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STUDIES OF MYDIDAE (DIPTERA) SYSTEMATICS AND EVOLUTION. III. THE GENUS *MESSIASIA* D'ANDRETTA IN THE AMERICAS (MYDINAE)

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CONTENTS

ABSTRACT

Messiasia *d'Andretta occurs exclusively in the Americas, ranging from the southwestern United States to Uruguay and northern Argentina; it is found both in forests and in open formations. Species considered as valid in this revision are:*

1. californica (*Cole*, 1970; *s.w. USA, n. Mexico*); 2. carioca, *sp. n.* (= decor *Osten Sacken of d'Andretta*, 1951, *misident.; Brazil: Guanabara*); 3. carrerai *d'Andretta*, 1951 (*Brazil: Santa Catarina*); 4. dalcyana *d'Andretta*, 1951 (*Brazil: Guanabara and Rio de Janeiro*); 5. decor (*Osten Sacken*, 1886; *Costa Rica, Panama*); 6. lanei *d'Andretta*, 1951 (*coastal Peru and Ecuador*); 7. mocoronga, *sp. n.* (polita *Wiedemann of d'Andretta*, 1951, *misident.; Brazil: Pará;? Bolivia*); 8. notospila (*Wiedemann*, 1828; = cingulatus *Williston*, 1898; *s. Brazil, Paraguay, Uruguay, n. Argentina*); 9. painteri, *sp. n.* (*Mexico: Guerrero and Morelos*); 10. penai, *sp. n.* (*Peru*); 11. perpolita (*Johnson*, 1933; = polita *Wiedemann of d'Andretta*, 1951, *part, misident.; s. Mexico*); 12. pertenuis (*Johnson*, 1926; *USA: Arizona; Mexico: Sonora*); 13. testaceiventris (*Macquart*, 1850; = puniceus *Séguy*, 1928; *Uruguay, Argentina*); 14. uaupes, *sp. n.* (= zikani *d'Andretta*, 1951, *part, misident.; Brasil: Amazonas*); 15. virgata (*Wiedemann*, 1830; = sarpedon *Séguy*, 1928c; *Brazil: Amazonia*); 16. yacochuya, *sp. n.* (*Argentina: Salta*); 17. zikani *d'Andretta*, 1951 (*Brazil: Mato Grosso; Paraguay*).

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A key to the species, descriptions, a speculative history of the evolution, data on ecology, biology, and distribution, are given.

1. INTRODUCTION

The genus *Messiasia* d'Andretta (1951) was erected for *carrerai, dalcyana, lanei* and *zikani* d'Andretta, from South America, and included the following species from Central and South America, previously placed in *Mydas* Fabricius: *decor* (Osten Sacken), *notospila* (Wiedemann), *polita* (Wiedemann), and *punicea* (Séguy). Some of the species were misidentified, and some other did not belong in *Messiasia.*

Mydas pertenuis Johnson was added by Papavero & Wilcox (1968), and *Mydas californicus* Cole (1970) also belongs in *Messiasia.*

Study of type-specimens in the United States and Europe by the junior author in 1970, 1971, and 1972, revealed several misidentifications, resulting in several synonyms. Six species have been described as new from material collected in recent years or from previously misidentified specimens.

These flies resemble *Mydas* Fabricius, but in general are smaller and slenderer. The main difference is in the mouth parts: in *Messiasia* the stem of the proboscis is short and attached to middle of labella, the labella is semicircular and almost always subequal in length to the oral cavity; the oral cavity is situated at about one-fourth the distance from the lower eye margin to the antennae. In *Mydas* and its allies the stem of the proboscis is normally subequal to the length of the oral cavity, the labella is attached to about the apical one-half of the stem, is triangular in shape and extends out at about a right angle to the stem, and the oral margin is about opposite the lower eye margin.

More complete descriptions and illustrations will be found in d'Andretta (1951) and Wilcox & Papavero (1971).

2. MATERIALS AND METHODS

In addition to the senior author's (JW) private collection, and the collections of the Museu de Zoologia da Universidade de São Paulo (MZUSP), the authors have studied the collections listed below. To the institutions and persons who loaned us specimens we are deeply obliged.

AMNH	American Museum of Natural History, New York (P. Wygodzinsky)
ASU	Arizona State University, Tempe (Mont A. Cazier)
BMNH	British Museum (Natural History), London (H. Oldroyd)
CAS	California Academy of Sciences, San Francisco (P. H. Arnaud, Jr.)
CDA	California Department of Agriculture, Sacramento (Marius S. Wasbauer)

CIS	California Insect Survey, University of California, Berkeley (Frank R. Cole, Jerry A. Powell, Evert I. Schlinger)
CNC	Canadian National Collection, Ottawa (B. V. Peterson)
CSCLB	California State College, Long Beach (E. L. Sleeper)
EF	Eric M. Fisher, Long Beach
FRAN	Natur-Museum und Forschungsinstitut (Senckenberg), Frankfurt a. M. (W. Tobias)
FSCA	Florida State Collection of Arthropods, Gainesville (Howard V. Weems, Jr.)
IML	Instituto Miguel Lillo, Tucumán
IOC	Instituto Oswaldo Cruz, Rio de Janeiro
LACM	Los Angeles County Museum, Los Angeles (Charles L. Hogue)
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge (Howard E. Evans)
MNHN	Muséum National d'Histoire Naturelle, Paris (Léonide Tsacas, Loïc Matile)
MNRJ	Museu Nacional, Rio de Janeiro (Dalcy de O. Albuquerque)
NMB	Naturhistorisches Museum Basel, Basel (Fred Keiser)
OhioSU	Ohio State University, Columbus (C. A. Triplehorn)
RHC	R. H. Crandall, Pasadena, Calif. (via EF)
RHP	R. H. Painter, Manhattan, Kansas (Elizabeth M. Painter)
UA	University of Arizona, Tucson (Floyd G. Werner)
UCD	University of California, Davis (Robert O. Schuster)
UCR	University of California, Riverside (Saul I. Frommer, P. H. Timberlake)
UK	University of Kansas, Lawrence (Peter D. Ashlock)
USNM	United States National Museum, Washington, D.C. (Lloyd V. Knutson)
WIEN	Naturhistorisches Museum, Vienna (R. Lichtenberg)
ZMB	Zoologisches Museum (Museum für Naturkunde), Humboldt-Universität, Berlin

Drawings were made with the help of a camera lucida; the male gonopods and hypandrium were shadowed in the drawings, and hairs and bristles not represented; measurements of antennae, legs, bullae, etc., are given in millimeters. Coordinates for mapping the localities were obtained from Vanzolini & Papavero, 1969, for Brazilian localities, and from Hanson, 1945, and the gazetteers of the United States Board on Geographical Names, for the other countries.

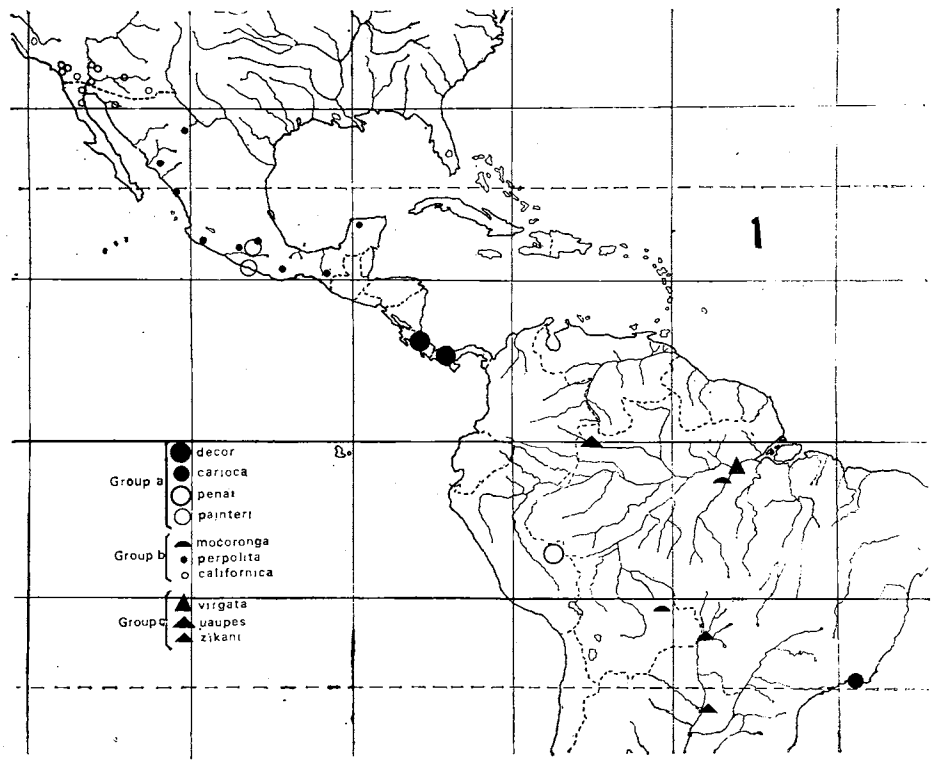
3. ACKNOWLEDGMENTS

The authors are especially indebted to Drs. P. Wygodzinsky (AMNH) and Léonide Tsacas (MNHN) for the loaning of types; to Dr. Lloyd V. Knutson for Berg's reference to the biology of *M. testaceiventris*, and to Dr. Howard E. Evans (MCZ) for the examination of critical specimens and types.

The junior author is particularly indebted to the John Simon Guggenheim Memorial Foundation, whose Grant made possible the examination of types and collections in North America and Europe in 1971-72; also to the Fundação de Amparo à Pesquisa do Estado de São Paulo, and to the Conselho Nacional de Pesquisas do Brasil, for Grants "Biológicas 68/604", and "69/3289", respectively, which made possible the study of collections in the United States and Canada (1968), and England and France (1970).

4. GEOGRAPHICAL DISTRIBUTION

Specimens of *Messiasia* are relatively rare in collections, and, with very few exceptions, species are known from very small series, and still fewer localities. More extensive series would be needed to obtain a good geographical pattern. Therefore, the following arguments are mostly speculative, but should serve to orient future investigations on the zoogeography of the group.



Map 1, Distribution of groups "a-c" of *Messiasia*.

Messiasia is predominantly South American (Guiano-Brazilian), with 12 species known south of Panama, but also occurs in Central America and Mexico, extending to the north up to California, New Mexico, and Arizona, in a total of 5 species. The genus does not occur in Chile or in the West Indies. Its total range is therefore from approximately 33°N to 33°S.

A closer examination of the distribution of the several groups of species shows the following patterns:

(i) Species with black abdomen, and with at least a clump of white hairs on tergite 1 are "peripheral" to the Amazonian basin:

1. *painteri,* sp. n., occurs in Southern Mexico;

2. *decor* (Osten Sacken) in Costa Rica and Panama;

3. *penai,* sp. n., in Peru (Madre de Dios region);

4. *carioca,* sp. n., only in the State of Guanabara, Brazil.

(ii) Species with black abdomen and tergite 1 exclusively with black hairs are predominantly Amazonian, occurring also in Mexico (forested areas) and in the Sonoran Desert:

1. *mocoronga,* sp. n., occurs in the Brazilian State of Pará, and probably in Bolivia;

2. *uaupes,* sp. n., and *virgata* (Wiedemann) in the Brazilian Amazonia;

3. *zikani* d'Andretta, very closely related to *uaupes,* occurs outside the Amazonian basin, in southern Mato Grosso and Paraguay;

4. *perpolita* (Johnson) in southern Mexico;

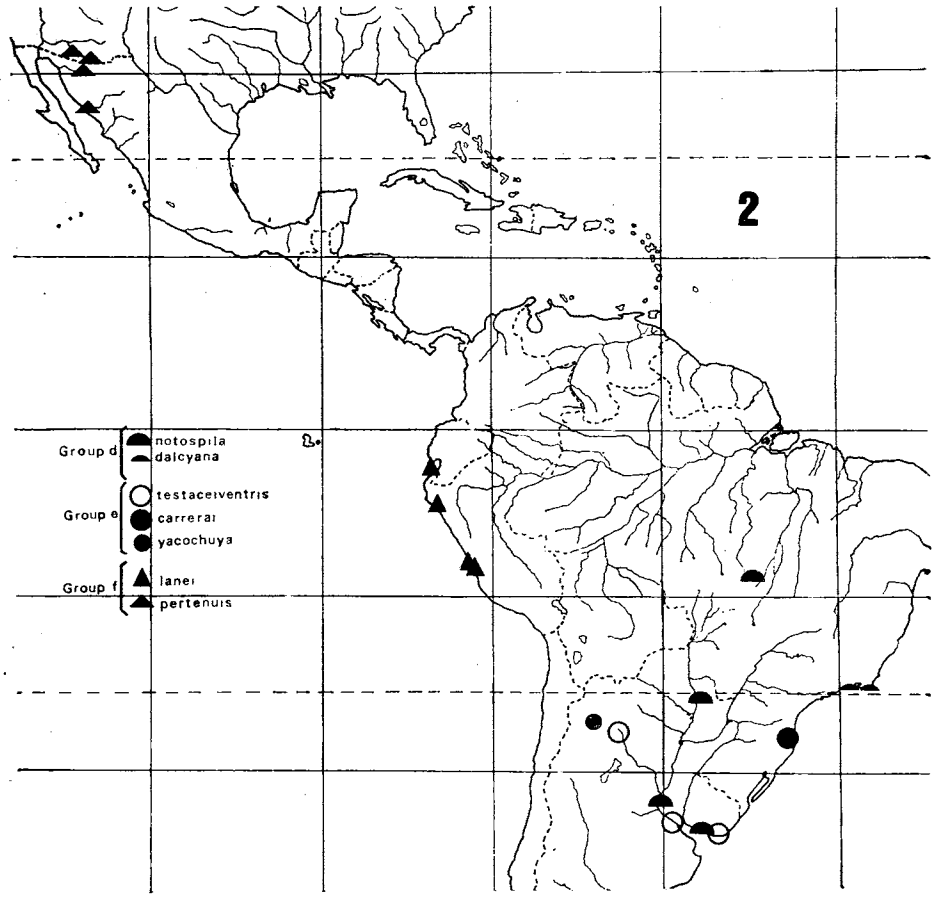
5. *californica* (Cole) in Sonora, Baja California, California, New Mexico, and Arizona.

(iii) Species with brown abdomen, the posterior margins of tergites 1-7 yellowish, and hairs of the head yellowish, occur in southern Brazil, Uruguay, and northern Argentina, and on the coast of the States of Guanabara and Rio de Janeiro, in Brazil:

1. *dalcyana* d'Andretta only in the coast of Guanabara and Rio de Janeiro;

2. *notospila* (Wiedemann) along the Paraná-Paraguay basin, northern Argentina, and Uruguay.

(iv) Species with tergites orange and sternites black occur in southern Brazil, Uruguay, and northern Argentina:



Map 2, Distribution of groups "d-f" of *Messiasia* (open formations species).

1. *carrerai* d'Andretta, known only from Santa Catarina, Brazil;

2. *testaceiventris* (Macquart), from Uruguay and northern Argentina.

(v) Species with orange tergites and sternites occur in coastal Ecuador and Peru, and in the Sonoran Desert:

1. *pertenuis* (Johnson) in Arizona and Sonora;

2. *lanei* d'Andretta in coastal Ecuador and Peru.

(vi) *M. yacochuya,* sp. n., an entirely black species with lateral margins of the mesonotum orange, is known only from its type-locality in Salta, Argentina.

5. ECOLOGY AND BIOLOGY

5.1. ADULTS

As pointed out in our 1971 paper, very few data on the ecology of the Mydidae, and of *Messiasia* in particular, are known. The few data that we have come from three different sources:

(i) Direct evidence. *Messiasia dalcyana* d'Andretta, as published by Wilcox & Papavero (1971: 44) "has been collected by the junior author on the sand dunes at Cabo Frio, Rio de Janeiro, Brazil, on flowers of *Cassia* sp. Dr. Hugo Souza Lopes also collected the same species on sand dunes areas." Séguy (1928: 143) cites an observation made by d'Orbigny, while travelling through Maldonado, Uruguay, about *M. testaceiventris* (Macquart); it occurs "sur le sommet des montagnes, rare, vole peu et à la manière des taons". Specimens of *M. notospila* (Wiedemann), captured at Posto Jacaré, lower Culuene River, Mato Grosso, had a note pinned with the specimen saying that they had been captured on sand, at the shores of the Culuene River; for that same species we have the information pinned with the type of *cingulatus* Williston: "shore of Rio Paraguay, below Concepción, Dec. 28, forest. Hit on ground". Specimens of *M. pertenuis* (Johnson) have been collected on sea beach, at Desemboque, Sonora.

(ii) Indirect evidence. Some species of *Messiasia* are known from areas so uniform in ecology that it is possible to tell their habitat. Thus, *M. yacochuya,* sp. n., was collected at Yacochuya, Cafayate, Province of Salta, Argentina — the area is characterized by dry, high-altitude (1950m) sand dune areas in the inter-Andean region; a description and photograph of the area are given by Hueck (1972: 349-351, fig. 198). *M. californica* (Cole) is surely an inhabitant of semi-arid formations. The same evidence is obtained for *pertenuis* (Johnson), in the Sonoran Desert, and *lanei* d'Andretta, from the arid coasts of Peru and Ecuador.

(iii) Inferred evidence. Examination of the distribution maps, and comparison with vegetation maps (e.g., Hueck, 1972; Knapp, 1965) show that the species of *Messiasia* fall into two large groups:

1. Species that probably live in forested areas: *painteri, perpolita, decor, uaupes, virgata, mocoronga, penai,* and *carioca;*

2. Species that live in arid or semi-arid, or other open formations:

a. Mexican plateau and Sonoran Desert: *californica* and *pertenuis;*

b. Trans-Andean or Andean dry areas: *lanei* and *yacochuya;*

c. Cerrados, pampas, river or sea shores of southern Brazil, Uruguay, and northern Argentina: *zikani, carrerai, notospila, testaceiventris,* and *dalcyana.*

It is to be noted that species probably living in forest areas are always black; those of open formations may have a black, brown or orange abdomen.

5.2. LARVAE

As to the habitat of the larvae, still less is known. Berg (1899) published the following note on *M. testaceiventris*:

> "Anotaré aquí una particularidad biológica de esta especie, consistindo en que habita sólo en cumbres de cierta altura (400 à 500 m), y de pasarse casi únicamente en los hormigueros de *Atta hystrix* (Latr.) Halid. y *Atta Lundi* (Guér.) Mayr [now *Acromyrmex hystrix* (Latreille, 1802), and *A. lundi* (Guérin-Méneville, 1838); cf. Kempf, 1972], los cuales quizás le sirven de morada de su cría."

This observation was never confirmed; it is however highly probable that *Messiasia* larvae live in *Acromyrmex* nests as those of *Mydas* in nests of *Atta*.

Specimens of *Messiasia pertenuis* (Johnson), at the UA, were reared from larvae and pupae collected at the Santa Rita Range Reserve, Arizona, from nests of the banner-tailed kangaroo rat (*Dipodomys spectabilis spectabilis* Merriam, Fam. Heteromyidae). According to Miller & Kellog (1955: 389) this subspecies of kangaroo rat ranges from the "higher plateau region of southeastern Arizona (...) east through northern Chihuahua and southeastern New Mexico generally on barren mesa tops and foothill slopes of desert ranges to western edge of Rio Grande Valley."

6. HYPOTHETICAL HISTORY OF EVOLUTION

The distribution, morphology, systematics, and ecology of the different species groups of *Messiasia* suggest to us the following speculative history of evolution (see Fig. 35 for phylogenetic relationships):

1. *Origin of the group.* *Messiasia* probably evolved in the forests of the Guiano-Brazilian subregion, during the Tertiary isolation of South America; penetration and speciation in South American open formations has probably occurred as a secondary phenomenon; after the definite establishment of the Panama land-bridge in the Plio-Pleistocene transition (Haffer, 1970b), three different species-groups invaded North America, colonizing first the forests of Central America and southern Mexico, and later the Mexican Plateau and the Sonoran Desert.

2. *Evolution in South American forests.* Three different species-groups are known presently from the forests of the Guiano-Brazilian subregion:

a. One group characterized by the entirely black abdomen, and tergite 1 with at least some white hairs (*decor, carioca, penai;* also including *painteri,* from southern Mexico);

b. One characterized by the equally black abdomen, but tergite 1 only with black hairs, and sternites black or dark-brown (*mocoronga;* in North America *perpolita* and *californica*);

c. One with black abdomen (tergite 2 sometimes with yellow spots), tergite 1 entirely black haired, but sternites 1-2 partially or totally dirty white (or yellowish) (*virgata, uaupes,* and *zikani*).

We believe that group "a" was the first to evolve, and that it occupied all the forests of the Guiano-Brazilian subregion; its species were probably formed in peripheral refugia (eastern Peru, Serra do Mar, and Guianas), during arid cycles, according to the models proposed by Haffer (1969, 1970a), and Vanzolini & Williams (1970) (see also Vuillemier, 1971).

Groups "b" and "c", derived from "a", evolved mainly in the Amazonian basin forest, and, by competition, probably eliminated the representatives of group "a", which are now distributed in peripheral areas — *carioca* in the Serra do Mar forest, *penai* in the forests of the Madre de Dios region in Peru, and *decor* in the forests of Panama, later entering Central America. Species of groups "b" and "c" (*mocoronga, virgata,* and *uaupes*) occupied then the Amazonian valley.

With the establishment of the Panama land-bridge, groups "a" and "b" invaded Central and North America, producing new species, derived from South American stocks — *painteri* in southern Mexico (group "a"); *perpolita* in Mexico and *californica* in the Sonoran subregion (group "b").

Group "c" expanded towards the south, evolving into a different species in the "cerrados" (savanna-like formations) of southern Mato Grosso and Paraguay — *zikani* is clearly derived from *uaupes.*

3. *Evolution in South American open formations.* The same as with the forest inhabiting species-groups, three different species-groups were formed in the open formations of South America:

d. Characterized by the brown tergites, with yellow hind margin, the head with yellow hairs — *notospila* and *dalcyana;*

e. With orange (or black) tergites, sides of mesonotum orange or black, and black sternites — *testaceiventris, carrerai,* and *yacochuya;*

f. Tergites orange, sternites also orange — *lanei* and *pertenuis.*

Group "d" has most certainly evolved in the "cerrados" of Central and Southern Brazil, and in the pampas of Uruguay and northern Argentina; the formation of *dalcyana* will be discussed in a further item.

Group "e" also probably evolved in the cerrados and pampas, and invaded several open formations, now isolated by forests or other barriers, during different climatic cycles in South America. This is probably the explanation of the origin of *carrerai* and *yacochuya* — during an arid cycle, with the retreat of the forest and consequent expansion of

the semi-arid or other open formations, group "b" had the occasion to spread and occupy new areas; once the humid conditions returned, the forests occupied their former extensions, and populations of group "b" became isolated in enclaves of open vegetation. This is what probably happened with *yacochuya,* now isolated on top of the Cafayate semi-desert in Salta, Argentina (1950 m), and with *carrerai,* probably isolated in an area of cerrados surrounded by forests in Santa Catarina, Brazil.

Group "f" evolved in the arid coasts of Peru and Ecuador (*lanei*), and later, during an arid episode, had the occasion to spread northwards, colonizing the Mexican Plateau. With the return of humid conditions and forests, the northern populations became isolated, evolving into a different species — *pertenuis.*

4. *Evolution of Messiasia dalcyana.* This species is only known from a few localities, its range extending from the long sand bar of Marambaia (Restinga de Marambaia), State of Guanabara, to Cabo Frio and Arraial do Cabo, State of Rio de Janeiro, some 180 km further east. It is limited to a narrow strip of land at most some tens of meters wide, next to the sea, where sand dunes are found; a description of the area has been given by Dansereau (1947).

Closest to *dalcyana,* taxonomically, ecologically, and geographically, is *M. notospila* (Wiedemann), an inhabitant of sandy areas along river and sea shores, ranging from Central and Southern Brazil to Uruguay.

Both species are now widely separated geographically, both along the Atlantic coast, from Rio Grande do Sul to Guanabara, and, in the interior, by the forests along the Serra do Mar.

This case parallels remarkably close the one described and analyzed by Vanzolini & Ab'Saber (1968), for two species of the iguanid lizard *Liolaemus.* The same explanation of the evolution of this pattern may be employed here, and we are quoting those authors verbatim:

"Given the distribution of the two species, it is reasonable to accept the hypothesis that they are offshoots of a single ancestral species, formerly widespread, whose range has been broken up by disappearance in the intervening region [northern Rio Grande do Sul to Guanabara] of the suitable ecology. Since both species are narrowly restricted to sand dunes and sand bars, their evolution must be closely linked to the history of land forms in the coast of southern Brazil."

"Bigarella (1965) presents a good summary of the evolution of the coast in the area of interest, correlating changes of absolute and relative sea level with local climate and geomorphic events, and providing several C_{14} datings."

"From his Fig. 1 it is easy to see that optimal conditions for the existence of a continuous coastal belt of sand bars and dunes obtained during a dry phase which followed the Cananéia submergence, whose earlier half is synchronous with Fairbridge's (1961, 1962) Younger Perón. This dry phase contained: (i) the Crane Key and Pelham Bay emergences of Fairbridge, separated by a minor short-lived ascension (not reaching the general mean) of the sea level, called by Bigarella (1965) "Ilha do Mel"; (ii) the deposition of the southern Brazilian stone-lines (Ab'Saber, 1962); (iii) a strong reactivation of a previous generation of dunes (Ab'Saber, 1965)."

"The beginning of this phase is dated by the Sambaqui (shell mound) do Macedo, for which Hurt (1964) gives ages varying between 3,513 ± 56 and 3,284 ± 48 years B.P. The end of the period is dated, also by Hurt, cited by Bigarella (1965) at 2,680 ± 150 years B.P.; this is the C_{14} age for the hanging beach of Saco da Tamburutaca (Paranaguá submergence of Bigarella)."

"We consider it most probable that the spread of *Liolaemus* [and also of *Messiasia*] happened during this Crane Key-Pelham Bay interval, and that its range was broken up by the Paranaguá submergence."

"However the possibility must be faced that the migration route of *Liolaemus* [and of *Messiasia*] was the previous generation of dunes cited above (Ab'Saber, 1965). This would imply into epeirogenetic phenomena to explain the raised position of the relevant wavebuilt terraces, which are 3 to 4 m higher than Fairbridge's Older Perón. Those (Delaney, 1963) who do not believe in epeirogenetic movements would place these dunes in Tyrrhenian times, 25 to 60,000 years ago. Bigarella (1965) tentatively refers them to the Older Perón, 5,000 to 5,500 B.P."

"Even if we accept the oldest, and to us less probable date, the rate of divergence observed is still very fast. This indicates that no interpretation of present patterns of differentiation should be undertaken without close attention being paid to the very drastic and rapid late Quaternary changes of climate and to their influence on local topography and ecology."

7. SYSTEMATICS

Genus **Messiasia** d'Andretta

Messiasia d'Andretta, 1951: 52. Type-species, *carrerai* d'Andretta (orig. des.). Refs. — Papavero & Wilcox, 1968: 4 (cat.); Wilcox & Papavero, 1971: 88 (descr.), map 3 (distr.).

Key to species

1. Abdominal tergites black, sometimes with metallic blue reflections, at most with a yellow spot on 1 or 2, or the very narrow posterior margins of 2-6 or 2-7 brownish or reddish; thorax black (if tergites black, but mesonotum with orange sides, see couplet 12) 2

   Abdominal tergites brown with the posterior margins of 1-7 yellowish, or tergites 2-7 yellowish-red with or without brown spots 12

2(1). Hairs on tergite 1 white, narrow posterior margins of 2-7 brown or whitish; mystax and hairs to sides of antennae largely white; antennae black, apical 1/2 of club reddish, segments ♂ 0.39-0.13-1.71-1.71(0.47), ♀ 0.39-0.16-1.58-1.58(0.39) mm; wings very light brown, submarginal cell 2 closed; hind femora 4.3 to 5.0 times as long as wide, ♂ 5.26(1.05), ♀ 5.00(1.16) mm; length 13-16 mm (Mexico: Guerrero and Morelos) .. *painteri*, sp. n.

   Hairs on tergite 1 largely black 3

3(2). Tergite 1 with a lateral clump of white hairs above hind coxae 4

   Hairs on tergite 1 all black 6

4(3). Fore femora with anterior ventral fringe of dense hairs; hind femora 7-8 times as long as wide, ♂ 7.37(1.05), ♀ 8.42(1.05) mm; tergites with faint metallic blue reflections; mesonotum dull black, intermediate stripes including dorsocentral stripes shining; antennae black, segments ♂ 0.47-0.16-2.16-2.18 mm; wings pale brown, submarginal cell 2 narrowly to broadly open; length 21-26 mm (Costa Rica, Panama) .. *decor* (Osten Sacken)

Fore femora with short anterior ventral fringe 5

5(4). Tergites with metallic blue reflections; mesonotum subshining black; antennae black, apical 2/3 of club dark red, segments ♀ 0.63-0.21-2.58-2.63(0.58); wings brown, submarginal cell 2 closed; hind femora 9 times as long as wide, ♀ 10.0(1.11) mm; length 30 mm (Peru) ..... ♀ *penai,* sp. n.

Tergites shining black, but without metallic blue reflections; mesonotum dull black, sparsely ash-grey pollinose; dorsocentral stripes and lateral margins of mesonotum more intensely pollinose, whitish under certain lights; antennae black, club ferrugineous, more reddish on venter, segments ♀ 0.40-0.20-2.00-2.00(0.48) mm; wings brown, with lighter stripes in submarginal cell 1 (near stump of R_3), posterior cells 4 and 5, and anal cell; hind femora 6 times as long as broad, ♀ 7.80(1.36) mm; length 23 mm (Brazil: Guanabara) ..... ♀ *carioca,* sp. n.

6(3). Sternites more or less uniformly brownish or black 7

Sternite 1 and at least posterior margin of 2 dirty white (light yellowish) 10

7(6). Wings brown, apical 1/3 and interior of cells lighter; entirely black species; mystax white at sides, black on middle; apical 2/3 of antennal club reddish; hind femora 8 times as long as broad, ♀ 8.00(0.96) mm; lenght 20-23 mm (Brazil: Pará; ? Bolivia) ..... *mocoronga,* sp. n.

Wings brown, sometimes interior of cells lighter, but never with lighter apical 1/3 8

8(7). Hind femora 7.1 times as long as wide, ♀ 5.63(0.79) mm; mesonotum greyish pollinose, narrow median stripe and dorsocentral stripes bare, at some angles anterior dorsocentral stripes whitish pollinose; length 15 mm (Ecuador) .....
..... ♀ *lanei* d'Andretta, ?black form

Hind femora 4.2 to 5.5 times as long as wide; central and intermediate stripes of mesonotum shining or subshining black .. 9

9(8). Hind femora 4.2 to 5.0 times as long as wide, ♂ 6.42 (1.31), ♀ 6.74(1.37) mm; mystax black, white on sides in ♂, sparse in ♀; antennae black, ♂ 0.39-0.18-2.37-2.08(0.58) ♀ 0.42--0.16-2.21-1.95(0.50) mm; bullae black, ♂ 0.92(0.18) mm; tergites with metallic blue reflections; length 19-23 mm (Mexico) ..... *perpolita* (Johnson)

Hind femora 5.3 to 5.5 times as long as wide, ♂ 5.63(1.05), ♀ 5.74(1.05) mm; mystax black; antennae black, segments ♂ 0.39-0.16-1.37-1.24(0.39), ♀ 0.42-0.16-1.32-1.47(0.55); bullae brown, ♂ 0.74(0.13) mm; length 14-26 mm (USA): Arizona, California, New Mexico; Mexico: Baja California Norte, Sonora) ..... *californica* (Cole)

10(8). Tergites uniformly shining black, but without metallic blue reflections; sternite 1 and hind margin of 2 whitish; hind margin of remaining sternites dark reddish-brown; mystax and hairs to sides of antennae white (♂); antennae black, club ferrugineous, reddish on ventral side, segments ♂ 0.44-0.14-2.10-1.90 (0.44), ♀ 0.42-0.11-2.06-1.89(0.64) mm; wings uniformly very light brown; mesonotum shining black, dorsocentral stripes and lateral margins of mesonotum ashgrey pollinose (whitish under certain lights); hind femora 6.2-6.7 times as long as broad, ♂ 7.60(1.12), ♀ 8.12(1.31) mm; length 23 mm (Amazonia) ..... *virgata* (Wiedemann)

Tergite 2 (also sometimes posterior margin of 1) with a regular, intensely yellow spot (Figs. 32-34); remaining tergites black, with violet or blue metallic reflections 11

11(10). Spot on tergite 2 as in Fig. 32; sternite 1 and posterior margin of 2 dirty white (yellowish); sternites 2-3 with yellowish-brown posterior margin; mystax and hairs to sides of antennae black and white (♂); antennae black, club dark ferrugineous, venter reddish; ♂ segments 0.40-0.20-1.70-1.70(0.64) mm; mesonotum dull black, with faint pollinose dorsocentral rows and lateral margins; wings brown, specially along veins, lighter in the interior of cells; hind femora 6 times as long as broad, ♂ 7.20 (1.20) mm; length 23 mm (Amazonia) ..... ♂ *uaupes,* sp. n.

Spot on tergite 2 as in Fig. 33; sternites 1-2 completely dirty white (yellowish); hind margin of sternites 3-7 reddish-brown; sternite 8 entirel, reddish-brown; mystax and hairs to sides of antennae pure white (♂), or mixed with black (♀); antennae black, club ferrugineous, ♂ segments 0.44-0.16-1.90-1.80(0.50) mm; ♀ antennae ferrugineous, club reddish, segments 0.40-0.14-1.90--1.90(0.52) mm; mesonotum as in the preceding species; wings light brown, somewhat darker in ♂, interior of cells lighter; hind femora 5.3 to 5.6 times as long as broad, ♂ 6.00 (1.12),

♀ 6.80(1.20) mm; length 23 mm (Brazil: Mato Grosso; Paraguay) ..... *zikani* d'Andretta

12(1). Abdomen brown with posterior margins of tergites 1-7 yellowish; hairs of the head yellowish 13

Abdominal tergites orange with or without dark spots, or entirely black, in which case the lateral margins of the mesonotum are orange; hairs of the head black 14

13(12). Legs yellowish, spur on hind tibiae present, hind femora ♂ 3.68(0.63), ♀ 4.50(0.72) mm; central and intermediate stripes of mesonotum confluent black, remainder yellowish; abdomen brown, anterior margin of 2 and posterior margins of 1-7 yellow, bullae black, ♂ 0.39(0.08), ♀ 0.80(0.16) mm; wings pale brown, submarginal cell 2 closed at margin; length 13-14 mm (Brazil: coast of Guanabara and Rio de Janeiro) .... *dalcyana* d'Andretta

Legs brown, spur on hind tibiae absent, with 2 subapical bristles; hind femora ♂ 4.32(0.72), ♀ 5.53(0.79) mm; mesonotum brown, humeri and postalar calli yellowish, lateral margins and anterior dorsocentral stripes white pollinose; abdomen black or brown, posterior margins of 1-7 yellow, hairs on 1 yellow, brown on remainder, bullae black, ♂ 0.40(0.14), ♀ 0.47(0.18) mm; wings yellowish-brown, submarginal cell 2 short petiolate; length 16 mm (Brazil; Argentina; Uruguay; Paraguay) .... *notospila* (Wiedemann)

14(12). Mesonotum, including humeri and postalar calli, orange (mustard, yellow) in ground color; central and intermediate stripes confluent, black; scutellum black; abdomen shining black, with metallic blue reflections; apical 2/3 of antennal club deep orange-red; mystax scanty, black; wings uniformly brown; length 12 mm (Argentina: Salta) ..... *yacochuya,* sp. n.

Lateral margins of mesonotum orange or black, but abdominal tergites always orange, with or without dark spots 15

15(14). Sternites black 16

Sternites orange, brown to black apically in some females 17

16(15). Lateral margins of mesonotum orange including humeri and postalar calli; tergite 1 and basal one-third of 2 dark brown, 2 small black spots on 7-8; alula brown with margin and fringe brown; length 16-20 mm (Uruguay; Argentina) .... *testaceiventris* (Macquart)

Lateral margins of mesonotum black, humeri and postalar calli dark brown; tergite 1 and ♀ tergites 7-8 black, remainder shining orange-brown, hairs black; wings brown; alula black, margin and fringe brown; length 13-15 mm (Brazil: Santa Catarina) ..... *carrerai* d'Andretta

17(15). Tergite 1 dull black, with narrow posterior margin brown, 2-7 yellowish-red with narrow sides brown to black; antennae 1-3 black to dark red, club largely red, segments 0.39-0.13-2.11--1.82(0.50) (♂); hind femora dark red, 4.9 times as long as wide, ♂ 6.47(1.31), ♀ 6.05(1.21) mm; wings brown, submarginal cell 2 petiolate; bullae black, red internally, ♂ 0.71 (0.13), ♀ 0.39(0.13) mm; length 18-23 mm (USA: Arizona; Mexico: Sonora) ..... *pertenuis* (Johnson)

Tergite 1 shining black with narrow posterior margin yellow to brown, 2-7 yellowish-red with narrow sides brown, sides of sternites 5-7 extending inward and touching posteriorly on 6-7 brown; antennae black, club in part red, segments ♂ 0.29-0.16--1.13-1.45(0.34), ♀ 0.32-0.16-1.37-1.50(0.42) mm; hind femora black, 6.6 to 6.8 times as long as wide, 4.89 (0.74) (♂), 5.37(0.79) (♀); wings brown, submarginal cell 2 closed to petiolate; bullae, ♂ yellow, 0.34(0.11), ♀ reddish, 0.32 (0.08) mm; length 14-16 mm (Peru; Ecuador) .... *lanei* d'Andretta

Messiasia californica (Cole), comb. n.

(Figs. 1-3)

Mydas californicus Cole, 1970: 181. Description as follows: "*M. californicus* Hull (evidently a manuscript name), a medium sized jet black species with blackish wings, was taken in series at Whitewater, at the western edge of the Colorado Desert, in Riverside Co., Calif., July 9 (Linsley and MacSwain). It is not listed in the Catalog". Syntypes ♂ ♀, CAS.

Male. Length, 14-22 mm. Head black, gibbosity and frons shining; sides of face extending across below antennae, very narrow sides of frons, and occiput, white pollinose. Hairs black, subequal in length to antennae 1; semierect on gibbosity, erect on frons, slightly longer above and below on occiput, moderately dense but not concealing ground color. Proboscis black, labella subequal to length of oral cavity, length 0.95; oral margin at 0.37/1.26 distance from lower eye margin to antennae. Face at lower eye margin 0.63, at antennae 1.37, vertex 1.16, one eye 1.05 in width. Antennae black, hairs black; segments 0.39-0.16-1.37--1.24 (0.39), sensory area 0.32, in length (width).

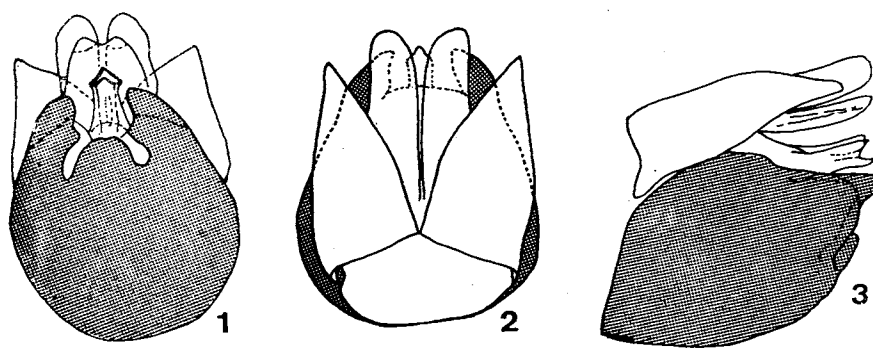
Mesonotum shining black; hairs black, semierect anteriorly and subequal in length to antennae 1, short sparse posteriorly. Pleura and coxae shining black; hairs black, quite long, dense, on propleura and pteropleura. Scutellum and post-scutellum black, hairs short, sparse, black, on scutellum.

Tergites shining black with slight metallic blue reflections. Hairs black, dense, erect, on 1, recumbent on 2-7, numerous on 2-3 becoming sparse apically; bullae black, 0.74(0.13) in length (width). Sternites shining black; hairs sparse, recumbent, black, numerous on 7-8 and longer on 8. Genitalia (Figs. 1-3) black, "hypandrium" shining reddish-brown, with "gonopods" black (the hypandrium is fused to the gonopods); hairs black, quite long on epandria, proctiger and gonopods, "hypandrium" bare.

Legs black, hairs and bristles black. Hairs short semierect on fore and middle legs. Hind femora 4.63(0.74) in length (width), 16 black tuberculate spines on venter; hairs on dorsum sparse, erect, as long as antennae 1, on posterior side dense, erect, directed ventrad, and as long as antennae 1-2; short, sparse, semierect otherwise. Hind tibiae with dense, short, semierect hairs and sparse bristles; apical spur 0.26 in length; tarsal segments 0.79(0.21), 0.42, 0.32, 0.26, 0.37 in length (width); claws dark red, tip black; pulvilli brown.

Halteres and alulae black, margin and fringe black. Wings dark brown, with lighter spots in the posterior cells; axillary cell and lobe lighter; submarginal cell 2 closed and short petiolate; posterior crossvein present.

Female. Length, 17-26 mm. Similar to ♂. Face at lower eye margin 0.79, at antennae 1.58, vertex 1.16, one eye 1.11, in width. Antennal segments 0.42-0.16-1.32-1.47(0.74), sensory area 0.21, in length (width). Tergite 8 dark brown, apical semicircular area dirty white. Hind femora 5.26(1.00); tibial spur 0.24, with black bristles at base; hind tarsi 0.89 (0.21), 0.53, 0.39, 0.26, 0.39 in length (width).



Messiasia californica (Cole), male genitalia: 1, ventral view; 2, dorsal view; 3, lateral view.

Other specimens, while in general appear to be black, have all or part of the following areas dark-red or reddish-brown: posterior lateral margins of mesonotum, pleura, and coxae; incisures of tergites and broad anterior margin of 2; broad incisures of sternites and the hind femora. Intense metallic reflections of purple and greens were noted on the abdomen of several specimens from the type-locality, and the bullae at times are reddish.

Material examined

UNITED STATES. *Arizona*: Maricopa Co., Tempe, x.1968 (J. Mc Bride), ♀, ASU; Pinal Co., Florence Jct., vi.1953 (T. R. Haig), 2 ♂, ♀, UCD; Yuma Co., 5 mi n.w. Bouse, v.1966 (J. M. Davidson, S. A. Gorodenski), ♀, ASU; 6 and 16 mi s.e. Parker, v.1966 (S. A. Gorodenski, J. H. & J. M. Davison, M. A. Cazier), 2 pairs, 15 ♂, 3 ♀, ASU; Yuma, v.1955 (G. D. Butler), verbina, ♂, UA. *California*: Imperial Co., 6 mi w. Coyote Wells, v.1966 (R. R. Snelling), ♂ ♀, EF; 22 mi s. Oasis, v.1942 (G. F. Toland, J. Wilcox), 4 ♂, JW; Inyo Co., 6 mi n. Ballarat, vi.1961 (R. L. Westcott), ♂, LACM; Riverside Co , Coachella, vi.1963 (R. L. Westcott), ♂, UCD; do. (Eric Fisher), 5 ♂, ♀, EF; Indio, vi.1955 (Simonds), ♀, CDA; Palm Springs, vii.1950 (J. D. Paschke), pair, CIS; do., vii.1952 (D. S. Thompson), ♀ UCD; 5 mi n. Palm Springs, vi.1959 (G. H. Nelson), on *Ephedra californica*, 4 ♂, FSCA; Station, vii.1952 (D. E. Barcus), ♂, UCD; White Water, vii.1950 (H. L. Hansen, P. D. Hurd, E. G. Linsley, J. W. MacSwain), 11 ♂, 2 ♀, CIS; AMNH; do. (J. C. Hall, W. O. Marshall, A. T. & M. F. McClay, M. J. Stebbins, K. G. Whitesell), pair, 16 ♂, 2 ♀, UCD; San Bernardino Co., 8 mi e. Old Woman Spgs., vii.1965 (W. D. Dyer), ♂, EF; *New Mexico*: Hidalgo Co., Skeleton Cyn., viii.1965 (G. Forister), ♂, UCR.

MEXICO. *Baja California Norte*: Laguna Salada, v.1958 (E. L. Sleeper), ♂, CSCLB; 15 mi s. San Felipe, vi.1967 (E. M. Fisher), 2 ♀, EF. *Sonora*: 10 mi s. Caborca, vi.1962 (D. H. Janzen), ♀, CIS; Cholla Bay, vi.1968 (F. G. Andrews), pair, ♀, UCR.

Messiasia carioca, sp. n.

Messiasia decor Osten Sacken of d'Andretta, 1951: 68, misident. (part; only ♀ from Guanabara, Rio de Janeiro).

Female. Length, 23 mm. Head black; gibbosity and frons subshining; sides of face extending across below antennae, sides of frons, eye margin of occiput, ash-grey pollinose. Hairs black, with brownish-golden reflections on sides of gibbosity, slightly longer than antennae 1-2; recumbent on gibbosity, erect on frons, semierect above antennae, longer above and below on occiput. Proboscis black, subequal in length to oral cavity, 0.16 in length; oral margin at 3/11 distance from lower eye margin to antennae. Face at lower eye margin 0.96, at antennae 2.0,

vertex 1.60, one eye 1.76 in width. Antennae black, club dark reddish-ferrugineous, sparsely grey pollinose; hairs black; segments 0.40-0.20--2.00-2.00(0.48) in length (width).

Mesonotum dull black; dorsocentral stripes and lateral margins of mesonotum ash-grey pollinose, more visible under certain lights; hairs black, semierect, shorter than antennae 1 anteriorly, becoming shorter and erect posteriorly. Pleura and coxae subshining black, grey (or brownish) pollinose, a little golden-brown pollen on sternopleura; hairs black, quite long, dense, on pteropleura; hind coxae with very long, soft, white hairs. Scutellum black, arms with long black hairs; postscutellum black, grey pollinose, transverse rugose.

Tergites shining black; hairs long, semierect, black, anteriorly, recumbent posteriorly, on tergite 1; a clump of long, soft, white hairs laterally, above hind coxae; remainder tergites with short, sparse, recumbent, black hairs, longer on apical segments. Bullae black, 0.70 (0.20) in length (width). Sternites shining black, with dark reddish-brown posterior margins; hairs short, sparse, black.

Legs very dark reddish-brown, fore and middle femora darker on dorsum; hairs and bristles black. Hairs dense, short, black, on fore and middle tibiae; longer, semierect, on femora. Hind femora 7.80(1.36) in length (width), 16 very dark reddish-brown to black tuberculate spines on venter; hairs on dorsum and venter sparse, semierect, as long as antennae 1-2, and short, recumbent ones mixed. Tarsal segments 0.80 (0.17), 0.40, 0.30 (others missing), in length (width).

Halteres and alulae black, margin and fringe brown. Wings brown, darker on anterior half; lighter stripes in submarginal cell 1, near stump of R_3; less visible one in submarginal 2 and posterior 1; broader and more visible on posterior cells 4-5 and anal cell; submarginal cell 2 closed and petiolate; posterior crossvein present.

Male. Unknown.

Holotype ♀, BRAZIL. *Guanabara*: Rio de Janeiro, ii.1939 (Serviço de Febre Amarela, Ministério de Educação e Saúde), in the MZUSP (misidentified as *decor* (Osten Sacken) by d'Andretta, 1951).

Messiasia carrerai d'Andretta

Messiasia carrerai d'Andretta, 1951: 55, figs. 16 (head, frontal view), 17 (proboscis), 18 (hypopharynx), 19 (maxilla and palpi), 20 (labella), 21 (labro-epipharynx), 40 (head, lateral view), 83 (hind leg), 85 (spines on venter of hind femur), 85 (apex of hind tibia), 161 (♂ genitalia, lateral view), 169 (epandrial half), 135 (fused gonopods and hypandrium), 183 (aedeagus). Type-locality: Brazil, Santa Catarina, Imbituba. Type ♂, MNRJ; paratypes ♂ ♀, MZUSP, IOC.

Messiasia carrerai; Papavero & Wilcox, 1968: 4 (cat.; Brazil: Santa Catarina); Wilcox & Papavero, 1971: 90, fig. 88 (epandrium).

Male. Length, 13 mm. Head black; sides of face extending across below antennae, sides of frons and occiput, yellowish-grey pollinose. Hairs black, slightly longer than antennae 1-2; shorter, black, on occiput. Proboscis very dark brown, labella 0.48, oral cavity 0.68 in width. Face at lower eye margin 0.96, at antennae 1.48, vertex 1.40, one eye 1.40 in width. Antennae black, club very dark ferrugineous-red, darker on base and apex; hairs short, black; segments 0.28-0.10-1.14-1.50(0.44) in length (width).

Mesonotum dull black (greased in our specimens), sparsely grey pollinose, anterior dorsocentral rows and lateral margins yellowish-grey pollinose. Hairs black, anteriorly semierect and as long as antennae 1-2, becoming very short posteriorly. Pleura very dark chocolate-brown, thinly grey pollinose; coxae black, hairs black. Scutellum black, sparsely grey pollinose, arms very dark reddish-brown. Postcutellum black, grey pollinose, transverse rugose.

Tergite 1 black, broad posterior margin orange-brown; hairs black; 2-7 orange-brown, with narrow sides black, the black areas increasing in size towards apex; hind narrow margins of 6-7 black; tergite 2 with a small, oblong, black spot on anteromedian margin; hairs short, sparse, recumbent, black; bullae black, 0.48(0.14) in length (width). Sternites very dark brown to black, anterior and posterior margins of 2-4, and anterior margin of 5 dark orange-brown; hairs short, sparse, recumbent, black, becoming longer from sternite 6 onwards. Genitalia black, bristles black.

Legs black; hairs short, recumbent, black, more numerous on tibiae and tarsi. Hind femora 4.00(0.80) in length (width), 18-20 black tuberculate spines on venter, hairs semierect, black, slightly longer than antennae 2. Hind tibiae very dark reddish-brown, with sparse recumbent black hairs; spur length 0.20. Hairs on tarsi sparse, recumbent, black; bristles black; segments 0.44(0.26), 0.30, 0.24, 0.20, 0.44 in length (width); claws reddish, tip black; pulvilli yellowish-brown.

Halteres and alula black, margin and fringe brown. Wings brown, lighter areas inside the cells, except in costal, subcostal, and basal-1; apex of wing lighter; submarginal cell 2 closed and petiolate; posterior crossvein present.

Female. Length, 15 mm. Similar to ♂. Face at lower eye margin 0.80, at antennae 1.32, vertex 1.20, one eye 0.84 in width. Antennal segments 0.24-0.12-1.00-1.40(0.44) in length (width). Abdomen broad, tergites with black areas on lateral and hind margins broader than in males, 7-8 almost entirely black, with diffuse, translucid dark reddish-brown areas; sternites black (very dark brown), hind margins of 2-5 broadly dark reddish-brown; terminalia shining black; bullae black, 0.40 (0.12) in length (width); hairs very short, sparse, black. Legs more dark reddish-brown; hind femora 4.00(0 44) in length (width); tibial spur 0.20, hind tarsal segments 0.60(0.22), 0.32, 0.28, 0.20, 0.40 in length (width).

Material examined

BRAZIL. *Santa Catarina*: Imbituba, xii.1936 (Mello Leitão), 2 ♂, 1 ♀, MZUSP (paratypes).

Messiasia dalcyana d'Andretta

Messiasia dalcyana d'Andretta, 1951: 62, figs. 46 (head, lateral view), 160 (♂ genitalia, lateral view), 167 (epandrial half), 173 (fused gonopods and hypandrium), 179 (aedeagus). Type-locality: Brazil, Guanabara, Rio de Janeiro, Restinga de Marambaia, ix.1936 (H. S. Lopes). Type ♂, MZUSP; paratype ♂, Guanabara, Sernambitiba, x.1950, MZUSP.

Messiasia dalcyana; Papavero & Wilcox, 1968: 4 [cat.; Brazil: Espírito Santo (in error), Guanabara]; Wilcox & Papavero, 1971: 44 (found on flowers, on sand-dunes at Cabo Frio, State of Rio de Janeiro), 89, figs. 85-87 (♂ genitalia), fig. 89 (p. 90; epandrium).

Male. Length, 13 mm. Head black; sides of face wider above, and bare below antennae, narrow sides of frons, and occiput, white pollinose. Hairs yellowish, part black to sides of antennae and upper occiput, subequal in length to antennae 1-2. Labella brown, length 0.68; oral cavity length 0.79; oral margin at 0.42/1.31 distance from lower eye margin to antennae. Face at lower eye margin 0.63, at antennae 1.16, vertex 0.89, one eye 0.84, in width. Antennae black; hairs black; segments 0.26-0.13-1.05 (4 missing).

Mesonotum yellow-brown in ground color, central stripe and intermediate stripes confluent black. Hairs semierect, black, as long as antennae 2 and extending to scutellum in dorsocentral rows. Pleura yellowish with black below on sternopleura, meron-2 and meron-3; propleura and coxae largely black; hairs black. Scutellum black, posterior margim reddish; short hairs black. Postscutellum yellowish, narrowly black at middle; white pollinose and shallow rugose.

Tergites black; posterior margins of 1-7, broad anterior margin of 2, anterior corners of 3-6 extending narrowly across anterior margins on 3-5 yellow; broad sides of 7 reddish; bullae yellowish, narrowly margined with black, 0.39(0.08) in length (width). Hairs sparse, erect, black on 1, short, sparse, recumbent on 2-7. Sternites brown; 1, anterior and posterior margins of 2-5 yellow, 7 reddish-brown, 8 yellowish-red; hairs sparse, recumbent, black, more numerous on 7-8. Genitalia yellowish-red, apex of gonopods black; hairs sparse black, yellowish on proctiger.

Legs yellowish red. Hairs black, sparse, erect and semierect on fore and middle femora and short semierect on their tibiae and tarsi. Hind femora 3.68(0.63) in length (width), 11-12 black tuberculate spines on venter; hairs short, sparse, semierect, longer on posterior ventral surface. Hairs on tibiae sparse semierect, spur 0.21 in length; tarsi

with numerous semierect hairs and sparse, black bristles; segments 0.53(0.21), 0.26, 0.21, 0.16, 0.37 in length (width); claws yellowish-red, tip black; pulvilli light-brown.

Halteres brown; alulae brown, margin and fringe yellowish. Wings hyaline; costal, subcostal, marginal and submarginal 1 apically, light brown; veins light brown; submarginal cell 2 closed at wing margin or petiolate; posterior crossvein present.

Female. Length, 13 mm. Similar to ♂. Face at lower eye margin 0.84, at antennae 1.36, vertex 1.16, in width. Antennae very dark ferrugineous, club reddish-ferrugineous on apical 2/3, apical 1/3 still darker; segments 0.36-0.12-1.20-1.20(0.60) in length (width). Mesonotum dark yellowish-brown in ground color, black stripes larger than in males; dorsocentral and lateral margins stripes yellowish-grey pollinose, more visible and pollinose than in males. Pleura and coxae light-brown; pteropleura more yellowish. Tergites shining brown, yellow areas as in males; bullae as in the males, 0.80 (0.16) in length (width). Sternites shining brown, anterior and posterior margins of 1-5 yellow, remainder with diffuse blackened areas. Legs more brownish than in males; hind femora 4.50(0.72) in length (width); tibial spur 0.24, tarsal segments 0.64(0.20), 0.30, 0.24, 0.18, 0.40 in length (width).

Material examined

BRAZIL. *Guanabara*: Restinga de Marambaia, xi.1939 (H. S. Lopes), ♂ (holotype), MZUSP; Sernambitiba, x.1937 (no collector), ♂ (paratype), MZUSP; Barra da Tijuca, ii.1962 (H. S. Lopes), ♂, and 1 spec. with tip of abdomen missing, MZUSP; do., 6 ♂, MNRJ, ♂, JW; no other data, iii.1952 (Silva), ♂, MNRJ. *Rio de Janeiro*: Cabo Frio, i.1964 (N. Papavero), 2 ♂, MZUSP; Arraial do Cabo, ii.1967 (Jurberg), ♀, MZUSP.

Messiasia decor (Osten Sacken)

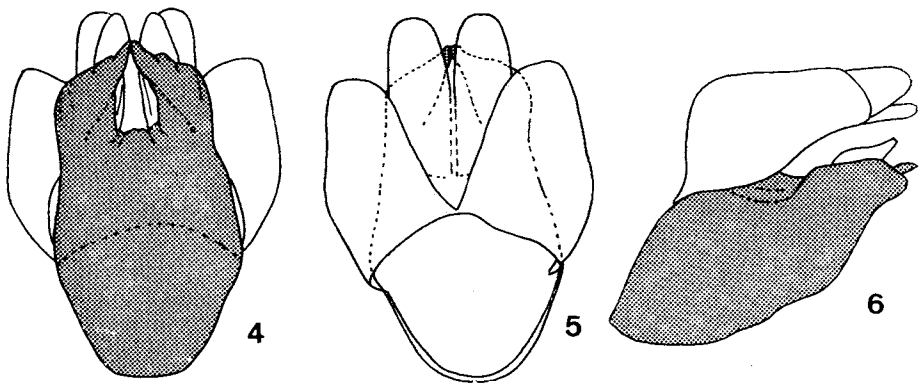
(Figs. 4-6)

Midas decor Osten Sacken, 1886: 71. Type-locality: Panama, Bugaba, 800-1500 feet (Champion). Type ♂, BMNH (seen in 1972).

Mydas decor; Williston, 1898: 55 (Reports from New Mexico, and Mexico: Venta de Zopilote. These records are questioned); 1901: 263 (Mexico: Venta de Zopilote in Guerrero. Record questioned); Aldrich, 1905: 251 (Panama; Osten Sacken and Williston references); Kertész, 1909: 37 (America sept. et centr.; above references).

Messiasia decor; d'Andretta, 1951: 68, figs. 44 (head), 52 (antennae), 76, 77 (legs), 159, 165, 174, 180 (♂ genitalia). Description of ♂ ♀;

reports from Costa Rica, Turrialba (Schild & Burgdorf) ♂; the Brazilian record (Guanabara, Rio de Janeiro) refers to *Messiasia carioca,* sp. n., q. v.; Papavero & Wilcox, 1968: 5 (cat.; Panama; ?New Mexico; Mexico; Costa Rica; Brazil; Osten Sacken and d'Andretta's references. Records from New Mexico and Mexico questioned; record from Brazil refers to *carioca,* sp. n., q. v.); Wilcox & Papavero, 1971: 51, fig. 17 (antenna).



Messiasia decor (Osten Sacken), male genitalia: 4, ventral view; 5, dorsal view; 6, lateral view.

Male. Length, 21 mm. Head black, gibbosity and ocellar area shining; sides of face extending inward below antennae and occiput, white pollinose. Hairs black, subequal in length to antennae 1-2 on face, frons, and vertex; shorter on occiput, black along margins, white internally. Proboscis brown, labella 1.63, oral cavity 1.58 in length; oral margin at 0.79/2.11 distance from lower eye margin to antennae. Face at lower eye margin 1.16, at antennae 1.89, vertex 1.53, one eye 1.26 in width. Antennae black, apical 2/3 of 3 and venter of 4 reddish; hairs black, long, numerous on 1; segments 0.47-0.16-2.16-2.18(0.55), sensory area 0.79, in length (width).

Mesonotum dull black, intermediate stripes including the posterior dorsocentral stripes shining; dorsocentral stripes for a short distance anteriorly, humeri, and posterior lateral margins, white pollinose. Hairs sparse, erect, black, anteriorly nearly as long as antennae 1, gradually becoming shorter apically. Pleura and coxae black; hairs black. Scutellum black, arms reddish, white pollinose apically, short hairs black. Postscutellum black, whitish pollinose.

Tergites shining black; hairs on 1 sparse, erect, brown, and a lateral clump of white above hind coxae; remaining hairs sparse, recumbent, black; bullae brown, 0.45(0.18) in length (width). Sternites shining black, posterior margins of 2-5 brown; hairs sparse, recumbent, black, slightly longer and more numerous on 8. Genitalia black, "hypandrium"

basally, and aedeagus, reddish; hairs sparse, long, black, on gonopods short, golden.

Legs black, hairs black. Hairs sparse, long, erect, on fore and middle femora, short laterally, fore femora with a dense long fringe, directed ventrally on anterior ventral surface; on tibiae and tarsi dense, recumbent, black, dorsally on tibiae semierect, making the tibiae appear to be as wide as their femora; bristles black. Hind femora 7.37(1.05) in length (width); 20 brown tuberculate spines on venter; hairs on sides and dorsum short, recumbent, venter with long posterior fringe. Hairs on tibiae recumbent, numerous on dorsum, sparse, short, erect on sides; spur length 0.47, with a basal bristle as long as spur. Tarsi with dense, recumbent hairs and sparse bristles; segments 1.31(0.37), 0.63, 0.53, 0.47, 0.79 in length (width); claws black, basal 1/2 red; pulvilli light brown.

Halteres black; alulae brown, margin and fringe whitish. Wings very pale brown, color mostly in rivulets (vertical anteriorly and angular posteriorly); veins light brown; submarginal cell 2 narrowly open.

Female. Length, 27 mm. Similar to ♂. Face at lower eye margin, 0.95, at antennae 2.21, vertex 1.58, one eye 1.37, in width; antennae, except segment 1, missing. A few black hairs on katepimeron and a few white basally on hind coxae. Hairs on tergites 2-8 recumbent, black, a few long on 9-10; apical semicircle on 8 black, with brown basal margin; bullae black, 0.55(0.13) in length (width). Sternites shining black, posterior margins brownish at middle; hairs sparse, recumbent, black, on 2-7, short, erect, on 8. Hind femora 7.89(1.05) in length (width); tibial spur 0.39 in length; hind tarsi 1.58(0.39), 0.79, 0.58 (others missing), in length (width). Alulae black, margin light brown, fringe black.

Material examined

COSTA RICA. La Suiza, iii-iv.1923 (P. Schild), ♂, 2 ♀, USNM, A. L. Melander Collection.

PANAMA. Boquete, Chiriquí Prov., iii.1923 (F. M. Gaige), ♀, OhioSU, labelled "topotype"; according to Selander & Vaurie (1962): "Boquete — Bajo Boquete, Panama, 30 km N. of David, 3500′, 8°36′N, 82°27′W", and the type-locality is Bugaba, Chiriqui, Panama, 22 km N.W. of David, 1000′, 8°28′N, 82°38′W..

The dense long fringe of hairs on the anterior ventral side of the fore femora (♂ ♀) has not been noted in other species. Other characters that help to separate it from other black species are the all black mystax; polished intermediate stripes of the mesonotum; tuft of white hairs on tergite 1 above hind coxae; slender hind femora; open submarginal cell 2; different male genitalia (Figs. 4-6).

Messiasia lanei d'Andretta

(Figs. 7-9)

Messiasia lanei d'Andretta, 1951: 56, figs. 41 (head, lateral view), 193 (♀ terminalia), 194 (♀ segment 9), 195 (♀ sternite 8). Type-locality: Peru, Lima. Type ♀, USNM; paratypes, same data, ♀, USNM, ♂, MZUSP.

Messiasia lanei; Papavero & Wilcox, 1968: 4 (cat.; Peru, Lima).

Male. Length, 15 mm. Head black; sides of face extending in below antennae, narrow sides of frons, and occiput, whitish pollinose. Hairs black; mystax, hairs to sides of antennae, on frons and vertex as long as antennae 1-2; shorter, black, on occiput, with yellowish internally. Proboscis brown, labella 0.68, oral cavity 0.89, oral margin at 0.53/1.31 distance from lower eye margin to antennae. Face at lower eye margin 0.68, at antennae 1.37, vertex 1.16, one eye 0.89, in width. Antennae black; segment 2 and apical 1/2 of 4 reddish; sparse hairs black; segments 0.29-0.16-1.13-1.45(0.34), sensory area 0.32, in length (width).

Mesonotum dull black, lateral margins and postalar calli dark reddish; dorsocentral rows and narrow median stripe appear to be bare of pollen, but at some angles the anterior dorsocentral rows are white pollinose. Hairs black, anteriorly semierect and as long as antennae 2, becoming very short posteriorly. Pleura dark red, coxae black; thinly white pollinose, sparse hairs black. Scutellum black, posterior margin and arms dark red; hairs short, sparse, black. Postscutellum reddish, whitish pollinose, transverse rugose.

Tergite 1 shining black, with erect, black hairs; 2-7 shining yellowish-orange, with narrow sides of 4-6 brown to black, hairs short, sparse, recumbent, black; bullae yellowish, bordered with light brown, 0.34 (0.11) in length (width). Sternite 1 brown; 2-8 yellowish-orange, narrow lateral and posterior margins of 6 and broader on 7 brown; hairs short, sparse, recumbent, black, longer and more numerous on 8. Genitalia (Figs. 7-9) orange, tips of gonopods black; hairs sparse, long, black.

Fore and middle legs dark reddish-brown; hairs short, recumbent, black, quite numerous on tibiae and tarsi. Hind legs black; femora 4.63 (0.68) in length (width), 20 black tuberculate spines on venter, hairs sparse, recumbent, black, with longer, erect, on posterior ventral surface. Hind tibiae with sparse, recumbent, black hairs; spur length 0.16, basal black bristles (1-2) longer than spur. Hairs on tarsi dense, recumbent, black, bristles black, segments 0.63 (0.21), 0.37, 0.32, 0.26, 0.42 in length (width); claws reddish, tip black; pulvilli light brownish.

Halteres black; alulae black, margin and fringe whitish. Wings dark brown, with lighter areas in the cells, except in costal and subcostal; veins brown; submarginal cell 2 barely closed.

Female. Length, 15 mm. Similar to ♂. Gibbosity thinly white pollinose. Face at lower eye margin 0.68, at antennae 1.42, vertex 1.05,

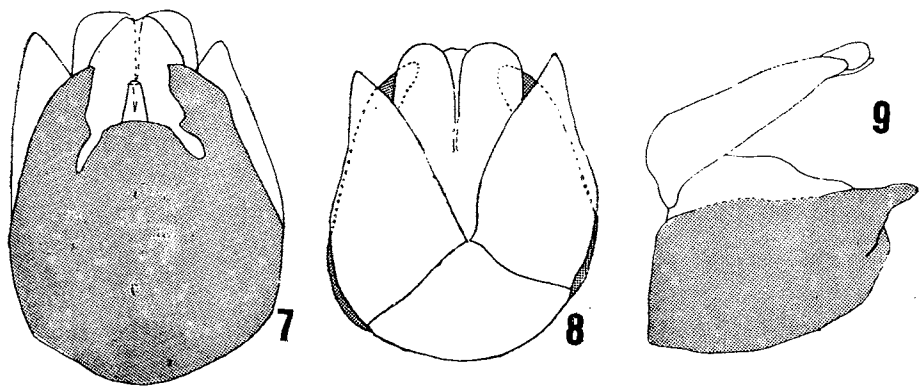
one eye 0.89, in width. Antennal segments 0.32-0.16-1.37-1.50(0.42), sensory area 0.29, in length (width). Abdomen broad; tergite 1 brown, 2-10 yellow with purple reflections, narrow sides of 2-5 and broad sides of 6-7 black, posterior margin of 8 brown, bullae reddish, 0.32(0.08) in length (width); hairs black, erect on 1, sparse, recumbent on 2-7, short, sparse, erect, on 8-9, long on 10. Sternites shining, 1-3 mostly yellowish, 4-8 black. Hind femora 5.26(0.79), tibial spur 0.21, tarsal segments 0.95(0.21), 0.53, 0.37, 0.32, 0.47, in length (width).

Two other ♀ in general appear to be all black, but the following areas are brown or reddish-brown: pleura and coxae; tergites 1-3 largely, anterior margins of 4-5, and 8-9 with posterior margin of 8 lighter; and sternites 2-3; abdomen polished, with purple reflections. We are considering these females as a black form of *lanei;* however, only study of further series will show whether they are only a melanic form or a distinct species.

Material examined

ECUADOR. Puerto Grande, Isla Puná, no date (F. Campos R., Santiago A. Navarro), 5 ♂, ♀, AMNH, ♂, 2 ♀, UK.

PERU. Lima, i.1924 (no collector), ♀, MZUSP; do., i.1939 (Weyrauch), ♂, MZUSP; Chosica, i.1968 (Picho), ♂, MZUSP; 40 mi n. Lambayeque, Chiclayo, i.1955 (E. I. Schlinger, E. S. Ross), ♂, CAS.



Messiasia lanei d'Andretta, male genitalia: 7, ventral view; 8, dorsal view; 9, lateral view.

Messiasia mocoronga, sp.n.

Messiasia polita (Wiedemann) of d'Andretta, 1951: 64, misident. (part, only ♀ from Boa Vista, Rio Tapajós, Pará; specimens from Mexico, Tehuantepec, are *M. perpolita* (Johnson); the real *Mydas politus*

Wiedemann is the type-species of the mydine genus *Mapinguari;* see Part II).

Mydas clavatus var. *atratus* Walker of d'Andretta, 1951: 64, misident., wrong combination [*Mydas atratus* var. of Walker, 1854, refers to *M. virgata* (Wiedemann), q.v.].

Female. Length, 20 mm. Head black; very narrow sides of face and frons, visible only under certain angles, eye margins of occiput, silvery-white pollinose; gibbosity dark reddish-brown; mystax white on sides, a few black hairs on middle; hairs to sides of antennae and frons as long as antennae 1-2, semierect, black; on occiput shorter, longer ventrally and dorsally, black on margins, white internally. Proboscis light brown on stem; labella black on proximal half, near stem, ferrugineous distally, 1.60(0.60) in length (width), subequal to length of oral cavity. Face at lower eye margin 0.40, at antennae 1.88, vertex 1.20, one eye 1.32 in width. Antennae black, apical 2/3 of club red, thinly white pollinose, segments 0.40-0.20-2.20-2.20(0.54) in length (width).

Mesonotum dull velvety black, sides (especially posterolateral margins and postalar calli) dark reddish-brown, thinly white pollinose. Hairs as long as antennae 1, limited to anterior half of mesonotum. Pleura and coxae dark reddish-brown; hairs as long as antennae 1-2, black. Scutellum black, hind margin very dark reddish-brown, white pollinose; postscutellum black.

Tergites uniformly shining black, with metallic violet reflections. Hairs on 1 long, semierect, black; on remainder tergites short, recumbent, black, longer on 7-8. Tergite 8 with posterior margin dirty white (yellowish). Bullae dark reddish-brown, 0.48(0.10) in length (width). Sternites shining dark reddish-brown; anterior and posterior margins of 1-4 and posterior margins of 5-7 lighter colored; hairs black, longer on 6-8. Terminalia reddish-brown, hairs black.

Legs dark reddish-brown, tibiae and tarsi, especially dorsally, black; hairs dense, short, recumbent, black, on fore and middle tibiae; femora with sparse, black, semierect, black bristles and short, recumbent, black hairs. Hind femora 8.00(0.96) in length (width); 16 black tuberculate spines on venter; tibial spur 0.26, tarsal segments 1.50(0.44), 0.76, 0.60, 0.40, 0.86 in length (width); claws reddish, tip black; pulvilli light yellowish.

Halteres, alulae, margin and fringe, black. Wings brown, apical 1/4 of wings very light, as also the interior of posterior cell 5; submarginal and posterior cells with lighter areas inside, but not so much as the apical 1/4 of the wings. Submarginal cell 2 closed at margin (broadly open in the paratype); posterior crossvein present.

The ♀ paratype from Bolivia differs from the holotype only in its larger size (23 mm) and in being entirely velvety black; all other details agree very well with the holotype.

Holotype ♀ from BRAZIL. *Pará*: Boa Vista, Rio Tapajós (no date) (C. H. T. Townsend), in the MZUSP (misidentified as *polita* (Wiedemann) by d'Andretta, 1951). Paratype ♀ from BOLIVIA: Buenavista, xi.1933 (no collector), in the USNM.

Messiasia notospila (Wiedemann)

Midas notospilus Wiedemann, 1828: 244. Type-locality: Uruguay, Montevideo. Type ♀, ZMB. Refs. — Wiedemann, 1831: 37, 52, pl. 64, fig. 20 (whole insect, color; Uruguay: Montevideo); Walker, 1837: 339 (Uruguay: Gorrite Is.); Westwood, 1841: 54 (Uruguay: Montevideo; brief diagnosis); Walker, 1848: 228 (cat.); 1854: 366 (Uruguay: Montevideo; brief diagnosis); Gerstaecker, 1868: 101 [♀; "La Plata-Staaten" (Bescke), ZMB]; Williston, 1898: 57 (Brazil; note on ♀); Hunter, 1901: 154 (cat.; Uruguay: Montevideo); Kertész, 1909: 39 (cat.; America mer.).

Mydas cingulatus Williston, 1898: 57. Type-locality: Paraguay, shore of Rio Paraguay, below Concepción, Dec. 28, forest, hit on ground (H. H. Smith). Type ♀, AMNH (seen in 1972). *N. SYN.* Refs. — Hunter, 1901: 153 (cat.; Paraguay: Concepción); Kertész, 1909: 36 (cat.; Paraguay); Grossbeck, 1912: 373 (with reference to specimen in AMNH, says "Though our single specimen was labelled 'type' by Williston himself it is probably not a type. The species was described from 'Rio Paraguay below Concepción'; our specimen bears the locality label 'Chapada' "; not the type of *cingulatus*); d'Andretta, 1951: 8, 73 (no specimens, but says it probably belongs in *Messiasia* d'Andretta); Papavero & Wilcox, 1968: 7 (cat.; Paraguay; type ♀, UK, incorrect; type in AMNH).

Messiasia notospila; d'Andretta, 1951: 60, figs. 43 (head), 70, 71 (legs), 164, 168, 171, 182 (genitalia) [descr. of ♀ ♂ from Brazil: Mato Grosso, Posto Jacaré, Baixo Culuene, 1948 (J. P. Carvalho); Paraguay: Paacupé, Febr. 1947 (Miss. Cient. Brasil.), MZUSP]; Papavero & Wilcox, 1968: 4 (cat.; Brazil: Mato Grosso; Paraguay: Paacupé; Uruguay: Montevideo); Wilcox & Papavero, 1971: 90, fig. 90 (epandrium).

Female. Length, 15 mm. Head shining black, small reddish spot on each side of vertex; occiput yellowish-white pollinose; sides of face and frons yellowish pollinose. Hairs sparse, yellowish, semierect on mystax, short, erect, on frons, longer on vertex and occiput. Proboscis brown, labella 0.74, oral cavity 1.21, oral margin at 0.53/1.58 distance from lower eye margin to antennae. Face at lower eye margin 0.84, at antennae 1.74, vertex 1.31, one eye 1.00, in width. Antennae reddish-brown, 2 and apical 2/3 of 4 orange; hairs black; segments 0.39-0.16-2.11-1.74(0.53), sensory area indistinct, in length (width).

Mesonotum black, humeri yellowish-red, postalar calli yellowish; humeri, lateral margins, postalar calli and anterior 1/5 of dorsocentral stripes, yellowish pollinose. Hairs erect, brown, anteriorly subequal in length to antennae 2, shorter posteriorly. Pleura and coxae reddish-brown; hairs mostly black on coxae, yellowish on pleura. Scutellum black, sides and arms yellowish-red, hairs yellowish; postcutellum black.

Tergites punctate, shining reddish-brown, broad posterior margin of 1-7 yellow, posterior margin of 8 slightly lighter, bullae black, 0.47 (0.18) in length (width). Hairs yellowish, short, sparse, recumbent on 2-7, longer on 1 and 8-10. Sternites shining reddish-brown, posterior margins of 2-5 yellow, hairs short, sparse, recumbent, yellowish.

Legs reddish-brown, fore and middle tibiae and tarsi lighter. Hairs on fore and middle legs sparse, semierect, black, pile on fore tibiae orange. Hind femora 5.53(0.79) in length (width); 14 brown tuberculate spines on venter; hairs short, sparse, semierect, black, long hairs on posterior lateral surface golden. Hind tibiae with short, semierect, black hairs, 2 brown subapical bristles, no spur; hairs on tarsi black, bristles brown, segments 0.79(0.26), 0.42, 0.37, 0.26, 0.53, in length (width); claws reddish, tip black; pulvilli light brown.

Halteres brown; alulae brown, margin and fringe white. Wings hyaline, light brown in costal, subcostal, marginal and apex of submarginal cell 1, and along veins in other areas; veins light brown; submarginal cell petiolate; posterior crossvein present.

Male. Lenght, 15 mm. Agrees with the female in most respects. Antennae entirely dark reddish-brown, segments 0.30-0.14-2.0-1.70 (0.40) in length (width). Face at lower eye margin 0.60, at antennae 1.60, vertex 1.20, one eye 0.80, in width. Mesonotum with the same color and stripes, plus one crescent-shaped small yellow pollinose spot on posterior slopes of mesonotum, in front of the scutellum. Sternopleura with transversal elongate yellow pollinose stripe. Postscutellum yellowish pollinose. Bullae 0.40(0.14), hind femora 4.32(0.72), tarsal segments 0.60(0.20), 0.36, 0.28, 0.22, 0.44, in length (width). Punctuation on tergites and sternites more noticeable than in females.

Material examined

BRAZIL. *Mato Grosso*: Posto Jacaré, Baixo Rio Culuene, 1948 (J. P. Carvalho), ♀, MZUSP.

URUGUAY. Rio de La Plata, Gorrite (Capt. P. P. King; ex coll. W. W. Saunders, 68.4), ♂ ♀, BMNH; Montevideo (no date), ♂, n.° 4118, cabinet n.° 7, drawer 255 (?Wiedemann's syntype), WIEN.

PARAGUAY. Shore of Rio Paraguay, below Concepción, xii.? (H. H. Smith), ♀ (type of *cingulatus* Williston), AMNH; Concepción, ii.1944 (Missão Científica Brasileira), ♂, MZUSP.

ARGENTINA. *Buenos Aires*: Madarias, xii.1930 (Mrs. M. Bell de Aberg Cobó), ♀ (BM 1932-194), BMNH; Córdova, no date (Davis), ♀, MCZ.

Messiasia painteri, sp. n.

(Figs. 10-12)

Male. Length, 18 mm. Head black, gibbosity and frons shining; sides of face widening above, but bare below antennae; narrow sides of frons and occiput, white pollinose. Mystax white, on oral margin at middle and scattered hairs above black; long hairs to sides of antennae white below, black above; on frons and vertex black; on occiput short, sparse, white, with black above and along upper 3/4 of eye margins. Proboscis black, labella brown and subequal in length to oral cavity; oral cavity 1.31 in length; oral margin at 0.79/1.84 distance from lower eye margin to antennae. Face at lower eye margin 0.68, at antennae 1.53, vertex 1.68, one eye 1.16, in width. Antennae black, hairs black; segments 0.39-0.13-1.71-1.71(0.47), sensory area 0.53, in length (width).

Mesonotum subshining black, thinly greyish pollinose; humeri, anterior and lateral margins, postalar calli, and dorsocentral stripes, white pollinose, but distinct only at some angles, except anteriorly. Hairs sparse, semierect, black, anteriorly subequal in length to antennae 1, becoming shorter apically. Pleura and coxae black, thinly white pollinose; hairs black, a few on middle coxae and largely on hind coxae white, a few white below on pteropleura and about 1/2 white on metasternum. Scutellum and postscutellum thinly white pollinose; short hairs on scutellum black.

Tergite 1 black, with sparse, erect, white hairs; 2-7 shining black, with strong bluish-green reflections; narrow posterior margins brown, hairs sparse, recumbent, black; bullae black, 0.58(0.16) in length (width). Sternites shining black, with slight blue reflections, broad posterior margins of 2-4 and narrow on 5-6, brown; hairs recumbent, black, more numerous on 6-7 and slightly longer on 8. Genitalia black, hypandrium reddish-brown, hairs quite long, black, yellow on proctiger.

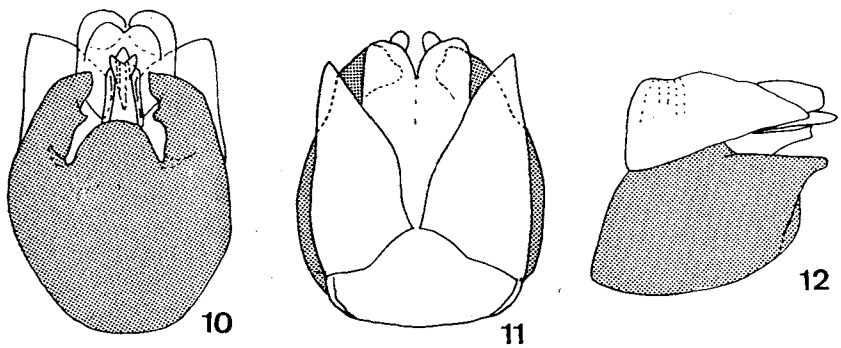
Fore and middle femora dark reddish-brown, remainder of legs black. Hairs on fore and middle femora short, sparse, black, on their tibiae and tarsi dense, recumbent, black. Hind femora 5.37(1.16) in length (width); 18 brown tuberculate spines on venter; hairs short, sparse, semierect, black; long, dense, erect, on posterior ventral surface. Hind tibiae with short, sparse, recumbent, black hairs, spur 0.79 in length. Hind tarsi with short, dense, recumbent, black hairs and sparse, black bristles; segments 0.84(0.21), 0.47, 0.37, 0.26, 0.42, in length (width); claws red, tip black; pulvilli light brown.

Halteres black; alulae black; margin white, fringe black. Wings light brown anteriorly, nearly hyaline posteriorly; veins brown; submarginal cell 2 closed and short petiolate; posterior crossvein present.

Female. Length, 17 mm. Similar to ♂. Face at lower eye margin 0.63, at antennae 1.47, vertex 1.05, one eye 1.11, in width. Antennal segments 1-2 black, 3-4 reddish-brown, 4 white pollinose; segments 0.39--0.16-1.58-1.58(0.39), sensory area 0.18 in length (width). Posterior margin of scutellum and postscutellum densely white pollinose. Tergites shining black, narrow posterior margins of 2-7 brown, semicircular area on 8 whitish; bullae black, 0.42(0.13) in length (width). Wings hyaline, veins light brown, submarginal cell 2 closed at wing margin.

Holotype ♂, MEXICO. *Morelos*: 12 mi. e. Cuernavaca, 4000', Lobos Cyn., vi.1965 (R. H. Painter), RHP. Paratypes: 2 ♂, 1 ♀, MEXICO. *Guerrero*: 20 mi N.E. Acapulco, 12.viii.1962 (U. K. Mex. Exp.), UK.

Named in honor of the late Dr. R. H. Painter, Kansas State University, Manhattan, Kansas.



Messiasia painteri, sp. n., male genitalia: 10, ventral view; 11, dorsal view; 12, lateral view.

Messiasia penai, sp. n.

Female. Length, 30 mm. Head black; sides of face extending across below antennae, narrow sides of frons, and occiput, whitish pollinose. Hairs black, shorter hairs below on each side of mystax and inner hairs on occiput, white; a black bristle on each side of oral cavity below. Stem of proboscis black, labella dark brown, length 1.84; oral cavity length 1.68; oral margin at 0.95/2.53 distance from lower eye margin to antennae. Face at lower eye margin 0.95, at antennae 2.37, vertex 1.58, one eye 1.63, in length. Antennae black, ventral 2/3 of segment 4 reddish apically; hairs black; segments 0.63-0.21-2.58-2.63(0.58) in length (width), sensory area not well defined.

Mesonotum dull black, intermediate areas subshining; narrow dorsocentral stripes anteriorly extending to suture and narrow posterior lateral margins, gray pollinose. Hairs short, black, erect, in dorsocentral rows extending to scutellum. Pleura and coxae black, thinly grey pollinose;

hairs sparse, long, black, with a few anteriorly on the katepimeron, and a few white basally on the hind coxae. Scutellum black, hairs short, sparse, black. Postscutellum black, thinly grey pollinose and shallow rugose.

Tergites shining black with slight blue reflections; 1a white pollinose and bare of hairs; 1p with quite long, dense, black hairs and a clump of white on each side above hind coxae; hairs short, numerous, recumbent, black on 2-8, longer on 9-10; apical semicircular area on 8 light brown; bullae dark brown, 0.66(0.24) in length (width). Sternites shining black, with blue reflections, posterior margins of 2-5 brown; hairs short, sparse, recumbent, black, more numerous on 6-7, short, sparse erect on 8 and fine transverse rugose.

Legs black; hairs black, short, numerous, on fore and middle femora, dense, semierect on their tibiae, so that they appear broader than the femora; dense on tarsi. Hind femora 10.00(1.11) in length (width), 16 tuberculate spines on venter, hairs numerous, short, semierect; short, sparse, erect, on venter. Hind tibiae with dense, recumbent, black hairs; apical spur 0.37 in length, with 1 basal bristle; hind tarsi 1.68(0.53), 0.95, 0.79, 0.47, 1.00 in length (width); claws black, pulvilli light brown.

Halteres black; alulae black, margin brown, fringe black. Wings dark brown, lighter within the cells except in the costal, subcostal and marginal cells; submarginal cell 2 closed but not petiolate.

Holotype ♀, PERU, Avispas, Madre de Dios, 400 m, ix.1962 (L. Peña), CNC.

Named in honor of Luís E. Peña G., who has been a very active collector of Diptera in western South America.

Messiasia perpolita (Johnson)

(Figs. 13-15)

Mydas perpolitus Johnson, 1933: 72. Type-locality: Mexico, Yucatán, Chichen Itzá, vi.1929 (J. Bequaert). Type ♂ and paratype ♂, same data, MCZ.

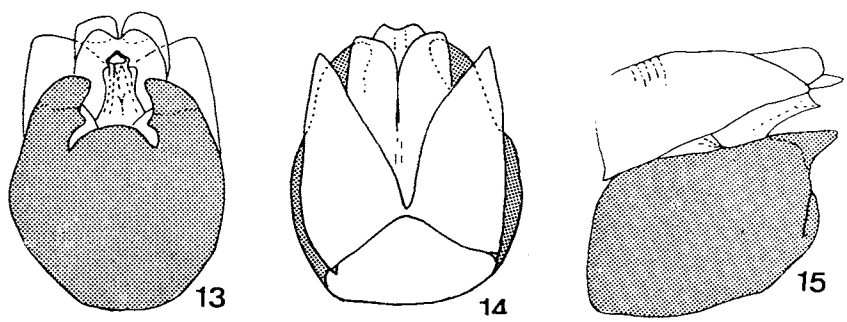
Messiasia polita (Wiedemann) of d'Andretta, 1951: 64, figs. 1, 45 (head), 6, 7, 9-11, 14 (proboscis), 162, 170, 172, 181 (♂ genitalia), misident. Description of ♂ ♀ from Costa Rica, Mexico, and Brazil. *Mydas clavatus* var. Walker, 1854, and *Mydas perpolitus* Johnson, 1933, erroneously listed as synonyms. The Costa Rica record is questioned; the record for Brazil refers to *Messiasia mocoronga,* sp. n., q.v. *Mydas politus* Wiedemann is the type-species of the mydine genus *Mapinguari* (see Part II); Papavero & Wilcox, 1968: 4 (cat.). Mexico, Costa Rica, and Brazil; *Mydas atratus* Walker, 1854, and *Mydas perpolitus* Johnson, 1933, listed as synonyms. For the assignment of these, see above.

Male. Length, 23 mm. Head black; sides of face extending across below antennae, narrow sides of frons, and occiput, white pollinose. Hairs black; sides of mystax and lower hairs to sides of antennae, white; inner occipital hairs yellowish. Oral margin at 0.53/1.68 distance from lower eye margin to antennae. Face at lower eye margin 0.68, at antennae 1.79, vertex 1.47, one eye 1.37, in width. Antennae black; hairs numerous, black; segments 0.39-0.13-2.11-1.95(0.58), sensory area 0.47, in length (width); club silvery white pollinose, sensory area brown.

Mesonotum dull black; humeri, anterior margin and posterior lateral margins, indistinctly greyish pollinose. Central and intermediate stripes bare; anterior hairs erect and as long as antennae 1, much shorter posteriorly, but reaching scutellum in dorsocentral rows and on lateral margins. Scutellum posteriorly and postscutellum greyish pollinose; scutellum with a few short black hairs. Pleura and coxae subshining black, thinly brownish pollinose, hairs black.

Abdomen black, tergites 2-7 shining, with blue-green reflections, posterior margins of 2-7 dark brown; bullae black, 0.92(0.18) in length (width). Tergite 1-a bare, 1-p with long, erect, black hairs; dense, short, recumbent, on 2-7. Sternites shining black, with blue reflection, posterior margins of 2-6 brown; hairs short, sparse, recumbent, black, becoming numerous on 6-7; slightly longer on 8. Genitalia black, "hypandrium" brown; hairs black, longer apically on "hypandrium".

Legs black; hairs black, dense, short, semirecumbent, on fore and middle tibiae and tarsi. Hind femora 6.95(1.68) in length (width); 17 tuberculate spines on venter; dorsal hairs dense, semierect, as long as antennae 1; sparse, short, semierect laterally; erect, dense, and 1 and 1/2 times as long as antennae 1 on posterior ventral surface. Tibial spur length 0.47, one bristle at base. Hind tarsi 1.16(0.42), 0.63, 0.47, 0.32, 0.53 in length (width); claws black; pulvilli light brown.



Messiasia perpolita (Johnson), male genitalia: 13, ventral view; 14, dorsal view; 15, lateral view.

Halteres black. Alulae black, margin brown, fringe brown. Wings dark brown, lighter narrow spots in submarginal 1, posterior, anal, and axillary cells; a small clear spot in basal cell 1 near base.

Female. Length, 20 mm. Hairs of head all black; face at lower eye margin 0.74, at antennae 1.58, vertex 1.31, one eye 1.16, in width; antennal segments 0.42-0.16-2.21-1.95(0.50) in length (width). Hind femora 7.11(1.58), tibial spur 0.42 in length (width). Wings quite uniformly dark brown.

Material examined

MEXICO. *Chiapas*: El Zapotal, 2 mi s. Tuxtla Gutiérrez, vii.1957 (J. A. Chemsak, B. J. Rannells), 2 ♂, CIS. *Chihuahua*: Santo Niño, vii.1968 (T. A. Sears, R. C. Gardner, C. S. Glaser), ♂, UCD. *Jalisco*: 3 mi s.e. Plan de Barrancas, vii.1963 (F. D. Parker, L. A. Stange), ♀, UCD. *Michoacán*: El Sabino, Uruap., vii.1936 (H. D. Thomas), ♀, UK. *Morelos*: 12 mi e. Cuernavaca, 4300′, viii.1954 (U. K. Mex. Exp.), ♀, UK. *Oaxaca*: Salina Cruz, vii.1952 (E. E. Gilbert, C. D. MacNeill), ♂, CIS. *Sinaloa*: 4 mi n.w. Choix, vii.1968 (T. A. Sears, R. C. Gardner, C. S. Glaser), ♂ ♀, UCD; 5 mi n. Mazatlán, vii.1964 (J. Powell), ♂ ♀, CIS; do., viii.1964 (H. F. Howden), ♂, CNC. *Sonora*: Álamos, vii.1957 (R. H. Arnett, Lot 296), ♀, CNC. *Tamaulipas*: Tampico, vi.1951 (P. H. Hurd), ♂, CIS.

Messiasia pertenuis (Johnson)

(Figs. 16-18)

Mydas pertenuis Johnson, 1926: 137. Type-locality: USA, Arizona, Baboquivari Mts. (F. H. Snow). Type ♂, MCZ (Coll. Nathan Banks).

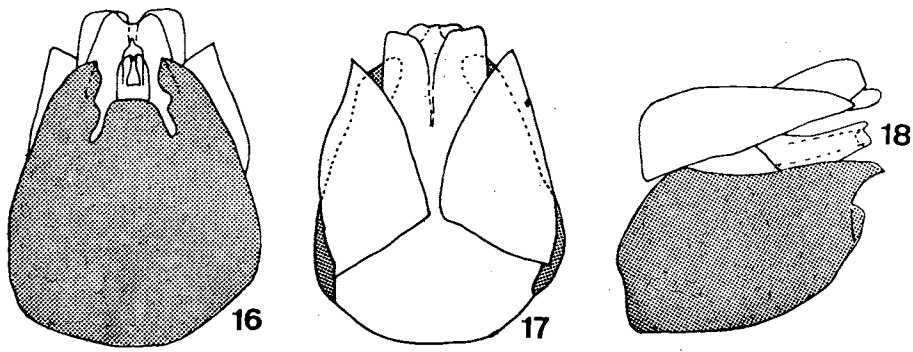
Mydas pertenuis; Curran, 1965: 359 (cat.; USA: Arizona).

Messiasia pertenuis; Papavero & Wilcox, 1968: 4 (cat.; USA: Arizona; Mexico: Sonora); Wilcox & Papavero, 1971: 51, fig. 19 (antenna); fig. 47 (bullae); fig. 69 (♀ terminalia).

Male. Length, 19-22 mm. Head black; sides of face widening above, narrow sides of frons, and occiput, whitish pollinose. Hairs black, sparse, semierect in mystax, others erect and subequal in length to antennae 1. Proboscis black, labella as long as oral cavity; oral cavity 1.85 in length; oral margin at 0.37/1.31 distance from lower eye margin to antennae. Face at lower eye margin 0.74, at antennae 1.63, vertex 1.31, and one eye 1.21 in width. Antennae black, apical 2/3 of club reddish; hairs black; segments 0.39-0.13-2.11-1.82(0.50), sensory area 0.39, in length (width).

Mesonotum black; humeri and postalar calli dark reddish; humeri, anterior and narrow lateral margins, postalar calli, and anterior 1/2 of dorsocentral stripes, whitish pollinose, distinct only at some angles. Pleura and coxae reddish-brown; hairs black. Scutellum black basally, reddish apically; short hairs black; postscutellum black.

Tergite 1 black, posterior margin reddish, hairs dense, erect, black; 2-7 yellowish red, narrowly brownish laterally, hairs short, sparse, recumbent, black; bullae black, 0.71 (0.13) in length (width). Sternites yellowish-red, posterior margins of 2-6 yellowish, hairs short, sparse, recumbent, black, becoming more numerous apically and slightly longer on 8. Genitalia yellowish red, gonopods black and proctiger brown; hairs black.



Messiasia pertenuis (Johnson), male genitalia: 16, ventral view; 17, dorsal view; 18, lateral view.

Legs reddish-brown, hind femora lighter. Hairs short, recumbent, black, on fore and middle legs; sparse on femora, numerous on tibiae and tarsi. Hind femora 6.42(1.26) in length (width); 16 black tuberculate spines on venter; hairs short, semierect, black; long, erect, on posterior ventral surface. Spur on hind tibiae 0.7; tarsi 1.00 (0.32), 0.53, 0.42, 0.32, 0.58, in length (width); claws brown, tip black; pulvilli brown.

Halteres black; alulae black, margin and fringe brown. Wings brown, somewhat lighter posteriorly; narrow lighter spots in submarginal 2 and posterior cells; small whitish spot at middle of submarginal 1 and base of basal 1; veins brown, submarginal cell 2 short petiolate; posterior crossvein present.

Female. Length, 18-22 mm. Similar to ♂. Antennal segments 0.37-0.16-1.84-1.79(0.53), sensory area 0.29, in length (width). Tergite 1 black, 2-7 yellowish red, with narrow lateral margins black, 8-10 brown with broad posterior margin of 8 yellowish; hairs short, recumbent, black; longer on 1, 9, and 10.

Material examined

UNITED STATES. *Arizona*: Pima Co., Sabino Cyn., vii.1950 (D. J. & J. N. Knull), ♂, OhioSU; Santa Rita Range Reserve, larvae collected March 4, 1930, in kangaroo rat nest, 4000′ (C. Reynard), emerged March-July; banner-tail kangaroo rat, *Dopodomys spectabilis spectabilis;*

pupal case on pin, head missing, ♂, UA; Tucson, vii.1937 (D. J. & J. N. Knull), ♂, OhioSU; Vail, 8 mi n. of., vii.1962 (F. G. Werner), ♂, UA.

MEXICO. *Sonora*: Desemboque, vii.1953 (B. Malkin), 3 ♂, 2 ♀, CAS, on sea beach; Guaymas, San Carlos Bay, vii.1965 (D. G. Marqua, P. A. Sullivan), ♂, RHC.

Messiasia testaceiventris (Macquart), comb. n.

(Figs. 19-21)

Mydas testaceiventris Macquart, 1850: 365 (sep., p. 61), pl. 5, fig. 6. Type-locality: Uruguay, Maldonado. Type ♀. MNHN, (n.° 1461 bis; seen in 1972). Refs. — Gerstaecker, 1868: 99 (Uruguay; Macquart ref.); Berg, 1899: 130 (biol. note; probably in association with ants' nest); Hunter, 1901: 155 (cat.; Uruguay); Kertész, 1909: 41 (cat.; Uruguay); Séguy, 1928: 143 [Uruguay: Maldonado, 15-28 Nov. 1826, "sur le sommet des montagnes, rare, vole peu et à la manière des taons" (d'Orbigny, 9511.15), MNHN"; descr. of type ♀]; d'Andretta, 1951: 55, 74 (not identified, but believes it belongs in *Messiasia* d'Andretta); Papavero & Wilcox, 1968: 9 (cat.; Uruguay; Macquart and Séguy refs.).

Mydas puniceus Séguy, 1928: 143. Type-locality: Argentina, Chaco de Santiago del Estero, margins of Rio Salado, environs of Icaño (E. R. Wagner, 1904), MNHN (seen). Paratypes from Argentina: Rio Salado, La Palisa, 25 km nw. of Icaño, Laguna Mamaita (E. R. Wagner, 1903), and vic. Icaño, Mistol Paso (E. R. Wagner), 1914; margins of Rio Salado, Averias (E. R. Wagner, 1909), in the MNHN and MZUSP. *N. SYN.*

Messiasia punicea; d'Andretta, 1951: 59, fig. 12 (head) [Argentina, Chaco de Santiago del Estero, margins of Rio Salado, 1910 (E. R. Wagner), ♀, MZUSP; descr. of ♀ identified by Séguy]; Papavero & Wilcox, 1968: 4 (cat.; Argentina; Séguy and d'Andretta refs.).

Examination and comparison of the types of *testaceiventris* and *puniceus* proved that they are the same species.

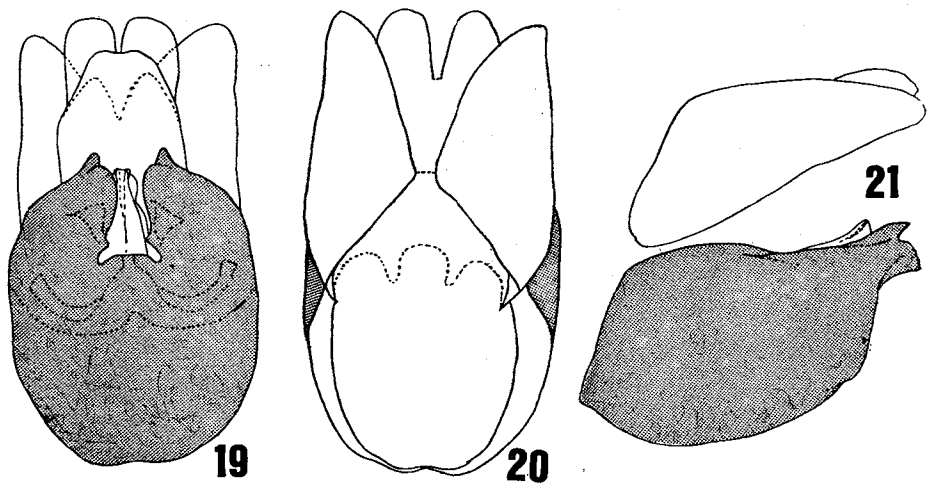
Female. Length, 18 mm. Head black, or with gibbosity and frons dark reddish-brown; sides of face extending across below antennae, very narrow sides of frons, and occiput, thinly ochre-grey pollinose. Hairs black, short, scanty, recumbent, on gibbosity; shorter than antennae 1, semierect, black, to sides of antennae; subequal to antennae 1-2, erect, dark brown or black on vertex; shorter, black, on occiput. Proboscis black, labella 0.60, oral cavity 0.80, in length. Face at lower eye margin 0.88, at antennae 1.80, vertex 1.40, one eye 1.00, in width. Antennae very dark reddish-brown, hairs short, scanty, black; segments 0.36-0.18--1.48-2.00(0.48) in length (width).

Mesonotum, including humeri and postalar calli, dark orange in ground color; central and intermediate stripes broad, confluent, black, extending to and confluent with black scutellum. Hairs short, slightly longer than antennae 2 anteriorly, much shorter and scanty posteriorly. Pleura and coxae dark reddish-brown, hairs black. Scutellum black, posterior margin (sometimes) and arms dark reddish-brown; postscutellum dark reddish-brown, thinly grey pollinose, transverse rugose.

Tergite 1 dark reddish-brown, or anterior and lateral margins darker, almost black, and shining; hairs subequal to antennae 2, numerous, recumbent, black; tergites 2-7 shining dark orange, sparsely punctate, with sides black, and metallic green reflections; 8 (sometimes also 7)-10 almost entirely black, with diffuse reddish-brown areas; hairs short, sparse, recumbent, black, longer on apical segments. Bullae black, 0.44 (0.14) in length (width). Anterior margin of tergite 2 sometimes darker, with 2 small spots, one rounded, on anteromedian margin, confluent with darker area, the other oblongate, on posteromedian margin. Sternites shining dark reddish-brown, sparsely punctate; anterior and posterior margins of 2-6 lighter; hairs short, sparse, recumbent, black.

Legs dark reddish-brown, fore and middle tibiae almost black, or black, vestiture black. Hind femora 6.60(0.80) in length (width); 20 black tuberculate spines on venter; tibial spur 0.14, tarsal segments 0.80(0.28), 0.50, 0.36, 0.24, 0.50 in length (width); claws reddish, tip black; pulvilli yellowish-brown.

Halteres, alulae, margin and fringe very dark chocolate-brown (transparent in one specimen) or almost black. Wings light brown, darker along margins of veins, especially on anterior half of wing. Second submarginal cell closed and petiolate; posterior crossvein present.



Messiasia testaceiventris (Macquart), male genitalia: 19, ventral view; 20, dorsal view; 21, lateral view.

Male. Length, 16 mm. An imperfectly preserved specimen, greased, lacking both antennae. Bullae 0.40(0.14); hind femora 4.64(0.80), tibial spur 0.24, hind tarsi 0.60(0.24), 0.38, 0.30, 0.20, 0.48, in length (width). As far as can be observed, similar to ♀.

Material examined

ARGENTINA. *Santiago del Estero*: margins of Rio Salado, near Icaño, 1904, 1910 (E. R. Wagner), ♂♀, MZUSP; 25 km n.w. of Icaño, 1903 (E. R. Wagner), ♀, MZUSP.

Messiasia uaupes, sp. n.

(Fig. 32)

Messiasia zikani d'Andretta, 1951: 67, part, misident. (only ♂ specimen from Brazil, Amazonas, Uaupés), figs. 163, 166, 176, 177, 178 (♂ genitalia).

Messiasia zikani; Wilcox & Papavero, 1971: 90, fig. 92 (epandrium), misident.

Male. Length, 23 mm. Head subshining black; sides of face, frons, and occiput, grey pollinose; mystax white on sides, black, with longer, recumbent hairs on middle; hairs on sides of antennae black; subequal to antennae 1-2, erect, and white near eye margin; on vertex erect, subequal to antennae 1-2, black; shorter, except dorsally and ventrally, on occiput. Stem of proboscis dark brown, labella black, 1.56 mm in length, subequal to oral cavity. Face at lower eye margin 1.00, at antennae 1.60, vertex 1.12, one eye 1.28, in width. Antennae black, club very dark ferrugineous, lighter on ventral side; hairs short, scanty, black; segments 0.40-0.20-1.70-1.70(0.64) in length (width).

Mesonotum dull black; anterior dorsocentral rows and lateral margins bluish-grey pollinose; hairs as long as antennae 1-2, black anteriorly, and very short and scanty posteriorly. Pleura and coxae black, hairs black. Scutellum and postscutellum black, thinly grey pollinose.

Tergites black, with strong violet, blue or green metallic reflections; tergite 2 with characteristic yellow spot (Fig. 32); hairs on 1 longer than antennae 1-2, dense, numerous, on sides; on remainder tergites short, sparse, recumbent, black. Bullae 0.60(0.16) in length (width). Sternites shining black, 1 and posterior margin of 2 dirty white (yellowish); posterior margins of 3-4 reddish-brown; hairs short, black.

Legs dark reddish-brown, tibiae black; vestiture black. Hind femora 7.20(1.20) in length (width); 20 reddish-brown tuberculate spines, and dense, long, black hairs on venter; hairs on dorsum shorter, black; tibial spur 0.30, hind tarsal segments 1.34(0.40), 0.60, 0.50 (others missing), in length (width).

Halteres, alulae, margin and fringe dark chocolate-brown. Wings light-brown with faint metallic reflections, darker along veins. Second submarginal cell closed at margin; posterior crossvein present.

Holotype ♂, BRAZIL. *Amazonas*: Uaupés (as São Gabriel), x.1927 (J. F. Zikán), MZUSP (misidentified as "paratype" of *zikani* by d'Andretta, 1951).

Messiasia virgata (Wiedemann), comb. n.

(Figs. 22-24)

Mydas virgatus Wiedemann, 1830: 630. Type-locality: "Brazil". Type ♂ (not ♀ as reported by Wiedemann, ZMB). Refs. — Wiedemann, 1831: 51, pl. 54, fig. 19 (whole insect, color; Brazil); Westwood, 1841: 63 (Brazil; brief diagnosis; Wied. ref.); Walker, 1854: 364; Gerstaecker, 1868: 97 (Brazil; Wied. ref.; says type is ♂ and not ♀ as reported by Wiedemann); Osten Sacken, 1886: 71 (compares to *M. decor* Osten Sacken); Hunter, 1901: 155 (cat.; Brazil); Kertész, 1909: 42 (cat.; Brasil); d'Andretta, 1951: 8, 73 (listed but not treated).

Mydas atratus var. ? Walker, 1854: 364 (Brazil, Pará, Rio Tapajós; brief descr.). Specimens, BMNH (seen). *N. SYN.*

Mydas sarpedon Séguy, 1928c: 143. Type-locality: Viet Nam, Tonkin, Hoa Binh (Coll. Surcouf); evidently a mislabelled South American specimen. Type ♂, MNHN (seen in 1972). *N. SYN.*

Mydas atratus; Papavero & Wilcox, 1968: 4 (cat.; misident.; listed as syn. of *Messiasia polita* (Wiedemann) of d'Andretta; the reference is incorrect, and should be *Mydas atratus* var. ? Walker, 1854: 364. *Mydas atratus* Macq. is a different species and equals *Mydas carbonifer* Osten Sacken, 1874: 186, from North America; see this species in Part IV).

Female. Length, 21 mm. Head black; sides of face extending inwards to antennal base, whitish pollinose. Mystax, lower hairs to sides of antennae and inner hairs on occiput, white; other hairs black. Oral cavity length 1.66; proboscis dark brown, labella length 1.56. Face at lower eye margin 0.78, at antennae 1.78, vertex 1.39, one eye 1.28, in width. Antennae black, apical 2/3 of club dark reddish; hairs black; segments 0.42-0.11-2.06-1.89(0.64), in length (width).

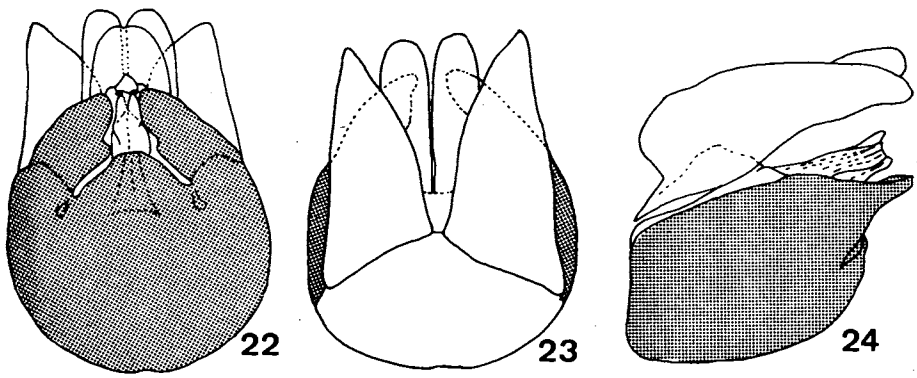
Mesonotum shining black; anterior 1/3 of dorsocentral stripes and posterior lateral margins indistinctly whitish pollinose. Hairs short, sparse, black. Scutellum shining black, short, black, erect hairs on arms. Postscutellum black, whitish pollinose, transverse rugose. Pleura and

coxae black, whitish pollinose; hairs mostly white on pleura, mostly black on coxae.

Abdomen polished black, crescent on tergite 8 yellowish; hairs black, erect on 1-p; 1-a rounded and bare; sparse, recumbent hairs on remainder; bullae dark brown, length 0.53, width 0.19; apical hairs long, black. Sternites shining black, 1 and posterior 1/3 of 2 dull yellowish; hairs recumbent, black; sparse basally, becoming dense apically.

Femora reddish-brown; hairs black, dense, recumbent. Hind femora length 8.12, width 1.31, about 16 tuberculate spines below; hairs black, quite dense, recumbent; longer, semierect below. Hind tibiae black, hairs dense, recumbent, black; apical spur length 0.31, with 1 basal bristle. Hind tarsi black, hairs dense, recumbent; segments 1.40(0.33), 0.72, 0.50, 0.42, 0.53, in length (width); claws reddish, tip black; pulvilli yellowish.

Halteres black, Alulae black, margin whitish, fringe blackish. Wings dark brown, small whitish spots in the submarginal cell and lighter spots in the posterior, anal, and axillary cells; submarginal cell 2 short petiolate.



Messiasia virgata (Wiedemann), male genitalia (Holotype of *sarpedon* Séguy: 22, ventral view; 23, dorsal view; 24, lateral view.

Male. (Holotype of *sarpedon* Séguy). Similar to ♀. Labella 1.44, subequal to oral cavity. Face at lower eye margin 0.80, at antennae 1.60, vertex 1.00, one eye 1.28 mm, in width. Antennal segments 0.44-0.14--2.10-1.90(0.44) in length (width). Hind femora 7.60(1.12), tibial spur 0.30, in length (width). Tarsi missing.

Material examined

BRAZIL. *Pará*: Santarém, viii.1950 (J. Kesselring), ♀, NMB.

Messiasia yacochuya, sp. n.

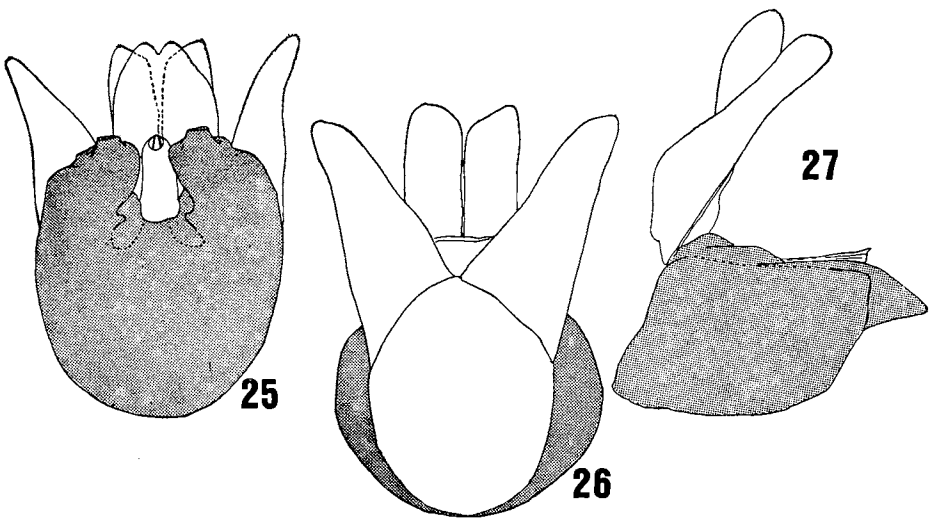
(Figs. 25-27, 28)

Male: Length, 10 mm. Head shining black, narrow sides of face and frons, area below antennae, outer margins of occiput, thinly white pollinose. Hairs black, longer than antennae 1-2, recumbent or semi-erect on gibbosity, erect on sides of antennae and frons, shorter on occiput. Proboscis short, labella black, 0.44, oral cavity 0.80 in length. Face at lower eye margin 0.80, above antennae (maximum width) 1.30, vertex 1.10, one eye 0.60, in width. Antennae black, apical 2/3 of club intensely orange, segments 0.38-0.10-1.10-1.20(0.40) in length (width).

Mesonotum, including humeri and postalar calli, orange; central and intermediate stripes confluent, black, leaving narrow hind margin of mesonotum orange (Fig. 28); hairs black, as long as antennae 1 anteriorly, becoming shorter posteriorly. Pleura and coxae subshining black, hairs black. Scutellum and postscutellum black.

Tergites and sternites uniformly shining black, narrow hind margin of tergites dark reddish-brown, all segments with metallic violet reflections; hairs on tergite 1 long, black; remaining segments with short, recumbent, black hairs. Bullae black, 0.48(0.12) in length (width). Genitalia black, hairs black.

Legs very dark reddish-brown to black, vestiture black. Hind femora 3.68(0.72) in length (width); 16 reddish-brown tuberculate spines on venter; tibial spur length 0.14 mm; tarsal segments 0.40(0.18), 0.28,



Messiasia yacochuya, sp. n., male genitalia: 25, ventral view; 26, dorsal view; 27, lateral view.

0.18, 0.38 in length (width); claws reddish-brown, tip black; pulvilli yellowish-brown.

Halteres, alulae, margin and fringe black. Wing and veins uniformly light brown. Second submarginal cell long petiolate. Posterior crossvein present.

Holotype ♂, ARGENTINA. *Salta*: Yacochuya (Cafayate), 1950 m, x.1968 (Willink, Terán & Stange) (Malaise trap), IML.

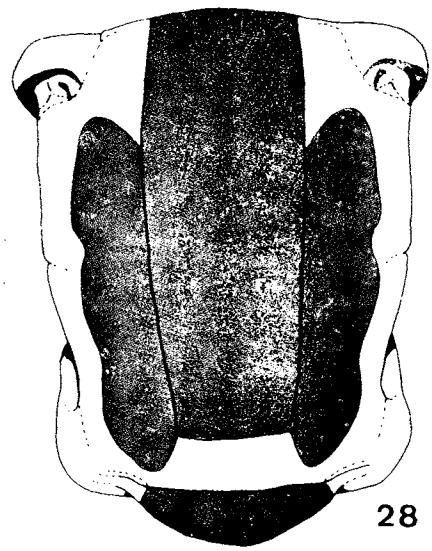


Fig. 28, *Messiasia yacochuya*, sp. n., color pattern of mesonotum.

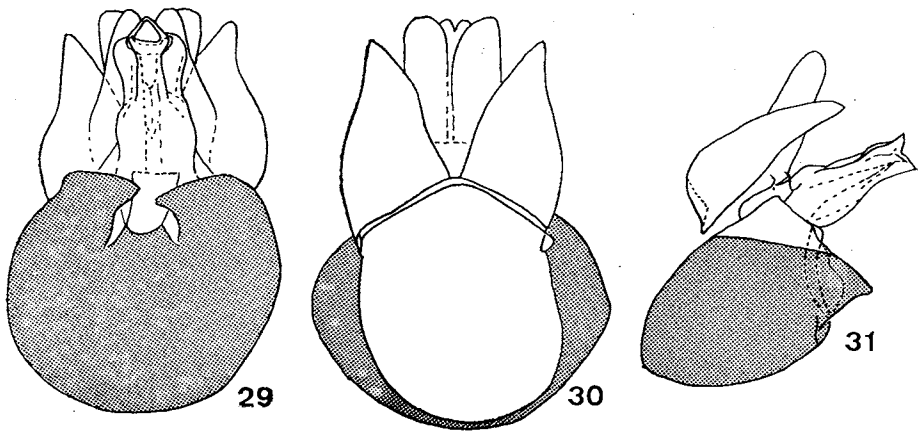
Messiasia zikani d'Andretta

(Figs. 29-31, 33-34)

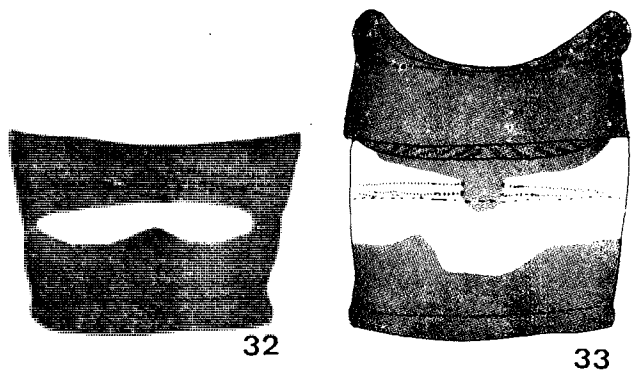
Messiasia zikani d'Andretta, 1951: 67. Type-locality: Paraguay, San Bernardino, xii.1929 (Fiebrig.). Type ♂, USNM. Paratype ♀, same data, MZUSP. Paratype ♂ from Brazil, Amazonas, Uaupés (= São Gabriel) is *M. uaupes*, sp. n., q. v.

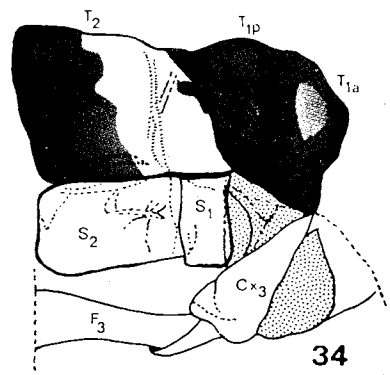
Messiasia zikani; Papavero & Wilcox, 1968: 5 (cat.; Paraguay: San Bernardino). Brazil record refers to *uaupes*, sp. n., q. v.; d'Andretta reference.

Male. Length, 20 mm. Head shining black; face and occiput thinly white pollinose; mystax and hairs to sides of antennae, the latter mixed with black, white; vertex and occiput with black hairs. Proboscis very



Messiasia zikani d'Andretta, male genitalia: 29, ventral view; 30, dorsal view; 31, lateral view.





Color pattern of tergites: 32, *Messiasia uaupes*, sp. n., tergite 2, dorsal view; 33, *Messiasia zikani* d'Andretta, tergites 1-2, dorsal view; ♀; 34, same, lateral view; Cx_3: coxa 3; F_3: femur 3; S_1: sternite 1; S_2: sternite 2; T_{1a}: tergite 1 (anterior); T_{1p}: tergite 1 (posterior).

dark brown, labella 1.00, subequal to oral cavity. Face at lower eye margin 0.80, at antennae 1.60, vertex 1.20, one eye 1.28, in width. Antennae black, apical 2/3 of club ferrugineous-red, lighter on venter, segments 0.44-0.16-1.90-1.80(0.50), in length (width).

Mesonotum subshining black, sparsely grey pollinose, dorsocentral rows and lateral margins, under certain angles, grey pollinose. Hairs short, black. Pleura, coxae, scutellum, and postscutellum black; latter densely grey pollinose, transverse rugose; hairs black.

Abdomen shining black with blue-green metallic reflections. Tergite 1 with reddish-brown hind margin. Tergite 2 with characteristic light-yellow large spot (Figs. 33-34). Sternites brown. Hairs short, recumbent, black, long on sides of tergite 1. Bullae 0.50(0.10) in length (width).

Legs black, vestiture black. Hind femora 6.00(1.12); 20 black tuberculate spines on venter; tibial spur 0.36, tarsal segments 1.10(0.32), 0.56, 0.40, 0.30, 0.60 in length (width); claws reddish, tip black; pulvilli yellowish.

Halteres black. Alulae black, margin and fringe whitish. Wings light brown, darker on anterior half, lighter areas inside cells, especially on posterior half of wing.

Female. Length, 22 mm. Similar to ♂. Mystax with some black hairs on middle. Labella 1.28 mm. Antennae reddish-brown, segments 0.40-0.14-1.90-1.90(0.52) in length (width). Face at lower eye margin 0.80, at antennae 1.60, vertex 1.20, one eye 1.28 in width. Thorax, legs and abdomen reddish-brown, margins of tergites and sternites lighter reddish-brown; tergites 8-10 entirely light reddish-brown, posterior mar-

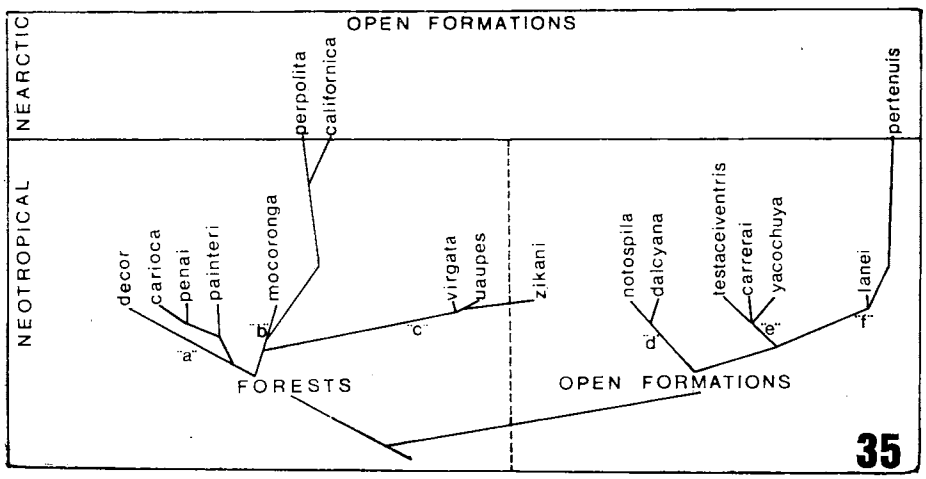


Fig. 35, Hypothetical phylogeny of the species of *Messiasia*.

gin of 8 with yellow crescent-shaped spot. Bullae black, 0,50(0.14). Hind femora 6.80(1.20), tibial spur 0.32, tarsal segments 1.00(0.30), 0.60, 0.40, 0.30, 0.60 in length (width).

Material examined

BRAZIL. *Mato Grosso*: Serra do Urucum, Corumbá, xi.1960 (K. Lenko), ♂, MZUSP.

PARAGUAY. San Bernardino, xii.1929 (Fiebrig), ♀ ("allotype" of *zikani* d'Andretta), MZUSP.

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