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## Revision of *Melanocryptus* Cameron (Ichneumonidae, Cryptinae), with description of seven new species

ALEXANDRE P. AGUIAR<sup>1</sup> AND BERNARDO F. SANTOS<sup>2</sup>

### ABSTRACT

The Neotropical genus *Melanocryptus* Cameron is revised, with a new defense for the genus based on an entirely new redescription. The genus is characterized mainly by the following characters: apical half of female flagellum with a ventral stripe formed by dense, short pilosity; clypeus with a central pointy tooth; areolet large, pentagonal, about as long as wide, sides converging anteriorly; and ovipositor blade shaped, about 2.0–3.0× higher than wide. Eleven valid species are recognized: *M. cyaneus* (Schmiedeknecht), *M. niger* (Szépligeti), *M. violaceipennis* Cameron, *M. whartoni* Kasparyan et Ruíz, and seven new taxa, *M. aurantius*, sp. nov., *M. delos* Aguiar, sp. nov., *M. dnopheros*, sp. nov., *M. hadroglyptus* Aguiar, sp. nov., *M. rufigladius*, sp. nov., *M. tessellatus* Aguiar, sp. nov., and *M. tupan*, sp. nov. The complex morphological variation of male specimens, particularly for *M. hadroglyptus*, was cladistically investigated in order to objectively delimit and demonstrate the range of morphological variation of the involved species. The first host record is reported for the genus, an unidentified pyralid moth (Lepidoptera), attacked by *M. whartoni*. The males of *M. cyaneus* and *M. niger* are reported for the first time. Photographic illustrations and distribution maps are provided for all valid species, with several new distribution records for previously known taxa. Keys for the species are presented separately for females and males.

### INTRODUCTION

Cryptinae are the largest subfamily of Ichneumonidae, with over 4500 described species placed in 397 valid genera (Yu et al., 2005, 2012). In spite of this copious number of genera,

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many of them are rather morphologically uniform. As a rule, for each cryptine genus there is at least another one, in the same subfamily, to which it is closely similar. This makes cryptine species in general hard to ascribe to a particular genus. The species of *Melanocryptus* Cameron, however, tell a different story. Their somewhat outstanding appearance seems to have caused an impression on earlier entomologists, to such an extent that nothing less than three new genera were proposed for the first three specimens reported in the literature: *Melanocryptus* Cameron, 1902, *Lobocryptus* Schmiedeknecht, 1904, and *Hoplophorina* Szépligeti, 1916, all proposed from female singletons. It was only half a century later that Townes and Townes (1966) interpreted these as a single taxon.

The uniqueness of *Melanocryptus* remains intriguing. Townes and Townes (1966) first classified the genus as part of the Mesostenina (lato sensu), together with several other genera, but later erected an exclusive subtribe for it, Melanocryptina (Townes, 1970). Their relationships with other Cryptinae were never directly investigated, and remain a subject of speculation. Two *Melanocryptus* spp. were coded as outgroup in Aguiar (2005) and another one was coded for the more extensive matrices of Tedesco and Aguiar (2013) and Santos and Aguiar (2013), but results were not explored for the Melanocryptina.

Townes (1970) reported having sorted six *Melanocryptus* species, but he did not describe any of them. Kasparyan and Ruíz-Cancino (2008) described an additional species from Mexico, *M. whartoni*, while revising the country's Cryptini fauna. Aside from this, taxonomic publications about the genus or the tribe have dealt only with listings (Viereck, 1914; Carrasco, 1972; Terán, 1980; Yu and Horstmann, 1997) or nomenclatural information (Fitton and Gauld, 1976). No host record has been previously reported to *Melanocryptus*. The aims of this work are to propose a new delimitation for *Melanocryptus* and revise its species.

## MATERIAL AND METHODS

This work incorporates data from 253 specimens of *Melanocryptus*, corresponding to 102 females and 151 males. For the distribution maps, available records from earlier literature were also included when possible. The acronyms used for the depositories follow Arnett et al. (1993), except for UFES and UATM, not treated in that work. Curators, when contacted, cited between parenthesis: **AEIC**, American Entomological Institute, Gainesville, Florida (D. Wahl); **AMNH**, American Museum of Natural History, New York (J. Carpenter); **BMNH**, British Museum of Natural History, London (G. Broad); **CASC**, California Academy of Sciences, San Francisco (B. Fisher); **CNCI**, Canadian National Collection of Insects, Ottawa (A. Bennett); **DZUP**, Universidade Federal do Paraná, Curitiba, Brazil (G. Melo); **FSCA**, Florida State Collection of Arthropods, Gainesville (J. Wiley); **HNHM**, Hungarian Natural History Museum, Budapest (G. Puskás); **MUCR**, Universidad de Costa Rica, San Pedro Montes de Oca (P. Hanson); **UATM**, Museo de Insectos de la Universidad Autónoma de Tamaulipas, Victoria Mexico; **RMNH**, Nationaal Natuurhistorische Museum, Leiden (R. de Vries); **UFES**, Universidade Federal do Espírito Santo, Vitória, Brazil (M. Tavares); **USNM**, Smithsonian Institution, Washington, D.C. (R. Kula); **ZMUC**, Zoological Museum, Natural History Museum, Copenhagen (L. Vilhelmsen); **ZSMC**, Staatliche Naturwissenschaftliche Sammlungen Bayerns, Zoologische Staatssammlung, Munich (S. Schmidt).

Morphological terminology follows Santos and Aguiar (2013), which includes Harris (1979). Measurements of ovipositor length were taken from the point where it first becomes visible (apex of last sternite) to the apex of dorsal valve. In Distribution, countries are listed from north to south, as standardized by Zanella et al. (2000). When specimens are from different countries or states, provinces, or departments, the full data is provided for the first specimen only; identical information for a series of specimens is not repeated, being replaced instead by the statement “same data except” and then followed by the unique data for that specimen. New distribution records are indicated for the respective countries only, between parentheses. Coordinates for the distribution maps were found through comparative searches in various sources, but mostly via GeoNames (<http://geonames.nga.mil/ggmagaz/>) and Google Earth (<http://www.google.com/earth/>). For labels with information on altitude or navigation (e.g., “3 mi W. Vilavicencio”), the found locality was browsed with Google Earth, in search of the closest point matching the described information, and the used coordinates were those of that point. Maps were built with Python, using Basemap (<http://matplotlib.org/basemap/>).

Whenever possible, species were described or redescribed from the holotype. For *M. cyaneus*, a conceptual redescription (i.e., based on several specimens) is provided because the respective type specimen is lost (Townes and Townes, 1966). Only specimens directly compared with the holotype were designated as paratypes; those studied only in the respective holding institutions are listed under the item “Other specimens.”

Phylogenetic analyses were performed exclusively as an aid to find the most parsimonious solution for complex, overlapping morphological variations for specimens of closely related species, which is otherwise difficult to interpret consistently. The technique was used to investigate the limits of *M. hadroglyptus*, sp. nov., and *M. whartoni*. The analyses were performed under maximum parsimony with the program TNT (Goloboff et al., 2008a), using implied weighting (Goloboff, 1993), which resolves character conflict in favor of characters that have less homoplasy during tree search. All searches were exact, that is, performed with implicit enumeration. Visualization and cladogram analyses were performed with WinClada, version 1.00.08 (Nixon, 1999). Multistate characters were treated as unordered, except where a quantitative sequence seemed obvious (chars. 4, 6–9; table 1). Goloboff et al. (2008b) suggested that the concavity value  $K$  should be calculated as a function of  $N$ , which is the ratio of a single extra step to the cost of the most homoplastic character. We used the TNT script `setk.run`, written by Salvador Arias (Instituto Miguel Lillo, San Miguel de Tucumán, Argentina), to calculate the appropriate value of  $K$  under  $N = 15$ .

**SPECIFIC TERMINOLOGY:** *Felt stripe* – distinctive stripe of short, stiff, dense setosity on the underside of the apical half of the flagellomere (figs. 4–5), which might be hard to see on dark or greased specimens. *Coronal suture* – as defined by Snodgrass (1935), this is the midlongitudinal suture, or carina, often distinct on the supraantennal area. It is usually slightly raised, but sometimes inconspicuous or even present as a true suture. *Subapical irregularity* – the ridges on the apex of the ventral valve of the ovipositor are arranged in a fairly regular series of decreasing size in *M. cyaneus* and *M. niger* (figs. 64–65), but in all other *Melanocryptus* spp. some of the most basal ridges are differently arranged or shaped, and a slight constriction might also be associated (figs. 61–62, 66–69); such modification is referred in the descriptions

as the subapical irregularity. The occurrence of these two patterns was also noted, but not named, by Townes (1970: 299). *Pospectal carina* is used instead of *posterior transverse carina of mesothoracic venter* of some authors. *Orbital bands* – the approximate position of interruptions of the orbital band is indicated as “hours” of the clock because visualization in degrees is counterintuitive, e.g., “interrupted between 7–8 h,” vs. “interrupted between 210°–250°.”

## RESULTS

### *Melanocryptus* Cameron, 1902

*Melanocryptus* Cameron, 1902: 370. Type species: *Melanocryptus violaceipennis* Cameron, 1902, by monotypy. Schmiedeknecht, 1908: 13, diagnosis, figure. Viereck, 1914: 91, type species listed. Townes and Townes, 1962: 13, listed. Townes and Townes, 1966: 68, 306, catalog, keyed. Townes, 1970: 299, 490–1, keyed, diagnosis, synonym, figures. Terán, 1980, record from Venezuela. Yu and Horstmann, 1997: 269, catalog. Kumagai and Graf, 2000: 163, faunistic study. Aguiar and Santos, 2010: 262, sampling efficiency. Tedesco and Aguiar, 2013: 86, 89, and Santos and Aguiar, 2013: 225, 229, coded for cladistic analysis.

*Melanocryptus* Linnavuori, 1982: 20, 33 [Hemiptera]. Homonym resolved by Rider (1998).

*Melanocryptus* [sic] *calandra*: Richardson, 2003. *Lapsus calami* for *Melanocorypha calandra* (Linnaeus, 1766), a bird.

*Lobocryptus* Schmiedeknecht, 1904: 414. Keyed only, no species assigned. Type species: *Lobocryptus cyaneus* Schmiedeknecht, 1908, by monotypy. Viereck, 1914: 91, type species listed. Townes and Townes, 1962: 13, listed. Synonymized by Townes and Townes, 1966: 68.

*Hoplophorina* Szépligeti, 1916: 238. Type species: *Hoplophorina nigra* Szépligeti, 1916, by monotypy. Townes and Townes, 1962: 13, listed. Synonymized by Townes and Townes, 1966: 68.

**REDESCRIPTION:** *Female*. Antenna centrolaterally compressed but also expanded dorsoventrally; flagellomeres 1–2 cylindrical, f3 intermediate, f4–10 or more distinctly dilated in dorsal view; apical half of flagellum ventrally with a “felt stripe” composed of short, dense, golden pilosity, starting on f10 (f9 in *M. aurantius*; f11 in *M. dnopheros*) (figs. 4–5); apical 5–7 flagellomeres with weak brownish hue; apical flagellomere at the very tip partially to distinctly compressed or sharpened, bearing about 4–9 specialized, short, stiff setae (fig. 3). Malar space usually about 0.7× basal width of mandible, except around 1.0× in *M. cyaneus*. Clypeus with one pointy, triangular tooth hanging above anterior inflected margin (figs. 6–7; compare with fig. 8 for non-*Melanocryptus*). Supraclypeal area just below level of toruli, medially, with at least a raised line or keel, sometimes developed as stout protuberance (fig. 76, 89–90). Temple in lateral view narrow. Occipital carina complete, dorsally delicate.

Pronotum dorsoposteriorly with distinct angle or fold (*M. cyaneus*, *M. niger*) (figs. 85–86) or more often sunken from one side to the other, forming a semicircular channel or shaft (all other spp.) (figs. 77–78, 87–88); epomia distinct (figs. 42–47); its posterior margin, below pronotal spiracle, crenulate, from distinct and stout (*M. cyaneus*, *M. niger*) to delicate (*M. dnopheros*). Epicnemial carina reaching 0.55–1.00× of distance to subalar ridge; sometimes ending at level of pronotal spiracle, distinctly curved and reaching close to posterior margin of pronotum (*M. cyaneus*, *M. niger*), or more straight or irregular or angled, sometimes shaped as a square bracket

(*M. aurantius*) and ending more distant from pronotal margin (other spp.). Hypoepimeron elongate, often narrowing ventroposteriorly. Hind margin of metanotum and anterior margin of propodeum never forming a small angular or toothlike widening on each side at level of postscutellum, at most with wide round projections (fig. 53, *M. aurantius*). Postpectal carina laterally distinctly projected, sharp, otherwise absent. Transverse furrow at base of propodeum wide and shallow, densely and distinctly crenulate (figs. 52–60), narrowing laterally to approximately linear beyond level of propodeal spiracles. Foretibia inflated, basally on posterior face with delicate slitlike impression, sometimes associated with small protuberance on anterior face (most distinct in *M. cyaneus* and *M. niger*). Preapical tarsomeres deeply incised, bifid. Mid t5 large, wide, its maximum/minimum width around 1.60–1.75, its length nears the combined length of t2–3.

Forewing (figs. 10–21) at least partially infuscated or spotted; veins 1m-cu and 1M+Rs usually bended at two points, most distinct in *M. cyaneus* (fig. 16) less distinct in other taxa and veins perfectly continuous in *M. tupan* and *M. violaceipennis* (figs. 12, 21); vein 2Cua usually shorter or much shorter than crossvein 2cu-a (except similar length in *M. niger*, longer in *M. cyaneus*). Areolet large, pentagonal, about as long as wide, sides converging anteriorly, posterior veins in “V” (angled). Hind wing (figs. 16, 20–30) vein Cua distinctly longer than crossvein cu-a.

Petiole (figs. 48–50, 81, 96, 114) without basolateral tooth; anteriorly with distinct dorso-lateral and ventrolateral carinae, delimiting a shallow glymma; spiracle of first tergite placed approximately at midlength. Ovipositor quite blade shaped (figs. 1–2), about 2.0–3.0× higher than wide, from straight (*M. aurantius*, *M. cyaneus*, *M. dnopheros*) (figs. 1, 61A, 75, 97, 101, 111) to slightly curved downward; ventral valve usually with subapical irregularity (e.g., *M. delos*, *M. aurantius*) (figs. 61–63, 66, 68), or regularly decrease in size toward tip (figs. 64–65). Ovipositor sheaths apparently quite soft, in dried specimens always detached from ovipositor and curved or curled (all studied specimens) (fig. 61A).

*Male.* Males do not have the centrally expanded antennae observed in females, nor the ventrolongitudinal felt stripe; the three basal flagellomeres are regularly shaped, not particularly elongate; a central or subapical white band is usually present (vs. absent on females). The dorsal protuberance on the supraclypeal area is always much more pronounced and conspicuous than on females. Areolet sides sometimes conspicuously convergent, very close anteriorly. T8 longitudinally split, forming two plates, the left one partially overlapping the right plate (fig. 108).

*Color.* Most species correspond well with the name of the genus in that they are predominantly black or dark brown (figs. 1–2, 70–71, 97, 100–101, 110–111), but *M. aurantius* is a surprising exception by its head and mesosoma bright orange (fig. 75). The presence of metallic bluish reflections (e.g., figs. 33, 45, 55, 82–86), even if weak (as in figs. 37, 46, 56, 87), in most of the darkened areas, also seems to be characteristic in the genus, and is detectable even in *M. aurantius*, on its metasoma.

**DISTRIBUTION:** Central America from northeastern Mexico to southern South America, apparently restricted to humid forest habitats (fig. 139).

**RECOGNITION:** The redescription above is intended as a full redefinition of *Melanocryptus*, and is important in both expanding and setting a more precise limit to the genus. This seems relevant because the characteristic look of *Melanocryptus* might nonetheless be easily deceiving



TABLE 1. Character coding used in the phylogenetic analysis. Coding was based on all available males of *M. hadroglyptus*, sp. nov., and *M. whartoni* Kasparyan et Ruíz, and on the outgroup species, *M. delos*, sp. nov.

#	Characters and States
0	Pediceal, color pattern: [0] entirely black; [1] ventrally yellowish
1	Flagellum, pilosity: [0] uniform, at most with weak tuft at apex of each flagellomere, not noticeable to naked eye; [1] each flagellomere apex with distinct tuft of hairs, visible to the naked eye
2	White band of antenna, color pattern: [0] entirely white; [1] ventrally darkened
3	Mandible color: [0] basally yellowish; [1] entirely dark brown
4	Clypeus apical margin, color: [0] concolorous with yellowish supraclypeal area; [1] light brown or brown, fusing with yellowish of supraclypeal area; [2] entirely dark brown, contrasting with yellowish of supraclypeal area
5	Gena ventrally, color: [0] pale yellow reaching entire width; [1] dark brown and yellowish in similar proportions
6	Pronotum collar, extension of yellow mark: [0] yellow present dorsally only, not reaching beyond epomia; [1] yellow dorsally and dorsolaterally, reaching beyond epomia; [2] collar entirely yellow, reaching ventroposterior end
7	Propleuron, color pattern: [0] entirely black; [1] posterior half with large yellowish area, or patterned but about 50% yellow; [2] entirely yellowish
8	Forecoxa, color pattern: [0] from about 90% to entirely yellowish; [1] about 15%–50% yellowish; [2] entirely dark brown or black
9	Midcoxa, color pattern: [0] entirely black or dark brown; [1] from 10%–40% yellowish or brownish; [2] entirely yellowish
10	Hind tibia basally, color: [0] black or at most brown; [1] distinctly yellowish or yellow.
11	Hind t2, color pattern: [0] entirely black or at most tip yellowish; [1] mostly or entirely yellowish; [2] basally dark brown, apical 0.3–0.5 yellowish
12	Hind t5, color pattern: [0] entirely darkened; [1] darkened, basally yellowish; [2] yellowish, apically darkened; [3] entirely yellowish
13	Hind t3 color: [0] entirely yellowish; [1] entirely darkened
14	Notauli, differentiation: [0] faint, barely reaching center of mesonotum; [1] deeply impressed, meeting or almost meeting beyond posteriad level of tegulae
15	Tegula, color: [0] partially yellowish or pale, usually medially or anteriorly; [1] entirely bright yellowish
16	Mesepimeron, color: [0] black (concolorous with mesepisternum); [1] yellowish; [2] black, except dorsal apex yellowish or whitish
17	Scutellum color: [0] yellow spot rounded or anteriorly concave; [1] yellow spot somewhat rectangular, covering nearly entire scutellum; [2] entirely black
18	Forewing around crossvein 1cu-a, infuscation: [0] distinctly nebulous around crossvein; [1] hyaline around crossvein
19	Forewing, position of apical stripe of infuscation: [0] apical, entirely covering wing tip; [1] subapical, not reaching wing tip, which remains hyaline
20	Forewing, extension of apical stripe of infuscation: [0] not reaching areolet; [1] distinctly covering areolet, in part or entirely
21	Pleural carina structure: [0] fragmented or irregular; [1] widely crenulate (produced by several stout straight rugosities meeting carina at 90°); [2] truly crenulate [deep; crenulation mostly unrelated to rugosity]; [3] linear complete, not fragmented
22	T1 and S1 (petiole), color pattern: [0] T1 basally and apically yellowish, S1 entirely yellowish; [1] T1 and S1 nearly entirely black
23	T3 apical yellowish stripe or spot, development: [0] narrow or quite small; [1] wide or large
24	Sternites, color pattern: [0] S2–4 brownish except apical margin yellowish, S5–8 dark brown from side to side on basal 0.2–0.9; [1] S2–3 midlongitudinally whitish, S4–8 entirely whitish

TABLE 2. Data matrix used in the phylogenetic analyses. Data compiled for nearly all available males of *M. hadroglyptus*, sp. nov., and *M. whartoni* Kasparyan et Ruiz, and for two selected specimens of the outgroup species, *M. delos*, sp. nov. Codification: a = [01], b = [02].

Species	Specimen reference	Character Number				
		11111	11111	22222	01234	56789
		00010	11010	01200	00011	00011
<i>M. delos</i> (a) [outgroup]	Brazil [UFES60451]	00010	10010	01200	02011	00011
<i>M. delos</i> (b) [outgroup]	Ecuador [14-16.VII]	11101	00111	0?001	01000	11100
<i>M. hadroglyptus</i> (a)	Br. Honduras	11112	00010	00101	00200	11100
<i>M. hadroglyptus</i> (b)	Costa Rica	11101	01111	00011	00000	11100
<i>M. hadroglyptus</i> (c)	Ecuador [June]	11100	01101	?0001	01000	11100
<i>M. hadroglyptus</i> (d)	Ecuador [July]	10110	10101	12000	02101	01010
<i>M. hadroglyptus</i> (e)	Colombia	11112	10020	02001	00201	13100
<i>M. hadroglyptus</i> (f)	Panama [March]	01112	10020	00001	00201	13100
<i>M. hadroglyptus</i> (g)	Panama [July]	11102	10020	a0011	00201	11100
<i>M. hadroglyptus</i> (h)	Ecuador [April 1]	11101	01101	00001	00001	11110
<i>M. hadroglyptus</i> (i)	Ecuador [April 2]	11102	10011	02001	10001	13100
<i>M. hadroglyptus</i> (j)	Panama [1928]	11101	00110	02001	00001	10100
<i>M. hadroglyptus</i> (k)	Panama [1929]	11112	10020	0b001	00201	13100
<i>M. hadroglyptus</i> (l)	Panama [1987]	10000	02202	11301	11100	02011
<i>M. whartoni</i> (a)	Costa Rica [May]	10000	01202	11300	11110	00011
<i>M. whartoni</i> (b)	French Guyana	10000	02202	11300	11101	02011
<i>M. whartoni</i> (c)	El Salvador					

in some cryptine taxa which are superficially similar to it. Thus, some extra attention might be needed for a more accurate recognition of the genus. The following features are of good diagnostic value, and helpful as a first approximation for recognizing *Melanocryptus*: On females, flagellomere apical half ventrally with a “felt” stripe, formed by dense, short pilosity; flagellum centrolaterally compressed but also expanded dorsoventrally; single tooth of clypeus pointy, developed as a projection of the main area of the clypeus, hanging over the anterior inflected margin (figs. 6–7) (must not be confused with an elevation sometimes present on the anterior inflected margin of other Cryptini, as in fig. 8); forewing partially or entirely infusate, rarely fully hyaline; areolet large, pentagonal, about as long as wide, sides converging anteriorly. Spiracle of first tergite approximately at middle (0.45–0.57). Ovipositor blade shaped, about 2.0–3.0× higher than wide; sheaths soft, in dried specimens always detached from ovipositor and curved or curled. Body darkened or black; dark tonalities with bluish reflections, even if weak.

**RARITY:** Specimens of *Melanocryptus* are uncommon in collections, and therefore might appear to be rare in the field as well. It is however difficult to establish to what extent this is only a sampling artifact. Malaise traps, for example, traditionally preferred for sampling Hymenoptera (e.g., 150 Malaise trap-years in Hanson and Gauld, 1995), will capture mostly males of *Melanocryptus* (Aguiar and Santos, 2010), which are, however, more difficult to recognize to genus level than females. Moericke traps (= yellow pan traps), on the other hand, seem to be



more efficient in collecting females of this genus (Aguilar and Santos, 2010). An apparent exception appears in the work of Kumagai and Graf (2000), which report the capture of 21 females and 29 males of an unidentified *Melanocryptus* sp. with Malaise traps, but all vouchers of that work were examined in loco (DZUP), and specimens of *Melanocryptus* were not found.

INTERPRETATION OF MALE SPECIMENS: *Melanocryptus hadroglyptus* and *M. whartoni* are at the same time similar and morphologically variable. The main problem is in the intricate variability of *M. hadroglyptus* males, which hardly seem to represent a unity. If subjectively interpreted, this kind of situation typically results in varied interpretations by different authors. Therefore, a phylogenetic interpretation of the variation was performed, using *M. delos*, a similar but clearly distinct, and uniform species, as the outgroup. The following character-coding scheme (table 1) was considered, corresponding to all informative external characters observed to vary among the examined specimens. The respective character matrix is presented in table 2.

The single tree recovered with the analysis (fig. 9) makes evident the problematic interpretation of *M. hadroglyptus* populations, which cannot be split into natural or sound groups representing more than a single species. At the same time, however, there is good support for the separation of this clade (char. states 7:2, 9:2, 15:1, 16:1) from that of *M. whartoni* (supported by 2:1, 21:1, 24:0, all nonhomoplasious).

#### KEY TO THE SPECIES OF MELANOCRYPTUS

##### Females:

1. Propodeal apophysis projected as distinct thorn (figs. 45, 55–56); anterior transverse carina of propodeum centrally distinctly interrupted (figs. 55–56); supraclypeal area densely covered with silvery pilosity (figs. 82–83) . . . . . 2
- Propodeal apophysis low, from scale shaped to linear (figs. 44, 46–54); anterior transverse carina of propodeum complete (figs. 52–54, 57–60); supraclypeal area sparsely pilose (figs. 73, 76, 89–90, 93), or if moderately abundant, pilosity is yellowish . . . . . 3
- 2 (1). Body bluish, with moderate to distinct metallic luster (figs. 33, 45, 55, 82–86); midbasitarsus basally or entirely dark brown, rarely orange brown; forewing bearing two dark stripes, one central, another apical or subapical (fig. 16); T2 and T7 with apical whitish stripe or spots . . . . . *M. cyaneus* (Schmiedeknecht)
- Body blackish, without or with weak metallic luster (figs. 38, 43, 56, 97); midbasitarsus basal half or more whitish to pale yellow, apex dark brown or black; forewing without stripes (fig. 10), or at most with small spots (fig. 11); T2 and T7 entirely black or dark brown (fig. 97). . . . . *M. niger* (Szépligeti)
- 3 (1). T2 and T7 with apical whitish stripe or spots; forewing mostly clear hyaline, with central or apical stripes or spots (figs. 17–19) . . . . . 4
- T2 and T7 entirely black or dark brown; forewing mostly or entirely infuscate, with or without stripes (figs. 12–14, 20–21) . . . . . 7
- 4 (3). Ovipositor and legs with distinct reddish tinge (fig. 101); posterior transverse carina of propodeum complete (Fig. 105); forewing with a small brownish spot on its midlength and an infuscate apical area . . . . . *M. rufigliadius*, sp. nov.

- Ovipositor and legs blackish or brownish, without reddish tinge; posterior transverse carina of propodeum incomplete, represented by three distinct apophyses (figs. 52, 54); forewing with two distinct brownish stripes on its midlength and subapically (figs. 17–19) . . . . . 5
- 5 (4). Posterior half of mesosoma laterally covered with short, regular or sometimes sparse pilosity (fig. 46); forewing apical infuscation covering entire wing tip and areolet (figs. 2, 18); maxillary palpus with most articles patterned in whitish and dark brown; pleural carina fragmented or indistinct (fig. 49); orbital band on dorsal half of head narrow and widely interrupted above, or absent (fig. 2) . . . . . *M. delos* Aguiar, sp. nov.
- Posterior half of mesosoma seen laterally covered with conspicuous, dense silvery pilosity (as in figs. 45, 47); forewing apical infuscation not reaching the tip, which remains hyaline, and covering or not the areolet (figs. 17, 19); maxillary palpus articles uniformly colored, not patterned; pleural carina distinct (figs. 48, 50); orbital band on dorsal half of head wide and continuous at least above (figs. 72–73) . . . . . 6
- 6 (5). Pleural carina linear (fig. 48); subalar ridge concolorous with mesepisternum (fig. 70); propodeum posteriad anterior transverse carina mostly rugulose, matte (fig. 52); S1 ending basad petiolar spiracle, even if very near to it. . . . . *M. tessellatus* Aguiar, sp. nov.
- Pleural carina widely crenulate (fig. 49); subalar ridge light colored, contrasting with blackish mesepisternum (fig. 42); propodeum posteriad anterior transverse carina mostly smooth, shiny (fig. 50); S1 ending opposite petiolar spiracle. . . . . *M. hadroglyptus* Aguiar, sp. nov.
- 7 (3). Mesosoma, including fore- and midlegs and hind coxa, orange (figs. 75–81). Wing infuscation weak and uniform or nearly so, at most narrowly darker on wing tip (fig. 14). Pleural carina distinct (fig. 44) . . . . . *M. aurantius*, sp. nov.
- Mesosoma, including all legs, black or dark brown. Wing infuscation intense or distinctly heterogeneous, wing darker apically, or centrally, or both (figs. 12, 20, 21). Pleural carina distinct or indistinct . . . . . 8
- 8 (7). Forewing more or less uniformly amber infuscate, except apex with diffuse darkened area which is often C-shaped (fig. 12); foretibia with two distinct longitudinal yellowish stripes (dorsolateral and ventromesal); body pilosity distinctly whitish or silvery. Southern and southeastern Brazil . . . . . *M. tupan*, sp. nov.
- Forewing dark amber infuscate, with wide central and basal light amber areas at least partially discernible (figs. 20–21); foretibia entirely black or at most with ventromesal stripe only; body pilosity distinctly yellowish. Amazonia . . . . . 9
- 9 (8). Petiolar sternite (S1) ending distinctly apicad petiolar spiracle (fig. 96); forewing 1cu-a opposite 1M+Rs, at 90° with M+Cu, its apex straight (fig. 20); light/dark areas of forewing distinct, infuscation therefore distinctly patterned (fig. 20); epicnemial carina straight, except basally angled; tergite of petiole mostly matte, shiny only at apex (fig. 95) . . . . .  
. . . . . *M. dnopheros*, sp. nov.
- Petiolar sternite (S1) ending distinctly basad petiolar spiracle (fig. 114); forewing 1cu-a distinctly basad 1M+Rs, at slightly obtuse angle with M+Cu, its apex curved toward wing base (figs. 21, 110); light/dark areas of forewing weakly contrasting, infuscation more uniform (figs. 21, 110); epicnemial carina intensely sinusoidal; tergite of petiole nearly entirely shiny (fig. 113) . . . . . *M. violaceipennis* Cameron

## Males:

1. Supraclypeal area dark brown to black . . . . . 2  
 – Supraclypeal area mostly (fig. 74) or entirely whitish or pale yellow . . . . . 4
- 2 (1). Forewing with large subapical spot or stripe, otherwise hyaline (similar to fig. 16, but less extensive); antenna without white band; posterior half of mesosoma seen laterally covered with conspicuous, dense pilosity (as in fig. 45); midtibia dark brown to black; supraclypeal area densely covered with silvery pilosity (as in figs. 82–83). *M. cyaneus* Schmiedeknecht  
 – Forewing without large spot or stripe, darkened along wing apex, membrane otherwise weakly infuscate (fig. 13); antenna centrally with distinct white band; posterior half of mesosoma seen laterally covered with short, regular or sparse pilosity; midtibia light colored, whitish to light orange; supraclypeal area sparsely pilose, or at most moderately abundant and pilosity yellowish. . . . . *M. tupan*, sp. nov.
- 3 (1). Forewing with large apical spot (fig. 15) or subapical stripe (figs. 71, 100, 115–116; also as in figs. 17–19); subalar ridge of contrasting color with mesepisternum; hind tibia often lighter or yellowish at basal end; T1–3 apex with transverse whitish stripe or large spot 5  
 – Forewing without large spot or stripe, at most narrowly infuscate along wing apex (as in figs. 10, 14); subalar ridge concolorous with mesepisternum; hind tibia basally dark brown to black; T1–3 apex with tiny whitish marks or uniformly colored. . . . . 4
- 4 (3) Head and mesosoma orange (figs. 6, 32, 44, 53, 75–80); midfemur and tibia entirely orangish; wings weakly but entirely infuscate (fig. 14) . . . . . *M. aurantius*, sp. nov.  
 – Head and mesosoma black with weak bluish reflections (figs. 38, 43, 56); midfemur dark brown, the respective tibia almost entirely whitish; wings mostly hyaline (fig. 10) . . . . .  
 . . . . . *M. niger* (Szépligeti, 1916)
- 5 (3). Forewing apical infuscation not reaching areolet, even if ending at it (figs. 15, 71, 100, 115–116); flagellomeres with regular pilosity or with small tuft of hairs apicoventrally not readily noticeable; pleural carina linear (figs. 48–49, 51) . . . . . 6  
 – Forewing apical infuscation covering areolet entirely or at least partially (similar to figs. 1–2, 18–19); flagellomeres apicoventrally with distinct tuft of hairs (fig. 98); pleural carina widely crenulate (as fig. 50) . . . . . *M. hadroglyptus* Aguiar, sp. nov.
- 6 (5). Forewing with large apical spot or infuscation, distinctly reaching wing tip (fig. 100; or similar to apical spot in fig. 18); posterior half of mesosoma seen laterally covered with short, regular or sparse pilosity, mesepisternum posteriorly nearly glabrous; forewing hyaline around crossvein 1cu-a . . . . . 7  
 – Forewing with subapical stripe or spot, wing tip hyaline (figs. 15, 115–116); posterior half of mesosoma seen laterally covered with conspicuous, dense pilosity, mesepisternum posteriorly distinctly pilose (fig. 71); forewing sometimes weakly nebulous around crossvein 1cu-a. . . . . 8
- 7 (6). Forewing apical infuscation touching the areolet (similar to fig. 15); midcoxa and tibia black or dark brown; propleuron partially or entirely dark brown or black; mandible entirely dark brown; white on T2–3 apical margin forms distinct stripe, sometimes quite wide; tegula from partially yellowish to entirely darkened; posterior transverse carina of propodeum weak but complete (as in fig. 54). . . . . *M. delos* Aguiar, sp. nov.

- Forewing apical infuscation close but distinctly not reaching the areolet (fig. 100); midcoxa and tibia almost entirely yellowish or light brown (fig. 100); propleuron entirely pale yellow; mandible basally pale yellow; white on T2–3 apical margin more irregularly delimited, narrow; tegula entirely whitish; posterior transverse carina of propodeum incompletely formed, only its three weak apophyses visible . . . . . species inquirenda
- 8 (6). Fore- and midcoxa, propleuron, mesepimeron, tegula, labial and maxillary palpi, and scalelike plate above pygostylus, light colored in whitish or pale yellow (figs. 115–117); supraclypeal area entirely whitish; forewing hyaline around crossvein 1cu-a (fig. 15) . . . . . *M. whartoni* Kasparyan et Ruiz-Cancino
- Forecoxa from brown and yellow to entirely dark brown, midcoxa, propleuron, mesepimeron, tegula, labial and maxillary palpi, and scalelike plate above pygostylus, entirely or nearly entirely dark brown; supraclypeal area with M-shaped blackish mark (fig. 74); forewing hyaline weakly nebulous around crossvein 1cu-a (fig. 71) . . . *M. tessellatus* Aguiar, sp. nov.

***Melanocryptus aurantius*, sp. nov.**

Figures 3, 6, 14, 26, 32, 44, 53, 61, 75–81, 126

DESCRIPTION: *Female holotype*. Forewing 14.75 mm. Body delicately sculptured, at first sight almost smooth (fig. 75), except coarse on propodeum behind anterior transverse carina. Supraclypeal area just below level of each torulus with stout keel (fig. 6); supraantennal area delicately punctulate, nearly smooth, coronal suture raised as a keel in front of anterior ocellum, remaining 0.7 quite low, inconspicuously developed. Antenna with 28 flagellomeres. Malar space 0.68 × mandible basal width. Occipital carina apically meeting hypostomal carina at some distance from base of mandible, Y-shaped where they meet. Pronotum dorsomedial margin not raised, aligned with anterior margin mesoscutum (figs. 77–78); epomia short, delicate but distinct; sculpturing quite delicate, laterocentrally with a few parallel, delicate longitudinal strigation, which extends along ventroposterior margin as short crenulations (fig. 44); pronotum otherwise finely punctulate, matte. Mesoscutum (figs. 77–78) matte, finely punctulate. Notaulus narrow, linear, but deep, converging posteriorly, ending a little anterior to center of mesoscutum. Axillary trough of mesonotum basally widely concave, with a few, weak, concentric crenulation, apically sculptured as scutellum (fig. 32). Scutellar carina advancing little over scutellum, which is subtriangular, dorsally moderately convex, laterally flat (fig. 32). Subalar ridge more or less elongate pyramid. Epicnemial carina reaching about 0.77 of distance to subalar ridge, shape as in figure 44. Sternaulus deep, short, straight (figs. 44, 79); mesepisternum finely, densely, transversely rugulose and alutaceous, coarser above (fig. 44). Forewing (fig. 14) crossvein 1cu-a basal to 1M+Rs by about 0.3 its own length, very slightly and uniformly curved, apex not differentially curved in relation to remaining of crossvein; 2Cua 0.90 length of crossvein 2cu-a. Hind wing (fig. 26) vein Cua 1.90 × length of crossvein cu-a.

Transverse furrow at base of propodeum deep, wide, closely and fully crenulate (fig. 53); area anterior to anterior transverse carina centrally arcuately strigate, laterally longitudinally strigate; area posterior to anterior transverse carina transversely coarsely strigate, also somewhat arcuately; area posterior to apophyses somewhat reticulate and rugulose (fig. 53). Anterior transverse carina complete, stout, centrally slightly curved; posterior transverse carina indi-





FIGURES 1–8. Generic features. 1–2, *Melanocryptus delos*. 3, *M. aurantius*, apex of antenna. 4–5, *M. niger*, antennae, ventral, showing the felt stripe. 6, *M. aurantius*, mandibles and clypeus. 7, *M. delos*, clypeus, dorsolateral. 8, Unidentified cryptine: note that clypeal tooth is structurally different from that of *Melanocryptus*.

cated by lateral, low, stout, wide apophyses, and a central, anterior, small transverse portion, barely connected to apophyses (fig. 53). Propodeal spiracle elongate, 3.00× longer than wide. Pleural carina from well defined anteriorly to indicated only by meeting of metapleuron and propodeum posteriorly; propodeum not smoothly continuous with metapleuron, somewhat deep along the line where both meet, forming shallow channel or “step” between them (fig.

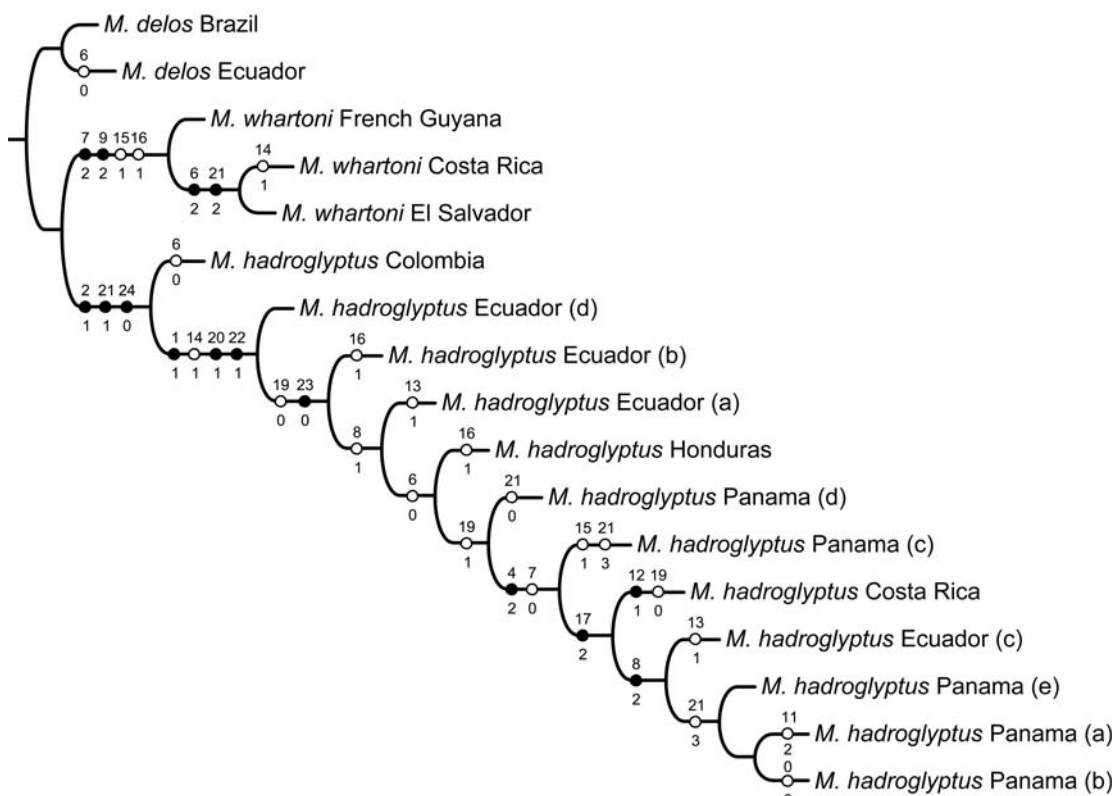


FIGURE 9. Single cladogram recovered for data of tables 1–2. Concavity constant,  $K = 3.046875$ . Exact search with implicit enumeration. Best score: 6.21202.

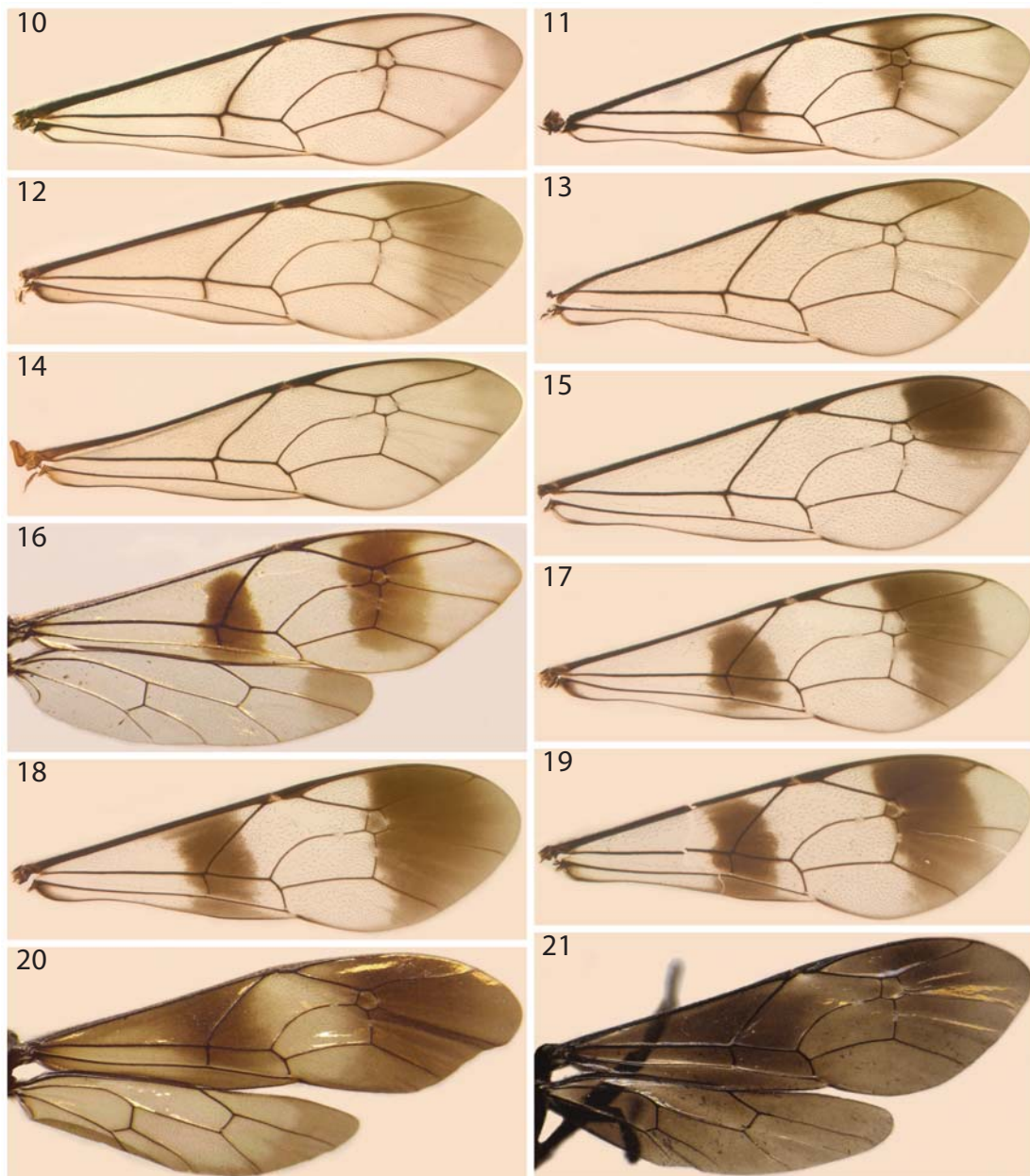
44). Metapleuron very finely transversely strigate, matte. T1 spiracle at middle (basal 0.48) (fig. 81); dorsolateral and ventrolateral carinae stout, complete from base to apex; sternite ending slightly but distinctly basad of spiracle (fig. 81). Tergites equally very delicately punctulate. Ovipositor blade shaped, 1.84 time taller than wide at midlength, length 1.24× length of hind tibia, straight (figs. 61A, 75); ventral valve ridges with subapical irregularity (fig. 61B).

*Pilosity.* Head and mesosoma apparently glabrous (fig. 75), at most with very fine, inconspicuous pilosity; T1 glabrous, remaining tergites with same distinct, dense yellowish pilosity.

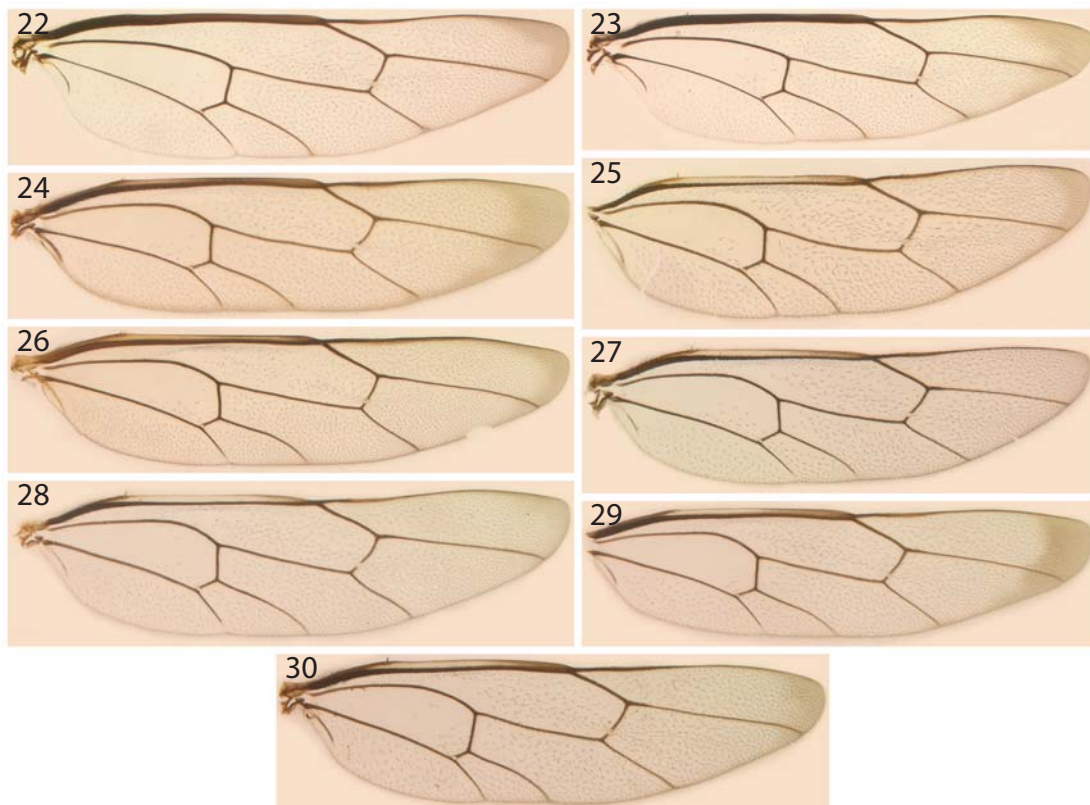
*Color* (fig. 75). Head orange dorsally to more yellowish ventrally; scape basally orange, apically black, flagellum black. Mesosoma orange, with more red hue dorsally; forelegs light orange, except t2–5 dorsally darkened; midlegs light orange, except tibia lateral side and tarsi, dark brown; hind coxa orange, hind trochanter and throchantellus mixed orange and black, remainder of hind leg entirely black. Petiole orange, postpetiole black; T2–8 black with weak metallic bluish hue; S2 mostly white, with black spot laterally, S3 apical margin and S4–5 apical third, white, remainder of S3–5 and entire S6, black. Ovipositor sheath dark brown, the very tip orange, shaft white (fig. 61A). Wings more or less uniformly lightly amber, except forewing apex diffusely darkened (fig. 14).

**MALE:** Same overall structure and color pattern of female, but with following differences. Smaller, forewing 11.32 mm; antenna with 31 flagellomeres. Propodeum much more delicately sculptured. Mesosternum conspicuously sunk just below sternaulus (fig. 80) (apparently a





FIGURES 10–21. Right wings. **10**, *Melanocryptus niger*, female from Bolivia. **11**, *M. niger*, female from Colombia. **12**, *M. tupan*, female from southern Brazil. **13**, *M. tupan*, male from southeastern Brazil. **14**, *M. aurantius*, female holotype. **15**, *M. whartoni*, male from French Guiana. **16**, *M. cyaneus*, female from Venezuela. **17**, *M. tessellatus*, female holotype. **18**, *M. delos*, female. **19**, *M. hadroglyptus*, female holotype. **20**, *M. dnopheros*, female holotype. **21**, *M. violaceipennis*, female from Suriname.



FIGURES 22–30. Right hind wing. **22**, *Melanocryptus niger*, female from Bolivia. **23**, *M. niger*, female from Colombia. **24**, *M. tupan*, female from southern Brazil. **25**, *M. tupan*, male from southeastern Brazil. **26**, *M. aurantius*, female holotype. **27**, *M. whartoni*, male from French Guiana. **28**, *M. tessellatus*, female holotype. **29**, *M. delos*, female. **30**, *M. hadroglyptus*, female holotype.

unique feature in the genus). S1 ending opposite spiracle. Color pattern generally similar, except as follows: supraclypeal area pale yellow; scape entirely orange, flagellum with preapical whitish band, covering flagellomeres 12–15 and basal half of 16; postpetiole orange, only its tip black; tip of hind t2, entire t3–4 and basal half of t5 whitish. Tergites with distinct metallic bluish hue; all sternites entirely white.

**VARIATION:** Paratypes nearly equivalent to the holotype, except forewing length 15.30–16.25 mm, with narrowly darkened apical margin; ovipositor 1.22–1.31× length of hind tibia.

**BIOLOGY:** Unknown.

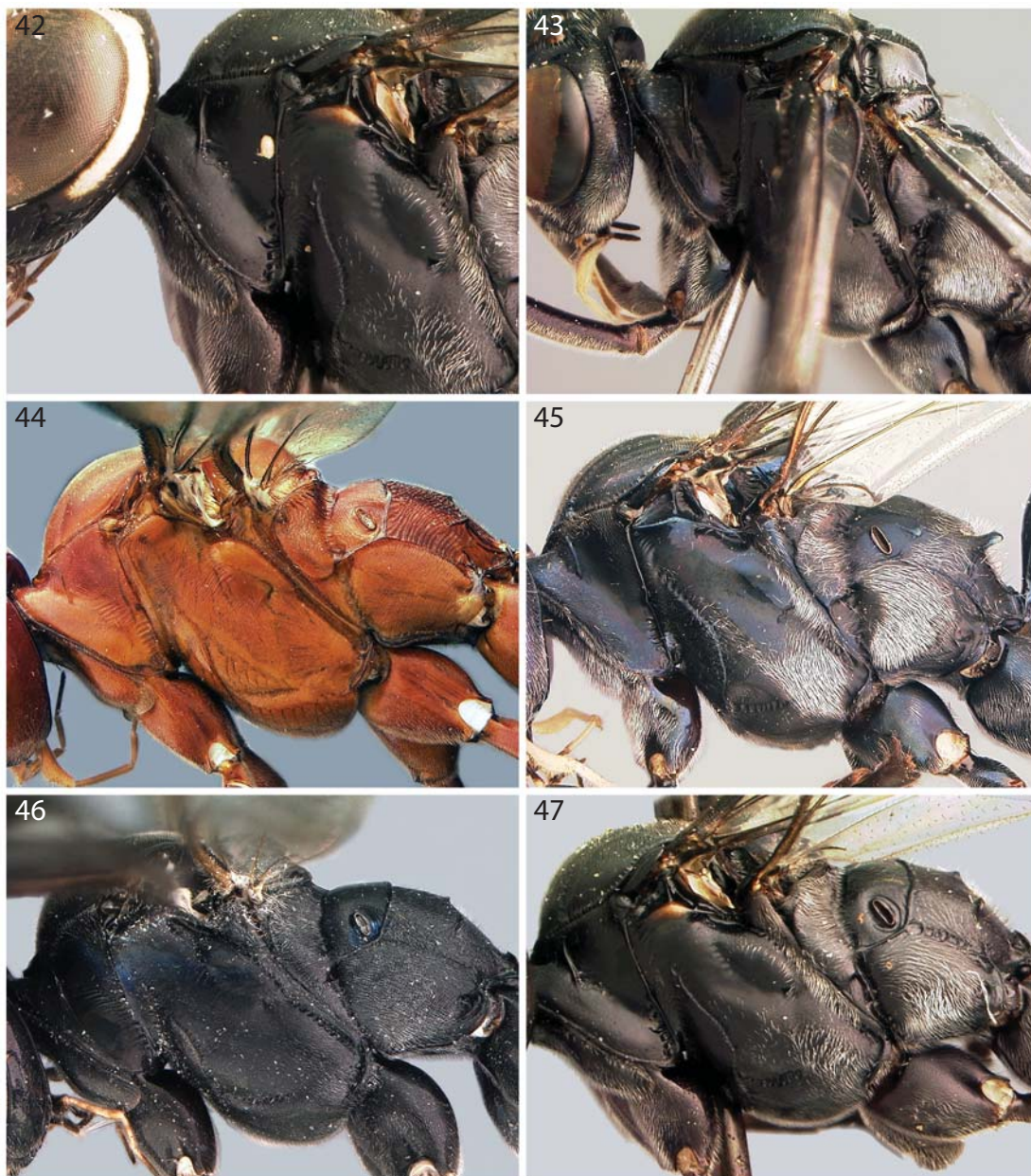
**COMMENTS:** The deeply orange head and mesosoma, contrasting with black antenna, hind legs and metasoma, represents a unique color pattern in *Melanocryptus*. Females are large, spanning 15–19 mm in body length, excluding the ovipositor. Dorsolateral carina conspicu-





FIGURES 31–41. Mesoscutum and scutellum in dorsolateral view, left side, to show structure of axillary through. All females, except last one. 31, *Melanocryptus tessellatus*, holotype. 32, *M. aurantius*, holotype. 33, *M. cyaneus*. 34, *M. delos*, holotype. 35–36, *M. dnopheros*, holotype: dorsal and dorsolateral views. 37, *M. hadroglyptus*, holotype (flipped horizontally). 38, *M. niger*. 39, *M. violaceipennis* (flipped horizontally). 40–41, *M. tupan*: female from southern Brazil and male from southeastern Brazil.





FIGURES 42–47. Mesosoma, left, females. 42, *M. hadroglyptus*, holotype (white spot on pronotum is a mite). 43, *M. niger*. 44, *M. aurantius*, holotype. 45, *M. cyaneus*. 46, *M. delos*, holotype. 47, *M. hadroglyptus*, holotype (mite on pronotum digitally erased).





FIGURES 48–51. Propodeum, left. 48, *M. tessellatus*, holotype. 49, *M. delos*, holotype (flipped horizontally). 50, *M. hadroglyptus*, holotype. 51, *M. whartoni*, male. Figures 52–54. Propodeum, dorsal, females. 52, *M. tessellatus*, holotype. 53, *M. aurantius*, holotype. 54, *M. delos*, holotype.





FIGURES 55–60. Propodeum, dorsal. All females, except last one. **55**, *M. cyaneus*. **56**, *M. niger*. **57**, *M. tupan*, female from southern Brazil. **58**, *M. dnopheros*, holotype. **59**, *M. violaceipennis*. **60**, *M. tupan*, male from southeastern Brazil.

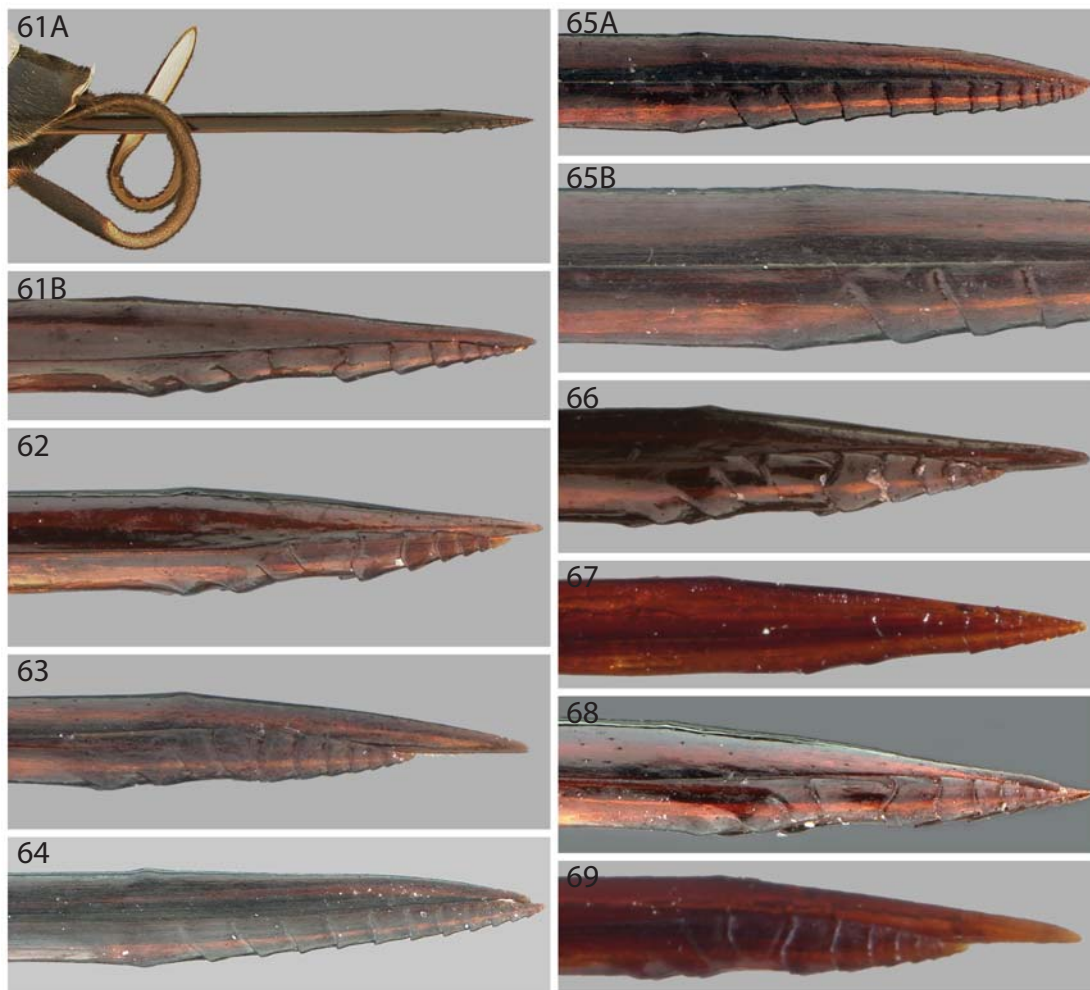
ously distinct on entire length of petiole and postpetiole (fig. 81) (vs. differentiated only basally on petiole on all other spp.). The short and straight sternaulus (figs. 79–80) is also unique.

**ETYMOLOGY:** The specific epithet derives from the Latin *aurantium*, “orange,” a reference to the deep orange color of the head and mesosoma.

**DISTRIBUTION:** BRAZIL (Mato Grosso, Espírito Santo) (fig. 126).

**MATERIAL EXAMINED:** Four females, one male. **Holotype** ♀ BRAZIL: *Espírito Santo*: ES, Cariacica, Res. Biol. Duas Bocas, Pau Amarelo [primary forest], 23–25.X.2005, YPT, Pt.21, APAguiar et al., *Melanocryptus* sp., BF Santos det. 2007, UFES43055 (UFES). Triangle mount. Complete, in good condition. **Paratypes:** BRAZIL: *Espírito Santo*: ♀ ES, Pinheiros, Reserva Biológica Córrego do Veado, 18°21.749S 40°09.849'W,





FIGURES 61–69. Ovipositor and ovipositor tip, left. **61A–B**, *M. aurantius*, holotype. **62**, *M. tessellatus*, holotype. **63**, *M. hadroglyptus*, holotype. **64**, *M. niger*. **65A–B**, *M. cyaneus*. **66**, *M. delos*, holotype. **67**, *M. rufigliadius*, holotype. **68**, *M. tupan*. **69**, *M. tessellatus*, paratype.

Trilha Água Limpa, Pt20, 9–11.VI.2011, Malaise trap, M.T. Tavares et al., pinned, complete, in good condition (UFES); ♀ same data except 18°22.246S 40°08.785'W, Estrada Oeste, 10–12.VI.2011, Armadilha Moericke Pt. 8, M.T. Tavares et al. [in alcohol] (UFES); ♀ Dpto. Zool, UF-Paraná, Conc[eição] da Barra – ES, Brasil 10/09/1969, C.T. and C. Elias, “*Melanocryptus* ?”, V. Graf det. 19\_\_, pinned, complete, in good condition (DZUP). Mato Grosso: 3♂ Sinop, M. Grosso, 12°31'S 55°37'W, X.1974, Brazil, M. Alvarenga, *Melanocryptus* sp. 7, pinned, left hind tarsi missing, otherwise complete, in good condition (AEIC).

*Melanocryptus cyaneus* (Schmiedeknecht, 1908)

Figures 16, 33, 45, 55, 65, 82–86, 121

*Lobocryptus cyaneus* Schmiedeknecht, 1908: 10. ♀. Original description, figure (plate 1). Type lost according to Townes and Townes, 1966.

*Melanocryptus cyaneus* (Schmiedeknecht): Townes and Townes, 1966: 68, catalog, synonymy. Townes, 1970: 299, listed. Yu and Horstmann, 1997: 269, catalog.

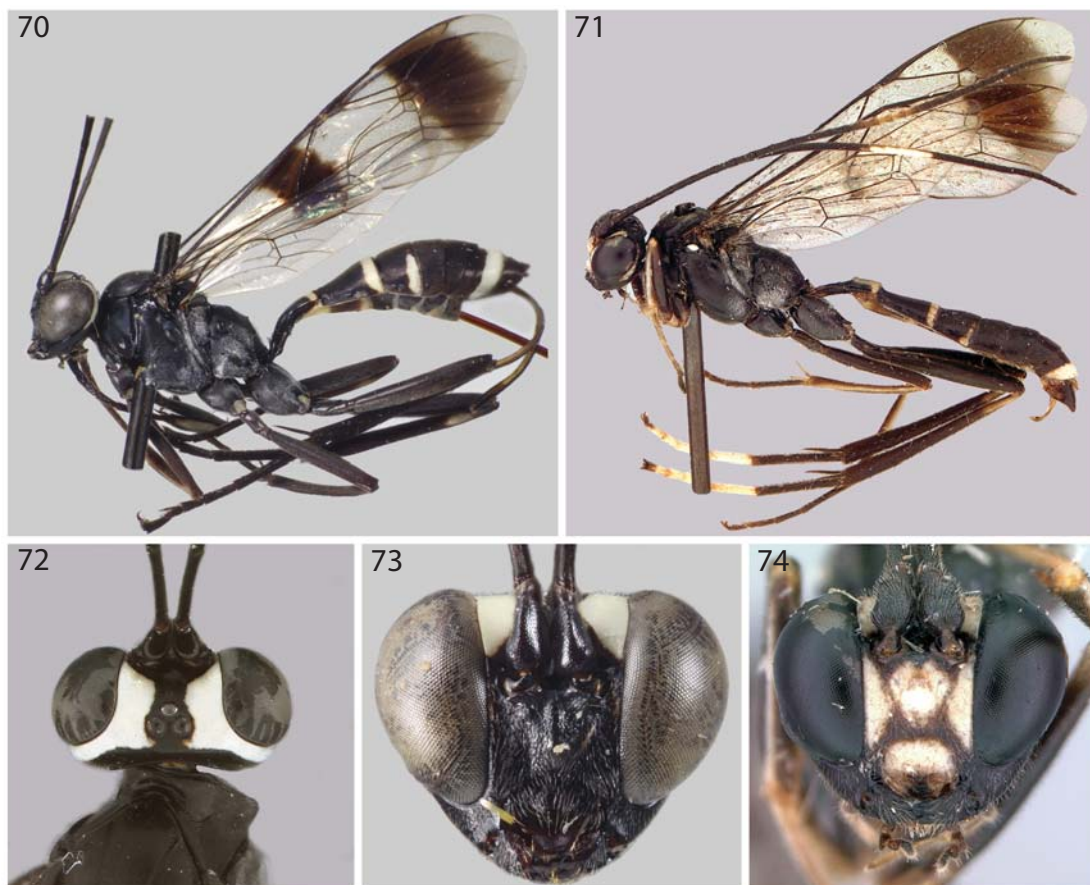
*Melanocryptus* sp.: Townes, 1970: 490, figure 258a, ♀.

**REDESCRIPTION:** *Female.* Forewing 14.5 mm. Supraclypeal area flat, dorsally, near toruli, with minute brownish callosity (fig. 83); supraantennal area laterally smooth, centrally with distinct coronal suture, which receives on each side several oblique to transverse carinae. Antenna with 28 flagellomeres ( $n = 2$ ). Malar space  $0.91\text{--}1.10\times$  mandible basal width ( $n = 4$ ). Occipital carina in lateral view, on its basal 0.4, with slight emargination; apically making an abrupt shift inward before meeting the hypostomal carina (fig. 84). Pronotum dorsally mostly flat, then posteriorly bent upward, but not forming a transverse channel or shaft (figs. 85–86); epomia distinct, well developed; ventroposterior margin crenulate, otherwise smooth, shiny (fig. 45). Mesoscutum mostly smooth, shiny (figs. 85–86). Notaulus deep, entirely distinctly crenulate, converging posteriorly, reaching clearly beyond level of tegula, ending near posterior 0.2 of mesoscutum (figs. 85–86). Axillary trough of mesonotum basally widely concave, with 4–5 thick crenulations, apically almost perfectly fused to and with same sculpture of scutellum (fig. 33). Scutellar carina weakly advanced over scutellum, which is protuberant, quite rounded (fig. 33). Epicnemial carina reaching 0.8–1.0 of distance to subalar ridge, shape as in figure 45. Subalar ridge narrow, delicate. Sternaulus nearly straight, deep, crenulate, restricted to anterior 0.55; mesepisternum smooth (fig. 45). Forewing (fig. 16) vein 1M+Rs perfectly uniform, without indication of original point of connection between Rs and M; crossvein 1cu-a basal to 1M by about 0.15 its own length; vein 2Cua  $1.56\times$  length of crossvein 2cu-a. Hind wing (fig. 16) vein Cua  $1.44\times$  length of crossvein cu-a.

Transverse furrow at base of propodeum deep, entirely densely crenulate, regular width; anterior margin of propodeum sinking progressively into the transverse furrow, thus not forming a border or step (fig. 55). Propodeum anterior transverse carina interrupted on central 0.3, where both sides bend anteriorly at  $90^\circ$ , until almost reaching transverse furrow (fig. 55); apophyses tall, thorn shaped (figs. 45, 55), posterior transverse carina indicated by rugulosities, or distinct laterally; propodeum otherwise smooth, shiny. Propodeal spiracle quite elongate,  $3.36\text{--}3.40\times$  longer than wide ( $n = 2$ ). Pleural carina complete, linear. Metapleuron with few weak transverse rugosities centroposteriorly, partially hidden by pilosity. T1 spiracle at middle (basal 0.52–0.53); dorsolateral carina weak, hardly distinct from spiracle to apex only; ventrolateral carina absent; sternite ending slightly basad, almost opposite spiracle. T1–8 smooth, polished. Ovipositor blade shaped,  $2.75\text{--}2.77\times$  taller than wide, straight,  $1.55\times$  length of hind tibia; ventral valve ridges without subapical irregularity (fig. 65A), but basalmost ridge reduced to a small tubercle (fig. 65B), ridges otherwise regular.

*Pilosity.* Supraclypeal area with dense, white, ventrally decumbent pilosity (figs. 82–83). Pronotum collar, especially laterally, propleuron, mesepisternum ventral half, mesopseudosternum, mesepimeron dorsally, metapleuron, and propodeum weakly, except glabrous on area anterior to anterior transverse carina, covered with dense whitish to silvery pilosity, most intense on metapleuron. Tergites 2–7 with yellowish, short pilosity, progressively denser toward T8.

*Color.* Apparently blackish at first sight, but on close inspection dark blue with metallic and violaceous luster; otherwise as follows. Pale yellow to whitish at maxillar and labial palpi, except brown apical article, small spot on gena centrally at eye margin and supraantennal area



FIGURES 70–71. Habitus of *M. tessellatus*. 70, Female (atypical white mark on T3). 71, Male. Figures 72–74. Head of *M. tessellatus*. 72, Female holotype, dorsal. 73, Female, frontal. 74, Male, frontal.

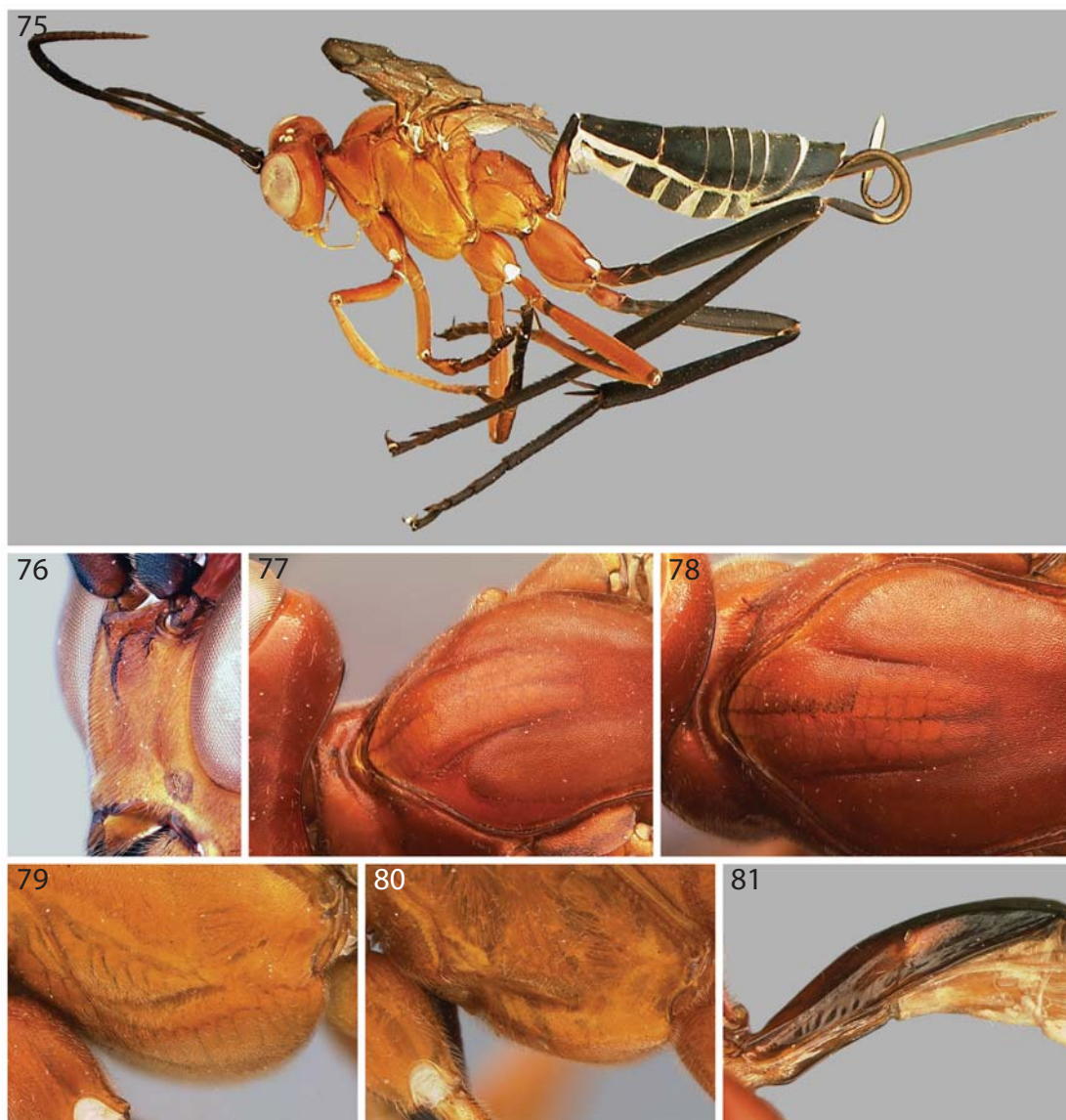
on dorsal 0.7 at eye margin, fore t1–4, tegula mesally on posterior 0.7, small spots at apical corners of T1, wide triangular spots or M-shaped stripe on T2 posterior margin, and large round spot laterally on T5. Fore- and midtibiae somewhat brown. Ovipositor sheath dark brown. Wings hyaline with dark stripes (fig. 16). Forewing centrally with large brown to black spot extending from posterior margin to about apical 0.2 of vein 1M, and wide stripe subapically, extending from anterior margin, crossing areolet, almost but not reaching posterior margin. Hind wing (fig. 16) apical 0.2 weakly infuscate, Costal cell entirely dark infuscate.

**MALE** (first record): Similar to female, most important differences as follows. Smaller, forewing 10.70 mm. S1 ending distinctly beyond spiracle. *Color*: Metasoma without yellow marks. Yellow spot on gena linear, narrow. Foretibia apex ventrally and laterally yellowish, t1–4 whitish; midtibia basal end and t1 basal 0.9 yellowish brown. Stripes on forewing tend to be smaller due to overall small size of male.

**BIOLOGY**: Unknown.

**VARIATION**: Yellowish spot at posterior eye margin from distinct to absent; apical white bands on T2 and T7 sometimes complete, just a little narrower medially, sometimes interrupted





FIGURES 75–81. *Melanocryptus aurantius*, holotype (except fig. 80, paratype). 75, Habitus. 76, Supraclypeal areal, frontolateral. 77, Pronotum and mesoscutum, dorsolateral. 78, Pronotum and mesoscutum, dorsal. 79, Sternaulus, female. 80, Sternaulus, male. 81, First metasomal tergite and sternite, left.

medially; forewing veins 2Cu and 2cu-a can be perfectly aligned, forming a single straight diagonal line.

COMMENTS: Somewhat similar and apparently most related to *M. niger*, with which it shares body mostly dark with bluish or violaceous reflections, and few yellow marks, forewing with two large dark stripes, color pattern repeated on hind wing; distinctly blade-shaped ovipositor, and similar overall pilosity pattern (see also Comments for *M. niger*). Nonetheless, *M. cyaneus* is promptly recognized by its much more intense dark blue and

violaceous metallic reflections (vs. appearing mostly black in *M. niger*; fig. 45 vs. 43), T2 and T7 with large apical yellowish marks (vs. absent in *M. niger*), supraclypeal area flat, without a conspicuous dorsal prominence near toruli (vs. distinct; fig. 83 vs. 93), and anterior transverse carina centrally widely interrupted (vs. approximate, narrowly interrupted in *M. niger*; fig. 55 vs. 56). The forewing  $2Cua/2cu-a = 1.63$  and hind wing  $Cua/cu-a = 1.21$  are both also distinct from *M. niger*, for which these values are around 1.10 and 1.40, respectively.

The female of this species also has several unique features in relation to the other *Melanocryptus* spp.: anterior margin of propodeum sinks progressively into the transverse furrow, thus not forming a border or step (vs. with distinct step and margin; e.g., fig. 55 vs. 58), very pilose supraclypeal area and mesepisternum lateroposteriorly (vs. glabrous to sparsely pilose); anterior transverse carina centrally widely interrupted and curved forward (vs. complete); tall, thorn- or tongue-shaped propodeal apophyses (vs. low, scale shaped); forewing vein  $2Cua$  distinctly longer than crossvein  $2cu-a$  (vs. smaller or at most of the same size); notaulus reaching far into the posterior margin, ending behind level of tegulae (vs. ending centrally, at level of tegulae); body mostly smooth, shiny (vs. matte, nearly entirely covered with delicate sculpturing); petiole basally with weakly developed dorsolateral and ventrolateral carinae (vs. stout); propodeal spiracle very elongate, length  $3.37 \times$  width (vs. at most  $3.00$ ); pleural carina complete, stout (vs. fragmented, mostly indicated by confluent sculpturing); ventral valve of ovipositor with regular ridges (vs. with subapical irregularity on all other species except *M. niger*).

Males of *M. cyaneus* have two conspicuous dark spots on the forewing (vs. entirely hyaline in the single known male specimen of *M. niger*); head and scape are entirely bluish with metallic reflections (vs. supraclypeal area, wide stripe on scape, and gena, entirely yellow, and dorsal bump near toruli brownish in *M. niger*); and the midtibia is bluish, except basal end yellowish (vs. almost entirely yellowish, except ventrally brown in *M. niger*).

DISTRIBUTION: Costa Rica (first record), Panama, Venezuela (first record), Colombia (first record), Ecuador (first record) (fig. 121). Townes and Townes (1966) mention "Panama: Chiriqui" for the type specimen, even though they report that the type is lost, and the label information is not originally cited by Schmiedeknecht (1908), who mentions only "Central America."

MATERIAL EXAMINED: Seven females, three males. COLOMBIA: ♀ Colombia: Dept. Valle, Lower Anchicayá, Alt. 400 m. Tropical very wet forest, Netted, R. Wilkerson, IV.2.76.7 (FSCA); ♂ Colombia: Dept. Valle Central de Anchicaya, 30 km E. Buenaventura, Tropical very wet forest, 560 m, R. C. Wilkerson, 12-VI-1975, Malaise trap (FSCA). COSTA RICA: ♀ Heredia, La Selva, 10-17.VIII.1987, J. Brambila (AEIC); ♂ San Carlos, Schild and Burgdorf leg., no date (USNM). ECUADOR: ♀ Ecuador, Pr. Napo, Rio Oyacachi, bei, El Chaco, 1500 m, 8-13.VI.1977, W. Schacht (ZSMC); ♂ Ecuador, Pichincha, Nambillo Valley near Mindo, 1450 m, 5.VII.1987, M. Cooper (BMNH); ♀ Palmar, Manabi, Ecuad.,  $0^{\circ}10'S$   $79^{\circ}28'W$ , 07.IV.1941, 200 m (AMNH). PANAMA: ♀ Darien, 1967, C.A. Triplehorn. (FSCA); ♀ Porto Bello, 28.II.1911, A. Busck leg. [this is the specimen illustrated in fig. 258a in Townes 1970: 490, as indicated by yellow label pinned with the specimen] (USNM). VENEZUELA: ♀ Caracas, Styrup, Mus: Drens (ZMUC).

*Melanocryptus delos* Aguiar, sp. nov.

Figures 1–2, 7, 9, 18, 29, 34, 46, 49, 54, 66, 87–91, 125

*Melanocryptus* sp. nov.: Santos and Aguiar, 2013: 225; Tedesco and Aguiar, 2013: 86, 89. Outgroup of cladistic analysis.

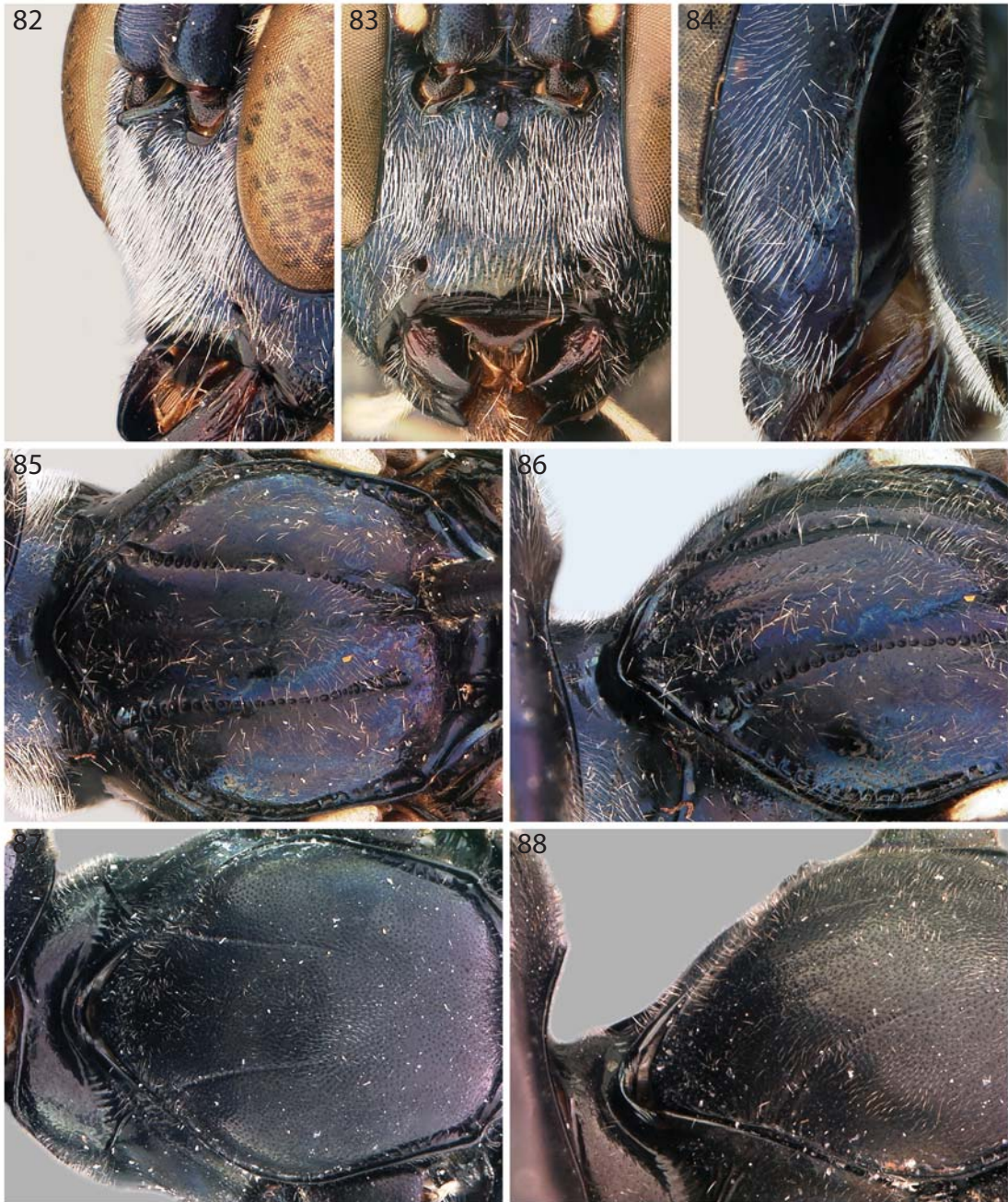
*Melanocryptus niger* [lapsus calami]: Santos and Aguiar, 2012: 37, 39, 40; Santos and Aguiar, 2013: 229. Outgroup of cladistic analysis.

**DESCRIPTION:** *Female holotype.* Forewing 11.10 mm. Body delicately sculptured. Supraclypeal area dorsally with distinct, slightly raised midlongitudinal carina; supraantennal area sparsely pilose, coronal suture short but distinct. Antenna with 26 flagellomeres. Malar space 0.65 mandible basal width. Occipital carina laterocentrally without emargination; apically fusing smoothly with hypostomal carina, forming a Y. Pronotum dorsal margin medially thick, distinctly raised above level of the anterior margin of mesonotum (fig. 88); epomia conspicuous but short, dorsally splitting into a few thin rugosities; pronotum laterocentrally with parallel, delicate longitudinal strigation, which extends along ventroposterior margin as short subcrenulation (fig. 46); otherwise smooth, shiny. Mesoscutum somewhat matte, covered with delicate punctulate (figs. 87–88). Axillary trough of mesonotum centrally with transverse, crenulated channel, otherwise nearly smooth (fig. 34). Notaulus faint, linear, straight, converging posteriorly, ending at center of mesoscutum (figs. 87–88). Scutellar carina advancing a little over scutellum, which is protuberant and weakly elongate. Epicnemial carina reaching 0.55 of distance to subalar ridge, shape as in figure 46. Subalar ridge large, swollen, somewhat elongate oval. Sternaulus nearly straight, deep, crenulate, restricted to anterior 0.55; mesepisternum with punctulate associated with pilosity only, otherwise smooth. Forewing (fig. 18) crossvein 1cu-a basal to 1M+Rs by about 0.15 its own length, its posterior end curved toward wing base; 2Cua 0.83 length of crossvein 2cu-a. Hind wing (fig. 29) vein Cua 2.16× length of crossvein cu-a.

Transverse furrow at base of propodeum moderately deep, densely crenulate (fig. 54). Area anterior to anterior transverse carina smooth; area between anterior and posterior transverse carinae from concentric centrally to obliquely rugulose laterally; area posterior to posterior transverse carina rugulose in varied directions; anterior transverse carina complete, centrally slightly curved forward; posterior transverse carina indicated by two lateral, low, wide apophyses connected with a midanterior transverse portion (fig. 54). Propodeal spiracle elongate, 2.80× longer than wide. Pleural carina weak, delicate, fragmented (fig. 49). Metapleuron finely, densely rugulose, matte. T1 spiracle at middle (basal 0.49); dorsolateral carina differentiated only from spiracle to apex; ventrolateral carina from basally conspicuous to apically inconspicuous; sternite ending opposite spiracle. Tergites finely punctulate, more distinct on T2–3. Ovipositor somewhat blade shaped, 1.62 times taller than wide at midlength, its length 0.95× length of hind tibia, very slightly curved downward; ventral valve ridges with subapical irregularity (fig. 66).

*Pilosity.* Supraclypeal area sparsely pilose (figs. 89–90). White pilosity covering entire upper and lower divisions of metapleuron, propodeum laterally, hind coxa (fig. 46). Mesosoma dorsally, including propodeum and entire mesoscutum and scutellum, nearly glabrous. T1 glabrous, other tergites with short yellowish pilosity, progressing from T2 nearly glabrous to T8 densely pilose.





FIGURES 82–86. *Melanocryptus cyaneus*, female. 82–83, Supraclypeal area, frontolateral and frontal. 84, Gena. 85–86, Pronotum and mesoscutum, dorsal, and dorsolateral. Figures 87–88. *Melanocryptus delos*, female holotype. Pronotum and mesoscutum, dorsal and dorsolateral.





FIGURES 89–90. *Melanocryptus delos*, female holotype. Supraclypeal area. **89**, Frontolateral. **90**, Frontal. Figures 91–92. Apical tergites, pygostylus and external male genitalia. **91**, *M. delos*. **92**, *M. tessellatus* from Colombia. Figures 93–96, *M. dnopheros*, female holotype. **93**, Head, frontal. **94**, Propodeum, left. **95–96**, First metasomal tergite, dorsal and lateral (left) views.

*Color* (figs. 1–2). Black, with faint bluish reflections, wings with two wide stripes. Body chiefly black with a few bluish reflections, and with following white marks: along eye margin, narrow stripe on supraclypeal area (fig. 90), wide spot on supraantennal area, very narrow stripe along 1–2 h; T1 apex with wide curved stripe, not reaching lateral margin; T2 apical margin with narrow, complete, uniform stripe; T7 apical margin narrowly, then a wide spot laterally. Yellowish areas: spot on forefemur apex mesally, and foretibia ventromesal stripe from end to end, and entire lateral side. Ovipositor sheath dark brown, shaft white. Forewing hyaline, with two wide, fuscous stripes, crossing wing fully from anterior to posterior margin: one centrally, basad to pterostigma, one apically, fully covering apical 0.31 of wing, including areolet entirely. Hind wing apex with narrow, C-shaped fuscous stripe.

**MALE:** Superficially similar to female, mostly because of overall color pattern, but with several differences. Differences from female and diagnostic features as follows, based on specimen UFES60555, from same locality as female holotype. Generally considerably smaller than female, but forewing length 6.5–12.0 mm. Antenna with 30 flagellomeres, all flagellomeres of similar shape, cylindrical, from 5 (flagellomere 1) to 2 times (apical flagellomeres) as long as wide. Supraclypeal area dorsally, near toruli, with stout, somewhat triangular carina; remainder of body structurally as in the female. *Color* pattern quite distinct from that of female. Antenna with central white band (flagellomere 12 apex, 13–17 entirely, 18 basally). White or whitish on following areas: entire labial and maxillary palpi, supraclypeal area, orbital band interrupted only at malar space and from 11 h to 1 h, progressing from very narrow on temple to very wide on gena, ventrally; most of propleuron, entire anterior region of pronotum, anterad epomia; tegula except posterior tip, subalar ridge, mesepimeron dorsally, scutellum, foreleg except brownish femur and brown t5, some spots on midcoxa anteriorly, entire midtrochanter, midcoxa anteriorly, entire tibia, midbasitarsus on basal third, most of hind trochanter, basal 0.2 of hind tibia, entire hind t2–4, hind t5 except tip; S1 entirely, T1 on basal half, reaching level of spiracles, and at apex, T2–3 and T7–8 with wide apical transverse stripe (fig. 91). Wing light amber, with apical fuscous stripe ending at, but not covering, the areolet.

Male and female share what seems to be a distinctive feature of the species, the dorsoposterior margin of pronotum thick and distinctly raised above the level of the anterior margin of mesonotum (fig. 88). The sculpture of the mesonotum and structure of notaulus of the male and female are also quite similar, a feature somewhat characteristic of the species.

**MORPHOLOGICAL VARIATION:** Females and males show relatively stable structure and color patterns. Small variations which might be of some interest are as follows. Female: Central stripe of forewing of reduced size in the only known female from southern Brazil. Antenna with 25–27 flagellomeres. T7 apical white stripe variable, sometimes wide and somewhat divided into sections, or dorsally narrowed or absent and present only laterally as a large to small spot. Ovipositor shaft dark brown. *Male:* Antenna with 28–31 flagellomeres. Orbital band sometimes not reaching beyond 5 h. Forewing 7.00–9.80 mm. Forefemur varies from whitish to blackish. The specimen from Ecuador has reduced yellow areas on pronotum and tegula, and its apical fuscous stripe of front wing is restricted to the anterior portion (similar to fig. 15).

**COMMENTS:** Quite similar to the related *M. tesselatus* and *M. hadroglyptus*, from both of which it can be differentiated as follows. Females: (1) forewing apical infuscation covering the

apex entirely (vs. not reaching to the wing tip, which remains hyaline in *M. tessellatus*; fig. 18 vs. 17, 19); (2) orbital band absent dorsally at least from 11 to 1 h, often more (vs. wide and complete at least from 10 to 2 h, often from 9 to 3 h; fig. 2 vs. 72); (3) T7 apical whitish stripe narrow, irregular or absent (vs. usually wide and uniform); (4) notaulus faint, almost indistinct (fig. 88) (vs. thin but distinct, well marked in *M. tessellatus*, or deep, meeting behind, in *M. hadroglyptus*); (5) maxillary palpus often spotted in pale yellow or whitish (vs. dark brown); (6) mesosoma laterally, posterior of point of insertion of hind wing, with short, somewhat sparse pilosity (vs. densely pilose, hairs long, overlapping; fig. 46 vs. 70); (7) mesopleural suture almost glabrous and straight, or at most slightly curved (vs. densely pilose and bent/angled at level of hypoepimeron); (8) pleural carina faint, fragmented (vs. distinctly developed and complete in *M. tessellatus*, or conspicuously widely crenulate in *M. hadroglyptus*; fig. 49 vs. 48, 50).

Males can be differentiated from those of *M. hadroglyptus* as follows: (1) flagellomeres without apical tufts of pilosity, flagellum cylindrical (vs. flagellomeres from f4 to subapical ones with distinct tuft of pilosity apicoventrally, so that antenna is apparently serrate, as in fig. 98); (2) hind tibia basal 0.2 and t2–5 whitish (vs. hind tibia entirely black, hind tarsus black or at most t3–4 whitish); (3) petiole whitish from base to almost level of spiracles, then with a large apical whitish spot (vs. petiole black, postpetiole with small apical whitish spot); (4) white band of antennae formed by entirely whitish flagellomeres (vs. flagellomeres of white band ventrally dark brown or brown); (5) pleural carina a fine line (vs. widely crenulate); (6) wing around base of vein 1M+Rs and crossvein 1cu-a hyaline (vs. surrounded by narrow infuscated area, as in fig. 71); (7) sternites almost completely whitish (vs. with alternated black and white stripes, areas of about same size).

*M. delos* can potentially be mistaken as *M. cyaneus*, particularly in function of a predominantly black body with some metallic bluish reflections, T2 and T7 with apical whitish stripe or spots, forewing with two conspicuous fuscous stripes, and hind wing apex weakly fuscous. *Melanocryptus delos* is however easily separated by having a propodeum of quite different structure, with complete anterior transverse carina, posterior of which it is distinctly rugulose, and bearing low, linear apophyses (vs. carina widely interrupted centrally and curved forward, polished surface, and tall and stout apophyses in *M. cyaneus*; fig. 54 vs. 55), ovipositor short, 0.95× length of hind tibia (vs. 1.55), ovipositor slightly but distinctly curved downward (vs. straight), and supraclypeal area mostly glabrous (vs. covered with conspicuous, dense white pilosity). Males of these two species are also similar, but the male of the present species can be promptly recognized by having a distinct white band on the antenna (vs. absent, antenna entirely bluish black for male *M. cyaneus*), T1–3 and T7 with conspicuous apical white stripe (vs. entirely black), and forewing only with apical fuscous stripe (vs. central and apical spots or stripes). Geographical distribution also apparently partially distinct: *M. delos* mainly occurring in southeastern and southern Brazil, while *M. cyaneus* seems to be typical of Central America. The distributions of these two species overlap, however, at least in Colombia (fig. 127 vs. 121).

The greatly superior number of male specimens available for study is probably related to the fact that the specimens were collected mostly with Malaise traps, which collect predominantly males for *Melanocryptus* (Aguiar and Santos, 2010).

**ETYMOLOGY:** The specific epithet derives from the Greek work *delos*, “evident, visible, clear,” as a reference to the fact that this is a large and conspicuous species.



**DISTRIBUTION:** Colombia, Ecuador, Brazil, and Argentina (fig. 125). In Brazil, apparently most common in the southeastern and southern portions of the Atlantic Forest (Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina).

**MATERIAL EXAMINED:** Twenty-one females, 64 males. **Holotype** ♀ from BRAZIL: *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Gambá 1, Mata secundária baixa, 10–17.XII.2005, Malaise trap, J.C.R.Fontenelle, UFES60584 (UFES). Triangle mount, complete, in good shape. **Paratypes:** ARGENTINA: ♂ Missiones, P.N. Iguazu, Pto Canoas, 09.XII.1990–06.I.1991, 180 m, S. and J. Peck, Malaise (AEIC); ♂ same data except 08.XII.1990 (AEIC); ♂ Tucuman, S. Pedro d. Colalao, II.1949, 1200 m, Arnau (CNCI). BRAZIL: *Bahia*: ♂ Firmino Alves, Fazenda Santo Antônio, 14°59'51"S 39°55'55"W, 09.IV.2003, Malaise, Pt.6, J. Cardoso and J. Maia, UFES60551 (UFES). *Espírito Santo*: ♀ Cariacica, Reserva Biológica de Duas Bocas, Pau Amarelo, 23–25.X.2005, YPT, Pt14, A.P. Aguiar et al., UFES51244; 2♀ same data except 26–28.X.2005, YPT, Pt06, UFES43047, UFES43054; ♂ Rio Novo do Sul, Sítio Bortoloti, 12–17.X.2007, Malaise, Pt.04, F. Rampinelli and M. Araújo, UFES43051 (UFES); ♂ Santa Maria de Jetibá, Fazenda Paulo Seick, Área 1, 20°02'31.1"S 40°41'51.3"W, 29.XI–06.XII.2002, Malaise B3, M. Tavares, C. Azevedo, et al., UFES43049 (UFES); ♂ Domingos Martins, Mata Pico do Eldorado, 20°22'17"S 40°39'29"W, 03–10.XII.2004, Malaise T6, M. Tavares et al. (UFES); ♂ same data except 26.XI–03.XII.2004, Malaise B8 (UFES); ♂ Cariacica, Reserva Biológica de Duas Bocas, Pau Amarelo, 21–30.X.2005, Malaise, Pt12, A.P. Aguiar et al., UFES51243 (UFES). *Minas Gerais*: 2♀ Parque Estadual do Rio Doce, Trilha do Gambá 1, Mata secundária baixa, 10–17.VII.2002, Malaise trap, J.C.R.Fontenelle, UFES60585, UFES60586; ♀ same data except 17–24.VII.2005, UFES60587; ♀ same data except Trilha do Vinhático 1, Mata secundária alta, 09.XI.2000, UFES60590; ♀ same data except Trilha do Vinhático 3, UFES60591; ♀ same data except 09–15.VII.2004, UFES60592; ♀ same data except Trilha do Gambá 2, Mata secundária baixa, 17–24.VIII.2002, UFES60588; ♀ same data except Área da Tereza 2, Mata Primária, 01–08.VII.2003, UFES60589; ♂ Dionísio, Fazenda Morro do Gavião, Mata primária, 22–29.X.2005, Malaise, J.C.R. Fontenelle, UFES60562 (UFES); ♂ same data except Pt. 2, 05–12.XI.2005, UFES60557 (UFES); 3♂ same data except 22.X.2005, UFES60560, UFES60561, UFES60577 (UFES); ♂ same data except Pt.3, 24–31.VII.2005, UFES60559 (UFES); ♂ Parque Estadual do Rio Doce, 19°42'S 42°33'W, Trilha da Lagoa Bonita 2, Mata secundária baixa, 20–26.X.2000, Malaise trap, J.C.R. Fontenelle, UFES60558 (UFES); 2♂ same data except Trilha da Lagoa Bonita 3, 02–09.XI.2000, UFES60556, UFES60579 (UFES); 2♂ same data except 13–20.X.2000, UFES60576, UFES60578 (UFES); 2♂ same data except Área da Tereza 2, Mata primária, 01–08.VII.2003, UFES60564, UFES60565 (UFES); ♂ same data except 12–19.X.2000, UFES60563 (UFES); ♂ same data except 02–09.XI.2000, UFES60580 (UFES); ♂ same data except Área da Tereza 3, 31.VII–07.VIII.2002, UFES60566 (UFES); ♂ same data except Trilha do Gambá 3, 10–17.VII.2001, UFES60555 (UFES); ♂ same data except Trilha do Vinhático 1, Mata secundária alta, 13–19.X.2000, UFES60567 (UFES); ♂ same data except 01–08.XI.2001 (UFES); ♂ same data except 09.XI, UFES60568 (UFES); ♂ same data except 22–29.X.2005 (UFES); ♂ same data except Trilha do Vinhático 2, 13–19.X.2000, UFES60569 (UFES); ♂ same data except 24.X.2002, UFES60451 (UFES); ♂ same data except 03–10.XI.2004 (UFES); ♂ same data except 10–17.VII.2007, UFES60581 (UFES); ♂ same data except 04–11.XI.2007, UFES60554 (UFES); 3♂ same data except Trilha do Vinhático 3, 24.X.2002, UFES60570–60572 (UFES); ♂ same data except 10–17.VI.2002, UFES60582 (UFES); ♂ same data except 10–17.VI.2003, UFES60573 (UFES); ♂ same data except 03–10.X.2004, UFES60574 (UFES); ♂ same data except 24–31.VII.2005, UFES60575 (UFES). *Paraná*: ♂ Foz do Iguaçu, 03.XII.1966, Excursão Depto Zoologia UFPR; ♂ Fênix, Reserva Estadual ITCF, 08. IX.1986, Levantamento Entomológico PROFAUPAR, Malaise (DZUP); 3♂ Antonina, Reserva Sapitan-duva, 15.IX.1986, Levantamento Entomológico PROFAUPAR (DZUP); 2♂ same data except 06.X (DZUP); ♂ same data except 13.X (DZUP); ♂ same data except 20.X (DZUP); ♂ same data except 08.XII (DZUP); ♂ same data except 29.VI.1987 (DZUP). *Santa Catarina*: ♀ Itajaí, 22.II.1994, E.M. Oliveira (DZUP); ♂ Blumenau, 18–27.X.1976, Depto Zoologia UFPR (DZUP). ECUADOR: ♂ Pastaza,



22 km SW Puyo, 900 m, 14–16.VII.1976, S. and J. Peck (AEIC). **Other specimens:** BRAZIL: *Rio de Janeiro*: ♀ Mangaratiba, Muriqui, VII.1969, M. Alvarenga (AEIC); 2 ♀ and 2 ♂ Teresópolis, 8.III.1966, Townes and Townes (AEIC); 2 ♂ same data except 11.III (AEIC); ♂ same data except 13.III (AEIC); ♀ same data except 09.III.1966 (AEIC); ♂ Guanabara, Represa Rio Grande, I.1972, M. Alvarenga (AEIC); ♂ same data except VII.1972 (AEIC). São Paulo: ♀ Barueri, 16.IV.1955, K. Lenko (AEIC). COLOMBIA: ♀ Leticia, 10.VII.1970, H. Howden and A. Howden (AEIC). PERU: ♀ Avispas, nr. Marcapata, 1–15.X.1962, Luis Peña (AEIC).

*Melanocryptus dnopheros*, sp. nov.

Figures 20, 35–36, 58, 93–96, 122

**DESCRIPTION:** *Female holotype.* Forewing 11.60 mm. Body entirely matte, only apex of T1 smooth, polished. Supraclypeal area (fig. 93) distinctly convex centrally, from base of toruli to clypeal suture, distinct from area along eye margin; dorsally with short midlongitudinal elevation just below level of toruli; supraantennal area with fine sculpturing, matte, coronal suture faint, inconspicuous. Antenna with 26 flagellomeres. Malar space 0.74 mandible basal width. Occipital carina laterocentrally without emargination; apically fusing with hypostomal carina far from base of mandible. Pronotum dorsomedial margin not raised, aligned with anterior margin mesoscutum; epomia short, somewhat inconspicuous; sculpturing fine but well marked, entire pronotum matte, laterocentrally with stout, somewhat parallel, longitudinal strigation, which extends along ventroposterior margin as short subcrenulation. Mesoscutum matte, covered with fine sculpturing resembling goose pimples. Notaulus narrow but distinctly impressed, straight, slightly converging posteriorly, ending at center of mesoscutum. Axillary trough of mesonotum anterior wall polished, basally with transverse, crenulated channel, remainder distinctly transversely striated (figs. 35–36). Scutellar carina distinctly advancing until about mid-length of scutellum (fig. 35), which is very triangular in dorsal view, not protuberant (fig. 36). Subalar ridge narrow, longitudinal. Epicnemial carina reaching 0.72 of distance to subalar ridge, nearly straight. Sternaulus deep, closely crenulate, weakly curved upward, not continued posteriorly by shallow depression toward mesopleural fovea; mesepisternum intensely transversely rugulose, matte. Forewing (fig. 20) crossvein 1cu-a perfectly opposite 1M+Rs, its posterior apex straight, not even minimally curved; vein 2Cua 0.78 length of crossvein 2cu-a. Hind wing (fig. 20) vein Cua 1.27× length of crossvein cu-a.

Transverse furrow at base of propodeum sunken, wide, crenulate, narrowing moderately toward the sides (fig. 58). Propodeum area anterior to anterior transverse carina allutaceous, matte; area posterior to it entirely finely rugose; anterior transverse carina complete, bow shaped; posteriorly with lateral, low, scale-shaped apophyses, and a central, anterior bump or elevation (fig. 58). Propodeal spiracle elongate, 2.46× longer than wide. Line of meeting along propodeum and metapleuron quite sharply defined, but respective pleural carina incompletely formed by confluent rugosities (fig. 94). Metapleuron densely transversely rugulose, matte (fig. 94). T1 spiracle approximately at middle (basal 0.45); dorsolateral carina complete from base of petiole to apex of postpetiole; ventrolateral carina distinct; sternite ending distinctly beyond level of spiracle (fig. 96). T1 (fig. 95) alutaceous, except apex polished; T2–8 with finely alutaceous combined with goose-pimple sculpturing associated with pilosity. Ovipositor blade

shaped, 2.18× taller than wide at midlength, length 1.19 length of hind tibia, straight; ventral valve ridges with subapical irregularity (similar to fig. 62).

*Pilosity.* All body pilosity yellowish brown. Supraclypeal area sparsely pilose, nearly glabrous. Short, moderately visible pilosity on most of mesosoma. T1 glabrous; remaining tergites with conspicuous and somewhat abundant pilosity.

*Color.* Entirely black to dark brown. Forewing dark amber infuscate, with wide central and basal lighter areas. Hind wing light amber infuscate, darkened along apical and posterior margins.

MALE: Unknown.

VARIATION: Unknown.

BIOLOGY: Unknown.

COMMENTS: Most similar to *M. violaceipennis* Cameron, including body and wings darkened, but distinct from that species by many features, as follows: forewing distinctly patterned, showing sharp contrast between light and dark areas (vs. more uniformly infuscate in *M. violaceipennis*; fig. 20 vs. 21); S1 ending distinctly apicad spiracle, and petiole laterally with delicate dorsolateral and ventrolateral carinae (vs. distinctly basad, and stout carinae; fig. 96 vs. 114); propodeum sculpture fine (vs. coarse; fig. 58 vs. 59); pleural carina faint (vs. conspicuous and complete); petiolar tergite mostly matte, polished only at apex (vs. mostly smooth and polished; fig. 95 vs. 113); supraclypeal area medially more distinctly raised (vs. weakly so; fig. 93 vs. 112); scutellum elongate and triangular, sculpturing evident, coarser, and carina clearly advancing over it (vs. more wide and round, with delicate sculpturing, scutellar carinae weakly advancing over it; fig. 36 vs. 39); foretibia entirely black (vs. ventrally pale); epicnemial carina nearly straight (vs. quite sinuous or somewhat W-shaped); face entirely black (vs. bearing yellow marks on eye margin above and below level of toruli; fig. 93 vs. 112); forewing crossvein 1cu-a perfectly opposite vein 1M+Rs, its apex straight (vs. 1cu-a distinctly basad 1M+Rs, its apex distinctly curved toward wing base; fig. 20 vs. 21); and hind wing vein Cua 1.30× length of crossvein cu-a (vs. twice the length; fig. 20 vs. 21).

Also similar to *M. tupan*, from which it can be differentiated by the wing color pattern (fig. 12 vs. 20), pilosity, and several other features (see Comments for *M. tupan*).

ETYMOLOGY: The specific epithet derives from the Greek *dnopheros*, “dark, gloomy, murky”; in reference to the darkened body and wings of the new species.

DISTRIBUTION: Ecuador (fig. 122).

MATERIAL EXAMINED: 1 female. **Holotype** ♀ ECUADOR: Napo, Baeza, 2000 m, Feb[ruary] [19]79, [WRM] Mason (AEIC). Pinned. Right foreleg beyond coxa missing, otherwise complete, in good condition.

*Melanocryptus hadroglyptus* Aguiar, sp. nov.

Figures 9, 19, 30, 37, 42, 47, 50, 63, 98–99, 120

DESCRIPTION: *Female holotype.* Forewing 9.50 mm. Body delicately sculptured. Supraclypeal area dorsally with distinct, longitudinal protuberance; supraantennal area laterally smooth, coronal suture irregularly shaped, depressed in front of ocelli. Antenna with 25 flagel-

lomes. Malar space 0.61 mandible basal width. Occipital carina laterocentrally without emargination; subapically slightly irregular (fig. 99). Pronotum dorsomedial margin not raised above level of anterior margin of mesonotum; epomia stout, distinct, vertical, dorsally straight, not curving mesally; pronotum (figs. 42, 47) laterally with few rugulosities associated with epomia, ventroposterior margin with short subcrenulation, otherwise smooth, shiny. Mesoscutum partially shiny, covered with delicate punctulate. Notaulus deep, narrow but distinctly microcrenulate, straight, converging and meeting posteriorly, ending close to posterior 0.1 of mesoscutum. Axillary trough of mesonotum basally with transverse, crenulated channel, otherwise mostly smooth, dorsally sculptured as scutellum (fig. 37). Scutellar carina ending at scutellum, which is moderately protuberant, triangular (fig. 37). Epicnemial carina reaching about 0.8 of distance to subalar ridge, shape as in fig. 47. Subalar ridge conspicuous, elongate oval. Sternaulus (fig. 42) sinuous, deep, crenulate, on anterior 0.7 of mesepisternum, which is mostly smooth. Forewing (fig. 19) crossvein 1cu-a based vein 1M+Rs by little more than its own width, its posterior end slightly but distinctly curved toward wing base; vein 2Cua 0.72 length of crossvein 2cu-a. Hind wing (fig. 30) vein Cua 2.78× length of crossvein cu-a.

Transverse furrow at base of propodeum deep, from centrally wide to laterally narrow, fully crenulate. Propodeum generally smooth; anterior transverse carina complete, centrally bent forward, at this same region anteriorly with two small carinae projecting divergently anteriorly, posterior face of carina with short, stout rugosities; posterior transverse carina only indicated by three large, conspicuous scale-shaped apophyses, two lateral, one central. Propodeal spiracle elongate, 2.94× longer than wide. Pleural carina conspicuously crenulate (fig. 50). T1 spiracle at middle (basal 0.53); dorsolateral and ventrolateral carinae absent, except at the very base of petiole; surface smooth, polished; sternite ending opposite spiracle. T2–8 with fine sculpturing associated with pilosity, coarser on T2. Ovipositor somewhat blade shaped, 2.14× taller than wide at midlength, but 19% taller at apex than at base; its length 1.13× length of hind tibia, straight; ventral valve ridges with subapical irregularity (fig. 63).

*Pilosity.* Supraclypeal area sparsely pilose, hairs short, whitish. Thick silvery pilosity covering mesepisternum posteroventrally, entire upper and lower divisions of metapleuron, propodeum laterally, and hind coxa (fig. 47); propodeal pilosity becomes easily invisible depending on angle of illumination; mesoscutum and scutellum inconspicuously pilose. T2–8 covered with fine yellowish pilosity, T8 apex with long, dense, erect pilosity.

*Color.* Black, with wide, yellowish ivory stripes on head and metasoma (fig. 42), forewing with two wide dark stripes (fig. 19). Body black, T2–8 with weak bluish reflections, with following whitish to yellowish marks: supraclypeal area with narrow streaks along eye margin between 8–9 h; most of supraantennal area except black around toruli and midlongitudinally; proceeding laterally without reaching ocelli, continuing laterally as narrow stripe until about 4 h; T1 with two large apical spots almost entirely fused with each other centrally, T2 and T7 with wide apical stripe extending from one side to the other, on T2 narrowing centrally, on T7 covering most of tergite. Sternites black, except yellowish for S2 apical 0.2 and S4–5 narrowly at apical margin. All legs dark brown, foretibia ventrally with narrow yellowish streak. Ovipositor sheath, including shaft, dark brown. Forewing hyaline, with two wide, fuscous stripes,



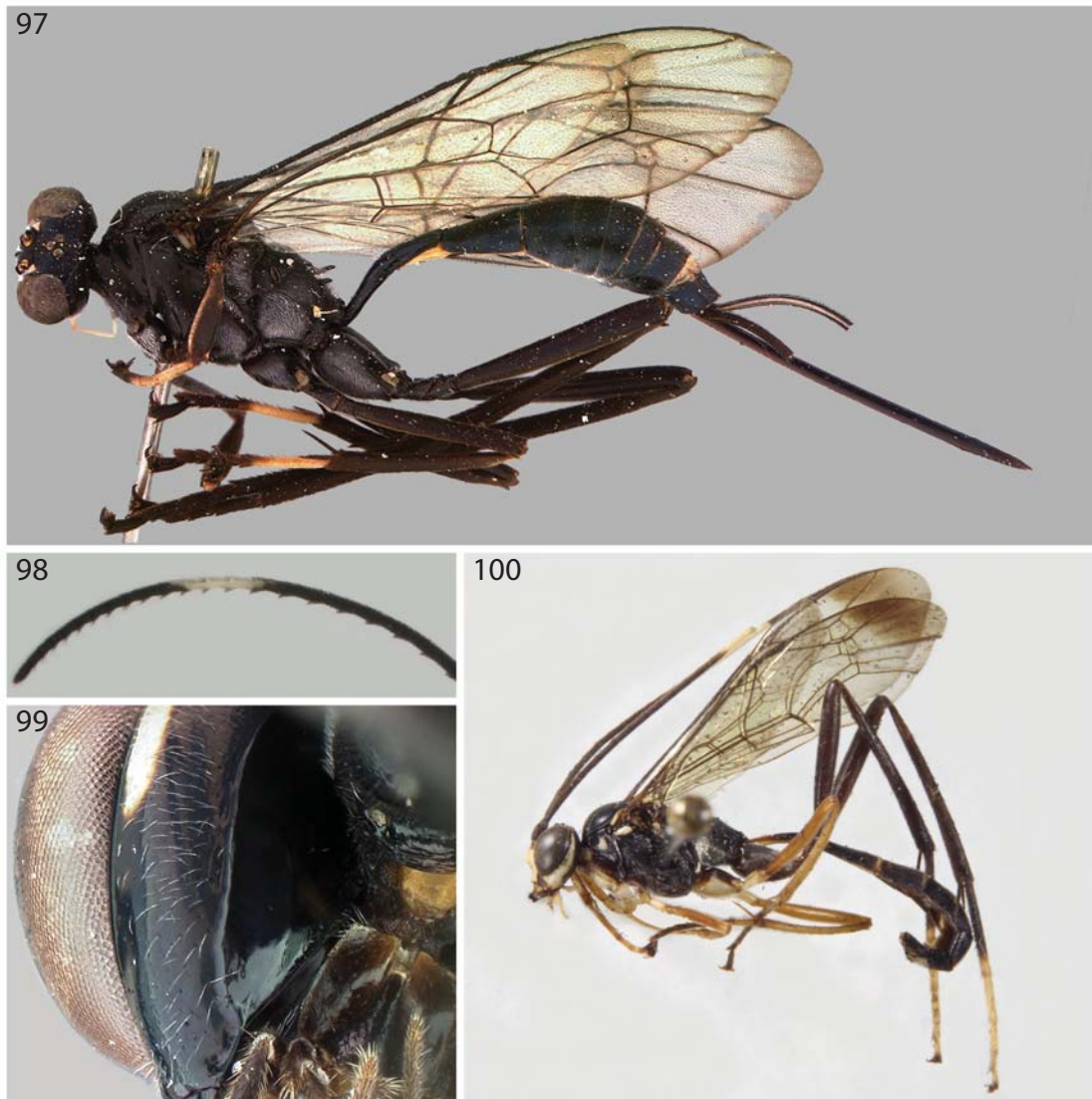


FIGURE 97, *Melanocryptus niger*, habitus. Figures 98, 99, *Melanocryptus hadroglyptus*. 98, Flagellomere, lateral view, male. 99, Gena, occiput, hypostoma, left side. Figure 100, *Species inquirenda* (*Melanocryptus*), male. Habitus.

reaching fully from anterior to posterior margins; apical stripe not reaching apical 0.1 of wing, but covering areolet entirely. Hind wing nearly entirely hyaline (fig. 30).

MALE: Structurally similar to female, but color pattern differs considerably; see cladistic analysis for details (tables 1–2, fig. 9).

VARIATION: Longitudinal carinae at anterior area of propodeum faint; propodeum behind posterior transverse carina rugulose; eye margin between 8–9 h light brown; apical whitish spots on T1 totally fused. Males show complex variation; see cladistic analysis (tables 1–2, fig. 9). The male from Colombia (Camp Sautata) is unique in having a yellow spot dorsoposteriorly on the metapleuron.

The male from Panama (Coclé) is unique in having pleural carina sharply deep and truly crenulate, i.e., crenulations mostly unconnected to rugosities from propodeum, and forecoxa entirely black.

**BIOLOGY:** An unidentified phoretic mite present in one female (fig. 42).

**COMMENTS.** Similar to *M. tessellatus*, from which it can be differentiated by having the notaulus deeply impressed, distinctly microcrenulate, clearly converging and meeting posteriorly of tegulae (vs. faint, ending quite separated, and at level of tegulae, in *M. tessellatus*); subalar ridge light brown, contrasting with black mesepisternum (vs. black, concolorous with mesepisternum; fig. 47 vs. 70); scutellar carina ending at scutellum (vs. distinctly advancing over anterior third of scutellum; fig. 37 vs. 31); pleural carina conspicuously crenulate (vs. linear; fig. 50 vs. 48); S1 ending opposite petiolar spiracle (vs. distinctly basal); and T8 apex with long, erect pilosity (vs. delicate, decumbent pilosity). Other differences might be less stable: hind wing vein Cua about 2.80× length of crossvein cu-a (vs. 1.9; fig. 30 vs. 28); areolet entirely covered by apical stripe (vs. not covered, not even partially; fig. 19 vs. 17); minor differences in the shape of the dorsal protuberance of supraclypeal area, number of flagellomeres, and shape of epomia and epicnemial carina (see descriptions).

Also somewhat similar to *M. delos*, from which it can be differentiated as follows: on both sexes, the forewing apical stripe of infuscation covering the areolet partially or entirely, but not reaching to the wing tip, which remains hyaline (vs. stripe not or barely reaching areolet on males, and wing apex entirely covered by infuscation on both sexes, for *M. delos*). Females: (1) Orbital band wide and complete at least from 10 to 14 h, often from 9 to 15 h (vs. absent from 11 to 13 h, often more; fig. 42 vs. 2); (2) T7 apical yellowish stripe wide and uniform (vs. narrow, irregular, or absent); (3) Notaulus deep, meeting behind (vs. faint, almost indistinct, not meeting, ending centrally); (4) Maxillary palpus dark brown (vs. often spotted in pale yellow or whitish); (5) Mesosoma laterally, posterior to level of hind-wing base, densely pilose, hairs overlapping (vs. short, sparse pilosity; fig. 47 vs. 46); (6) Mesopleural suture densely pilose and bent (angled) at level of hypoepimeron (vs. almost glabrous and straight or at most slightly curved; fig. 47 vs. 46); (7) pleural carina conspicuously crenulate (vs. faint, fragmented; fig. 50 vs. 49). Males: (1) flagellomeres from f4 to apical with distinct tuft of pilosity apicoventrally, so that antenna is apparently serrate (fig. 98) (vs. without tufts, antenna cylindrical); (2) hind tibia entirely black, hind tarsus black or at most with t3–4 whitish (vs. hind tibia basal 0.2 and t2–5 whitish); (3) petiole black, with small apical whitish spot (vs. petiole whitish from base to almost level of spiracles, apical spot large); (4) subapical white band of antennae covering dorsal and lateral sides of flagellomeres only (vs. respective flagellomeres entirely whitish); (5) pleural carina distinctly crenulate (vs. delimited by a fine line); (6) base of vein 1M+Rs and crossvein 1cu-a surrounded by narrow infuscated area (vs. hyaline); (7) sternites with alternated black and white stripes or areas of about same width/size (vs. sternites almost completely whitish).

Males are also somewhat similar to those of *M. whartoni*; see Comments of that species for differential details.

**ETYMOLOGY:** The specific epithet derives from the combination of the Greek words *hadros*, “thick, stout, strong,” + *glyptos*, “carved,” in reference to the distinctly crenulate notaulus and pleural carina.

DISTRIBUTION: Belize, Costa Rica, Panama, Colombia, Ecuador. (fig. 120).

MATERIAL EXAMINED: Three females and 24 males. **Holotype** ♀ COSTA RICA: Golfito, VII.22.1981, "B.K. Dozier Collector, *Melanocryptus* sp. det. Santos 2010 (FSCA). Pinned, hind right t5 missing, otherwise in good condition. **Paratypes**: BELIZE: ♂ BR. HONDURAS [old name for Belize], Middlesex, 125 m, 25.IV.1965, E.C.Welling (CNCI). COLOMBIA: ♂ Camp Sautata, Rio Atrato, Colom., 12.XI–14.XII.1967 (AEIC). COSTA RICA: ♂ Pto. Viejo, La Selva Sta., 18.II.1980, 50 m, W. Mason (AEIC). ECUADOR: ♂ ECUADOR, Pichincha, 47 km S. Santo Domingo, Rio Palenque, Sta., 1–14.VII.1975, A. Forsyth (CNCI); ♂ ECU[ADOR]: Pich. [incha] 500 m, Tinalandia, 16 km SE. Sto. Domingo, 4–14.VI.1976, S. and J. Peck" (AEIC). **Other specimens**: COSTA RICA: ♀ Est. Biol. La Selva, 50–150 m, 10°26'N, 84°01'W, Jul. 1993, INBio-OET, 15 Julio 1993, bosque primário, M/07/157; ♀ same data except "May 1993" + "3 Mayo 1993, M/10/089" (MUCR); ♀ Heredia, Prov., Pto. Viejo, Finca La Selva, 13–16.VII.1973, D.C. Rentz, K.R. Brodey + Arboretum II (CASC); ♂ CR [Costa Rica], Puntarenas, Golfito-United Fruit Co., VII-I-1976, M. Wasbauer, malaise trap + UC Berkeley, EMEC, 731734 (EMEC). ECUADOR: 2♂ Pichincha, nr. Tinalandia, 09–13.V.1987, 1150 m, Brown and Coote; Tinalandia, 16 km SE Sto. Domingo, 04–14.VI.1976, 500 m, S. Peck and J. Peck (AEIC); ♂ Palmar, Manabi, 0°10'S 79°28'W, 06.IV.1941, 200 m (AMNH); 7♂ same data except 07.IV (AMNH); 2♂ same data except 10.IV (AMNH); ♀ same data except 11.IV, also handwritten label "*Melanocryptus*/det. Porter" (AMNH); ♂ same data except 27.IV (AMNH). PANAMA: 2♂ Barro Colorado, Canal Zone, II-18-1829, Collector C.H. Curran (AMNH); ♂ same data except XII-24-1928 (AMNH) [both specimens with handwritten label "Hoplophorina n. sp., Prat '41"]; ♂ Provincia de Panama, Capira, Cerro Campana [spelled "Comana" in label], 800 m, 1. II.1987, Edward S. Ross (CASC).

*Melanocryptus niger* (Szépligeti, 1916)

Figures 4–5, 10–11, 22–23, 38, 43, 56, 64, 97, 124

*Hoplophorina nigra* Szépligeti, 1916: 238. ♀. Original description. Type in HNHM (Hungary), examined.

*Melanocryptus niger* (Szépligeti): Townes and Townes, 1966: 68, catalog, synonymy. Townes, 1970: 299, listed. Carrasco 1972: 328, listed for Peru. Yu and Horstmann, 1997: 269, catalog.

REDESCRIPTION: *Female holotype*. Forewing 16.40 mm. Supraclypeal area flat, middorsally with short elevation near toruli; supraantennal area deep, covered with distinct, concentric striations, coronal suture distinct, complete; crenulate depression in front of ocelli. Antenna [missing; 27–28 flagellomeres in other female specimens]. Malar space 1.00× mandible basal width. Occipital carina in lateral view without emargination; apically meeting the hypostomal carina to form a Y. Pronotum dorsally regularly curved, posteriorly sunk into a shallow channel or shaft, then curving upward; epomia conspicuous, quite long (fig. 43), dorsally bent, laterally straight vertical, ending at level of pronotal spiracle; ventroposterior margin coarsely crenulate, pronotum otherwise smooth, shiny (fig. 43). Mesoscutum distinctly punctulate. Notaulus deep, narrow, centrally almost linear, wider on posterior apex, crenulate throughout, converging posteriorly to end close together, but not fused, a little posterior of level of tegulae. Axillary trough of mesonotum basally with transverse, broad channel crossed by 5 thick crenulations, otherwise mostly smooth, polished (fig. 38). Scutellar carina advanced over anterior 0.2 of scutellum, which is a little protuberant and rounded, with sparse punctuation (fig. 38). Epicnemial carina reaching about 0.75–0.87 of distance to subalar ridge, approximately straight,



short, ending at level of pronotal spiracle (fig. 97). Subalar ridge somewhat elongate, not much pronounced. Sternaulus slightly curved, deep, crenulate, restricted to anterior 0.50; mesepisternum smooth, dorsal half polished, shiny. Forewing (figs. 10–11) vein 1M+Rs with small bump at basal 0.25, perhaps an indication of original point of connection between Rs and M; crossvein 1cu-a basal to 1M by about half its own length; vein 2Cua  $1.31\times$  length of crossvein 2cu-a. Hind wing (figs. 22–23) vein Cua  $1.47\times$  length of crossvein cu-a.

Transverse furrow at base of propodeum shallow, subcrenulate, central crenulations obsolescent, furrow width more or less regular; anterior margin of propodeum merging smoothly with transverse furrow, therefore not forming an edge (fig. 56). Propodeum in between carinae generally smooth, shiny; anterior transverse carina interrupted on central 0.2 or less, each side bending anteriorly at almost  $45^\circ$ , bent part of carina with short crenulation on both sides (fig. 56); apophyses distinctly projected (fig. 97), tongue shaped (flat in cross section); rugulosity extending between bases of apophyses and crenulation extending laterally from each apophysis to meet pleural carina may indicate presence of posterior transverse carina. Propodeal spiracle quite elongate,  $3.67\times$  longer than wide. Pleural carina complete, distinct, shaped as a crenulate longitudinal shaft. Metapleuron rugulose, mostly hidden by dense pilosity. T1 spiracle slightly beyond middle (basal 0.57); dorsolateral and ventrolateral carina absent; sternite ending opposite spiracle (fig. 97). Petiole polished, apicad of spiracles with sparse punctures and some alutaceous; T2 matte, with dense punctation, T3–8 nearly smooth, faintly alutaceous. Ovipositor blade shaped,  $2.33\times$  taller than wide,  $1.43\times$  length of hind tibia, straight; ventral valve ridges without subapical irregularity, but basalmost tooth reduced, a small tubercle (fig. 64), ridges otherwise regular.

*Pilosity.* Supraclypeal area with dense, white, ventrally decumbent pilosity. Dense silvery pilosity on pronotum collar, propleuron, all coxae and trochanters, pectum, mesosternum, mesepisternum (except dorsal half glabrous), entire mesoepimeron, upper and lower divisions of metapleuron (fig. 43), and propodeum posteriad anterior transverse carina (fig. 56). T1 glabrous; T2–7 with short yellowish pilosity.

*Color.* Nearly entirely black with bluish, metallic reflections (fig. 97). Yellowish only on the following: labial palpus articles 2–3; maxillary palpus articles 2–4; paraocular stripe, as a short triangular spot, at 10 h, and a narrow one between 3–4 h; entire ventral surface of foretibia, dorsally a subbasal spot and at apex; entire fore t1–3; mid t1 on basal 0.9. Ovipositor sheath brown. Wings (figs. 10–11, 22–23) hyaline, very weakly yellowish; forewing apical margin narrowly, weakly infuscate; hind wing Costal cell entirely dark infuscate.

**MALE** (first record): Forewing 10.05 mm. Overall structure quite similar to female, although with finer sculpturing, such as small propodeal apophyses, more delicate anterior transverse carinae, etc., probably related to its much smaller size. *Color differences* (incomplete legs and antennae): supraclypeal area entirely pale yellow, continuing shortly at supraantennal area along eye margin; also yellowish on scape laterally, gena along eye margin between 3–6 h, apex of scutellum with transverse spot, forecoxa ventrally, foretrochanter entirely, mid- and hind trochanters basally, hind tibia except ventrally brownish, and hind basitarsus except brown apex. Wings hyaline, forewing weakly infuscate marginally at apex.

BIOLOGY: Unknown.

VARIATION: Forewing 15.10 mm. Antenna with 27–28 flagellomeres. Malar space 0.82–0.83 mandible basal width. Propodeal spiracle  $2.91\times$  longer than wide. T1 spiracle at middle (basal 0.55). T1–8 more smooth than in holotype. Ovipositor  $2.41\times$  taller than wide,  $1.45\times$  length of hind tibia. Crossvein 1cu-a basal to 1M by about 0.4 its own length. Forewing vein 2Cua  $0.85\text{--}1.03\times$  length of crossvein 2cu-a. Hind wing vein Cua  $1.32\text{--}1.35\times$  length of crossvein cu-a. *Color*: In the female from Colombia, the forewing shows two distinct spots, centrally and subapically (fig. 11). In the female from Bolivia, metallic reflections are mostly restricted to metasoma, and are more violaceous than bluish, eye margin at 3–4 h without yellowish spot, and mid-t1 yellowish only on basal 0.6. Both females with narrow yellowish on ventral side of foretibia, and fore-t3 yellowish only basally.

COMMENTS: *Melanocryptus niger* shares several important features with *M. cyaneus*, strongly suggesting these are closely related taxa, uniquely distinct from all other species in the genus: (1) ovipositor ventral valve apex without preapical irregularity, ridges regular (figs. 64–65); (2) basalmost ridge subtle, developed only as a small tubercle (fig. 65B); (3) supraclypeal area densely covered by whitish pilosity; (4) notaulus deep, crenulate, ending distinctly posteriad at level of tegulae (as in fig. 85), (5) body with many bluish reflections, (6) thorn- or tongue-shaped propodeal apophyses, (7) anterior transverse carina centrally much pronounced running forward (*M. niger*, fig. 56) or interrupted and running forward (*M. cyaneus*, fig. 55), (8) dorsolateral and ventrolateral carinae more or less distinct only at the very base of petiole, glymma shallow; (9) dorsoposterior margin of pronotum not forming a channel or shaft; ratio between forewing 2Cua/2cu-a close or superior to 1.0 (vs. always less than 1.0 for all other spp.); (10) hind wing costal cell entirely dark, infusate (figs. 16, 22–23).

*Melanocryptus niger* can however be easily separated from *M. cyaneus* by having a predominantly black body (vs. much more intense dark blue and violaceous metallic reflections in *M. cyaneus*), T2 and T7 unicolorous (vs. with large apical yellowish marks in *M. cyaneus*), supraclypeal area with a keel-shaped elevation near toruli, which is concolorous with its surroundings (vs. with low, circular or drop-shaped, often brownish bump near toruli in *M. cyaneus*), and the anterior transverse carina centrally approximate, only narrowly interrupted (vs. widely interrupted and curved forward in *M. cyaneus*). The ratios between the forewing veins 2Cua/2cu-a around 1.10, and hind wing veins Cua/cu-a around 1.40 are both also distinct from *M. cyaneus*, with 1.63 and 1.21, respectively.

The single known male of *M. niger* has entirely hyaline forewings (vs. with two conspicuous dark spots in males of *M. cyaneus*); the supraclypeal area, a wide stripe on scape and gena are entirely yellow (vs. head and scape entirely bluish with metallic reflections); a small keel-shaped elevation near toruli (vs. low and circular); and the midtibia almost entirely yellowish, except ventrally brown (vs. bluish, except basal end yellowish).

DISTRIBUTION: Colombia (first record), Peru, Bolivia (first record) (fig. 124).

MATERIAL EXAMINED: 4 females, 2 males. **Holotype** ♀ PERU Pachitea, manuscript label “*Hoplophorina*, n. gen., n. sp.,” id nr.114849, HNHM, Hym. coll. [blue] (HNHM). Pinned, antennae missing, scape + flagellomeres 1–2 glued to label; otherwise complete, fair condition. **Other specimens**: BOLIVIA: ♀ Bolivia, Cochabamba, Villa Tunari. 300m. 18.X.1981, M. Cooper, M.Cooper BMNH(E)2005-152

(BMNH). COLOMBIA: ♀ COLOMBIA: *Amazonas*, PNN Amacayacu, San Martin, 3°23'S 70°06'W, 150m; 18–26.x.2000; B. Amado, M.839 (AEIC); ♂ 3 mi. W. Vilavicencio, Meta. 920 m, III.11.1955 + E.I. Schlinger and E.S. Ross collectors (CASC). ECUADOR: ♂ Coca and Napo Rivers, V. 1–12. 65, Ecuador, Luis Peña. Missing: flagellomeres beyond number 5 on left antenna and number 10 of right antenna, forelegs beyond trochanter, entire right mid leg, left mid t5, all articles beyond femur of right hind leg, tarsi of left hind leg; head + propleuron glued to pronotum. PERU: ♀ Monson Valley, Tingo Maria, XII-2-.1954 + E.I. Schlinger and E.S. Ross collectors (CASC).

*Melanocryptus rufigliadius*, sp. nov.

Figures 67, 101–106, 123

DESCRIPTION: *Female holotype*. Forewing 12.1 mm. Body mostly shiny and delicately sculptured. Supraclypeal area dorsally with distinct, somewhat keeled, longitudinal protuberance; supraantennal area with delicate, nearly smooth, glossy sculpturing, coronal suture distinct. Antenna with 26 flagellomeres. Malar space 0.59 mandible basal width. Occipital carina laterocentrally without emargination; apically fusing smoothly with hypostomal carina, forming a Y, at some distance from base of mandible. Pronotum dorsomedial margin not raised above level of anterior margin of mesonotum; epomia distinct, moderately long, vertical; pronotum smooth, shiny, without laterocentral strigation (fig. 102). Mesoscutum shiny, punctate, near apex of notaulus somewhat strigate and more coarsely punctate (fig. 104). Axillary trough of mesonotum anterior wall smooth, medially with transverse, rugose to crenulate channel, posteriorly transversely striate. Notaulus moderately deep, delicately crenulate, converging and nearly meeting posteriorly, ending slightly past center of mesoscutum (fig. 104). Scutellar carina advancing shortly over scutellum, which is moderately protuberant, round. Epicnemial carina sinuous, irregular. Subalar ridge narrow, strongly projected, approximately elongate oval. Sternaulus deep, crenulate (fig. 105), somewhat curved upward, restricted to anterior 0.65 of mesepisternum; mesepisternum mostly smooth, distinctly striated along dorsal portion of epicnemial carina and next to hypoepimeron. Forewing (fig. 101) crossvein 1cu-a basal to 1M+Rs by about 0.20 its own length, its posterior end slightly curved toward wing base; vein 2Cua 0.91 length of crossvein 2cu-a. Hind wing Cua 3.26× length of crossvein cu-a.

Transverse furrow at base of propodeum deep, medially wide, densely crenulate. Area anterior to anterior transverse carina smooth; area between anterior and posterior transverse carinae with oblique, irregular striation; area posterior to posterior transverse carina rugulose in varied directions; both anterior and posterior transverse carinae complete, medially distinctly arched forward, somewhat bell shaped; posterior transverse carina median point slightly elevated, forming a delicate crest, sublaterally forming distinct, scale-shaped apophyses (fig. 105). Propodeal spiracle elongate, 3.10× longer than wide. Pleural carina thin, delicate, conspicuously crenulate (fig. 105). Metapleuron finely alutaceous, somewhat shiny. T1 spiracle at middle (basal 0.53); dorsolateral carina absent except at the very base of petiole; ventrolateral carina faintly suggested along entire petiole; sternite ending opposite spiracle. T2–8 with fine sculpturing associated with pilosity. Ovipositor somewhat blade shaped, 1.80× taller than wide





FIGURES 101–106. *Melanocryptus rufigladius*, holotype. **101**, Habitus. **102**, Left side, detail. **103**, Head, frontal. **104**, Head and mesosoma, dorsal. **105**, Propodeum, dorsolateral (left). **106**, Metasoma, from apex of petiole, left.

at midlength, at the level of nodus distinctly taller than at base,  $1.08\times$  as long as hind tibia, straight; ventral valve ridges with subapical irregularity (fig. 67).

*Pilosity.* Most of the body behind base of hind wing covered with moderately dense pilosity; metapleuron, propodeum laterally and all coxae densely covered with whitish, moderately long pilosity. T1 glabrous, other tergites with short yellowish pilosity, T8 posteriorly with long, erect pilosity.

*Color.* Black, with faint bluish reflections. Body chiefly black with a few bluish reflections, and with following whitish areas: palpi entirely; dorsal portion of supraclypeal area (fig. 103);

subcircular mark on orbital band at 12 h (fig. 104); lateral basal mark and ventral stripe along foretibia; small lateral spot on posterior margin of T2 (fig. 102); lateral elongate mark on T7 apical margin; posterior stripe on S2–6, narrower toward posterior sternites. All legs with distinct reddish-brown tinge (fig. 101). Wings hyaline; forewing fuscous on the very apex. Ovipositor reddish orange (figs. 101, 106).

MALE. Unknown.

COMMENTS: Most similar to *M. delos*, from which it can be differentiated by the following characters: forewing mostly hyaline (vs. with two broad stripes; fig. 101 vs. 18), its apex fuscous (vs. hyaline); orbital band distinct and wide only on supraantennal area, to the level of ocelli (vs. narrow and distinct as separate marks on supraantennal area and gena); notaulus deep, converging and nearly meeting posteriorly (vs. faint, straight, ending anterad of tegula; fig. 104 vs. 2); supraclypeal area with large dorsal yellow spot (vs. blackish, except by narrow orbital band; fig. 103 vs. 89–90); T2 posterior margin with small lateral yellowish spot (vs. with distinct whitish stripe); posterior transverse carina of propodeum complete (vs. indicated only by scale-like apophyses; fig. 105 vs. 54); legs with distinct reddish tinge (vs. black); hind wing vein Cua  $3.26\times$  length of crossvein cu-a (vs. 2.16).

ETYMOLOGY: From the Latin *rufus*, “red,” and *gladius*, “sword,” in reference to its reddish ovipositor.

DISTRIBUTION: Peru (fig. 123).

MATERIAL EXAMINED: One female. **Holotype** ♀ from PERU: Monson Valley, Tingo Maria, XII-2-1954 + E.I. Schlinger and E.S. Ross collectors (CASC). Pinned through mesopleuron; ovipositor sheath missing, otherwise in good shape.

*Melanocryptus tesselatus* Aguiar, sp. nov.

Figures 17, 28, 31, 48, 52, 62, 69–74, 92, 119

DESCRIPTION: *Female holotype*. Forewing 11.80 mm. Body delicately sculptured. Supraclypeal area dorsally with distinct, somewhat pointy protuberance; supraantennal area smooth, polished, coronal suture faint. Antenna with 27 flagellomeres. Malar space  $0.71\times$  mandible basal width. Occipital carina laterocentrally without emargination; apically bending shortly where it fuses with hypostomal carina. Pronotum dorsomedial margin not raised above level of anterior margin of mesonotum; epomia distinct, vertical, dorsally curving toward center of pronotum; pronotum laterocentrally with parallel, delicate longitudinal strigation, stouter toward ventroposterior margin; pronotum otherwise smooth. Mesoscutum partially shiny, covered with delicate punctations, median lobe posteriad tegulae also longitudinally strigate. Axillary trough of mesonotum (fig. 31) basally with transverse channel, mostly transversely striate, except polished apex. Notaulus linear, delicate, straight, converging posteriorly, ending a little posteriad of center of mesoscutum. Scutellar carina advancing approximately over anterior third of scutellum, which is protuberant, round (fig. 31). Epicnemial carina reaching 0.67 of distance to subalar ridge, nearly straight (fig. 70). Subalar ridge weakly projected, approximately elongate oval. Sternaulus

straight, deep, crenulate, restricted to anterior 0.45 of mesepisternum; mesepisternum with punctulate associated with pilosity, otherwise smooth. Forewing (fig. 17) crossvein 1cu-a basad 1M+Rs only by approximately its own width, its posterior end very slightly curved toward wing base; 2Cua 0.86 length of crossvein 2cu-a. Hind wing (fig. 70) vein Cua 1.87× length of crossvein cu-a.

Transverse furrow at base of propodeum (fig. 52) deep, from centrally wide to laterally narrow, fully crenulate. Propodeum closely punctulate where pilose, otherwise as follows: areas posterior to anterior transverse carina closely rugulose, more oblique centrally on central area, otherwise somewhat irregular; anterior transverse carina complete, centrally curved forward, at this same region anteriorly with rugulosities projecting divergently anteriorly; posterior transverse carina almost complete, formed by three large, connected, conspicuous scale-shaped apophyses, two lateral, one central and anterior (fig. 52). Propodeal spiracle elongate, 2.45× longer than wide. Pleural carina distinct, complete, linear (fig. 48). Mesopleuron and metapleuron densely punctulate (from pilosity), matte. T1 spiracle at middle (basal 0.55); dorsolateral and ventrolateral carinae mostly weak, but complete; T1 delicately alutaceous, apically almost smooth; sternite ending distinctly basad of spiracle. T2–8 with fine sculpturing associated with pilosity, coarser on T2. Ovipositor somewhat blade shaped, 2.23× taller than wide at midlength, but 22% taller at apex than at base; its length 1.11× length of hind tibia, very weakly curved downward; ventral valve ridges with subapical irregularity (fig. 62).

*Pilosity.* Supraclypeal area moderately pilose, hairs long, distinct, weakly yellowish. Thick silvery pilosity covering mesopleuron posteriorly, entire upper and lower divisions of metapleuron (fig. 48), propodeum (fig. 52), all coxae, but this pilosity becomes easily invisible depending on angle of illumination; mesoscutum and scutellum inconspicuously pilose. T2–8 covered with fine yellowish pilosity, more distinct on T2.

*Color.* Black, with wide ivory stripes on head and metasoma, forewing with two wide dark stripes (fig. 70). Body black, metasoma with weak bluish reflections. With following ivory yellowish marks: supraclypeal area with narrow streaks along eye margin between 8–9 h, supra-antennal area widely except around toruli and mid longitudinally, ending posteriorly in straight line without reaching posterior portion of vertex (fig. 72), continuing laterally as wide, regular stripe until a little past 15 h; T1–2 and T7 with wide apical stripe reaching full width from one side to the other, on T7 covering apical 0.5 of tergite. S2 centrally largely brown, other sternites black. Legs dark brown, forelegs lightest; foretibia ventrally, and laterodorsally on basal 0.7, pale yellowish. Ovipositor sheath dark brown, shaft basally brightly white, apical dilated part darkened, except tip yellowish. Forewing (fig. 17) with two wide, fuscous stripes, otherwise hyaline; central stripe not reaching anterior and posterior margin; apical stripe fully reaching apical and posterior margins, but not reaching apical 0.1 of wing, and not covering the areolet, not even partially. Hind wing (fig. 28) entirely hyaline.

**MALE** (fig. 71): Quite distinct from the female. Males from the same collecting event as the female from Colombia differ from it as follows. Antenna with central white band, covering flagellomeres 12–16; supraclypeal area yellow, with M-shaped blackish mark (fig. 74); forecoxa from spotted to mostly yellowish; midtibia mostly pale yellowish; forewing with an apical stripe only, centrally hyaline; apical stripe ending at, but not invading, the areolet; T3



with distinct, regular apical yellow stripe; T7 apical yellow stripe wide, width regular, not centrally narrowed.

**VARIATION:** Females: Forewing length 9.00–13.60 mm ( $n = 3$ ). On the paratypes from Panama and Colombia the propodeum has a delicate posterior transverse carina, with weakly developed apophyses; ovipositor 1.00–1.17 $\times$  length of hind tibia ( $n = 3$ ). Dorsal elevation on supraclypeal area elongate. *Color:* head with smaller yellowish area, restricted to 10–13 h only; forewing central stripe may fully reach anterior or posterior margin; hind tibia basally on mesal side with small whitish spot (vs. absent in 2 specimens, small/weak on 1 specimen); T3 laterally, at apical margin, with large whitish mark (vs. entirely dark brown); T7 apical yellowish stripe centrally narrowed.

**BIOLOGY:** Unknown.

**COMMENTS.** Closest to *M. hadroglyptus*, from which it can be differentiated mostly by having more delicate notaulus, ending at center of mesoscutum (vs. deeply impressed, meeting posteriorly, ending near posterior margin of mesoscutum); pleural carina linear (vs. conspicuously crenulate; compare fig. 48 vs. 50); sternaulus straight (vs. sinuous); propodeum posteriad anterior transverse carina densely rugulose, matte (vs. mostly smooth, polished); subalar ridge black, concolorous with mesepisternum (vs. light brown, contrasting with black mesepisternum; fig. 70 vs. 47); S1 ending distinctly basad petiolar spiracle (vs. opposite).

Also quite similar to *M. delos*, from which it can be differentiated as follows: (1) forewing apical stripe of infuscation covering the areolet partially or entirely, but not reaching to the wing tip, which remains hyaline (vs. stripe not or barely reaching areolet and wing apex entirely covered with infuscation on both sexes of *M. delos*; fig. 17 vs. 19); (2) orbital band wide and complete at least from 10 to 14 h, often from 9 to 15 h (vs. absent from 11 to 13 h, often more; fig. 72 vs. 2); (3) T7 apical whitish stripe usually (2 of 3 cases) wide and uniform (vs. narrow, irregular or absent); (4) notaulus thin but distinct, well marked (vs. faint, almost indistinct); (5) maxillary palpus dark brown (vs. often spotted in pale yellow or whitish); (6) mesosoma laterally, apical base of hind wing, densely pilose, hairs long and overlapping (vs. short, somewhat sparse pilosity); (7) mesopleural suture densely pilose and bent (angled) at level of hypopimeron (vs. almost glabrous and straight or at most slightly curved); and (8) pleural carina distinct, complete, linear (vs. faint, fragmented; fig. 48 vs. 49).

Males differ from those of *M. delos* mostly by the forewing with subapical spot (vs. reaching wing tip in *M. delos*), and supraclypeal area bearing a M-shaped blackish mark (vs. uniformly whitish).

**ETYMOLOGY:** The specific epithet derives from the Greek *tesselatus*, meaning “inlaid with small, square stones, checkered”, a reference to the patchy color pattern of the species.

**DISTRIBUTION:** Costa Rica, Panama, Venezuela, Colombia (fig. 119).

**MATERIAL EXAMINED:** Seven females, three males. **Holotype** ♀ VENEZUELA: Falcon, Curimagua, 1640 m. 22-III-1987, R. Miller and L. Stange, cloud forest (FSCA). Pinned. Mid left leg broken at base, glued back on specimen; hind right t4–5 glued on label; otherwise in good condition. **Paratypes:** COLOMBIA: ♀ Dept Valle, Lago Calima, 3 Mi behind dam, tropical wet forest, R. C. Willkerson, 16-VII-1975, Malaise trap (FSCA). Pinned. Right antenna beyond scape, right foretarsus beyond t2, left mid tarsus entirely, and left hind t5 missing; apex of both right wings somewhat damaged. 3♂ Dept. Valle, Lago Calima, 3 miles behind dam, Tropical wet forest, 16.VII.1975, Malaise, R.C. Willkerson; ♂

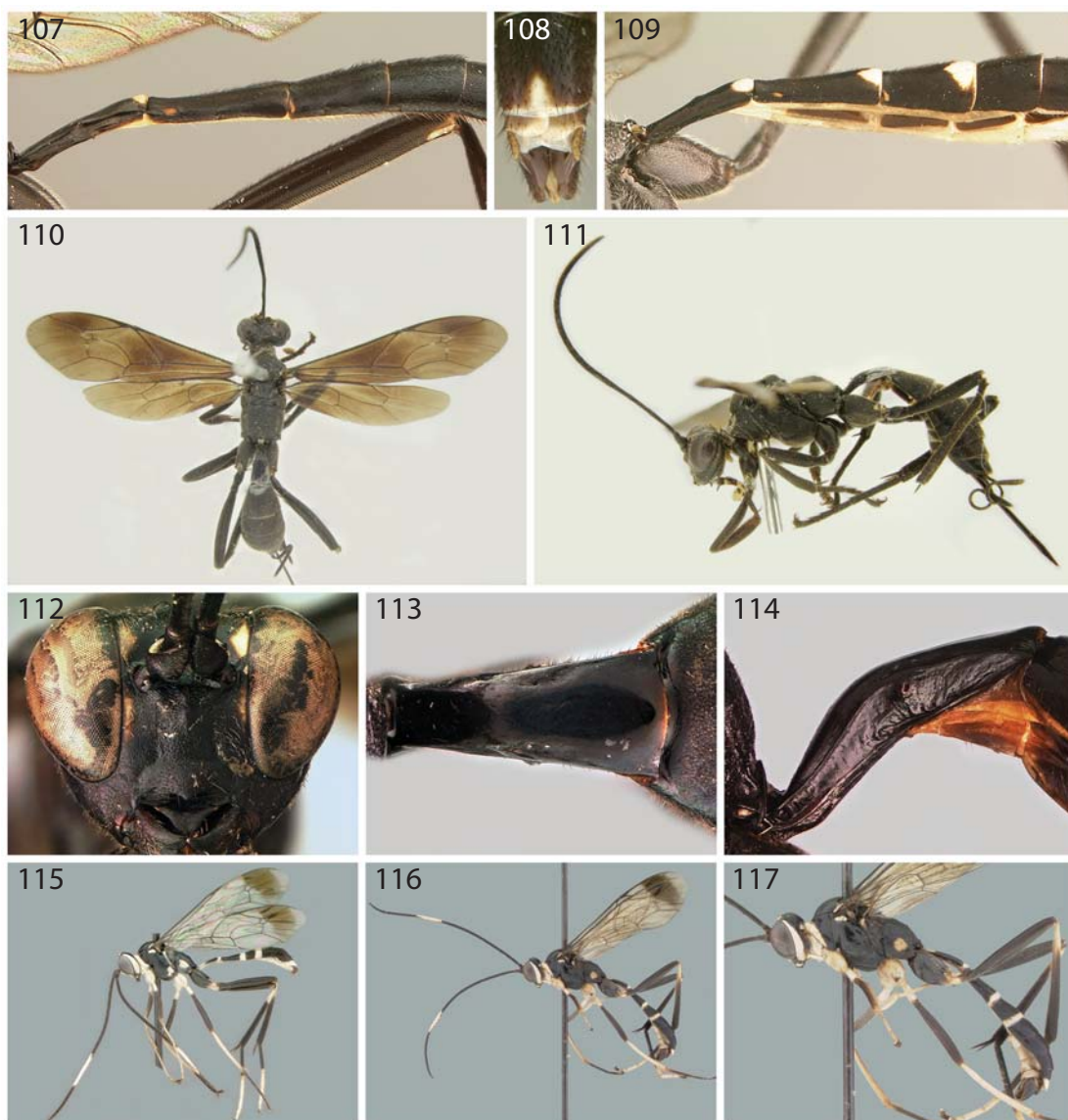
same data except Below dam, 25.XI.1974 (FSCA). PANAMA: 4 ♀ *Coclé*, El Copé, P. N. Omar Torrijos; 23-30.ix.1999; A. Santos, yellow pan trap (AEIC). Pinned, complete. **Other specimens:** COSTA RICA: ♀ Alajuela, Est. Biol. San Ramón [Reserva Biológica Alberto Brenes Mesen], 900 m, VII-VIII.1995, P. Hanson (MUCR); ♀ Cartago, Turrialba, grounds of IICA, 2.VI.1976, M. Wasnaier, Malaise trap, 7A-5P + UC Berkeley, EMEC, 731735 (EMEC).

*Melanocryptus tupan*, sp. nov.

Figures 12–13, 24–25, 40–41, 57, 60, 68, 107–109, 127

**DESCRIPTION:** Female holotype. Forewing 12.70 mm. Body delicately sculptured. Supraclypeal area with short midlongitudinal elevation near toruli; supraantennal area with delicate, nearly smooth, glossy sculpturing, coronal suture indistinct. Antenna with 28 flagellomeres. Malar space 0.67 mandible basal width. Occipital carina laterocentrally without emargination; apically fusing with hypostomal carina nearly at base of mandible. Pronotum dorsomedial margin not raised, aligned with anterior margin mesoscutum; epomia short but distinct; sculpturing quite delicate, laterocentrally with parallel, delicate longitudinal strigation, which extends along ventroposterior margin as short subcrenulation; pronotum otherwise faintly punctulate. Mesoscutum matte, covered with fine, dense punctulation. Notaulus narrow but distinctly impressed, crenulate, straight, posteriorly slightly converging, ending at center of mesoscutum. Axillary trough of mesonotum anterior wall smooth, basally with transverse, rugose to crenulate channel, remainder transversely striate, except apex sculptured as scutellum (fig. 40). Scutellar carina advancing shortly over scutellum, which is protuberant, globose (fig. 40). Subalar ridge narrow, somewhat keeled. Epicnemial carina reaching about 0.75 of distance to subalar ridge, straight, reaching above level of pronotal spiracle. Sternaulus deep, closely crenulate, somewhat curved upward, continued dorsally by shallow depression that reaches mesopleural fovea; mesepisternum distinctly rugulose. Forewing (fig. 12) crossvein 1cu-a basal to vein 1M+Rs by about 0.15 its own length, its posterior end slightly curved toward wing base; vein 2Cua 0.70 length of crossvein 2cu-a. Hind wing (fig. 24) Cua 1.71× length of crossvein cu-a.

Transverse furrow at base of propodeum dorsally shallow, wide, densely crenulate, immediately narrowing toward the sides until laterally linear (fig. 57). Propodeum area anterior to anterior transverse carina with delicate punctulation; area posterior to it conspicuously, densely rugulose; anterior transverse carina complete, centrally slightly curved forward; posterior transverse carina indicated by lateral, low, small apophyses, and a central, small transverse portion, placed centrally, anterior to apophyses (fig. 57). Propodeal spiracle elongate, 2.80× longer than wide. Pleural carina incompletely formed by confluent rugosities from propodeum. Metapleuron coarsely alutaceous, matte. T1 spiracle at middle (basal 0.47); dorsolateral carina differentiated only on basal 0.2 and then from spiracle to apex; ventrolateral carina distinct; sternite ending slightly basad to spiracle. Tergites delicately punctulate, more distinct on T2. Ovipositor somewhat blade shaped, 1.76× taller than wide at midlength, 1.10× length of hind tibia, very slightly curved downward; ventral valve ridges with subapical irregularity (fig. 68).



FIGURES 107–109. *Melanocryptus tupan*, male. Metasoma. **107**, Specimen from southern Brazil, T1–4, left. **108–109**, Specimen from southeastern Brazil: T7–9, pygostylus and external genitalia in dorsal view, and T1–4, left. Figures 110–114. *Melanocryptus violaceipennis*, female. **110**, Dorsal habitus, holotype. **111**, Lateral habitus, holotype. **112**, Head, frontal. **113–114**, First metasomal segment, dorsal and lateral (left) views. Figures 115–117. *Melanocryptus whartoni*, habitus, male. **115**, Specimen from Costa Rica. **116–117**, Specimen from Venezuela.



*Pilosity.* Supraclypeal area sparsely pilose, nearly glabrous. Very short, whitish or silvery pilosity on most of mesosoma; mesonotum pilosity yellowish. T1 glabrous; remaining tergites with same short, yellowish pilosity.

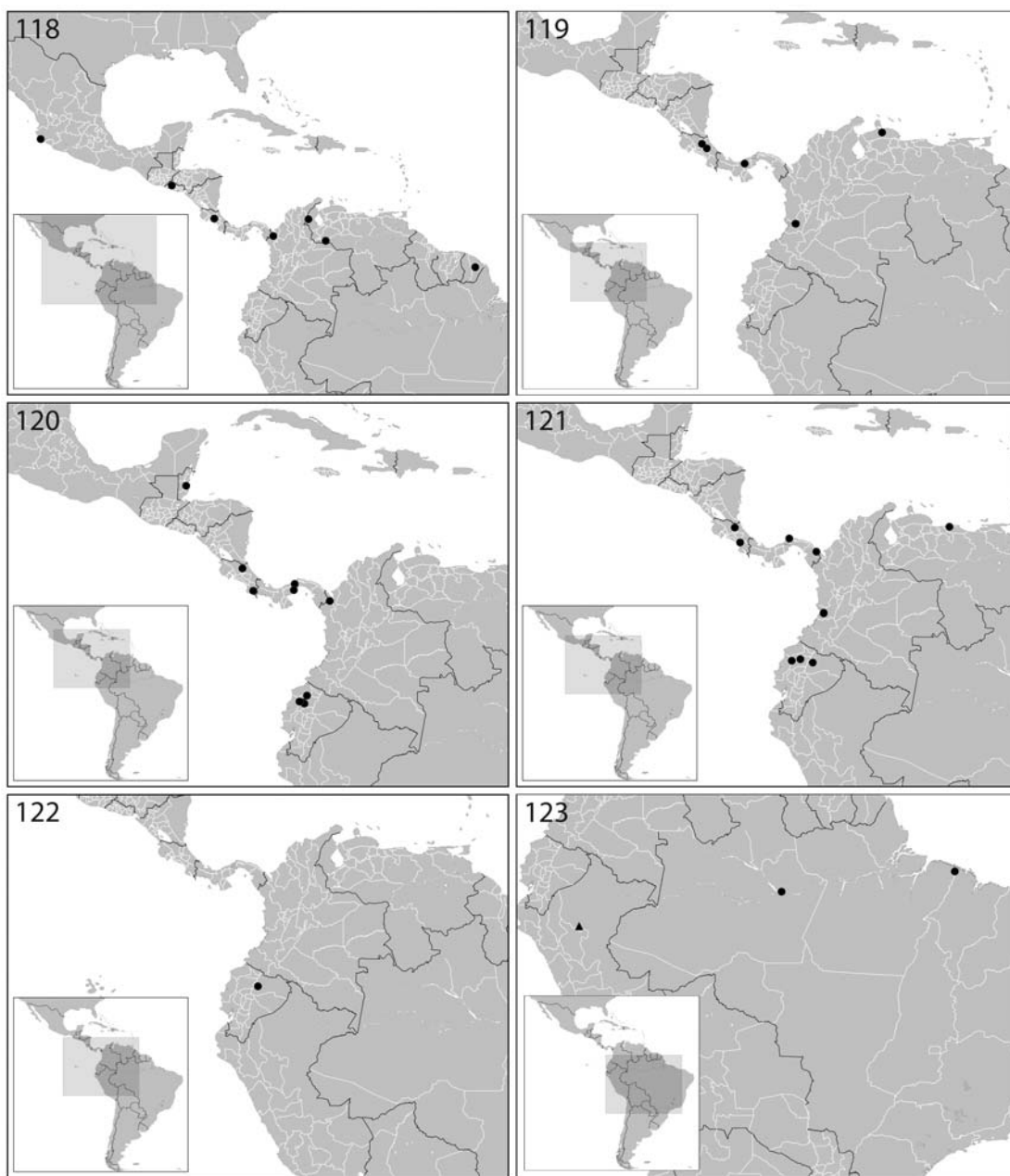
*Color.* Blackish, with weak metallic reflections on head and tergites only. Foreleg dark brown; foretibia with pale yellow ventromesal stripe from end to end, and pale yellow stripe dorsolaterally, not reaching apex. Ovipositor sheath dark brown, shaft amber. Forewing more or less uniformly amber infusate, except apex with diffuse darkened area (C-shaped in some specimens) (fig. 12). Hind wing (fig. 24) amber infusate.

**MALE:** Same overall structure and color pattern of female, but with the following differences. Smaller, forewing 6.30–11.65 mm; sculpturing distinctly coarser. Antennae with 32 flagellomeres (27 on smallest specimen), with distinct preapical white band, covering flagellomeres 14–19 (13–17 on smallest specimen). Supraclypeal area middorsally with stout protuberance (vs. modest longitudinal elevation). S1 ending slightly apicad of spiracle. Following yellowish to whitish areas are absent on female: narrow paraocular stripe between 8–9 h, sometimes continued on supra-antennal area as thin, linear stripe, sometimes with spot at 4 h; foretibia laterally and mesally, foretarsus except t5; midtibia except brown on posterior face, midtibial spurs, mid-t3 entirely and t2 on basal half; more brightly on hind t2–4 entirely, and t5 on basal half; spot on apex of scutellum (fig. 41); transverse furrow at base of propodeum shallow, propodeum less pilose, sculpturing more sparse (fig. 60 vs. 57); distinct apical spot on T1–3, varying from fully distinct to most commonly absent on T2–3; T7 apical margin and apical midlongitudinal stripe, T8 entirely (fig. 108). Forewing (fig. 13) vein 2Cua 0.41–0.61 length of crossvein 2cu-a.

**VARIATION:** Female: Forewing length 12.5–13.7 mm; its apical dark spot varies from weak and diffuse to more intensely dark and distinctly C-shaped. Forewing vein 2Cua 0.71 length of crossvein 2cu-a; hind wing vein Cua 1.58× length of crossvein cu-a. Propodeal spiracle length 2.80–3.05× width. Ovipositor 1.02–1.10× length of hind tibia. Male: in the two northernmost specimens (from Espírito Santo) the apicomarginal infuscation of the wing is slightly more evident because the wing is otherwise nearly hyaline (fig. 13); in one of these specimens, the whitish spot on scutellum (fig. 41) and those on T2–3 (fig. 109) are the largest observed for the species (otherwise mostly dark, as in fig. 107).

**BIOLOGY:** Host unknown. Phoretic mites attached to one specimen, from southern Brazil.

**COMMENTS:** Most similar to *M. violaceipennis* and *M. dnopheros*, with which it shares the body nearly entirely black and general structure. The wings of the present species are, however, light amber, with a diffuse or at most C-shaped spot at the apex of the forewing (vs. dark infusate with central and basal lighter areas in *M. violaceipennis* and *M. dnopheros*; fig. 12 vs. 20–21); the scutellum is large, swollen, and rounded (vs. triangular, somewhat elongate, with well-delimited corners at least in *M. dnopheros*; fig. 40 vs. 35–36); the mesosomal sculpturing is mostly delicate (vs. distinctly coarser, conspicuously matte); forefemur with two distinct longitudinal yellowish marks, one laterodorsally and one mesoventrally (vs. entirely black or at most yellowish brown ventrally only); and mesosoma pilosity silvery (vs. yellow; fig. 57 vs. 58–59). The new species also seems to be larger, with forewing reaching 12.5–13.7 mm (vs. 11.6 for *M. dnopheros*), but females of *M. tupan* are all known from the very same locality, and



FIGURES 118–123. Distribution maps for species of *Melanocryptus*, sorted from most northern to most southern taxa. **118**, *M. whartoni*. **119**, *M. tessellatus*. **120**, *M. hadroglyptus*. **121**, *M. cyaneus*. **122**, *M. dnopheros*. **123**, *M. rufigliadius* (triangle) and *M. violaceipennis* (circles).



FIGURES 124–127. Distribution maps for species of *Melanocryptus*, sorted from most northern to most southern taxa. **124**, *M. niger*. **125**, *M. delos*. **126**, *M. aurantius*. **127**, *M. tupan*. Figure **128**, Combined distribution of all available records for *Melanocryptus* spp.



there is only one known specimen for *M. dnopheros*, so size differences must be considered with caution. The propodeal spiracle is also slightly more elongate, 2.94–3.10× longer than wide (vs. 2.50–2.80 [right and left]), and the hind tibia is relatively shorter, with 1.07–1.11× the length of the mesosoma (vs. 1.20), but these proportions are likely to be size related.

**ETYMOLOGY:** The specific epithet is a reference to the Guarany myth of creation of the night and the moon, in which the god Tupã was a protagonist. *Melanocryptus tupan* is nearly entirely dark (as the night), the males having, typically, only a white stripe in the antennae (comparable to the white of the moon in the night sky).

**DISTRIBUTION:** Brazil (Rio de Janeiro, São Paulo, Paraná, Santa Catarina), and Paraguay (fig. 127).

**MATERIAL EXAMINED:** Forty-nine females, 41 males. **Holotype** ♀ BRAZIL: Nova Teutonia, 27°11'S, 52°23'W. Brasil, 300–500 m, 12.I.1960, Fritz Plaumann, “*Melanocryptus* Det. Porter, red holotype label (CNCI). Pinned. Apical flagellomeres (24–28) of left antenna missing, otherwise in good condition. **Paratypes:** BRAZIL: *Espírito Santo*: ♂ Santa Maria de Jetibá, Fazenda Clarindo Kruger, 20°04'27.9"S 40°44'51.3"W, 29.XI–06.XII.2002, Malaise trap, point B6, M. Tavares, C. Azevedo et al., UFES43048 (UFES); ♂ same data except point B6, MTavares, UFES43050 (UFES). *Paraná*: ♂ Telêmaco Borba, Reserva Samuel Klabin, 04.V.1987, Malaise, Levantamento Entomológico PROFAUPAR (DZUP); 3♂ same data except 03.XI.1986, 3♂ same data except 24.XI.1986, 15.XII.1986, and 22.XII.1986 (DZUP). *Santa Catarina*: ♀ Nova Teutonia, 27°11'S 52°23'W, I.1965, Malaise, Fritz Plaumann; 18♀ same data except I.1968, 08.I.1968, I.1969, II.1967, II.1968 ×3, 05.II.1968, 08.II.1968, 09.II.1968, 12.III.1959, III.1966, III.1969, IV.1969, VIII.1967, XI.1968, XII.1968 (CNCI); ♀ Nova Teutonia, 27°11'S 52°23'W, I.1937, Malaise, Fritz Plaumann; 13♀ same data except 05.I.1939, 10.I.1938, 13.I.1938, II.1937, 02.II.1939, 04.II.1939, 14.II.1938, 17.II.1938, 26.II.1938, 02.III.1939, 07.III.1939, 16.III.1939, 14.XI.1938 (BMNH); ♂ Nova Teutonia, 27°11'S 52°23'W, II.1966, Malaise, Fritz Plaumann; 15♂ same data except II.1968, 09.II.1968, 06.III.1967, IV.1966, IV.1969, VIII.1966, XI.1968 ×5, 15.XI.1952, XII.1968 ×2, 12.XII.1968 (CNCI); ♂ Nova Teutonia, 27°11'S 52°23'W, 23.I.1939, Malaise, Fritz Plaumann; 13♂ same data except I.1937, 19.II.1938, 17.III.1939, 29.IX.1938, 17.XI.1938, 18.XI.1938, 25.XI.1938, 01.XII.1938, 16.XII.1938, 29.XII.1938; *São Paulo*: 2♂ Boraceia Field Station, Casa Grande, Grid 23KMP092837, 19–26.II.1975, Thomas E. Rogers (BMNH). **Other specimens:** BRAZIL: *Santa Catarina*: 11 ♀ Nova Teutonia, I.1971, 19.II.1954 [illustrated in fig. 258b in Townes 1970: 491, as indicated by yellow label pinned with the specimen], II.1968 ×2, II.1971, III.1968, IV.1971, X.1968, X, XI, XII.1970, Fritz Plaumann (AEIC); 13♂ Nova Teutonia, I.1968 ×2, I.1971, II.1968 ×2, IV.1971, 08.VII.1940, XI.1970 ×2, 25.XII.1951, XII.1968, XII.1970 ×2, Fritz Plaumann (AEIC). *Rio de Janeiro*: 4♀ Teresópolis, 9.III.1966, Townes and Townes (AEIC); 3♂ same data except 11.III.1966 ×2, and 13.III.1966 (AEIC). PARAGUAY: ♂ Pirapó, 29.XII.1971, Luis Peña (AEIC).

### *Melanocryptus violaceipennis* Cameron, 1902

Figures 21, 39, 59, 110–114, 123

*Melanocryptus violaceipennis* Cameron, 1902: 371. ♀. Original description. Type in BMNH, examined (original pictures). Schmiedeknecht 1908: 13, listed. Townes and Townes, 1966: 68, catalog. Yu and Horstmann, 1997: 269, catalog.

**DESCRIPTION:** *Female* (type and new specimen). Forewing 11.37 mm. Body matte (figs. 110–111), except T1 smooth, polished (fig. 113). Supraclypeal area just below toruli with short, narrow midlongitudinal elevation near toruli (fig. 112); supraantennal area somewhat shiny but with fine sculpturing, coronal suture well developed. Antennae with 28 flagellomeres. Malar space 0.78 mandible basal width. Occipital carina laterocentrally without emargination; apically fusing with hypostomal carina far from base of mandible. Pronotum dorsomedial margin not raised, aligned with anterior margin mesoscutum; epomia well developed, conspicuous; sculpturing fine but well marked, entire pronotum matte, laterocentrally to ventroposteriorly with stouter, somewhat parallel, longitudinal strigation. Mesoscutum matte, covered with fine sculpturing. Notaulus quite narrow, linear, but distinctly impressed, straight, slightly converging posteriorly, ending at center of mesoscutum. Axillary trough of mesonotum with indistinct basal channel, entirely transversely sculptured, from basally rugose to apically rugulose (fig. 39). Scutellar carina not distinctly advancing over scutellum, which is triangular in dorsal view, its apex rounded (fig. 39). Subalar ridge large, rounded, low. Epicnemial carina reaching about 0.8 of distance to subalar ridge, quite sinuous (fig. 111). Sternaulus deep, closely crenulate, almost straight, not continued posteriorly by shallow depression; mesepisternum transversely rugulose, matte. Forewing (fig. 21) crossvein 1cu-a distinctly basad 1M+Rs, its posterior apex distinctly curved toward wing base; 2Cua 0.82 length of crossvein 2cu-a. Hind wing (fig. 21) vein Cua 1.96× length of crossvein cu-a.

Transverse furrow at base of propodeum sunken, wide, crenulate, narrowing moderately toward the sides (fig. 59). Propodeum area anterior to anterior transverse carina allutaceous, matte; area posterior to it finely rugose; anterior transverse carina complete, bow shaped; posterior transverse carina marked by one central, more advanced, and two lateral, low, scale-shaped apophyses (fig. 59). Propodeal spiracle elongate, 2.43× longer than wide. Pleural carina distinct, receiving several perpendicular rugosities throughout its length. Metapleuron densely rugulose, matte. T1 spiracle slightly beyond middle (apical 0.45; fig. 114); dorsolateral and ventrolateral carinae conspicuous from base of petiole to apex of postpetiole; sternite ending distinctly basad of level of spiracle (fig. 114). T1 entirely shiny (fig. 113), but delicately allutaceous at close inspection; T2–8 coarsely alutaceous. Ovipositor somewhat blade shaped, 1.64× taller than wide at midlength, length 1.41× length of hind tibia, straight; ventral valve ridges with subapical irregularity (similar to fig. 61B).

**Pilosity.** All body pilosity yellowish brown (as in fig. 58). Supraclypeal area sparsely pilose (fig. 112). Mesosoma with short, moderately visible pilosity, except hypoepimeron glabrous. T1 glabrous (fig. 113); remaining tergites with conspicuous and somewhat abundant pilosity.

**Color.** Entirely black to dark brown (figs. 110–111), except small whitish marks along eye margin just above and below level of antennal foramen (fig. 112), forefemur apex and foretibia ventrally yellowish. Forewing dark amber infusate, darkest centrally and subapically (fig. 21). Hind wing nearly uniformly amber infusate (fig. 21).

**MALE:** Unknown.

VARIATION: No significant variation observed between the examined specimen and the holotype pictures.

BIOLOGY: Unknown.

COMMENTS: Most similar to *M. dnopheros*, with which it shares body nearly entirely black, infuscated wings, etc. Differs, in particular, by having forewing centrally, and hind wing entirely lightly infuscated (vs. wing entirely dark infuscate in *M. dnopheros*; fig. 20 vs. 21), petiole laterally with distinctly more delicate sculpturing (fig. 114 vs. 96), and S1 ending distinctly basad of petiolar spiracle (vs. distinctly apicad; fig. 114 vs. 96).

Also similar to *M. tupan*, from which it can be differentiated by the wing color pattern (fig. 20 vs. 12), pilosity, and several other features (see Comments for *M. tupan*).

There is some indirect evidence that the original description of *M. violaceipennis* is based on a singleton: no variation is described, measurements and overall description fit well the studied specimen from BMNH, the species is rare, and no other type specimens were found. Thus, the BMNH specimen might be the holotype (ICZN, art. 73.1.2), but since Cameron (1902) does not provide data about specimens, that information is, strictly speaking, in doubt. Because of this, a lectotype is not designated here, and the BMNH specimen is treated simply as “type.” Furthermore, it also differs a little from the original description, as follows: wings more opaque and black than “bluish purple,” and definitely not uniformly colored, but patterned; areolet rather pentagonal, with sides distinctly converging toward anterior margin, instead of “areolet square, the transverse cubital nervures not converging above”; and metasoma entirely black, not with tergites “narrowly white at apex” (although this is probably simply a reference to the whitish intersegmental membranes, as seen in fig. 111).

DISTRIBUTION: Brazil (Manaus?); Suriname (first record) (fig. 123).

MATERIAL EXAMINED: Two females. **Holotype** ♀ (pictures) from Amazons (Prof. I. W. H. Trail), according to Cameron (1902: 371); cited to “Brazil” in Yu and Horstmann (1997). Pinned, dusty but in regular condition (figs. 110–111) (BMNH). **Other specimens:** SURINAME: ♀ Paramaribo, Kwatta, Vangkooi [= trapped] half febr by Geyskes (RMNH).

### *Melanocryptus whartoni* Kasparyan et Ruíz-Cancino

Figures 15, 27, 51, 115–118

*Melanocryptus whartoni* Kasparyan et Ruíz-Cancino, 2008: 173, 367. ♂. Type in UATM (pictures examined). Description, figures.

REDESCRIPTION. *Male*. Forewing 7.60 mm. Body generally smooth, shining (fig. 115–117). Supraclypeal area dorsally with small projection or bump; supraantennal area smooth, polished, coronal suture indistinct. Antenna with 30 flagellomeres, apex of flagellomeres without distinct tuft of pilosity, white band formed by flagellomeres 11–18. Malar space 0.59 mandible basal width. Occipital carina laterocentrally without emargination; apically fusing smoothly with hypostomal carina, forming a Y. Pronotum dorsomedial margin not distinctly raised above level of the anterior margin of mesonotum; epomia distinct but

short, vertical; short crenulation along ventroposterior margin; pronotum otherwise smooth, polished. Mesoscutum mostly smooth. Axillary trough of mesonotum basally with transverse channel, entirely rugulose, this sculpture somewhat transverse. Notaulus distinctly impressed, linear, straight, slightly converging posteriorly, ending at center of mesoscutum. Scutellar carina not advancing over scutellum, which is large, somewhat trapezoidal, not distinctly protuberant. Epicnemial carina shape slightly arched (fig. 117). Subalar ridge wide, low. Sternaulus curved, deep, crenulate, extending on anterior 0.8 of mesepisternum, which is delicately sculptured, mostly smooth. Forewing (fig. 15) crossvein 1cu-a basal to vein 1M+Rs by about 0.2 its own length, its posterior end slightly curved toward wing base; 2Cua 0.63 length of crossvein 2cu-a. Hind wing (fig. 27) vein Cua 2.93× length of crossvein cu-a.

Transverse furrow at base of propodeum densely crenulate. Propodeum area anterior to anterior transverse carina smooth, polished, perfectly contiguous with transverse furrow; area posterior to it conspicuously rugose (fig. 51); anterior transverse carina complete, centrally bent forward; posterior transverse carina indicated by confluence of small lateral and anterior apophyses (fig. 51). Propodeal spiracle elongate, 2.54× longer than wide. Pleural carina distinct and linear on its entire length (fig. 51). Upper and lower metapleuron almost smooth, polished. T1 spiracle at middle (basal 0.48); dorsolateral and ventrolateral carina indistinct; sternite ending distinctly apicad at spiracle. T1 nearly polished, smooth, T2–8 distinctly alutaceous, also with sculpturing associated with pilosity. T8 longitudinally split (similar to fig. 108).

*Pilosity.* Supraclypeal area sparsely pilose. Moderate white pilosity covering upper and lower divisions of metapleuron, propodeum laterally (fig. 51), and hind coxa. T1 glabrous; remaining tergites with short, distinct yellowish pilosity, more abundant on apical tergites.

*Color* (figs. 115–117). Black with whitish marks, wings hyaline except for wide preapical fuscous area, reaching toward, but not invading, the areolet. Flagellomeres 12–17 entirely white, 11 and 18 ventrally partially darkened. Pale yellow to whitish on the following: spot at base of mandible; entire labrum and supraclypeal area; supraantennal area except midlongitudinally; wide areas of eye orbits, except interrupted at 12 h and at malar space; entire propleuron, pronotal collar, subalar ridge, tegula, scutellum, and mesoepisternum; large spot ventroposteriorly on mesepisternum, large dorsal area on lower division of metapleuron; legs as in figures 115–117; T1 basal 0.3 and apical 0.2, T2–3 and T7 widely at apical margin; sternites white, except laterosternites dark brown.

**VARIATION:** The full ranges for the most relevant external variation are as follows: forewing 7.60–10.60 mm; sternaulus from indistinctly to distinctly crenulate; pleural carina from distinct to somewhat indistinct and fragmented (crossed by fine transverse rugosities); white band on antennae with flagellomeres 12–17 entirely whitish; pronotal collar from entirely yellowish to blackish on ventral apex; T7 whitish on apical 0.3–0.8. A specimen from Venezuela (figs. 116–117) lacks the ventroposterior white spot on the mesepisternum, and the specimen from French Guyane lacks the spots on both mesepisternum and metapleuron.

*Female.* Unknown.



**BIOLOGY:** One male specimen reared from an unidentified pyralid borer (Lepidoptera, Pyralidae) in wild rice, *Oryza latifolia* (Poaceae).

**COMMENTS:** The examined specimens are most similar to the males of *M. hadroglyptus*, but show a set of features that are most parsimoniously interpreted as belonging to a separate group (fig. 9; see cladistic analysis). The present species can be separated from *M. hadroglyptus* by the forewing apical infuscation not reaching areolet, even though ending at it (vs. covering areolet entirely or at least partially in males of *M. hadroglyptus*); flagellomeres with regular pilosity (vs. apex with distinct tuft of hairs, rendering a somewhat serrate aspect to antenna; fig. 116 vs. 98); propleuron, tegula, mid coxa, and hind t2 and t5 entirely pale yellow to whitish (vs. partially to entirely darkened); pleural carina linear (vs. widely crenulate); white band of antenna ventrally entirely or mostly whitish (vs. ventrally darkened); and sternites mostly white (vs. mostly brown or dark brown).

**DISTRIBUTION:** Mexico, El Salvador (first record), Costa Rica (first record), Venezuela (first record), French Guiana (first record) (fig. 118).

**MATERIAL EXAMINED:** 11 males. COSTA RICA: ♂ C. Rica: Escazú, May 21, 1987, H. and M. Townes (AEIC); ♂ same data except 25.V.1987, H. and M. Townes; ♂ same data except 26.V (AEIC); ♂ San Vito de C.B., Las Cruces, 28.VI-05.VII.1983, 1200 m, B.Gill (AEIC). FRENCH GUIANA: ♂ Guyane Française, Nouragues (ins), 4°94'18"N, 52°43'57"W, 19.II.2010, S.E.A.G. (UFES). COLOMBIA: ♂ Camp. Sautata, Rio Atrato, XII.1967 (AEIC). EL SALVADOR: ♂ 5 miles north of Quezaltepeque, VI-17.1963 + D.Q. Cavagnaro and M.E. Irwin Collectors (CASC). VENEZUELA: 3♂ Zulia, Tucuco, 23.IV.1981, H.K. Townes; same data except 26.IV; same data except 28.IV (AEIC); ♂ Guasualito, II.5.1950, Bax and Guagliumi, 175 m, USNM2048979, pinned with host cocoon (USNM).

### Species Inquirenda

#### Figure 100

**COMMENTS:** For two male specimens, morphological association with the known females was not evident. As organized in the key to species provided above, these specimens also seem to belong to a distinct taxon. Males of *Melanocryptus* exhibit, however, a complex dynamic of morphological variability, making its interpretation too risky with few specimens and without the corresponding female. The specimens in question are therefore better interpreted, at least for now, as species inquirenda.

**MATERIAL EXAMINED:** 2 males. ECUADOR: ♂ Napo Province, Rio Napo, Cabanas Alinahui, 01°00'S, 77°25'W, late December 1994, P. Buickerood (CASC); ♂ Pastaza, Pompeya, Napo River, 14–22.V.1965, L.Peña (CNCI).

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