). *Batesiana* is distinguished from *Odontolytes* by the tuberculate elytra and from *Napoa* by the widely explanate lateral pronotal margin.

The genus *Odontolytes* has 19 described species and several undescribed species that are morphologically diverse (Stebnicka 2009; P. Skelley, personal observation). Some of these species show intermediate character states among some members of *Odontolytes*, *Batesiana*, and *Napoa*. The genera *Batesiana* and *Napoa* have a few autapomorphies, most notably the tuberculate elytra that distinguish them from *Odontolytes*. The validity of these generic limits, along with the potential paraphyly of these genera, needs to be reviewed. However, generic level analysis of this complex is not the purpose of this paper. For now, we maintain the current generic limits.

## KEY TO THE SPECIES OF *BATESIANA*

1. Medial clypeal gibbosity moderately prominent, obtusely ( $> 90^\circ$ ) angled in lateral view (Fig. 7); lateral pronotal explanation with posterior angle right-angled, not projecting posteriorly (Fig. 6); prosternal process behind coxae with carina encompassing broad triangular area flattened medially (Fig. 8); metafemur with posterior line complete (Fig. 8) ..... *B. tuberculata* (Bates)
- 1'. Medial clypeal gibbosity tuberculate,  $90^\circ$  in lateral view (Fig. 2); lateral pronotal explanation with posterior angle more acute ( $< 90^\circ$ ), projecting posteriorly (Fig. 1); prosternal process behind coxae with carina enclosing a circular area with a median tubercle (Fig. 3); metafemur with posterior line effaced proximally (Fig. 3) ..... *B. chamorro*i Skelley and Vaz-de-Mello, new species

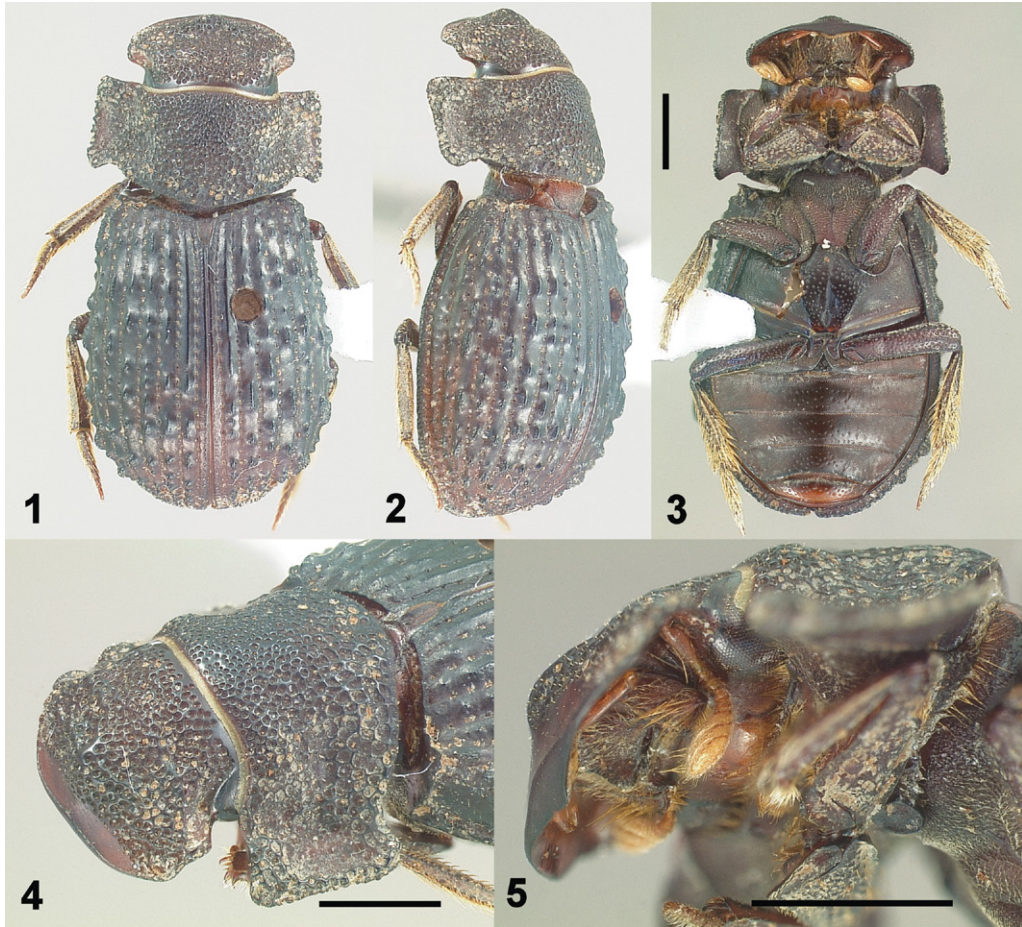
### *Batesiana chamorro*i Skelley and Vaz-de-Mello, new species

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 Figs. 1–5

**Type.** Female labeled “/ Ecuador Pastaza / Chuyayacu km 25 / 3-May-99 / Trampa de Luz Hg / Pablo Araujo /”, “/ kn0222 /”, “/ FSCA 00033335 /”, “[red paper] HOLOTYPE ♀ / *Batesiana / chamorro*i Skelley / & Vaz-de-Mello /”. Deposited in CEMT.

**Distribution.** Ecuador: Pastaza, Chuyayacu. Known only from the type locality.

**Diagnosis.** Adults of *B. chamorro*i are distinguished from those of *B. tuberculata* by a larger



**Figs. 1–5.** *Batesiana chamorroii*, **new species**, holotype. 1) Dorsal habitus; 2) Lateral habitus; 3) Ventral habitus; 4) Head and pronotum, oblique dorsal view; 5) Head and prothorax, oblique ventral view showing medially projecting mentum. Scale line on Figs. 3–5 = 1 mm. Figs. 1–3 at same scale.

body size, coarser and denser dorsal punctation, medial clypeal gibbosity tuberculate, mentum with projecting medial carina, posterior angles of pronotum acutely angled, prosternal process circular posteriorly, metafemur with posterior line incomplete proximally, and protibial teeth not equally separated.

**Description.** Length 7.5 mm. Body piceous black, moderately glossy (Figs. 1–3). Head broad, strongly deflexed, everywhere coarsely, closely punctate; punctures large, foveate over most of central surface (Fig. 4); clypeal margin nearly truncate, with distinct elliptical, inflexed clypeopleuron in medial fifth; medial clypeal gibbosity tuberculate, angled 90° in lateral view; mentum conical, projected, large medial longitudinal carina (Fig. 5). Pronotal surface with large, foveate, close punctures; lateral area scabrous, swollen along margin

with shallow, contiguous punctures, punctures not evident in depressed medial scabrous area; lateral pronotal explanation with posterior angles acute, projecting posteriorly. Scutellar shield triangular, flat. Elytra ovate, strongly convex, humeri dentate; base with weakly defined marginal bead; striae and stria punctures fine, intervals with tubercles and swellings, irregular in shape and spacing. Ventral sclerites alutaceous. Prosternal process behind coxae with carina encompassing a circular area with small medial tubercle; mesoventrite declivous, transversely concave medially; mesocoxae widely separated, intercoxal carina wide, glossy; metaventral disc convex, punctate, lateral area alutaceous, smooth. Abdominal sternites convex, fused, fluting along sutures inconspicuous, surface irregularly punctate medially, alutaceous laterally; disc of pygidium broad, not deeply eroded. All femora

punctate; posterior lines of meso- and metafemora effaced proximally; protibia short, externally with 3 minute lateral teeth, basal tooth farther from medial tooth than medial tooth from apical tooth; meso- and metatibiae with longitudinal lines and close golden setae, apical spurs very short, spine-like; tarsi short, robust, tarsomeres triangular, covered with close golden setae; claws minute. External sexual differences unknown.

**Material Examined.** Only known from the unique female holotype.

**Etymology.** Named for MSc William Chamorro, Colombian-Ecuadorian entomologist who provided the only known specimen.

**Remarks.** The COI barcode shows *B. chamorro* to be 19.9% divergent from *B. tuberculata*. The holotype of *B. chamorro* was collected at a mercury vapor light; otherwise, nothing is known of its habits. We suspect its habits are similar to those of *B. tuberculata*.

***Batesiana tuberculata* (Bates, 1887)**

Figs. 6–12, 14

*Euparia tuberculata* Bates 1887: 94, pl. 6, fig. 23.

*Phalangochaeta tuberculata* (Bates). Martínez 1952: 95.

*Batesiana tuberculata* (Bates). Chalumeau 1983: 144, figs. 1, 10; Stebnicka 2007: 585, pl. III, fig. 20; Stebnicka 2009: 22–23.

**Type Specimen.** Holotype *Batesiana tuberculata* (Bates) (NHML, examined) label data: PANAMA “/ Bugaba, / 800-1500 ft. / Champion. /”, “/ [red ringed disc] Holo- / type /”, “/ B.C.A., Col., II(2) /”, “/ Sp. figured. /”, “/ [black bordered label] Generotype de / *Batesiana* [handwritten blue ink] / Det. F. Chalumeau [print] 180 [handwritten blue ink] /”, “/ [black bordered label] *Batesiana / tuberculata* (Bates) [handwritten blue ink] / Det. F. Chalumeau [print] 180 [handwritten blue ink] /”.

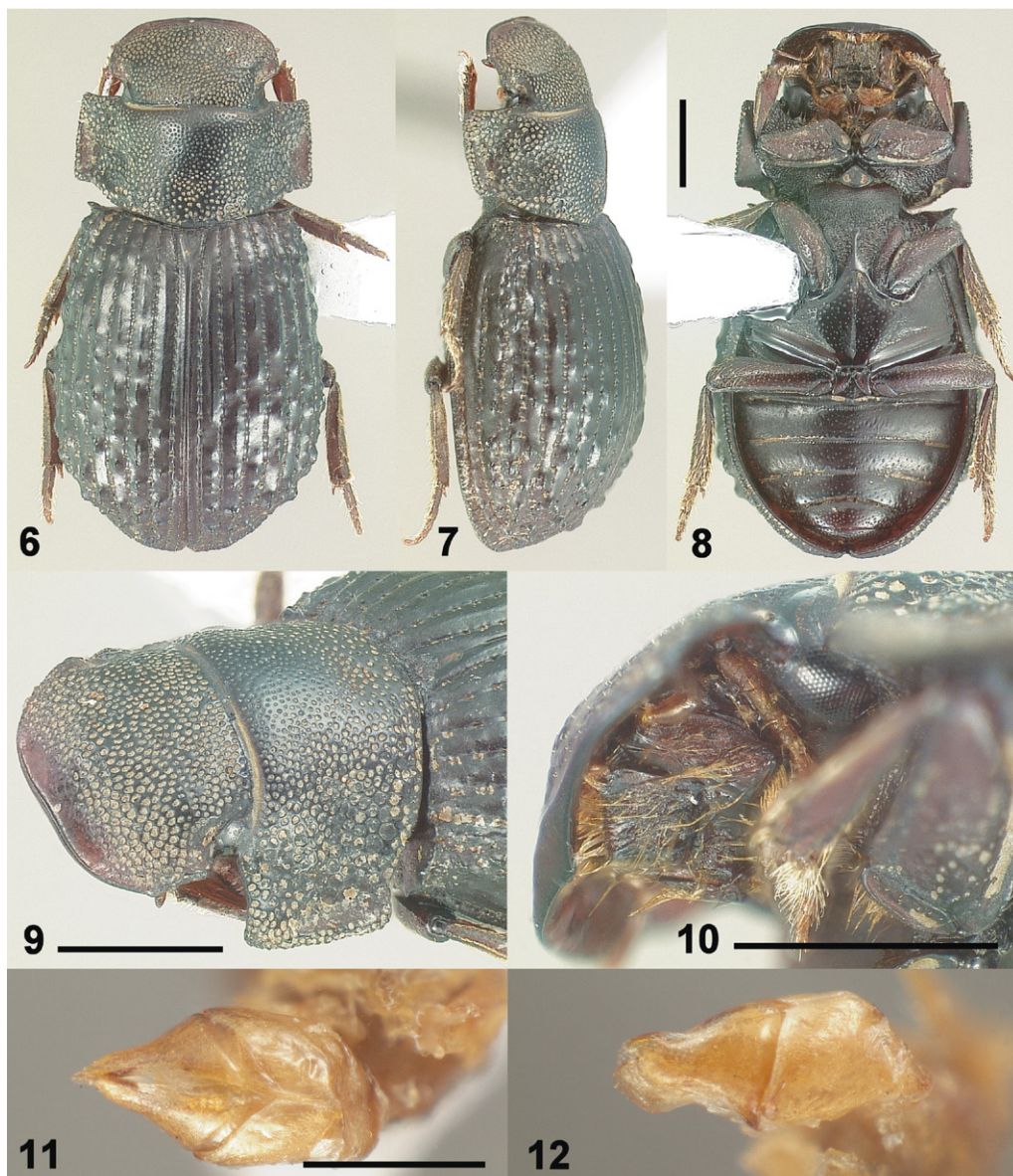
**Distribution.** Costa Rica, Panama, Guyana, Brazil (Stebnicka 2009), and Colombia (Pardo-Locarno and Schoolmeesters 2019), to which we add Trinidad, French Guiana, Suriname, and Bolivia.

**Diagnosis.** *Batesiana tuberculata* is distinguished from the new species by the smaller body size, smaller, shallower, and less dense dorsal punctation, moderately gibbous clypeus, mentum simply swollen, posterior angles of pronotum 90°, prosternal process triangular posteriorly, metafemoral posterior line complete, and protibial teeth equidistant from each other.

**Description.** (Updated from Stebnicka 2009) Length 5.3–6.6 mm. Body piceous black, moderately glossy (Figs. 6–8). Head broad, strongly deflexed, everywhere coarsely, closely punctate;

punctures moderate, not foveate over most of central surface (Fig. 9); clypeal margin nearly truncate, with distinct subelliptical, inflexed clypeopleuron in medial third; medial clypeal gibbosity moderately prominent, obtusely (> 90°) angled in lateral view; mentum with indistinct medial longitudinal swelling (Fig. 10). Pronotal surface with moderate, close, nonfoveate punctures; lateral area scabrous, swollen along margin with shallow, contiguous punctures, punctures evident in medial scabrous area; lateral pronotal explanations with posterior angles 90°, not projecting posteriorly. Scutellar shield triangular, flat. Elytra ovate, strongly convex, humeri dentate; base with sharply defined marginal bead; striae and stria punctures fine, intervals with tubercles and swellings, irregular in shape and spacing. Ventral sclerites alutaceous. Prosternal process behind coxae with carina encompassing broad triangular area that is flattened medially; mesoventrite declivous, transversely concave medially; mesocoxae widely separated, intercoxal carina wide, glossy; metaventral disc convex, punctate, lateral area alutaceous, smooth. Abdominal sternites convex, fused, fluting along sutures inconspicuous, surface irregularly punctate medially and along posterior margin from side to side, laterally alutaceous anteriorly, often slightly wrinkled; disc of pygidium broad, not deeply eroded. All femora punctate; posterior lines of meso- and metafemora complete; protibia short, with 3 minute lateral teeth, equidistant; meso- and metatibiae with longitudinal lines and close golden setae, apical spurs very short, spine-like; tarsi short, robust, tarsomeres triangular, covered with close golden setae; claws minute. External sexual differences slight: male penultimate abdominal ventrite shorter than in female, male disc of pygidium broader. Male genitalia simple, short, narrowing posteriorly, rounded in lateral view (Figs. 11–12).

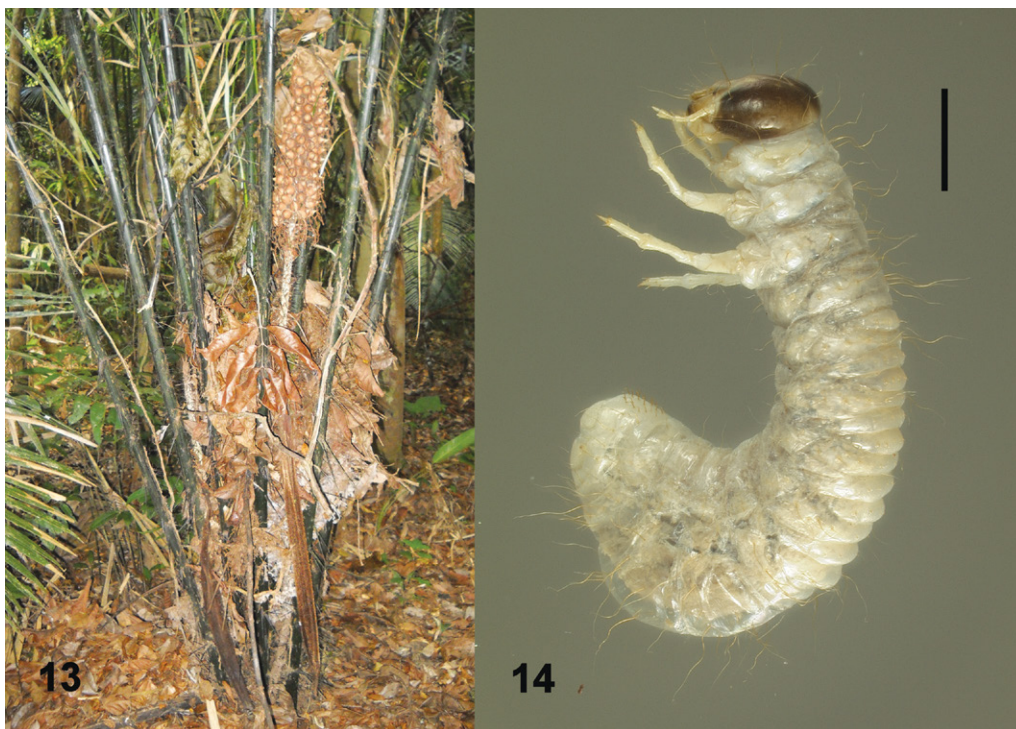
**Material Examined.** The holotype and following materials were studied (total = 119): **BOLIVIA: Santa Cruz:** Portrerillo del Guenda, 17°40'S, 63°27'W, Snake Farm, 350–400 m, 21–24-X-2011, Wappes and Skillman (1-FSCA: FSCA 00033334); 5 km SSE Buena Vista, Hotel Flora & Fauna, 440 m, W63°39.128', S17°29.925', 10–22-X-2004, J. E. Eger, at UV, MV and incandescent lights (1-MNKM: FSCA 00033333). **BRAZIL: Acre:** Assis Brasil, 10°35'44"S, 69°37'11"W, 18-IX-2016, wild environment, CDC light trap, Ortiz & Borges leg. (2-CEMT); **Mato Grosso:** Cotriguaçu. Fazenda São Nicolau, Matinha, 09°50'19" S, 58°15'03" W, X-2010, *Attalea* accum. debris, F. Z. Vaz-de-Mello (4-CEMT); **Pará:** Novo Progresso, Faz. Florentino, 7°08'11"S, 55°23'42"W, 230 m, Amazon forest, light, X–XI-2010, D. Krinski (2-CEMT); **Rondônia:** Nova Mamoré, mata 3, 10°19'47"S, 64°45'12"W, 190 m, I–II-2010, F. Coletti (1-CEMT); Porto Velho,



**Figs. 6–12.** *Batesiana tuberculata*. Adult from Suriname: **6)** Dorsal habitus; **7)** Lateral habitus; **8)** Ventral habitus; **9)** Head and pronotum, oblique dorsal view; **10)** Head and prothorax, oblique ventral view showing swollen mentum. **11–12)** Male genitalia, dorsal and lateral view, specimen from Barro Colorado Island, Panama. Scale line on Figs. 8–10 = 1 mm, Fig. 11 = 0.5 mm. Figs. 6–8 at same scale. Figs. 11–12 at same scale.

Rio das Garças, Bom Jesus, 8°49'47"S, 63°46'51"W, FIT [flight intercept trap], 22-X-2017, D. C. Santos & K. K. G. Silva legs. (1-CEMT). **COLOMBIA:** **Chocó:** Jurubidá 100 m, 9-IX-1995, litter, P. Duque (2-CEMT). **COSTA RICA:** **Puntarenas:** Osa Peninsula, Fundacion Neotrop., 10 km W. Rincon, 08°42'30"N, 83°31'30"W, 100 m, 21-VI-1997, R. S. Anderson, lowland forest litter 97-023A,B,D,G,

97-024A (7-CMNC; 1-FSCA: FSCA 00033336); same data, 200–350 m, 22.VI.1997, R. S. Anderson, ridge, for. litter 97-027 (4-CMNC); same data, 200 m, 23.VI.2001, R. Anderson, lowland forest litter, 2001-118D-E (2-CMNC); same data, 22-XI-2001, D. Chandler, up trail, ex. treefall litter (3-CMNC); Osa Peninsula, 5 km W Rincon de OSA, 8°42'N, 83°31'W, 500 m, 27-III-1973, J. Wagner &



**Figs. 13–14.** Larva and habitat from Suriname. **13)** The palm *Asterocaryum paramaca* holding debris in which *Batesiana tuberculata* adults and larvae were collected; **14)** Larva of *B. tuberculata*, scale line = 1 mm.

J. Kethley, ridge in OSA, buttress mold concentrate 800cc (1-FMNH); Corcovado National Park, Sirena Station, 8.4133, -83.5894, 5 m, 26-VI-2000, Falin, Zachary (1-SEMC). **FRENCH GUIANA:** Montagne des Chevaux, 4°44'56"N, 52°26'28"W, 75 m, 21-XII-2013, SEAG (3-CEMT; 2-FSCA: FSCA 00033337); same data, 31-III-2013, SEAG (1-CEMT; 1-NHML); same data, 11-II-2013, SEAG (3-CEMT); same data, 4-II-2013, SEAG (4-CEMT); same data, 4-IV-2014, SEAG (1-CEMT); same data, 26-V-2013, SEAG (1-CEMT); Kourou, Forêt de Wayabo, 01-xii-2012, M. Duranton (1-CEMT). **PANAMA: Canal Zone:** Barro Colorado Island, 12-V-1980, Henk Wolda (2-FSCA); same data, 14-V-1980 (1-FSCA); same data, 24-VI-1980 (1-FSCA: FSCA 00033330); same data, 6-VII-1980 (4-FSCA); same data, 13-20-IX-1980, ground light trap (4-FSCA); Barro Colorado Island, 9°10'N 79°50'W, 3-VIII-1974, H. A. Hespeneheide (1-CMNC); same data, 10-VIII-1974 (1-CMNC); same data, 9-VI-1977 (1-CMNC); same data, 12-VIII-1978 (1-CMNC); 5 mi. NW Gamboa, 13-IV-1970, M. Aru, light trap (1-CMNC; 1-FSCA; 1-NHML); Ft. Gulich, 17-V-1976, at light (2-UNSM); Ft. Gulich Qtrs. 40QA, 6-11-V-1981, N. J. Marian, black light trap (1-FMNH); **Chepo:** Altos de Maje, 17-V-1975, Stockwell-Engleman, at

light (1-CMNC); **Colón:** Ciricito, Canal Zone, 31-VII-1931 (1-NHML); Gamboa 50 m, 4-v-2007, D. Curoe (1-CEMT); Pipeline Road, Parque Nac. Soberania, 9.1167, -79.7500, 20-40 m, 26-V-1995, J. Ashe & A. Ashe, treefall litter (1-SEMC); Pipeline Rd, km 0.2, Parque Nac. Soberania, 9.1167, -79.7500, 40 m, 2-VI-1995, J. Ashe & R. Brooks, treefall litter (1-SEMC); Santa Rita Ridge, 24-V-1977, B. C. Ratcliffe (1-UNSM); **Darien:** Cana Biological Station, Serrania de Pirre, 950 m, 7°45'18"N, 77°41'6"W, 5-VI-1996, S. Ashe & R. Brooks, treefall litter (1-SEMC); same data, 06-VI-1996 (2-SEMC; 1-FSCA: FSCA 00033329); same data, 08-VI-1996 (2-FSCA, 3-SEMC); Cana Station, Peleton Trail, km 0-2, 500 m, 7°45'N, 77°41'W, 28-VI-2009, L. Sekerka & D. Windsor, beating of forest vegetation (1-NHML); **Panama:** 9 km SE Bayano Bridge, 9°10'N, 78°46'W, 8-IX-1974, H. Stockwell (4-UNSM). **SURINAME: Para District:** near Overbridge River Resort, N05°31.8', 055°03.5'W, 14-15-II-2010, P. Skelley, detritus in crown of understory palm, *Asterocaryum paramaca* (27-FSCA: FSCA 00033331, FSCA 00033332). **TRINIDAD:** Tunapuna, Mt. St. Benedict, 550 m, 5-21-VI-93, summit rain, forest FIT, Mt. Tabor, S & J Peck, 93-6 (2-CMNC).

**Remarks.** *Batesiana tuberculata* is a widespread yet uncommonly collected species, occasionally found at light. Henk Wolda ran light traps on Barro Colorado Island while working on ecological observations of rainforests (e.g., Wolda 1978). His research collected many specimens of *B. tuberculata* that have been scattered widely in personal and institutional collections, many of which were observed but their data are not recorded here.

Members of the related *Odontolytes* have been collected in arboreal litter situations (Stebnicka and Skelley 2005, see account for “*Auperia* Chevrolat”, now *Odontolytes*). In Suriname during 2010, PES was looking for arboreal masses of organic debris in hopes of finding *Odontolytes*. Near Overbridge, he noticed an understory palm tree, *Asterocaryum paramaca* Mart. (Arecaceae) (Fig. 13), that accumulated falling debris in its crown that could house beetles. This palm has long spines along the leaf rachis to protect the plant. Using an insect net or beating sheet inserted between the spines to collect falling debris, he used a stick and later a machete to dig out the rich organic matter. Sifting this debris yielded several interesting beetles, including adults and larvae of *B. tuberculata* (Fig. 14). COI analysis of adults and associated larvae were 99% similar, confirming the identity of the larva as *B. tuberculata*. These larvae are preserved and deposited in the FSCA for future descriptive work. FVM found adults and presumed larvae sifting debris accumulated in the axillae of *Attalea speciosa* Mart. (Arecaceae) in Cotriguaçu, Mato Grosso, Brazil, first during 2010 and then on other occasions in the same forest.

#### ACKNOWLEDGMENTS

We thank the collections curators who loaned materials for this study as listed in the Material and Methods section. Matt Moore, FDACS-DPI, is acknowledged for the molecular analyses that confirmed the identity of larvae. Oliver Keller, FDACS-DPI, helped locate literature and reviewed the manuscript. William B. Warner, Chandler, AZ, provided an exceptional pre-submission review. We thank UFMT/Propeq (Universidade Federal de Mato Grosso, Pró-Reitoria de Pesquisa) for funding

PES as a visiting researcher in 2018 to curate the Aphodiinae, where the new species was discovered. Most of the maintenance of collection is funded by CNPq and FAPEMAT through different project grants to FVM, who is also a CNPq PQ1A fellow. We thank the Florida Department of Agriculture and Consumer Services, Division of Plant Industry for support of this work.

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