

A matrix-based revision of the genus *Hypogena* Dejean, 1834 (Coleoptera: Tenebrionidae)

LUNA GREY^{1,*} & AARON D. SMITH^{1,2}

¹Northern Arizona University, Department of Biological Sciences, 617 S. Beaver St., Flagstaff, AZ 86011-5640, USA

✉ lunagrey990@gmail.com;  <https://orcid.org/0000-0002-6036-0281>

²Purdue University, Department of Entomology, 901 W. State Street, West Lafayette, IN 47907

✉ Pimeliinae@purdue.edu;  <https://orcid.org/0000-0002-1286-950X>

*Corresponding author

Abstract

The darkling beetle genus *Hypogena* Dejean, 1834 (Tenebrionidae: Tenebrioninae) is revised. *Hypogena* is entirely composed of dorsoventrally flattened species that live subcortically in dead trees. This genus is generally identified by male specific characters, particularly the presence of cephalic horns. *Hypogena* is currently placed within the tribe Triboliini Gistel, 1848. However, several previously overlooked morphological characters call into question its placement within the tribe. A morphological matrix of 94 external adult characters was assembled to examine species relationships and boundaries. The resulting phylogeny is presented. Thirteen *Hypogena* species were previously recognized as valid, including *Hypogena marginalis* Doyen & Poinar from Dominican amber. Four previously unidentified species are described in this study: *Hypogena akuma* sp. nov. (Brazil), *Hypogena cryptica* sp. nov. (Mexico), *Hypogena hirsuta* sp. nov. (Ecuador), and *Hypogena reburra* sp. nov. (Colombia). Lectotypes are designated for *Hypogena depressa* (Champion, 1886), *Hypogena dejeani* (Champion, 1886), *Hypogena canaliculata* (Champion, 1886), and *Hypogena vacca* (Fabricius, 1801). A neotype is designated for *Tenebrio biimpressus* (Latreille, 1833) (type species of *Hypogena*, synonymized under *Hypogena brasiliica* (Perty)) in order to maintain stability within the genus.

Keywords: Darkling Beetles, horns, new species, taxonomic key, tropical biodiversity, phylogeny

Introduction

The genus *Hypogena* was first described by Dejean (1834) and is currently placed in the tenebrionid tribe Triboliini Gistel, 1848 (Bousquet *et al.* 2018). *Hypogena* was later placed as a subjective synonym of *Ulosonia* Laporte, 1840 (Champion 1886). In 1962, ten species were included in *Ulosonia* (Kulzer 1962): *Hypogena amazonica* (Kulzer, 1962), *Hypogena biimpressa* (Latreille, 1833), *Hypogena brasiliensis* (Kulzer, 1962), *Hypogena canaliculata* (Champion, 1886), *Hypogena dejeani* (Champion, 1886), *Hypogena depressa* (Champion, 1886), *Hypogena laevicollis* (Kulzer, 1962), *Hypogena marginata* (LeConte, 1851), *Hypogena tricornis* (Dalman, 1823), and *Hypogena vacca* (Fabricius, 1801). Spilman (1973) resurrected *Hypogena* with the inclusion of *Tenebrio biimpressus* Latreille as the designated type species. *Hypogena biimpressa* (Latreille, 1833) has since been synonymized under *Peltis brasiliica* Perty (Grimm *et al.* 2018). Since 1973, three species of *Hypogena* have been described—*Hypogena marginalis* Doyen and Poinar, 1994 (from Dominican amber), *Hypogena cat* Steiner, 2005 and *Hypogena triceratops* Steiner, 2005—but new records, even at the country level (Smith *et al.* 2015) are rare and no revision of the genus has been undertaken.

Hypogena species have a distinct dorsoventrally flattened form and range in size from 5 (*H. marginalis*) to 10 mm (*H. brasiliica*). Adults have been collected at lights and under loose bark on dead trees. The larvae and pupae for this group have not been described. *Hypogena* species are distributed from the USA (Florida, Texas, Arizona, and California) to Argentina (Blackwelder 1945, Steiner 2005).

The main identifying character for this genus is the presence of prominent cephalic horns on the males of all known species. Males from most of the species have three horns: a clypeal horn and two supraorbital horns. In some

species, the clypeal horn is absent. The last *Hypogena* key (Kulzer 1962), uses characters associated with the horns, pronotal puncturing, the overall length of the beetle, the depth of the elytral striae, and the elytral puncturing for species identification. Kulzer also provides images of the aedeagi for eight of the 13 species. However, Kulzer's key does not allow for the identification of female specimens, and it no longer includes all of the known species.

The current placement of *Hypogena*, along with the genus *Mycotrogus* Horn, 1870 within the tribe Triboliini is somewhat doubtful. Several structures show a distinct difference between these genera and the rest of Triboliini. The most distinctive are the presence of stellate antennal sensoria (Doyen 1985) and cuticular outgrowths on the protarsi in *Hypogena* and *Mycotrogus* (absent in all other Triboliini genera), and the presence of a row of cuticular teeth around the posterior edge of the metasternum in *Hypogena*. Another closely related monotypic genus, *Tharsus seditiosus* LeConte, 1866 (= *Metaclisa seditiosa* (LeConte, 1862), was recently moved from Triboliini to the genus *Metaclisa* within the tribe Metaclisini based on a suite of characters linking it to other members of the genus (Steiner 2016), including the presence of stellate antennal sensoria.

For this revision, type material was examined for all current *Hypogena* species. A morphological matrix of external adult characters was assembled to examine species relationships and boundaries, and four additional undescribed species (*Hypogena akuma* sp. nov. (Brazil), *Hypogena cryptica* sp. nov. (Mexico), *Hypogena hirsuta* sp. nov. (Ecuador), and *Hypogena reburra* sp. nov. (Colombia)) were uncovered in collections. Descriptions or redescriptions of all known *Hypogena* species are provided, along with distribution maps, a morphology-based phylogeny for the genus, and a species key including characters applicable to both sexes within each species.

Material and Methods

This study was conducted based on material from the following collections. The number of specimens examined from each collection is listed in brackets.

ADSC—Aaron D. Smith Collection, West Lafayette, IN, USA [29]
BMNH—The Natural History Museum, London, United Kingdom [204]
CASC—California Academy of Sciences, San Francisco, CA, USA [432]
CSCA—California State Collection of Arthropods, Sacramento, CA, USA [280]
EMEC—Essig Museum of Entomology, University of California, Berkeley, CA, USA [201]
FMNH—Field Museum of Natural History, Chicago, IL, USA [25]
FSCA—Florida State Collection of Arthropods, Gainesville, FL, USA. [79]
GOPC—George O. Poinar, Jr. Collection, to be deposited in the EMEC [1]
MCZC—Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA [1]
NHMB—Naturhistorisches Museum Basel, Basel, Switzerland [185]
NHRs—The Swedish Museum of Natural History [2s]
NMNH—National Museum of Natural History, Smithsonian Institution, Washington, DC, USA [374]
NMPC—Czech Republic National Museum, Prague, Czech Republic [31]
OSAC—The Oregon State Arthropod Collection [3]
RLAC—The Rolf L. Aalbu Collection, El Dorado Hills, CA, USA [10]
TAMU—Texas A&M University Insect Collection, College Station, TX, USA [50]
UCDC—Bohart Museum of Entomology, University of California, Davis, CA, USA [30]
ZMUK—Zoological Museum of Kiel University [2]

Muséum National d'Histoire Naturelle (MNHN) personnel were unable to locate the type material for *H. brasiliica*, *H. laevicollis* (Kulzer, 1962), or *H. amazonica* (Kulzer, 1962). The University of São Paulo was contacted, but no specimens were borrowed. The Swedish Museum of Natural History, as per their loan policy with type material, imaged the holotype of *H. tricornis* (Dalman, 1823) for the authors. The Zoological Museum of Kiel University imaged type specimens of *H. vacca* (Fabricius, 1801) for the authors.

Morphology and distribution

The present study is based primarily on adult external morphological data. Specimens were identified by comparison to type material, previously identified specimens, and characters used in the literature (Champion 1895, Kulzer 1962, Aalbu *et al.* 2002), as well as novel characters codified during this research. Male specimens, once identified,

were sorted based on locality. If any females shared the same collecting event information, they were examined for similarities with the males.

Specimens were databased and georeferenced in mx (<http://mx.phenomix.org>) through the TenebrioniDBase portal. Specimens were each given a unique identifier (TenebrioniDBase number, abbreviated to TB#) linked to their georeferenced collecting event. If the coordinates were not given, then they were inferred, with variable geographic error ranges assigned, using Google Earth. Specimen distributions were then downloaded as kml files for each species. Maps were made in ArcGIS version 10 (ESRI 2011). Maps were not made for species represented by only one specimen. Verbatim and determined label data for all specimens examined can be found on TenebrioniDBase (tenebrionidbase.org). Maps were obtained from © OpenStreetMap contributors, which is licensed by CC BY-SA and can be found at openstreetmap.org.

Flight wings were dissected from *Hypogena vacca*, *H. tricornis* and *H. depressa* to explore variation of wing structure and venation within the genus. Ethanol washes were used to spread the wing. After the last ethanol wash, the wing was briefly placed in HMDS to prevent it from collapsing before it could be board-mounted. Prepared wings were then compared to published wing structure information for *Tenebrio molitor* Linnaeus, 1758 (Doyen 1966).

As *Hypogena* shows some variation in the shape of male genitalia (Kulzer 1962), representatives from each species were dissected. The female genitalia were also dissected from two representatives each of *H. vacca*, *H. depressa*, and *H. marginata* (LeConte, 1851). The abdomens were cleared with 10% potassium hydroxide, dyed with Bioquip double stain and preserved in glycerin. All dissections were compared to *T. molitor* using the same terminology as Doyen (1966) and Iwan & Kaminski (2016).

SEM Preparation

Scanning electron microscopy (SEM) was used to examine small morphological structures (i.e., cuticular outgrowths on protarsi, stellate sensoria, and teeth on the metasternum). Methodology was modified from Kuo's Electron Microscopy (2014). Due to the relatively thick cuticle of the beetles, specimens were not fixed in a buffer (Kuo 2014). To further dehydrate the specimens, they were submerged in two graded alcohol baths, up to 100% for ten minutes. The 100% EtOH bath was repeated three times to remove any excess water. Specimens were then critical point dried and sputter coated with gold/palladium for 75 seconds. To examine the antennae, one antenna was taken from specimens of *T. molitor*, *Tribolium confusum* Jacquelin du Val, 1868 and *Tribolium castaneum* (Herbst, 1797). Antennae were placed onto a stub with two-sided carbon tape so that the antennal sensoria would be in clear view of the detectors. They were then sputter coated for six seconds. If the image was obscured by charging, then they were recoated for an additional six seconds. All images of the antennal sensoria are of the terminal flagellomeres. A Zeiss Supra 40VP was used to examine all specimens. Specimens were viewed with an accelerating voltage of between five and six KeV. Two images were taken for each structure examined. The first was an image of the structure of interest at a close magnification (224-7370X magnification). The second image was taken to show the general layout of the structure of interest in relation to the rest of the organism (74-150X magnification).

Phylogenetic Analysis

Kulzer (1962) was used to identify potentially informative characters for identification. These data, along with newly identified characters, were used to construct a morphological matrix for the genus in Mesquite v3.5 (Maddison and Maddison 2018) with 94 adult characters for the 13 recognized species, four new species, and six outgroup taxa (Triboliini: *Latheticus oryzae* Waterhouse, 1880, *Mycotrogus angustus* Horn, 1870, *Mycotrogus mentalis* Blaisdell, 1923, *Tribolium castaneum* (Herbst, 1797); Metacislini: *Metaclisa seditiosa* (LeConte, 1862); Tenebrionini: *Tenebrio molitor* Linnaeus, 1758. The only fossil for this group, *H. marginalis* from Dominican amber, was coded but not included in the final analyses due to the large amount of missing data (Table 1). If the character was obscured or otherwise not able to be scored, then it was marked with a question mark. Adult *Hypogena* were analyzed for morphological characters that were consistent within species and varied across the genus. Trees were inferred from heuristic maximum parsimony searches in Paup* 4.0a (Swofford 2003) and Bayesian likelihood analyses in Mr. Bayes 3.2.7 (Ronquist *et al.* 2003, Ronquist *et al.* 2012). *Tenebrio molitor* was used to root the resulting topologies.

TABLE 1. Matrix of 94 phenotypic characters for 23 OTUs.

Species	Characters																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
<i>Hypogena akuma</i>	2	1	0	1	0	0	1	0	-	1	0	0	1	0	1	0	0	1	2	1	1	0	?	?	?
<i>Hypogena amazonica</i>	2	1	0	1	0	0	2	1	1	1	1	0	0	1	1	1	0	2	2	1	1	0	2	1	1
<i>Hypogena brasiliica</i>	2	1	0	1	0	0	2	0	1	1	1	1	1	1	1	0	0	2	2	1	1	0	1	1	1
<i>Hypogena brasiliensis</i>	2	1	0	1	1	0	3	1	1	1	1	0	1	0	1	0	0	1	2	1	1	0	?	?	?
<i>Hypogena canaliculata</i>	2	2	0	1	1	0	2	0	0	1	1	0	1	0	0	0	0	1	2	1	1	0	2	1	1
<i>Hypogena cat</i>	1	0	0	1	1	1	2	0	0	1	1	1	1	2	1	0	0	1	2	1	1	0	?	?	?
<i>Hypogena cryptica</i>	2	1	0	1	0	0	2	0	1	1	1	1	1	0	1	0	0	0	2	0	1	0	1	1	2
<i>Hypogena dejeani</i>	1	1	0	1	1	1	2	0	0	1	1	2	1	1	0	1	0	1	2	1	1	0	2	1	1
<i>Hypogena depressa</i>	2	1	0	1	1	0	2	1	1	1	1	1	0	0	1	0	0	0	2	1	1	0	2	1	2
<i>Hypogena hirsuta</i>	2	1	0	1	0	?	2	0	1	1	0	0	0	0	1	0	0	0	2	1	1	0	1	1	2
<i>Hypogena laevicollis</i>	2	1	0	1	0	0	1	0	1	1	1	1	1	2	1	1	0	1	2	1	1	0	1	1	1
<i>Hypogena marginalis</i>	1	?	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	1	0	1	0	?
<i>Hypogena marginata</i>	2	1	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	0	2	1	1	0	1	1	1
<i>Hypogena reburra</i>	2	1	1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	1	0	2	0	2
<i>Hypogena triceratops</i>	2	1	0	1	1	0	1	1	1	1	1	2	1	1	1	1	0	1	2	0	1	0	?	?	?
<i>Hypogena tricornis</i>	2	1	0	1	1	0	1	1	1	1	1	1	1	0	1	0	0	0	2	1	1	0	2	1	2
<i>Hypogena vacca</i>	1	1	0	1	0	0	1	0	0	1	1	0	1	1	1	1	0	0	2	1	1	0	2	1	2
<i>Lethiticus orzae</i>	0	0	0	0	0	0	0	2	2	0	3	3	2	3	2	2	1	0	0	0	0	2	0	1	1
<i>Mycotrogus angustus</i>	1	0	0	0	0	0	0	2	2	1	2	0	1	0	1	1	0	1	1	1	1	0	0	1	1
<i>Mycotrogus mentalis</i>	1	0	0	0	0	0	0	2	2	1	2	0	1	0	1	1	0	1	1	0	1	0	0	1	1
<i>Tenebrio molitor</i>	2	1	0	0	0	0	0	2	2	0	3	3	2	3	2	2	0	1	2	1	0	2	0	0	2
<i>Metaculisa seditiosa</i>	1	0	0	0	0	0	0	2	2	0	3	3	2	3	2	2	0	0	1	1	1	0	0	0	2
<i>Tribolium castaneum</i>	1	0	0	0	0	0	0	2	2	0	3	3	2	3	2	2	0	0	1	0	0	2	0	0	1

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TABLE 1. (continued)

Species	Characters																								
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
<i>Hypogena akuma</i>	1	?	1	1	?	?	?	?	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	1
<i>Hypogena amazonica</i>	1	1	1	1	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	0
<i>Hypogena brasiliica</i>	1	1	1	1	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	1
<i>Hypogena brasiliensis</i>	1	?	1	0	?	?	?	?	1	1	0	0	1	1	?	?	?	?	1	1	1	1	0	1	1
<i>Hypogena canaliculata</i>	0	1	0	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	0
<i>Hypogena cat</i>	1	?	1	1	?	?	?	?	1	1	0	0	1	1	0	0	1	0	1	1	1	1	0	0	1
<i>Hypogena cryptica</i>	1	1	1	2	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	1
<i>Hypogena dejeani</i>	0	1	0	2	1	1	2	0	1	1	0	0	1	1	0	0	1	0	1	1	1	1	0	0	0
<i>Hypogena depressa</i>	1	2	1	1	1	1	2	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	0
<i>Hypogena hirsuta</i>	2	2	1	2	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	1
<i>Hypogena laevicollis</i>	0	1	0	1	1	1	2	1	1	1	0	0	1	1	0	0	1	0	1	1	1	1	0	0	0
<i>Hypogena marginalis</i>	?	?	?	?	1	0	?	?	1	?	?	1	1	?	0	?	?	?	?	1	1	1	1	1	0
<i>Hypogena marginata</i>	1	1	1	2	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	1	1	0
<i>Hypogena reburra</i>	?	2	?	?	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	1	1	0
<i>Hypogena triceratops</i>	1	?	1	0	?	?	?	?	1	1	0	0	1	1	0	0	1	2	1	1	1	1	0	0	0
<i>Hypogena tricornis</i>	0	2	0	1	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	0
<i>Hypogena vacca</i>	0	2	0	2	1	1	2	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	0	1	0
<i>Lethiticus orzae</i>	1	1	1	2	2	1	2	0	1	0	1	0	1	1	1	1	1	0	1	0	1	0	1	0	1
<i>Mycotrogus angustus</i>	1	1	1	0	0	1	2	0	0	0	1	0	1	1	0	1	1	0	1	1	1	1	0	1	0
<i>Mycotrogus mentalis</i>	1	1	1	1	0	1	2	0	0	0	1	0	1	1	0	1	1	0	1	1	1	1	0	1	1
<i>Tenebrio molitor</i>	2	2	2	2	1	1	2	0	0	0	1	0	0	?	0	0	1	0	1	1	1	0	2	1	0
<i>Metacilisa seditiosa</i>	2	2	2	1	1	2	2	0	1	1	0	0	1	1	0	0	1	0	1	0	1	1	0	1	0
<i>Tribolium castaneum</i>	1	1	1	2	2	1	1	0	0	1	1	0	1	1	0	0	1	0	1	0	1	0	2	0	0

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TABLE 1 (continued)

Species	Characters																								
	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
<i>Hypogena akuma</i>	1	1	1	1	1	2	2	0	1	2	0	2	1	1	2	0	1	1	1	1	2	1	0	0	0
<i>Hypogena amazonica</i>	1	1	1	1	1	2	2	1	1	1	1	1	2	1	2	0	1	0	0	1	1	1	0	0	2
<i>Hypogena brasiliica</i>	1	1	1	1	1	1	0	0	1	1	0	2	1	0	2	1	1	1	0	1	2	2	0	1	1
<i>Hypogena brasiliensis</i>	1	1	1	1	1	2	2	0	1	1	1	1	0	1	2	0	?	?	0	-	2	1	0	0	2
<i>Hypogena canaliculata</i>	1	1	1	0	1	0	?	0	1	1	1	2	1	1	2	0	0	-	0	0	1	0	0	0	0
<i>Hypogena cat</i>	1	1	1	1	1	1	0	0	1	1	0	1	0	1	2	0	1	1	0	1	1	0	0	0	0
<i>Hypogena cryptica</i>	1	2	1	1	1	2	2	0	1	1	1	2	1	1	2	0	1	1	0	0	1	1	0	0	2
<i>Hypogena dejeani</i>	1	1	1	0	1	0	?	0	1	1	1	1	1	0	2	0	1	1	0	0	1	1	0	0	2
<i>Hypogena depressa</i>	1	2	1	1	1	2	2	0	1	1	1	2	1	1	2	0	1	0	0	0	1	1	0	0	2
<i>Hypogena hirsuta</i>	2	1	1	1	1	1	2	0	1	2	1	2	2	1	2	1	1	1	0	1	2	1	1	1	2
<i>Hypogena laevicollis</i>	1	1	1	0	1	0	?	1	1	1	0	1	1	1	2	0	1	0	0	0	1	0	0	0	2
<i>Hypogena marginalis</i>	2	1	1	1	1	0	?	1	1	?	1	1	?	?	?	0	1	1	1	?	?	?	?	?	0
<i>Hypogena marginata</i>	2	1	1	1	1	2	2	0	1	2	1	2	1	1	2	0	1	1	0	0	1	0	0	0	2
<i>Hypogena reburra</i>	1	2	1	1	1	1	0	0	1	2	0	1	0	1	2	0	2	1	0	0	2	0	0	0	0
<i>Hypogena triceratops</i>	2	1	1	0	1	0	?	0	1	1	0	1	1	1	2	0	1	1	1	0	1	1	0	0	0
<i>Hypogena tricornis</i>	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	0	1	1	0	1	1	0	0	0	2
<i>Hypogena vacca</i>	1	1	1	1	1	2	0	0	1	2	1	2	1	1	2	0	1	1	0	1	2	1	0	0	2
<i>Lethiticus orzae</i>	1	2	1	0	-	2	2	0	0	2	0	0	0	0	2	0	1	0	0	0	0	?	0	0	0
<i>Mycotrogus angustus</i>	1	1	1	1	1	2	2	0	1	1	0	1	2	0	2	0	1	0	0	1	1	0	0	0	0
<i>Mycotrogus mentalis</i>	1	1	1	1	1	2	2	0	1	1	1	2	2	0	2	0	1	1	0	1	1	1	0	1	2
<i>Tenebrio molitor</i>	2	2	1	1	1	0	?	0	1	2	0	1	0	0	2	0	1	1	0	0	1	0	0	0	1
<i>Metacrisa seditiosa</i>	1	2	1	0	0	2	2	0	1	1	0	1	1	0	0	0	2	1	0	1	2	1	0	0	0
<i>Tribolium castaneum</i>	2	2	1	0	-	2	2	1	0	2	0	0	0	1	2	0	1	1	0	0	1	1	0	0	0

...Continued on the next page

TABLE 1 (continued)

Species	Characters																		
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
<i>Hypogena dkuma</i>	0	1	1	0	1	0	0	1	1	1	1	?	1	2	2	2	0	0	0
<i>Hypogena amazonica</i>	0	1	0	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	2
<i>Hypogena brasiliica</i>	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	0	0	0	2
<i>Hypogena brasiliensis</i>	0	?	0	0	1	1	0	0	1	1	1	?	1	?	?	?	?	?	2
<i>Hypogena canaliculata</i>	0	1	0	0	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0
<i>Hypogena cat</i>	0	1	0	0	1	1	0	0	1	1	1	?	1	1	1	1	0	0	2
<i>Hypogena cryptica</i>	0	1	0	0	1	1	0	0	0	1	1	1	1	0	0	0	0	0	0
<i>Hypogena dejeani</i>	0	1	0	0	1	1	0	1	1	1	1	1	1	1	1	2	0	0	0
<i>Hypogena depressa</i>	0	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	0	0	2
<i>Hypogena hirsuta</i>	0	1	0	0	1	1	0	0	0	1	1	1	1	1	1	1	0	0	3
<i>Hypogena laevicollis</i>	0	1	0	0	1	1	0	0	1	1	1	1	1	2	2	2	0	0	2
<i>Hypogena marginalis</i>	0	1	?	?	?	?	?	?	?	1	?	?	?	0	0	0	0	0	?
<i>Hypogena marginata</i>	0	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	0	0	3
<i>Hypogena reburra</i>	0	?	0	0	1	1	2	1	0	1	?	1	1	0	0	0	0	0	0
<i>Hypogena triceratops</i>	1	1	0	0	1	1	0	0	1	1	1	?	1	1	1	1	0	0	3
<i>Hypogena tricornis</i>	0	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	0	0	3
<i>Hypogena vacca</i>	0	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	0	0	3
<i>Lethiticus orzae</i>	0	0	0	0	0	2	3	1	0	0	0	0	0	0	0	0	0	0	0
<i>Mycotrogus angustus</i>	0	1	0	0	1	1	1	1	0	1	2	2	1	0	0	0	0	0	2
<i>Mycotrogus mentalis</i>	0	1	0	0	1	1	1	1	1	1	2	2	1	0	0	0	0	0	2
<i>Tenebrio molitor</i>	0	0	0	0	0	2	3	0	1	1	0	0	0	0	0	0	0	0	0
<i>Metaclista seditiosa</i>	0	0	0	0	0	2	3	1	1	1	0	0	0	0	0	0	0	0	0
<i>Tribolium castaneum</i>	0	0	0	0	0	2	3	0	1	1	0	0	0	0	0	0	0	0	0

Heuristic maximum parsimony analyses were implemented with 1,000 random stepwise additions and TBR branch swapping. All multistate morphological characters were first treated as nonadditive. Initial analyses were performed with equal weight assigned to all characters. A second set of analyses were performed with all characters weighted *a posteriori* based on consistency index scores. Branch support was determined for parsimony analyses using the nonparametric bootstrap (Felsenstein 1985) with 1,000 replicates (each with 100 random additions each) in PAUP*. Bayesian analyses were run using a fixed-state frequency model, with all states treated as equal, and flat priors. Two searches were performed with four chains each for twenty million generations with a 0.5 burn-in, and trees were sampled every 1,000 generations. Clade support for Bayesian analyses was inferred based on the posterior probability distribution of tree topologies. Posterior probabilities were mapped onto the majority-rule consensus cladogram from the parsimony analyses.

Characters used in the analyses are listed below and organized by body region:

General

1. Length: (0) less than 4.5mm long; (1) 4.5 to 7.5 mm long; (2) greater than 7.5 mm long.
2. Width: (0) less than 3 mm wide; (1) 3 to 6.5 mm wide; (2) greater than 6.5 mm wide.
3. Long erect hairs on pronotum and elytra: (0) absent; (1) present.

Head

4. Clypeal horn: (0) Absent; (1) Present.
5. Clypeal horn length: (0) Short, tuberculate; (1) Long, not tuberculate.
6. Clypeal horn: (0) Not emarginate; (1) Emarginate, truncated at the apex of horn.
7. Clypeal horn thickness: (0) Clypeal horn absent; (1) Clypeal horn of equal thickness to supraorbital horn; (2) Clypeal horn with a diameter two times that of the supraorbital horn; (3) Clypeal horn with a diameter three times that of the supraorbital horn.
8. Projection of clypeal horn: (0) Projected forward; (1) Projected perpendicularly from head; (2) Absent.
9. Texture on clypeal horn: (0) Not punctate; (1) Finely punctate; (2) Absent.
10. Supraorbital horn (0) Absent; (1) Present.
11. Supraorbital horn length: (0) Short, tuberculate; (1) Long, not tuberculate; (2) Intraocular space raised near eyes; (3) Absent.
12. Supraorbital horn lateral bend: (0) Not bending inwards; (1) Weakly bent inwards; (2) Strongly bent inwards; (3) Absent.
13. Projection of supraorbital horn: (0) Projected forward; (1) Projected perpendicularly from head; (2) Absent.
14. Supraorbital horn forward bend : (0) Not bent; (1) Weakly bent toward anterior; (2) Strongly bent toward anterior; (3) Absent.
15. Texture of supraorbital horn: (0) Not punctate; (1) Finely punctate; (2) Absent.
16. Supraorbital horn thickness: (0) Thin, less than a sixth the thickness of the head; (1) Thick greater than a sixth of the thickness of the head; (2) Absent.
17. Distal antennomeres: (0) Forming a distinct club; (1) Not forming a distinct club.
18. Length of third antennomere in relation to fourth: (0) Third antennomere equal in size to fourth; (1) Third antennomere is larger than fourth, but smaller than 1.5x the size of the fourth; (2) Third antennomere more than 1.5 times the size of fourth.
19. Length of third antennomere in relation to the second: (0) Third antennomere equal in size to second; (1) Third antennomere is larger than second, but smaller than 1.5x the size of the fourth; (2) Third antennomere more than 1.5 times the size of second.
20. Antennal length: (0) Not reaching to posterior edge of pronotum; (1) At least reaching to the posterior edge of the pronotum.
21. Compound sensoria: (0) Absent; (1) Present.

22. Compound sensoria type: (0) Stellate; (1) Placoid; (2) Absent.
23. Intraocular space, female: (0) Flat; (1) Narrowly raised near eye; (2) Raised near eye and extending transversely inwards.
24. Intraocular space impinging on eye: (0) Absent; (1) Present.
25. Vertex, female: (0) Not punctured; (1) With punctures smaller than facets of the eye; (2) With punctures larger than facets of the eye.
26. Vertex, male: (0) Not punctured; (1) With punctures smaller than facets of the eye; (2) With punctures larger than facets of the eye.
27. Frons, female: (0) Not punctured; (1) With punctures smaller than facets of the eye; (2) With punctures larger than facets of the eye.
28. Frons, male: (0) Not punctured; (1) With punctures smaller than facets of the eye; (2) With punctures larger than facets of the eye.
29. Anterior edge of clypeus, male: (0) Forming a well-rounded edge; (1) Flat, but with anterior corners of sclerite rounded; (2) Not forming a well-rounded edge due to production of clypeal horn.
30. Anterior edge of clypeus, female: (0) Forming a circular arch; (1) Flat, but with anterior corners of sclerite rounded; (2) Not forming circular arch.
31. Texture of clypeus, female: (0) Not punctured; (1) Finely punctured; (2) Coarsely punctured.
32. Concentration of clypeal puncturing, female: (0) In center of sclerite; (1) On edges of sclerite; (2) Spread evenly across clypeus.
33. Clypeus, female: (0) Not tumid; (1) Tumid.
34. Distance between cardo and eye: (0) Greater than the width of cardo; (1) Less than or equal to width of cardo.
35. Eyes: (0) Not arched; (1) Arched.
36. Gena: (0) Not extending laterally past eye; (1) Extending laterally past eye.
37. Apical segment of maxillary palps: (0) Scalene; (1) Quadrate.
38. Labrum setose: (0) Not setose; (1) Setose.
39. Labrum: (0) Not fully setose; (1) Fully setose.
40. Mentum, shape: (0) Trapezoidal; (1) Not trapezoidal.
41. Mentum, setation: (0) Not setose; (1) Setose.
42. Mentum: (0) Not punctate; (1) Punctate.
43. Mentum, texture: (0) Flat; (1) Medially and longitudinally raised; (2) Weakly depressed.
44. Groove on mandible: (0) Absent; (1) Present.

Thorax

45. Elytral epipleuron: (0) Abruptly ending before elytral apex; (1) Tapering gradually posteriorly.
46. Elytral striae: (0) Absent; (1) Present.
47. Elytral striae, punctation: (0) Absent or punctures very weakly depressed; (1) Present and distinct.
48. Strial puncture distance: (0) Strial punctures within one diameter of each other; (1) Strial punctures greater than one diameter from each other; (2) Absent.
49. Elytral interstices: (0) Flat; (1) Convex.
50. Elytral interstices, texture: (0) Bearing punctures smaller than one fourth the size of the strial punctures; (1) Bearing punctures larger than one fourth the size of the strial punctures.
51. Density of puncturing on interstices: (0) Not punctate; (1) Punctures not within one diameter of each other; (2) Punctures within one diameter of each other.
52. Anterior half of elytra, alignment: (0) Not parallel; (1) Subparallel; (2) Parallel.
53. Epipleural carina: (0) Not explanate; (1) Explanate.
54. Pronotal puncturing: (0) Uniform size; (1) Biordinal in size.
55. Fine pronotal puncturing: (0) Absent; (1) Present.
56. Coarse pronotal puncturing: (0) Absent; (1) Present.
57. Coarse pronotal puncturing concentration: (0) On lateral portions of pronotum; (1) On the disc; (2) Scattered evenly across pronotum.

58. Pronotum arched in lateral view: (0) Not arched; (1) Weakly forming arch.
59. Narrowest part of pronotum: (0) Posterior; (1) Anterior.
60. Pronotum arched in anterior view: (0) Not arched; (1) Disc flat; (2) Arched.
61. Lateral margins of pronotum: (0) Not parallel; (1) Subparallel; (2) Parallel
62. Marginal edge of pronotum: (0) Not expanded; (1) Expanded by less than the diameter of a coarse puncture; (2) Expanded by more than the diameter of a coarse puncture.
63. Anterior edge of pronotum produced forward: (0) Not extending to middle of eye; (1) Extending to middle of eye, but not past it; (2) Extending past eye.
64. Anterior margin of scutellum: (0) Flat; (1) Concave; (2) Convex.
65. Lateral margin of scutellum (0) Flat; (1) Concave; (2) Convex.
66. Prosternum, setation: (0) Not pubescent; (1) Pubescent.
67. Prosternum, puncturing: (0) Not punctate; (1) Punctate with punctures smaller than eye facets; (2) Punctate with punctures larger than eye facets.
68. Prosternum, puncture density: (0) Punctures further than one diameter from each other; (1) Punctures less one or equal to one diameter from each other.
69. Prosternal process length: (0) Not extending past posterior edge of pronotum; (1) Extending past posterior edge of pronotum.
70. Short setae coming from prosternal punctures: (0) Absent; (1) Present.
71. Mesepisternum, puncturing: (0) Not punctate; (1) Punctures smaller than size of eye facets; (2) Punctures equal or larger than size of eye facets.
72. Mesepisternum, puncture density: (0) Punctures further than one diameter from each other; (1) Punctures less than one or equal to one diameter from each other.
73. Mesepisternum, setae: (0) Absent; (1) Present.
74. Mesepisternum: (0) Flat; (1) Sculptured.
75. Hypomeron texture: (0) Smooth; (1) Rugulose; (2) Rugulose on lateral portions of hypomeron.
76. Posterior half of hypomeron: (0) Not bearing setae; (1) Bearing setae.
77. Row of cuticular teeth around posterior edge of metacoxae: (0) Absent; (1) Present.

Legs

78. Femur bearing line of setae: (0) Absent; (1) Present.
79. Proximal side of femur bearing cuticular process: (0) Absent; (1) Present.
80. Socketed spines on lateral edge of protibia: (0) Absent; (1) Present.
81. Number of spines present on lateral edge of protibia: (0) 6 or fewer spines; (1) 7 or more spines; (2) Absent.
82. Protibial spines: (0) Present on distal third of tibia; (1) Present on distal half of tibia; (2) Present on distal 2/3 of tibia; (3) Absent.
83. Medial spines on protibia: (0) Absent; (1) Present.
84. Brush of setae on distal portion of protibia: (0) Absent; (1) Present.
85. Apical spurs on tibia: (0) Absent; (1) Present
86. Cuticular outgrowths on tarsi, male: (0) Absent; (1) Present on proximal two tarsomeres; (2) Present on proximal 4 tarsomeres.
87. Cuticular outgrowths on tarsi, female: (0) Absent; (1) Present on proximal two tarsomeres; (2) Present on proximal 4 tarsomeres.
88. Tarsomeres asymmetrical: (0) No; (1) Yes.

Abdomen

89. Puncturing on first abdominal segment: (0) Smooth; (1) Rugulose laterally; (2) Rugulose on anterior fourth of sclerite.
90. Puncturing on second abdominal segment: (0) Smooth; (1) Rugulose laterally; (2) Rugulose on anterior fourth of sclerite.

91. Puncturing on third abdominal segment: (0) Smooth; (1) Rugulose laterally; (2) Rugulose on anterior fourth of sclerite.
92. Puncturing on fourth abdominal segment: (0) Smooth; (1) Rugulose laterally; (2) Rugulose on anterior fourth of sclerite.
93. Puncturing on fifth abdominal segment: (0) Smooth; (1) Rugulose laterally; (2) Rugulose on anterior fourth of sclerite.
94. Abdomen bearing short setae: (0) Absent; (1) Present on first two abdominal segment; (2) Present on first three abdominal segments; (3) Present on all abdominal segments.

Morphological character systems examined, but not included in the morphological matrix

Male Genitalia of Hypogena are relatively distinctive at the species level. The length of the basal piece in relation to the apical piece, the rate of tapering on the apical piece, the presence of setae on the parameres, whether the parameres are fused, the presence of a membranous area on the basal piece, and whether the edges of the apical piece are sinuate are all included as characters to distinguish between species (Fig. 1). Due to the limited number of available males for dissection, or lack of any known male specimens, for some taxa (e.g., *H. akuma*, *H. cat*, *H. reburra*), variation could not be properly assessed within most species. As such, characters associated with the male genitalia were not included in the matrix.



FIGURE 1: Male genitalia in *Hypogena*. A. *H. brasiliica* dorsal. B. *H. brasiliica* lateral. C. *H. canaliculata* dorsal. D. *H. canaliculata* lateral. E. *H. brasiliensis* dorsal. F. *H. laevicollis* dorsal. G. *H. cryptica* dorsal. H. *H. cryptica* lateral. I. *H. depressa* dorsal. J. *H. depressa* lateral. K. *H. hirsuta* dorsal. L. *H. hirsuta* lateral. M. *H. marginata* dorsal. N. *H. marginata* lateral. O. *H. tricornis* dorsal. P. *H. tricornis* lateral. Q. *H. vacca* dorsal. R. *H. vacca* lateral

Female Genitalia were not found to be useful in distinguishing between species of *Hypogena*. The coxites are highly reduced with the gonostyles arising apically from the fourth coxite. The paraprocts are large and partially enclose the coxites. The bursa copulatrix has a single spermatheca and accessory gland. The spermathecal gland has an apical spermatheca (Fig. 2).

Flight wings showed little variation between the three species of *Hypogena* examined (Fig. 3). In comparison with *T. molitor*, *Hypogena* wings lack a median vein, cubitoanal vein (cu-a), and fourth anal vein (4a). The third anal vein (3A) and radiomedian cross vein (r-m) are reduced. The wedge cell is quadrate. The anterior branch of the first anal vein (1A) does not continue far into the cubital area. This usually ends near the side of the wedge cell closest to the jugal region of the wing. The radical cross vein (r) and the recurrent radius (Rr) can be very thick, which makes

the area that is produced between those areas small. No veins meet the edge of the wing. Wing venation may be useful at higher classification levels for placing *Hypogena*, hence their inclusion for future reference.

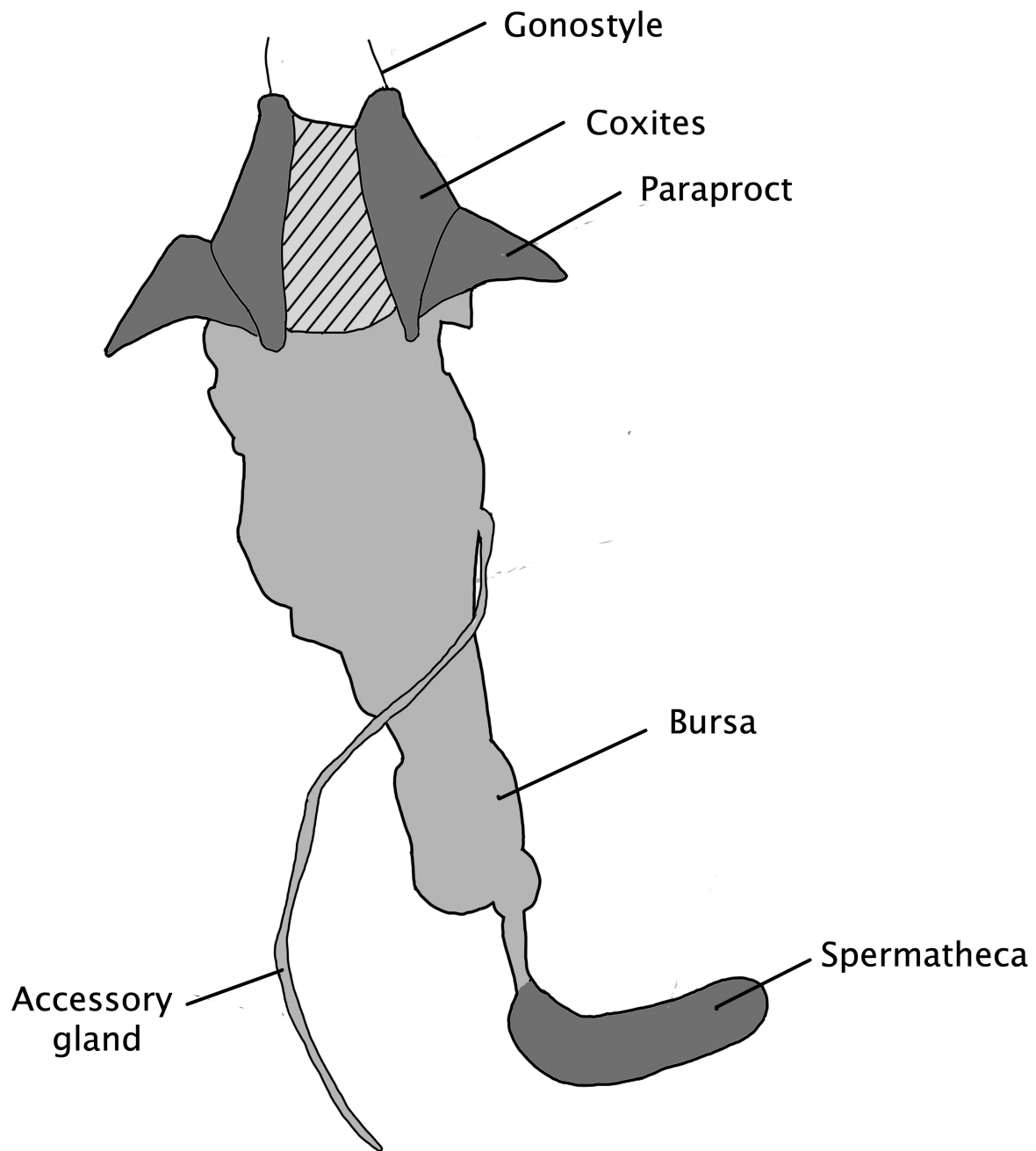


FIGURE 2: Female genitalia of *Hypogena*. Illustration of the female genitalia of *H. marginata*

Results

Phylogenetic analyses

Unweighted heuristic parsimony analyses returned 88 most parsimonious topologies (Length (L): 310, Consistency-Index (CI): 0.41, Retention-Index (RI): 0.55). Parsimony analyses with characters reweighting based on CI scores returned a single topology (L: 127, CI: 0.55, RI: 0.67). Bayesian analyses reached an average standard deviation of split frequencies below 0.05 within 125,000 generations. The majority rule topology from 88 most parsimonious trees is shown (Fig. 4) with bootstrap values and posterior probabilities. The single most parsimonious topology from reweighted analyses is also illustrated (Fig. 5).

While *Hypogena* was supported as a monophyletic genus, sister to *Mycotrogus*, in all analyses, support for re-

relationships within the genus from unweighted analyses, based on bootstrap values and posterior probabilities, was minimal. This is likely due to the large amount of homoplasy found within the selected species-level characters. Despite poor statistical support for relationships within *Hypogena*, characters within the matrix were useful for defining species boundaries based on synapomorphies or shared homoplastic states between taxa. Specific character states for and between taxa are discussed within species descriptions and diagnoses.

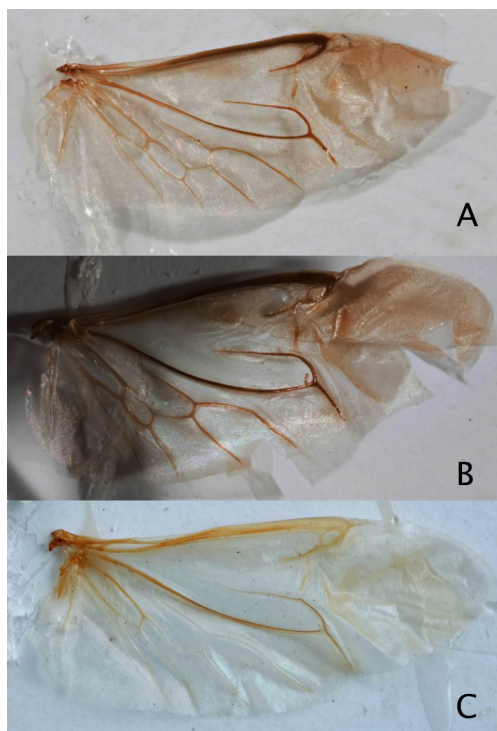


FIGURE 3: Hind wing of *Hypogena* species. 3a. Wing of *H. vacca*. 3b. Wing of *H. depressa*. 3c. Wing of *H. tricornis*.

Taxonomy

Hypogena Dejean, 1834

Type species: *Tenebrio biimpressus* Latreille, 1833 (synonym of *Peltis brasilica* Perty, 1830); by monotypy.

Revised diagnosis: The males of the genus *Hypogena* are recognizable by a combination of the following characters: supraocular horns present, antennae bearing stellate sensoria (Fig. 6c,d), first two protarsomeres with cuticular outgrowth to form spines (Fig. 7), row of cuticular teeth along posterior edge of metasternum (Fig. 8), body distinctly dorsoventrally flattened (Fig. 10, lateral). Some species also have a horn arising from the clypeus (Fig. 36, male, dorsal). Females similar to males, except lacking produced horns (Fig. 17) and with more prominent punctures on the vertex, frons, and clypeus (Fig. 21).

Redescription: General: color black to reddish brown. Body dorsoventrally flattened. Size: length: 5–10 mm; width: 2–4 mm.

Head. Distance between cardo and eye less than width of cardo. Males with two or three cephalic horns. Mandibles with groove extending to connection point on cranium. Labrum fully setose. Gena not extending laterally past widest point of eye. Antennae 11 segmented; not forming distinct club. Apical six antennomeres bearing stellate sensoria. Mentum trapezoidal, punctate. Eye large, reniform.

Thorax. Pronotum always finely punctate; punctures smaller than eye facet; many coarsely punctate; punctures larger than eye facet. Posterior margin of pronotum bisinuate. Prothorax laterally explanate; anterior apices of prothorax produced anteriorly, sometimes reaching middle of eye. Elytra striate; striae punctate. Epipleuron tapering posteriorly; epipleural fold explanate. Prosternum punctate. Mesepisternum coarsely punctate, unless otherwise indicated. Posterior edge of metasternum with row of cuticular teeth.

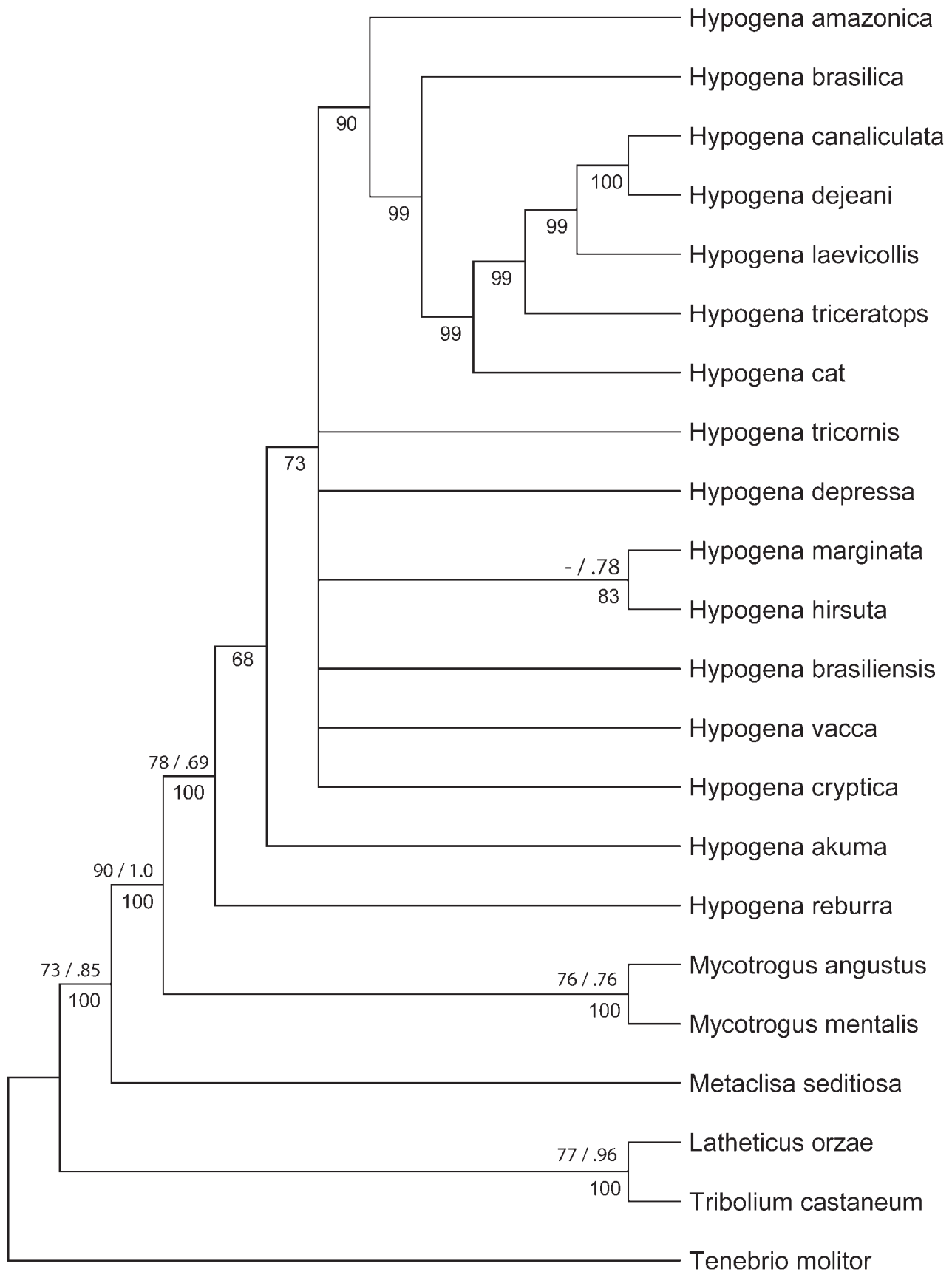


FIGURE 4: Majority-rule consensus of 88 most parsimonious trees (Length: 310) of *Hypogena* and closely related taxa based on morphology. Proportion of supporting MP trees listed below branches. Non-parametric bootstrap values (BS), from 1000 pseudo-replicates, shown above branches and posterior probabilities (PP) from Bayesian analyses (20,000,000 generations, 50% burn-in, sample frequency: 1000) shown above branches (BS/PP). Scores lower than 50 BS or 0.5PP not shown.

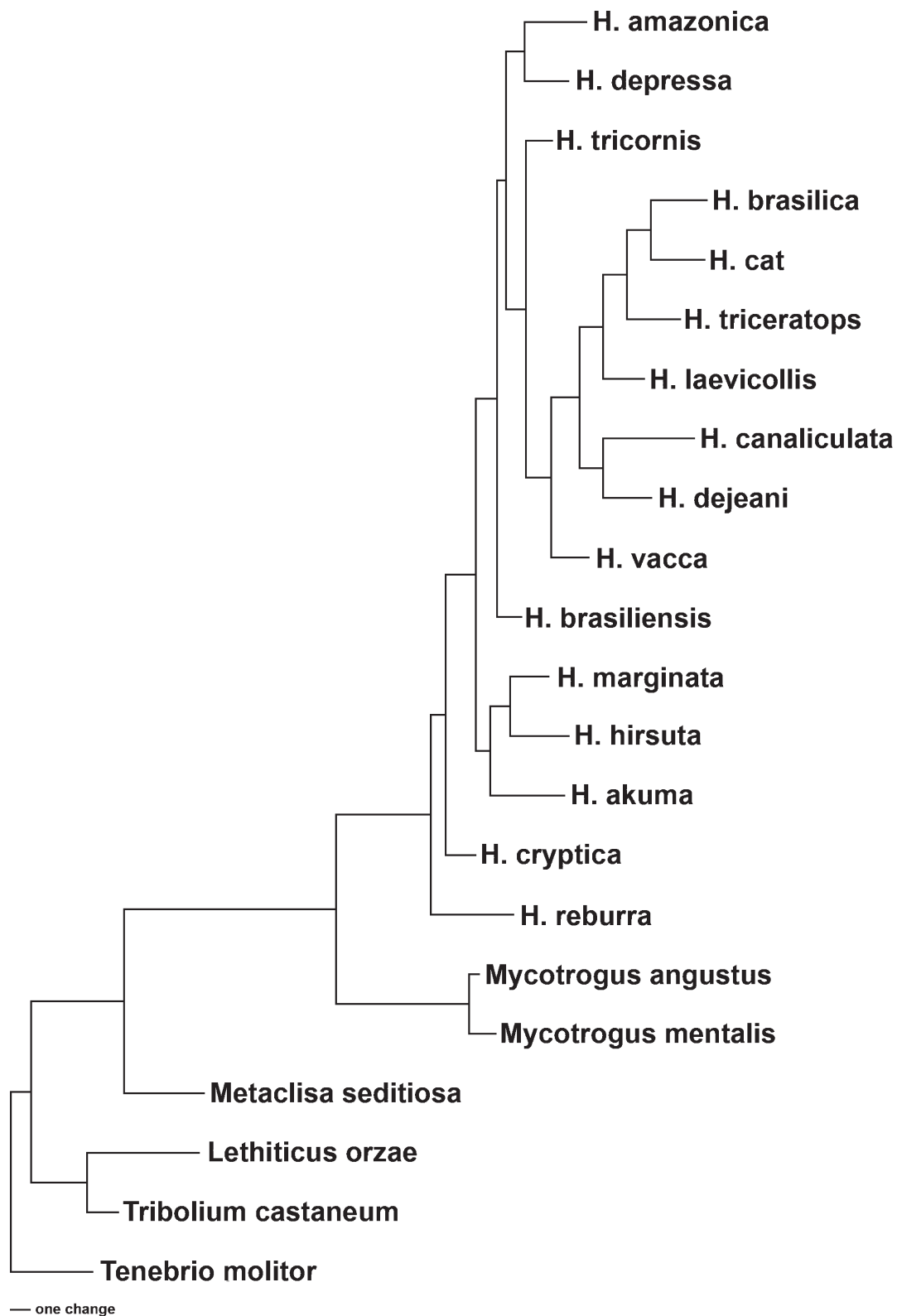


FIGURE 5: Most Parsimonious topology from reweighted analysis (L=127, CI: 0.55, RI: 0.67).

Legs. Tarsal formula: 5-5-4. Protibia with first two tarsomeres expanded to form spines. Lateral side of protibia with socketed spines. All tibiae with two apical spurs.

Abdomen. All abdominal segments punctate; punctures on last two ventrites finer than on previous segments. Aedeagus with parameres fused. Female genitalia with coxites highly reduced; spermathecal gland with single apical spermatheca.

Distribution (Fig. 9): USA (AZ, CA, TX and FL) south to Argentina.

Etymology: The name *Hypogena* is feminine. The name potentially refers to the gena being under the male cephalic horns.

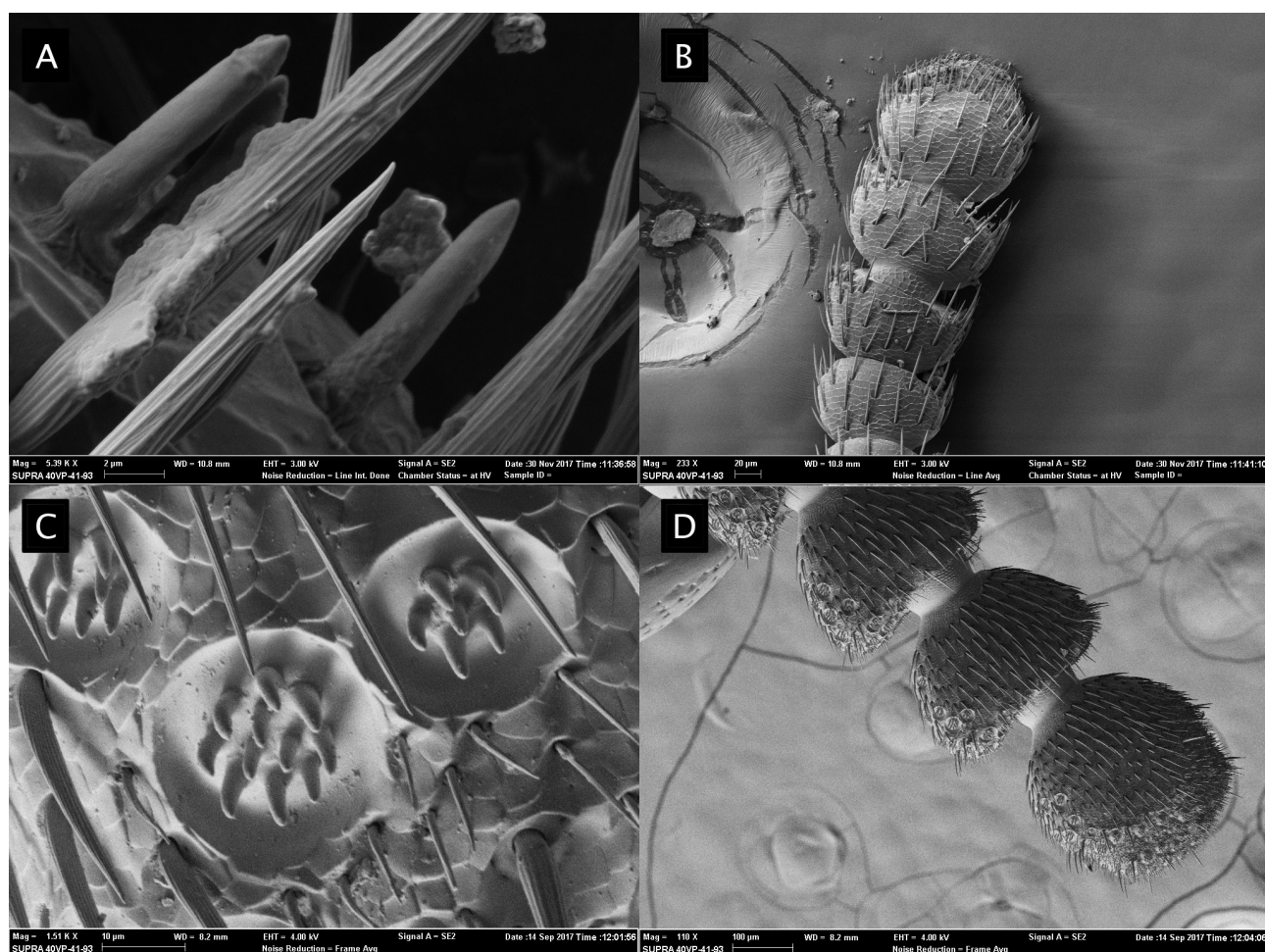


FIGURE 6: Comparison of antennal sensoria between *Hypogena* and *Tribolium*. 6a. Sensoria of *Tribolium confusum* at 5390X magnification with an accelerating voltage of 3 kV. 6b. Terminal segments of antennae of *Tribolium confusum* at 233X magnification with an accelerating voltage of 3kV. 6c. Sensoria of *Hypogena tricornis* at 1510X magnification with an accelerating voltage of 4kV. 6d. Terminal segments of antennae of *Hypogena tricornis* at 110X magnification with an accelerating voltage of 4 kV.

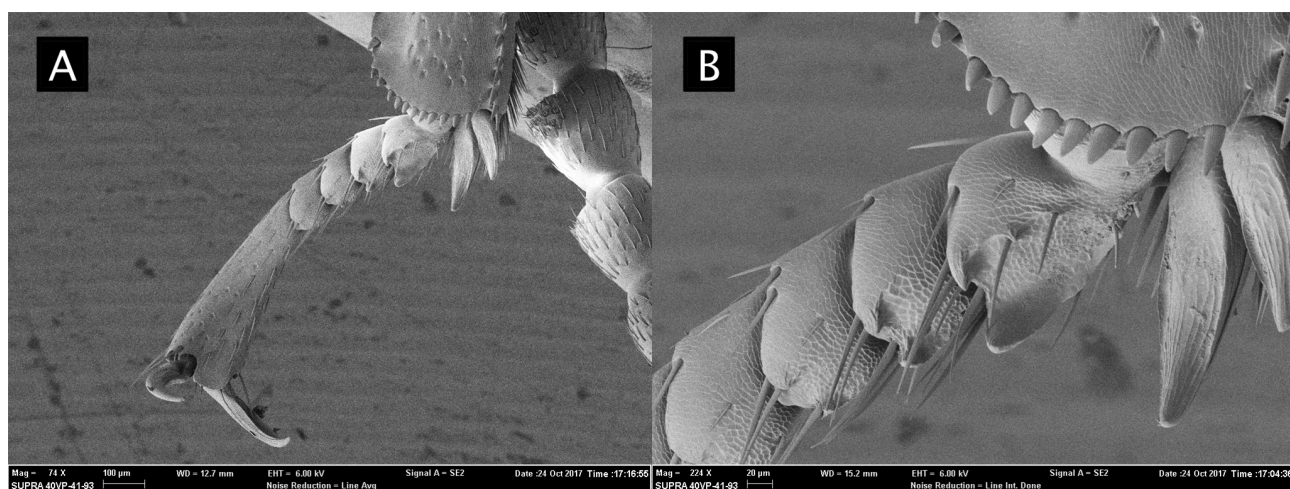


FIGURE 7: Tarsal outgrowths on *Hypogena tricornis*. A. The tarsal outgrowths at 74X magnification with an accelerating voltage of 6 kV. B. The tarsal outgrowths at 224X magnification with an accelerating voltage of 6 kV

Checklist of *Hypogena* species

Hypogena akuma **sp. nov.**

Hypogena amazonica (Kulzer, 1962)

Ulosonia amazonica Kulzer, 1962: 97

Hypogena brasílica (Perty, 1830)

Peltis brasílica Perty, 1830: 40

= *Tenebrio biimpressus* Latreille, 1833: 17 (Synonymy in Grimm et. al. 2018). Type species

Hypogena brasiliensis (Kulzer, 1962)

Ulosonia brasiliensis Kulzer, 1962: 94

Hypogena canaliculata (Champion, 1886)

Ulosonia canaliculata Champion, 1886: 164

Hypogena cat Steiner, 2005

Hypogena cat Steiner, 2005: 573

Hypogena cryptica **sp. nov.**

Hypogena dejeani (Champion, 1886)

Ulosonia dejeani Champion, 1886: 165

Hypogena depressa (Champion, 1886)

Ulosonia depressa Champion 1886: 164

Hypogena hirsuta **sp. nov.**

Hypogena laevicollis (Kulzer, 1962)

Ulosonia laevicollis Kulzer, 1962: 95

Hypogena marginalis Doyen & Poinar, 1994—Dominican amber

Hypogena marginalis Doyen & Poinar, 1994: 35

Hypogena marginata (LeConte, 1851)

Uloma marginata LeConte, 1851: 149

Hypogena reburra **sp. nov.**

Hypogena triceratops Steiner, 2005

Hypogena triceratops Steiner, 2005: 571

Hypogena tricornis (Dalman, 1823)

Phaleria tricornis Dalman, 1823: 59

= *Ulosonia tricornis* Laporte, 1840: 220 (Synonymy in Spilman 1973: 42)

Hypogena vacca (Fabricius, 1801)

Trogosita vacca Fabricius, 1801: 153.

Ulosonia vacca (Fabricius, 1801). (Shultz, 1901).

= *Ulosonia parvicornis* Fairmaire, 1892: 250 (Synonymy in Kulzer 1962: 93).

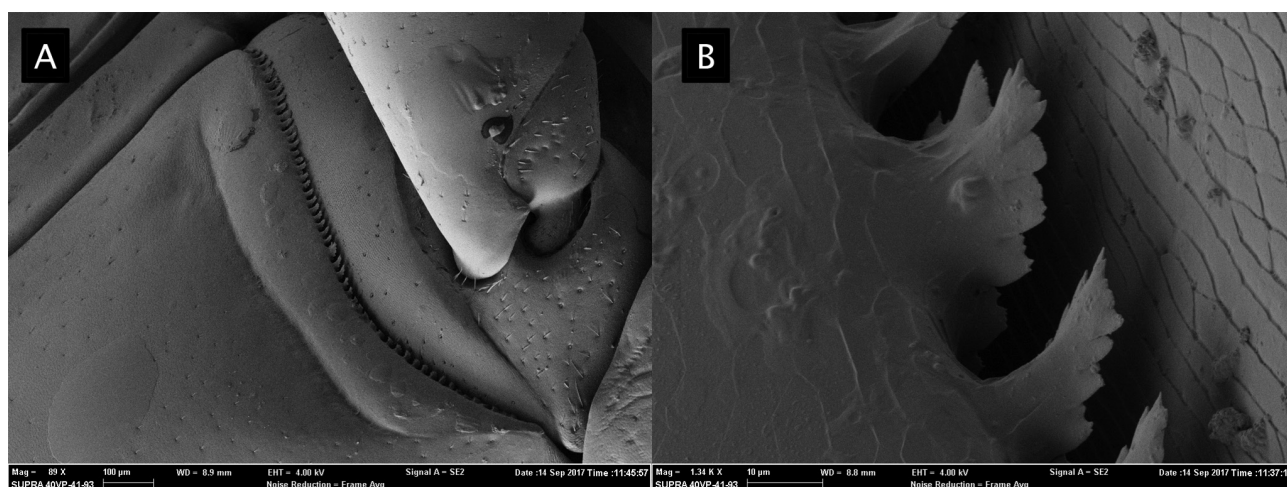


FIGURE 8: Posterior edge of metasternum on *Hypogena tricornis*. 8a. Posterior metasternal gearing at 89X magnification with an accelerating voltage of 4 kV. 8b. Posterior metasternal gearing at 1340X magnification with an accelerating voltage of 4 kV.

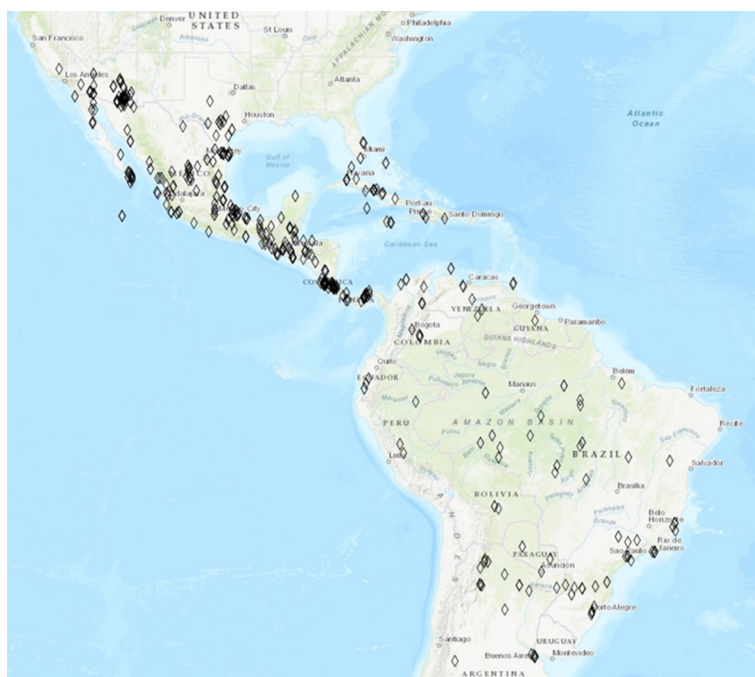


FIGURE 9: Distribution of all *Hypogena* species. Based on 1429 databased specimens.



FIGURE 10: *Hypogena akuma*, Holotype, male. Dorsal view, lateral view, and labels.

Species descriptions and redescriptions

Hypogena akuma sp. nov.

(Fig. 10)

urn:lsid:zoobank.org:act:A8A3A916-5ADC-4B24-9429-F3DF4BD2A091

Type Material: HOLOTYPE (Male) labeled: (a) “Brazil.”; (b) “Rondonia/ 62 km SW Ariguemes/ nr. Fdza Rancho Grande / 8-20-XI-1994”; (c) “J. Eger; C. O’Brien”; (d) “black light”; (e) “HOLOTYPE/ *Hypogena/ akuma/* Grey & Smith, 2020” (FSCA). Designated here.

Diagnosis: This species is distinguished from all other *Hypogena* species by the presence of a dense line of setae on the proximal end of the medial edge of each femur. It also has horns similar to those of *H. marginata*, but shorter and straighter than in the type for that species. As many species of *Hypogena* have both major and minor males, it is unclear whether this is a major male or a minor male.

Description: Male. Size. Length 8–9 mm; width 2–3 mm.

Head. Distance between eye and cardo much smaller than width of cardo (34:1); cardo directly adjacent to eye. Clypeal horn weakly produced (4:1; 5:0) and not emarginated (6: 0); projected forward (8:0). Supraorbital horns short (10:1); tuberculate (11:0); not bent after initial production (12:0; 14:0); projected perpendicular from eye (13:1); finely punctate (15:1). Punctures on vertex and frons smaller than eye facets (26: 1). Antennae do not form club (17:1). Length of third antennomere less than 1.5 times size of fourth antennomere and is more than 1.5x size of second (18:1; 19:2); antennae with stellate sensoria (22:0). Gena not extending laterally past eye (36:0). Anterior edge of clypeus flat, corners rounded (29:1). Mentum trapezoidal and flat (40:0; 43:0); punctate and setose (42:1; 41:1). Labrum fully setose (39:1). Groove on mandible present, continuing to attachment point on cranium (44:1). Thorax. Puncturing on pronotum biordinal in size (54:1); Coarse punctures approximately size of eye facets; scattered across pronotum (57:2). From lateral view, pronotum flat (58:0). Lateral margins of pronotum not parallel (61:0). Margins of pronotum expanded larger than size of one coarse puncture (62:2). Pronotum narrowest anteriorly (59:1). Anterior edge of pronotum extending to middle of eye, but not past middle of eye (63:1). Hypomeron almost smooth, not punctate (75:0); not setose (76:0). Row of cuticular teeth present on posterior edge of metasternum (77:1). Mesepisternum punctate; punctures equal to size of eye facets (71:2); punctures separated by less than one diameter (72:1); not setose (73:0). Prosternum punctate; punctures smaller than eye facets (67:1); not setose (66:0); separated by less than one diameter (68:1). Prosternal process extends past posterior margin of pronotum (69:1). Elytra striate and shallowly punctate (46:1; 47:1); punctures separated by less than one diameter (48:0). Elytral interstices convex and punctate (49:1) punctures smaller than one fourth of size of one stria puncture (50:1); punctures separated by more than one diameter (51:1).

Abdomen. Anterior fourth of first three visible abdominal sternites laterally rugulose (89:2; 90:2; 91:2). All abdominal sternites punctate and glabrous (94:0).

Legs. Tarsi pubescent. Cuticular outgrowths present on first two protarsomeres (86:1). Tibiae with two apical spurs (85:1). Lateral edge of protibia with less than 6 socketed spines on distal fourth of tibia (81:0). Spines present on medial edge of protibia (80:1). Brush of setae present distally on medial edge of tibiae (84:1). Medial edge of femurs with distinct line of setae (78:1).

Female. Unknown.

Distribution. Brazil (Rondônia).

Etymology. The specific epithet is derived from the Japanese name for a devil or demon. This is in reference to the male horns, which are similar to those in popular portrayals of demons. It is feminine.

Hypogena amazonica (Kulzer, 1962)

(Figs 11, 12)

Ulosonia amazonica Kulzer, 1962: 97.

Type Material Examined: HOLOTYPE (male) labeled: “Teffé (Ega) Amazonas, M. de Mathan, 3. Trimestre, 1878” (MNHN). ALLOTYPE (female) and PARATYPES (one male, one female) labeled same as HOLOTYPE. PARATYPE (male) labeled: (a) Teffé (Ega) / Amazonas / M. de Mathan / 3e Trimestre 1878”; (b) “PARATYPUS / Uloso-

nia / amazonica / n sp. / det. H. Kulzer 1961”; (c) on blue paper “Tenebrionid Base / Aaron D. Smith / Catalog # 20135” (NHMB). PARATYPE (female) labeled: (a) Teffé (Ega) / Amazonas / M. de Mathan / 3e Trimestre 1878”; (b) “PARATYPUS / Ulosonia / amazonica / n. sp. / det. H. Kulzer 1961”; (c) on blue paper “Tenebrionid Base / Aaron D. Smith / Catalog # 20136” (NHMB).” (See Fig. 11).



FIGURE 11: *Hypogena amazonica*, Paratypes. Top, male: dorsal view, lateral view, and labels. Bottom, female: Dorsal view, lateral view, and labels.

Abdomen. First three visible abdominal sternites are laterally rugulose (89:1; 90:1; 91:1). All abdominal sternites punctate; first three sternites coarsely punctate. First three abdominal sternites setose; setae arising from punctures (94:2). Remaining sternites finely punctate.

Female. Similar to male, except as follows: Clypeal and suborbital horns absent; intraocular space extending transversely inwards (23:2); intraocular space impinging on eye (24:1). Puncturing on vertex smaller than eye facet (25:1). Puncturing on frons smaller than eye facet (27:1). Clypeus finely and evenly punctured on clypeus (31:1). Anterior edge of clypeus flat; anterior corners rounded (30:1); clypeus tumid (33:1). Cuticular process not present on medial edge of profemur.

Distribution (Fig. 12): Brazil (Pará, Rondônia, Amazonas, Rio de Janeiro), Peru (Amazonas).

***Hypogena brasílica* (Perty, 1830)**

(Figs 1, 13, 14)

Peltis brasílica Perty, 1830: 40

= *Tenebrio biimpressus* Latreille, 1833: 17 (Synonymy in Grimm et. al. 2018)

Type Material: LECTOTYPE (female): labeled (a) “Brasília P., *brasílica* Pert”; (b) “Holotypus, Zool. Staatssammlg. München”.

Tenebrio biimpressus Latreille, 1833. NEOTYPE (male) labeled (a) “Espírito Santo”; (b) “6442”; (c) “Descourtils”; (d) “Fry Coll. / 1905.100.”; (e) “NEOTYPE/ *Hypogena/ biimpressa/* Grey & Smith, 2020” (BMNH). Designated here. (See Fig. 13). The holotype for this species could not be found in the MNHN. To maintain stability for the taxonomic concept, a neotype is designated herein.

Additional material examined: BRAZIL: 1 male, 6 females. TB# 20483-20484 (NMNH); TB# 21274 (NHMB); TB# 20372 (CASC); TB# 21346, 21349, 21353 (BMNH). BRAZIL:Bahia: 1 male, 1 female. TB# 21357, 21360 (BMNH). BRAZIL:Espírito Santo: 5 males, 2 females. TB# 20799, 21255-21256 (NMNH); TB# 21240 (ADSC); TB# 21350-21351 (BMNH); TB# 20463 (RLAC). BRAZIL:Mato Grosso: 1 male, 1 female. TB# 20854 (ADSC); TB# 21271 (CASC). BRAZIL:Pará: 1 male, 2 females. TB# 21258 (CASC); TB# 21344, 21358 (BMNH). BRAZIL:Rio de Janeiro: 1 male, 1 female. TB# 20417 (CASC); TB# 21343 (BMNH). BRAZIL:Rondônia: 2 males, 3 females. TB# 20806, 21272 (NMNH); TB# 20947-20949 (ADSC). BRAZIL:Santa Catarina: 2 males. TB# 20597 (NHMB); TB# 21229 (BMNH). BRAZIL:Sao Paulo: 5 males. TB# 20580-20581, 20595 (NHMB); TB# 20855, 21354 (BMNH). COLOMBIA: 1 male, 2 females. TB# 21230, 21233-21234 (BMNH). COSTA RICA: 4 males, 4 females. TB# 20443, 20797 (NMNH); TB# 20550-20551, 20556-20557, 20561 (EMEC); TB# 21347 (BMNH). COSTA RICA:Alajuela: 1 female. TB# 20560 (EMEC). COSTA RICA:Guanacaste: 11 males, 18 females. TB# 20547-20549 (EMEC); TB# 20460, 20462 (UCDC); TB# 20415, 20418, 20792, 21339 (CASC); TB# 20438-20440, 20552, 20558-20559, 20562-20573, 20791, 21260 (EMEC). COSTA RICA:Heredia: 1 female. TB# 21277 (NMNH). DOMINICAN REPUBLIC: 1 female. TB# 20631 (TAMU). ECUADOR:Los Ríos: 1 male. TB# 20487 (CASC). EL SALVADOR: 1 male, 1 female. TB# 20486 (NMNH); TB# 20553 (CASC). EL SALVADOR:La Unión: 1 male. TB# 20798 (NMNH). GUATEMALA: 7 males, 13 females. TB# 20802 (NMNH); TB# 20373-20390, 20578 (CASC). GUATEMALA:Escuintla: 5 males, 4 females. TB# 20584-20591 (NHMB); TB# 20583 (BMNH). HAITI: 2 males, 4 females. TB# 21242-21247 (BMNH). HONDURAS:Atlántida: 1 female. TB# 20546 (NMNH). HONDURAS:El Paraíso: 1 female. TB# 20789 (FSCA). MEXICO: 12 males, 17 females. TB# 20800 (NMNH); TB# 20944-20945 (ADSC); TB# 20579 (NHMB); TB# 20574, 20602-20621 (CASC); TB# 20554 (EMEC); TB# 21250-21251 (BMNH); TB# 20457 (NMNH). MEXICO:Chiapas: 2 males, 1 female. TB# 21327-21328 (NMPC); TB# 20441 (CASC). MEXICO:Colima: 3 males, 1 female. TB# 20437, 20796, 21259 (NMNH); TB# 20946 (ADSC). MEXICO:Guerrero: 1 female. TB# 20788 (FSCA). MEXICO:Hidalgo: 1 male. TB# 20455 (NMNH). MEXICO:Jalisco: 2 males, 2 females. TB# 20451-20453, 20555 (EMEC). MEXICO:Morelos: 1 female. TB# 21273 (RLAC). MEXICO:México: 1 male. TB# 20456 (NMNH). MEXICO:Nayarit: 1 male, 5 females. TB# 20461 (UCDC); TB# 21248-21249, 21254, 21261 (CASC); TB# 20576 (EMEC). MEXICO:Sinaloa: 1 male. TB# 20447 (EMEC). MEXICO:Tabasco: 2 males, 2 females. TB# 20371, 20407, 21268-21269 (CASC). MEXICO:Tamaulipas: 6 males, 2 females. TB# 20402-20406 (CASC); TB# 20454 (EMEC); TB# 20448-20449 (RLAC). MEXICO:Veracruz: 6 males, 5 females. TB# 20442, 20801 (NMNH); TB# 20592-20594 (NHMB); TB# 20444, 20459 (CASC); TB# 20445-20446, 20450 (EMEC); TB# 21235 (BMNH). MEXICO:Yucatán: 1 male. TB# 20582 (BMNH). NICARAGUA:



FIGURE 13: *Hypogena brasiliica* (= *H. biimpressa*), Neotype and representative female. Top, Neotype, male: dorsal view, lateral view, and labels. Bottom, female: Dorsal view, lateral view, and labels.

1 female. TB# 21231 (BMNH). NICARAGUA:Chontales: 1 female. TB# 21238 (BMNH). PANAMA: 3 males, 2 females. TB# 20419, 20545, 21275 (NMNH); TB# 20416 (CASC); TB# 21232 (BMNH). PANAMA:Colón: 1 male. TB# 20411 (CASC). PANAMA:Panama: 4 males, 2 females. TB# 20795, 21276, 21331 (NMNH); TB# 20410, 20412, 20414 (CASC). PARAGUAY:Alto Paraná: 1 female. TB# 20790 (NHMB). PERU: 2 females. TB# 20598-20599 (NHMB). VENEZUELA: 1 female. TB# 21332 (NMPC). VENEZUELA:Aragua: 1 male. TB# 20793 (NMNH). country not specified: 23 males, 1 sex unknown, 37 females, 2 unknowns. TB# 20420, 20425-20427, 20436, 20485, 20544, 20600-20601, 20622-20629, 21262-21267 (NMNH); TB# 17959, 20630, 21270 (NHMB); TB# 20401, 20408-20409, 20421-20424, 20458, 21252-21253, 21257, 21330, 21338 (CASC); TB# 20575, 20577, 20794, 21329 (EMEC); TB# 20787 (FSCA); TB# 20596, 20632, 20951, 21236-21237, 21239, 21241, 21333-21334, 21340-21342, 21345, 21348, 21352, 21356, 21359, 21361-21362 (BMNH).

Diagnosis: The supraorbital horns of this species are long, projecting perpendicularly to head and bend slightly inwards. The clypeal horn is short, conical and projects forward. The punctures on the pronotum are of two sizes and the coarse punctures are mostly concentrated on the lateral portions of the pronotum. The ventral side of the thorax bears golden setae. The female is similar in most characters, except for the presence of the horns. The mesepisternal punctures often intersect and form a scalloped appearance (Fig. 13).

Redescription: Male. Size: 10—11 mm; 3.5—4 mm.

Head. Clypeal horn present (4:1), short and conical (5:0); not emarginate (6:0); two times thickness, at base, then one supraorbital horn (7:2); projected forward (8:0). Supraorbital horns long (10:1; 11:1), thin and slightly bent inwards toward each other (12:1); produced perpendicular to head (13:1); slightly bent forward (14:1). Supraorbital and clypeal horns finely punctate (15:1; 9:1). Third antennomere more than 1.5 times length of both second and fourth antennomere (18:2; 19:2); antennae with stellate sensoria (22:0). Puncturing on vertex and frons smaller than one eye facet (26:1; 28:1). Gena not extending laterally past eye (36:0). Anterior corners of clypeus rounded (29:1). Mentum trapezoidal and setose (40:0; 41:1). Labrum fully setose (39:1). Mandibles with groove continuing to connection point of cranium (44:1).



FIGURE 14: Distribution of *Hypogena brasiliica* (= *H. biimpressa*). Based on 269 databased specimens.

Thorax. Pronotal puncturing biordinal in size (54:1); coarse punctures rare and concentrated on lateral portions of pronotum (57:0). Lateral margins of pronotum not parallel (61:0). Margins of pronotum expanded wider than one coarse puncture (62:2). Pronotum narrowest anteriorly (59:1). Anterior edge of pronotum reaching to middle of eye, but not past middle of eye (63:1). Hypomeron rugulose (74:1). Prosternum and hypomeron setose (66:1; 75:1); setae long, dense and yellow to gold in color. Prosternal puncturing smaller than facets of eye (67:1); prosternal puncturing separated by less than one diameter (68:1). Mesepisternum punctate; punctures larger than one eye facet (70:1); punctures intersecting (72:2). Row of cuticular teeth present on posterior edge of metasternum (77:1). Elytral striae punctate (47:1); punctures separated by less than one diameter (48:0). Elytral interstices convex and punctate (49:1);

punctures smaller than one fourth of striae puncture size (50:1); punctures numerous and separated by more than one diameter (51:1). Legs. Tarsi pubescent. On protarsi, proximal two tarsomeres with cuticular spines (86:1). Apex of tibia with brush of setae (84:1). Tibia with two apical spurs (85:1). Protibia with more than seven laterally socketed spines on distal third of protibia (81:1; 82:0); line of medial marginal spines present (83:1).

Abdomen. First two abdominal sternites laterally rugulose (89:1; 90:1); first three abdominal sternites setose (94:2); and coarsely punctate; last two abdominal segments finely punctate.

Female. Cuticle on intraocular space narrowly raised near eye (23:1); intraocular space impinging on eye (24:1). Clypeus with punctures smaller than eye facets, spread evenly across clypeus (31:1; 32:2). Clypeus tumid (33:1).

Distribution (Fig. 14): Honduras (El Paraíso, Atlántida), Mexico (Jalisco, Sinaloa, Chiapas, Tabasco, Yucatán, México, Hidalgo, Veracruz, Tamaulipas, Morelos, Colima, Nayarit, Guerrero), Peru, Panama (Panama, Colón), Brazil (Pará, Rondônia, Espírito Santo, Mato Grosso, São Paulo, Santa Catarina, Rio de Janeiro, Bahia), Paraguay (Alto Paraná), Venezuela (Aragua), Haiti, Nicaragua (Chontales), Colombia, Ecuador (Los Rios), Dominican Republic, El Salvador (La Unión), Costa Rica (Alajuela, Guanacaste, Heredia), Guatemala (Escuintla).



FIGURE 15: *Hypogena brasiliensis* Holotype, male. Dorsal view, lateral view, and labels.

Hypogena brasiliensis (Kulzer, 1962)

(Figs 1, 15, 16)

Ulosonia brasiliensis Kulzer, 1962: 94.

Type Material: HOLOTYPE (male) labeled: (a) on green paper “Brazil / S Leopoldo”; (b) on red bordered paper “HOLOTYPE / Ulosonia brasiliensis / det. H. Kulzer 1962”; (c) Tenebrionid Base / Aaron D. Smith / Catalog #

20134" (NHMB). PARATYPE (male) labeled: "Brasilien, S. Leopoldo". (NHMB). This paratype has not been examined. (See Fig. 15 for holotype).

Additional material examined: (3 males, 1 female): BOLIVIA: 1 female. TB# 20933 (FSCA). BOLIVIA: Santa Cruz: 1 male. TB# 20934 (ADSC). COLOMBIA: 1 male. TB# 20879 (FSCA).

Diagnosis: The supraorbital horns of this species are similar to those of *H. brasiliica*, but do not curve inwards and are thicker than in that species. The clypeal horn is much thicker (three times as thick) as one supraorbital horn. All the horns are produced perpendicular to the head and continue without bending. The pronotum has punctures of two sizes. The coarse punctures are much larger and more distinct than in other species in this genus. The coarse punctures are scattered throughout the pronotum. Presently there is no identified female for this species. But it is assumed that, similar to other members of this genus, that the female will be similar in most characters except for the absence of the horns (Fig. 15).

Redescription: Male. Size: 8–9 mm; 3–4 mm.

Head. Clypeal horn long (4:1; 5:1), thick; somewhat flattened; three times thickness, at base, then one supraorbital horn (7:3); produced perpendicularly to head (8:1); finely punctate (9:1). Supraorbital horns long (10:1; 11:1), thin and are not curved laterally (12:0); not bent forward (14:0); produced perpendicularly to head (13:1); horns finely punctate (15:1). Antennae bearing stellate sensoria (22:0). Third antennomere less than 1.5 times size of fourth but more than 1.5 times size of second (18:1; 19:2). Vertex and frons punctate, punctures smaller than eye facet (26:1; 28:1). Gena not extending laterally past eye (36:0). Groove on mandible present, continuing to attachment point on cranium (44:1). Labrum fully setose (39:1).

Thorax. Pronotal puncturing biordinal in size (54:1); coarse punctures numerous and scattered over pronotum (57:2); coarse punctures more than two times size of fine punctures; in lateral view, pronotum not arched (58:0). Lateral margins of pronotum subparallel (61:1). Margins of pronotum expanded less than size of one coarse puncture (62:1). Anterior edge of pronotum not reaching middle of eye (63:0). Hypomeron laterally rugulose (75:2); not punctate; not pubescent (76:0). Mesepisternum with punctures larger than eye facets and separated by less than one diameter (71:2; 72:1). Prosternal process not continuing past posterior edge of pronotum (69:0). Elytra striate and punctate (46:1; 47:1); punctures separated by less than one diameter (48:0). Elytral interstices convex, and punctate (49:1); puncture size smaller than one fourth stria puncture size (50:1); punctures separated by more than one diameter (51:1).

Legs. Tarsi pubescent. Cuticular outgrowths present on proximal two protarsomeres (86:1). Apical spurs present on tibiae (85:1). More than seven socketed spines present on lateral edge of protibial (81:1). Brush of setae present on apex of tibiae (84:1).

Abdomen. Abdominal sternites punctate, first three abdominal sternites setose (94:3).



FIGURE 16: Distribution of *Hypogena brasiliensis*. Based on 2 databased specimens.

Distribution (Fig. 16): Brazil (Rio Grande do Sul), Columbia. A second male specimen was identified from comparison with the Holotype, despite being collected 3,000 miles away from the holotype.



FIGURE 17: *Hypogena canaliculata*, Lectotype and Paralectotype. Top: dorsal view, lateral view, and labels of Lectotype, male. Bottom: Dorsal view, lateral view, and labels of Paralectotype female.

Hypogena canaliculata (Champion, 1886)

(Figs 1, 17, 18)

Ulosonia canaliculata Champion, 1886: 164.

Type Material: LECTOTYPE (male) labeled: (a) “V. de Chiriqui, / 2-3000ft / Champion”; (b) “Godman-Salvin / Coll., Ciol. / Centr.-Amer.”; (c) “Ulosonia / canaliculata / ♂ Ch”; (BMNH); (d) “Tenebrionid Base / Aaron D. Smith / Catalog # 15334”; (e) “LECTOTYPE/ *Hypogena/ canaliculata/* Grey & Smith, 2020”. Designated here. (See Fig. 17). Champion did not originally describe a holotype for this species. Therefore, a lectotype is designated here from Champion’s series of syntypes to maintain the taxonomic concept for this species.

Additional material examined: (22 females, 47 males, 1 sex unknown): BRAZIL: Santa Catarina: 1 female. TB# 20320 (CASC). COSTA RICA: 2 females, 9 males. TB# 17793-17794, 17796 (EMEC); TB# 17803-17804, 20312 (NMNH); TB# 17845-17846 (NHMB); TB# 20300-20301, 21778 (EMEC). COSTA RICA: Alajuela: 5 males. TB# 20313 (NMNH); TB# 17795, 17798, 20303, 21779 (CASC). COSTA RICA: Guanacaste: 3 females, 14 males. TB# 17783-17789 (EMEC); TB# 17790-17792, 17797, 20304-20307 (CASC); TB# 20302, 21777 (EMEC). COSTA RICA: Limón: 1 male. TB# 17810 (BMNH). CUBA: 1 female. TB# 20321 (NMPC). GUATEMALA: 2 females, 1 male, 1 sex unknown. TB# 17801, 21179 (NMNH); TB# 15681 (unknown); TB# 16356 (ADSC). GUATEMALA: Petén: 1 female. TB# 20315 (NMNH). HONDURAS: 1 female. TB# 21781 (BMNH). MEXICO: 1 female, 2 males. TB# 17802, 20316 (NMNH); TB# 17843 (BMNH). MEXICO: Tabasco: 1 male. TB# 17800 (NMNH). MEXICO: Tamaulipas: 1 female. TB# 20314 (EMEC). NICARAGUA: Chontales: 1 female, 5 males. TB# 15336, 17805-17809 (BMNH). PANAMA: 1 male. TB# 20319 (UCDC). PANAMA: Coclé: 2 females, 3 males. TB# 17799, 20297-20299, 20322 (NMNH). country not specified: 6 females, 5 males. TB# 20309-20311, 20317-20318 (NMNH); TB# 20308 (CASC); TB# 20323 (NHMB); TB# 15333, 17844, 21780 (BMNH).

Diagnosis: This species is similar to *H. tricornis* in size and form. The type specimen for this species has poorly developed horns, but in other specimens, they can be as long as those seen in *H. tricornis*. The puncturing on the pronotum is primarily of one size. Most punctures are fine, but on the lateral portions of the pronotum, there may be at most one or two larger punctures. The hypomeron is smooth and does not have any punctures. The female is similar in most character states except the presence of the horns (Fig. 17).

Redescription: Male. Size: 9.5–11 mm; 3–4 mm.

Head. Clypeal horn long (4:1; 5:1); not emarginate (6:0); twice as wide at base as one supraorbital horn (7:2); projected forward (8:0); almost smooth (9:0). Supraorbital horns long, thin and not curved (10:1; 11:1; 12:0; 14:0); projecting perpendicular to head (13:1); almost smooth (15:0). Third antennomere less than 1.5 times size of fourth and more than 1.5 times size of second (18:1; 19:2). Vertex and frons almost smooth (26:0; 28:0). Anterior corners of clypeus rounded (29:1). Gena not extending laterally past eye (36:0). Mentum trapezoidal and lightly setose (40:0; 41:1); mentum medially and longitudinally produced (43:1). Groove on mandible present, continuing to connection point to cranium (44:1). Labrum fully setose (39:1).



FIGURE 18: Distribution of *Hypogena canaliculata*. Based on 67 databased specimens.

Thorax. Pronotal puncturing of one size (54:0); coarse punctures, if present (at most 3), are located on lateral portions of pronotum. From lateral view, pronotum not arched (58:0). Lateral edges of pronotum subparallel (61:1). Marginal edge of pronotum widely expanded by twice length fine punctures (62:2). Row of cuticular teeth present on posterior edge of metasternum (77:1). Anterior edge of pronotum reaching middle of eye but not past it (63:1). Hypomeron and prosternum not punctate (75:0; 67:0); not setose (70:0; 76:0). Mesepisternum finely punctate, punctures smaller than eye facet (71:1); separated by more than one diameter (72:0); not setose (73:0). Elytra striate and punctate (46:1; 47:1), punctures separated by more than one diameter (48:1). Elytral interstices convex and punctate (49:1); punctures larger than one fourth of stria puncture size (50:0); separated by more than one diameter (51:1).

Legs. Tarsi pubescent. Cuticular outgrowth present on proximal two protarsomeres (86:1). Apical spurs on tibia present (85:1). Less than seven socketed spines on distal third of lateral edge of protibial (81:0; 82:0). Spines on entire medial edge of protibia (83:1). Apex of protibiae, with brush of setae (84:1).

Abdomen. First three visible abdominal sternites laterally rugulose (89:1; 90:1; 91:1). All abdominal sternites finely punctate and not setose (94:0).

Female. Similar to male, except as follows: Cuticle next to eye on intraocular space raised and extending transversely inwards (23:2); intraocular space impinging on eye (24:1). Puncturing on vertex and frons smaller than one eye facet (25:1; 27:1). Clypeus finely punctate (31:1); punctures concentrated in center (32:1); Clypeus tumid (33:1).

Distribution (Fig. 18): Brazil (Santa Catarina), Guatemala (Petén), Costa Rica (Alajuela, Limón, Guanacaste), Panama (Coclé), Cuba, Mexico (Tamaulipas, Tabasco), Nicaragua (Chontales).



FIGURE 19: *Hypogena cat*, Holotype, male. Dorsal view, lateral view, and labels.

Hypogena cat Steiner, 2005

(Figs 19, 20)

Hypogena cat Steiner, 2005: 573.

Note: This species was recently described and the original description is sufficient to identify specimens to species (Steiner, 2005). See Fig. 19 for images of holotype and Fig. 20 for distribution.

Material examined: (2 females, 6 males): MEXICO: 1 female. TB# 20206 (NHMB). MEXICO:Veracruz: 1 male. TB# 20203 (EMEC). PANAMA: 2 males. TB# 20878 (CASC); TB# 20205 (BMNH). country not specified: 1 female, 2 males. TB# 19605, 20207, 20884 (BMNH).

Diagnosis: The clypeal horn is long and thinnest at the base and widens apically and is truncated at the apex with an emargination. The supraorbital horns are long, thin and strongly bent forward. The horns of this species are similar to those in *H. dejeani*, but this species can be distinguished by having some large pronotal punctures on the lateral portions of the pronotum and the clypeal horns are not as thick as those in *H. dejeani* (Fig. 19).

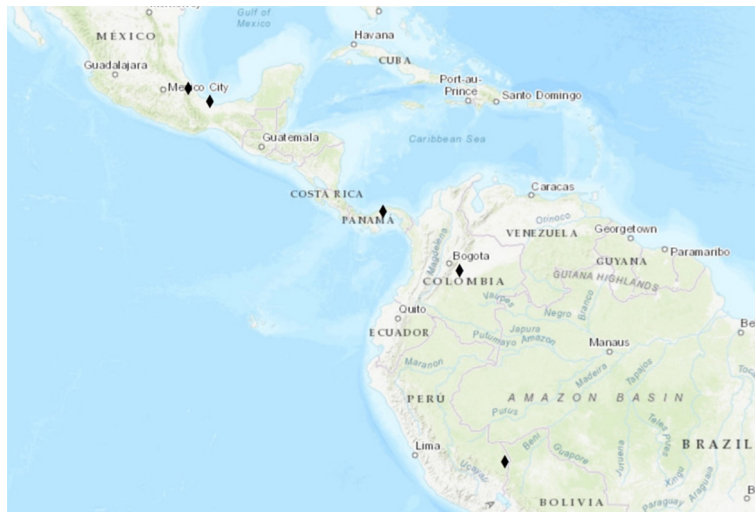


FIGURE 20: Distribution of *Hypogena cat.* Based on 7 databased specimens.

***Hypogena cryptica* sp. nov.**

(Figs 1, 21, 22)

urn:lsid:zoobank.org:act:73FFCE8E-60F7-48E9-ADF8-8A89CEA814BA

Type Material: HOLOTYPE (male) labeled: (a) “MEX: Baja Norte / 9 mi NNW Rosarito / X-5-1983 / D. Faulkner & / F. Andrews”; (b) “Under leaves on / stalk of dead / *Agave shawii*”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21889”; (d) “HOLOTYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”. (CSCA). Designated here. PARATYPES (5 males, 8 female) labeled: (a) “MEX: Baja Sur, Santa Inez Dam/ 8 mi. NE Todos Santos/ X-10-83/ F. G. Andrews k”; (b) “Under bark of dead *Bursura microphylla*”; (c) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”; (d) Tenebrionid Base numbers: 21594-21603, 21782, 21798, 21803. (CSCA). PARATYPES (6 males, 1 female) labeled: (a) “Todos Santos,/ L. Cal. VII-15-38”; (b) “Michelbacher&/Ross Collectors”; (c) “tricornis/ Determined by/ FEBlaisdell”; (d) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”; (e) Tenebrionid Base numbers: 20772-20774, 20782-20785 (CSCA). PARATYPES (4 males) labeled: (a) “Todos Santos,/ L. Cal. VII-15-38”; (b) “Michelbacher&/Ross Collectors”; (c) “tricornis/ Determined by/ FEBlaisdell”; (d) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”; (e) Tenebrionid Base numbers: 21793-21796. (CASC). PARATYPE (male) labeled: (a) “Santiago,/ L. Cal. VII-8-38”; (b) “Michelbacher&/ Ross Collectors”; (c) “tricornis/ Determined by/ FEBlaisdell”; (d) “Tenebrionid Base / Aaron D. Smith / Catalog # 20786”; (e) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020” (CSCA). PARATYPES (4 males, 4 females) labeled: (a) “MEX: Baja Calif. Sur. 3.6 mi NE Cabo San Lucas./ IX-29-1981/ F. Andrews & D.Faulkner”; (b) “Collected under bark of standing dead “Torote” *Bursera microphylla*”; (d) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”; (c) Tenebrionid Base numbers: 21783-21789, 21891. (CSCA). PARATYPE (female) labeled: (a) “MEX: Baja Calif. Sur. 3.6 mi NE Cabo San Lucas./ IX-29-1981/ F. Andrews & D.Faulkner”; (b) “Collected under bark of standing dead “Torote” *Bursera microphylla*”; (c) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”; (d) Tenebrionid Base number: 21797;. (RLAC). PARATYPE (female) labeled: (a) “AZ: Pima Co./ Tucson/ July 25, 2007/ Eric Eaton coll.”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21810”; (c) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”. (DMNS). PARATYPES (3 male) labeled: (a) “AZ: Pima Co./ Tucson/ July 27, 2007/ Eric Eaton coll.”; (c) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”; (b) Tenebrionid Base numbers: 21790-21792. (DMNS). PARATYPES (4 males, 1 female) labeled: (a) “MEX: Baja Norte / 7.7 mi NNW Rosarito / X-4-1983 / D. Faulkner & / F. An-

draws”; (b) “Under leaves on / stalk of dead / *Agave shawii*”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”; (d) Tenebrionid Base numbers: 21799-21802, 21890. (CSCA). PARATYPE (female) labeled: (a) “MEX: Baja Norte / 9 mi NNW Rosarito / X-5-1983 / D. Faulkner & / F. Andrews”; (b) “Under leaves on / stalk of dead / *Agave shawii*”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21809”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CSCA). PARATYPE (male) labeled: (a) “Mex. :Baja Calif. Sur/ 1.5 mi. east of San / Jorge. 24.VII.1971/ H.G Real & R.E.Main/ In decaying Cardón”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21804”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (female) labeled: (a) “Mexico: Baja California/ Sur. Ramal naranjos rd./ 2.9 mi W Highway 1,650/ IX-1-1990 F. Andrews/ T. Eichlin & A. Gilbert”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21805”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CSCA). PARATYPE (male) labeled: (a) “5 mi S./ Miraflores,/ L Cal. VII-10-38”; (b) “Michelbacher &/ Ross Collectors”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21806”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (male) labeled: (a) “5 mi. W San Bartolo/ L. Cal. VII-13-1938”; (b) “Michelbacher & Ross Coll.”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21807”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (female) labeled: (a) “MEXICO: S. L. P./ 12 mi S Cu. Mante / VI-21-1975”; (b) “under bark/ DS Chandler”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21808”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (UCDC). PARATYPE (male) labeled: (a) “Colossal Cave/ Park. Arizona/ 8.4.1970”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21811”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (NMNH). PARATYPE (male) labeled: (a) “Needles Cal./ XI-27-21/ J.A Kusche/ Collector”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21812”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (NHMB). PARATYPE (male) labeled: (a) “GUATEMALA:/ Nueva Concepcion/ 50”. VIII-17-63/ D.Q. Cavagnaro/ & M.E. Irwin/ collectors”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21813”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (male) labeled: (a) “ARIZ: Pima Co./ Avra Valley #1/ Mar. 29, 1972 JCS”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21814”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (male) labeled: (a) “FtGrant/ 14.7 Ar”; (b) “CollHubbard/ &Schwarz” (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21815”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (NMNH). PARATYPE (male) labeled: (a) “FtYuma/ 9.4 Ar”; (b) “CollHubbard/ &Schwarz”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21816”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (NMNH). PARATYPE (female) labeled: (a) “San Bernardino Co./ Needles Cal./ X-14-61”; (b) “A. Hardy Coll.”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21817”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CSCA). PARATYPE (male) labeled: (a) “MEX:B.Calif./ 4.5 mi.NE.of/ Los Planes/ 21-XII-1958”; (b) “H.B.Leech/ Collector”; (c) “Ex dead/ *Bursera sp.*”; (d) “Tenebrionid Base / Aaron D. Smith / Catalog # 21818”; (e) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (female) labeled: (a) “Venedio/ Sinaloa Mex./ VI-10-1918”; (b) “Van Dyke/ Collection; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21819”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (female) labeled: (a) “CALIF:Imperial CO./ Algodones Dunes, 7miSE/ Glamis 32°,55’,20”N/ 114°, 59’, 14”W Site 4/ V-1to15-1979” (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21820”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CSCA). PARATYPE (female) labeled: (a) “El Zapotal, 2 mi.S./ Tux.Gutierrez, Chias/ MEX. VII-12-57”; (b) “J.A Chemsak/ B.J Rannells/ Collectors”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21821”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (EMEC). PARATYPE (female) labeled: (a) “8 mi E Concordia/ Sin. Mex./ VIII-23-69/ J.Doyen”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21822”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CASC). PARATYPE (male) labeled: (a) “Indio/ Riverside Co./ Cal VIII-6-1963”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21823”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CSCA). PARATYPE (female) labeled: (a) MEX: S. L. Potosi/ Tamazunchale, 18/ mi. SW. VIII-2-53”; (b) “J. Doyen/ Collector”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 21824”; (d) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (EMEC). PARATYPE (male) labeled: (a) ”Mexico: Baja/ California Sur/ 16 km N. Tropic of / Cancer, Near/ Santiago/ 9 November 1981/ W. E. Steiner”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21825”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (NMNH). PARATYPE (male) labeled: (a) “Lago Catemaco Vera/ Cruz MEXICO/ VIII-20-1965/ A.R.Gillooly”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21826”; (c) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (RLAC). PARATYPE (female) labeled: (a) “Blythe Cal./ X-8-1945”; (b) “InQuar from/ Providence RI”; (c) “Collected from/ soil”; (d) “Cal.Dept.Agr./ No. BL45J19”; (e) “Tenebrionid Base / Aaron D. Smith / Catalog # 21827”; (f) “PARATYPE/ *Hypogena/ cryptica*/ Grey & Smith, 2020”. (CSCA). PARATYPE (male) labeled: (a) “Arizona, St. Catalina/ Mts., Molino Basin/ Oct. 13 1974/ K. Stephan leg.”; (b)

“Tenebrionid Base / Aaron D. Smith / Catalog # 21828”; (c) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”. (FSCA). PARATYPE (male) labeled: (a) “MEX.San Felipe/ Baja Calif/ III-26-1963/ G.I. Stage”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 21892”; (c) “PARATYPE/ *Hypogena/ cryptica/* Grey & Smith, 2020”. (CSCA). (See Fig. 21).



FIGURE 21: *Hypogena cryptica*, Holotype and Paratype. Top, Holotype, male: dorsal view, lateral view and labels of male. Bottom, Paratype, female: Dorsal view, lateral view and labels of female.

Diagnosis: This species is similar in size and shape to *H. brasílica*. The horns are also similar to *H. brasílica* by having a short clypeal horn and long supraorbital horns that point inward toward each other. The hypomeron and prosternum not having long, gold/yellow setae distinguish this species from *H. brasílica*. The mesepisternum is also not scalloped as in *H. brasílica*. Finally, in this species the coarse punctures are not primarily concentrated on the lateral portions of the pronotum, rather they are spread out across the pronotum (Fig. 21).

Description: Male. Size: 8–11 mm; 3–4 mm.

Head. Distance between cardo and eye less than width of cardo (34:1). Clypeal horn short, conical (4:1; 5:0); twice as wide, at base, as one supraorbital horn (7:2); produced forward (8:0); finely punctate (9:1). Supraorbital horns long, thin and slightly bent inwards (11:1; 12:1); produced perpendicular to head (13:1); not bent anteriorly (14:0); finely punctate (15:1). Antennae not forming club (17:0). Antennae with stellate sensoria (22:0). Third antennomere equal in size to fourth and more than 1.5 times size of second (18:0; 19:2). Vertex and frons with punctures smaller than eye facets (26:1; 28:1). Gena not extending laterally past eye (36:0). Clypeus is pointed in middle (29:2). Mentum trapezoidal and densely setose (40:0; 41:1). Groove on mandible present and continuing to connection point on cranium (44:1). Labrum fully setose (39:1).

Thorax. Pronotum punctures biordinal in size (54:1). Coarse punctures numerous and spread evenly across pronotum (57:2). From lateral view, pronotum not arched (58:0); disc flat (60:1). Anterior edge of pronotum reaching middle of eye, but not past eye (63:1). Lateral margins of pronotum subparallel (61:1). Margins of pronotum expanded wider than diameter of one coarse puncture (62:2). Hypomeron laterally rugulose (75:2). Mesepisternum punctate; punctures smaller than eye facets and separated by one or less than one diameter (71:1). Mesepisternum not pubescent (73:0). Prosternum punctate and not pubescent (66:0); punctures smaller than eye facets (67:1), puncturing separated by less than one diameter (68:1). Prosternal process not continuing past posterior edge of pronotum (69:0). Elytra striae present and punctate (46:1); punctures shallow (47:1); separated by less than one diameter (48:0). Elytral interstices convex (49:1); punctures equal to or smaller than one fourth size of stria punctures (50:1); punctures separated by more than one diameter (51:1).



FIGURE 22: Distribution of *Hypogena cryptica*. Based on 69 databased specimens.

Abdomen. All abdominal segments densely punctate; first three visible abdominal segments coarsely punctate (89:0; 90:0; 91:0); fourth and fifth visible abdominal segments finely punctate; punctures separated by less than one diameter. Abdominal sternites not setose (94:0). Legs. Tarsi pubescent. Cuticular outgrowths present on proximal two tarsomeres (86:1). Tibiae with two apical spurs (85:1). On lateral edge of protibia, seven or more socketed spines present on distal third (81:1; 82:0). All tibiae and femurs setose along entire length.

Female. Similar to male, except as follows: Cuticle on intraocular space narrowly raised near eye (23:1). Intraocular space impinging on eye (24:1). Puncturing on vertex as large as or larger than eye facets (25:2). Clypeus with punctures smaller than eye facets and spread evenly across clypeus (31:1; 32:2). Anterior edge of clypeus flat but corners are rounded (30:1). Clypeus tumid (33:1).

Distribution (Fig. 22): Mexico (Baja California, San Luis Potosí, Veracruz, Tamaulipas, Baja California Sur), USA (Arizona, California), Guatemala.

Etymology: The specific epithet *cryptica* is a reference to the similarity that this species bears to *H. brasílica*. It is feminine.

***Hypogena dejeani* (Champion, 1886)**

(Figs 23, 24)

Ulosonia dejeani Champion, 1886: 165.

Type Material: LECTOTYPE (male) labeled: “Las Mercedes, / 3000 ft. / Champion”; (b) “*Ulosonia* ♂ / *dejeani* Ch.”; (c) on blue paper “Tenebrionid Base / Aaron D. Smith / Catalog # 19606”; (d) “LECTOTYPE/ *Hypogena/ dejeani*/ Grey & Smith, 2020” (BMNH). Designated here. (See Fig. 23). Champion did not designate a holotype for this species. In order to maintain the taxonomic concept for this species a lectotype is designated herein from Champion’s syntype series.

Additional material examined: (5 males, 1 female): COSTA RICA:Puntarenas: 1 female. TB# 20204 (unknown). MEXICO: 1 male. TB# 20201 (NMNH). MEXICO:Veracruz: 1 male. TB# 20202 (NHMB). country not specified: 2 males. TB# 19607, 20208 (BMNH).

Diagnosis: The male of this species has distinctive armature. The clypeal horn for this species is long and wide at the base, becoming thinner until the anterior third, where it becomes wider. The end of the horn is emarginate. The supraorbital horns are also long, and produced perpendicular to the head. The horns then curve forward to point anteriorly. The punctures are of one size with no coarse punctures present. This species is very similar to *H. cat* but can be differentiated by the lack of coarse punctures. There are very few female specimens, but most characters are similar to those in the male except the presence of the horns (Fig. 23).



FIGURE 23: *Hypogena dejeani*, Lectotype, male. Dorsal view, lateral view, and labels.

Redescription: Male. Size: 7—9 mm; 2—3 mm.

Head. Clypeal horn long (4:1; 5:1); thinner in middle and widening apically; apex truncated and emarginated (6:1); horn flattened; twice as thick at base than one supraorbital horn (7:2); projected forward (8:0); not punctate (9:0). Supraorbital horns long (10:1; 11:1); bent inwards toward each other (12:2); produced perpendicularly to head (13:1); strongly bent to point anteriorly (14:1); not punctate (15:0). Antennae with stellate sensoria (22:0). Third antennomere less than 1.5 times longer than fourth and more than 1.5 times length of second (18:1; 19:2). Vertex and frons almost smooth (26:0; 28:0). Gena not extending laterally past eye (36:0). Anterior margin of clypeus not forming circular arch (29:2). Mentum trapezoidal, punctate (40:0; 42:1); not pubescent (41:0). Groove on mandible present, continuing to connection point to cranium (44:1). Labrum fully setose (39:1).

Thorax. Pronotal punctures of one sizes (54:0); coarse punctures not present (56:0). From lateral view, pronotum not arched (58:0). Lateral margins of pronotum subparallel (61:1). Margins of pronotum narrowly expanded, by less than twice the diameter of fine punctures (62:1). Anterior margin of pronotum reaching middle of eye but not past eye (63:1). Hypomerone rugulose and finely punctate (75:2). Prosternum finely punctate (67:1); punctures separated by less than one diameter (68:1). Prosternal process not continuing past posterior margin of pronotum (69:0). Mesepisternum with punctures smaller than eye facets and separated by less than one diameter (71:1). Row of cuticular teeth present on posterior edge of metasternum (77:1). Elytra striate and punctate (46:1; 47:1); punctures separated by less than one diameter (48:0). Elytral interstices flat to weakly convex (49:0); punctate; punctures larger than one fourth stria puncture size and separated by more than one diameter (50:0).

Legs. Tarsi pubescent. Cuticular outgrowths present on proximal two protarsomeres (86:1). Two apical spurs present on tibiae (85:1). protibia more than seven socketed spines present on distal third (81:1; 82:0). Spines present along entire medial marginal edge of protibial (83:1). Apex of tibiae bearing brush of setae (84:1).

Abdomen. First two visible abdominal segments laterally rugulose (89:1; 90:1). Third visible abdominal sternites laterally rugulose on anterior fourth (91:2). All abdominal segments glabrous and punctate; first three coarsely punctate and remaining two finely punctate.

Female. Similar to male, except as follows: Intraocular space raised and extending transversely inwards to meet in middle of head (23:2). Intraocular space impinging on eye (24:1). Vertex and frons with puncturing smaller than eye facets (25:1; 27:1). Clypeus with punctures smaller than eye facets and spread evenly across clypeus (31:1; 32:2). Anterior margin of clypeus flat, but with rounded corners (30:1). Clypeus not distinctly elevated (33:0).

Distribution (Fig. 24): Mexico (Veracruz), Costa Rica (Puntarenas).



FIGURE 24: Distribution of *Hypogena dejeani*. Based on 6 databased specimens.

Hypogena depressa (Champion, 1886)

(Figs 1, 2, 3, 25, 26)

Ulosonia depressa Champion 1886: 164.

Type Material: LECTOTYPE (male) labeled: (a) Cuernavaca (b) “Mexico / Salle Coll.”; (c) “Godman-Salvin / Coll. Biol. / Centr.-Amer.”; (d) on grey paper “1899”; (e) “*Ulosonia* ♂ / *depressa* Ch.”; (f) on blue paper “Tenebrionid Base / Aaron D. Smith / Catalog # 19609” (g) “LECTOTYPE/ *Hypogena/ depressa*/ Grey & Smith, 2020” Designated here. (BMNH, Fig. 25). Champion did not designate a holotype for this species, so in order to maintain the taxonomic concept for this species a lectotype is designated from Champion’s syntype series.

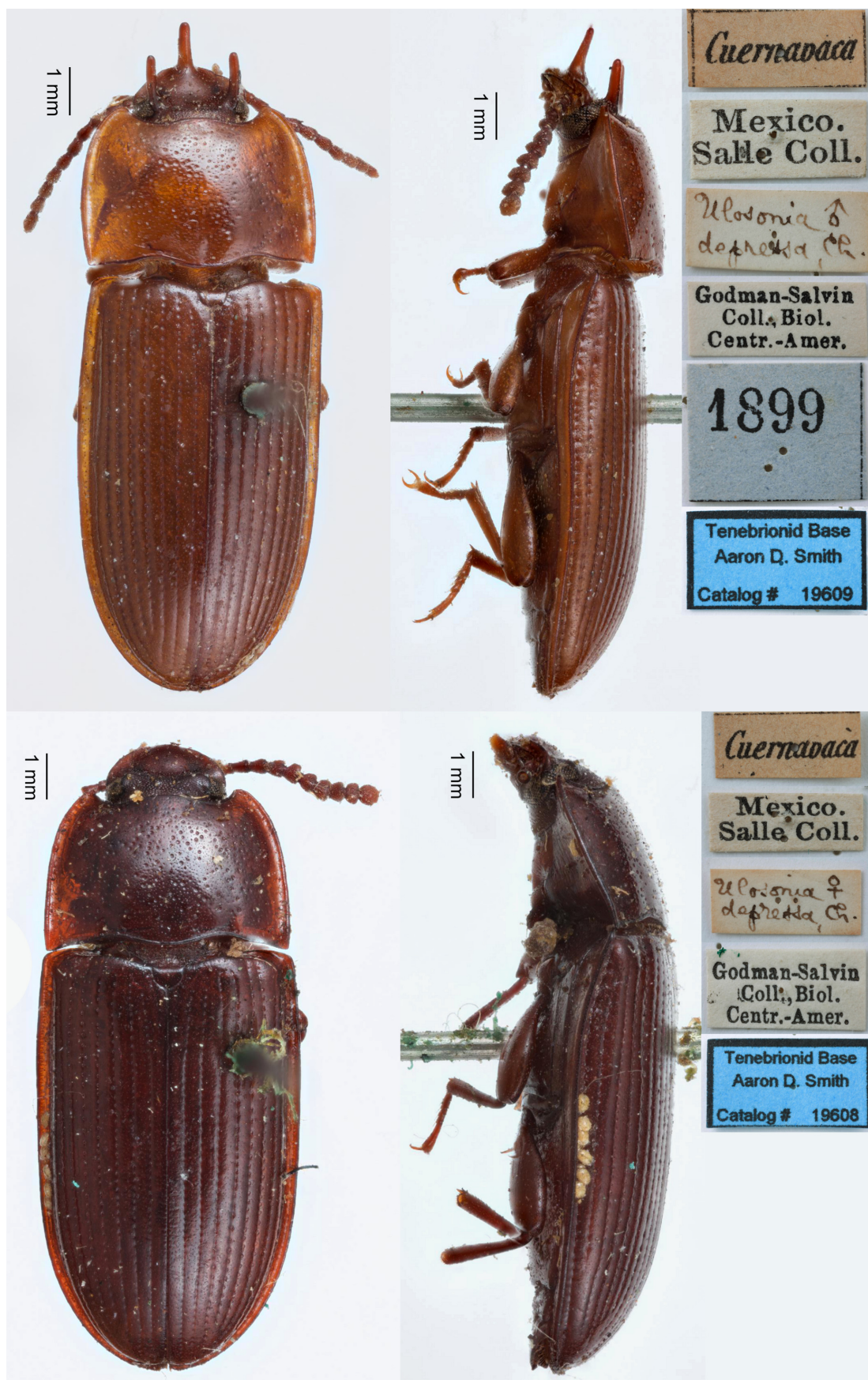


FIGURE 25: *Hypogena depressa*, Lectotype and Paralectotype. Top, Lectotype, male: dorsal view, lateral view, and labels. Bottom, Paralectotype, female: dorsal view, lateral view, and labels.

Additional material examined: (82 males, 99 females): BAHAMAS: 22 males, 28 females. TB# 17811-17812, 19280-19282, 19313-19317, 19379-19380, 19387-19393, 19745-19756, 19773-19788; mx_id 47107 (NMNH); TB# 21771-21772 (NMNH). BRAZIL:Pará: 1 female. TB# 21130 (BMNH). COSTA RICA: 3 males, 2 females. TB# 20132-20133 (NMNH); TB# 20031 (EMEC); TB# 20131, 20162 (CASC). COSTA RICA:Guanaacaste: 9 males, 8 females. TB# 19520-19522, 19525, 20028, 20065-20068, 20120 (EMEC); TB# 20069, 20107, 20121-20122 (CASC); TB# 20304-20306 (CAS). COSTA RICA:San José: 2 males. TB# 20032, 21125 (NMNH). CUBA: 2 males, 8 females. TB# 19855-19857 (NMNH); TB# 19758, 21124 (CASC); TB# 20928-20932 (NMPC). GUATEMALA: 1 male. TB# 21123 (NMNH). GUATEMALA:Zacapa: 1 female. TB# 15682 (ADSC). HONDURAS: 3 females. TB# 21122 (EMEC); TB# 20029, 21119 (NMNH). HONDURAS:Comayagua: 1 female. TB# 20030 (EMEC). JAMAICA: 1 male, 3 females. TB# 19757, 19858, 20130, 21117 (NMNH). MEXICO: 7 males, 11 females. TB# 19405, 19526 (NMNH); TB# 19394, 19863 (EMEC); TB# 19403, 19527, 19759, 19862, 20127, 21120 (CASC); TB# 17956, 19404 (NHMB); TB# 17965, 21775 (CAS); TB# 21127, 21129, 21131 (BMNH); TB# 21121 (RLAC). MEXICO:Baja California Norte: 4 females. TB# 20126 (NMNH); TB# 20123-20125 (NMNH). MEXICO:Baja California Sur: 1 female. TB# 21309 (CASC). MEXICO:Nayarit: 7 males, 5 females. TB# 19524 (NMNH); TB# 19523, 19528, 20027, 20053-20057, 20101 (CASC); TB# 21776 (EMEC); TB# 21126 (NABF). MEXICO:Oaxaca: 3 males, 7 females. TB# 20129 (CASC); TB# 21773 (CAS); TB# 20058-20064 (EMEC); TB# 21774 (unknown). MEXICO:Puebla: 3 males. TB# 19864 (NMNH); TB# 19518-19519 (TAMU). MEXICO:Sinaloa: 3 males, 2 females. TB# 20102-20106 (CASC). MEXICO:Veracruz: 1 male. TB# 20128 (EMEC). USA: 1 male. TB# 21118 (NABF). USA:Arizona: 1 male. TB# 21315 (NABF). USA:New Mexico:Socorro Co.: 11 males, 10 females. TB# 19859-19860, 20026, 20033-20050 (CASC). USA:Texas: 1 female. TB# 19861 (EMEC). country not specified: 4 males, 3 females. TB# 19402, 19529 (NMNH); TB# 19653 (NHMB); TB# 18509 (CASC); TB# 19608, 21128, 21132 (BMNH).

Diagnosis: This species is very similar to *H. tricornis* in size and form. The horns, while similar to those of *H. tricornis* but not as long. The puncturing on the pronotum in both the male and female are of two sizes. The coarse punctures are not concentrated only on the disc and can be found throughout the pronotum. The lateral portions of the pronotum are gradually raised to form the disc. The hypomerion is laterally rugulose, but not punctate. Most of the character states are the same in the female, except the presence of the horns (Fig. 25).

Redescription: Male. Size: 8—9 mm; 2—3 mm.

Head. Clypeal horn long; thin (4:1; 5:1); twice as thick as supraorbital horn (7:2); produced perpendicularly to head (8:1); finely punctate (9:1). Supraorbital horns long (10:1; 11:1); produced forward (13:0); bent slightly inwards (12:1). finely punctate 15:1). Anterior corners of clypeus rounded (29:1). Puncturing on vertex and frons smaller than eye facet (26:1; 28:1). Third antennomere same size as fourth and more than 1.5 times size of second (18:0; 19:2). Antennae with stellate sensoria (22:0). Gena not extending laterally past eye (36:0). Mentum trapezoidal and lightly setose (40:0;41:1). Labrum fully setose (39:1). Groove on mandible continuing to connection point on cranium (44:1).

Thorax. Pronotal puncturing biordinal in size (54:1); numerous coarse punctures scattered across pronotum (57:2). Lateral portions of pronotum gradually raised to form disc. From lateral view, pronotum not arched (58:0). Lateral margins of pronotum subparallel (61:1). Lateral edge of pronotum expanded wider than diameter of one coarse puncture (62:2). Pronotum narrowest anteriorly (59:1). Anterior portion of pronotum reaching middle of eye, but not past middle of eye (63:1). Hypomerion laterally rugulose and not punctate (75:2). Row of cuticular teeth present on posterior edge of metasternum (77:1). Mesepisternum punctate; punctures smaller than eye facets and less than one diameter from each other (71:1). Prosternum punctate; punctures smaller than eye facets (67:1); separated by more than one diameter (68:0); not bearing setae (66:0). Elytra striate (46:1); punctate (47:1); punctures farther than one diameter from each other (48:1). Elytral interstices convex and punctate (49:1); punctures larger than one fourth of stria puncture size (50:0); mostly more than one diameter from each other (51:1).

Legs. Tarsi pubescent. Protarsal outgrowths present on proximal two tarsomeres (86:1). Tibia bearing two apical spurs (85:1). More than seven socketed spines on distal half of lateral edge of protibial (81:1; 82:1). Medial marginal spines on tibia absent (83:0). Apex of tibiae bearing brush of setae (84:1).

Abdomen. First three abdominal sternites laterally rugulose (89:1; 90:1; 91:1), coarsely punctate with setae arising from punctures (94:2); remaining two abdominal sternites finely punctate.

Female. Similar to male, except as follows: Intraocular space raised and extending transversely inwards (23:2); intraocular space impinging on eye (24:1). Puncturing on vertex and frons as large or larger than eye facet (25:2);

27:2). Punctures on clypeus smaller than eye facet and spread evenly across clypeus (31:1; 32:2). Clypeus tumid (33:1).

Distribution (Fig. 26): Brazil (Pará), Guatemala (Zacapa), Honduras (Comayagua), USA (Texas, New Mexico, Arizona), Costa Rica (San José, Guanacaste), Jamaica, Bahamas, Cuba, Mexico (Baja California, Nayarit, Veracruz, Sinaloa, Oaxaca, Puebla).

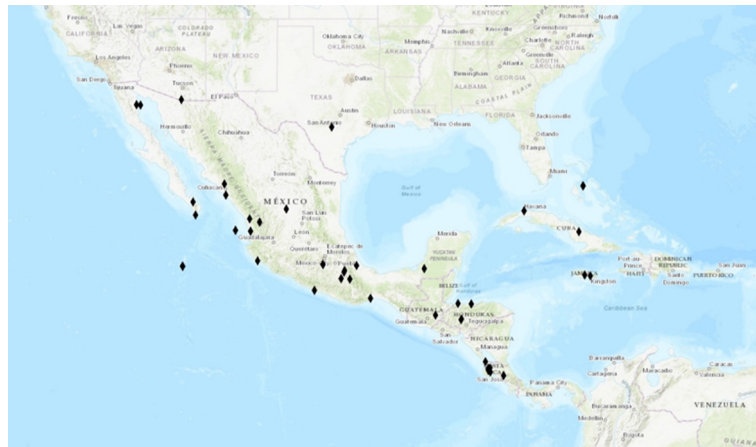


FIGURE 26: Distribution of *Hypogena depressa*. Based on 175 databased specimens.

***Hypogena hirsuta* sp. nov.**

(Figs 1, 27, 28)

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Type Material: HOLOTYPE (male) labeled: (a) “ECUADOR / Puna Is / XI-9-1950”; (b) “Ross and Michelbacher Collectors”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20887”; (d) “HOLOTYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (e) “CASTYPE19718” (CASC). Designated here. ALLOTYPE (female) labeled: (a) “ECUADOR / Puna Is / XI-9-1950”; (b) “Ross and Michelbacher Collectors”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20888”; (d) “ALLOTYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020” (CASC). Designated here. PARATYPES (2 males) labeled: (a) “HAMBURGFARM/ REVENTAZON/ EBENE LIMON”; (b) “COSTA RICA/ F NEVERMANN/ 15 V 24”; (c) “Ulosonia / caniculata / Champ”; (d) “U.L. Rinde”; (e) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (f) Tenebrionid Base Number: 20804-20805. (NMNH). PARATYPES (2 males, 2 female) labeled: (a) “Ciricito/ Canal Zone/ 3/20/30”; (b) “11958”; (c) “Blackwater/ Collection”; (e) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (d) Tenebrionid Base numbers: 20812-20815. (NMNH). PARATYPES (3 males, 1 females) labeled: (a) “COSTA RICA:/ Guanacaste, Lomas/ Barbudal, Valle/ Balas de Canon/ 29 June 1991 J. Doyen/ Cal. Acad. Sci. Collect.”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (b) Tenebrionid Base numbers 20809-20810, 20819-20820. (CASC). PARATYPES (1 male, 3 females) labeled: (a) “COSTA ROCA:Gte.Prov./ Playa Hermosa,Bahia/ de Culebra III-24-74/ P.Opler under bark/ *Enterolobium cycloc.*”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (b) Tenebrionid Base numbers: 20816-20818, 20846. (EMEC). PARATYPES (2 males, 1 female) labeled: (a) “Mexico: Nayarit/ 3 mi N of Las Varas/ 10 February 1953/ Donated by E. L. Klee”; (b) “under/ “Higuerra”/ bark”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (d) Tenebrionid Base numbers 20826-20828. (CASC). PARATYPES (2 males, 2 female) labeled: (a) “Guatemala/ Escuintla/ 1879. VIII.”; (b) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (c) Tenebrionid Base numbers: 20829-20832. (NHMB). PARATYPES (1 male, 1 female) labeled: (a) “Cayamas/ 14.1 Cuba”; (b) “E.A Schwarz/ Collector”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (d) Tenebrionid Base numbers: 20823-20824. (NMNH). PARATYPE (3 females) labeled: (a) “ECUADOR/ Puna Is/ XI-9-1950”; (b) “Ross and/ Michelbacher/ Collectors”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”; (d) Tenebrionid numbers: 20803, 20847-20848. (CASC). PARATYPE (female) labeled: (a) “CURACAO/ Savonet/ 12 February 1987/ W.E. Steiner &/ J.M. Swearingen”; (b) “Under bark of/ dead/ *Hippomans/ mancinella*/ EM. May 16”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20807”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (male) labeled: (a) “CURACAO: 1 km SE Lagun/ 12°18’41.5”N, 69°08’30”W/ 16/ November 2014/ Under loose bark of/ fallen trunk/ *Hippomane mancinella*”; (b) “W.E. Steiner,/ M.C. Thomas,/ R.H. Turnbow/ col-

lectors”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20821”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (CASC). PARATYPE (female) labeled: (a) “La Ceiba/ Honduras/ X.24.16”; (b) “F.J. Doyen Col./ No. 20501/ 20580”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20808”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (female) labeled: (a) “Cabima Pan/ May 22.11/ August Busck”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20811”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (female) labeled: (a) “MEX: Chis. 24/ mi. NW Huixtla/ VI-27-65”; (b) “C. Slobo-dchikoff Collector”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20822”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (EMEC). PARATYPE (female) labeled: (a) “EL PARAISO/ 17-9-77”; (b) “J. V. Mankins/ collector”; (c) “15914”; (d) “Tenebrionid Base / Aaron D. Smith / Catalog # 20825”; (e) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (EMEC). PARATYPE (male) labeled: (a) “Guatemala./ 55 71. ”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20833”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (BMNH). PARATYPE (male) labeled: (a) “COSTA RICA/ 2 MI. N.W. CANAS/ May 18-21 1974/ E. GIESBERT, COLL.”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20834”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (EMEC).

PARATYPE (male) labeled: (a) “Rancho Grande/ Maracay Venezuela/ XI.1960 G. Frey”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20835”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NHMB). PARATYPE (male) labeled: (a) “CR: Guanacaste/ Playa El Coco V-/ 13/18-1976 malaise/ trap M. Wasbauer”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20836”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (EMEC). PARATYPE (female) labeled: (a) “Chiapas Mex/ L Hotzen ‘19/ Pacific Slope/ Cordilleras/ 800-1000M”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20838”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (female) labeled: (a) “Colima/ Col Mex/ Conradt”; (b) “474”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20839”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (female) labeled: (a) “Taladro Hond./ 26-8-77”; (b) “J.V. Mankins/ collector”; (c) “15505”; (d) “Tenebrionid Base / Aaron D. Smith / Catalog # 20840”; (e) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (EMEC). PARATYPE (male) labeled: (a) “MEX: Ver., 7mi./ N. Santiago/ Tuxtla VII-8-63”; (b) “John T. Doyen./ Collector”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20841”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (EMEC). PARATYPE (male) labeled: (a) “BRIT. HONDURAS:/ Columbia./ May 1932./ J.J. White./ B.M. 1933-334.”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20842”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (BMNH). PARATYPE (male) labeled: (a) “Mexico via/ San Pedro/ 47-3700”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20843”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (female) labeled: (a) “PANAMA/ Almirante/ 25-XI-1952”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20844”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (male) labeled: (a) “PANAMA: Chiriqui/ 3 km N David/ 31 May 1983/ W. E. Steiner”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20845”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (NMNH). PARATYPE (male) labeled: (a) “Costa Rica/ F Nevermann/ 15 X 37”; (b) “Unter loser Rinda”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20853”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (CASC). PARATYPE (male) labeled: (a) “Santarín”; (b) “F. Bates Coll. 81-19”; (c) “Tenebrionid Base / Aaron D. Smith / Catalog # 20856”; (d) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (BMNH). PARATYPE (male) labeled: (a) “Pernam/ 5th d.Coin y”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20857”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (BMNH). PARATYPE (male) labeled: (a) “COSTA RICA: Guanacaste./ Prov. Finca La Pacifica/ 5 Km NW Canas/ VII-19-1973 J.Doyen and P. Opler”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20885”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (EMEC). PARATYPE (female) labeled: (a) “BRASIL: Mato Grosso./ Sinop(12°32’S,55°37’W)/ X-1974 M. Alvarenga”; (b) “Tenebrionid Base / Aaron D. Smith / Catalog # 20886”; (c) “PARATYPE/ *Hypogena/ hirsuta*/ Grey & Smith, 2020”. (ADSC). (Fig. 27)

Diagnosis: This species has horns similar to those of *H. marginata*, which are short tubercles that point slightly inwards and a clypeal horn that is very weakly produced, resembling a pointed forward projected clypeus. This species is different in the presence of distinctive golden setae on the prosternum and hypomeron. It also has a mesepisternum that is setose and punctate in such a way that it resembles rows of scalloping. The female is similar except without the horns (Fig. 27).

Description: Male. Size: 8—10 mm; 3—4 mm.

Head. Distance between eye and cardo less than width of cardo (34:1). Clypeal horn short (4:1; 5:0); with anterior edge of clypeus pointed; width, at base, twice size of one supraorbital horn (7:2); produced forward (8:0) finely

punctate (9:1). Supraorbital horns short, conical and not bent (10:1; 11:0; 12:0); produced forward (13:0); finely punctate (15:1). Third antennomere same size and fourth and more than 1.5 times size of second (18:0; 19:2). Puncturing on vertex as large as or larger than eye facets (26:2); puncturing on frons smaller than eye facets (28:1) Gena not extending laterally past eye (36:0). Mentum trapezoidal and lightly setose (40:0; 41:1). Mandible with distinct groove continuing to attachment point of cranium (44:1). Labrum fully setose (39:1).



FIGURE 27: *Hypogena hirsuta*, Holotype and Paratype. Top, Holotype, male: dorsal view, lateral view, and labels. Bottom, Paratype, female: Dorsal view, lateral view, and labels.

Thorax. Pronotal puncturing biordinal in size (54:1). Coarse punctures not numerous; scattered across pronotum (57:2). From lateral view, pronotum not arched (58:0). Lateral edges of pronotum subparallel (61:1). Margins of pronotum expanded wider than one coarse puncture (62:2). Pronotum narrowest anteriorly (59:1). Anterior edge of pronotum reaching middle of eye (63:2). Hypomeron laterally rugulose (75:2). Prosternum finely punctate; puncturing smaller than eye facets (67:1); separated by less than one diameter (68:1). Prosternum and hypomeron setose (66:1; 76:0); setae white to golden. Prosternal process not extending past posterior portion of pronotum (69:0). Mesepisternum setose (73:1), punctate; punctures elongated anteriorly; larger than one eye facet (71:2); separated by less than one diameter (72:1). Row of cuticular teeth present on posterior edge of metasternum (77:1). Elytral striae punctate (46:1; 47:1), punctures separated by less than one diameter (48:0). Elytral interstices convex and punctate (49:1); punctures as large or larger than one fourth of stria punctures (50:1); separated by one diameter (51:2).

Legs. Tarsi pubescent. Cuticular outgrowths present on proximal two tarsomeres (86:1). Two apical spurs on tibiae (85:1). On lateral edge of protibia, more than seven socketed spines on distal third of protibia (81:1; 82:0). Apex of tibia without brush of setae (84:0).

Abdomen. First three abdominal sternites laterally rugulose (89:1; 90:1; 91:1). All sternites punctate and setose (94:3); setae arising from punctures. First four abdominal sternites coarsely punctate. Fifth visible abdominal sternite finely punctate. Genitalia. Basal piece arched ventrally, widest near base. Lateral edges of basal piece sclerotized, inner area membranous. Apical piece slightly wider at base than distal end. Sides sinuate and coming to rounded end. Parameres not divided. From lateral view, apical piece sinuate.

Female. Similar to male, except as follows: Cuticle on intraocular space narrowly raised near eye (23:1). Intraocular space impinging on eye (24:1). Puncturing on frons smaller than facets of eye (27:2). Clypeus with puncturing smaller than eye facets (31:1); spread evenly across surface (32:2). Anterior edge of clypeus flat; anterior corners rounded (30:1). Clypeus tumid (33:1).

Distribution (Fig. 28): Brazil (Mato Grosso), Guatemala (Escuintla), Honduras (Atlántida), Costa Rica (Guanacaste), Panama (Panama), Mexico (Colima, Nayarit, México, Veracruz, Chiapas), Venezuela (Aragua).

Etymology: The specific epithet *hirsuta* is a reference to the distinctive golden setae that is present on the prosternum and hypomeron of this species. It is feminine.



FIGURE 28: Distribution of *Hypogena hirsuta*. Based on 51 databased specimens.

Hypogena laevicollis (Kulzer, 1962)

(Figs 1, 29, 30)

Ulosonia laevicollis Kulzer, 1962: 95.

Type Material: HOLOTYPE (male) labeled: (a) “Hansa Humboldt / Sta. Satharina / Brasilien, Reitter”; (b) on red bordered paper “HOLOTYPUS / Ulosonia laevicollis n. Sp. / det H. Kulzer 1961”; (c) On blue paper “Tenebrionid Base / Aaron D. Smith / Catalog # 20144” (NHMB). ALLOTYPE (female) labeled: (a) “Hansa Hum-

boldt / Sta. Satharina / Brazilien, Reitter”; (b) on red bordered paper “ALLOTYPUS / Ulosonia laevicollis n. Sp. / det H. Kulzer 1961”; (c) On blue paper “Tenebrionid Base / Aaron D. Smith / Catalog # 20145” (NHMB). PARATYPES (4 males, 3 females) labeled: (a) “Hansa Humboldt / Sta. Satharina / Brazilien, Reitter”; (b) on red bordered paper “PARATYPUS / Ulosonia laevicollis n. Sp. / det H. Kulzer 1961”; (c) Tenebrionid Base numbers: 20143, 20137-20142 (NHMB). PARATYPES (1 male, 1 female) labeled: (a) on yellow bordered paper “Paratype”; (b) “Hansa Humboldt / Sta. Catharina / Brasilien Reitter”; (c) “Paratypus / Ulosonia / laevicollis / det H.Kulzer 1961”; (d) “Brit. Mus. / 1961-329”; (e) Tenebrionid Base numbers: 20150-20151; (BMNH). PARATYPE (male) labeled: (a) “Vila Oliva / 19 - 2 - 52”; (b) Rio Grande do Sul / 3886 / Pe Buck Leg.” (c) “PARATYPUS / Ulosonia laevicollis n. Sp. / det H. Kulzer 1961”; (d) on blue paper “Tenebrionid Base / Aaron D. Smith / Catalog # 20146”; (NHMB). PARATYPES (1 male; 2 females) labeled (a) on green paper “S Catharina / Nova Teutonia”; (b) on green paper “F. Plaumann / leg 8 1935” (c) “PARATYPUS / Ulosonia / laevicollis n. sp. / det H. Kulzer 1961”; (d) Tenebrionid Base numbers: 20147-20149; (NHMB). Several additional paratypes were described in Kulzer (1962) but not examined during for the current study. Specimens should be in the Hungarian Natural History Museum, the Muséum National d’Histoire Naturelle and the Zoologische Staatssammlung.

Additional material examined: (8 males, 5 females): BRAZIL: 4 males, 3 females. TB# 20158-20159; mx_id 48027 (NHMB); BRAZIL:Rio de Janeiro: 2 males. TB# 20160-20161 (NHMB). BRAZIL:Rondônia: 1 female. TB# 20156 (FSCA). country not specified: 2 males, 1 female. TB# 20152-20154 (BMNH).

Diagnosis: The clypeal horn of this species is short, conical and projects forward. The supraorbital horns are long, projecting initially perpendicularly and then bending to point anteriorly. They are also thinnest at the base and become more thick away from the head. The punctures on the pronotum are almost exclusively fine. The head of the male is smooth, whereas the head of the female has larger punctures, but not larger than one eye facet. This species is larger than others of this genus (11 mm). The female has similar characters as the male, except without horns (Fig. 29).

Redescription: Male. Size: 9—11 mm; 3—4 mm.

Head. Clypeal horn short (4:1; 5:0); equal thickness to supraorbital horns (7:1); produced forward (8:0); finely punctate (9:1). Supraorbital horns long and thick (10:1; 11:1); thinner proximally and thicker apically; produced perpendicular to head (13:1); bent inwards toward each other (12:1); strongly bent to point anteriorly (14:2); finely punctate (15:1). Antennae with stellate sensoria (22:0). Third antennomere less than 1.5 times size of fourth and more than 1.5 times size of second (18:1; 19:2). Vertex and frons not punctate (26:0; 28:0). Gena not extending laterally past eye (36:0). Anterior margin of clypeus flat, corners rounded (29:1). Mentum trapezoidal and flat (40:0; 43:0); finely punctate (42:1); not setose (41:0). Labrum fully setose (39:1). Groove on mandible present, continuing to attachment point on cranium (44:1).

Thorax. Only fine punctures present on pronotum (54:0; 56:0). From lateral view, pronotum slightly arched (58:1). Lateral margins of pronotum not parallel (61:0). Margins of pronotum narrowly expanded by less than twice the size (62:1). Pronotum narrowest anteriorly (59:1). Anterior edge of pronotum reaching middle of eye but not past eye (63:1). Hypomerone laterally rugulose (75:2); not setose (76:0). Prosternum finely punctate and not pubescent (67:1; 66:0); punctures separated by more than one diameter (68:0). Mesepisternum with punctures smaller than eye facet and separated by more than one diameter (71:1; 72:0). Row of cuticular teeth present on posterior edge of metasternum (77:1). Elytra striate and punctate (46:1; 47:1); punctures separated by less than one diameter (48:0). Elytral interstices flat and punctate (49:0); punctures smaller than one fourth size of striae punctures and separated by more than one diameter (50:0; 51:1).

Legs. Tarsi pubescent. Cuticular outgrowths present on proximal two tarsomeres (86:1). Tibiae with two apical spurs (85:1). Protibiae with more than 7 socketed spines on distal third of lateral edge (81:1; 82:0). Apex of tibiae with brush of setae (84:1).

Abdomen. First three abdominal segments laterally rugulose on anterior fourth of sclerite and coarsely punctate (89:2; 90:2; 91:2); last two abdominal segments finely punctate. Punctures of first three abdominal segments bearing setae 94:2).

Female. Similar to male, except as follows: Cuticle on intraocular space narrowly raised near eye (23:1). Intraocular space impinging on eye (24:1). Punctures on vertex and frons smaller than eye facet (25:1; 27:1). Clypeus with fine punctures that are spread evenly across surface (31:1; 32:2). Clypeus tumid (33:1).

Distribution (Fig. 30): Brazil (Rondônia, Rio de Janeiro, Rio Grande do Sul).



FIGURE 29: *Hypogena laevicollis*, Holotype and Paratype. Top, Holotype, male: dorsal view, lateral view, and labels. Bottom, Paratype, female: Dorsal view, lateral view, and labels.



FIGURE 30: Distribution of *Hypogena laevicollis*. Based on 25 databased specimens.

***Hypogena marginalis* Doyen & Poinar, 1994**

(Fig. 31)

Hypogena marginalis Doyen & Poinar, 1994: 35.

Note: This species was described from Dominican amber in 1994 and the description found therein is sufficient for this species.

***Hypogena marginata* (LeConte, 1851)**

(Figs 1, 2, 32, 33)

Uloa marginata LeConte, 1851: 149.

Type Material: HOLOTYPE (male) labeled: (a) Gold circular paper (Refers to collection location: California); (b) On red paper “Type 4672”; (c) “Ulosonia marginata Lec” (MCZ). (See Fig. 32). This image was taken by the Museum of Comparative Zoology at Harvard University.

Additional material examined: (78 males, 60 females, 15 sex unknowns): COSTA RICA: 1 female. TB# 20031 (EMEC). GUATEMALA: 2 males, 1 sex unknown. TB# 17760 (NMNH); TB# 16357, 16883 (ADSC). MEXICO: 3 females. TB# 21219-21221 (CASC). MEXICO:Baja California Norte: 7 males, 9 females. TB# 21322 (EMEC); TB# 21185-21189, 21192-21193, 21312 (CASC); TB# 21191 (NHMB); TB# 17655-17658 (CASC); TB# 21190 (EMEC); TB# 21323 (ALRC). MEXICO:Baja California Sur: 6 males, 5 females. TB# 21321 (EMEC); TB# 21304, 21310-21311, 21313 (CASC); TB# 17659-17664 (CASC). MEXICO:Colima: 1 male. TB# 21184 (CASC). MEXICO:Nuevo León: 1 male. TB# 17762 (EMEC). MEXICO:Sonora: 3 females. TB# 21283-21285 (NMNH). MEXICO:Tamaulipas: 1 male, 1 female. TB# 21298 (UCDC); TB# 21768 (EMEC). MEXICO:Veracruz: 1 female. TB# 21297 (EMEC). PERU:Lima: 1 female. TB# 21303 (CASC). USA:Arizona: 21 males, 2 sex unknowns, 28 females. TB# 21320 (EMEC); TB# 17574-17576, 17585-17590 (NMNH); TB# 21183, 21217-21218 (OSAC); TB# 21286-21290, 21295-21296 (CASC); TB# 17577-17578, 17584, 17665, 17672-17674, 17749-17753, 17758, 17763-17764, 21767, 21769 (CASC); TB# 21278-21282, 21291-21294, 21299, 21307, 21317-21319 (NABF). USA:Arizona:Gila Co.: 2 males. TB# 17754-17755 (RLAC). USA:Arizona:Pima Co.: 5 males, 5 females, 12 sex unknowns. TB# 21302 (EMEC); TB# 17552-17564, 17666-17667, 21305, 21765; mx_id 45317 (NMNH); TB# 21300, 21308, 21314 (NABF). USA:Arizona:Santa Cruz Co.: 1 male. TB# 21301 (CASC). USA:California: 4 males. TB# 17670-17671, 17678, 21766 (CASC). USA:California:Imperial Co.: 3 males. TB# 17565, 17668-17669 (NMNH). USA:Texas: 1 male. TB# 17756 (NMNH). country not specified: 23 males, 3 females. TB# 17571, 17573, 17759, 21152, 21306 (NMNH); TB# 17640-17654, 17675-17677, 17757, 17761 (CASC); TB# 21770 (NMNH).

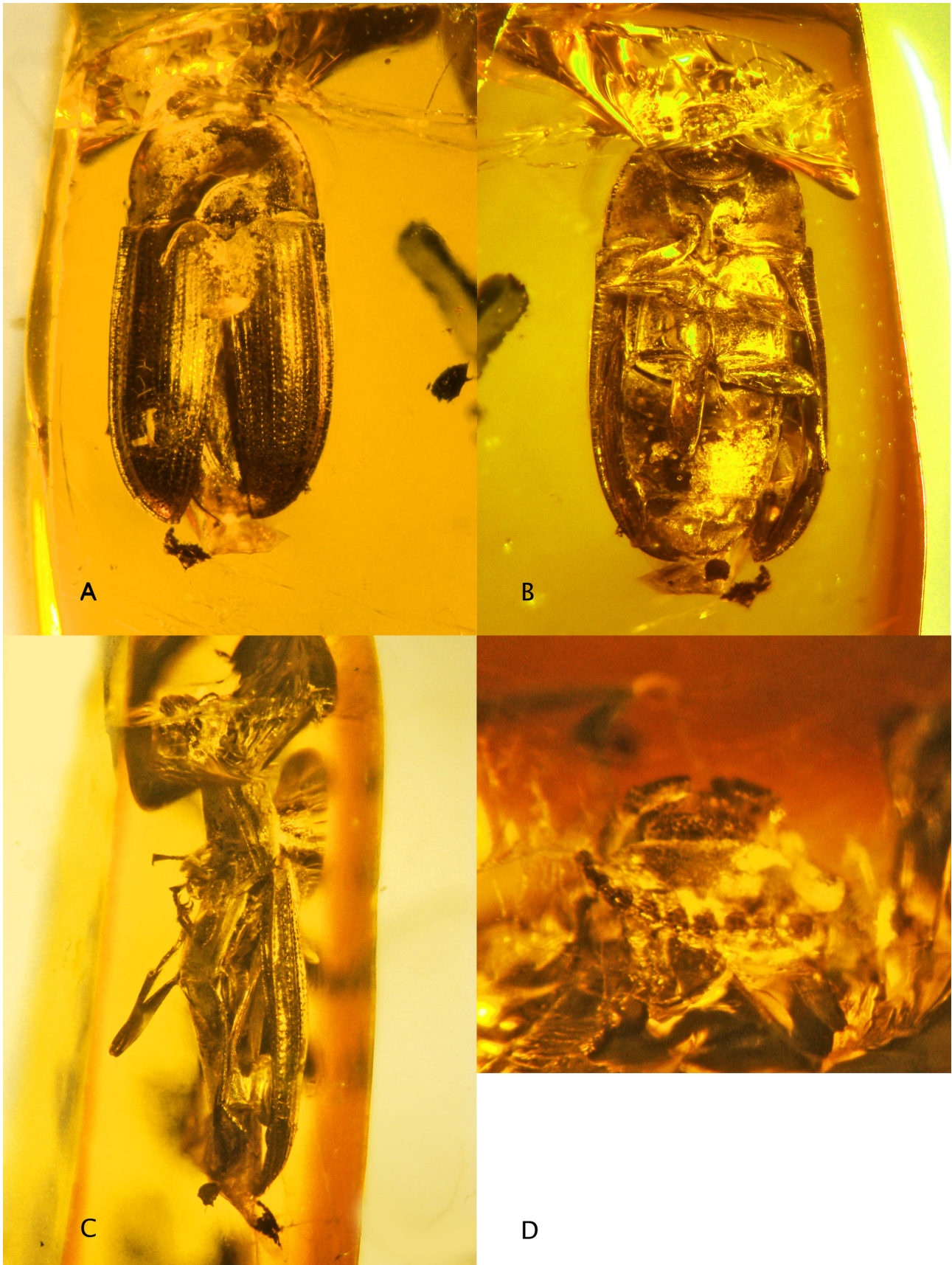


FIGURE 31: *Hypogena marginalis*, Holotype in Dominican Amber. 31a. Dorsal view. 31b. Ventral view. 31c. Lateral view. 31d. Anterior view of head. Images obtained from Dr. George Poinar at Oregon State University.



FIGURE 32: *Hypogena marginata*, Holotype, male. Dorsal view, lateral view, ventral view, and labels. Photographs obtained from the Museum of Comparative Zoology at Harvard University (MCZ).

Diagnosis: The male of this species has two short conical horns that arise from between the eyes and a very short clypeal horn. These horns project forward, parallel to the body. The clypeal horn may be absent or simply a tubercle projected forward at the anterior edge of the clypeus. The pronotal punctures for this species are of two sizes and the coarse punctures are scattered throughout the pronotum. The prosternum does not bear setae. The female is similar in most regards, except for the presence of the horns (Fig. 32).

Redescription: Male. Size: 6—7 mm; 2—3 mm.

Head. Clypeal horn short (4:1; 5:0). equal thickness to supraorbital horns (7:1); projected forward (8:0). Supraorbital horns short, barely reaching past eye (10:1; 11:0); projected forward (13:0); not bent after initial production (12:0; 14:0); finely punctate (15:1). Vertex and frons punctate; punctures smaller than eye facets (26:1; 28:1). Antennae bearing stellate sensoria (22:0). Third antennomere of same size as fourth and more than 1.5 times size of second (18:0; 19:2). Gena not extending laterally past eye (36:0). Clypeus pointed from production of clypeal horn (29:2). Mentum trapezoidal, flat and lightly setose (40:0; 43:0; 41:1). Labrum fully setose (39:1). Groove on mandible present, continuing to connection point to cranium (44:1).

Thorax. Pronotal puncturing biordinal in size (54:1). Coarse punctures numerous; scattered throughout pronotum.

tum (57:2). From lateral view, pronotum not arched (58:0). Lateral margins of pronotum subparallel (61:1). Margin of pronotum expanded more than diameter of one coarse puncture (62:2). Row of cuticular teeth present on posterior edge of metasternum (77:1). Anterior edge of pronotum reaching middle of eye but not past eye (63:1). Prosternum punctate; punctures smaller than eye facet (67:1); separated by less than one diameter (68:1). Hypomerone laterally rugulose (75:2). Mesepisternum punctate; punctures smaller than eye facet (71:1); separated by more than one diameter (72:0). Elytra striate and punctate (46:1; 47:1); punctures separated by more than one diameter (48:1). Elytral interstices convex and punctate (49:1); punctures larger than one fourth stria puncture size (50:0); separated by less than one diameter (51:2).

Legs. Tarsi pubescent. Cuticular outgrowths present on proximal two protarsomeres (86:1). Tibiae with two apical spurs (85:1). Lateral edge of protibia with seven or more socketed spines on distal half (81:1; 82:1). Apex of tibiae with brush of setae (84:1).

Abdomen. First three visible abdominal segments weakly laterally rugulose (89:1; 90:1; 91:1). All abdominal sternites punctate. Punctures on first four abdominal segments coarsely punctate; Last abdominal sternite finely punctate. All abdominal sternites with setae arising from punctures; setae longer on first abdominal segment than on last (94:3).

Female. Similar to male, except as follows: Cuticle on intraocular space narrowly raised near eye (23:1); Intraocular space impinging on eye (24:1). Clypeus with punctures smaller than eye facets and spread evenly across clypeus (31:1; 32:2). Anterior edge of clypeus flat with corners rounded (30:1). Clypeus tumid (33:1).

Distribution (Fig. 33): Peru (Lima), Guatemala, USA (Texas, California, Arizona), Costa Rica, Mexico (Sonora, Colima, Baja California, Veracruz, Tamaulipas, Nuevo León, Baja California Sur).



FIGURE 33: Distribution of *Hypogena marginata*. Based on 152 databased specimens.

Hypogena reburra sp. nov.

(Fig. 34)

urn:lsid:zoobank.org:act:366ACB0D-E575-4B75-BD9D-1C71CE1013DB

Type Material: HOLOTYPE: (female) labeled: (a) Columbia; (b) 46-20; (c) *Hypogena topino*; (d) Tenebrionid Base / Aaron D. Smith / Catalog # 20166 ; (e) “HOLOTYPE/ *Hypogena/ reburra/* Grey & Smith, 2020” (BMNH). Designated here. This specimen is in poor condition, so no internal structures were examined. (See Fig. 34).

Diagnosis: This species can be readily identified by the long erect hairs that arise from punctures on the pronotum and the elytral striae. This species is also more elongate than other *Hypogena*. The type for this species is a female and does not have horns. It is assumed that as all other species in this genus have horns, this species also has a horned male. However, since most other characters are conserved between males and females of this genus, this species is distinct enough that the male could be correctly identified (Fig. 34).

Description: Female. Size: 9–10 mm, 2–3 mm.

Head. Intraocular space raised and continues transversely inwards (23:2); intraocular space not impinging on eye (24:0). Antennae at least as long as pronotum (20:1). Puncturing on vertex and frons at least as large as eye fac-

ets (25:2; 27:2). Punctures on clypeus smaller than eye facets (31:1); evenly distributed across clypeus (32:2). Gena does not extend laterally past eye (36:0). Antennae does not form club (17:0). Third antennomere more than 1.5 times second but same size as fourth (18:0; 19:2). Anterior edge of clypeus flat with anterior corners rounded (30:1). Mentum trapezoidal (40:0); punctate and setose (41:1; 42:1); setae long. Labrum fully setose (39:1). Mandible with distinct groove continuing to attachment point of cranium (44:1).

Thorax. Pronotal punctures biordinal in size (54:1); coarse punctures concentrated on lateral portions of pronotum (57:0). In lateral view, pronotum is not arched (58:0). Lateral edges of pronotum not parallel (61:0). Margin of pronotum narrowly expanded less than size of coarse puncture (62:1). In anterior view, pronotum forms shallow, complete arch (60:2). Anterior edge of pronotum not reaching eye (63:0). Hypomeron not smooth (75:0); prosternum coarsely punctate (67:2); punctures separated by about one diameter (68:1); setae not present on prosternum (66:0). Mesepisternum coarsely punctate (71:2); punctures separated by one diameter (72:0). Elytra striate and shallowly punctate (46:1; 47:1). Strial punctures separated by more than one diameter (48:1). Long hairs arising from strial punctures (3:1). Elytral interstices convex and punctate (49:1); punctures more than one fourth size of strial punctures (50:0).

Legs. Tarsi setose. Cuticular outgrowth present on proximal two protarsomeres (86:1). Tibiae with two apical spurs (85:1). Lateral edge of protibia with more than seven socketed spines on distal two thirds of protibia (81:1; 82:2). Spines present on medial edge of protibia, along entire length of tibia (83:1).

Abdomen. First three abdominal segments not rugulose (89:0; 90:0; 91:0); first three abdominal segments coarsely punctate; punctures with hairs arising from them (3:1). Length of hairs that arise from abdominal punctures more than five times width of puncture. Last two abdominal segments finely punctate. No abdominal segments bear setae shorter than five times width of abdominal punctures (94:0).



FIGURE 34: *Hypogena reburra*, Holotype, female. Dorsal view, lateral view, and labels.

Distribution: Colombia

Etymology: The specific epithet *reburra* is a Latin root meaning “one with bristling hair.” This is a reference to the long erect hairs that cover the body of this species. It is feminine.

***Hypogena triceratops* Steiner, 2005**

(Figs 35)

Note: This species was recently described and the original description is sufficient to identify specimens to species (Steiner, 2005).

Material examined: (2 males): BRAZIL:Mato Grosso: 1 male. TB# 20882 (ADSC).

Diagnosis: The clypeal horn is long and thinnest at the base, widening apically and tapering at the apex and without an apical emargination. The supraorbital horns are long and strongly curved inward and forward. The horns of this species are very similar to those of *H. dejeani*, but this species has thicker supraorbital horns and no emargination at the apex of the clypeal horn. The mentum of this species is also medially and longitudinally bent and the metafemur is weakly bent (Fig. 35).



FIGURE 35: *Hypogena triceratops*, Holotype, male. Dorsal view, lateral view, and labels.

***Hypogena tricornis* (Dalman, 1823)**

(Figs 1, 3, 4, 5, 36, 37)

Phaleria tricornis Dalman, 1823: 59.

= *Ulosonia tricornis* Laporte, 1840: 220. (Synonymy in Spilman 1973:42).

Type Material: LECTOTYPE (male) labeled: (a) “Jamaica/ Wellfelt?”; (b) “♂”; (c) “NHRS-JLKB 000027279” (NHRS), designated here. PARALECTOTYPE (female) labeled: (a) “Jamaica/ Wellfelt?”; (b) “♀”; (c) “NHRS-

JLKB 000027280" (NHRS), designated here. (See Fig. 36). This image was taken by Dr. Johannes Bergsten at The Swedish Museum of Natural History.

Additional material examined: (3 unknowns, 137 females, 140 males, 5 sex unknowns): BELIZE: 1 female, 2 males. TB# 15354, 19634 (NMNH); TB# 20281 (BMNH). COLOMBIA: 1 female, 1 male. TB# 20257-20258 (BMNH). COSTA RICA: 2 females, 5 males. TB# 15341, 19674, 19676-19677 (NMNH); TB# 15319-15320 (CASC); TB# 19683 (EMEC). COSTA RICA:Guanacaste: 1 male. TB# 15323 (FSCA). COSTA RICA:Heredia: 1 male. TB# 19675 (NMNH). CUBA: 2 females, 2 males. TB# 15359 (NMNH); TB# 20861, 20864-20865 (NMPC). ECUADOR:Guayas: 1 male. TB# 20235 (KKIC). EL SALVADOR: 2 females, 3 males. TB# 19643-19647 (NMNH). EL SALVADOR:San Salvador: 1 female, 2 males. TB# 19631, 19633, 19648 (CASC). GUATEMALA: 2 females, 1 male, 1 sex unknown. TB# 20863 (NMNH); TB# 16884, 20849 (ADSC); TB# 20282 (BMNH). GUATEMALA:Escuintla: 1 male. TB# 15356 (NHMB). GUATEMALA:Petén: 1 female. TB# 20280 (BMNH). MEXICO: 15 females, 12 males. TB# 19658, 20209-20211 (NMNH); TB# 20180-20184, 20188, 20236, 20245, 20284 (NHMB); TB# 21363-21364 (NMNH); TB# 20283, 20862, 20866-20868, 20870, 20872-20873, 20876-20877, 21335 (BMNH); TB# 15313 (EMEC). MEXICO:Baja California Sur: 2 females. TB# 15317-15318 (EMEC). MEXICO:Chiapas: 3 males, 1 sex unknown. TB# 20172, 20296 (CASC); TB# 15680 (ADSC); TB# 19642 (EMEC). MEXICO:Nayarit: 1 female. TB# 19678 (CASC). MEXICO:Nuevo León: 2 females, 1 male. TB# 19616-19618 (EMEC). MEXICO:Oaxaca: 1 male. TB# 21336 (BMNH). MEXICO:Puebla: 2 females. TB# 20195-20196 (EMEC). MEXICO:San Luis Potosi: 5 females, 4 males. TB# 19681 (CASC); TB# 15377, 20189-20193, 20286, 20293 (EMEC). MEXICO:Sonora: 1 female. TB# 20279 (BMNH). MEXICO:Tamaulipas: 1 female, 3 males. TB# 19680 (EMEC); TB# 15378, 20173-20174 (UCDC). MEXICO:Veracruz: 27 females, 38 males. TB# 19655, 19659, 20168-20170, 20259-20261 (NMNH); TB# 15379-15402, 20163-20165, 20227 (NHMB); TB# 20262-20270, 20278 (BMNH); TB# 15314, 20176-20179, 20186-20187, 20194, 20197-20200, 20285, 20287-20291 (EMEC); TB# 15324 (FSCA). MEXICO:Yucatán: 1 unknown, 2 females. TB# 20272-20274 (BMNH). PANAMA:Panama: 1 male. TB# 15351 (CASC). TRINIDAD AND TOBAGO: 1 female. TB# 20869 (BMNH). UNITED KINGDOM:Cayman Islands: 2 females, 1 male. TB# 15329-15331 (FSCA). USA:Florida: 1 female, 2 males. TB# 15375 (NMNH); TB# 15355 (NMNH); TB# 19684 (FSCA). USA:Florida:Dade Co.: 1 unknown, 2 females, 1 male. TB# 15337-15340 (FSCA). USA:Florida:St. Lucie Co.: 1 male. TB# 15328 (FSCA). USA:Texas: 4 females, 3 males. TB# 19641 (CASC); TB# 19639-19640, 20230-20231 (NMNH); TB# 19632 (unknown); TB# 15332 (FSCA). USA:Texas:Austin Co.: 1 female. TB# 20239 (ADSC). USA:Texas:Bexar Co.: 5 females, 2 males. TB# 20237 (TAMU); TB# 15348, 15360, 20223, 20238 (EMEC); TB# 15325-15326 (FSCA). USA:Texas:Cameron Co.: 1 unknown, 10 females, 5 males. TB# 19635-19636, 20229, 20241 (NMNH); TB# 15342-15346, 20212-20213, 20233 (TAMU); TB# 15321-15322, 19685-19686 (FSCA). USA:Texas:Comal Co.: 1 male. TB# 19638 (RLAC). USA:Texas:Hidalgo Co.: 12 females, 12 males, 3 sex unknowns. TB# 15357, 15361-15368, 15370-15374, 20218-20222, 20226, 20228, 20244, 20292 (NMNH); TB# 20232, 20234 (TAMU); TB# 20216-20217 (ADSC). USA:Texas:San Patricio Co.: 1 female, 1 male. TB# 20224-20225 (TAMU). USA:Texas:Starr Co.: 1 female, 2 males. TB# 20240 (NMNH); TB# 20214-20215 (ADSC). USA:Texas:Victoria Co.: 3 females, 1 male. TB# 19627, 20242-20243, 20295 (NMNH). VENEZUELA: Bolívar: 1 male. TB# 19679 (RLAC). VENEZUELA:Zulia: 1 female. TB# 19682 (NMNH). country not specified: 23 females, 24 males. TB# 20185 (CASC); TB# 15316, 15347, 15349, 15352, 15358, 15376, 19610-19614, 19626, 19628, 19637, 20171, 20175, 20246-20250, 29628 (NMNH); TB# 19624-19625 (unknown); TB# 15350 (NHMB); TB# 20874 (NMNH); TB# 20251-20256, 20271, 20275-20277, 20858-20860, 20871, 20875, 21180, 21337 (BMNH); TB# 15315, 20294 (EMEC); TB# 15327 (FSCA).

Diagnosis: The male of this species can be readily identified by the three long, thin, erect horns that are placed between the eyes and on the clypeus. The horns are equal in length and thickness. This species is also distinctive in the coarse punctures on the pronotum are almost always closely concentrated in the center of the disc. The female is similar in all respects, except that the horns are not present and the frons is more punctate (Fig. 36).

Redescription: Male. Size: 7—8 mm; 2—3 mm.

Head. Clypeal horn long, thin (4:1; 5:1); not emarginated (6:0); equal in thickness to one supraorbital horn (7:1); equal in length to supraorbital horns; produced perpendicular to head (8:1); not curved; finely punctate (9:1). Supraorbital horns long, thin (10:1; 11:1); bent slightly inwards (12:1); produced perpendicular to head (13:1); not curved forward (14:0); finely punctate (15:1). Antennae with stellate sensoria (22:0); third antennomere same size and fourth and more than 1.5 times size of second (18:0; 19:2). Vertex and frons of male almost smooth (26:0; 28:0). Anterior edge of clypeus flat with corners rounded (29:1). Mentum trapezoidal, flat, punctate and lightly setose

(40:0; 43:0; 42:1; 41:1). Labrum fully setose (39:1). Groove on mandible present, continuing to connection point to cranium (44:1).

Thorax. Pronotum with puncturing biordinal in size (54:1); coarse punctures concentrated primarily on disc (57:1). Lateral margins of pronotum subparallel (61:1). Marginal edges of pronotum expanded more than one coarse puncture's diameter (62:2). Anterior edge of pronotum reaching middle of eye, but not past middle of eye (63:1). Short setae on prosternum arising from punctures (70:1); puncturing on prosternum smaller than one eye facet (67:1); prosternal punctures separated by less than one diameter (68:1). Hypomeron laterally rugulose (75:2). Mesepisternum punctate; punctures smaller than eye facets (71: 1); separated by more than one diameter (72:0); not setose (73:0). Row of cuticular teeth present on posterior edge of metasternum (77:1). Elytra striate and punctate (46:1; 47:1); punctures separated by less than one diameter (48:0). Elytral interstices convex and punctate (49:1); punctures larger than one fourth of striae size (50:0); separated by more than one diameter (51:1).

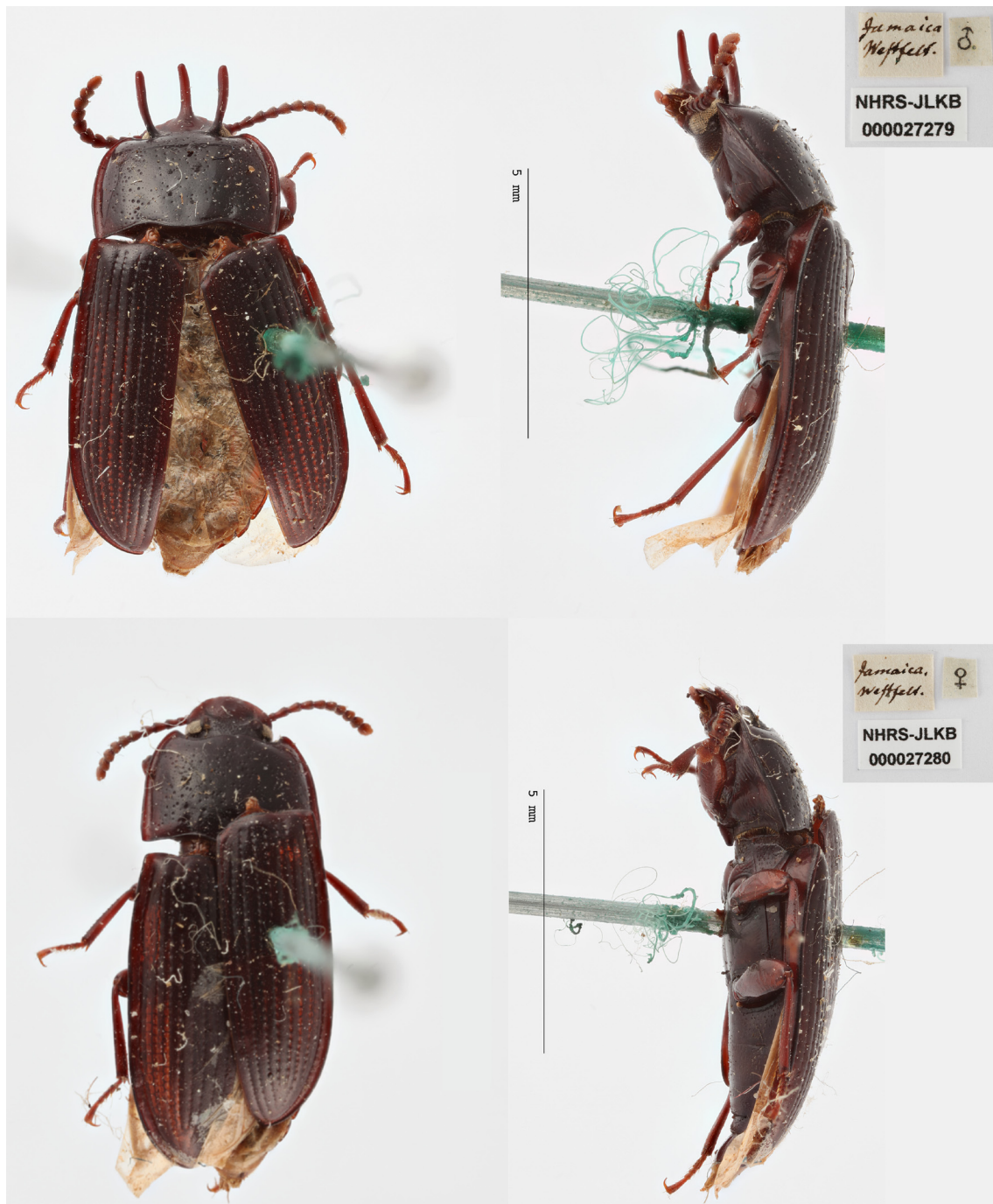


FIGURE 36: *Hypogena tricornis*, Holotype and Paratype. Top, Holotype, male: dorsal view, lateral view, and labels. Bottom, Paratype, female: dorsal view, lateral view, and labels. Images obtained from Dr. Johannes Bergsten at The Swedish Museum of Natural History (NHRS).

Legs. Tarsi pubescent. Cuticular outgrowths present of proximal two protarsomeres (86:1). On lateral edge of protibia, seven or more socketed spines on distal third of protibial (81:1; 82:0). Medial edge of protibial with entire length (83:1). Apex of protibia bearing brush of setae (84:1).

Abdomen. First three visible abdominal segments laterally rugulose (89:1; 90:1; 91:1); fourth and fifth abdominal sternites punctate. All abdominal segments setose (94:3); setae arising from punctures.

Female. Similar to male, except as follows: Intraocular space raised and extending transversely inwards (23:2); intraocular space impinging on eye (24:1). Punctures of vertex and frons smaller than eye facet (25:2; 27:2). Clypeal punctures smaller than one eye facet spread evenly across clypeus (31:1; 32:2). Clypeus tumid (33:1).

Distribution (Fig. 37): Cuba, Trinidad, Mexico (Chiapas, Nuevo León, Yucatan, San Luis Potosi, Tamaulipas, Veracruz, Sonora, Puebla, Baja California Sur, Oaxaca, Nayarit), Belize, Panama (Panama), Venezuela (Bolívar, Zulia), Colombia, Ecuador (Guayas), Cayman Islands, Costa Rica (Guanacaste, Heredia), El Salvador (San Salvador), USA (Texas, Florida), Guatemala (Escuintla, Petén). The type material is from Jamaica.

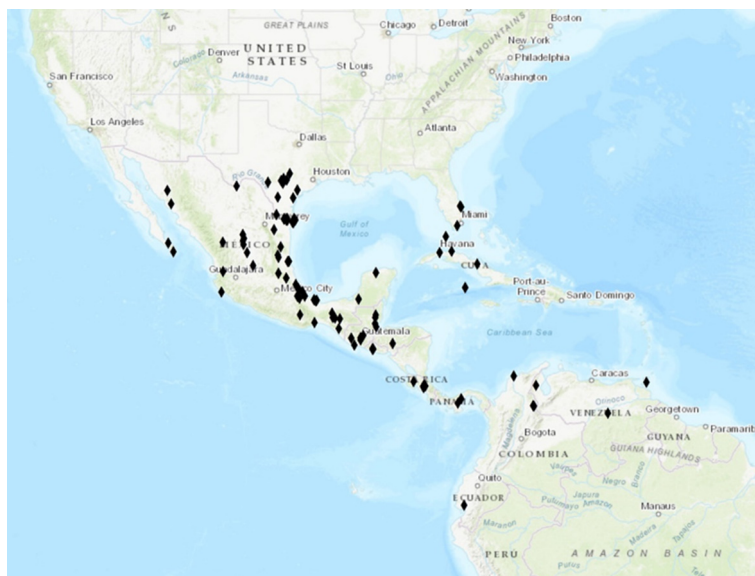


FIGURE 37: Distribution of *Hypogena tricornis*. Based on 284 databased specimens.

Hypogena vacca (Fabricius, 1801)

(Figs 1, 2, 3, 38, 39)

Trogosita vacca Fabricius, 1801: 153.

Ulosonia vacca (Fabricius, 1801). (Shultz, 1901).

= *Ulosonia parvicornis* Fairmaire, 1892: 250 (Synonymy in Kulzer 1962: 93).

Type Material: LECTOTYPE (male) labeled: (a) “Amer. Mer. / Schmidt”; (b) “Mus de Sehestedt”; (c) “*Trogosita vacca* Fabr.”; (d) on red paper “Type.”; (e) “LECTOTYPE/ *Hypogena/ vacca/* Grey & Smith, 2020” (ZMUK). Designated here. PARALECTOTYPE (female) labeled: (a) on a red label “Type”; (b) “Amer. Mer. / Schmidt”; (c) “Mus de Sehestedt”; (d) “*Trogosita* ♀ *vacca* Fabr.”; (e) “PARALECTOTYPE/ *Hypogena/ vacca/* Grey & Smith, 2020” (ZMUK). (See Fig. 38). This image was taken by Dr. Michael Kuhlmann at the Zoological Museum of Kiel University. In the original description, Fabricius (1801) did not designate a holotype. The specimen designated here is intended to fix the taxonomic status of this species. The designated specimen was chosen from the syntype series because it had the most complete locality information.

Additional material examined: (139 females, 172 males, 2 sex unknowns): ARGENTINA: 8 females, 9 males. TB# 21182, 21206 (NMNH); TB# 18130-18131 (CASC); TB# 17928, 17935, 18133 (NHMB); TB# 18020, 18025, 21762 (NMNH); TB# 18134, 21169-21174 (BMNH). ARGENTINA:Buenos Aires: 7 females. TB# 17936-17937 (NHMB); TB# 18036-18039 (NMNH); TB# 21208 (BMNH). ARGENTINA:Chaco: 2 males. TB# 18138 (NHMB); TB# 18136 (BMNH). ARGENTINA:Jujuy: 1 female. TB# 18137 (NHMB). ARGENTINA:Mendoza: 1 male. TB# 17934 (NHMB). ARGENTINA:Salta: 1 female. TB# 21209 (CASC). ARGENTINA:Tucumán: 2 females, 6 males. TB# 18132 (CASC); TB# 18728-18729 (NHMB); TB# 18518, 18520-18523 (BMNH). BOLIVIA: 5 females, 8

males. TB# 21153-21162, 21165-21166 (NABF); TB# 18141 (NMNH). BRAZIL: 27 females, 31 males. TB# 21216 (ALRC); TB# 21167-21168 (NABF); TB# 18352-18353, 18360-18363 (CASC); TB# 18731-18732 (unknown); TB# 21215 (CASC); TB# 21133-21151 (NMPC); TB# 17920, 17927, 17930, 17932-17933, 17938, 17941-17950, 17958, 18730, 18733-18734 (NHMB); TB# 18026-18028, 18030, 21181 (ADSC); TB# 21177 (BMNH); TB# 18029 (RLAC). BRAZIL:Espirito Santo: 1 female, 3 males. TB# 21211-21214 (BMNH). BRAZIL:Minas Gerais: 1 male. TB# 18139 (ADSC). BRAZIL:Rio Grande do Sul: 1 female. TB# 18144 (NHMB). BRAZIL:Santa Catarina: 19 females, 26 males. TB# 21178 (NMNH); TB# 17963, 17966-17967, 18333-18335, 18349, 18354, 18372-18373, 18377-18378, 18387, 18506-18508, 21760 (CASC); TB# 17926, 17931, 17939-17940, 18706-18719, 18721-18725 (NHMB); TB# 17968-17970 (NMNH); TB# 18524 (BMNH). BRAZIL:Sao Paulo: 1 male. TB# 18135 (BMNH). MEXICO: 1 female, 1 male. TB# 21203, 21205 (BMNH). PARAGUAY: 2 females, 3 males. TB# 17951-17955 (NHMB). USA:New Mexico:Santa Fe Co.: 2 males. TB# 18726-18727 (NHMB). country not specified: 64 females, 78 males, 2 sex unknowns. TB# 17847-17856, 17960-17962, 17964, 18331-18332, 18336-18348, 18350-18351, 18355-18359, 18364-18371, 18374-18376, 18379-18386, 18388-18428, 18456-18469, 18505, 18510, 18513-18517, 21758-21759, 21761 (CASC); TB# 21210 (CASC); TB# 17921-17925, 17929, 18143 (NHMB); TB# 17971-17972, 18031-18035, 18140, 18142 (NMNH); TB# 21164, 21175-21176, 21204, 21207, 21763-21764 (BMNH).

Diagnosis: The male of this species has two large supraorbital horns and a small tuberculate clypeal horn. The supraorbital horns are usually very thick, perpendicular to the head, and often diverge away from each other. The clypeal horn is variable, sometimes appearing very short, or sometimes larger with the middle portion of the horn being somewhat thinner than the apical portion. The punctures on this species are of two sizes and the coarse punctures are primarily located on the lateral portions of the pronotum and are widely spaced away from one another. The posterior edge of the pronotum is raised. This species is small, usually between 5 - 7 mm long. The female is similar in every aspect except the presence of the horns (Fig. 38).

Redescription: Male. Size: 5—7 mm; 2.5—3 mm.

Head. Clypeal horn short and similar in thickness at base to one supraorbital horn (4:1; 5:1; 7:1). Clypeal horn projected forward, almost smooth (8:0; 9:0); may be tuberculate or thinner in middle and widen slightly apically. Supraorbital horns long and thick (10:1; 11:1); from dorsal view, may not bend or may bend outwards (12:0); produced perpendicularly to head (13:1); bent slightly forward (14:1); finely punctate (15:1). Antennae with stellate sensoria (22:0). Third antennomere similar size as fourth and more than 1.5 times size of second (18:0; 19:2). Vertex and frons not punctate, almost smooth (26:0; 28:0). Gena not extending laterally past eye (36:0). Clypeus not forming circular arch due to clypeal horn (29:2). Mentum trapezoidal, punctate and setose (40:0; 42:1; 41:1). Labrum fully setose (39:1). Groove on mandible present, continuing to connection point to cranium (44:1).

Thorax. Pronotal puncturing biordinal in size (54:1). Coarse punctures numerous; concentrated on lateral portions of pronotum (57:0). Posterior edge of pronotum raised. From lateral view, pronotum not arched (58:0). Lateral margins of pronotum subparallel (61:1). Margins of pronotum expanded wider than diameter of one coarse puncture (62:2). Anterior edge of pronotum extending to middle of eye but not past eye (63:1). Hypomerone laterally rugulose (75:2); not punctate. Prosternum finely punctate (67:1); separated by less than one diameter (68:1); no pubescent (66:0). Prosternal process not continuing past posterior margin of pronotum (69:0). Elytral striae punctate (46:1; 47:1); punctures separated by less than one diameter (48:0). Elytral interstices convex and punctate (49:1); punctures as large or larger than one fourth size of striae puncture size (50:0); separated by more than one diameter (51:1). Mesepisternum with punctures as large as or larger than eye facets (71:2); separated by less than one diameter (72:1). Row of cuticular teeth present on posterior edge of metasternum (77:1).

Legs. Tarsi pubescent. Cuticular outgrowths present on proximal two protarsomeres (86:1). Tibiae bearing two apical spurs (85:1). Lateral edge of protibia with more than seven socketed spines on distal half of tibia (81:1; 82:1). Spines on medial edge of protibia along entire length (83:1).

Abdomen. First three visible abdominal segments setose and laterally rugulose (89:1; 90:1; 91:1). All abdominal segments are finely punctate. setae arising from punctures (94:3).

Female. Similar to male, except as follows: Cuticle on intraocular space raised near eye and extending transversely inwards (23:2). Intraocular space impinging on eye (24:1). Vertex and frons punctate; punctures as large or larger than facets of eye (25:2; 27:2). Clypeus punctate; punctures smaller than eye facets and spread evenly across clypeus (31:1; 32:2). Anterior margin of clypeus flat, but with corners rounded (30:1). Clypeus tumid (33:1).-

Distribution (Fig. 39): Paraguay, Brazil (Minas Gerais, Sao Paulo, Espirito Santo, Rio Grande do Sul, Santa Catarina) Bolivia, Argentina (Tucumán, Jujuy, Salta, Buenos Aires, Chaco, Mendoza).



FIGURE 38: *Hypogena vacca*, Lectotype and Paralectotype. Top, Lectotype, male: dorsal view, lateral view, and anterior view of head. Bottom, Paralectotype, female: Dorsal view, lateral view, and anterior view of head. Images obtained from Dr. Michael Kuhlmann from The Zoological Museum of Kiel University (ZMUK).

Key to *Hypogena* species

- 1) Mesepisternum setose; prosternum and hypomeron setose with white to golden setae; coarse pronotal punctures scattered across pronotal surface; clypeal horn short, pointed anteriorly from clypeus; supraorbital horns short, tuberculate, and pointed anteriorly (Fig. 27); Ecuador, Brazil, Costa Rica, Honduras, Panama, Venezuela, Mexico, Cuba, Guatemala (Fig. 28) *H. hirsuta* sp. nov.
- Mesepisternum not setose; pronotal punctures occasionally as above, but not in combination with setation on the mesepister-

- num; hypomeron occasionally setose, setae always absent on mesepisternum; clypeal and supraorbital horns variable 2
- 2) Line of setae present on all femurs; coarse punctures scattered across pronotum; clypeal horn short, tuberculate; supraorbital horns short, tuberculate, not pointing inwards as in *H. marginata* (Fig. 10); Brazil ***H. akuma* sp. nov.**
- Line of setae not present on any femur; pronotal punctures and horns may be similar to those in *H. akuma*, but not in combination with line of setae on femora 3
- 3) Pronotum and elytra with long distinct setae arising from coarse punctures; body elongate; coarse pronotal punctures concentrated on lateral portions of pronotum (Fig. 34); [male specific characters unknown] Columbia ***H. reburra* sp. nov.**
- Pronotum and elytra not bearing long porrect hairs; body usually not as elongate; pronotal puncture concentration variable; if pronotal punctures concentrated on lateral portions of pronotum, then the elytra and pronotum not bearing long setae 4
- 4) Pronotal punctures small, of one size, or with at most 4 larger punctures (Fig. 17) 5
- Pronotal punctures of two sizes with numerous large punctures (Fig. 21) 8
- 5) Mentum medially and longitudinally produced; hypomeron without punctures, smooth; horns long, thin, straight and subequal in length; horns usually not as well developed as those of *H. tricornis* (Fig. 17); Brazil, Costa Rica, Cuba, Guatemala, Nicaragua, Mexico, Panama (Fig. 18) ***H. canaliculata* (Champion)**
- Mentum not raised; hypomeron usually punctate; horn thickness variable, but bent to point anteriorly, usually not equal in length 6
- 6) Mentum medially depressed; hind femur weakly bent; clypeal horn long, and arising perpendicular to head; clypeal horn thinnest at base and widening apically and flat on top; supraorbital horn strongly bent both inwards and forward (Fig. 35); Peru ***H. triceratops* Steiner**
- Mentum not depressed; hind femur not bent; horns variable 7
- 7) Anterior portion of first two abdominal segments laterally rugulose; length: 9–10 mm; clypeal horn conical, projecting forward from clypeus; supraorbital horns large, thinnest basally and widening apically; supraorbital horns strongly bent to point anteriorly (Fig. 29); Brazil, Peru (Fig. 30) ***H. laevicollis* (Kulzer)**
- First two abdominal segments completely laterally rugulose; length: 7–9 mm; clypeal horn long, flat, widening apically and flat to emarginate on top; supraorbital horns long, produced perpendicular to head and strongly curved forward (Fig. 23); Mexico, Costa Rica (Fig. 24) ***H. dejeani* (Champion)**
- 8) Coarse pronotal punctures densely clustered on disc; all horns subequal in length; supraorbital horns bending slightly toward each other (Fig. 36); USA, Mexico, Guatemala, Belize, El Salvador, Honduras, Costa Rica, Panama, Columbia, Venezuela, Ecuador, Cayman Islands, Cuba, Jamaica (Fig. 37) ***H. tricornis* (Dalman)**
- Coarse pronotal punctures not concentrated primarily on disc; horns usually not equal in length or as thin as in *H. tricornis* 9
- 9) Coarse pronotal punctures concentrated on lateral portions of pronotum 10
- Coarse pronotal punctures scattered throughout pronotum 12
- 10) Hypomeron and prosternum setose with distinct golden setae; clypeal horn short, conical and arising forward from clypeus; supraorbital horns long, bending slightly inward toward each other; supraorbital horns projecting perpendicularly from head (Fig. 13); Nicaragua, Mexico, Peru, Columbia, Panama, Haiti, Brazil, Ecuador, Honduras, Guatemala, Dominican Republic, Costa Rica, El Salvador (Fig. 14) ***H. brasiliica* (Perty)**
- Hypomeron and prosternum without distinct setae; horns not similar to above, either much thicker or bent to point anteriorly 11
- 11) Posterior edge of pronotum with raised edge; supraorbital horns thick and either not bending laterally or bending away from each other; clypeal horn short, tuberculate; clypeal horn often conical but may be thinner in the middle and widening apically (Fig. 38); Brazil, Bolivia, Paraguay, Argentina (Fig. 39) ***H. vacca* (Fabricius)**
- Posterior edge of pronotum without raised edge; clypeal horn long, flattened and truncated; clypeal horn widening apically and then becoming flat to slightly emarginate on top; supraorbital horns strongly curved forward to point anteriorly (Fig. 19); Peru, Colombia, Panama, Mexico (Fig. 20) ***H. cat* Steiner**
- 12) Coarse pronotal punctures more than twice the size of fine punctures; male with three long horns; clypeal horn three times the diameter, at base, of supraorbital horns; Hind horns perpendicular, not bending (Fig. 15); Brazil, Colombia (Fig. 16) ***H. brasiliensis* (Kulzer)**
- Coarse pronotal punctures two times the size or less of fine punctures; clypeal horn less than three times the size of one supraorbital horn 13
- 13) Lateral edges of pronotum gradually raised, weakly sloping upwards from margins of pronotum; clypeal horn not short, of similar size to supraorbital horns; horns similar to *H. tricornis* but not as long (Fig. 25); Honduras, Mexico, Bahamas, Costa Rica, Guatemala, Brazil, Cuba, USA, Jamaica (Fig. 26) ***H. depressa* (Champion)**
- Lateral edges of pronotum not as depressed as above; after flat margin, lateral edges of pronotum steeply raised and flattens out near disc; clypeal horn usually short; supraorbital horns variable 14
- 14) Male with cuticular spike on profemur; conical and produced forward; supraorbital horns long, not curved toward each other, but slightly bent forward (Fig. 11); Brazil, Peru (Fig. 12) ***H. amazonica* (Kulzer)**
- Male without cuticular spike on profemur; supraorbital horns variable in size but not bent forward 15
- 15) Supraorbital horns short, tuberculate, projected forward from head (Fig. 32); Mexico, Costa Rica, Guatemala, Peru, USA (Fig. 33) ***H. marginata* (LeConte)**
- Supraorbital horns long, projected perpendicularly from head (Fig. 21); USA, Mexico, Guatemala (Fig. 22) ***H. cryptica* sp. nov.**



FIGURE 39: Distribution of *Hypogena vacca*. Based on 311 databased specimens.

Discussion

Species distributions within *Hypogena* present a complicated story. Distributions are fairly broad for species with many museum records, such as *H. brasiliica*, which occurs across the Amazon Basin, up to Central Mexico, and east across the West Indies (Fig. 14). However, several species are known from single localities (e.g., *H. akuma* and *H. reburra*) or from broadly separated areas (e.g., *H. amazonica* and *H. brasiliensis*). Species also often co-occur within a fairly limited region, for example six species have been documented from Guatemala. This underscores the need for both increased taxonomic sampling and careful examination and identification of species.

While external adult morphology did not recover a well resolved phylogenetic hypothesis for species relationships within *Hypogena*, the implementation of a matrix-based approach to coding morphological data was useful in defining and describing, or redescribing, taxa. During the course of examining specimen morphology, several novel morphological structures were observed within *Hypogena*, two of which were also found in the related genus *Mycotrogus* and the recently moved species *Metaclisa seditiosa*. Cuticular tarsal outgrowths were found in both sexes on the proximal two protarsomeres in *Hypogena* (Fig. 7), and the proximal four protarsomeres in the sister genus *Mycotrogus*. As little is known about the lifecycle of *Hypogena* or *Mycotrogus*, it is difficult to determine the function of these structures. In various families of Coleoptera, tarsal structures seen in one sex are used during mating (Bilton *et al.* 2008). However, these structures occur in both sexes and no grooves were found on the females for reception of the tarsal outgrowths. It is possible that they provide purchase while moving through subcortical spaces in dead trees, but this has not been confirmed. All species of *Hypogena* also have a row of microscopic cuticular teeth arising from the posterior of the metasternum and facing the metacoxae (Fig. 8). The function for these structures is likewise unknown. Of particular note, *Hypogena* and *Mycotrogus*, as well as *Metaclisa seditiosa*, all have stellate antennal sensoria, which are absent in all other members of the tribe Triboliini examined in this study (Fig. 6). The occurrence of differing antennal sensoria has previously been used to help delimit tribes within Tenebrionidae (Doyen 1989, Doyen and Tschinkel 1982), including the transfer of *Metaclisa seditiosa* to the tribe Metaclisini. A currently unpublished molecular phylogeny of Tenebrionidae (Kanda 2017) also indicates that *Hypogena* falls outside of Triboliini. However, further study is needed, including a detailed examination of additional Triboliini genera (i.e., *Aesymnus* Champion, 1886, *Metulosonia* Bates, 1873, *Spelaebiosis* Bouquet and Bouchard, 2017) and *Metaclisa*, before changes are made to the tribal classification.

Acknowledgements

The authors thank Kojun Kanda, Amelia Smith, Ryan Lumen, Elliot Hunsinger and Chris Wirth for helping with examinations of specimens and providing specimens for comparison and examination; Aubrey Funke for helping with preparation of specimens and operation of the Scanning Electron Microscope; and Rose Borrer, Victoria Vargas, and Laronda Lee for their invaluable assistance with databasing specimens; Michael Kuhlmann at the Zoological Museum of Kiel University, Crystal Maier at The Museum of Comparative Zoology at Harvard University, George Poinar at Oregon State University and Johannes Bergsten at The Swedish Museum of Natural History for providing photos of type specimens. Funding and equipment were provided by the NSF ARTS program (DEB-1523605, 1754630), MRI (DBI-1229740), and Northern Arizona University.

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