6 Taxonomic exploration of Neotropical Microdontinae (Diptera: Syrphidae) mimicking stingless bees

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Abstract. Several species of Neotropical Microdontinae (Diptera: Syrphidae) are mimics of stingless bees. Most of these species have previously been grouped in *Ubristes* Walker, 1852, with *Carreramyia* Doesburg, 1966, *Hypselosyrphus* Hull, 1937 and *Stipomorpha* Hull, 1945 treated as synonyms in recent literature. The species of the recently described genus *Mermerizon* Reemer are also treated in the present paper. Recent evidence published elsewhere supports an independent origin for all of these taxa, which is why they are now treated as different genera (Chapters 3-5). The present paper investigates all specific taxa previously associated with these genus-group names, in order to classify them into the different groups. A total number of 51 species is treated in this paper, 22 of which are described as new. These are divided among the genera as follows: *Carreramyia* (4 species, 2 new), *Ceratophya* (5 species, 1 new), *Hypselosyrphus* (11 species, 5 new), *Mermerizon* (3 species, 2 new), *Stipomorpha* (25 species, 10 new), *Ubristes* (3 species, 2 new). *Microdon scolopus* Shannon, 1927, previously classified in *Ubristes*, is transferred to *Ceratophya* Wiedemann, 1824, which is why this genus group is also treated in this paper. *Ceratophya longicornis* Wiedemann, 1824 is excluded from *Ceratophya* and treated as a species *incertae sedis*. Two other species are excluded, because they belong to other groups of Microdontinae not treated in the present paper: *Microdon angulatus* Hull, 1943 and *Ubristes chrysopygus* Giglio-Tos, 1892. Three new synonyms are proposed, two specific taxa previously considered as synonyms are rendered valid status, and one new name is introduced to replace a junior primary homonym. A key to the genus-groups and to the species is given. The genus *Rhoga* is included in the key to the genus-groups, but specific taxonomy is not worked out. The paper concludes with some remarks on mimicry as a possible drive for speciation and on species of *Stipomorpha* visiting flowers.

Introduction

Mimicry of noxious Hymenoptera commonly occurs in hoverflies (Diptera: Syrphidae). For instance, approximately 22% of all European species are considered to be mimics of bees or aculeate wasps to varying extent (Gilbert 2005). The potential selective advantage of mimicking noxious insects is obvious. It may come as a surprise, therefore, that several species of Syrphidae seem to mimic apparently harmless models of aculeate Hymenoptera: the stingless bees (Apidae: Apinae: Meliponini), which are characterized by their rudimentary sting. Harmless these bees may seem, but certain taxa are known to secrete formic acid from cephalic glands, which can cause an itching or even burning sensation when bitten by such a bee (Roubik et al. 1987). Such chemical properties of stingless bees may be an explanation for the noxiousness underlying their use of models for the evolution of mimicry.

Stingless bees are found all over the tropics, but their greatest diversity (about 75% of 500 species) occurs in the Neotropics (Costa et al. 2003). Likewise, this seems to be the only region in which many species of Syrphidae have evolved as mimics of stingless bees. Unpublished observations by the author in Surinam indicate that stingless-bee mimics occur among all three currently recognized subfamilies of Syrphidae: Syrphinae (e.g. *Ocyptamus* Macquart, 1834), Eristalinae (e.g. *Copestylum* Macquart, 1846, *Lepidomyia* Loew, 1864) and Microdontinae. Especially the latter subfamily is rich in mimics of stingless bees.

Most species of Neotropical Microdontinae resembling stingless bees have traditionally been grouped in the genus *Ubristes* Walker, 1852 (Thompson et al. 1976). This genus was originally erected for *U. flavitibia* Walker, 1852. Shannon (1927) applied the name *Ubristes* to several other species of Microdontinae with long, brush-like pilosity on the hind-tibia, resembling the corbicula of stingless bees. Subsequent authors, such as Hull (1949) and Van Doesburg (1966), have adopted this application of the name, sometimes considering *Ubristes* as a genus, sometimes as a subgenus of *Microdon* Meigen, 1803. In the catalogue of South American Syrphidae, Thompson et al.

(1976) treated *Ubristes* as a subgenus of *Microdon*, in which they included 31 specific taxon names (two of which as synonyms). They included the following genus-group names as synonyms of *Ubristes*: *Carreramyia* Doesburg, 1966, *Hypselosyrphus* Hull, 1937 and *Stipomorpha* Hull, 1945. Subsequently, Cheng & Thompson (2008) considered *Ubristes* as a genus, *Carreramyia* as a subgenus of *Ubristes*, and *Hypselosyrphus* and *Stipomorpha* as species groups of *Ubristes*. Recent evidence indicates that all of these genus group names represent unrelated taxa, implying that mimicry of stingless bees has evolved several times independently within the Microdontinae (Chapters 3-4). Therefore, the groups have all been given generic status. The generic diagnoses and a key to the groups are given in Chapter 5. So far, the taxonomy of these genus-groups has not been studied in detail. Keys to species were published by Shannon (1927), Curran (1940) and Van Doesburg (1966), but these are very incomplete.

The aim of the present paper is to revise the species names listed under *Ubristes* by Thompson et al. (1976), to attribute them to the available supraspecific taxa, and to describe hitherto undescribed species. Three new species are assigned to the recently described genus *Mermerizon* Reemer (Chapter 5). A key is presented to the groups of Microdontinae resembling stingless bees (i.e. those taxa with widened and/or brush-like pilose hind tibiae), and for each group keys to the species are given. The genus *Ceratophya* Wiedemann, 1824 is also included in this paper, because one of its species (*C. scolopus* (Shannon, 1927)) used to be included in *Ubristes* s.l. Although species of *Rhoga* Walker, 1857 also have 'corbiculate' hind tibiae, making them resemble stingless bees, this taxon has always been considered distinct from *Ubristes* auct. It has been well characterized by e.g. Cheng & Thompson (2008) and Hull (1949). To avoid confusion *Rhoga* is also included in the generic key provided in this paper, but no key to the species is provided nor are the species treated separately.

Material and methods

Acronyms for collections

AMNH	American Museum of Natural History, New York
BMNH	British Museum (Natural History), London
CNC	Canadian National Collection, Ottawa
CSCA	California State Collection of Arthropods, Sacramento
CU	Cornell University, Ithaca
INBIO	Instituto Nacional de Biodiversidad, Santo Domingo de Heredia (Costa Rica)
MCZ	Museum of Comparative Zoology, Harvard
MRSN	Museu Regionale di Scienze Naturali, Torino
MZLU	Museum of Zoology, Lund
MZUSP	Museu de Zoologia da Universidade de São Paulo
NMW	Naturhistorisches Museum Wien, Vienna
RMNH	National Museum of Natural History, Leiden
SEMC	Snow Entomological Museum, University of Kansas, Lawrence
SNSD	Senckenberg Naturhistorische Sammlungen Dresden
UCD	University of California, Davis
USNM	United States National Museum, Smithsonian Institutions, Washington D.C.
ZMAN	Zoölogisch Museum Amsterdam
ZMHB	Museum für Naturkunde der Humboldt Universität, Berlin

Terminology

For morphology the terminology of McAlpine (1981) is used, as specifically applied to Syrphidae by Thompson (1999). For some additional characters terms of Hippa & Ståhls (2005) are used (e.g. antennal fossa, antetergite). A description and discussion of morphology of Microdontinae can be found in Chapter 3.

Table 1. Morphological differences between the genera of Microdontinae treated in the present paper.

	Carreramyia	*Ceratophya*	*Hypselosyrphus*	*Mermerizon*	*Rhoga sepulchrasilva*	*Stipomorpha*	*Ubristes*
Basoflagellomere	male: bifurcate; female: unfurcate	unfurcate	unfurcate	unfurcate	unfurcate	unfurcate	unfurcate
Eye	bare	bare	short pilose	bare	short pilose	bare	bare
Occiput	dorsally wide, laterally and ventrally narrow	narrow over entire length	narrow at least dorsally	dorsally wide, ventrally narrow	wide over entire length	dorsally wide, ventrally narrow	dorsally wide, ventrally narrow
Scutellum	apicomedially sulcate	varies between species	triangular or apicomedially more or less sulcate	semicircular, not sulcate	apicomedially slightly sulcate	semicircular, not sulcate	semicircular, not sulcate
Anepimeron	bare on ventral half	entirely pilose (pile very short)	entirely pilose	bare on ventral half	entirely pilose	varies between species	entirely pilose
Vein sc	joins costal vein at about same level as crossvein rm	joins costal veins proximal of crossvein rm	joins costal vein distal of crossvein rm	joins costal vein distal of crossvein rm	joins costal vein distal of crossvein rm	joins costal vein at same level as or proximal of crossvein rm	joins costal veins proximal of crossvein rm
R4+5	without appendix	with appendix	without appendix	with appendix	without appendix	usually with appendix	with appendix
Tergites 3 and 4	fused	not fused	fused	fused	fused	fused	fused
Sternite 1	bare or pilose	pilose	pilose	bare	bare *	bare	pilose
Membranes between sternites 1-3	normal	normal	normal	normal	normal	with very wide membraneous parts in between	normal
Epandrium	without lateral 'fenestrae'	without lateral 'fenestrae'	without lateral 'fenestrae'	without lateral 'fenestrae'	without lateral 'fenestrae'	without lateral 'fenestrae'	with lateral 'fenestrae'
Hypandrium	basally bulged	basally not bulged	basally bulged	basally bulged	basally bulged	basally bulged	basally not bulged
Aedeagus	furcate, furcation point close to apex	furcate, furcation point close to base	furcate, furcation point close to apex	furcate, furcation point close to apex	furcate, furcation point close to apex	unfurcate	furcate, furcation point close to base

*: In certain other *Rhoga* species sternite 1 is pilose.

Keys

Keys to species of *Ubristes* auct. have been published by Shannon (1927), Curran (1940) and Van Doesburg (1966), but these only contain a small part of the species treated in this paper. The following key covers all species listed under *Ubristes* by Thompson et al. (1976) (including *Carreramyia*, *Hypselosyrphus* and *Stipomorpha*), all species of *Ceratophya*, and all new species described in the present paper, which include the species of the recently described genus *Mermerizon* Reemer (Chapter 5). A summary of diagnostic characters for distinguishing the genera treated here is given in table 1.

Not all Neotropical Microdontinae resembling stingless bees can be identified with the keys below. However, the key should work for all species included in the treated genera and species groups. In general, Neotropical microdontines with widened hind tibiae and / or brushes of long pile on the hind tibiae should get identified using these keys. If a specimen does not belong to one of those groups, the key to the genera will tell you so.

Be aware that probably several undescribed species lurk on the South American continent. Always check an identification with the figures, diagnoses and (re) descriptions as given in the species accounts.

Key to genera of Neotropical Microdontinae mimicking stingless bees

1. Hind tibia without long pile and not conspicuously widened. other groups of Microdontinae
– Hind tibia appearing corbiculate (as in bees): with long, brush-like pile and / or hind tibia conspicuously widened medially or apically 2

2. Scutellum with calcars..... other groups of .....Microdontinae
– Scutellum without calcars. 3

3. Sternites 2 and 3 separated by unusually wide membraneous parts, about as wide as tergite 2 medially or wider (fig. 150, 151) (may be hard to see in dry specimens). Aedeagus unfurcate (figs. 228-249). ..... *Stipomorpha*
– Sternites 2 and 3 not separated by wide membraneous part. Aedeagus furcate apically or basally (figs. 55-57, 106-110, 122-124, 263-265). 4

4. Vein R4+5 with posterior appendix in cell R4+5 (e.g. figs. 40, 159, 107) 5
– Vein R4+5 without posterior appendix in cell R4+5 (e.g. figs. 8, 62, 85) 7

5. Tergites 3 and 4 not fused, posterior margin of tergite 3 strongly overlapping with tergite 4 (figs. 31, 37). Tergite 4 in lateral view perpendicular to tergite 2. Face in most species laterally depressed, appearing somewhat carinate medially..... ..... *Ceratophya*
– Tergites 3 and 4 fused, posterior margin of tergite 3 not overlapping with tergite 4 (figs. 9, 141, 203). Tergite 4 in lateral view not perpendicular to tergite 2. Face laterally not depressed..... 6

6. Tergite 2 with lateral tubercles (fig. 256). Basoflagellomere longer than scape. Face in frontal view wider than an eye (fig. 257)..... *Ubristes*
– Tergite 2 without lateral tubercles. Basoflagellomere about as long as scape. Face in frontal view narrower than an eye (fig. 113, 118, 121) .... *Mermerizon*

7. Vertex wider than an eye (fig. 2, 8, 21). Basoflagellomere at least four times as long as scape; bifurcate in male. ..... *Carreramyia*
– Vertex narrower than an eye (fig. 60, 83). Basoflagellomere maximally twice as long as scape, but usually shorter than scape; not furcate 8

8. Occiput wide dorsally (also ventrally) (fig. 1), wider than length of ocellar triangle, also wider than length of pedicel..... *Rhoga* (no key to species included in this paper)
– Occiput narrow dorsally, usually also ventrally (fig. 61, 84), but not always (fig. 101), narrower than length of ocellar triangle, also narrower than length of pedicel..... *Hypselosyrphus*

Key to species of *Carreramyia*

1. Abdomen yellowish with dark vittae medially and laterally (fig. 3, 17) 2
– Abdomen unicolorous black or yellowish brown (fig. 8, 13)..... 3

2. Scutum mostly yellow; only with dark stripe laterally between notopleuron suture and posterior margin. Scutellum yellow. Hind leg: tibia wider than femur. Female basoflagellomere with arista; shape as in fig. 7 ..... *flava*
– Scutum mostly black; with yellow margins and narrow yellow lines. Scutellum black laterally, yellow medially. Hind leg: tibia wider than femur. Female basoflagellomere without arista; shape as in fig. 19. ..... *tigrina*

3. Yellowish brown species..... *megacephalus*
– Black species..... *megacera*

Key to species of *Ceratophya*

1. First tarsomeres of all tarsi with strong ventrobasal tooth (fig. 54). Tergites 2 and 3 black. ..... *scolopus*
– First tarsomeres without ventrobasal tooth. Tergites 2 and 3 at least partly yellow..... 2

2. Scutellum (dorsal view) semicircular, without apicomedian sulcus..... 3
– Scutellum (dorsal view) with (sometimes weak) apicomedian sulcus..... 4

3. Tergite 2 posteromedially black, laterally with wide, oblique yellow vitta (fig. 30) ..... *carinifacies*
– Tergite 2 posteromedially yellow, laterally black (fig. 24)..... *argentinensis*

4. Scutellum with weak apcomedian sulcus (fig. 42). Male: tergite 3 blackish brown with posterior margin broadly yellow. Female: tergites predominantly brownish black; tergite 2 with two oblique yellow vittae, tergites 3 and 4 with yellow posterior margins..... *notata*
– Scutellum with deep apicomedian sulcus (fig. 47). Male: tergite 3 blackish brown with posterior margin broadly yellow and with yellow lateral vittae (based on description of Curran 1930; in holotype the abdomen is missing). Female: tergites yellow, only brownish along lateral margins ..... *panamensis*

Key to species of *Hypselosyrphus*

1. Scutellum triangular, apex acute. (fig. 65) ..... *amazonicus*
– Scutellum not triangular: semicircular or apicomedially sulcate. 2

2. Alula entirely microtrichose 5
– Alula with small bare area basomedially 3

3. Thorax and abdomen entirely yellow..... *helvus*
– Thorax and abdomen largely black..... 4

4. Tergite 4 with posterior margin widely yellowish; sternite 4 largely yellowish. Scutellum entirely black pilose. Wing tinged yellowish on apical third, otherwise brownish. ..... *anax*
– Tergite and sternite 4 entirely blackish brown. Scutellum black pilose, except pale pilose posteroventrally. Wing entirely tinged brownish. ..... *plaumanni*

5. Wing with contrasting pattern of dark brown and yellow fasciae (fig. 85, 104) 6
– Wing without contrasting colour pattern (may be tinged with brown or yellow) 7

6. Mesonotum and scutellum yellow pilose..... *pingo*
– Mesonotum and scutellum black pilose ..... *vexillipennis*

7. Hind tibia yellow, yellow pilose. Only female known..... *corbiculipes*
– Hind tibia at least partly brown, black pilose..... 8

8. Abdomen orange to reddish brown 10
– Abdomen black 9

9. Occiput narrow over entire length (fig. 77) ..... *maurus*
– Occiput ventrally widened (fig. 101) ..... *ulopodus*

10. Scutellum apicomedially sulcate. Face dark brown. Thorax dark brown ..... *trigonus*
– Scutellum more or less semicircular, not sulcate. Face yellow. Thorax yellow, except for blackish brown maculae on mesoscutum. ..... *pseudorhoga*

Key to species of *Mermerizon*

1. Hind tibia with appressed pile, which are shorter than half the width of the tibia. Antenna entirely black. Wing with vaguely defined, greyish transverse fasciae (fig. 120).....*mesmerizus*
– Hind tibia with more or less erect brush-like pile, which are at least half as long as the width of the tibia. Antenna with at least basoflagellomere yellow. Wing without greyish fasciae (fig. 116, 119). 2

2. Mesonotum and scutellum entirely yellow pilose. Hind femur and basal half of hind tibia yellow pilose.....*mellosus*
– Mesonotum, scutellum and hind leg entirely black pilose. .....*inbio*

Key to species of *Stipomorpha*

1. Anepisternum pilose posterodorsal margin pilose (often only sparsely).....2
– Anepisternum with posterodorsal margin bare (only anterior part pilose) 14

2. Katepisternum dorsally pilose 3
– Katepisternum dorsally bare 7

3. Abdomen with contrasting colour pattern: tergite 2 orange brown, tergites 3 and 4 blackish (fig. 132).....*dichromata*
– Abdomen more or less unicolourous 4

4. Abdomen yellowish brown 5
– Abdomen blackish 6

5. Front and mid legs yellow ..... *micromidas*
- Front and mid legs black (except apical tarsomeres yellow). ..... *elcopala*

6. Wing with whitish transverse fascia posterior to pterostigma (view against dark background). Male genitalia as in fig. 235 .....*lacteipennis*
– Wing without whitish fascia. Male genitalia as in fig. 237.....*litoralis* (only male known)

7. Alula entirely microtrichose 8
– Alula partly bare basomedially.....9

8. Head in frontal view clearly wider than high (fig. 128). Basoflagellomere at least four times as long as wide. Frontal ocellus round, not split in two.... ..... *crematogastri* (only female known)
– Head in frontal view about as wide as high (fig. 220). Basoflagellomere less than three times as long as wide. Frontal ocellus split in two..*wheeleri*

9. Vertex shining black, more or less convex (fig. 209, 212).....10
– Vertex mostly yellow, irregularly swollen (not convex) (fig. 177,196) 12

10. Vein R2+3 joins costal vein at about same level as junction of M1 and R4+5. Wing more or less colourless. Male genitalia as in fig. 235..... *spuria*
– Vein R2+3 joins costal vein clearly distal of junction of M1 and R4+5. Wing tinged with yellow on anterobasal ½.....11

11. Male genitalia as in fig. 246: surstylus in lateral view slender with 'hooked' appearance. Alula: band of microtrichia along posterior margin maximally as wide as 1/6 of width of alula (fig. 174)..... *tenuicauda*
– Male genitalia as in fig. 226: surstylus in lateral view approximately quadrate. Alula: band of microtrichia along posterior margin about as wide as 1/4 of width of alula (fig. 173).....*mackiei*
[*Two externally very similar species, both quite variable in colouration. In both species the hind leg and the metanotum can be entirely yellow or almost entirely dark. The character of the distribution of microtrichia on the alula should be used with caution, as it could only be verfiied on a small number of males*.]

12. Wing with dark brown spot anteromedially. Male genitalia as in fig. 239.....*maculipennis*
– Wing without dark spot anteromedially.....13

13. Face narrower than one eye in frontal view. Hind tibia as wide as or slightly wider than hind femur. Male genitalia as in fig. 233.....*guianica*
– Face wider than one eye in frontal view. Hind tibia about twice as wide as hind femur. Male genitalia as in fig. 243.....*panamana*

14. Alula entirely microtrichose 15
– Alula partly or entirely bare 23

15. Wing uniformly hyaline or slightly infuscated, without whitish cloud or fascia (may be tinged with yellow).....16
– Wing with yellow or white cloud at or posterior to pterostigma, sometimes small, sometimes extending to posterior wing margin, thus forming a transverse fascia (may be inconspicuous, be sure to view against dark background!) 20

16. Abdomen black. Face with median black vitta occupying about 3/4 of width of face. . *trigoniformis* (only male known)
– Abdomen yellow. Face yellow or with narrow, vague brownish median vitta.....17

17. Front- and mid-legs: first 3-4 tarsomeres dark brown. Basoflagellomere slightly shorter than scape.....*fraudator*
– Front- and mid-legs: tarsi entirely yellow. Basoflagellomere at least as long as scape. 18

18. Abdomen somewhat constricted: narrowest width at tergite 3 (less pronounced in female). Pilosity of hind tibia less than half as long as width of tibia. Female: vertex at least partly yellow, sometimes with vague dark markings..... *lanei*
– Abdomen not constricted at tergite 3; tapering from anterior margin of tergite 3 towards apex. Pilosity of hind tibia about as long as half the width of the tibia. Female: vertex black. 19

19. Anterior margin of tergite 2 not curled around tergite 1 laterally (fig. 227). Females: greatest width of tergite 2 posteriad of half its length. More robust species .....*mixta*
– Anterior margin of tergite 2 more or less curled around tergite 1 (fig. 226). Females: greatest width of tergite 2 at or anteriad of half its length. Slender species .....*mendax*

20. Scutellum yellow.....21
– Scutellum black 22

21. Vertex black ..... *mendax* (female)
– Vertex yellow, except ocellar triangle darkened. .. ..*goettei*

22. Basoflagellomere 1.5 times as long as scape. Vein sc joins coastal vein proximal of crossvein rm. Pale mark on wing large, extended to posterior wing margin. Black facial vitta occupying about 1/2 of width of face.....*puerilis* (only female known)
– Basoflagellomere about as long as scape. Vein sc joins coastal vein at about same level as crossvein rm. Pale mark on wing small: reaching from pterostigma to halfway wing or less. Black facial vitta occupying about 1/6 of width of face. Male genitalia as in fig. 244.....*simillima*

23. Scutellum yellowish 24
– Scutellum brown or black. 26

24. Vertex yellow.....*goettei*
– Vetex black.....25

25. Scape 4 times as long as pedicel. Genitalia as in fig. 240.....*mendax* (only male known)
– Scape 2 times as long as pedicel. Genitalia as in fig. 230.....*fallax* (only male known)

26. Basoflagellomere clearly longer than scape. Anterior part of anepisternum black pilose. ..... *zophera*
– Basoflagellomere slightly shorter than or as long as scape. Anterior part of anepisternum yellow pilose.....27

27. Abdomen black or dark brown. ..... *inarmata*
– Abdomen pale orange brown. ..... *apicula*

Key to species of *Ubristes*

1. Abdomen black. .....*flavitibia*
– Abdomen partly or entirely yellow. 2

2. Abdomen entirely yellow.....*ictericus*
– Abdomen brownish with yellow maculae. ....*jaguarinus*

Species accounts: descriptions, redescriptions and notes

***Carreramyia flava* (Sack, 1941) comb. nov.**
Figs 2–7.
Ceratophya flava Sack, 1941: 117.
Studied type specimens. HOLOTYPE. Female. PERU. Label 1 (green): "Peru – Rosalina / 28.8.03 / Urubambafl."; label 2 (green): "Coll. W. Schnuse / 1911 - 3"; label 3: [female sign]; label 4: "Ceratophya / flava Schnuse"; label 5 (orange): "16a. / ? Ceratophya Wied ? / flava sp. nov."; label 6: "Staatl. Museum für / Tierkunde, Dresden". Coll. SNSD.
Description (based on holotype)
Adult female. Body size. 5 mm.
Head. Face occupying almost 3/5 of head width in frontal view; yellow with small brown spot laterad of antennal fossa; short yellow pilose. Gena yellow; yellow pilose. Frons yellow, bare. Vertex strongly produced medially; yellow with a vague brown transverse fascia; yellow pilose, with pile getting longer posteriorly. Occiput yellow; yellow pilose. Eye bare. Antennal fossa about as wide as high. Antenna yellow, with basoflagellomere and base of scape darker; ratio of scape:basoflagellmere approximately as 1:4; pedicel very short, only about 1/18 of basoflagellomere; arista about as long as pedicel, yellowish white.
Thorax. Scutum yellow with brown lateral vitta between notopleuron and posterior margin; yellow pilose, except black pilose on bart of lateral brown vitta. Postpronotum yellow; bare. Postalar callus pale yellow; yellow pilose. Scutellum yellow; yellow pilose basally, black pilose apically; sulcate posteromedially. Anepisternum a little convex, without sulcus; brown anteriorly, yellow posteriorly; yellow pilose anterodorsally and posterodorsally. Katepisternum yellow, except brown posterodorsally; sparsely yellow pilose dorsally, bare ventrally. Katepimeron pale yellow; convex; bare. Calypter dark brown. Halter yellow.
Wing: hyaline, vaguely infuscated halfway from stigmal crossvein to rm and along marginal crossveins; with yellowish white transverse fascia from pterostigma almost to posterior margin (view against dark background); microtrichose, except bare on 1st costal cell, basal 1/2 of cell R, posterobasal 1/3 of cell BM, anterobasal 1/5 of cell CuP.
Legs: front and hind legs yellow [mid legs missing in type specimen], with hind tibia somewhat darker; short yellow pilose, except hind tibia dorsally longer appressed black pilose. Coxae and trochanters yellowish brown; yellow pilose.
Abdomen. Tergites yellow with brown markings on the following parts: tergite 1 anterolaterally; tergite 2 laterally and vaguely posteromedially; tergite 3-5 laterally and with median vitta. Tergites short dark pilose, except tergite 2 anterolaterally with longer yellow pile. Sternites yellow; yellow pilose, except sternite 1 bare.
Diagnosis. Distinguished from *C. megacephalus* and *C. megacera* by the striped pattern of the abdomen. From *C. tigrina* it differs by the mostly yellow scutum, the entirely yellow scutellum, the hind leg with its femur wider than its tibia, the presence of an arista in the female and the shape of the female basoflagellomere.
Distribution. Only known from Peru.
Notes. This species was listed by Thompson et al. (1976) under the 'Unrecognized species' of Syrphidae, not place in any genus of Syrphidae, not even in a subfamily. Examination of the type revealed that Sack (1941) was right in placing this species in the Microdontinae. It fully fits the characters described as diagnostic for *Carreramyia*.

***Carreramyia megacephalus* (Shannon, 1925)**
Figs 8–12, 23.
Microdon megacephalus Shannon, 1925: 213. Type locality: Panama.
Studied type specimen. HOLOTYPE. Male. PANAMA: Old Panama, 31.I.1911, leg. A. Busck, coll. USNM.
Additionally studied specimens. COSTA RICA: 2 males & 1 female, Guanacaste, 3 km SE R. Naranjo, 3-8.III.1992, leg. F.D. Parker, males coll. M. Hauser, female coll. RMNH; 1 male, same locality & leg as previous, 11-21.IV.1992, coll. RMNH; 1 female, Guanacaste, Parque Nacional Santa Rosa, Sector Santa Rosa, 5-18.VII.2001, leg. A.R. Deans, coll. M. Hauser.
Diagnosis. Body size 6-8 mm. Immediately distinguished from the other three *Carreramyia*-species by its entirely yellowish colouration, without any dark markings.
Distribution. Known from Costa Rica and Panama.

***Carreramyia megacera* spec. nov.**

Figs 13–16.

Studied type specimens. HOLOTYPE. Female. SURINAM: Commewijne, Peperpot, 05°46'08"N-55°07'33"W, 17-24.II.2006 (malaise trap), leg. M. Reemer, coll. RMNH.

Description (based on holotype)

Adult female. Body size. 6 mm.

Head. Face occupying about 2/5 of head width in frontal view; pale yellow with two vague submedian vittae; with short, sparse black pile, getting longer and more bristly around oral margin. Gena pale yellow, with a few black setae. Frons pale yellow, except for black lunula, black macula laterad of antennal fossa and narrow black line along eye margin; bare. Vertex pale yellow and bare on anterior half, black and with black bristly pile on posterior half; strongly elevated. Occiput black; black pilose dorsally, white pilose ventrally. Eye bare. Antennal fossa about as wide as high. Antenna black; ratio of scape:basoflagellmere approximately as 1:5; pedicel very short; basoflagellomere very long, about 1,5 times as long as face; arista yellow, about 2/3 of length of scape.

Thorax. Scutum black; bristly black pilose. Postpronotum yellow; bare. Postalar callus yellow; bristly black pilose. Scutellum black; bristly black pilose; deeply sulcate posteromedially; in lateral view making angle of about 45 with scutum. Anepisternum a little convex, without sulcus; black anteriorly, yellow posteriorly; bristly black pilose anterodorsally and along posterior margin, with wide bare part in between. Katepisternum black, except for small yellow macula at dorsal margin; dorsally bristly black pilose, bare ventrally. Katepimeron yellow; convex; bare. Calypter black. Halter yellow.

Wing: hyaline, faintly infuscated between base and stigmal crossvein, with faint yellow cloud apically of stigmal crossvein and crossvein RM; microtrichose, except bare on 1st costal cell, on cell R except along vena spuria, on most of cell BM except apical 1/6 and a narrow median stripe from base to apex, on anterior 1/3 of cell CuP.

Legs: missing in holotype, except middle leg: long and slender; femur black, except faintly yellow near apex; tibia black, except yellow at basal and apical 1/10; tarsus yellow; entirely black pilose. Coxae and trochanters black; bristly black pilose.

Abdomen. Black. Second segment wider than thorax, widest point at posterior margin; tergites 3 and 4 strongly narrowing. Tergites 1 and 2 black pilose, except yellow pilose medially along posterior margin of tergite 2. Tergite 3 black pilose, except for two large submedian patches of yellow pile which reach posterior margin. Tergites 4 and 5 mainly black pilose, with limited yellow pile. Sternites black, with wide yellow membrane between sternites 1 and 2. Sternite 1 bare, other sternites bristly black pilose.

Etymology. The specific epithet refers to the very long antennae: *megas* (Gr., large), *keras* (Gr., antenna, horn).

Diagnosis. Immediately distinguished from the other three *Carreramyia*-species by its black colouration and the deeply sulcate scutellum.

Notes. The male is unknown, so whether it has the furcate basoflagellomere characteristic for this genus or not can only be guessed at. Nevertheless the female is very similar to *C. megacephalus* in the diagnostic and other important characters: basoflagellomere very long, vertex strongly produced, face very wide, near oral margin with bristly pile, scutellum sulcate, vein R4+5 without appendix, crossvein RM close to base of cell DM. Because of these characters, this new species is placed in *Carreramyia*.

Distribution. Only known from Surinam.

Ecology. The holotype was collected in a malaise trap in secondary forest on moist clay soil in a former coffee- and cocoa plantation.

***Carreramyia tigrina* spec. nov.**

Figs 17–22.

Studied type specimens. HOLOTYPE. Female. PERU, Madre de Dios, Rio Tambopata, Sachavacayoc Centre, 12°51'S-69°22'W, malaise trap, 16-26.X.2008, leg. J.T. Smit, coll. RMNH.

Description (based on holotype)

Adult female. Body size. 5 mm.

Head. Face occupying almost 3/5 of head width in frontal view; yellow with small black spot laterad of antennal fossa; short yellow pilose. Gena yellow; yellow pilose. Frons yellow, short black pilose. Vertex strongly produced medially; yellow with a wide black transverse fascia; black pilose, with pile getting longer posteriorly. Occiput yellow; black pilose dorsally, yellow pilose ventrally. Eye short pale pilose. Antennal fossa about as wide as high. Antenna with scape and pedicel black, basoflagellomere yellow except black on dorsobasal 2/5; ratio of scape:basoflagellmere ap-

proximately as 1:5,5; pedicel very short; basoflagellomere very long and wide; arista absent.

Thorax. Scutum black medially with two narrow submedian yellow vittae, widely pale yellow along margins; yellow pilose, except black pilose posterolaterally. Postpronotum pale yellow; bare. Postalar callus pale yellow; bristly black pilose. Scutellum yellow on median 1/3, black on lateral 1/3; yellow pilose, with some long and bristly pile posteriorly; sulcate posteromedially. Anepisternum a little convex, without sulcus; black, except pale yellow along posterior margin; long black pilose dorsally, shorter and partly pale pilose medially, bare on ventral 1/4. Katepisternum black, except for yellow macula at dorsal margin; short yellow pilose dorsally, bare ventrally. Katepimeron pale yellow; convex; bare. Calypter blackish. Halter whitish yellow.

Wing: hyaline, infuscated blackish around veins, with yellow transverse fascia between pterostigma and vein M, also yellow on and around vein CuA; microtrichose, except bare on 1st costal cell, basal 1/4 of cell R, posterobasal 1/3 of cell BM, anterobasal 1/4 of cell CuP.

Legs: front and middle legs yellow, except basal 1/3 of femora blackish; hind femur blackish except yellow on subbasal 1/5, on narrow stripe dorsally and on postero-apical 1/3; hind tibia blackish except narrowly yellow at apex; hind tarsus yellow. Coxae and trochanters blackish; black pilose.

Abdomen. Tergite 1 black; other tergites yellow with black median vitta and widely black lateral margins; short black pilose. Tergite 2 wider than thorax, widest point at posterior 1/3. Sternites yellow, except for small dark lateral macula on tergite 5. All sternites short black pilose.

Etymology. The name *tigrina* (L., 'of tigers') is inspired by the pattern of black and buff spots and stripes on head, wings and abdomen.

Diagnosis. Distinguished from *C. megacephalus* and *C. megacera* by the striped pattern of the abdomen. From *C. flava* it differs by the mostly black scutum, the laterally black scutellum, the hind leg with its tibia wider than its femur, the absence of an arista in the female and the shape of the female basoflagellomere.

Notes. The male is unknown, so whether it has the furcate basoflagellomere characteristic for this genus or not can only be guessed at. Nevertheless the female is very similar to *C. megacephala* in the diagnostic and other important characters: basoflagellomere very long, vertex strongly produced, face very wide, scutellum sulcate, vein R4+5 without appendix, crossvein RM close to base of cell DM. Therefore, this new species is placed in *Carreramyia*.

The holotype was collected in a malaise trap at the edge of primary rainforest (varzea forest) in the Amazonian part of Peru.

Unfortunately, after description and taking photographs, the holotype was severally damaged by accident. The head and a large part of the thorax are lost.

Distribution. Only known from Peru.

Ecology. Collected at the edge of primary rain forest.

***Ceratophya argentinensis* spec. nov.**

Figs 24–28.

Studied type specimens. HOLOTYPE. Female. ARGENTINA. Label 1: "Argentina, Tucuman / Rio Potrerillo / S26.80674° / W65.46934°, 969 m", other side of label: "01.XI.2008 / leg. T. Ekrem"; label 2: "309 / Y1008 / DNA voucher". Coll. RMNH.

Description (based on holotype)

Adult female. Body size. 7 mm.

Head. Face occupying 1/3 of head width in frontal view; sides converging ventrad; laterally depressed; pale yellow, with vague, narrow, brown median vitta; black pilose on dorsal half and along eye margins, yellow pilose on ventral half. Face in profile slightly convex, slightly produced downward at anterior oral margin. Gena yellow. Frons anteriorly yellow, black pilose; posteriorly black, yellow pilose. Vertex blackish brown, yellow pilose. Occiput blackish; white pilose. Eye bare. Antennal fossa about as wide as high. Antenna: scape and pedicel blackish, basoflagellomere pale brown; antennal ratio approximately 4:1:5.

Thorax. Scutum blackish, except narrowly yellow along anterior margin; short appressed golden yellow pilose, except short black pilose posteriad of transverse suture on lateral 1/3. Postpronotum yellow; yellow pilose. Postalar callus yellow; black pilose. Scutellum yellow, short yellow pilose; semicircular, without sulcus or calcars. Anepisternum not differentiated by sulcus; anterior half black, posterior half yellow; mixed black and golden pilose anterodorsally. Anepimeron black; black pilose on dorsal 3/4. Katepisternum blackish brown, except yellow along dorsal and ventral margins; black pilose dorsally and ventrally, widely bare in between. Katatergum and anatergum blackish brown; short microtrichose. Ca-

lypter grey. Halter yellow.
Wing: hyaline; microtrichose, except bare on 1st costal cell, basal 1/4 of cell R1, most of cell R except microtrichose along vena spuria, entirely on cell BM, basal 1/2 of cell CuP, basal 1/10 of cell DM.
Legs: Front and hind legs yellow, slightly infuscated on basal 1/4 of femora and tarsi; pilosity short, mixed yellow and black. Coxae and trochanters blackish brown; yellow pilose.
Abdomen. Tergite 1 yellow anteriorly, dark brown posteriorly; yellow pilose laterally. Tergite 2 blackish brown with large, triangular marking posteromedially, which extends to anterior margin by narrow vitta; short black pilose, except bare on yellow parts; coarsely punctured over entire surface. Tergites 3 and 4 with colouration as tergite 2; bare, except tergite 4 short black pilose along lateral margin. Tergite 5 blackish, except narrowly yellow along lateral margin; short black pilose. In profile with tergite 4 almost perpendicular to tergite 2, so apex of abdomen curved downward. Sternites blackish anteriorly, yellow posteriorly; bare, except sternite 4 posteriorly and sternite 5 short black pilose.
Male. Unknown.
Diagnosis. Recognizable by the black posteromedian part of tergite 2 in combination with the unsulcate scutellum.
Distribution. Only known from northern Argentina (prov. Tucuman).

Ceratophya carinifacies **(Curran, 1934)**
Figs 29–35.
Microdon carinifacies Curran, 1934: 376.
Studied type specimens. HOLOTYPE. Female. GUYANA. Label 1 (red): "*Microdon carinifacies* Curran Type"; label 2: "Trop. research station New York Zool. Society, No. 201330"; coll. AMNH. The specimen is in bad condition: ventral parts of the thorax are missing, as well as front legs and all tarsi, and the wings are badly damaged. Attached to the pin is also an empty puparium, from which the female holotype has apparently been reared.
Additionally studied specimens. BRAZIL: 1 female, RO Fazenda, Rancho Grande, 62 km s. Ariquemes, 10°18'S 62°53'W, 8-20.IV.1997, malaise trap, leg. A.C. Rhen & C. Alexander, coll. UCD.
Redescription (based on holotype)
Adult female. Body size. 8 mm.
Head. Face occupying 2/5 of head width in frontal view; parallel-sided; submedially depressed; pale yellow, with brown median vitta from antennal fossa to oral margin, where it is at its narrowest; entirely short, appressed yellow pilose. Face in profile straight, produced downward at anterior oral margin. Gena blackish. Frons brown, short pale pilose; vertex blackish brown, short white pilose. Occiput blackish. Eye bare. Antennal fossa about as wide as high. Antenna with scape basally yellow, gradually getting brown in apical 1/2; pedicel and basoflagellomere blackish brown; antennal ratio approximately 4:1:5,5. Basoflagellomere parallel-sided, with apex directed a little upward. Arista slender, about half the length of the basoflagellomere.
Thorax. Scutum blackish brown, except narrowly yellow along margins; short black pilose, except lateral fasciae of white pile along anterior margin and transverse suture, and a complete white pilose fascia between postalar calli. Postpronotum and postalar callus yellow; short yellow pilose. Scutellum yellow, short yellow pilose; semicircular, without sulcus or calcars. Anterior and posterior part of anepisternum not differentiated; short yellow pilose except on ventral 1/3. Anepimeron entirely white pilose. Katepisternum white pilose, at least dorsally (ventral part not visible in type specimen). Katatergum and anatergum microtrichose. Other pleurae bare. Calypter and halter yellow.
Wing: hyaline; microtrichose, except bare on costal cells, basal 1/2 of cell R1, basal 1/3 of cell R4+5, entirely on cell RM except for traces of microtrichia around vena spuria, on cell BM, on basal 1/4 of cells DM and CuA1, on anterobasal 1/2 of cell CuP.
Legs: Front legs and all tarsi missing in holotype. Mid- and hindfemora and -tibiae yellowish brown, mid-femora paler on apical half. Legs short and appressed pilose, black on femora, yellow on tibiae. Coxae and trochanters brownish, with pale pile.
Abdomen. Tergite 1 brownish. Tergite 2 brownish with large, oblique, lateral yellow markings over entire length, which leave narrow brown lateral margins and a large median brown triangle. Tergite 3 brownish with yellow lateral margins and a widely yellow posterior margin, which vaguely extends forward medially and gradually turns into pale brown. Tergite 4 mostly yellow, except brownish sublaterally. Tergite 5 yellowish brown. In profile with tergite 4 almost perpendicular to tergite 2, so apex of abdomen curved

downward. Tergites short pilose, mostly black on brown parts and yellow on yellow parts. Sternites yellowish brown, short pale pilose.
Male. Unknown.
Puparium. [see pictures] about 8 mm., dorsally more or less flat, ventrally convex. Head skeleton and anterior parts (including anterior spiracles) lost. Posterior spiracle not visible.
Diagnosis. Recognizable by the yellow posteromedian part of tergite 2 in combination with the unsulcate scutellum.
Notes. The female from Brazil is darker in overall colouration: the scutellum has two blackish marks posteroventrally, tergites 3 and 4 are black with yellow posterior margins (tergite 3 also with yellow lateral margins).
Distribution. Known from Brazil and Guyana.

***Ceratophya longicornis* Wiedemann, 1824** (excluded from Ceratophya)
Ceratophya longicornis Wiedemann, 1824: 14. Type locality: Brazil. [type lost]
English translation of German description in Wiedemann (1830): "Antennae black, basally brown; third segment four times longer than first; face fawn-coloured ['rehhaarbräunlich']; frons black. Scutum black, with traces of fawn-coloured hairs along anterior margin, transverse suture, posterior margin and lateral margins. Abdomen black, second segment longer than in preceding species [*C. notata*], a little narrower than the other [segments], with 'longish', posteriorly forked ['hinten kurz gabelförmigen oder zweispitzigen'] yellow marking which does not reach the posterior margin. Base of abdomen ventrally and sternal margins widely yellow. Wing yellowish. Femora black, with narrowly yellow apex; tibiae and tarsi yellow. – In my collection, a specimen treated with arsenic-solution, because of which the colours are not well discernable."
Notes. According to Wiedemann (1830) the type was in his personal collection, which usually means that it is conserved in the NMW collection. However, no specimen recognizable as the type of *C. longicornis* is present in the NMW (pers. comm. P. Sehnal). It is not in the ZMHB collection either (pers. comm. J. Ziegler). Wiedemann (1830) wrote that the specimen had been treated with arsenic, a common practice in those days to prevent insect depredation of entomological collections. Sometimes arsenic solutions were applied in a mixture with other ingredients, e.g. soap or mercury (Albrecht 1993). Perhaps the chemical treatment of the specimen has eventually led to its disappearence.
The original description provides some indications that *C. longicornis* is quite different from other *Ceratophya* species:
basoflagellomere four times longer than scape (in all other *Ceratophya* species the basoflagellomere is less than twice as long as the scape);
the second tergite is longer than in *C. notata* and narrower than the other tergites (suggesting a constricted abdomen, which is found in no other *Ceratophya* species).
These characters indicate that *C. longicornis* is probably not a true *Ceratophya* as defined by Cheng & Thompson (2008) and Chapter 5 in the present thesis. At present the taxonomic affinities of *C. longicornis* remain unclear. However, there are few Neotropical species of Microdontinae with such an antennal ratio combined with a constricted abdomen, so possibly the identity of *C. longicornis* can be clarified later.

***Ceratophya notata* Wiedemann, 1824**
Figs 36-41, 55.
Ceratophya notata Wiedemann, 1824: 14.
Studied type specimens. HOLOTYPE. Male. BRAZIL. Label 1: "Brasilia, coll. Winthem"; label 2: "*notata*, det. Wiedem."; label 3: "*notata* Wied. Brasilia"; label 4 (yellow): "Lectotype *Ceratophya notata* Wied. Desig. Thompson 1977". Coll. NMW.
Additionally studied material. SURINAM: 1 female, Zanderij, 18-21.VII.1964, leg. D.C. Geijskes, coll. RMNH.
Adult male. Body size: 7 mm.
Head. Face parallel-sided, occupying 1/3 of head width in frontal view; laterally depressed; pale yellow, with brown median vitta from antennal fossa to oral margin, where it is at its narrowest; entirely short yellow pilose. Face in profile straight, produced downward at anterior oral margin. Gena brown. Oral cavity with lateral margins not produced. Frons blackish brown, short white pilose; vertex blackish, short white pilose. Occiput blackish brown. Eye bare. Antennal fossa about as wide as high. Antenna with scape yellow, gradually getting brown in apical 1/3, pedicel and scape brown; antennal ratio approximately 6:1:9. Basoflagellomere curled upward in apical

1/3. Arista slender, a little longer than half the length of the basoflagellomere.

Thorax. Scutum blackish brown; short black pilose, except lateral fasciae of white pile along transverse suture and posteriorly between postalar calli. Postpronotum yellow, short yellow pilose. Postalar callus pale brown, short black pilose. Scutellum yellow, short yellow pilose; slightly sulcate apicomedially; without calcars. Anterior and posterior part of anepisternum not differentiated; short yellow pilose except on ventral 1/3. Anepimeron entirely white pilose. Katepisternum white pilose. Katatergum and anatergum microtrichose. Other pleurae bare. Calypter and halter yellow.

Wing: hyaline; microtrichose, except bare on costal cell, anteriorly along vein RS, on cell RM except for traces of microtrichia around vena spuria, on cell BM, on anterobasal 1/3 of cell CuP.

Legs: Brown, with tarsi and apical 1/3 of pro- and mesotibiae yellow. Legs short yellow pilose. Coxae and trochanters brownish, with yellow to white pile.

Abdomen. Blackish brown, with large, oblique, lateral yellow markings over entire length of tergite 2, and yellow posterior margins of tergites 3 and 4. In profile with tergite 4 almost perpendicular to tergite 2, so apex of abdomen curved downward. Tergites 1 and 2 short black pilose, except yellow pilose on yellow markings. Tergites 3 and 4 entirely short yellow pilose. Sternites brown, short pale pilose. Male genitalia as in fig. 55.

Female. Same as male, except the following differences in the Abdomen. about 1,5 times wider than in male, with posterior margins of tergites strongly extending over next tergites, suggesting 'telescopic' capacities. The yellow poserior margins of tergites 3 and 4 are somewhat swollen.

Diagnosis. Recognizable by the following combination of characters: scutellum weakly sulcate, male: tergite 3 blackish brown with posterior margin broadly yellow, female: tergite 2 with two oblique yellow vittae, tergites 3 and 4 with yellow posterior margins.

Notes. The holotype of *C. notata* carries the label "Lectotype *Ceratophya notata* Wied. Design. Thompson 1977". However, assuming that this specimen indeed was used by Wiedemann to describe the species, and considering that there seems to have been only one specimen on which he based his description, it seems that this specimen should be regarded as the holotype.

Distribution. Known from Brazil and Surinam.

***Ceratophya panamensis* (Curran, 1930)**

Figs 42-47, 56.

Microdon panamensis Curran, 1930: 6.

Studied type specimens. HOLOTYPE. PANAMA. Male. Label 1: "France Field, Canal Zone. 18.I.1929"; label 2 (red): "Type Microdon panamensis Curran"; label 3: "Collector C.H. Curran". Coll. AMNH.

PARATYPE. – Female. Attached to same pin as male holotype, with which it has been collected 'in coitu' (Curran 1930).

Notes on type specimens. The male holotype and the female paratype are attached to the same pin. There is no question as to which of the specimens should be regarded as holotype, because Curran (1930) clearly designated the male as such. Unfortunately, the abdomen of the male is missing. Nonetheless, its genitalia are conserved in a microvial attached to the pin.

Adult male. Body size: 7-8,5 mm (Curran 1930).

Head. Face parallel-sided, occupying slightly less than 1/3 of head width in frontal view; sublaterally depressed, so medially slightly carinate; pale yellow, with brown median vitta from base of antenna to oral margin, where it is at its narrowest; entirely short yellow pilose. Face in profile straight, produced downward at anterior oral margin. Gena black. Frons black, short yellow pilose; vertex black, short yellow pilose. Occiput black. Eye bare. Antennal fossa about as wide as high. Antenna with scape brown, yellowish basally; pedicel and scape brown; antennal ratio approximately 5:1:8. Basoflagellomere parallel-sided, curled slightly upward in apical 1/4. Arista slender, about half the length of the basoflagellomere.

Thorax. Scutum black; short black pilose, except fasciae of pale pile, which are badly visible in type specimen. Curran (1930): 'golden hair forming three bands, the anterior one situated on the anterior margin, interrupted, the median one narrowest and entire, posterior band widest, situated on the posterior border, irregularly margined in front'. Postpronotum yellow, short yellow pilose. Postalar callus brown, short black pilose. Scutellum yellow, short yellow pilose, except short black pilose apicoventrally; deeply sulcate apicomedially; without calcars. Anterior and posterior part of anepisternum not differentiated; short yellow pilose except on ventral 1/3. Anepimeron entirely white pilose. Katepisternum white pilose

dorsally and ventrally, these patches widely separated. Katatergum and anatergum microtrichose. Other pleurae bare. Calypter pale brwon, halter yellow.

Wing: hyaline with brown veins; microtrichose, except bare on costal cells, on basal 1/4 of cell R1, on cell RM except for traces of microtrichia around vena spuria, on most cell BM except antero-apically, on anterobasal 1/3 of cell CuP.

Legs: Profemora and -tibiae reddish brown, with apical 1/3 of tibiae paler. Meso- and metafemora and -tibiae blackish brown. Femora very short blackish pilose; tibiae very short appressed golden pilose, most densely so on apical 1/3 of pro- and mesotibiae. Procoxae yellow and white pilose, other coxae brown and white pilose. Trochanters brown, short pale pilose.

Abdomen. Missing in type specimen. Curran (1930): 'Abdomen brownish black, with yellow markings. Second segment on either side with a large pale triangle which is continuous with a broad pale vitta on the third segment, the very broad apex of the third segment, except at the sides, yellowish, the base more or less yellow; fourth segment with the posterior border broadly yellow. Pile very short, golden yellow, on the fourth segment less abundant and more brassy. Second to fourth sternites brownish yellow with pale-yellow apices.' Genitalia as in fig. 56.

Female. Same as male, except the following differences. Face occupying slightly more than 1/3 of total head width in frontal view. Scutum and pleurae brownish. Postalar callus pale brown. Wing: veins yellow. Abdomen about 1,5 times wider than in male; tergites and sternites strongly overlapping and with posterior margins of tergite 3 and 4 appearing swollen; entirely yellow, except narrowly brown along lateral margins of tergites.

Diagnosis. Recognizable by the following combination of characters: scutellum deeply sulcate, male: tergite 3 blackish brown with posterior margin broadly yellow and with yellow lateral vittae (based on description of Curran 1930; in holotype the abdomen is missing), female: tergites yellow, only brownish along lateral margins.

The colouration of the abdomen appears to be strongly sexually dimorphic: mostly blackish in the male, mostly pale orange in the female.

Distribution. Only known from Panama.

***Ceratophya scolopus* (Shannon, 1927) comb. nov.**

Figs 48–54, 57.

Microdon scolopus Shannon, 1927: 20. Type locality: Amazon region.

Microdon (*Ubristes*) *scolopus* Shannon in Thompson et al. (1976)

Studied type specimens. HOLOTYPE. Male. Label 1 (small, round, red-bordered): "Holotype"; label 2: "Amazon. 66 53"; label 3: "*Microdon scolopus* Snn.". Coll. BMNH.

Adult male. Body size: 7 mm.

Head. Face occupying about 1/3 of the head width in frontal view; parallel-sided; laterally weakly depressed; pale yellow, with blackish median vitta from antennal fossa to oral margin, where it is at its narrowest; entirely short yellow pilose. Face in profile straight, produced downward at anterior oral margin. Gena black. Frons and vertex black, short pilose. Occiput black. Eyes bare. Antennal fossa about as wide as high. Antenna brown, except scape yellowish basally; antennal ratio approximately 5:1:8; arista slender, slightly longer than half the length of the basoflagellomere.

Thorax. Scutum black; short (black?) pilose. Postpronotum and postalar callus brown (perhaps yellow in better preserved specimens); short pilose. Scutellum yellow, with basal 1/3 and apical 1/4 blackish; apicomedially sulcate. Anterior and posterior part of anepisternum not differentiated; short pale pilose except on ventral 1/3. Anepimeron entirely white pilose. Katepisternum white pilose dorsally (ventral part not visible in type specimen). Calypter greyish brown. Halters missing in type specimen.

Wing: hyaline; microtrichose, except bare on costal cells, on basal 1/3 of cell R1, on cell RM except for traces of microtrichia around vena spuria, on cell BM, posterobasal 1/3 of cell R4+5, on basal 1/6 of cells DM and CuA1, on anterobasal 1/2 of cell CuP.

Legs: Blackish, with tarsi of pro- and mesolegs yellow. Hind leg with first tarsomere black, second tarsomere yellow (other tarsomeres missing in type specimen). First tarsomeres of all tarsi with strong basoventral tooth. Coxae and trochanters brownish, with pale pile.

Abdomen. Blackish brown, with yellow posterior margin of tergite 4; mostly whitish pilose. In profile with tergite 4 almost perpendicular to tergite 2. Sternites 1-3 brown, sternite 4 yellow; short pale pilose. Genitalia as in fig. 57.

Female. Unknown.
Diagnosis. This species is unique among *Ceratophya*-species in the presence of a strong basoventral tooth on the first tarsomeres of all tarsi. Furthermore, it's the only known *Ceratophya*-species with an almost black abdomen (except for the yellow posterior margin of tergite 4).
Notes. When Shannon (1927) described this species, he mentioned the similarity in general appearance to the stingless-bee mimics which he described in the subgenus *Ubristes*. Nonetheless, he did not place it in *Ubristes*, as Thompson et al. (1976) have done. Examination of the type revealed that it has all the characters of the genus *Ceratophya*. The specimen is a little dirty and greasy, so colours and pilosity are not always easy to assess.
Distribution. Only known from the holotype from the Amazon region, probably from Brazil.

***Hypselosyrphus amazonicus* nom. nov.**
Figs 58–66, 106.
Microdon (Ubristes) scutellaris Shannon, 1927: 20. Preoccupied by Schummel, 1842.
Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1 (small, round, red-bordered): "Holotype"; label 2: "Amazon. 6653"; label 3: "*Microdon Ubristes scutellaris* Snn.". Leg.: H.W. Bates (Shannon 1927), coll. BMNH.
Aditionally studied specimens: PERU: 1 male, Madre de Dios, Rio Tambopata, Sachavacayoc Centre, 12°51'S-69°22'W, mal. trap 26-28.X.2008, leg. J.T. Smit, coll. RMNH.
Redescription (based on holotype)
Adult female Body size: 8 mm.
Head. Face occupying 1/5 of head width in frontal view; black; entirely with long white pilosity, with lateral 1/4 along eye margins white pollinose. Gena hardly developed. Oral cavity directly bordering eye margins; with lateral margins not produced. Frons black; white pilose. Vertex more or less convex, dull black; white pilose anteriorly, black pilose posteriorly; ocellar triangle not elevated compared to rest of vertex. Occiput black; very narrow, barely visible in lateral view; with anterior row of dorsally orientated black pile on dorsal 1/3; with posterior row of posteriorly orientated pale pile on ventral 2/3. Eye entirely with short, pale pile, a little longer than ommati diameter. Antennal fossa about as wide as high. Antenna yellow; antennal ratio 4:1:? (basoflagellomeres missing in holotype; Shannon 1927 gives an antennal ratio of 1:0,25:1).
Thorax. Dark brown. Scutum densely black pilose, except for a few white pile along transverse suture. Postpronotum and postalar callus black pilose. Scutellum equilaterally triangular, with posterior corner quite blunt; directed upward, making an angle with the scutum of about 40°; paler brown than scutum; long black pilose anteriorly and dorsally, long pale pilose posteroventrally. Anepisternum a little convex, no clear division between anterior and posterior part; anterior part black pilose, posterior part bare. Anepimeron entirely black pilose. Katepisternum black pilose dorsally; with a few pile ventrally. Katatergum long microtrichose. Anatergum short microtrichose. Other pleurae bare. Calypter grey, halter yellowish.
Wing: hyaline, subtly tinged with brown; with vague, dark transverse fascia on anterior half just before middle of wing, and with vague, whitish transverse fascia just after middle of wing. Microtrichose, except for most of cell R (except for traces of microtrichia along vena spuria), posterobasal 1/2 of cell BM, anterobasal 2/5 of cell CuP, and on basomedian 1/2 of alula.
Legs: Blackish brown, except for whitish yellow last three tarsomeres of front- and hindlegs (mid-tibia and -tarsus missing in holotype); black pilose, except pale pilose on pale tarsomeres. Hind-tibia with greatest width apically of middle; about as wide as hind femur; with strong excavation at cicatrice (lateral view); pilosity about as long as width of tibia. Hind-basitarsus enlarged; about twice as wide as tibia in dorsal view. Coxae and trochanters brownish black, with black pile.
Abdomen. Oval, 1,5 times as wide as thorax, with largest width at tergite 3 (which only slightly narrows posteriorly). Yellowish brown; with wide dark lateral margins, dark posterior margins of tergites 2, 3 and 4, and a narrow median vitta; tergite 5 yellow with dark median vitta. All sternites yellow and yellow pilose.
Male. As female. The studied male is darker in overall colouration than the female holotype, but possibly the holotype has lost some of its colour over time.
Diagnosis. This is the only known species of *Hypselosyrphus* with a triangular scutellum.
Notes. The name *Microdon scutellaris* Shannon, 1927 is preoccupied by Schummel, 1842. In such cases it is a good custom to name the species after the person who described it first. In this case however, the name

shanonni is preoccupied too (by Curran, 1940), so another name was chosen: *amazonicus*, referring to the apparent distribution of the species.
Distribution. Known from Brazil and Peru.

***Hypselosyrphus anax* (Thompson, 1976) comb. nov.**
Figs 67, 107.
Microdon analis Curran, 1940: 3. Preoccupied by Macquart, 1842, new name *anax* introduced by Thompson et al. (1976).
Studied type specimens. HOLOTYPE. BRAZIL. Male. Label 1: "Brasilien, Nova Teutonia, 27°11' B, 52°23'L, Fritz Plaumann, 10.12.1937"; label 2 (red): "Microdon analis Curran Holotype". Coll. AMNH.
Redescription (based on holotype)
Adult male Body size: 8.5 mm.
Head. Face occupying 1/5 of head width in frontal view; black; entirely with long white pilosity except for black pile ventrolaterad of antennal fossa, with lateral strips of white pollinosity along eye margins. Gena black. Oral cavity with lateral margins not produced. Frons black; black pilose. Vertex black; black pilose; in profile almost vertical directly anteriad of anterior ocellus. Occiput black; with anterior row of dorsally orientated black pile on dorsal 1/3; with posterior row of posteriorly orientated pale pile over entire length. Eye entirely with short, pale pile, a little longer than ommati diameter. Antennal fossa about as wide as high. Antenna yellow; antennal ratio 4:1:? (basoflagellomere missing in holotype).
Thorax. Black, a little brownish on pleurae, posterior callus and scutellum. Scutum densely black pilose, except for a few white pile along transverse suture. Postpronotum and postalar callus black pilose. Scutellum directed upward, a little sulcate posteriorly; entirely long black pilose. Anepisternum a little convex, no clear division between anterior and posterior part; anterior part black pilose, posterior part black pilose along posterior margin. Anepimeron entirely black pilose. Katepisternum black pilose dorsally. Katatergum and anatergum pilose and microtrichose, respectively. Other pleurae bare. Calypter dark grey, halter pale brown.
Wing: hyaline, tinged with brown on basal 2/3, tinged yellowish on apical 1/3. Microtrichose, except for posterobasal 1/3 of cell R, anterobasal 1/3 of cell BM, anterobasal 1/6 of cell CuP, anterior to vein A2 and on a narrow basal strip on the alula.
Legs: Femora dark brown, black pilose; metafemur gradually paler towards apex. Front- and mid-tibia brown, black pilose, except for short yellow pile on posteroapical 1/3 of front-tibia. Hind-tibia with greatest width apically of middle; about as wide as hind femur; yellow, entirely with long (a little longer than maximal width of tibia) black pile. Tarsi yellow; yellow pilose, except first tarsomere of mid-leg. Coxae and trochanters brownish black, with black pile.
Abdomen. Blackish brown, except tergite 4 with widely yellow posterior and posterolateral margins. First tergite laterally with black pile, sublaterally with white pile. Tergites 2 and 3 black pilose. Tergites 3 and 4 not fused. Tergite 4 black pilose, except yellow pilose laterally and posteriorly. Sternites 1-3 blackish brown; sternite 4 yellow, except blackish brown anteriorly and laterally. Sternite 1 posteriorly with black pile; sternites 2 and 3 black pilose; sternite 4 yellow pilose on yellow parts, black pilose on dark parts. Pregenital segments yellowish brown. Genitalia as in fig. 107.
Female. unknown.
Diagnosis. Very similar to *H. plaumanni*, with which this species shares a sulcate scutellum and a partly bare lula. Differences are: tergite 4 with posterior margin widely yellowish, sternite 4 largely yellowish, scutellum entirely black pilose, wing tinged yellowish on apical third, otherwise brownish.
Notes. Curran (1940) made a mistake in the key in which he separates his *M. analis* from *M. plaumanni*: he states that the posterior *femora* are tawny pilose on the basal half in *M. plaumanni*, while the posterior femora are black pilose in *M. analis*. This character applies to the posterior *tibiae*, not to the femora.
Distribution. Only known from Brazil.

***Hypselosyrphus corbiculipes* Papavero, 1962**
Figs 68–69.
Hypselosyrphus corbiculipes Papavero, 1962: 320.
Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: "Rio de Janeiro D.F. Sumaré, Werner, Alvarenga, I.55"; label 2: "28.632"; label 3 (red): "Holotipo"; label 4: "Hypselosyrphus corbiculipes sp. n. N. Papavero det. 1962". Coll. MZUSP.
Redescription (based on holotype)
Adult female Body size: 7 mm.
Head. Face occupying 1/4 of head width in frontal

view; shining blackish brown; with long white pilosity and white pollinosity on lateral 1/3. Gena undeveloped, oral cavity directly bordering eye margins, with lateral margins not produced. Frons shining dark brown, pale pilose, with small spot of white pollinosity along eye margin. Vertex convexly produced, shining dark brown; brown pilose; ocellar triangle not elevated compared to rest of vertex. Occiput brownish black; narrow, only slightly widened dorsally; pale pilose; entirely pale pollinose; with anterior row of dorsally orientated short black pile on dorsal 1/2; with posterior row of posteriorly orientated pale pile over entire length; black pollinose on dorsal half, white pollinose on ventral half. Eye entirely with short, pale pile, about as long as ommati diameter. Antennal fossa about as wide as high. Antenna pale brown; antennal ratio 4:1:4. Basoflagellomere with acute apex; with small sensory pit slightly beyond half the segment. Arista pale, about as long as basoflagellomere.

Thorax. Dark brown. Postpronotum, scutum, postalar callus and scutellum black pilose, except for a few pale pile along transverse suture and on postalar callus. Scutellum apicomedially sulcate, without calcars; directed upward, making an angle with the scutum of about 45°. Anepisternum a little convex, no clear division between anterior and posterior part; anterior and posterior part black pilose, widely bare in between. Anepimeron entirely black pilose. Katepisternum black pilose dorsally; bare ventrally. Katatergum long microtrichose. Anatergum short microtrichose. Other pleurae bare. Calypter greyish brown, halter yellow with dark grey knob.

Wing: hyaline, except blackish on anterobasal 2/3; microtrichose, except on 1st costal cell, anterobasal 1/2 of 2nd costal cell, basal 1/10 of cell R1, basal 1/4 of cell R, posterobasal 2/3 of cell BM, anterobasal 1/4 of cell CuP.

Legs: yellowish brown, except tarsi and hind tibia yellow; black pilose, except yellow pilose on hind tibia, hind tarsus and apical three tarsomeres of other tarsi. Metatibiae strongly widened, with greatest width slightly apically of middle, about 1,5 times as wide as posterior femur at largest width; with strong excavation at cicatrice (lateral view); pilosity about half as long as width of tibia. Hind-basitarsus enlarged; almost twice as wide as apex of metatibia in dorsal view. Coxae and trochanters brown, with black pile.

Abdomen. Oval, wider than thorax, with largest width at posterior margin of tergite 2; entirely shining brown; white pilose. All sternites shining brown; pale pilose.

Male. unknown.

Diagnosis. Recognized by the following combination of characters: scutellum sulcate, alula entirely microtrichose, hind tibia yellow and yellow pilose.

Distribution. Only known from Brazil.

***Hypselosyrphus helvus* spec. nov.**

Figs 70–73.

Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: "Brasil: Roraima / Rio Uraricoera / Ilha de Maraca"; label 2: "19-24-vii-1987 / J.A. Rafael / L.S. Aquino"; label 3: "Armadilha de / malaise"; label 4 (yellow): "INPA / Rafael 1989". Coll. INPA (when studied the specimen was on loan in the USNM-collection).

Redescription (based on holotype)

Adult female Body size: 10 mm.

Head. Face occupying 1/4 of head width in frontal view; yellow; entirely yellow pilose. Gena hardly developed. Oral cavity directly bordering eye margins; with lateral margins not produced. Frons yellow, except black around lunula; yellow pilose, except black pilose around lunula. Vertex convexly produced, shining blackish brown; yellow pilose; ocellar triangle not elevated compared to rest of vertex. Occiput very narrow; black on dorsal half, yellow on ventral half; entirely yellow pilose. Eye entirely with short, white pile, a little longer than ommati diameter. Antennal fossa a little higher than wide. Antenna yellowish; antennal ratio approximately as 4:1:3.

Thorax. Entirely yellow and yellow pilose. Scutellum semicircular; with posterior margin apicomedially very faintly slightly sulcate; pale. Anepisternum convex, without sulcus; anterior part pilose, posterior part bare. Anepimeron entirely pilose. Katepisternum pilose dorsally; bare ventrally. Katatergum long yellow microtrichose. Anatergum short microtrichose. Other pleurae bare. Calypter and halter yellow.

Wing: hyaline; with veins yellow and anterior half tinged with yellow. Microtrichose, except bare on 1st costal cell, basal 1/10 of 2nd costal cell, basal 1/2 of cell R, posterobasal 1/3 of cell BM, anterobasal 1/6 of cell CuP, basomedian 1/4 of alula.

Legs: Yellow; yellow pilose; hind tibia strongly widened and with pile as long as width of tibia.

Abdomen. Widest point at posterior 1/3 of tergite 2. Tergites and sternites (including sternite 1) entirely yellow and yellow pilose.
Male. unknown.
Etymolgy: The Latin adjective *helvus* (bay, yellow) was chosen because of the entirely yellow thorax and abdomen of this species.
Diagnosis. This is the only *Hypselosyrphus*-species with entirely yellow thorax and abdomen and with hyaline wings.
Distribution. Only known from Brazil (Roraima).

***Hypselosyrphus maurus* spec. nov.**
Figs 75–80, 108.
Studied type specimens. HOLOTYPE. FRENCH GUYANA. Male. Label 1: "FRENCH GUIANA / Kaw Mountains / 4°32,893'N 52°10,245'W / Leg. V. Soon 29.12.2002. Coll. RMNH.
PARATYPE. FRENCH GUYANA: 1 female, Kaw Road, PK 37, Relais Patawa, N 4°32'42" / W 52°9'9", IX.2008 (malaise trap), leg. O. Morvan, coll. RMNH.
Additionally studied specimens. PERU: 1 female, Madre de Dios, Rio Tambopata, Sachavacayoc Centre, 12°51'S-69°22'W, malaise trap, 4-10.IX.2009, leg. J.T. Smit, coll. RMNH.
Redescription (based on holotype)
Adult male Body size: 7 mm.
Head. Face occupying 1/5 of head width in frontal view; shining black; long black pilose on lateral ¼, also with some white pile ventrolaterally; grey pollinose on lateral 1/4. Gena hardly developed. Oral cavity directly bordering eye margins; with lateral margins not produced. Frons shining black, dark pilose. Vertex strongly produced, shining black; black pilose. Occiput black; narrow; with anterior row of dorsally orientated short black pile on dorsal 1/2; with posterior row of posteriorly orientated pale pile over entire length; entirely pollinose. Eye entirely with short, pale pile, about as long as ommati diameter. Antennal fossa about as wide as high. Antenna brown; antennal ratio 4:1:4. Basflagellomere with acute apex; with small sensory pit at half the length of the segment. Arista pale, about as long as basoflagellomere.
Thorax. Black. Scutum densely black pilose, except for medially interrupted transverse fasciae of shorter white pile along suture. Postpronotum and postalar callus black pilose. Scutellum apicomedially sulcate, without calcars; directed upward, making an angle with the scutum of about 30°; black pilose. Anepisternum a little convex, no clear division between anterior and posterior part; anterior part black pilose, posterior part with a few black pile along posterior margin. Anepimeron entirely black pilose. Katepisternum black pilose dorsally; bare ventrally. Katatergum long microtrichose. Anatergum short microtrichose. Other pleurae bare. Calypter dark grey, halter brown with knob blackish.
Wing: hyaline, veins darkened around stigmal crossvein, veins around pterostigma yellow; microtrichose, except on 1st costal cell, basal ½ of 2nd costal cell, basal 1/10 of cell R1, entirely on cell R except microtrichose along vena spuria, posterior ½ of cell BM, basal 1/3 of cell CuP.
Legs: Black, except fore- and middle-tarsi yellow and apical four tarsomeres of hindleg yellow; black pilose, except yellow pilose on apical two tarsomeres. Hind tibia strongly widened, with greatest width at apical 1/3, about 1,5 times as wide as posterior femur at largest width; with strong excavation at cicatrice (lateral view); pilosity about half as long as width of tibia. Hind-basitarsus enlarged; about 1,5 times as wide as apex of metatibia in dorsal view. Coxae and trochanters blackish, with black pile.
Abdomen. More or less oval, wider than thorax, with largest width at posterior 1/3 of tergite 2; blackish brown. Tergite 1 shining, tergite dull except for shining median 1/3, tergite 3 dull except shining along lateral margins, tergite 4 shining. Tergites black bilose, except tergite 1 and posterior and lateral margins of tergite 4 white pilose. Sternite 1 white pilose, other sternites black pilose. Genitalia as in fig. 108.
Female. As male, except for usual sexual dimorphism. In the paratype, the colouration of the wing veins is entirely uniform (not dark around stigmal crossvein and yellow around pterostigma). In the additionally studied female from Peru, however, the colouration of the wing veins is as in the male holotype. These differences are considered to be intraspecific.
Etymology. The specific epithet *maurus* (Latin for 'dark') refers to the black appearance of this species.
Diagnosis. 7-8 mm. Recognized by the following combination of characters: scutellum sulcate, alula entirely microtrichose, hind tibia brown and black pilose, abdomen black.
Distribution. French Guyana & Peru.

***Hypselosyrphus pingo* spec. nov.**

Figs 81–87, 109.

Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: "Brasilien / Nova Teutonia / 27°11'B. 52°23'L / Fritz Plaumann / I 1971 / 300 . 500 m"; label 2 (red): "HOLOTYPE / *Hypselosyrphus pingo* / Reemer". Coll. ZMAN.

PARATYPES: BRAZIL: 1 male [head missing], Nova Teutonia, 27°11'B. 52°23'L , XI.1968, leg. F. Plaumann, coll. RMNH; 1 female, Nova Teutonia, 27°11'B. 52°23'L, 20.II.1937, leg. F. Plaumann, coll. CNC; 1 female, Nova Teutonia, 27°11'B. 52°23'L, I.1968, leg. F. Plaumann, coll. USNM.

Redescription (based on holotype)

Adult female Body size: 10 mm.

Head. Face occupying 1/4 of head width in frontal view; black; entirely white pilose. Gena hardly developed. Oral cavity directly bordering eye margins; with lateral margins not produced. Frons black; sparsely black pilose medially, white pilose along lateral margins. Vertex convexly produced, shining black; black pilose; ocellar triangle not elevated compared to rest of vertex. Occiput black; very narrow, barely visible in lateral view; dorsally black pilose, except for small patch of yellowish white pile next to vertex; ventrally white pilose. Eye entirely with short, pale pile, a little longer than ommati diameter. Antennal fossa a little higher than wide. Antenna black, except basoflagellomere blackish brown; antennal ratio approximately as 5:1:2.

Thorax. Scutum, postpronotum and postalar callus pale brown; densely yellowish brown pilose. Scutellum trapezoid, with posterior margin apicomedially slightly sulcate; pale brown; yellowish brown pilose. Anepisternum convex, without sulcus; dark brown; anterior part yellow pilose, posterior part black pilose. Anepimeron entirely yellow pilose. Katepisternum dark brown; yellow pilose dorsally; bare ventrally. Katatergum long black microtrichose. Anatergum short microtrichose. Other pleurae bare. Calypter and halter yellowish.

Wing: with dark brown fascia halfway wing, as wide as 1/5 of length of wing, and equally wide dark brown fascia at apex, with yellow fascia in between and also yellow between wing base and first brown fascia; colours most clear on anterior half, fading posteriorly. Microtrichose, except bare on 1st costal cell, basal 1/4 of cell R, basal 1/10 of cell BM.

Legs: Yellow; yellow pilose, except black pilose on basal 1/3 of hind femur.

Abdomen. More or less oval, but apical segments narrower than basal ones; a little wider than thorax, widest at posterior 1/4 of tergite 2. Tergite 1 yellowish brown. Tergite 2 yellowish brown with narrow dark brown median line and narrowly dark brown posterior margin. Tergite 3 dark brown, tergites 4 and 5 blackish. Tergites entirely yellow pilose. Basal sternites pale brown, apical sternites darker; yellow pilose.

Male. In the only known male specimen the head is lost. Otherwise, this specimen agrees with the female, except in that all tergites are yellowish brown, except for three black vittae on tergite 4. Genitalia as in fig. 109.

Etymology. The Latin verb *pingo* means to colour or to paint. The name refers to the painted wings of the species. As a species name it is to be treated as a noun in apposition.

Diagnosis. The wing marks and the unwidened hindtibiae of this species immediately distinguish it from other known *Hypselosyrphus*-species, except *H. vexillipennis*. From that species it differs by the completely yellowish brown pilose scutum and scutellum (black pilose in *H. vexillipennis*).

Notes. The colouration of the tergites seems to be sexually dimorphic: mostly yellow with three black vittae on tergite 4 in the male, mostly dark on tergites 3 and 4 in female. In two of the paratypes, the median dark fascia on the wing extends to the wing base, so the wing is dark brown on the basal 3/5 of the wing. In this species the hind tibiae are not widened or corbiculate, unlike in other species of *Hypselosyrphus* (except *H. vexillipennis*) and *Stipomorpha*. It is a matter of taste whether this species should be considered as a mimic of stingless bees or not. Nevertheless, it posesses all characters described as diagnostic for *Hypselosyrphus*.

Distribution. Only known from Brazil (Nova Teutonia).

***Hypselosyrphus plaumanni* (Curran, 1940) comb. nov. stat. nov.**

Figs 88.

Microdon plaumanni Curran, 1940: 3.

Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: "*Microdon plaumanni* Curran Holotype"; label 2: "Holotype"; label 3: "Brasilien,

Nova Teutonia, 27°11′ B, 52°23′L, Fritz Plaumann, 15.2.1937". Coll. AMNH.

Additionally studied specimens. BRAZIL: 1 male, Nova Teutonia, 27°11′ S, 52°23′W, 300-500 m, 1968, leg. F. Plaumann, coll. RMNH; 2 males, same locality, 12-1970, leg. F. Plaumann, coll. ZMAN; 1 male, same locality, XI.1966, leg. F. Plaumann, coll. CNC; 1 female, E. Rio, Itatiaya, 700 m., 2.XI.1939, leg. J.F. Zikán, coll. USNM.

Redescription (based on holotype)

Adult female Body size: 9 mm.

Head. Face occupying 1/5 of head width in frontal view; black; entirely with long white pilosity except for black pile ventrolaterad of antennal fossa, with lateral strips of white pollinosity along eye margins. Gena black. Oral cavity with lateral margins a little produced. Frons black; black pilose medially, white pilose laterally. Vertex black; black pilose; in profile almost vertical directly anterior to anterior ocellus. Occiput black; with anterior row of dorsally orientated black pile on dorsal 1/3; with poster row of posteriorly orientated pale pile over entire length. Eye entirely with short, pale pile, a little longer than ommati diameter. Antennal fossa about as wide as high. Antenna yellow; antennal ratio 4:1:2; basoflagellomere parallel-sided with narrowly rounded apex, with large oval sensory pit located approximately in middle, occupying about 1/3 of height of basoflagellomere. Arista slender, slightly longer than length of basoflagellomere.

Thorax. Black, a little brownish on pleurae, along posterior margin of scutum and scutellum. Scutum densely black pilose, except for patches of white pile along transverse suture and along posterior margin. Postpronotum and postalar callus black pilose. Scutellum directed upward, deeply sulcate posteriorly, thus leaving two large 'mammiform' processes; long black pilose, except white pilose ventrally. Anepisternum a little convex, no clear division between anterior and posterior part; anterior part black pilose, posterior part black pilose along posterior margin. Anepimeron entirely black pilose. Katepisternum black pilose dorsally. Katatergum and anatergum long and short microtrichose, respectively. Other pleurae bare. Calypter dark grey, halter pale brown.

Wing: hyaline, tinged with brown over most of surface, less so posteriorly and apically. Microtrichose, except for basal 1/8 of cells BM and R.

Legs: Front- and mid-femora dark brown, black pilose; hind-femora brown with apical 1/2 yellow, with long black pile. Front- and mid-tibiae yellowish brown, black pilose. Hind-tibia strongly widened, with greatest width in the middle; about 1,5 times as wide as posterior femur; yellow, with long (about as long as maximal width of tibia) yellow pile on basal 1/2, long black pile on apical 1/2. Tarsi yellow, dorsally black pilose on basal two tarsomeres, dorsally yellow pilose on apical three tarsomers; ventrally with dense, short, yellow pilosity. Coxae and trochanters brownish black, with black pile.

Abdomen. Blackish brown. First tergite laterally white pilose. Second tergite white pilose, except for black pile along extreme lateral margins. Tergite 3 short black pilose over most of surface, with longer white pile posterolaterally. Tergite 4 deeply emarginated along posterior margin; black pilose, except white pilose along posterior and lateral margins.; tergite 5 anteriomedially with convex bulge, which fits into the posterior emargination of tergite 4; white pilose. Sternite 1 with long white pile; other sternites with long black pile. Hypopygium yelowish brown.

Male. As female, except for usual sexual differences. Genitalia (not drawn) almost identical to those of *M. analis*.

Diagnosis. Very similar to *H. anax*, with which this species shares a sulcate scutellum and a partly bare lula. Differences are: tergite and sternite 4 entirely blackish brown, scutellum black pilose, except pale pilose posteroventrally, wing entirely tinged brownish.

Notes. Placed as a synonym of *Ubristes flavitibia* Walker by Thompson et al. (1976), but here transferred to *Hypselosyrphus* and reinstated as valid species.

Distribution. Only known from Brazil.

***Hypselosyrphus pseudorhoga* spec. nov.**

Figs 89–93.

Studied type specimens. HOLOTYPE. PERU. Label 1: "Quincemil / Peru 24/31 X / 1962 / L.E. Pena"; label 2 (red): "CNC / Ottawa"; label 3: "Pseudorhoga / new genus! / n. sp.!". Coll. CNC.

Redescription (based on holotype)

Adult female Body size: 7 mm.

Head. Face occupying about 1/5 of head width in frontal view; yellow; entirely yellow pilose. Gena hardly developed. Oral cavity directly bordering eye margins; with lateral margins not produced. Frons

yellow; yellow pilose. Vertex flat; shiny dark brown with faint metallic hues; yellow pilose. Occiput black; entirely yellow pilose. Eye bare. Antennal fossa about as high as wide. Antenna yellow; antennal ratio approximately as 2.5:1:5.

Thorax. Mesoscutum yellow with four blackish maculae anterolaterally and posterolaterally, with wide, vague, brownish median vitta; entirely yellow pilose. Scutellum semicircular; shining blackish brown with faint metallic hues; yellow pilose. Postpronotum and posterior callus yellow; yellow pilose. Pleurae yellow and yellow pilose. Anepisternum convex, without sulcus; anterior and posterior parts pilose. Anepimeron entirely pilose. Katepisternum bare. Katatergum long yellow microtrichose. Anatergum short microtrichose. Other pleurae bare. Mediotergite blackish. Calypter and halter yellow.

Wing: hyaline. Microtrichose, except bare on 1st costal cell, basal 2/3 of 2nd costal cell, basal 1/5 of cell R1, along anterior and posterior margins of cell R, posterobasal 3/4 of cell BM, anterobasal 1/2 of cell CuP.

Legs: Yellow, except hind tibia dark brown with yellow apices. All legs yellow pilose, except hind tibia with long black pile on dark parts.

Abdomen. Widest point at posterior margin of tergite 2. Tergites yellow, with oval dark macula medially on tergite 2 and three dark vittae on tergites 3-5; yellow pilose. Sternites yellow; yellow pilose, except sternite 1 bare.

Male. unknown.

Etymolgy. Chris Thompson came up with the name *pseudorhoga* because of the *Rhoga*-like appearance of this species, as evoked by the dark maculae on the mesoscutum and the three dark vittae on the abdomen. The name is to be treated as a noun in apposition.

Diagnosis. No other known species of *Hypselosyrphus* has a basoflagellomere that is twice as long as the scape. The abdominal colour pattern is also characteristic: yellow with three dark vittae. The unproduced vertex is only shared with *H. ulopodus*, from which it differs by the two characters just mentioned.

Notes. Only a female of this species is known. As this differs from other species of *Hypselosyrphus* in the unproduced vertex and the short scape, its placement in this genus is very tentative and preliminary. The phylogenetic affinities of this species should be revisited once additional specimens have been found, based on molecular studies and the male genitalia.

Distribution. Only known from Quince Mil in southern Peru, a place in the foothills of the Andes at around 600-700 m. above sea level.

Hypselosyrphus trigonus Hull, 1937

Figs 94–97.

Hypselosyrphus trigonus Hull, 1937: 21.

Studied type specimens. HOLOTYPE. PANAMA. Female. Label 1: "Canal Zone: Barro, Colorado. 16-VII-1924. N. Banks."; label 2 (red.): "M.C.Z. Type31169"; label 3 (large, red-bordered): "*Hypselosyrphus trigoniformis* Hull, F.M.H.". Coll. MCZ.

Additionally studied specimens. BELIZE. Female. No further data. Coll. RMNH. PANAMA: 1 female, Chiriqui, 15 km NW Hato del Volcan, 1200 m, 24-31.V.1977, Peck & Howden, coll. CNC.

Note on holotype: The holotype is labelled as *Hypselosyrphus trigoniformis* Hull, but this must be a mistake, because Hull has not described a species under that name. He did, however, describe *Hypselosyrphus trigonus*, the description of which agrees well with this specimen.

Redescription (based on holotype)

Adult female Body size: 7 mm.

Head. Face occupying 1/5 of head width in frontal view; shining blackish brown; with long white pilosity on lateral 1/3; with white pollinosity on lateral 1/5. Gena hardly developed. Oral cavity directly bordering eye margins; with lateral margins not produced. Frons shining dark brown, dark pilose, except white pilose directly along eye margin. Vertex convexly produced, shining dark brown; black pilose; ocellar triangle not elevated compared to rest of vertex. Occiput black; narrow; with anterior row of dorsally orientated short black pile on dorsal 1/2; with posterior row of posteriorly orientated pale pile over entire length; black pollinose on dorsal half, white pollinose on ventral half. Eye entirely with short, pale pile, about as long as ommati diameter. Antennal fossa about as wide as high. Antenna pale brown; antennal ratio 4:1:4. Basflagellomere with acute apex; with small sensory pit at half of the segment, situated in a wide groove from base of aritsta to near apex. Arista pale, about as long as basoflagellomere.

Thorax. Dark brown. Scutum densely black pilose, except for transverse fasciae of pale pile along suture and along posterior margin. Postpronotum black pi-

lose, postalar callus white pilose. Scutellum apicomedially sulcate, with convex posterior margin, without calcars; directed upward, making an angle with the scutum of about 45°; long white pilose anteriorly, long black pilose posteriorly, long white pilose posteroventrally. Anepisternum a little convex, no clear division between anterior and posterior part; anterior part black pilose, posterior part with a few black pilee along posterior margin. Anepimeron entirely black pilose. Katepisternum black pilose dorsally; with a few pile ventrally. Katatergum long microtrichose. Anatergum short microtrichose. Other pleurae bare. Calypter grey, halter brown.

Wing: hyaline, vaguely darkened around stigmal crossvein, and vaguely yellowishly tinged around and posteriad of pterostigma (best seen before a dark background); microtrichose, except on 1st costal cell, basal 2/5 of 2nd costal cell, basal 1/10 of cell R1, basal 2/5 of cell R, posterobasal 2/5 of cell BM, basal 2/5 of cell CuP.

Legs: Brown, except fore- and middle-tarsi yellow and apical four tarsomeres of hindleg yellow; black pilose, except yellow pilose on apical three tarsomeres. Metatibiae strongly widened, with greatest width slightly apically of middle, about 1,5 times as wide as posterior femur at largest width; with strong excavation at cicatrice (lateral view); pilosity about half as long as width of tibia. Hind-basitarsus enlarged; about 1,5 times as wide as apex of metatibia in dorsal view. Coxae and trochanters brown, with black pile.

Abdomen. Oval, wider than thorax, with largest width at posterior margin of tergite 2. Colours hard to assess in type specimen because of partial folding and darkening of the segments. Hull (1937) states: "Abdomen short, oval, flat, vitreous, dark reddish brown on first, second and narrowly on base of third segment. Remainder bright orange." Sternite 1 black and black pilose. Other sternites yellow and yellow pilose.

Male. Unknown.

Diagnosis. Recognized by the following combination of characters: scutellum sulcate, alula antirely microtrichose, hind tibia brown and black pilose, abdomen orange to reddish brown.

Distribution. Known from Belize and Panama.

***Hypselosyrphus ulopodus* (Hull, 1944) comb. nov.**

Figs 98–102, 110.

Ubristes ulopodus Hull, 1944: 34.

Studied type specimens. HOLOTYPE. PERU. Female. Label 1: "Lachoruria, Putmayo Distr. PERU. 17-20 Aug. 1920"; label 2: "Cornell Univ. Expedition. Lot 569"; label 3 (red): "Holotype ulopodus Hull"; label 4: "Holotype Ubristes ulopodus Hull"; label 5 (red): "Holotype Cornell U. No. 2196". Coll. CU.

Additionally studied specimens. PARAGUAY. 1 male. Label 1: "Paraguay, Vezenyi"; label 2: "Asuncion, 1904.x.5"; label 3: "Coll. Mus. Nat. Hung."; label 4: "Ceratophya analis Curr. male, det. v. Doesburg". Coll. RMNH.

Redescription (based on holotype)

Adult female Body size: 8,5 mm.

Head. Face occupying 1/3 of head width in frontal view; yellow, except narrowly black laterally on dorsal half and with vague brown median vitta on ventral half; yellow pilose laterally, black pilose medially, with pile longer and denser around oral margin; with narrow lateral strips of white pollinosity along eye margins. Gena brownish. Oral cavity with lateral margins a slightly produced and anterior margin slightly notched. Frons black, except yellow posterior to lunula; black pilose. Vertex black; black pilose. Occiput black; black pilose dorsally, white pilose ventrally. Eye entirely with dense, dark pile, a little longer than ommati diameter. Antennal fossa about as wide as high. Antenna dark brown; antennal ratio approximately as 4:1:3,5; basoflagellomere parallel-sided with narrowly rounded apex, with small sensory pit located at 2/5 from base. Arista slender, slightly shorter than length of basoflagellomere.

Thorax. Blackish brown. Scutum entirely with long, erect black pile; with two submedian and two lateral vittae of greyish pollinosity. Postpronotum and postalar callus black pilose. Scutellum semicircular, without calcars; long black pilose anteriorly, long yellow pilose posteriorly. Anepisternum a little convex, with very slight sulcus between anterior and posterior part; black pilose, with large bare medioventral area. Anepimeron entirely black pilose. Katepimeron pilose. Katepisternum black pilose dorsally, bare ventrally. Katatergum and anatergum long and short microtrichose, respectively. Other pleurae bare. Calypter and halter dark greyish brown.

Wing: hyaline with yellow veins; tinged with brown

in costal cells. Microtrichose, except for basal 1/4 of cell R and basal 1/3 of cell BM.

Legs, including coxae and trochanters, blackish brown, except apical four tarsomeres brownish yellow; entirely with long, black pile.

Abdomen. Brown. Tergites 3-5 fused, sutures not visible. Tergites black pilose laterally, pale yellow pilose medially, except tergite 4 entirely black pilose. All sternites with long black pile.

Male. (based on 1 specimen in coll. RMNH) Differs from female in the following: face black; antennal ratio approximately 4:1:2,5; tarsi entirely brownish yellow; abdomen blackish brown with posterior margin of tergite 4 yellow. Genitalia as in fig. 110.

Diagnosis. This is the only known species of *Hypselosyrphus* with a pilose katepimeron and a ventrally widened occiput.

Notes. This species is aberrant from its congenerics because of the pilose katepimeron, the ventrally widened occiput and the unproduced vertex (the latter character is only shared with *H. pseudorhoga* spec. nov.). The phylogenetic analysis based on morphological characters placed the species as a sister of the clade containing *Rhoga* and *Hypselosyrphus* (Chapter 4). The relationships within this clade are considered not well enough established to introduce another generic name, hence the current assignment of this species.

***Hypselosyrphus vexillipennis* spec. nov.**

Figs 103–105.

Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: "1.I.1955 / Barueri / S. Paulo / 3409"; label 2: "K. Lenko leg.". Coll. USNM.

PARATYPES. BRAZIL. Female. Label 1: "BRASIL Rio de Janeiro / D.F. Corcovado / XI.1957 / Seabra e Alvarenga". Coll. MZUSP.

Female. Label 1: "Barueri, / São Paulo, Brasil / 15.I.1966 / K. Lenke col.". Coll. MZUSP.

Redescription (based on holotype)

Adult female Body size: 10 mm.

Head. Face occupying 1/5 of head width in frontal view; black; entirely white pilose. Gena hardly developed. Oral cavity directly bordering eye margins; with lateral margins not produced. Frons black; sparsely black pilose medially, white pilose along lateral margins. Vertex convexly produced, shining black; black pilose; ocellar triangle not elevated compared to rest of vertex. Occiput black; very narrow, barely visible in lateral view; dorsally black pilose; ventrally white pilose. Eye entirely with short, pale pile, a little longer than ommati diameter. Antennal fossa a little higher than wide. Antenna black, except basoflagellomere blackish brown; antennal ratio approximately as 5:1:2,5.

Thorax. Scutum, postpronotum and postalar callus dark brown; densely black pilose. Scutellum trapezoid, with posterior margin apicomedially slightly sulcate; dark brown; black pilose. Anepisternum convex, without sulcus; dark brown; anterior part and posterior margin black pilose. Anepimeron entirely black pilose. Katepisternum dark brown; black pilose dorsally; bare ventrally. Katatergum long black microtrichose. Anatergum short microtrichose. Other pleurae bare. Calypter brown, halter yellowish white. Wing: dark brown on basal 3/5 and apical 1/5, with yellow fascia of 1/5 of wing lentgh in between, somewhat infuscated around vein DM-Cu; colours most clear on anterior half, fading posteriorly. Microtrichose, except bare on 1st costal cell, basal 1/6 of cell R, basal 1/10 of cell BM.

Legs: Brown; black pilose, except yellow pilose on apical four tarsomeres of front and mid tarsus.

Abdomen. More or less oval, but apical segments narrower than basal ones; a little wider than thorax, widest at posterior 1/4 of tergite 2. Tergites dark brown; black pilose, except tergites 1, 5 and posterolateral corners of tergite 4 yellow pilose. Basal sternites pale brown, apical sternites darker; yellow pilose.

Male. unknown.

Etymolgy. The name *vexillipennis* (flag-winged) refers to te painted wings of this species.

Diagnosis. The wing marks and the unwidened hindtibiae of this species immediately distinguish it from other known *Hypselosyrphus*-species, except *H. pingo*. From that species it differs by the completely black scutum and scutellum (yellowish brown pilose in *H. vexillipennis*).

Notes. Compared with the holotype, the paratype is darker, almost black, in overall colouration.

In this species the hind tibiae are not widened or corbiculate, unlike in other species of *Hypselosyrphus* (except *H. pingo*) and *Stipomorpha*. It is a matter of taste whether this species should be considered as a mimic of stingless bees or not. Nevertherless, it posesses all characters described as diagnostic for *Hypselosyrphus*.

Distribution. Brazil (São Paulo & Rio de Janeiro).

***Mermerizon inbio* Reemer**

Figs 111–115, 122.

Studied type specimens. HOLOTYPE. COSTA RICA. Male. Label 1: "COSTA RICA. Prov. Guanacaste, P.N. / Rincón de la Vieja, Send. a las aguas / termales, 900-1000 m, 6-7 OCT / 2001. D. Briceño, Red con Aguamiel. / L_N_305843_392970 #64950"; label 2: "INB0003380896 / INBIOCRI COSTA RICA"; label 3 (red): "Ultimo especimen en / BD A. Lépiz / 2-7-2002" / other side: "?MCR-25". Coll. INBIO.

Redescription (based on holotype)

Adult female Body size: 7,5 mm.

Head. Face occupying about 1/4 of head width in frontal view; yellow; yellow pilose, with narrow bare median line on dorsal half. Gena yellow. Frons black; yellow pilose laterally, black pilose posteriorly. Vertex dark yellow, except black at and around ocellar triangle; black pilose. Occiput black, except yellow posteriad of vertex; black pilose on dorsal half, yellow pilose on ventral half. Eye bare. Antennal fossa about as high as wide. Antenna with scape dark brown, pedicel and basoflagellomere yellowish brown; antennal ratio approximately as 4:1:4.

Thorax. Scutum blackish brown, except yellow on notopleuron and around postpronotum and postalar callus; black pilose. Postpronotum, postalar callus and scutellum yellow; black pilose. Scutellum semicircular, without calcars, Anepisternum blackish brown; convex, without sulcus; black pilose on anterior part and along posterior margin, widely bare in between. Anepimeron brown; black pilose on dorsal 1/4. Katepisternum yellow dorsally, brown ventrally; bare. Katepimeron yellow. Katatergum long black yellow microtrichose. Anatergum short pale microtrichose. Calypter blackish. Halter yellowish brown.

Wing: hyaline; microtrichose, except bare on 1st costal cell, basal 1/4 of cell R, basal 1/3 of cell BM, anterobasal 1/4 of cell CuP.

Legs: Front and mid legs yellowish brown; black pilose. Hind leg blackish brown, except basal 1/2 of tibia and apical four tarsomeres yellowish brown. Front and mid coxae and trochanters yellowish brown; yellow pilose apically. Hind coxa and trochanter dark brown; black pilose.

Abdomen. Tergites and sternites yellowish; yellow pilose, except sternite 1 bare. Genitalia as in fig. 122.

Female. Unknown.

Diagnosis. Distinguished from the other two known species of *Mermerizon* by the black pilose mesoscutum.

Distribution. Only known from Costa Rica.

***Mermerizon mellosus* spec. nov.**

Figs 116–118, 123.

Studied type specimens. HOLOTYPE. COSTA RICA. Male. Label 1: "COSTA RICA. Guan. / 3 km SE R. Naranjo / 4-6 Aug 1993 / F.D. Parker"; label 2: "Ubristes / sp [male symbol] / det.: M. Hauser 2007". Coll. INBIO.

Redescription (based on holotype)

Adult male Body size: 8,5 mm.

Head. Face occupying about 1/4 of head width in frontal view; yellow; yellow pilose, with narrow bare median line on dorsal half. Gena yellow. Frons black medially, yellow laterally; yellow pilose. Vertex yellow, except black at and around ocellar triangle; black pilose. Occiput yellow posteriad of vertex, black on dorsolateral half, yellow on ventral half; black pilose anteriorly on dorsal half, yellow pilose posteriorly on both dorsal and ventral half. Eye bare. Antennal fossa about as high as wide. Antenna yellow, with scape darker dorsally; antennal ratio approximately as 4:1:4.

Thorax. Scutum blackish brown dorsally, with margins widely yellow; entirely yellow pilose. Postpronotum, postalar callus and scutellum yellow; yellow pilose. Scutellum semicircular, without calcars. Pleurae yellow, except anepisternum brownish anterodorsally and katepisternum brownish dorsally. Anepisternum convex, without sulcus; yellow pilose on anterior part and along posterior margin, widely bare in between. Anepimeron yellow pilose on dorsal 1/4, with pile along dorsal margin blackish. Katepisternum bare. Katatergum long black microtrichose. Anatergum short pale microtrichose. Calypter and halter yellow.

Wing: hyaline; microtrichose, except bare on 1st costal cell, basal 1/10 of cell R, basal 1/4 of cell BM, anterobasal 1/10 of cell CuP.

Legs: Yellow and yellow pilose, except: hind tibia brown on apical 1/4 and black pilose on apical 1/3; first tarsomere of hind tarsus blackish and black pilose. Coxae and trochanters yellow; yellow pilose.

Abdomen. Tergites yellow, with vague, narrow, brown vitta medially; yellow pilose. Sternites yellow; yellow pilose, except sternite 1 bare. Genitalia as in fig. 123.

Female. Unknown.

Etymology. The specific epithet *mellosus* is a Latin adjective meaning or 'honey-coloured'.
Diagnosis. Differs from both other known species of *Mermerizon* by its entirely yellow femora.
Distribution. Only known from Costa Rica.

***Mermerizon mesmerizus* spec. nov.**
Figs 119-121, 124.
Studied type specimens. HOLOTYPE. ARGENTINA. Male. Label 1: "ARGENTINA. Catamarca / Prov., 9 km N La Merced. / 28°06,43'S-65°36,96'W / Mal. trap in damp ravine / 24.X-12.XI.2003. 1041 m / M.E. Irwin & F.D. Parker". Coll. RMNH.
PARATYPES: Two males from same locality and date as holotype. One in coll. RMNH, one in coll. CSCA.
Redescription (based on holotype, unless stated otherwise)
Adult male Body size: 5 mm.
Head. Face occupying about 1/3 of head width in frontal view; yellow; yellow pilose. Gena yellow. Frons and vertex brown; yellow pilose. Occiput brown; yellow pilose dorsally, white pilose ventrally. Eye bare. Antennal fossa about as high as wide. Antenna black; antennal ratio approximately as 2:1:4.
Thorax. Scutum black, with margins widely yellow; entirely yellow pilose. Postpronotum and postalar callus yellow; yellow pilose. Scutellum semicircular, without calcars; yellow, except black ventrolaterally; yellow pilose. Anepisternum convex, without sulcus; brown anteriorly, yellow posteriorly; yellow pilose anterodorsally and posterodorsally. Anepimeron brown with yellow margins; yellow pilose. Katepisternum brown; yellow pilose dorsally. Katepimeron yellow; bare. Katatergum yellow; long yellow microtrichose. Anatergum yellow; short yellow microtrichose. Calypter grey. Halter yellow.
Wing: hyaline, with costal cell grey and with vaguely defined greyish transverse fasciae from pterostigma to bm-cu, from appendix of R4+5 to dm-cu and at M1; microtrichose, except bare on 1st costal cell, basal 2/3 of cell R and narrowly along anterior margin of cell CuP.
Legs: [Front legs missing in holotype. Description partly based on paratypes.] Femora black, except narrowly yellow at apex; black pilose, except partly yellow pilose basally. Tibiae yellow, except hind femur black at apical 1/3; yellow pilose. Tarsi black; black pilose. Coxae and trochanters blackish brown; pale pilose.
Abdomen. Tergites brown, with lateral and posterior margins a little paler. Tergites 1 and 2 yellow pilose. Tergite 3 black pilose on anterior 2/3, yellow pilose on posterior 1/3. Tergite 4 black pilose on anterior 1/3 and laterally, yellow pilose medially and posteriorly. Sternites brownish. Sternite 1 bare. Sternite 2 yellow pilose. Sternites 3-4 black pilose. Genitalia as in fig. 124.
Female. Unknown.
Etymology. The specific epithet *mesmerizus* is a Latinized adjective derived from the English 'mesmerizing', which means 'hypnotizing' in the sense of 'fascinating'.
Diagnosis. Body size 5-6.5 mm. Unlike the other two known species of *Mermerizon*, this is not clearly a stingless bee mimic. The pilosity of the hind tibia is short and appressed. The wings have a pattern of vaguely defined greyish transverse fasciae.
Distribution. Only known from northern Argentina.

***Stipomorpha apicula* (Curran, 1930) comb. nov.**
Fig 125, 228.
Microdon apiculus Curran, 1930: 5.
Studied type specimens. HOLOTYPE. PANAMA. Male. Label 1 (red): "*Microdon apicula* Curran Type"; label 2: "Barro Colo Isld., Canal Zone, 1-7-1929"; label 3: "Collector C.H. Curran". Coll. AMNH.
Redescription (based on holotype)
Adult male. Body size: 8 mm.
Head. Face occupying 1/5 of head width in frontal view; shining pale yellow with black median stripe which gradually narrows from entire width of face at level of antennae down to 1/6 of width of face at oral margin; face with white pilosity on yellow parts and just below antennae, bare on median stripe. Gena brown. Oral cavity with produced brown lateral margins and notched anterior margin. Frons and lunula black and short black pilose, except for bare triangular part posterior to lunula. Vertex black; short black pilose. Occiput black; black pilose on dorsal half, white pilose on ventral half. Eye bare. Antennal fossa about as wide as high. Antenna blackish brown, scape and pedicel black pilose; antennal ratio 5:1:5; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 3/5 from base, within a vague groove that ranges from a little ventrad of base

of arista to a little beyond sensory pit; arista slender, about 2/3 of length of basoflagellomere.

Thorax. Black, but paler on posteroventral part of anepisternum, posterior part of anepimeron and katepimeron. Colour of pilosity on dorsal part hard to assess because of glue that has spread over it; Curran (1930) describes this pilosity as follows: "Pile black, an undulate anterior band on the mesonotum, a small spot at the inner ends of the suture, a very broad prescutellar band and the scutellum wholly, golden-reddish pilose." Scutellum semicircular, without calcars. Anepisternum more or less flat, pilose anterodorsally. Anepimeron pilose posterodorsally. Katepisternum and katepimeron bare. Calypter blackish brown, halter pale brown.

Wing: hyaline, with pterostigma and surrounding veins pale yellow; microtrichose, except bare near the junction of veins R1 and RS, on basal 1/3 of cell R, posterobasal 1/3 of cell BM, anterobasal 1-5 of cell CuP, basomedian 1/6 of alula.

Legs: Brownish black, except last two tarsomeres of each leg yellow. Femora black pilose. Front tibia white pilose; mid-tibia white pilose on basal half, black pilose on apical half. Hind-tibia white pilose on basal 1/3, black pilose on apical 2/3. Tarsi dorsally black pilose, with some yellow pile intermixed on last two tarsomeres. Tarsi ventrally with short, dense, appressed yellow pile. Coxae and trochanters blackish brown, black pilose, anterior coxa also with some yellow pile.

Abdomen. Orange brown. Second tergite wider than thorax, widest point at half the lentgh; third and fourth tergites strongly narrowing. Tergite 1 yellow pilose laterally, but black pilose along extreme lateral margin; with anterolateral 'ridges'; with anteromedian smooth, concave area. Tergite 2 yellow pilose, but black pilose along extreme lateral margin. Tergite 3 sparsely whitish yellow pilose. Tergite 4 quite densely yellow pilose, more whitish anterolaterally; with two oval marks of greyish pollinosity on the anterior half of the tergite. Sternite 1 bare, separated from sternite 2 by a wide membrane. Other sternites sparsely pale pilose. Genitalia as in fig. 228.

Female. According to Curran (1930) there is a female paratype. This has however not been studied.

Diagnosis. Distinguishable from other known species by the black legs and thorax in combination with the orange brown abdomen.

***Stipomorpha crematogastri* spec. nov.**

Figs 126-131.

Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: "BRAZIL: Mato Grosso / 12° 50'S., 51° 47'W. / 8-IV 1968 / O.W. Richards."; label 2: "R.S. & R.G.S. / Expedition / B.M. 1968-260"; label 3: "Dry / forest"; label 4: "bred nest / Crematogaster"; with empty puparium on piece of dry leaf attached to pin. Coll. BMNH.

PARATYPE. BRAZIL. Female. Label 1: "BRAZIL: Mato Grosso / 12° 50'S., 51° 47'W. / 26-III 1968 / O.W. Richards."; label 2: "R.S. & R.G.S. / Expedition / B.M. 1968-260"; label 3: "Dry / forest"; label 4: "Roadside"; label 5: "on leaf [illegible]"; label 6: "Microdon (Ubristes) / ? lanei Curran / N.P. Wyatt det. 1985". Coll. BMNH.

Description (based on holotype)

Adult female. Body size: 10 mm.

Head. Face occupying almost 1/2 of head width in frontal view; shining yellow; yellow pilose. Lateral oral margins produced. Frons yellow; yellow pilose laterally. Vertex yellow; yellow pilose, exceptfor transverse fasciae of black pile anteriorly and posteriorly. Occiput yellow; yellow pilose. Eye bare. Antennal fossa about as wide as high. Antenna pale brown. Antennal ratio approximately as 5:1:7; basoflagellomere parallel-sided with rounded apex, with sensory pit at around 2/5 from base. Arista slender, almost as long as basoflagellomere.

Thorax. Scutum black dorsally, with margins widely yellow; yellow pilose, except for four patches of black pile: two anteriad and two posteriad of transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow; yellow pilose anteriorly; yellow pilose along posterior margin. Anepimeron yellow; yellow pilose dorsally, bare ventrally. Katatergum and anatergum yellow; short and long microtrichose, respectively. Katepimeron yellow; bare. Katepisternum yellow; bare. Calypter and halter yellow.

Wing: hyaline, tinged with yellow, especially anteriorly and basally; microtrichose, except bare on 1st costal cell and on very small basomedian patch on alula.

Legs: Yellow; yellow pilose, except: hind femur black pilose on ventrobasal 1/4, hind tibia dorsally with long black pile on apical 2/3, hind tarsus dorsally black pilose. Coxae and trochanters yellow; yellow

pilose, except hind coxa and hind trochanter partly black pilose.

Abdomen. Yellow. Tergite 1 and 2 yellow pilose. Tergite 3 black pilose. Tergite 4 black pilose, except for median vitta of yellow pilosity on posterior 3/4, and yellow pilose along posterior margin. Tergite 5 black pilose, except yellow pilose posteromedially. Second tergite slightly wider than thorax, widest at approximately 1/2. Sternites yellow; yellow pilose; sternite 1 bare.

Diagnosis. The yellow vertex with patches of black pile is shared with *S. goettei, S. guianica*, *S. lanei* and *S. maculipennis*. From these species, *S. crematogastri* spec. nov. differs by the evenly yellow coloured abdomen and the yellow tinged wings. For further characters see key.

Etymology. The name refers to ants of the genus *Crematogaster*, in which the puparia of the type specimens were found.

Distribution. Only known from Brazil (Mato Grosso).

Notes. The labels of the type specimens indicate that they were collected in dry forest. The holotype was apparently found in and subsequently reared from a nest of a *Crematogaster* species (Hymenoptera: Formicidae). For the empty puparium see figs. 130-131.

***Stipomorpha dichromata* spec. nov.**

Figs 132-135.

Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: " Nova Teutonia / 27°11'S-52°23'W / Brazil, 300-500 m. / XI.1969 / Fritz Plaumann". Coll. CNC.

Description (based on holotype)

Adult female. Body size: 8 mm.

Head. Face occupying about 1/3 of head width in frontal view; shining dark brown; white pilose. Gena hardly developed, eyes almost directly bordering oral margin; brown. Lateral oral margins slightly produced; not reaching below eye margin in lateral view. Frons blackish brown; golden yellow pilose. Vertex shining blackish brown; golden yellow pilose; ocellar triangle equilateral. Occiput black; golden yellow pilose dorsally, yelowish white pilose ventrally. Eye bare. Antennal fossa about as wide as high. Antenna brown. Antennal ratio approximately as 2:1:4; basoflagellomere parallel-sided with rounded apex, with sensory pit at 2/3 from base. Arista slender, about 3/4 of length of basoflagellomere.

Thorax. Scutum black, with metallic hues along margins; appressed golden yellow pilose. Postpronotum, and postalar callus blackish, yellow pilose. Scutellum apically shallowly sulcate; blackish brown qwith metallic hues; appressed golden yellow pilose. Anepisternum weakly convex, without distinction between anterior and posterior part; dark brown; golden yellow pilose anteriorly and posteriorly. Anepimeron shining brown; entirely long yellow pilose dorsally. Katatergum and anatergum brown; long and short microtrichose, respectively. Katepimeron brown; bare. Katepisternum brown; yellow pilose dorsally, bare ventrally. Calypter and halter yellow.

Wing: hyaline, with faint brownish tinge, especially anteriorly; microtrichose except bare on 1st costal cell, basal 1/5 of cell R1, basal 3/4 of cell R, posterobasal 1/2 of cell BM, anterobasal 1/3 of cell CuP.

Legs: Yellowish brown, femora darker basally; all femora and entire hind leg black pilose, front and middle tibiae and tarsi yellow pilose. Coxae and trochanters dark brown; white pilose.

Abdomen. Tergites 1 and 2 shining yellowish brown, with posterior margin of tergite 2 narrowly pale yellow; yellow pilose. Tergites 3-5 dark brown; shining with metallic hues, except for large dull part medially on anterior 3/2 of tergite 3 and small, oval dull part medially on anterior 1/4 of tergite 4; golden yellow pilose, except black pilose on dull parts. Sternites yellowish brown, yellow pilose, excpet sternite 1 bare.

Diagnosis. The contrasting colour pattern of the abdomen is unique among all known *Stipomorpha* species: tergites 1 and 2 yellowish brown, other tergites dark brown.

Etymology. The name *dichromata* is Greek for tweocoloured.

Distribution. Only known from one specimen from Brazil, Nova Teutonia.

***Stipomorpha elcopala* spec. nov.**

Figs 136-139, 229.

Studied type specimens.

HOLOTYPE. COSTA RICA. Male. Label 1: "COSTA RICA. Cartago, Cordillera / central, Pejivalle, Humo, El Copal / 1026 m asl. Malaise trap. / 09°46'55.9"N 83°45'09.2"W / 9-10.IX.2010. Leg. J.T. Smit.". Coll. INBIO.

PARATYPE. HONDURAS. Male. Label 1: "Hon-

duras: Yoro, Palo de / Comba, 15°11'N, 87°39'W / 29.IX.1995 / leg. R. Cave". Coll. MZLU.

Description (based on holotype)

Adult male. Body size: 5 mm.

Head. Face occupying 1/4 of head width in frontal view; black with narrow yellow lateral margins; entirely white pilose. Gena black. Occiput black; black pilose dorsally, white pilose ventrally. Oral cavity with slightly produced lateral margins. Frons black; short black pilose, except for bare triangular part posterior to lunula. Vertex black; black pilose. Eye bare. Antennal fossa about as wide as high. Antenna black; scape and pedicel black pilose; antennal ratio 3:1:6; basoflagellomere parallel-sided with narrowly rounded apex, with small sensory pit at 3/4 from base; arista slender, about 3/4 of length of basoflagellomere, appearing bare under low magnification.

Thorax. Black. Postpronotum, scutum and postalar callus short black pilose, except for two small patches of white pile along transverse suture and two small white pilose patches anterior to scutellum. Scutellum subrectangular, without calcars; white pilose. Anepisternum a little convex, without sulcus, black pilose anterodorsally and along posterior margin. Anepimeron black pilose dorsally, white pilose ventrally. Katepisternum white pilose dorsally. Katepimeron bare. Calypter brownish yellow, halter blackish.

Wing: hyaline, with very faint dark cloud between apex of costal cell and vena spuria, and with yellowish veins bordering and posterior to pterostigma; microtrichose except bare basally on cell R1 along vein RS, on posterior 1/2 of cell R, basal 5/6 of cell BM, anterior 1/2 of cell CuP and mediobasal 1/5 of alula.

Legs: brownish black, except fifth tarsomeres of all legs yellow. Legs black pilose, except anterior four tibiae posteriorly pale pilose and hind-tibia pale pilose on basal 2/3; pile on hind-tibia about as long as width of tibia. Coxae and trochanters black pilose.

Abdomen. Reddish, except lateral margins of tergites 1 and 2 blackish brown. Tergite 2 wider than thorax, widest point at around half the lentgh; tergites 3 and 4 strongly narrowing. Antetergite very large. Tergite 1 laterally mixed black and yellow pilose, bare medially. Tergite 2 black pilose laterally, yellow pilose anterolaterally and sublaterally; almost bare medially. Tergites 3 and 4 fused, without a visible suture; sparsley black pilose medially. Sternite 1 bare, separated from sternite 2 by a membrane of about the width of sternite 1. Sternite 2 bare, laterally more than twice as wide as medially, separated from sternite 3 by a membrane of twice the median width of sternite 2. Genitalia as in fig. 229.

Female. Unknown.

Diagnosis. Although the black thorax and legs in combination with the reddish abdomen remind of *Stipomorpha apicula* (Curran), this species is morphologically most similar to *Stipomorpha lacteipennis* (Shannon). These two species share similar length ratios of the antennal segments, a pilose posterior margin of the anepisternum, a pilose dorsal part of the katepimeron, a partially bare alula, a notably triangular abdomen, and similar morphology of the male genitalia. However, the reddish abdomen readily separates *S. elcopala* from *S. lacteipennis*.

Etymology. The name of this species refers to its type locality: El Copal, a nature reserve in the Central Valley of Costa Rica. The name is to be treated as an adjective.

Notes. The paratype differs from the holotype in its larger size (6.5 mm) and the entirely yellow tergites 1 and 2 (lateral margins not blackish brown as in holotype).

Distribution. Known from Costa Rica and Honduras.

***Stipomorpha fallax* spec. nov.**

Figs 140-142, 230.

Studied type specimens. HOLOTYPE. COSTA RICA. Male, Atenas,18.IV-15.V.1995, leg. M.J. Sommeijer. Coll. ZMAN.

PARATYPE. PANAMA. Male. Label 1: "Museum Leiden, Canal Zone, 8 km NW Gamboa, Pipeline Rd. 9°10'N; 79°45'W."; label 2: "From *Luehea seemannii* (Tiliaceae). 30.III.1976. Y. Lubin & G. Montgomery". Coll. RMNH.

Description (based on holotype)

Adult male. Body size: 7.5 mm.

Head. Face occupying about 1/4 of the head width in frontal view; shining pale yellow; with whitish pilosity, most dense sublaterally and ventrally, very sparse medially; with narrow strip of white pubescence along eye margins. Gena hardly developed, eyes almost directly bordering oral margin; yellow. Lateral oral margins not produced; not reaching below eye margin in lateral view. Frons about as long as width of lunula; black; yellow pilose laterally. Vertex shining black; golden yellow pilose. Occiput black; golden yellow pilose dorsally, yelowish white pilose ventrally.

Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown. Antennal ratio approximately as 2:1:3; basoflagellomere parallel-sided with rounded apex. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Scutum black dorsally, with margins widely yellow; yellow pilose, except for four patches of black pile: two anteriad of and two posteriad of transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum semicircular; without calcars. Anepisternum weakly convex, without distinction between anterior and posterior part; brownish anteriorly and yellow pilose, whitish yellow posteriorly and bare. Anepimeron dark brown; yellow pilose dorsally, bare ventrally. Katatergum and anatergum brown; long and short microtrichose, respectively. Katepimeron yellow; bare. Katepisternum brown; bare. Calypter and halter yellow.

Wing: hyaline, without colouration, microtrichose except bare on 1st costal cell, basal 1/2 of cell R, posterobasal 1/5 of cell BM, basal 1/4 of cell CuP, basomedian 1/2 of alula.

Legs: Yellow, except hind tibia on apical 1/2 and basal four tarsomeres of hind tarsus blackish brown.; yellow pilose, except tarsi dorsally mixed black and yellow pilose and hind tibia long black pilose on apical 1/2. Coxae and trochanters yellow and yellow pilose.

Abdomen. Yellow and short yellow pilose. Second tergite slightly wider than thorax, widest at 1/2; third and fourth tergites much narrower. Sternites yellow; sparsely yellow pilose; sternite 1 bare. Genitalia as in fig. 230.

Diagnosis. Very similar to *S. fraudator, S. mendax* and *S. spuria*. For differences with those species see key.

Etymology. The name *fallax* (Latin for deceitful, false) was chosen in analogy of the names *fraudator*, *mendax* and *spuria*, which have approximately the same meaning, in order to stress the similarity of these species.

Notes. In the paratype from Panama the hind legs are entirely yellow, only slightly darkened on apical 1/2 of tibia and basal tarsomeres.

In the holotype the label states "From *Luehea seemannii* (Tiliaceae)", suggesting flower visiting.

Distribution. Known from Costa Rica and Panama.

***Stipomorpha fraudator* (Shannon, 1927) comb. nov.**

Figs 143-146, 231.

Ubristes fraudator Shannon, 1927: 20.

Studied type specimens. HOLOTYPE. BRAZIL. Male. Label 1 (small, round, red-bordered): "Holotype"; label 2: "Amazon 66 53"; label 3: "*Microdon*: *Ubristes fraudator* Snn.". Coll. BMNH.

Redescription (based on holotype)

Adult male. Body size: 9 mm.

Head. Face occupying about 1/4 of head width in frontal view; shining yellow with whitish pilosity, most dense sublaterally and ventrally, very sparse medially; with narrow strip of white pubescence along eye margins. Gena hardly developed, eyes almost bordering oral margin, yellow anteriorlty, black posteriorly. Oral cavity with lateral margins a little produced. Frons slightly longer than width of lunula; yellow; yellow pilose laterally. Vertex a little swollen; shining black; yellow pilose. Occiput black; yellow pilose dorsally, white pilose ventrally. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown. Antennal ratio 5:1:4; basoflagellomere parallel-sided with rounded apex, with small sensory pit located at 3/5 from base. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Scutum yellow, with large dark brown marks on most of dorsal surface, separated by narrow yellow lines medially, submedially and along transverse suture; yellow pilose, except for two patches of black pile posterior to transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum without calcars. Pleurae yellow dorsally, brownish ventrally. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow pilose anterodorsally, bare posteriorly. Anepimeron yellow pilose dorsally. Katatergum and anatergum long and short yellow microtrichose, respectively. Other pleurae bare. Calypter and halter yellow.

Wing: hyaline, without colouration, microtrichose except bare on posterobasal 1/2 of cell R, basal 1/4 of cell BM and basal 1/4 of cell CuP.

Legs: Yellow and yellow pilose, except: posterior tibia blackish with narrowly yellow base, white pilose on basal 3/4, black pilose on apical 1/4; first three tarsomeres of all tarsi blackish and blackish pilose dorsally,

fourth tarsomeres a little paler, fifth tarsomere yellow and yellow pilose. Hind tarsus ventrally with dense, appressed yellow pile. Coxae and trochanters yellow and yellow pilose.

Abdomen. Yellow and short yellow pilose. Second tergite wider than thorax, widest at basal 1/3; third and fourth tergites much narrower. Tergite 1 with anteromedian smooth, concave area. Sternites yellow. Genitalia as in fig. 231.

Female. Unknown.

Diagnosis. Very similar to *S. fallax*, *S. mendax* and *S. spuria*. For differences with those species see key.

Distribution. Only known from the holotype from Brazil.

***Stipomorpha goettei* (Shannon, 1927) comb. nov.**

Figs 147–151, 232.

Microdon (Ubristes) goettei Shannon, 1927: 19.

Studied type specimens. BRAZIL. Four syntypes examined, one of which is designated as lectotype. For label information see table 2, for further notes see account of *Stipomorpha guianica*.

Additionally studied specimens. SURINAM: 1 male, Akintosoela, Mapane area, SME Q.22, 28.VII.1995, leg. B. De Dijn & A. Gangadin, coll. RMNH; 1 female, SE of Zanderij, road to Kraka, 16.III.2006, leg. M. Reemer, coll. RMNH; FRENCH GUYANA: 1 female, Roura, Kaw Road, PK 37, Relais Patawa, N 04°32'42" – W 52°09'09", malaise trap, August 2008, leg. J.A. Cerda, coll. RMNH.

Body size: 8-10,5 mm.

Redescription (based on lectotype)

Adult female. Body size: 10 mm.

Head. Face occupying about 1/3 of head width in frontal view; in dorsal half with tubercles along eye margin; yellow, a little darker on dorsal 1/3; yellow pilose, short dorsally and medially, long ventrally and ventrolaterally; with narrow strip of white pubescence along eye margin. Gena yellow. Oral cavity with lateral margins a little produced and notched anteriorly. Frons about as long as width of lunula; blackish posterior to lunula, otherwise yellow; yellow pilose, except for posterolateral patches of black pile. Vertex swollen; yellow; with fasciae of black pile from ocellar triangle to black pile patches on frons; with black pile on ocellar triangle and along posterior margin; with yellow pile anteriorly and laterally. Occiput black; yellow pilose dorsally, more whitish pilose ventrally. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna with scape yellow, pedicel and basoflagellomere brown. Antennal ratio 3:1:5; basoflagellomere parallel-sided with rounded apex. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Scutum black, with widely yellow margins; yellow pilose, except for four patches of black pile, two of which anteriad of and two posteriad of transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum without calcars. Pleurae yellow dorsally, brownish ventrally. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow pilose anterodorsally, bare posteriorly. Anepimeron yellow pilose dorsally. Katatergum and anatergum yellow pilose and microtrichose, respectively. Other pleurae bare. Calypter and halter yellow.

Wing: hyaline, with a wide white fascia on apical half (best visible against dark background); microtrichose except bare on most of cell R, basal 1/5 of cell BM and basal 1/5 of cell CuP.

Legs: Front- and mid-legs yellow; yellow pilose. Hind femur yellowish brown, vaguely blackish on median 1/3; yellow pilose. Hind tibia strongly widened; brownish yellow, vaguely blackish around cicatrice on apical half; with long, dense pilosity dorsally: white on basal 1/3, black on apical 2/3; short yellow pilose apicolaterally. Hind tarsus: first tarsomere yellow and yellow pilose dorsally, except for black pile apically; other tarsomeres dark brown and black pilose dorsally; all tarsomeres densely, short, golden pilose ventrally. Coxae and trochanters yellow and yellow pilose.

Abdomen. Yellowish brown with large, vaguely demarkated, dark brown to black lateral markings on tergites 2-5, leaving only narrow median yellow vittae and widely yellow apical margins. Tergite 1 with anteromedian smooth, concave area. Second tergite about as wide as thorax, widest at basal 1/3; third and fourth tergites narrower, more or less parralel-sided. Entirely short, yellow pilose. Sternites brownish. Genitalia as in fig. 232.

Diagnosis. The yellow vertex with patches of black pile is shared with *S. crematogastri, S. guianica*, *S. lanei* and *S. maculipennis*. From these species, *S. goettei* differs by the absence of pile on the posterior part of the anepisternum in combination with the whitish cloud on the

wing (view against dark background). Differences between *S. goettei* and *S. guianica* are listed in table 3.

Notes. Shannon (1927) based his description of *Microdon goettei* on five females. Only four of these syntypes could be found in the BMNH-collection. This series of syntypes was found to consist of two closely similar species, each represented by two specimens. Two syntypes were found to agree with *Microdon guianicus* Curran. The other two are here considered as the 'real' *Microdon goettei* Shannon. Support for this view is provided by the original description, which states that in the antennae the 'third [joint is] a little longer than combined length of first and second' (Shannon 1927). To ensure the stability of the taxon, a lectotype is designated for *Microdon goettei* Shannon out of the syntype series (see table 2).

Distribution. Known from Brazil, French Guyana and Surinam. All records of "*Ubristes goettei*" from Surinam by Van Doesburg (1966) belong to *Stipomorpha guianica*, but specimens belonging to the 'real' *S. goettei* were collected in recent years (see additionally studied specimens).

***Stipomorpha guianica* (Curran, 1925) comb. nov.**

Figs 152-155, 233.

Microdon guianicus Curran, 1925: 340.

Studied type specimens. HOLOTYPE. GUYANA. Female. Bartica. Pictures of types studied from type database of the Museum of Comparative Zoology, accessible on the internet. Coll. MCZ.

Additionally studied specimens. ECUADOR: 1 female, Limon, 900 m., II.1948, Z. Muller, coll. AMNH. FRENCH GUYANA: 1 male, Montagnes Tortue, 04°15,007'N-52°21,512'W, 12.I.2003, leg. V. Soon, coll. RMNH. GUYANA: 1 male, Kurupkari: 4°4'N-8°40'W, malaise trap, IX-XI.1992, coll. BMNH. PERU: 1 female, Madre de Dios, Rio Tambopata, Sachavacayoc Centre, 12°51'S - 69°22'W, 16-26.X.2008 (malaise trap), leg. & coll. J.T. Smit. SURINAM: 1 female, Perica, 20.VIII-3.IX.1997 malaise trap, leg. B. De Dijn, coll. RMNH; 1 female, Perica, 10-24.XII.1997, malaise trap, leg. B. De Dijn, coll. RMNH; 1 female, Paramaribo Leiding, 28.I-6.II.2006, malaise trap, leg. M. Reemer, col. RMNH; 1 female, Peperpot, 2-9.II.2006, malaise trap, leg. M. Reemer, coll. RMNH; 1 male, Paramaribo Cultuurtuin, 7.III.2006, leg. M. Reemer, coll. RMNH; 1 female, Peperpot, 21-28.III.2006, malaise trap, leg. M. Reemer, coll. RMNH; 1 male, Peperpot, 28.III.2006, leg. M. Reemer, coll. RMNH; 1 female, Peperpot, 29.III-6.IV.2006, malaise trap, leg. M. Reemer, coll. RMNH; 2 females, Peperpot, 6-14.IV.2006, malaise trap, leg. M. Reemer, coll. RMNH; 2 females, 14-20.IV.2006, malaise trap, leg. M. Reemer, coll. RMNH; 1 female, Peperpot, 20-27.IV.2006, malaise trap, leg. M. Reemer, coll. RMNH.

Redescription (based on additionally studied material from Surinam)

Adult male. Body size: 7,5-10 mm.

Head. Face occupying about 1/4 of head width in frontal view; without tubercles along eye margin; yellow; yellow pilose, short dorsally and medially, long ventrally and ventrolaterally; with narrow strip of white pubescence along eye margin. Gena yellow. Oral cavity with lateral margins a little produced and notched anteriorly. Frons about as long as width of lunula; yellow; black pilose, except yellow pilose laterally. Vertex swollen; yellow, except black on ocellar triangle; black pilose, with pile more dense and appressed on anterior 1/2. Occiput black; yellow pilose, except black pilose anterodorsally. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa slightly higher than wide. Antenna with scape yellowish brown, pedicel and basoflagellomere brown. Antennal ratio 4:1:(4-)5; basoflagellomere parallel-sided with rounded apex. Arista slender, about 5/6 of length of basoflagellomere.

Thorax. Scutum black, with widely yellow margins; yellow pilose, except for fasciae of black pile, one of which anteriad of and the other posteriad of transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum without calcars. Pleurae yellow dorsally, brownish ventrally. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow pilose anterodorsally and along posterodorsal margin. Anepimeron yellow pilose dorsally. Katatergum and anatergum yellow pilose and microtrichose, respectively. Other pleurae bare. Calypter and halter yellow. Wing: hyaline, with a wide white fascia on apical half (best visible against dark background); microtrichose except bare on basal 1/2 of cell R, basal 1/5 of cell BM and basal 1/10 of cell CuP, basomedian 2/3 of alula.

Legs: Front- and mid-legs yellow, third and fourth tarsomeres slightly darkened; yellow pilose. Hind

Table 2. Syntypes of *Microdon goettei* Shannon, 1927 and their new type status. Two of these specimens are identified as belonging to *S. guianica* (Curran) All specimens are females and are kept in the collection of the BMNH.

Labels	New type status	New identity
Old labels: "Syntype"; "Ega"*; "*Microdon: Ubristes goettei* Snn." Added label: "*Microdon goettei* Shannon, LECTOTYPE, design. M. Reemer"	lectotype *U. goettei* Shannon	*Ubristes goettei* Shannon
Old labels: "Syntype"; "Amazon. 6653" Added label: "*Microdon goettei* Shannon, id. M. Reemer 2007"	paralectotype *U. goettei* Shannon	*Ubristes goettei* Shannon
Old labels: "Syntype"; "Amazon. 6653"; "*Microdon: Ubristes goettei* Snn." Added label: "*Microdon guianicus* Curran, id. M. Reemer 2007"	paralectotype *U. goettei* Shannon	*Ubristes guianicus* (Curran)
Old labels: Syntype; Para Added label: "*Microdon guianicus* Curran, id. M. Reemer 2007"	paralectotype *U. goettei* Shannon	*Ubristes guianicus* (Curran)

Table 3. Differences between *Stipomorpha goettei* (Shannon) and *S. guianica* (Curran). Unless stated otherwise, characters apply to both sexes.

***Stipomorpha goettei* (Shannon)**	***Stipomorpha guianica* (Curran)**
face in dorsal half with tubercles along eye margin	face smooth, without tubercles along eye margin
face in profile slightly concave at middle and clearly convex on lower half	face in profile straight or slightly convex
basoflagellomere almost 1,5 times longer than scape (antennal ratio 3:1:5)	basoflagellomere only slightly longer than scape (antennal ratio 4:1:(4-)5)
posterior part of anepisternum without pile	posterior part of anepisternum with pile along posterodorsal margin
female: tergites 3 and 4 with pale median vitta	female: tergites 3 and 4 without pale median vitta

femur yellowish brown, vaguely blackish on median 1/3; yellow pilose. Hind tibia strongly widened; brownish yellow, blackish on median 1/3; with long, dense pilosity posteriorly: white on basal 1/4, black on apical 3/43; short yellow pilose ventrally. Hind tarsus: first tarsomere yellow and black pilose dorsally; tarsomeres 2-4 blackish and black pilose dorsally; tarsomere 5 yellow and yellow pilose dorsally; all tarsomeres densely, short, golden pilose ventrally. Coxae and trochanters yellow and yellow pilose.

Abdomen. Dark brown, except tergite 1, anterior and lateral margins of tergite 2, posterolateral corner of tergite 3 and lateral and posterior margins of tergite 4 yellowish. Tergite 1 with anteromedian smooth, concave area. Second tergite slightly wider than thorax, widest at basal 1/4; third and fourth tergites narrower, more or less parralel-sided. Entirely short, yellow pilose. Sternites brownish. Genitalia as in fig. 233.

Diagnosis. The yellow vertex with patches of black pile is shared with *S. crematogastri, S. goettei, S. lanei* and *S. maculipennis*. From these species, *S. guianica* differs by the presence of pile on the posterior part of the anepisternum, the partly bare alula and the absence of a dark brown anteromedian spot on the wing. For further characters see key. For differences with *S. goettei* see table 3.

Notes. All records of "*Ubristes goettei*" from Surinam by Van Doesburg (1966) belong to *S. guianica*.

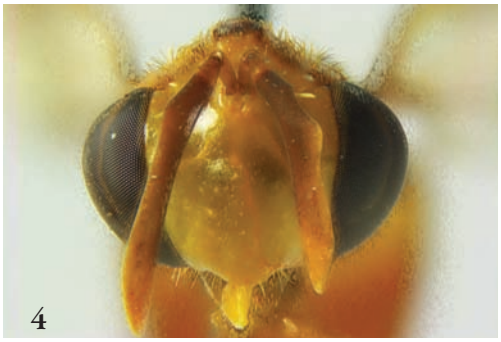
In Surinam, the present author observed this species visiting flowers on two occasions: a male on 17.III.2006 and a male on 28.III.2006.

Distribution. Known from Ecuador, Guyana, Surinam, French Guyana and Peru.

***Stipomorpha inarmata* (Curran, 1925) comb. nov.**
Figs 156–159, 234.
Microdon inarmatus Curran, 1925: 5.
Studied type specimens. HOLOTYPE. GUYANA. Male. Label 1: "Collection C.W. Johnson"; label 2: "Bartica, BG, IV.I 1901"; label 3 (red): "Type Microdon inarmatus Curran"; label 4 (red): "Type 7656"; label 5: "Jan.-July 2003, MCZ Image Database". Coll. MCZ.
Additionally studied specimens. BRAZIL: 1 male & 1 female, Boca do Cuminá-Miri, Oriximiná, PA [Pará], 19-26.I.1968, Exp. Perm. Amaz, coll. USNM. FRENCH GUYANA: 1 female, Kaw Mountains, 04°32,893'N-52°10,245'W, 8.XII.2002, leg. V. Soon, coll. RMNH; 1 female, Roura, Kaw Road, PK 37, Relais Patawa, N 04°32'42"- W 52°09'09", malaise trap, XII.2008, leg. J.A. Cerda, coll. RMNH. GUYANA: 1 male, Essequibo R., Moraballi Creek, 29.IX.1929, leg. Oxf. Univ. Expedn., coll. CNC.
Redescription
Adult male. Body size: 8 mm.
Head. Face occupying 1/4 of head width in frontal view; shining yellow with blackish brown median stripe from oral margin to antennal fossa; face with white pilosity, a little longer around oral margin, except bare on median stripe. Gena brown. Occiput black; black pilose dorsally, getting white laterally and ventrally. Oral cavity with produced lateral margins and notched anterior margin. Frons and lunula black and short black pilose, except for bare triangular part posterior to lunula. Vertex black; black pilose. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown; scape and pedicel dark pilose; antennal ratio 4:1:3,5; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 3/4 from base, within a vague groove that ranges from just before 1/2 to just after the pit; arista slender, about 2/3 of length of basoflagellomere, very shortly pilose, appearing bare under low magnification.
Thorax. Scutum black, postpronotum and postalar callus pale brown, pleurae dark brown, scutellum dark brown. Postpronotum, scutum, postalar callus and scutellum short black pilose, except scutum with lateral fasciae of white pile along transverse suture and lateral prescutellar patches of white pile. Scutellum semicircular, without calcars. Anepisternum more or less flat, yellow pilose anterodorsally, bare posteriorly. Anepimeron pilose posterodorsally. Katepisternum and katepimeron bare. Calypter grey, halter yellowish.
Wing: hyaline; microtrichose except bare on basal 3/4 of cell R, basal 1/2 of cell BM, anterobasal 1/4 of cell CuP, basomedially on alula.
Legs: brownish black, except anterior four tarsi yellow with first tarsomeres darker, and hind tarsi with last three tarsomeres yellow. Femora black pilose; anterior four tibiae white pilose; hind tibia white pilose on basal 2/3, black pilose on apical 1/3; tarsi black pilose dorsally, yellow pilose ventrally. Pile on hind-atibia a little longer than half the width of the tibia. First tarsomere of hind tarsus as long as 1/3 of length of hind-tibia, a little wider than apex of tibia, twice as long as wide (dorsal view). Coxae and trochanters pale pilose.
Abdomen. Blackish brown, except tergites 1 & 2 pale brown. Second segment wider than thorax, widest point at half the lentgh; third and fourth tergites strongly narrowing. Tergites pale pilose. Sternite 1 bare, sternite probably bare, sternite 3 and 4 pilose. Genitalia as in fig. 234.
Female. Unknown.
Diagnosis. From other *Stipomorpha*-species with a black thorax, *S. inarmata* can be recognized by the following characters: face largely yellow with narrow median brown stripe, basoflagellomere slightly shorter than scape, alula partly bare, anepisternum only pilose anterodorsally, katepisternum bare, structure of male genitalia.
Notes on variation. The tarsi may be darker than in holotype. The basoflagellomere may be as long as the scape.
Distribution. Known from Guyana, French Guyana and northern Brazil.

***Stipomorpha lacteipennis* (Shannon, 1927) comb. nov.**
Figs 160–162, 235.
Microdon lacteipennis Shannon, 1927: 18.
Microdon triangularis Curran, 1940: 6. Syn. nov.
Studied type specimens.
LECTOTYPE *Microdon lacteipennis* Shannon. BRAZIL. Male. Label 1 (blue label): "Syntype"; label 2: "Amazon. 66.53"; label 3: "*Microdon Ubristes lacteipennis* Snn.". Coll. BMNH.
HOLOTYPE *Microdon triangularis* Curran. BRA-

ZIL. Male. Label 1 (red label): "Microdon triangularis Curran Holotype"; label 2: "Abril 1937"; label 3: "Servico Febre Amarela, M.E.S., Bras."; label 4: Douradas, Mato Grosso, Brasil". Coll. AMNH.
PARATYPE *Microdon triangularis* Curran. BRAZIL. Male. Label 1: "Dourados, Mato Gross, Brasil", label 2: "Abril 1937", label 3: "Servico Febre, Amazon, M.E.S., Bras.", label 4: "R.C. Shannon collection", label 5: "From type series", label 6: "*Microdon triangularis* Cur., det. F.M. Hull". Coll. USNM.
Additionally studied specimens. BOLIVIA: 1 male, Santa Cruz distr. 4 km N Bermejo, Refugio Los Volcanes, 1000 m, 18°06'S, 63°36'W, 25-30.X.2007, leg. A.R. Cline, coll. RMNH; BRAZIL: 1 male, Mato Grosso, Dourados, IV.1937, leg. Servico Febre Amarela, coll. CNC; PERU: 1 male, Madre de Dios, Tambopata, Sachavacayoc centre, 12°51'20"S - 69°22'20"W, 25.VI-4.VIII.2010, leg. J.T. Smit, coll. J.T. Smit; 1 male, same data as previous except date 23.III-28.IV.2011; SURINAM: 1 male, Blakawatra, 13.VI.1963, leg. J. v.d. Vecht, coll. RMNH; 1 female, Peperpot, 20-27.IV.2006, leg. M. Reemer, coll. RMNH. VENEZUELA: 1 male, T.F. Amaz., Cerro de la Neblina, Basecamp, 140 m., 0°50'N, 66°10'W, 10-20.II.1985, malaise trap in rainforest, leg. P.J. & P.M. Spangler, R.A. Faitoute, W.E. Steiner colrs, coll. USNM.
Redescription (based on holotype)
Adult male. Body size: 5.5-7 mm.
Head. Face occupying 1/5 of head width in frontal view; black with narrow yellow lateral margins; entirely white pilose. Gena black. Occiput black; black pilose dorsally, white pilose ventrally. Oral cavity with slightly produced lateral margins. Frons black; short black pilose, except for bare triangular part posterior to lunula. Vertex black; black pilose. Eye appearing bare under low magnification. Antennal fossa about as wide as high. Antenna black, with basoflagellomere a little brownish; scape and pedicel black pilose; antennal ratio 3:1:6; basoflagellomere parallel-sided with narrowly rounded apex, with small sensory pit at 2/3 from base; arista slender, about 3/4 of length of basoflagellomere, appearing bare under low magnification.
Thorax. Black, postalar callus a little brownish. Postpronotum, scutum, postalar callus and scutellum short black pilose, except for two small patches of white pile along transverse suture and two small white pilose patches anterior to scutellum. Scutellum subrectangular, without calcars. Anepisternum a little convex, without sulcus, black pilose anterodorsally and along posterior margin. Anepimeron black pilose dorsally, white pilose ventrally. Katepisternum white pilose dorsally. Katepimeron bare. Calypter brownish yellow, halter blackish.
Wing: hyaline, with faint dark cloud between apex of costal cell and vena spuria, and with faint yellowish cloud on and posterior to pterostigma; microtrichose except bare on posterobasal 1/2 of cell R, posterobasal 1/2 of cell BM, anterobasal 1/2 of cell CuP and mediobasal 1/5 of alula.
Legs: brownish black, except fifth tarsomeres of all legs yellow. Legs black pilose, except anterior four tibiae pale pilose and hind-tibia pale pilose on basal 1/2; pile on hind-tibia about as long as width of tibia. First tarsomere of hind-tarsus as long as 1/3 of length of hind-tibia, clearly wider than apex of tibia, twice as long as wide. Coxae and trochanters black pilose.
Abdomen. Black. Tergite 2 wider than thorax, widest point at around half the lentgh; tergites 3 and 4 strongly narrowing. Antetergite very large. Tergite 1 laterally mixed black and white pilose, bare medially. Tergite 2 black pilose laterally, white pilose anterolaterally and sublaterally; almost bare medially. Tergites 2 and 3 separated by a yellowish membrane of almost the median length of tergite 2. Tergites 3 and 4 fused, without a visible suture; black pilose dorsally and posteriorly, bare laterally. Sternite 1 bare, separated from sternite 2 by a membrane of about the width of sternite 1. Sternite 2 bare, laterally more than twice as wide as medially, separated from sternite 3 by a membrane of twice the median width of sternite 2. Genitalia as in fig. 235.
Female. As Van Doesburg (1927) already noted, the female is quite similar to the male, except for usual sexual dimorphy and wing pattern more pronounced.
Diagnosis. *Stipomorpha lacteipennis* shares its pilose posterior anepisternum and pilose dorsal part of the katepisternum only with *S. litoralis*. From this species it differs by the presence of a whitish fascia in the wing and by the male genitalia.
Notes. Shannon (1927) only described the male, based on two male syntypes. In the BMNH collection there is only one syntype left, which is hereby designated as lectotype in order to stabilize nomenclature. The holotype and a paratype of *Microdon triangularis* Curran have been examined and were found to be conspecific with *S. lacteipennis* Shannon.
Distribution. Known from Bolivia, Brazil, Peru, Surinam and Venezuela.



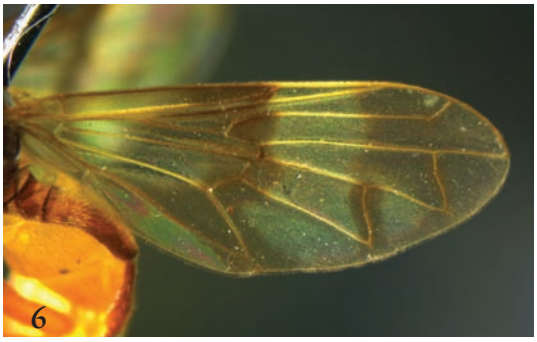
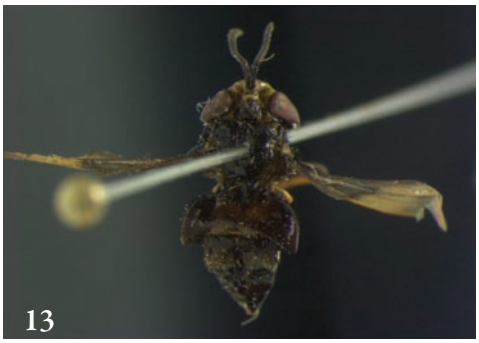
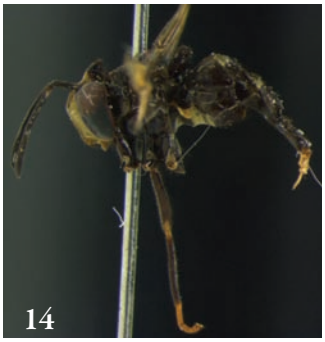
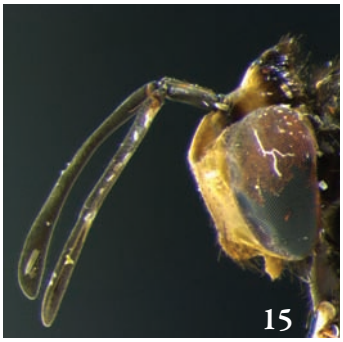
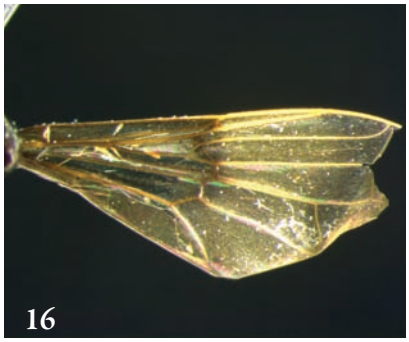


Fig. 1. *Rhoga sepulchrasilva* male, head lateral.
Figs 2-7. *Carreramyia flava* female (holotype). – 2. habitus dorsal; 3. habitus lateral; 4. head frontal; 5. head lateral; 6. wing; 7. basoflagellomere.
Figs 8-10. *Carreramyia megacephalus* male (Costa Rica, coll. M. Hauser). – 8. habitus dorsal; 9. habitus lateral; 10. head frontal.

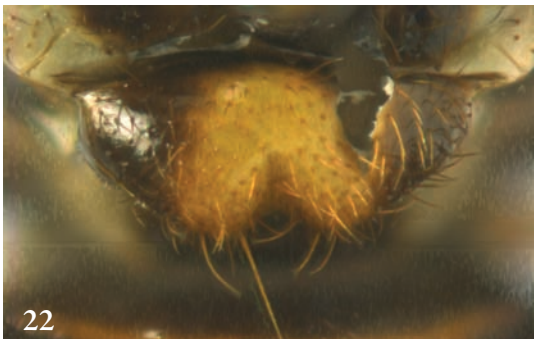


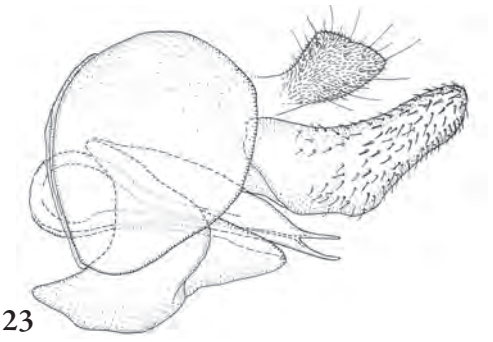






Figs 11-12. *Carreramyia megacephalus*. – 11. head male lateral; 12. head female frontal (Costa Rica, coll. RMNH).
Figs 13-16. *Carreramyia megacera* female (holotype). – 13. habitus dorsal; 14. habitus lateral; 15. head lateral; 16. wing.
Figs 17-21. *Carreramyia tigrina* female (holotype). – 17. habitus dorsal; 18. habitus lateral; 19. head frontal; 20. head lateral; 21. head dorsal.





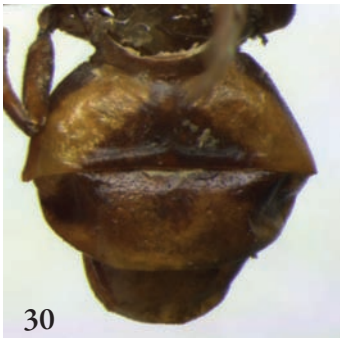
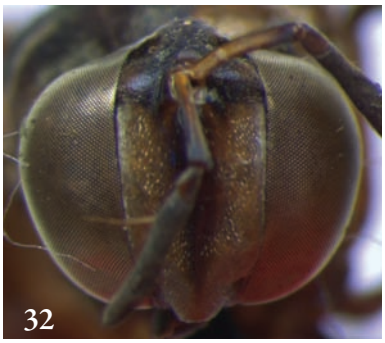
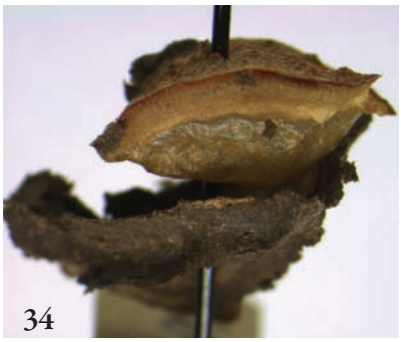
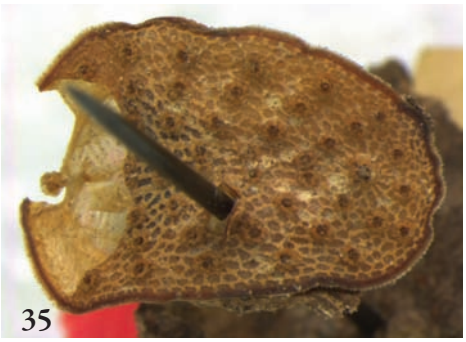
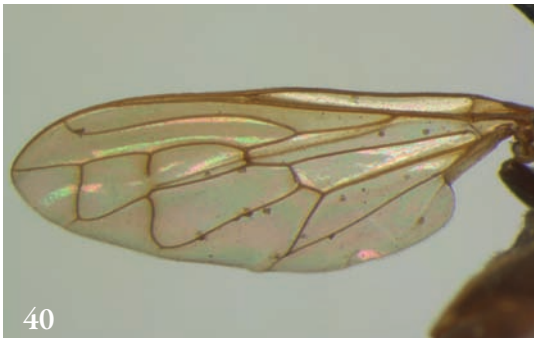


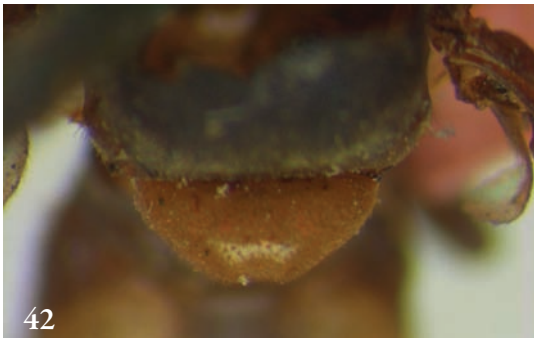
Fig. 22. *Carreramyia tigrina* (holotype), scutellum.
Fig. 23. *Carreramyia megacephalus* male (Costa Rica, coll. RMNH), genitalia lateral.
Figs 24-28. *Ceratophya argentinensis* female (holotype). – 24. habitus dorsal; 25. habitus lateral; 26. head frontal; 27. head lateral; 28. wing.
Figs 29-31. *Ceratophya carinifacies* female (holotype). – 29. habitus dorsal; 30. abdomen dorsal; 31. abdomen lateral.



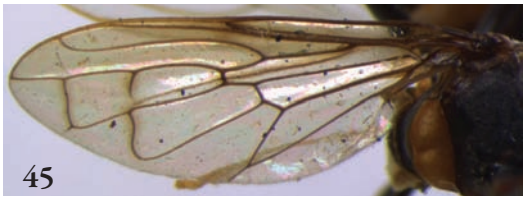


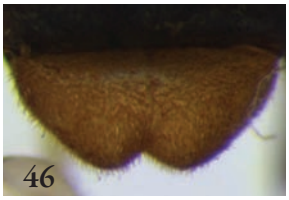


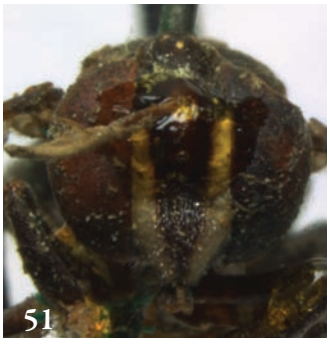


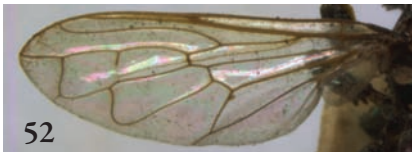


Figs 32-35. *Ceratophya carinifacies* female (holotype). – 32. head frontal; 33. head lateral; 34. puparium lateral; 35. puparium dorsal.
Figs 36-41. *Ceratophya notata* male (holotype). – 36. habitus dorsal; 37. habitus lateral; 38. head frontal; 39. head lateral; 40. wing; 41. scutellum.



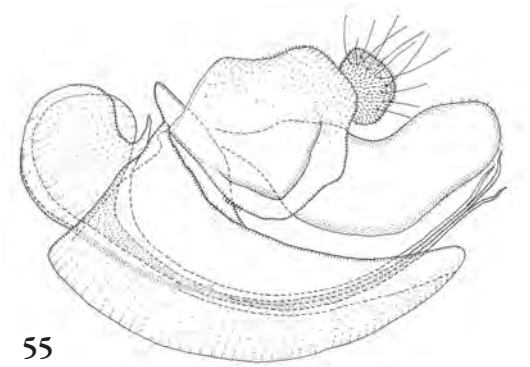


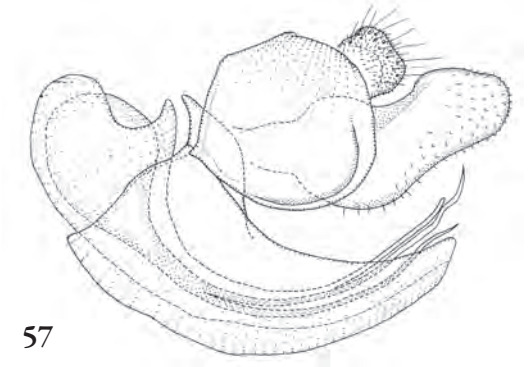


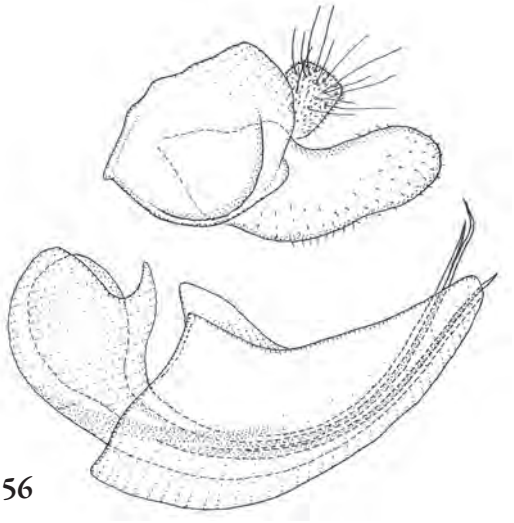


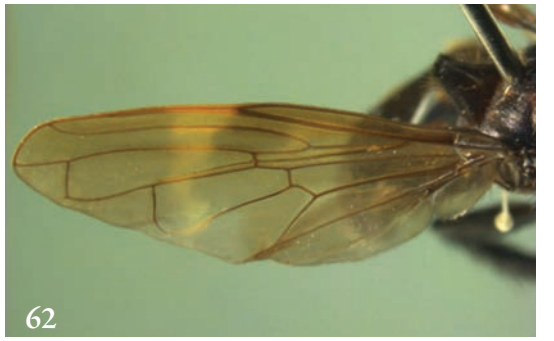
Figs 42-47. *Ceratophya panamensis*. – 42. male holotype (above) & female paratype (photo: American Museum of Natural History); 43. female, head frontal; 44. female, head lateral; 45. male, wing; 46. male, scutellum; 47. male, hind tarsus.

Figs 48-54. *Ceratophya scolopus* male (holotype). – 48. habitus dorsal; 49. habitus lateral; 50. abdomen posterodorsal; 51. head frontal; 52. wing; 53. scutellum; 54. apex of hind tibia with basitarsus, lateral.

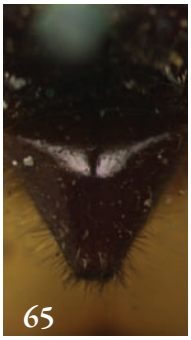






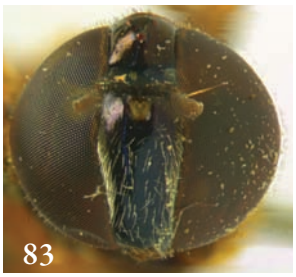


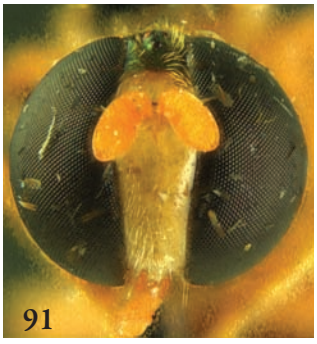
Figs 55-57. *Ceratophya*, male genitalia. – 55. *C. notata* (holotype); 56. *C. panamensis* (holotype); 57. *C. scolopus* (holotype).
Figs 58-62. *Hypselosyrphus amazonicus* male (Peru, coll. RMNH). – 58. habitus dorsal; 59. habitus lateral; 60. head frontal; 61. head lateral; 62. wing.



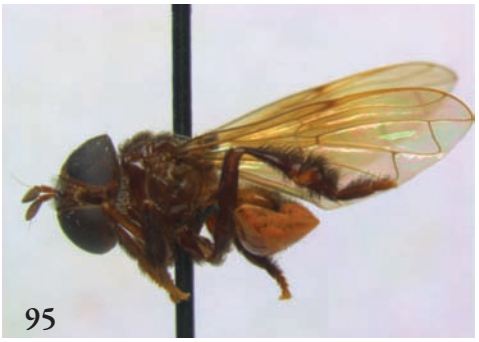
Figs 63-66. *Hypselosyrphus amazonicus* female (holotype). – 63. habitus dorsal; 64. habitus lateral; 65. scutellum; 66. wing.
Fig. 67. *Hypselosyrphus anax* male (holotype), habitus dorsal. Photo: American Museum of Natural History.
Figs 68-69. *Hypselosyrphus corbiculipes* female (holotype). – 68. habitus dorsal; 69. habitus lateral.
Figs 70-71. *Hypselosyrphus helvus* female (holotype). – 70. habitus dorsal; 71. habitus lateral.

Figs 72-73. *Hypselosyrphus helvus* female (holotype). – 72. head frontal; 73. head lateral.
Figs 74-78. *Hypselosyrphus maurus* male (holotype). – 74. habitus dorsal; 75. habitus lateral; 76. head frontal; 77. head lateral; 78. wing.
Figs 79-80. *Hypselosyrphus maurus* female (paratype). – 79. habitus dorsal; 80. habitus lateral.
Figs 81-82. *Hypselosyrphus pingo* female (holotype). – 81. habitus dorsal; 82. habitus lateral.

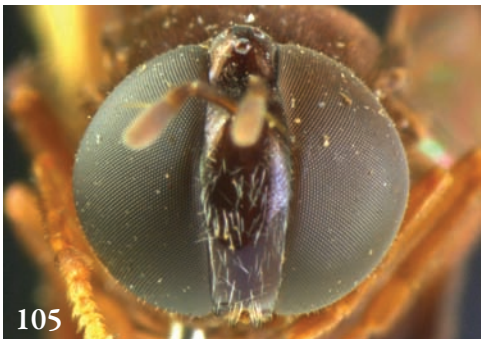




Figs 83-85. *Hypselosyrphus pingo* female (holotype). – 83. head frontal; 84. head lateral; 85. wing.
Figs 86-87. *Hypselosyrphus pingo*. – 86. female (paratype), habitus dorsal; 87. male (paratype), habitus dorsal.
Fig. 88. *Hypselosyrphus plaumanni* male (holotype), habitus dorsal. Photo: American Museum of Natural History.
Figs 89-93. *Hypselosyrphus pseudorhoga* female (holotype). – 89. habitus dorsal; 90. habitus lateral; 91. head frontal; 92. head lateral; 93. wing.



Figs 94-97. *Hypselosyrphus trigonus* female (holotype). – 94. habitus dorsal; 95. habitus lateral; 96. head frontal; 97. head lateral.
Figs 98-102. *Hypselosyrphus ulopodus* male (holotype). – 98. habitus dorsal; 99. habitus lateral; 100. head frontal; 101. head lateral; 102. wing.
Figs 103-104. *Hypselosyrphus vexillipennis* female (holotype). – 103. habitus dorsal; 104. habitus lateral.



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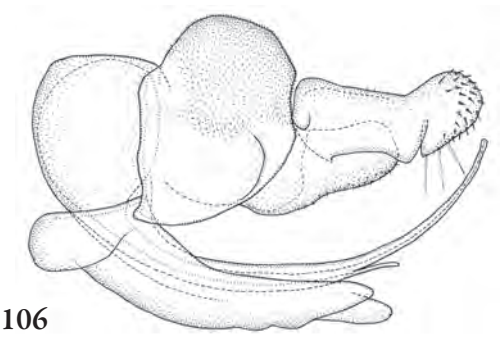

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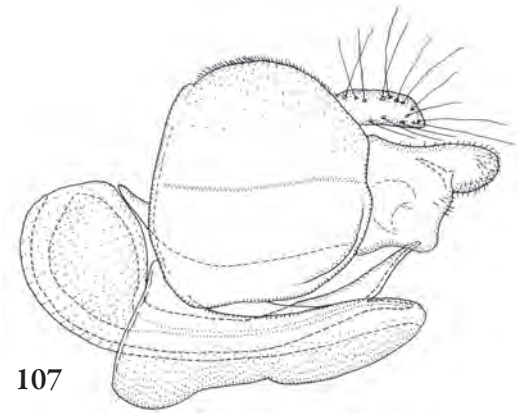

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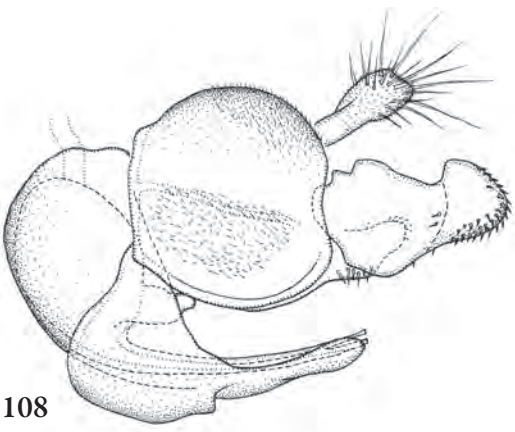

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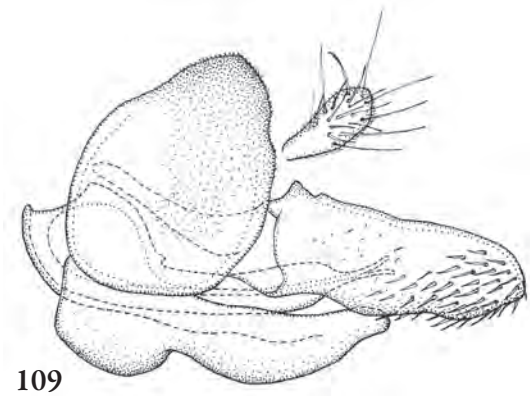

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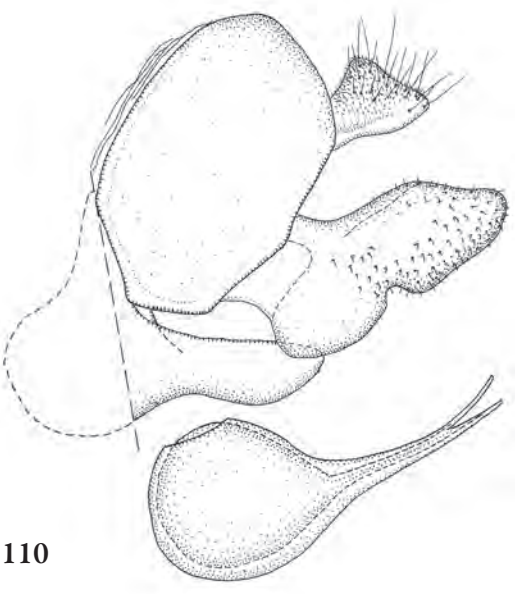

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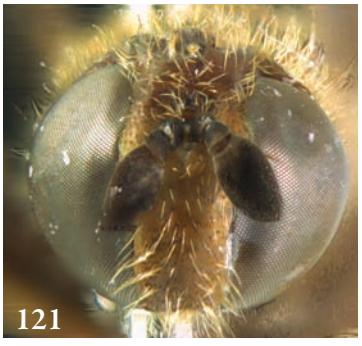
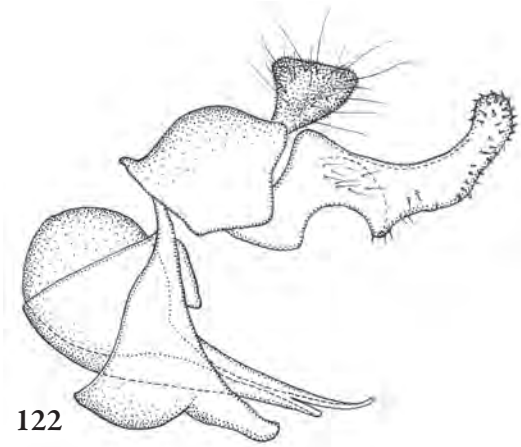
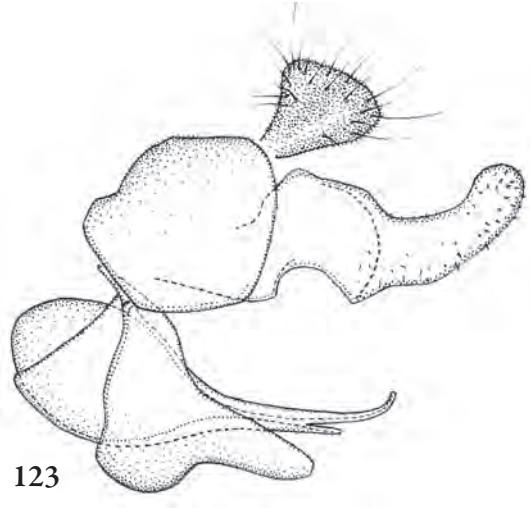
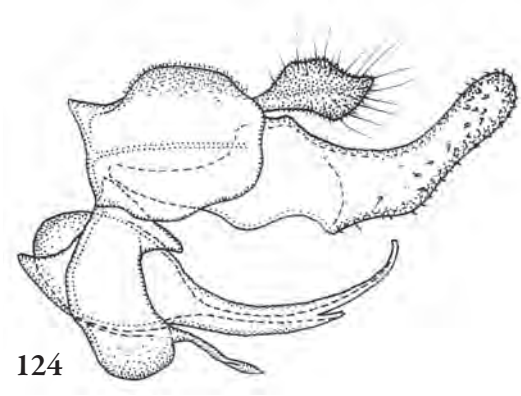
Fig. 105. *Hypselosyrphus vexillipennis* female (holotype), head frontal.
Figs 106-110. *Hypselosyrphus*, male genitalia. – 106. *H. amazonicus* (Peru. coll. RMNH); 107. *H. anax* (holotype); 108. *H. maurus* (holotype); 109. *H. pingo* (paratype); 110. *H. ulopodus* (holotype) (dashed lines indicate missing part in specimen).



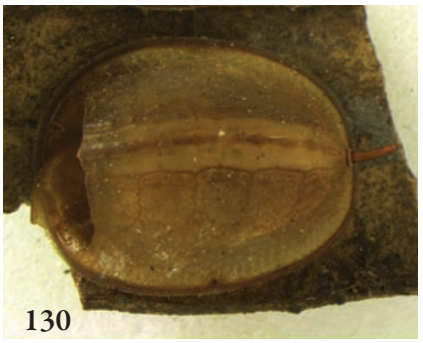
Figs 111-115. *Mermerizon inbio* male (holotype). – 111. habitus dorsal; 112. habitus lateral; 113. head frontal; 114. head lateral; 115. wing.
Figs 116-118. *Mermerizon mellosus* male (holotype). – 116. habitus dorsal; 117. habitus lateral; 118. head frontal.
Figs 119-121. *Mermerizon mesmerizus* male (holotype). – 119. habitus dorsal; 120. habitus lateral; 121. head frontal.

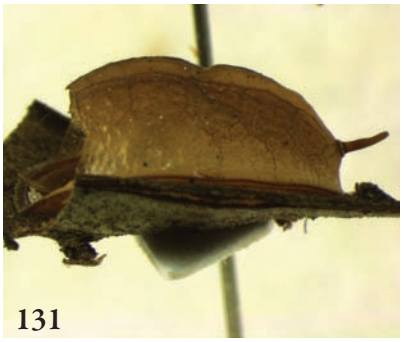






Figs 122-124. *Mermerizon*, male genitalia. – 122. *M. inbio* (holotype); 123. *M. mellosus* (holotype); 124. *M. mesmerizus* (holotype).
Fig. 125. *Stipomorpha apicula* male (holotype), habitus dorsal.
Figs. 126-127. *Stipomorpha crematogastri* female (holotype). – 126. habitus dorsal; 127. habitus lateral.

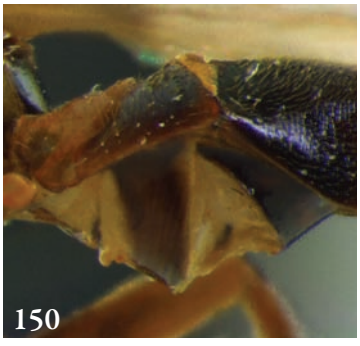




Figs 128-131. *Stipomorpha crematogastri* female (holotype). – 128. head frontal; 129. head lateral; 130. puparium dorsal; 131. puparium lateral.

Figs 132-135. *Stipomorpha dichromata* female (holotype). – 132. habitus dorsal; 133. habitus lateral; 134. head frontal; 135. head lateral.

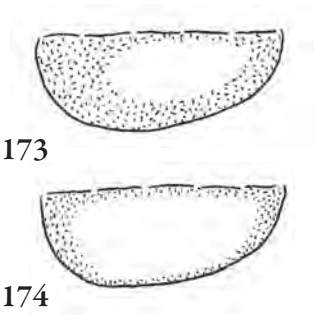
Figs 136-138. *Stipomorpha elcopala* male (holotype). – 136. head frontal; 137. habitus lateral; 138. habitus dorsal; 139. wing.

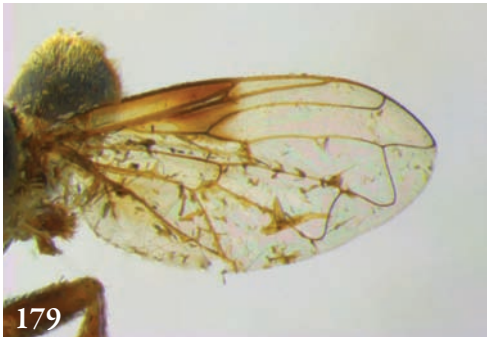


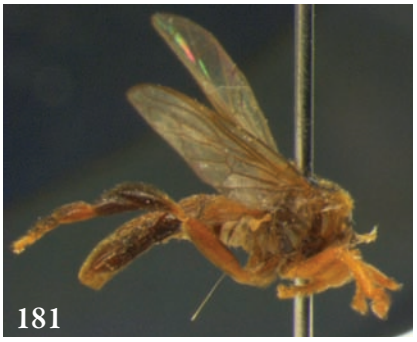
Figs 140-142. *Stipomorpha fallax* male (holotype). – 140. habitus dorsal; 141. habitus lateral; 142. head frontal.
Figs 143-146. *Stipomorpha fraudator* male (holotype). – 143. habitus dorsal; 144. habitus lateral; 145. head frontal; 146. head lateral.
Figs 147-151. *Stipomorpha goettei* female. – 147. (lectotype), head frontal; 148. (lectotype), head lateral; 149. (Surinam, coll. RMNH), head dorsal; 150. sternites 1-3 lateral; 151. sternites 1-3 ventral.

Figs 152-155. *Stipomorpha guianica* (Surinam, coll. RMNH). – 152. male, habitus dorsal; 153. male, habitus lateral; 154. male, head frontal; 155. female, habitus dorsal.
Figs 156-159. *Stipomorpha inarmata* male (holotype). – 156. habitus dorsal; 157. habitus lateral; 158. head frontal; 159. wing.
Fig. 160. *Stipomorpha lacteipennis* male (holotype), habitus dorsal.

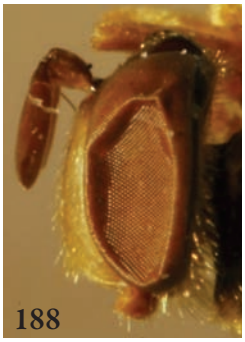
Figs 161-162. *Stipomorpha lacteipennis* male (holotype). – 161. habitus lateral; 162. head frontal.
Fig. 163. *Stipomorpha lanei* male (Surinam, coll. RMNH), habitus dorsal.
Figs 164-165. *Stipomorpha lanei* female (French Guyana, coll. RMNH). – 164. head frontal; 165. head dorsal.
Fig. 166. *Stipomorpha lanei* female (holotype), habitus dorsal. Photo: American Museum of Natural History.
Figs 167-168. *Stipomorpha litoralis* male (holotype). – 167. habitus dorsal; 168. habitus lateral.
Figs 169-170. *Stipomorpha mackiei* male (holotype). – 169. habitus dorsal; 170. habitus lateral.



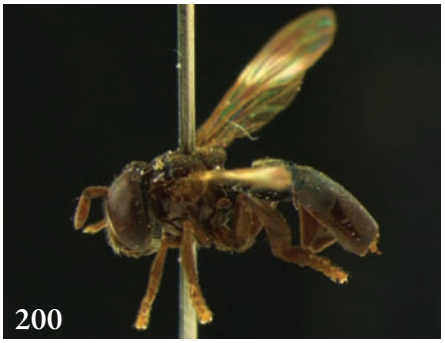




Figs 171-172. *Stipomorpha mackiei* male (holotype). – 171. head frontal; 172. head lateral.
Figs 173-174. *Stipomorpha*, alula. – 173. *S. mackiei*; 174. *S. tenuicauda*.
Figs 175-179. *Stipomorpha maculipennis* male (holotype). – 175. habitus dorsal; 176. habitus lateral; 177. head frontal; 178. head lateral; 179. wing.
Figs 180-183. *Stipomorpha mendax* male (holotype). – 180. habitus dorsal; 181. habitus lateral; 182. head frontal; 183. head lateral.

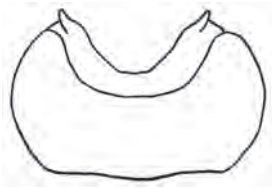


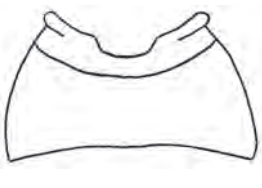
Figs 184-185. *Stipomorpha micromidas* male (Costa Rica, coll. INBIO). – 184. habitus dorsal; 185. habitus lateral.
Figs 186-188. *Stipomorpha micromidas* female (holotype). – 186. habitus dorsal; 187. habitus lateral; 188. head lateral.
Figs 189-193. *Stipomorpha mixta*. – 189. male (Surinam, coll. RMNH), habitus dorsal; 190. female (holotype), habitus dorsal; 191. female (holotype), habitus lateral; 192. female (holotype), head frontal; 193. female (holotype), head lateral.
Figs 194-198. *Stipomorpha panamana* male (holotype). – 194. habitus dorsal; 195. habitus lateral; 196. head frontal; 197. head lateral; 198. wing.

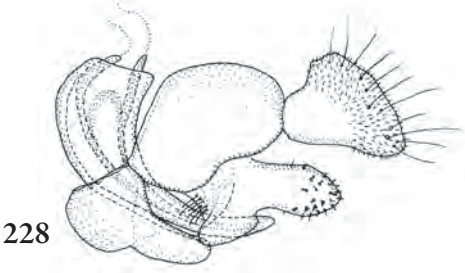


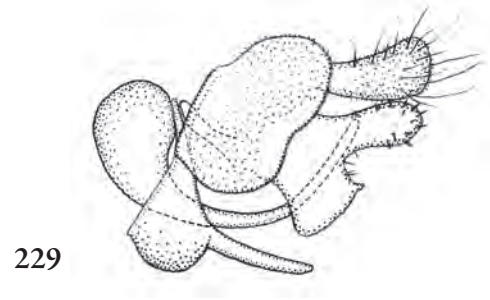
Figs 199-201. *Stipomorpha puerilis* female (holotype). – 199. habitus dorsal; 200. habitus lateral; 201. head frontal.
Figs 202-206. *Stipomorpha simillima* male (holotype). – 202. habitus dorsal; 203. habitus lateral; 204. head frontal; 205. head lateral; 206. wing.
Figs 207-209. *Stipomorpha spuria* male (holotype). – 207. habitus dorsal; 208. habitus lateral; 209. face frontal.

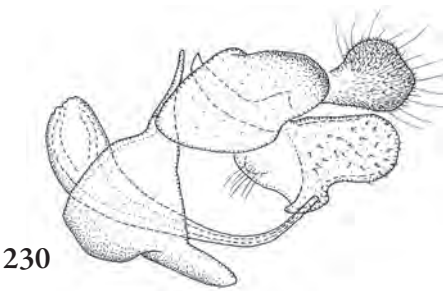
Figs 210-213. *Stipomorpha tenuicauda* female (holotype). – 210. habitus dorsal; 211. habitus lateral; 212. head frontal; 213. head dorsal.
Figs 214-217. *Stipomorpha trigoniformis* male (holotype). – 214. habitus dorsal; 215. habitus lateral; 216. head frontal; 217. wing.
Figs 218-219. *Stipomorpha wheeleri* male (paratype). – 218. habitus dorsal; 219. habitus lateral.



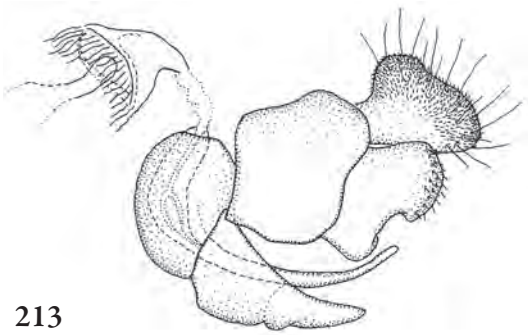








Figs 220-222. *Stipomorpha wheeleri*. – 220. male (paratype), head frontal. 221. female (holotype), habitus dorsal; 222. female (holotype); habitus lateral.
Figs 223-225. *Stipomorpha zophera* male (holotype). – 223. habitus dorsal; 224. habitus lateral; 225. head frontal.
Figs 226-227. *Stipomorpha*, tergites 1 & 2 dorsal. – 226. *S. mendax*; 227. *S. mixta*.
Figs 228-230. *Stipomorpha*, male genitalia lateral. – 228. *S. apicula* (holotype); 229. *S. elcopala* (holotype); 230. *S. fallax* (holotype).



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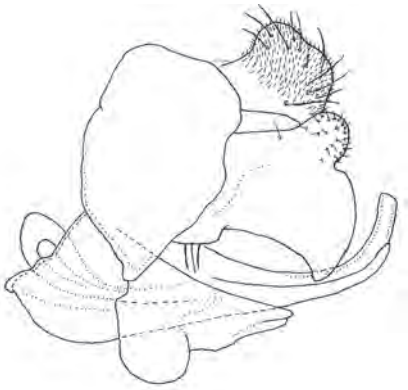

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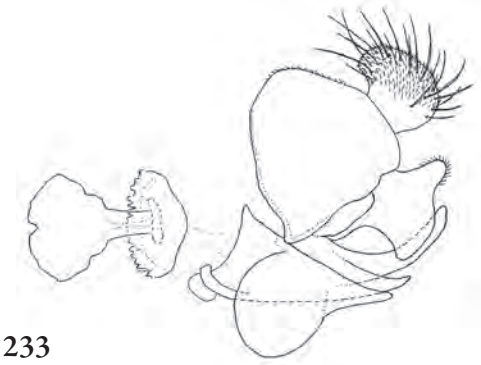

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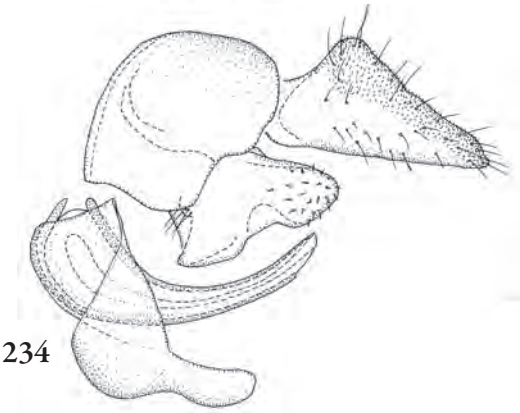

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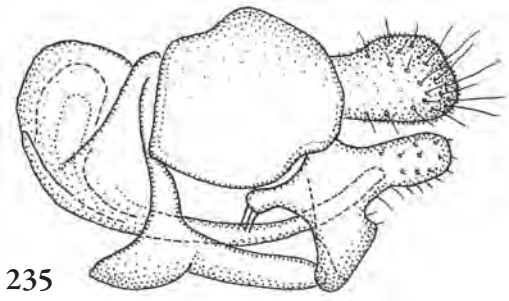

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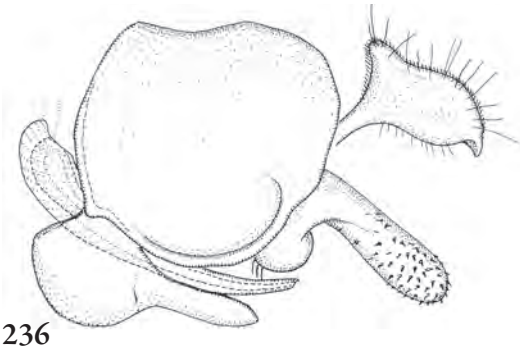

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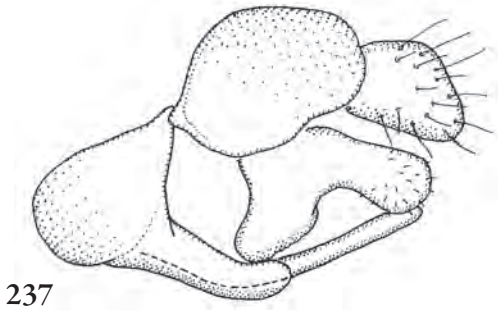

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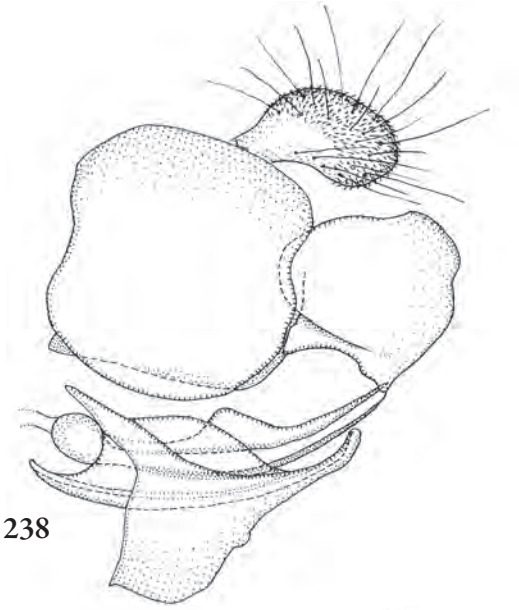
Figs 231-237. *Stipomorpha*, male genitalia. – 231. *S. fraudator* (holotype); 232. *S. goettei* (Surinam, coll. RMNH); 233. *S. guianica* (Surinam, coll. RMNH); 234. *S. inarmata* (holotype); 235. *S. lacteipennis* (lectotype); 236. *S. lanei* (Surinam, coll. RMNH); 237. *S. litoralis* (holotype).



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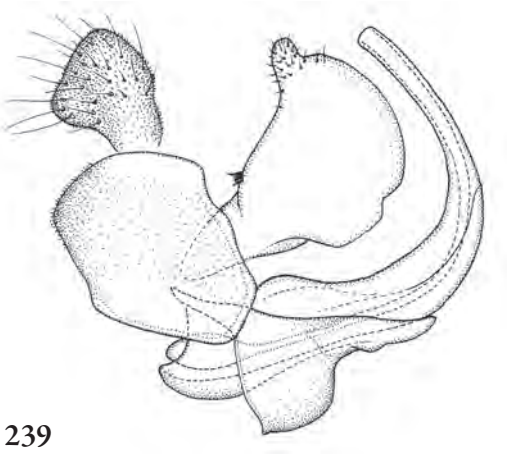

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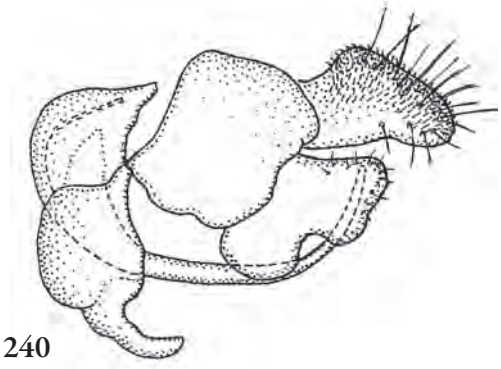

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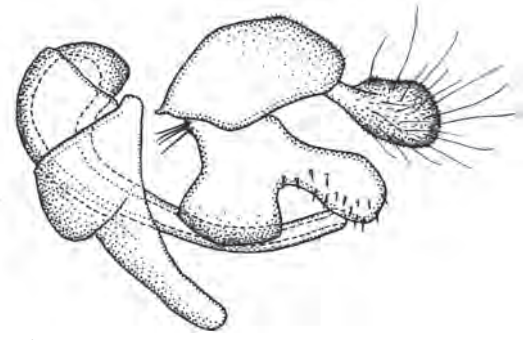

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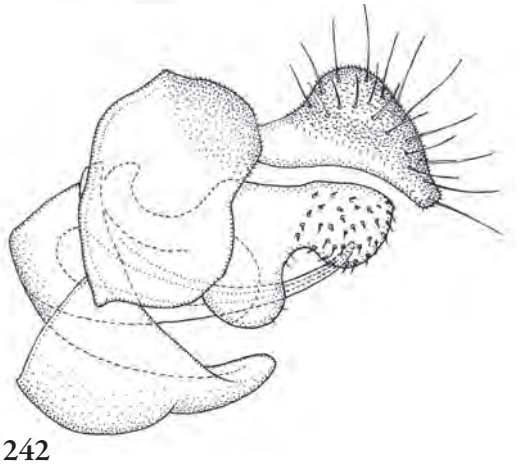

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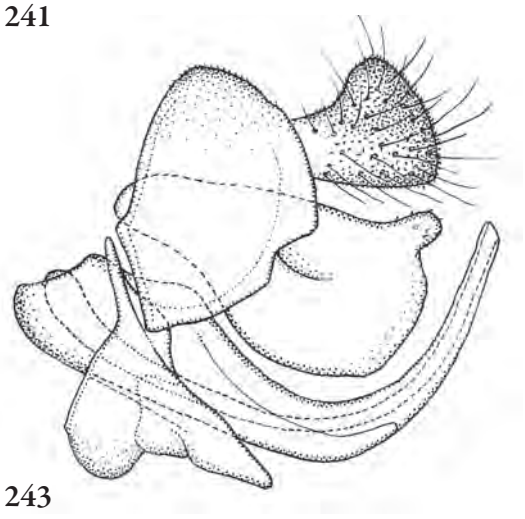

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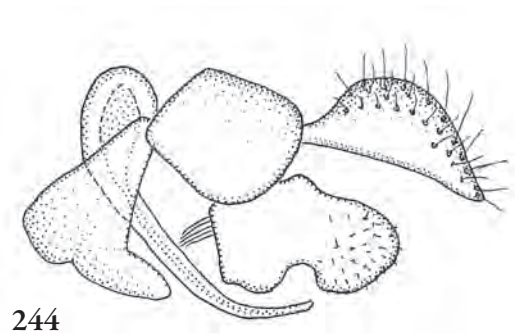
Figs 238-243. *Stipomorpha*, male genitalia. – 238. *S. mackiei* (Surinam, coll. RMNH); 239. *S. maculipennis* (holotype); 240. *S. mendax* (holotype); 241. *S. micromidas* (Costa Rica, coll. INBIO); 242. *S. mixta* (Guyana, coll. BMNH); 243. *S. panamana* (holotype).



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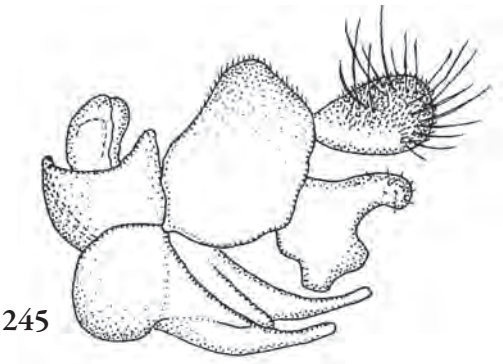

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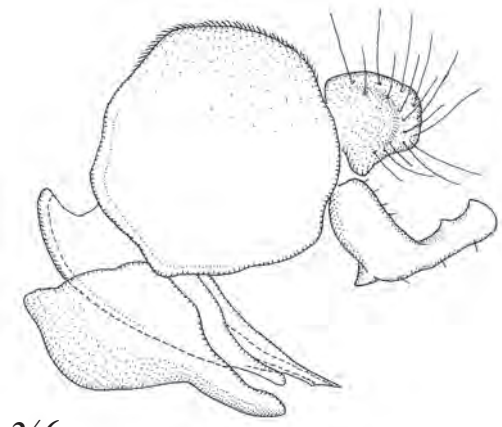

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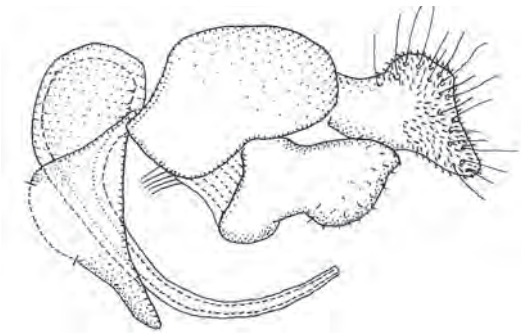

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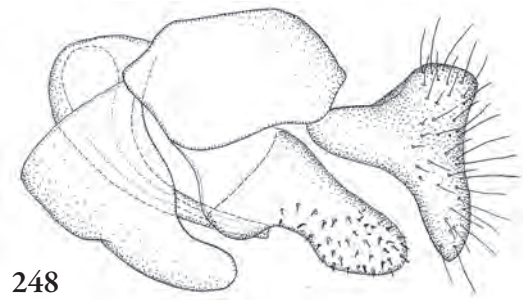

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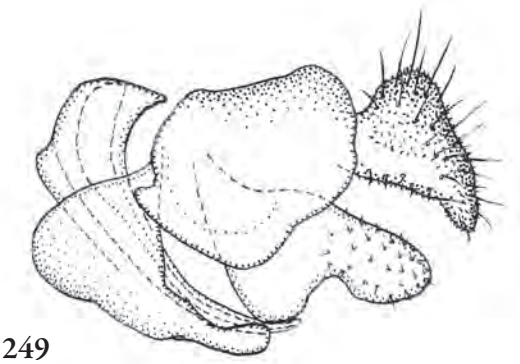

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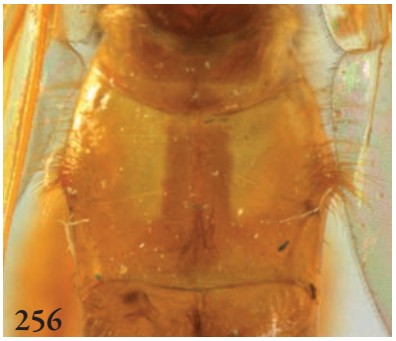
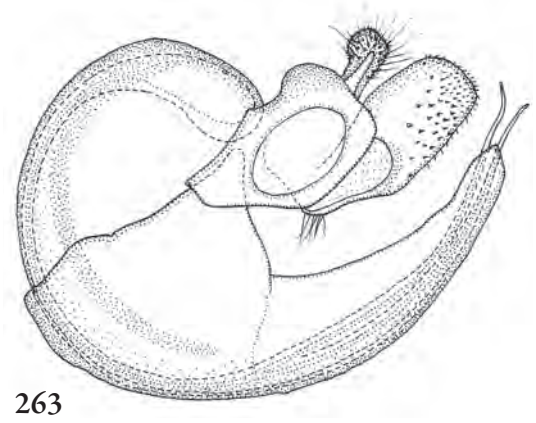
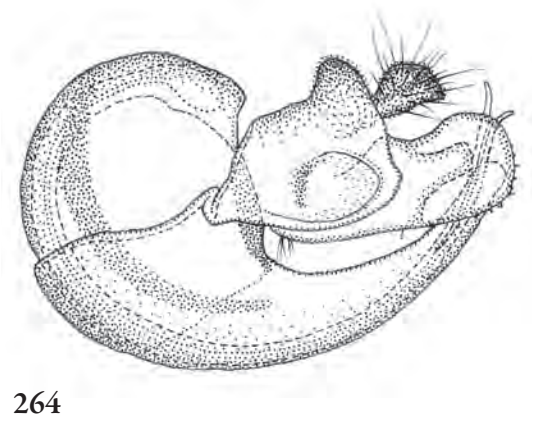
Figs 244-249. *Stipomorpha*, male genitalia latera. – 244. *S. simillima* (holotype); 245. *S. spuria* (holotype); 246. *S. tenuicauda* (Bolivia, coll. RMNH); 247. *S. trigoniformis* (holotype); 248. *S. wheeleri* (paratype); 249. *S. zophera* (holotype).

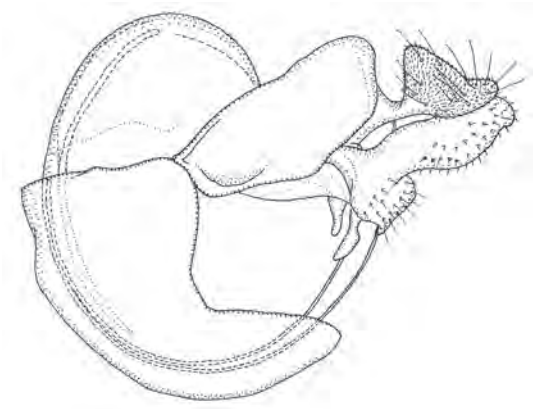


Figs 250-253. *Ubristes flavitibia* male (holotype). – 250. habitus dorsal; 251. habitus lateral; 252. head frontal; 253. head lateral.
Figs 254-258. *Ubristes ictericus* (holotype). – 254. habitus dorsal; 255. habitus lateral; 256. tergite 2 dorsal; 257. head frontal; 258. head lateral.





Figs 259-262. *Ubristes jaguarinus* male (holotype). – 259. habitus dorsal; 260. habitus lateral; 261. head frontal; 262. head lateral.
263-264. *Ubristes*, male genitalia lateral. – 263. *S. flavitibia* (holotype); 264. *S. ictericus* (holotype); 264. *S. jaguarinus* (holotype).



Figs 265-267. *Microdon (Chymophila) angulatus* male (paratype). – 265. habitus dorsal; 266. habitus lateral; 267. genitalia lateral.
Fig. 268. *Peradon chrysopygus* female (holotype), habitus dorsal. Photo: Luca Picciau (MRSN).

***Stipomorpha lanei* (Curran, 1936) comb. nov.**
Figs 163–166, 236.
Microdon lanei Curran, 1936: 5.
Studied type specimens. HOLOTYPE. BRAZIL. Female. Label 1: "Juquia - S.P., J. Lane, XI, 1929"; label 2 (red): "*Microdon lanei* Curran Holotype". Coll. AMNH.
Additionally studied specimens. FRENCH GUYANA: 1 female, Kaw mountains, 04°33,562'N-52°12,425'W, 21.X.2002, leg. V. Soon, coll. RMNH; 1 male, Roura, Kaw road, PK 37, Relais Patawa, N 04°32'42" – W 52°09'09", malaise trap, XII.2009, leg. J.A. Cerda, coll. RMNH; SURINAM: 1 male, Paramaribo, 9.XII.1957, leg. P.H. van Doesburg Jr., coll. RMNH; 1 female, Kwatta, 8.II.1964, leg. D.C. Geijskes, coll. RMNH; 1 male, Paramaribo, Leiding, 05°17'03"W, 28.I-6.II.2006, leg. M. Reemer, coll. RMNH. VENEZUELA: 1 male, T.F. Amaz., Cerro de la Neblina, 140 m., 0°50'N-66°10'W, 21-28. II.1985 (malaise trap in rain forest), leg. P.J. & P.M. Spangler, R.A. Faitoute & W.E. Steiner, coll. USNM.
Redescription (based on holotype)
Adult female. Body size: 8 mm.
Head. Face occupying about 1/4 of head width in frontal view; shining yellow with yellow pilosity, except on a bare median line occupying 1/2 of the width of the face. Gena yellow. Oral cavity with lateral margins not produced and not notched anteriorly. Frons yellow; short black pilose, laterally and posteriorly. Vertex yellow, except brown on ocellar triangle and posterior to it; short black pilose. Occiput yellow; black pilose dorsally, yellow pilose ventrally and over entire posterior surface. Eye appearing bare under low magnification. Antennal fossa about as wide as high. Scape and pedicel dark brown, basoflagellomere reddish brown. Antennal ratio 4:1:7. Basoflagellomere parallel-sided with narrowly rounded apex; with oval sensory pit, occupying 1/5 of height of basoflagellomere, located at 2/3 from base, within a vague 'sensory groove' that ranges from ventrad of the base of the arista almost to the apex. Arista slender, about 2/3 of length of basoflagellomere.
Thorax. Yellowish brown, except for two wide, vaguely demarkated dark brown lateral vittae on the scutum, narrowly divided in two along the transverse suture; medially the scutum is yellow anteriorly and dark brown posteriorly. Scutum short black pilose, except for two submedian vittae of short yellow pile and narrow lateral fasciae of yellow pile along the transverse suture. Postpronotum yellow pilose. Postalar callus and scutellum black pilose. Scutellum semicircular, without calcars. Anterior and posterior part of anepisternum not divided by a sulcus; anterior part yellow pilose, posterior part bare. Anepimeron yellow pilose on dorsal half. Katatergum and anatergum pilose and microtrichose, respectively. Other pleurae bare. Calypter and halter yellow.
Wing: hyaline, with veins yellowish anteriorly and apically. Microtrichose except bare along vein RS between veins R1 and R2+3, on basal 2/3 of cell R, posterobasal 1/4 of cell BM, anterobasal 1/6 of cell CuP.
Legs: Entirely yellow and yellow pilose, including coxae and trochanters.
Abdomen. Yellowish brown. Tergite 2 wider than thorax, with widest point at half the length; tergites 3 and 4 narrower, with tergite 4 strongly narrowing posteriorly. Tergites 3, 4 and 5 fused, with sutures vaguely visible. Tergites entirely yellow pilose; shining, tergite 3 dull on anterior 2/5, because of a fascia of microtrichia, which occupies most of the tergite's width; tergite 4 with two anterolateral dull oval markings of microtrichia of 1/3 of the length of the tergite. Sternites yellow. Sternite 1 bare. Pilosity of other sternites hard to assess in type specimen.
Male (based on specimens from Surinam): More or less as female, except hind femur, hind tibia and abdomen black pilose. Genitalia as in fig. 236.
Diagnosis. Instantly recognizable by the unproduced yellow vertex (compare e.g. *S. guianica*, in which the vertex is strongly produced). The male is unique among *Stipomorpha* species in the fact that the abdomen is somewhat constricted, with its smallest width at the transition between tergites 3 and 4. In the female this constriction is also present to some extent, but less pronounced.
Distribution. Known from Brazil, Surinam and Venezuela.

***Stipomorpha litoralis* (Papavero) comb. nov. stat. nov.**
Figs 167, 168, 237.
Ubristes litoralis Papavero, 1964: 21. Type locality: Brazil, São Paulo, Caraguatatuba.
Studied type specimens. HOLOTYPE (in bad condition). BRAZIL. Male. Label 1: "Caraguatatuba - SP, (Res. Flor. - 40 m.), Brasil, 2.IV.1962, K. Lemko col."; label 2 (red): "Holotipo"; label 3: "28.646"; la-

bel 4: "*Ubristes litoralis*, sp. n., N. Papavero det. 1962". Coll. MZUSP.

Redescription (based on holotype)

Adult male. Body size: 7 mm.

Head. (head of holotype in bad condition, not al characters can be assessed) face black on median 1/2 to 3/4, with yellow laterally; entirely white pilose. Gena black. Occiput black; black pilose dorsally, white pilose ventrally. Oral cavity with produced lateral margins and notched anterior margin. Frons and vertex black and black pilose. Eye bare. Antennal fossa about as wide as high. Antenna (basoflagellomere missing in holotype) black; scape about twice as long as wide and twice as long as pedicel.

Thorax. Black, pleurae brown. Postpronotum, scutum, postalar callus and scutellum black pilose. Scutellum without calcars. Anepisternum a little convex, without sulcus, black pilose anterodorsally and along posterior margin. Anepimeron black pilose dorsally, white pilose ventrally. Katepisternum white pilose dorsally. Katepimeron bare. Calypter and halter blackish brown.

Wing: hyaline, except a little darker anterobasally; microtrichose except bare on basal 1/5 of cell R, posterobasal 1/4 of cell BM, basal 1/5 of cell CuP.

Legs: brownish black, except fifth tarsomeresof middle leg yellow (other tarsi missing in holotype). Legs black pilose, except trochanter and tibia of foreleg and dorsobasal 1/2 of hind tibia pale pilose.

Abdomen. Shining blackish brown. Second segment wider than thorax, widest point at around half the lentgh; third and fourth tergites strongly narrowing. Tergite 1 mostly black pilose, with patch of white pile at posterior 1/2 of lateral margin. Other tergites black pilose. Sternites bare. Genitalia as in fig. 237.

Notes. According to Thompson et al. (1976) this is a synonym of *Microdon triangularis* Curran, which is here treated as a synonym of *M. lacteipennis* Shannon.

Diagnosis. *Stipomorpha litoralis* shares its pilose posterior anepisternum and pilose dorsal part of the katepisternum only with *S. lacteipennis*. From this species it differs by the lack of a whitish fascia in the wing and by the male genitalia.

Distribution. Only known from the holotype, which is from São Paulo, Caraguatatuba, in Brazil.

***Stipomorpha mackiei* (Curran, 1940) comb. nov.**

Figs 169, 238.

Microdon mackiei Curran, 1940: 5.

Studied specimens. HOLOTYPE. GUYANA. Male. Label 1: "Rockstone Br Guiana, June 2 1929 (A. Mackie)"; label 2 (red label): "Microdon mackiei Curran Holotype". Coll. AMNH.

Additionally studied specimens. PERU: 1 male, Madre de Dios, Rio Manu, B iolat biol. sta., Pakitza, 356 m., 11°56'47"S-071°17'W, 9.VII.1992, leg. T.E. Erwin, E. & F. Pfuno, coll. USNM.

SURINAM: 1 female, Blakawatra, 11.VI.1963, leg. J. v.d. Vecht, coll. RMNH; 1 male, Paramaribo, Charlesburg, 21.I.1964, leg. D.C. Geijskes, coll. RMNH; 1 female, Oost-West verbinding, 70 km E of Paramaribo, 21.X.1995, leg. B. De Dijn, coll. RMNH; 2 females, Marowijne, near Perica, malaise trap, 6-20.VIII.1997, leg. B. De Dijn, coll. RMNH; 1 female, Marowijne, near Perica, malaise trap, 21.I.-4.II.1998, leg. B. De Dijn, coll. RMNH; 1 female, Brownsberg, malaise trap, 21.VI-5.VII.2001, leg. A. Gangadin, coll. RMNH; 1 female, Commewijne, Peperpot, 05°46'08"N-55°07'33"W, malaise trap, 24.II-7.III.2006, leg. M. Reemer, coll. RMNH; 1 female, Zanderij, 05°26'19"N-55°12'20"W, leg. M. Reemer, coll. RMNH; 1 female, Commewijne, Peperpot, 05°46'08"N-55°07'33"W, 29.III-6.IV.2006, leg. M. Reemer, coll. RMNH; 1 female, Commewijne, Peperpot, 05°46'08"N-55°07'33"W, 6-14.IV.2006, leg. M. Reemer, coll. RMNH.

Redescription (based on additional material from Surinam)

Adult male. Body size: 9 mm.

Head. Face occupying about 1/3 of head width in frontal view; yellow, with vague, narrow, brownish median vitta on dorsal 2/3; yellow pilose; with narrow strip of white pubescence along eye margin. Gena; yellow; yellow pilose. Lateral oral margins produced; anterior margin notched. Frons about as long as width of lunula; black, except yellow along lunula; yellow pilose. Vertex shining black; golden yellow pilose, except black pilose posteriad of ocelli. Occiput black; yellow pilose. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna yellowish brown. Antennal ratio approximately as 4:1:6; basoflagellomere parallel-sided with rounded apex. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Scutum brownish dorsally, with margins widely yellow, transitions between yellow and brown parts vague; yellow and golden pilose, except for two patches of black pile posterior to transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum without calcars. Pleurae yellow. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow; yellow pilose anterodorsally and along posterodorsal margin. Anepimeron yellow pilose dorsally, bare ventrally. Katatergum and anatergum long and short microtrichose, respectively. Katepimeron bare. Katepisternum bare. Calypter and halter yellow.

Wing: hyaline, tinged with yellow anterobasally; microtrichose, except bare on cell R1 basally along vein RS, on basal 1/2 of cell R except microtrichose along vena spuria, on basal 1/6 of cell BM, on basal 1/10 of cell CuP and on basomedian 1/2 of alula.

Legs: Yellow (but see notes on variation below); yellow pilose, except brown pilose on apicodorsal 1/2 of hind tibia and dorsally on basal tarsomeres of hind leg. Coxae and trochanters yellow and yellow pilose.

Abdomen. Yellow; yellow pilose. Second tergite about as wide as thorax, widest at 1/2 of its length; third and fourth tergites much narrower. Sternites yellow; sparsely yellow pilose; sternite 1 bare. Genitalia as in fig. 238.

Diagnosis. Distinguishable from the very similar *S. tenuicauda* reliably only by the male genitalia. The character of the distribution of microtrichia on the alula, as mentioned in the key, could be verified in a few males only. Whether it works for all specimens (including females) is uncertain.

Notes. *Stipomorpha mackiei* (Curran) is described from the male (contrary to Thompson et al. (1976) who incorrectly state that the type is a female), which has a dark medial stripe on the face. The only known male from Surinam has a yellow face. In most females from Surinam the face is yellow, but some specimens have a faint dark medial stripe. In other characters the specimens from Surinam agree perfectly with the type of *Ubristes mackiei* (Curran). The studied male from Peru has a dark facial stripe, and also differs from the Surinam specimens in the almost entirely dark hind legs and metanotum (yellow in the Surinam specimens). However, in morphological characters, like the genitalia, the specimen is very similar and therefore is considered to belong to the same species. Apparently, colouration of hind legs and metanotum is not a reliable character.

Distribution. Known from Guyana, Peru and Surinam.

***Stipomorpha maculipennis* spec. nov.**

Figs 175–179, 239.

Studied type specimens. HOLOTYPE. ARGENTINA. Male. Label 1: "ARGENTINA: Mis., / Iguazu Nat. Park, / hosteria Hoppe. / c. 140 m. Malaise trap / 10-11.iv.1974. C.R. Vardy / B.M. 1974-204"; label 2 (red): "HOLOTYPE / Stipomorpha / maculipennis / M. Reemer". Coll. BMNH.

Description (based on holotype)

Adult female. Body size: 9 mm.

Head. Face occupying slightly more than 1/3 of head width in frontal view; yellow; yellow pilose, short dorsally and medially, long ventrally and ventrolaterally. Gena yellow. Oral cavity with lateral margins produced. Frons about as long as width of lunula; blackish posterior to lunula, otherwise yellow; yellow pilose, except for posterolateral patches of black pile. Vertex swollen, in profile produced for about 1/3 of height of eye; yellow; yellow pilose, except for two large anterior patches of black pile and black pile along posterior margin. Occiput yellow, except blackish over short dorsolateral stretch; yellowish pilose. Eye bare. Antennal fossa about as wide as high. Antenna with scape yellowish brown, pedicel and basoflagellomere brown. Antennal ratio approximately as 3:1:5; basoflagellomere parallel-sided with rounded apex, with sensory pit at about 2/5 from base. Arista slender, about 3/4 of length of basoflagellomere.

Thorax. Scutum black, with widely yellow margins; black pilose, except yellow pilose along anterior and posterior margins and with medially interrupted fascia of yellow pile along transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Pleurae yellow, except posterior part of anepimeron, dorsal and ventral part of katepisternum, and meron brown. Anepisternum yellow pilose anterodorsally, bare posteriorly. Anepimeron yellow pilose dorsally. Katatergum and anatergum long and short microtrichose, respectively. Other pleurae bare. Metanotum black. Calypter and halter yellow.

Wing: hyaline, with a wide tinge on apical half and with a brown macula anteromedially, between costal vein and base of vein R2+3; microtrichose, except bare on 1st costal cell, extreme base of 2nd costal cell,

entirely on cell R (except microtrichose along vena spuria), basal 2/5 of cell BM, basal 1/5 of cell CuP, basomedian 1/2 of alula.

Legs: Yellow, except hind femur and tibia mostly brownish; yellow pilose, except most of hind leg black pilose. Hind tibia strongly widened; with long, dense black pilosity posteriorly. Coxae and trochanters yellow and yellow pilose.

Abdomen. Tergites 1-2 pale brown. Tergites 3-4 dark brown, except yellow along posterior margin. Tergites yellow pilose, except tergite 2 laterally with black pile intermixed. Sternites 1-3 dark brown. Sternite 4 yellow, except dark brown anteriorly. Sternite 1 bare, other sternites yellow pilose. Genitalia as in fig. 239.

Diagnosis. This is the only known species of Stipomorpha with a dark brown macula anteromedially on the wing.

Etymology. The specific epithet is composed of the Latin words *macula* (spot, mark) and *penna* (wing). This name refers to the brown macula on the wing of this species.

Distribution. Only known from Argentina.

***Stipomorpha mendax* spec. nov.**

Figs 180–183, 240.

Studied type specimens. HOLOTYPE. SURINAM: male, Marowijne, near Perica, E-W verbinding, road 21. 25 km E of Commewijne river. Malaise trap. 6-20.VIII.1997. Leg. B. de Dijn. Coll. RMNH. PARATYPES (all in coll. RMNH). SURINAM: 1 male, Paramaribo, Charlesburg, Krepi, 21.I.1964, leg. D.C. Geijskes; 1 male, Paramaribo, Ma Retraite, 14.I.1964, leg. D.C. Geijskes; 1 male, Paramaribo, Ma Retraite, 9.II.1964, leg. D.C. Geijskes; 1 female, Kwatta, 1.II.1964, leg. D.C. Geijskes.

Additionally studied material. FRENCH GUYANA, 1 female, Montagne de Kaw, Camp Patawa, 11.XII.2002, leg. V. Soon, coll. RMNH.

Description (based on holotype)

Adult male. Body size: 6 mm.

Head. Face occupying about 1/4 of head width in frontal view; shining yellow with vague, narrow median dark vitta; with whitish pilosity, most dense sublaterally and ventrally, very sparse medially; with narrow strip of white pubescence along eye margins. Gena hardly developed, eyes almost directly bordering oral margin; yellow. Lateral oral margins not produced; not reaching below eye margin in lateral view. Frons about as long as width of lunula; brown; yellow pilose laterally. Vertex shining black; black pilose. Occiput black; yellow pilose dorsally, white pilose ventrally. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown. Antennal ratio approximately as 3:1:3,5; basoflagellomere parallel-sided with rounded apex. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Scutum black dorsally, with margins widely yellow; yellow pilose, except for two patches of black pile posterior to transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum without calcars; slightly sulcate apicomedially. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow; yellow pilose anteriorly, bare posteriorly. Anepimeron brownish; yellow pilose dorsally, bare ventrally. Katatergum and anatergum brown; long and short microtrichose, respectively. Katepimeron yellow; bare. Katepisternum brown; bare. Calypter and halter yellow.

Wing: hyaline, without colouration, microtrichose except bare basally on cell R1 along vein RS, on basal 3/4 of cell R, posterobasal 1/2 of cell BM, basomedian 1/6 of alula.

Legs: Yellow, except hind tibia blackish with narrowly yellow base and first three tarsomeres of hind tarsus brown; yellow pilose, except tarsi dorsally black pilose and hind tibia long black pilose on apical 3/4. Coxae and trochanters yellow and yellow pilose.

Abdomen. Yellow and short yellow pilose. Second tergite slightly wider than thorax, widest at basal 1/3; third and fourth tergites much narrower. Sternites yellow; sparsely yellow pilose; sternite 1 bare. Genitalia as in fig. 240.

Diagnosis. Very similar to *S. fallax*, *S. fraudator* and *S. spuria*. For differences with those species see key.

Etymology. The name *mendax* (Latin for lying, deceiving) was chosen in analogy of the names *fraudator* (Latin for cheating, deceiving) and *spuria* (Latin for false), two very similar-looking species of *Stipomorpha*.

Notes. This species is keyed out in the key three times, because of variability in microtrichosity on the alula, variability in overall colouration and colouration of pilosity, and because of sexual dimorphism in wing colouration. In some specimens the alula is entirely

microtrichose, while in others it has a small bare area basomedially. The only female identified as this species (see additionally studied material) differs from the males in the presence of a faint whitish cloud in the apical half of the wing (view against dark background). In other characters it is similar to the male.
Other varying characters: in some specimens the vertex is black pilose (as in the holotype), in others it is yellow pilose. The extent of black pile on the scutum also varies, as well as the extent of dark colouration on the abdomen. However, no discrete differences were found and the genitalia are similar in all male specimens.
Distribution. Only known from Surinam.

***Stipomorpha micromidas* (Shannon, 1925) comb. nov.**
Figs 184–188, 241.
Microdon micromidas Shannon, 1925: 112.
Studied type specimens. HOLOTYPE. PANAMA: female, label 1: "Taboga, Panama"; label 2: "23 Febr. 1912"; label 3: "A. Busck coll."; label 4: "Type no. 27833 U.S.N.M"; label 5: "Microdon micromidas Snn." Coll. USNM.
Additionally studied specimen. COSTA RICA. Male. Label 1: "COSTA RICA. Prov. Guanacaste, P.N. / Rincón de la Vieja, Send. a las aguas / termales, 900-1000 m. 6-7 OCT / 2001. D. Briceño. Red con Aguamiel. / L_N_305843_392970 #64950"; label 2 (barcode): "INB0003380896 / INBIOCRI COSTA RICA"; label 3 (red): "Ultimo especimen en / BD A. Lépiz / 2-7-2002" / other side: "? MCR-25". Coll. INBIO.
Redescription (based on holotype)
Adult female. Body size: 6,5 mm.
Head. Face occupying slightly less than 1/3 of head width in frontal view; shining yellow; entirely yellow pilose, most densely laterally and ventrally, very sparse medially. Gena hardly developed, eyes almost directly bordering oral margin; yellow. Lateral oral margins not produced; not reaching below eye margin in lateral view. Frons and lunula black; frons yellow pilose. Vertex convex; shining black; yellow pilose. Occiput black; yellow pilose dorsally, white pilose ventrally. Eye very sparsely and short pilose, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown; antennal ratio 3:1:5,5; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 3/4 from base; arista slender, about 3/4 of length of basoflagellomere.
Thorax. Scutum shining black; yellow pilose, except for three patches of black pile on anterior half and two patches of black pile on posterior half. Postpronotum and postalar callus black; yellow pilose. Scutellum black anteriorly, yellow along posterior margin; yellow pilose. Pleurae blackish. Anepisternum yellow pilose anteriorly and posteriorly, widely bare in between. Anepimeron entirely yellow pilose. Katepisternum yellow pilose dorsally, bare ventrally. Katepimeron bare. Katatergum and anatergum short and long microtrichose, respectively. Calypter and halter yellow.
Wing: hyaline, tinged with yellow, with greyish tip (apical of vein M1) and greyish fascia along vein dm-cu; microtrichose, except bare on basal 1/8 of cell CuP.
Legs: Front and mid legs yellow and yellow pilose. Hind leg yellow, except apical 1/2 of tibia and basal two tarsomeres of tarsus blackish (3rd tarsomere intermediately coloured); yellow pilose, except black pilose on blackish parts and on entire dorsal part of hind tarsus. Coxae and trochanters blackish yellow; yellow pilose.
Abdomen. Brownish yellow; short yellow pilose. Second tergite slightly wider than thorax, widest at basal 1/3; third and fourth tergites much narrower. Sternites yellow; bare, except sternite 4 yellow pilose.
Description of male. As female, except for following differences.
Adult male. Body size: 8 mm.
Head. Face occupying about 1/4 of head width in frontal view. Frons about as long as width of lunula. Vertex black; golden yellow pilose, except black pilose posteriad of ocellar triangle.
Thorax. Scutellum black; yellow pilose.
Wing: greyish fascia along vein dm-cu hardly visible.
Legs: Hind femur yellow and yellow pilose, except for vaguely demarkated dark ring around middle 1/3, with patch of black pile anteriorly. Hind tibia black and black pilose, except yellow and yellow pilose on basal 1/5. Hind tarsus with tarsomeres 1-2 black, tarsomere 3 brownish, tarsomeres 4-5 yellow; black pilose.
Abdomen. Genitalia as in fig. 241.
Diagnosis. The only known *Stipomorpha*-species with a pilose dorsal part of the katepisternum and a completely yellowish abdomen. The wing tip is grey-

ish, in contrast with the yellowish basal 2/3 of the wing.

Distribution. Costa Rica and Panama.

***Stipomorpha mixta* (Curran, 1940) comb. nov.**

Figs 189–193, 242.

Microdon mixtus Curran, 1940: 6.

Studied type specimens. HOLOTYPE. GUYANA. Female. Label 1 (small round, red-bordered label): "Holotype"; label 2: "British Guyana: Cuyuni R., Kamaria Landing. 22.XI.1929. Oxf. Univ. Expedn. B.M. 1929-485."; label 3: "6250"; label 4 (red): "*Microdon mixtus* Curran Holotype female"; label 5: "*Microdon mixtus* Curran Det. C.H. Curran"; label 6: "Note 389". Coll. BMNH.

Additionally studied specimens. FRENCH GUYANA: 1 male & 1 female, Kaw Mountains, 04°32,893'N-52°10,245'W, 30.XII.2002, leg. V. Soon, coll. RMNH; GUYANA: 1 male, Kurupkari: 4°40'N, 58°40'W, sept.-nov. 1992, leg. BMNH(E)2006-132, coll. BMNH; SURINAM: 1 female, Brownsberg, 04°56'45"N-55°10'59"W, 2.VI.2006, leg. M. Reemer, coll. RMNH.

Redescription (based on holotype)

Adult female. Body size: 8,5 mm.

Head. Face occupying almost 1/3 of head width in frontal view; shining yellow with yellow pilosity, a little longer around oral margin. Gena yellow. Oral cavity with lateral margins not produced and not notched anteriorly. Frons black; yellow pilose, except for bare triangular part posterior to lunula. Vertex black; yellow pilose. Occiput black; black pilose dorsally, yellow pilose laterally, gradually getting white ventrally. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown, scape yellow on basal 3/4. Antennal ratio 6:1:6; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 2/3 from base, just ventrad of a groove that ranges from the base of the arista to the apex. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Yellow, except blackish brown on scutum, leaving wide yellow lateral margins. Scutum yellow pilose, except for lateral patches of dark pile posterior to transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum without calcars. Anterior and posterior part of anepisternum not differentiated; anterior part yellow pilose, posterior part bare. Anepimeron yellow pilose dorsally. Katatergum and anatergum pilose and microtrichose, respectively. Other pleurae bare. Calypter and halter yellow.

Wing: hyaline, tinged with yellow in and posterior to costal cell and in and posterior to pterostigma. Microtrichose except bare on posterobasal 1/4 of cell R, basal 1/2 of cell BM.

Legs: Yellow and yellow pilose, except with long black pile on apical 1/2 of hind-etatibia and dorsally on hind tarsi. Hind-tibia strongly widened, widest point around 1/2. Coxae and trochanters yellow and yellow pilose.

Abdomen. Yellow. Tergite 2 wider than thorax, widest at posterior margin; tergites 3 and 4 about as wide as thorax. Tergite 1 and 2 black pilose. Tergite 1 with anteromedian smooth, concave area. Tergite 3 black pilose, with some yellow pile laterally. Tergite 4 black pilose anteriorly and medially (in the shape of a T with a wide cross-bar), yellow pilose laterally and posteriorly. Sternite 1 narrow and bare, separated from sternite 2 by a membrane of about the width of sternite 1. Sternite 2 pilose, laterally twice as wide as medially, separated from sternite 3 by a membrane of about the median width of sternite 2. Sternite 3 and 4 pilose, not separated by membrane

Male. (See also notes below!) Body size: 7 mm. As female, except for following characters (based on 1 specimen). Face occupying about 1/4 of total head width in frontal view. Frons yellow anteriorly, black posteriorly; mixed yellow and black pilose. Antenna yellowish brown; basoflagellomere slightly longer than scape; antennal ratio approximately as 4:1:5. Wing bare on basal 1/3 of cell R1, entirely on cells R and BM, basal 1/3 of cell CuP. Tergite 3 yellow pilose, except black pilose laterally. Tergite 4 yellow pilose along anterior margin, on median 1/3 and along posterior margin, black pilose on lateral 1/3. Genitalia as in fig. 241.

Diagnosis. From other *Stipomorpha* species with a yellow scutellum and abdomen, *S. mixta* differs by the following characters: posterior part of anepisternum bare, alula entirely microtrichose, wing uniformly hyaline, vertex black, tarsi entirely yellow, anterior margin of tergite 2 not curled around tergite 1 laterally.

Notes. A very variable species in colouration of pilosity, antennal ratio and extent of microtrichosity on wings. Possibly this variability indicate that there is more than one species involved, but this could not be determined with the available material.

The female specimen from Surinam was captured af-

ter the collector saw it tumbling down (from the canopy?) on shrub leaves along a narrow path in dense primary forest.
Distribution. Known from Guyana, Surinam and French Guyana.

***Stipomorpha panamana* spec. nov.**
Figs 194–198, 243.
Studied type specimens. HOLOTYPE. PANAMA. Male. Label 1: "El Cermeno / Pan. I-IV.41 / Fly trap / Zetek no. 4775"; label 2: "LotNo / 41-7233". Coll. USNM.
Redescription (based on holotype)
Adult male. Body size: 8 mm.
Head. Face occupying about 2/5 of head width in frontal view; yellowish brown, with oblique blackish line from anennal fossa to eye margin; yellow pilose, short dorsally and medially, long ventrally and ventrolaterally. Gena yellow. Oral cavity with lateral margins a little produced and notched anteriorly. Frons about as long as width of lunula; blackish posterior to lunula, yellow laterally; yellow pilose. Vertex swollen, in profile produced for about 1/4 of height of eye; yellowish brown; yellow pilose, except for fascia of black pile anteriorly and medially interrupted fascia of black pile along posterior margin. Occiput yellow, except black dorsolaterally; yellow pilose. Eye bare. Antennal fossa about as wide as high. Antenna brown, with scape yellowish on basal half. Antennal ratio 4:1:6; basoflagellomere parallel-sided with rounded apex, with sensory pit at approximately half its length. Arista slender, about 3/4 of length of basoflagellomere.
Thorax. Scutum black, with widely yellow margins; yellow pilose, except for four patches of black pile, two of which anteriad of and two posteriad of transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum without calcars. Pleurae yellow dorsally, brownish ventrally. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow pilose anterodorsally and along posterodorsal margin. Anepimeron yellow pilose dorsally. Katatergum and anatergum yellow pilose and microtrichose, respectively. Other pleurae bare. Calypter and halter yellow.
Wing: hyaline, with whitish tinge on apical half (only visble against dark background), costal and subcostal cells brownish; microtrichose except bare on basal 1/6 of cell R1, on basal 1/2 of cells R and BM, on basal 1/10 of cell CuP and basomedially on alula.
Legs: yellow; yellow pilose, except hind tibia dorsally mixed black and yellow pilose, and hind tarsus dorsally black pilose. Coxae and trochanters yellow and yellow pilose.
Abdomen. Tergites yellowish brown, except tergite 3 dark brown on anterior 2/3 and tergite 4 dark brown over most of dorsal surface (yellow along posterior and lateral margins); yellow pilose. Sternites brown; sternites 1 and 2 bare, sternites 3 and 4 yellow pilose. Genitalia as in fig. 243.
Diagnosis. See key.
Distribution. Only known from Panama.

***Stipomorpha puerilis* (Doesburg, 1966) comb. nov.**
Figs 199-201.
Ubristes puerilis Doesburg, 1966: 86.
Studied type specimens. HOLOTYPE. SURINAM. Female. Label 1 (yellow): "HOLOTYPE"; label 2: "Zanderij Surin. / 23-9-1960 / P.H. v. Doesburg Jr."; label 3: "Ubristes / nanus Dsb. [female sign] / det. v. Doesburg"; label 4: see notes. Coll. RMNH.
Additionally studied specimens. VENEZUELA: 1 female, T.F. Amaz., Cerro de la Neblina, 140 m., 0°50'N-66°10'W, 21-28.II.1985 (malaise trap in rain forest), leg. P.J. & P.M. Spangler, R.A. Faitoute & W.E. Steiner, coll. USNM.
Notes. No specimen labelled as this species could be found in the RMNH collection, but there is a specimen labelled as '*Ubristes nanus* Doesburg'. This specimen agrees with the description of *Ubristes puerilis* and is from the same date and locality as the type of *U. puerilis*. Presumably Van Doesburg first intended to name the species *nanus*, but later changed his mind without correcting the label. Under this assumption, a new label was added to the pin by the present author: 'HOLOTYPE *Ubristes puerilis* Van Doesburg, 1966'.
Distribution. Known from Surinam and Venezuela.

***Stipomorpha simillima* (Hull, 1950) comb. nov.**
Figs 202–206, 244.
Microdon simillimus Hull, 1950: 611.
Studied type specimens. HOLOTYPE. GUYANA: male, label 1 (small round, red-bordered): "Holotype"; label 2:"Dark forest"; label 3: "A in cop. with B"; label 4: "British Guyana: Essequibo R., Moraballi

Creek. 17.X.1929. Oxf. Univ. Expedn. B.M. 1929-485."; label 5 (red): "Holotype *Microdon simillima* Hull". Coll. BMNH.

PARATYPES. GUYANA: male; label 1 (small, round, yellow-bordered): "Paratype"; label 2: "Dark forest."; label 3: "British Guyana: Essequibo R., Moraballi Creek. 17.X.1929. Oxf. Univ. Expedn. B.M. 1929-485."; label 4 (yellow): "Paratype *Microdon simillima* Hull". Coll. BMNH.

Male. Label 1: "British Guiana: / Essequibo R., / Moraballi Creek / 25.ix.1929. / Oxf. Univ. Expedn. / B.M. 1929-485."; label 2 (yellow): "Paratype / Microdon / simillima / Hull". Coll. CNC.

Additionally studied specimens. BRAZIL: 1 male, Belém, Pará, 17.V.1967, leg. Y. Sedman, coll. USNM; FRENCH GUYANA: 1 male, Crique Sapokal Degrad Laurens, 95 m., N 3°16' / W 52°41', , 26.viii-2. ix.2000, malaise trap, leg. A.E.I. Guyane, coll. J.T. Smit; PERU: 1 female, Madre de Dios, Rio Tambopata, Sachavacayoc centre, N 12°51'20.1" / W 69°22'20.1", 9-14.X.2010, malaise trap, leg. & coll. J.T. Smit; 1 female, Madre de Dios, Rio Tambopata, Sachavacayoc centre, N 12°51'46.4" / W 69°21'46.6", 14-20.X.2010, malaise trap, leg. & coll. J.T. Smit.

Redescription (based on holotype)

Adult male. Body size: 6-7 mm.

Head. Face occupying 1/4 of head width in frontal view; shining yellow with a pale brown median stripe from oral margin to just below antennae, gradually narrowing upward; face with white pilosity, a little longer around oral margin, except bare on median stripe. Gena blackish. Occiput black; black pilose dorsally, getting white laterally and ventrally. Oral cavity with hardly produced lateral margins. Frons and lunula black and short black pilose, except for bare triangular part posterior to lunula. Vertex black; black pilose. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna blackish brown, except scape yellow on interior sides., scape and pedicel dark pilose; antennal ratio 4:1:3,5; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 3/4 from base, within a vague groove that ranges from just before 1/2 to just after the pit; arista slender, about 2/3 of length of basoflagellomere, very shortly pilose, appearing bare under low magnification.

Thorax. Black, more brownish on pleurae. Postpronotum, scutum, postalar callus and scutellum short black pilose, except a few pale pile on scutellum (and possibly along transverse suture of scutum, but not well visible in type specimen). Scutellum semicircular, without calcars. Anepisternum more or less flat, pilose anterodorsally. Anepimeron pilose posterodorsally. Katepisternum and katepimeron bare. Calypter grey, halter yellowish.

Wing: hyaline, with faint yellowish cloud on and posterior to pterostigma and with faint dark cloud between apex of costal cell and vena spuria, and microtrichose except bare on basal 3/4 of cell R, basal 1/2 of cell BM, anterobasal 1/4 of cell CuP.

Legs: brownish black, except anterior four tarsi yellow with first tarsomere more brownish. Legs black pilose, except anterior four tibiae pale pilose and hind-tibia pale pilose on basal 1/3; pile on hind-tibia a little longer than half the width of the tibia. First tarsomere of hind-tarsus as long as 1/3 of length of hind-tibia, a little wider than apex of tibia, twice as long as wide (dorsal view). Front-coxae and trochanters pale pilose; mid- and hind-coxae and -trochanters black pilose.

Abdomen. Blackish (but see diagnosis). Second segment wider than thorax, widest point at half the lentgh; third and fourth tergites strongly narrowing. Tergite 1 black pilose laterally; with anterolateral 'ridges'; with anteromedian smooth, concave area. Tergite 2 black pilose laterally, pale pilose dorsally. Tergite 3 black pilose. Tergite 4 black pilose, lateral margins with pale pilosity, which is posteriorly connected with two submedial lines of pale pile on posterior half of the tergite. Sternite 1 narrow and bare, separated from sternite 2 by a membrane of twice the width of sternite 1. Sternite 2 bare, laterally twice as wide as medially, separated from sternite 3 by a membrane of 1,5 times the median width of sternite 2. Sternite 3 and 4 pilose, not separated by membrane. Genitalia as in fig. 244.

Female. As male, except for usual sexual differences.

Diagnosis. From other *Stipomorpha*-species with a black thorax, *S. simillima* can be recognized by the following characters: face largely yellow with narrow median brown stripe, basoflagellomere about as long as or slightly shorter than the scape, anepisternum only pilose anterodorsally, katepisternum bare, structure of male genitalia. The colouration of the abdomen appears to be quite variable, from blackish in the holotype to pale brown in the paratype.

Distribution. Known from Guyana, French Guyana, Brazil and Peru.
Notes. The fourth label on the holotype reads "A in cop. with B". Apparently the male holotype has been collected in copula with a female that has later been labelled as specimen B. The whereabouts of this female are unknown. In the original description Hull (1950) only mentions two male paratypes, one of which is present in the BMNH collection.

***Stipomorpha spuria* nov. sp.**
Figs 207–209, 245.
Type specimens: HOLOTYPE. SURINAM: male, Commewijne, Peperpot. 05°46'08"N-55°07'33"W. 20.IV.2006. Leg. M. Reemer. Coll. RMNH.
Description (based on holotype)
Adult male. Body size: 7 mm.
Head. Face occupying about 1/3 of head width in frontal view; shining yellow with whitish pilosity, most dense sublaterally and ventrally, almost bare medially. Gena developed, about as wide as 2nd antennal segment; yellow. Oral margins laterally a little produced; in lateral view reaching below ventral eye margin. Frons about as long as lunula; yellow; yellow pilose laterally. Vertex a little swollen; shining black; yellow pilose. Occiput black; yellow pilose dorsally, whitish pilose ventrally. Eye bare. Antennal fossa about as wide as high. Antenna pale brown. Antennal ratio approximately as 3:1:4; basoflagellomere parallel-sided with rounded apex, with small sensory pit at 2/3 from base. Arista black; slender; about 3/4 of length of basoflagellomere.
Thorax. Scutum black, but widely yellow along margins and narrowly along transverse suture; golden yellow pilose, except for medially interrupted fascia of black pile posteriorly of transverse suture. Postpronotum, postalar callus and scutellum yellow and yellow pilose. Scutellum semicircular, without calcars. Pleurae yellow, except ventral part of katepisternum, meron, dorsal part of katatergum and metanotum blackish. Anepisternum weakly convex, without distinction between anterior and posterior part; yellow pilose anterodorsally and along posterior margin. Anepimeron entirely yellow pilose. Katatergum and anatergum long and short microtrichose, respectively. Other pleurae bare. Calypter and halter yellow.
Wing: hyaline, without colouration, microtrichose except bare on basal 1/4 of cell R, basal 1/4 of cell BM, basal 1/5 of cell CuP and basomedian 1/6 of alula.
Legs: Front- and mid-legs yellow and yellow pilose, except mid-femur partly black pilose posteriorly. Hind leg yellow, except apical 1/2 of tibia and first two tarsomeres darkened; femur yellow pilose, except black pilose anteriorly on basal 1/2; tibia yellow pilose on basal 1/3, black pilose on apical 2/3; first three tarsomeres black pilose dorsally, last two tarsomeres yellow pilose. Coxae and trochanters yellow and yellow pilose, except hind coxa black pilose anteriorly.
Abdomen. Yellow; entirely yellow pilose. Second tergite about as wide as thorax, widest at basal 1/3; third and fourth tergites much narrower. Sternites yellow; sparsely yellow pilose, except sternite 1 bare. Genitalia as in fig. 245.
Female. Unknown.
Etymology. The name *spuria* (Latin for false) was chosen in analogy of the names *fallax*, *fraudator* and *mendax*, which have approximately the same meaning, in order to stress the similarity of these species.
Diagnosis. Very similar to *S. fallax*, *S. fraudator* and *S. mendax*. For differences with those species see key.
Distribution. Only known from the holotype from Surinam.

***Stipomorpha tenuicauda* (Curran, 1925) comb. nov.**
Figs 210–213, 246.
Microdon tenuicaudus Curran, 1925: 339.
Studied type specimens. HOLOTYPE. PERU: female; label 1: "El Campamiento. Col. Perene. PERU. Jult '20"; label 2: "Cornell Univ. Expedition Lot 607"; label 3 (red): "Type Microdon tenuicauda Curran"; label 4 (red): "Holotype Cornell U. No. 1736"; label 5: "Microdon tenuicauda Curran Det. C.H. Curran". Coll. CU.
Additionally studied specimens. BOLIVIA: 1 male, La Paz Prov., Mapiri, Arroyo Tuhiri, 15°17'26"S-68°15'46"W, 12.IV.2004, leg. & coll. M. Hauser; 1 male with same locality info, but 13.IV.2004, coll. RMNH; BRAZIL: 1 male, Belém, Pará, 26.IV.1967, leg. Y. Sedman, coll. USNM; COSTA RICA: 4 females, Puntar, Golfo Dulce, 3 km SW Rincón, 10 m, 1989-1990, leg. Hanson, coll. USNM; ECUADOR: 1 female, Napo, Jatun Sacha Res., 6 km E Misahualli, 450 m, 30.IV-8.V.2002, leg. S.A. Marshall, DNA voucher specimen no. S259, G. Ståhls, FMNH Helsinki,

coll. USNM; FRENCH GUYANA: 1 male, Patawa, 4°32.658'N-52°9.132'W, leg. O. Morvan, coll. CNC; PERU: 1 female, Cusco, River Ceosnibata, 12.XII.1951, leg. Woytkowski, coll. CNC; 1 female, Avispas, Madre de Dios, 400 m, 20-30.IX.1962, leg. L. Pena, coll. USNM.

Redescription (based on holotype)

Adult female. Body size: 9 mm.

Head. Face occupying almost 1/3 of head width in frontal view; shining yellow with yellow pilosity, a little longer around oral margin. Gena yellow. Oral cavity with lateral margins produced and notched anteriorly. Frons black; yellow pilose, except for yellow bare triangular part posterior to lunula. Vertex black; yellow pilose; convexly produced. Occiput black; yellow pilose. Eye very sparsely and short pilose, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna yellowish brown, pedical and basoflagellomere a little darker. Antennal ratio 4:1:5; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at apical 1/4. Arista slender, about 3/4 of length of basoflagellomere.

Thorax. Scutum shining black, except yellow along margins, widely so around postpronotum and postalar callus; appressed golden yellow pilose, except erect along anterior and posterior margin and with lateral fasciae of half-erect black pile along transverse suture. Postpronotum and postalar callus yellow and yellow pilose. Scutellum yellow; yellow pilose anteriorly, otherwise black pilose. Pleurae yellow, except katepimeron posteriorly and katatergum anteriorly blackish. Anterior and posterior part of anepisternum not differentiated, more or less convex; anterior part yellow pilose, posterior part yellow pilose along posterior margin. Anepimeron yellow pilose dorsally. Katatergum and anatergum long and shortmicrotrichose, respectively. Other pleurae bare. Metanotum shining blackish, except yellow on dorsal 1/3. Calypter and halter yellow.

Wing: hyaline, tinged yellow, especially on anterobasal 1/2; microtrichose except bare on basal 1/2 of cell R, posterobasal 1/4 of cell BM, basal 1/4 of cell CuP and on at least 90% of alula.

Legs (including coxae and trochanters) yellow and yellow pilose, except: hind tibia whitish pilose on basal 3/5 and with black ground colour and black pilose on apical 2/5; hind tarsus with first two tarsomeres black and black pilose. Metatibia strongly widened, widest point around 1/2.

Abdomen. Yellow and yellow pilose. Second tergite about as wide as thorax, widest at posterior 1/3; other tergites clearly narrower. Sternite 1 narrow and bare, separated from sternite 2 by a membrane of about the width of sternite 1. Sternite 2 pilose, laterally twice as wide as medially, separated from sternite 3 by a membrane of about twice the median width of sternite 2. Sternite 3 and 4 pilose, not separated by membrane. Genitalia as in fig. 246.

Male. As female, except for usual sexual differences.

Diagnosis. Distinguishable from the very similar *S. mackiek* reliably only by the male genitalia. The character of the distribution of microtrichia on the alula, as mentioned in the key, could be verified in a few males only. Whether it works for all specimens (including females) is uncertain.

Distribution. Known from Brazil, Costa Rica, Ecuador, French Guyana and Peru.

***Stipomorpha trigoniformis* (Shannon, 1927) comb. nov.**

Figs 214–217, 247.

Microdon (Ubristes) trigoniformis Shannon, 1927: 19. Type locality:

Studied type specimens. HOLOTYPE. BRAZIL. Male. Label 1 (small, round, red-bordered): "Holotype"; label : "Villa Nova", other side: "55 37"; label 3: "*Microdon Ubristes trigoniformis* Snn.". Coll. BMNH.

Additionally studied specimens. FRENCH GUYANA: 1 male, Kaw mountains, 04°33,562'N-52°12,425'W, 21.X.2002, leg. V. Soon, coll. RMNH.

Redescription (based on holotype)

Adult male. Body size: 7,5 mm.

Head. Face occupying 1/4 of head width in frontal view; shining black with yellow lateral margins, the black part occupying 2/3 of face; face with white pilosity, bare on median 1/3. Gena hardly developed, yes directly bordering oral cavity. Oral margins black, laterally produced and anteriorly notched. Frons and vertex black and short black pilose, except for bare triangular part posterior to lunula. Occiput black; black pilose on dorsal half, white on ventral half. Eye sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna blackish brown; antennal ratio 3:1:3,5; basoflagellomere parallel-sided with narrowly rounded apex; arista

slender, about 3/5 of length of basoflagellomere.
Thorax. Black. Postpronotum, scutum, postalar callus and scutellum short black pilose, except a few pale pile along transverse suture. Scutellum semicircular, without calcars. Anepisternum more or less flat, pilose anterodorsally. Anterior part of anepimeron pilose dorsally. Katepisternum and katepimeron bare. Calypter grey, halter blackish.
Wing: hyaline, with faint brownish hue all over; microtrichose except bare on basal 2/3 of cell R, basal 1/8 of cell BM, anterobasal 1/4 of cell CuP.
Legs: brownish black, except fifth tarsomeres of all tarsi yellow. Legs black pilose, except tibiae pale pilose basally (extent hard to assess in holotype); pile on hind-tibia a little longer than half the width of the tibia. First tarsomere of hind- tarsus as long as 1/3 of length of hind-tibia, a little wider than apex of tibia, 1,5 times as long as wide (dorsal view). Coxae and trochanters black pilose.
Abdomen. Blackish brown. Second segment slightly wider than thorax, widest point at anterior 1/3; third and fourth tergites strongly narrowing. Tergite 1 black pilose anterolaterally; with anteromedian smooth, concave area. Tergite 2 black pilose anterolaterally, pale pilose laterally and dorsally. Tergite 3 and 4 pale pilose. Sternite 1 bare. Genitalia as in 235.
Female. Unknown.
Diagnosis. From other *Stipomorpha*-species with a black thorax, *S. trigoniformis* can be recognized by the following characters: katepisternum bare, alula entirely microtichose, wing without whitish transverse fascia.
Distribution. Known from Brazil and French Guyana.

***Stipomorpha wheeleri* (Mann, 1928) comb. nov.**
Figs 218–222, 248.
Microdon wheeleri Mann, 1928.
Studied type specimens. Two specimens labelled as types (red labels) in USNM-collection: 1 male & 1 female; both with same labels: label 1: "no. 147"; label 2: "Red Tank, C.Z. 2.27.23, W.M. Wheeler". The female has an additional label stating: "*Microdon wheeleri* Mann type". Mann (1928) stated that he designated a 'type and allotype'. As his description is based primarily on the female, which also carries a lable stating 'type', this is regarded as the holotype. There are also two specimens (same locality and date) labelled as paratypes on blue labels, as well as four empty puparia, from which the specimens were reared.
Redescription (based on holotype)
Adult female. Body size: 8 mm.
Head. Face occupying slighty more than 1/3 of head width in frontal view; shining pale yellow; yellow pilose on lateral 1/4, bare medially. Gena yellow. Oral margins not produced laterally, not notched anteriorly. Frons and vertex yellow; yellow pilose; ocellar triangle black, elevated; frontal ocellus split in two. Occiput yellow; yellow pilose. Eye bare. Antennal fossa about as wide as high. Antenna pale brown; antennal ratio 3,5:1:3; basoflagellomere parallel-sided with rounded apex, with sensory pit at 3/4 from base; arista slender, about 2/3 of length of basoflagellomere.
Thorax. Scutum shining dark brown, except yellow along margins; yellow pilose, except for a medially interrupted fascia of black pile posterior to tramsverse suture. Postpronotum and postalar callus yellow; yellow pilose. Scutellum yellow; yellow pilose. Anepisternum more or less flat, pilose anteriorly and posteriorly, widely bare in between; brown anteriorly, yellow posteriorly. Anterior anepimeron yellow pilose dorsally, bare ventrally. Posterior and dorsomedial anepimeron yellow; bare. Katepisternum and katepimeron yellow; bare. Meron, katatergum and anatergum brown; bare. Katatergum long microtrichose, anatergum short microtrichose. Calypter blackish, halter yellow.
Wing: hyaline, tinged with yellow; microtrichose except bare on basal 1/10 of cell R1, on most of cell R except microtrichose along vena spuria, on posterobasal 2/3 of cell BM, on basal 1/3 of cell CuP.
Legs: Yellow; yellow pilose, except dorsal surface of hind tibia and basal there tarsomeres of hind tarsus black pilose. Coxae and trochanters yellow; yellow pilose.
Abdomen. Yellow; yellow pilose. Second tergite wider than thorax, widest point at 2/3 from base; third and fourth tergites strongly narrowing. Tergites 3 and 4 fused, with abrupt lateral transition (view from dorsal). Sternite 1 bare, other sternites sparsely yellow pilose.
Male (based on paratype). As female, except for following differences.
Head. Face occupying about 1/3 of head width in frontal view. Frons dark brown; yellow pilose. Vertex dark brown, black pilose. Occiput brown; black

pilose dorsally, yellow pilose ventrally. Basoflagellomere with sensory pit at 2/3 from base; arista slender, about 2/3 of length of basoflagellomere.

Thorax. Scutum entirely blackish brown; entirely black pilose. Postpronotum, postalar callus and scutellum black pilose. Pilosity of pleurae as in female, bu black instead of yellow.

Legs: Brown, more extensively black pilose.

Abdomen. Brown and black pilose on tergites 1, 2 and basal half of 3, then gradually getting yellow and yellow pilose. Genitalia as in fig. 248 (drawn from paratype).

Notes. The male paratype is much darker in colouration than the female holotype. Mann (1928) writes that Wheeler, who reared the specimens from their pupae, told him that all specimens were yellow at the time of emergence and darkened gradually. So, possibly the female is yellow because it is teneral.

Distribution. Only known from Panama.

Ecology. According to Mann (1928) the pupae from which the type series was reared, were found in nests of *Crematogaster* (*Orthocrema*) *brevispinosa* Mayr subsp. *tumulifera* Forel in *Cordia alliodora* Ruiz & Pavon (Boraginaceae).

***Stipomorpha zophera* spec. nov.**

Figs 223–225, 249.

Studied type specimens. HOLOTYPE. FRENCH GUYANA. Male. Label 1: "FRENCH GUIANA / Montagnes Tortue / 4°15,007'N 52°21,512'W / leg. V. Soon 11.01.2003"; label 2 (red): "HOLOTYPE / Stipomorpha zophera / M. Reemer". Coll. RMNH.

PARATYPES: FRENCH GUYANA: 1 male same locality & leg. as holotype, but with date 9.IX.2002; 1 male, Kaw Mountains, 04°32,893'N-52°10,245'W, 8.XII.2002, leg. V. Soon, coll. RMNH.

Additionally studied specimens. ECUADOR: 1 male, Napo, Limoncocha, 15.VI.1977, leg. P.J. Spangler & D.R. Givens, coll. USNM. GUYANA: 1 male, Mazaruni-Potaro District, Takutu Mountains, 6°15'N, 59°5'W, 9.XII.1983, leg. W.E. Steiner, coll. USNM.

Description (based on holotype)

Body size. 7 mm.

Adult male. Head. Face occupying 1/4 of head width in frontal view; shining yellow with a blackish brown median stripe from antennal fossa to slightly below middle; face with yellow pilosity, replaced by longer black setae around oral margin, except bare on median stripe. Gena brown. Occiput black; black pilose dorsally, getting white laterally and ventrally. Oral cavity with lateral margins not produced. Frons and lunula black, short black pilose, except for bare triangular part posterior to lunula. Vertex black; black pilose. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown; scape and pedicel dark pilose; antennal ratio 6:1:8; basoflagellomere with apical 1/3 clearly narrower than basal 2/3, with sensory pit located at about 3/5 from base, within a vague groove; arista slender, about 3/5 of length of basoflagellomere, very shortly pilose, appearing bare under low magnification.

Thorax. Scutum black; black pilose, except for medially interrupted fascia of yellow pile along transverse suture. Postpronotum and postalar callus pale brown; black pilose. Scutellum brown; black pilose.

Anepisternum more or less flat, black pilose anterodorsally, bare posteriorly. Anepimeron black pilose dorsally. Katepisternum and katepimeron bare. Calypter grey, halter yellowish.

Wing: hyaline; microtrichose except bare along vein RS on basal part of cell R1, entirely on cell R, on basal 4/5 of cell BM, anterobasal 1/4 of cell CuP, basomedially on alula.

Legs: brownish black, except anterior four tarsi yellow and hind tarsi with last three tarsomeres yellowish brown. Legs black pilose, except hind coxa and trochanter mixed black and white pilose. Pile on metatibia a little longer than half the width of the tibia. First tarsomere of posterior tarsus as long as 2/5 of length of metatibia, a little wider than apex of tibia, twice as long as wide (dorsal view).

Abdomen. Blackish brown. Second segment wider than thorax, widest point at half the lentgh; third and fourth tergites strongly narrowing. Tergites pale pilose, except tergites 1 and 2 laterally black pilose. Sternite 1 bare, other sternites pilose. Genitalia as in fig. 249.

Female. unknown.

Diagnosis. From other *Stipomorpha*-species with a black thorax, *S. zophera* can be recognized by the following characters: face largely yellow with narrow median brown stripe, basoflagellomere longer than scape, alula partly bare, anepisternum black pilose anterodorsally, bare posteriorly, katepisternum bare, structure of male genitalia.

Very similar to *S. inarmata*, from which it differs by: basoflagellomere longer than scape, anterior part of anepisternum black pilose, front- and mid-tibiae black pilose,

Etymology. The specific epithet *zophera* (Gr., dusky, gloomy) refers to the dark colour of this species.

Distribution. Known from Ecuador, Guyana and French Guyana.

Ecology. According to the label, the studied specimen from Guyana was collected "at blacklight in forest clearing near streams".

***Ubristes flavitibia* Walker, 1852**

Figs 250–253, 263.

Ubristes flavitibia Walker, 1852: 217.

Microdon procedens Curran, 1941: 251. Syn. nov.

Microdon procteri Curran, 1941: 251. Syn. nov.

Studied type specimens. HOLOTYPE *Ubristes flavitibia*. BRAZIL. Male. Label 1: "Holotype"; label 2: "Type"; label 3: "*Ubristes flavitibia*"; label 4: "*Ubristes flavitibia* Wlk." Coll. BMNH.

HOLOTYPE *Microdon procedens*. – Male. Label 1 (red): "*Microdon procedens* Curran Holotype"; label 2: "Brasilien, Nova Teutonia, 27°11' B, 52°23'L. Fritz Plaumann. 27.10.1939". Coll. AMNH.

PARATYPE *Microdon procedens*. BRAZIL. Male. Label 1: "Brasilien, Nova Teutonia, 27°11'B, 52°23'L. 24.10.1939. Fritz Plaumann"; label 2: "Paratype, male, *Microdon procedens* Curran". Coll. USNM.

HOLOTYPE *Microdon procteri*. BRAZIL. Male. Label 1 (red): "Microdon procteri Curran Holotype"; label 2: " Brasilien, Nova Teutonia, 27°11' B, 52°23'L. Fritz Plaumann. 28.9.1939". Coll. AMNH.

Additionally studied specimens. BRAZIL: 1 female, Tijuca forest near Rio, 7-30.ix.1993, leg. T. Pape, coll. ZMUC.

Redescription (based on holotype *U. flavitibia*)

Adult male. Body size: 11 mm.

Head. Face occupying 1/3 of head width in frontal view; black, with two yellow submedian vittae on upper half, reaching antennal fossa, and a small yellow mark along eye margin on ventral half; with long white pilosity and a dense patch of black pile anterior to oral margin. Gena black. Oral cavity with lateral margins produced. Frons and vertex black and black pilose, with some white pile along eye margins and along transition between frons and vertex. Occiput black; grey pollinose; black pilose dorsally, white pilose ventrally. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown, scape a little paler; antennal ratio 8:1:10; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 3/4 from base, within a groove that ranges from the base of the arista to close to the apex. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Black, a little brownish on postpronotum, postalar callus, scutellum and pleurae. Scutum densely black pilose, except for some white pile along transverse suture and a small patch of white pile anterior to the scutellum. Postpronotum, postalar callus and scutellum black pilose. Scutellum without calcars. Anterior and posterior part of anepisternum divided by a weak sulcus; anterior part black pilose, posterior part black pilose along posterior margin. Anepimeron black pilose on dorsal 2/3. Katatergum and anatergum long and short microtrichose, respectively. Other pleurae bare. Calypter greyish, halter yellow with grey knob.

Wing: hyaline, brownly infuscated along anterior margin. Microtrichose except bare on posterobasal 1/2 of cell R and almost entirely on alula (only a narrow basal strip with microtrichia).

Legs: Front- and mid-femora brown, black pilose; hind-femur brown with apical 1/4 yellow, with long black pile. Front-tibia brown, black pilose; mid-tibia yellowish brown, with long black pile; hind-tibia yellow, with very long (some longer than maximal width of tibia) yellow pile on basal 3/4, long black pile on apical 1/4. Tarsi yellow, with basal tarsomeres a bit darker, black pilose dorsally, mid- and hind-tarsi ventrally with dense, short, yellow pile. Coxae and trochanters brownish black, with white pile.

Abdomen. Black. Tergite 1 with anterior half concave, laterally with white pile. Tergite 2 about as wide as thorax, with two lateral ′bulges′ halfway, which mark the maximum width of the abdomen; with long white pile anterolaterally, rather long black pile on the lateral 'bulges' and short, appressed pale pile on posterior half of tergite. Tergites 3 and 4 ith short black pile over entire surface and long black pile along posterior margin. Sternites 1 and 2 with long white pile; sternites 3 and 4 with mixed long black and white pile. Hypopygium yellowish. Genitalia as in fig. 263.

Female. As male, except for usual secual differences.

Diagnosis. Within *Ubristes* s.s. this is the only known entirely black coloured species.

Notes. The types of *Microdon procedens* and *M. procteri* (8- 9 mm) are smaller than the type of *Ubristes flavitibia* (11 mm). Besides that, the types of *M. procedens* differ from *U. flavitibia* only in the colour of the pile on the hind tibia: mostly brown (not black, as stated by Curran 1941) in *M. procedens*, yellow in *U. flavitibia*. However, it appears that the pilosity on the tibia of the type specimens of *M. procedens* has lost its natural colour and turned brown. No differences could be found in external morphology or genitalia. The type of *M. procteri* is even more similar to that of *U. flavitibia*. Therefore, both *M. procedens* and *M. procteri* are here considered as junior synonyms of *U. flavitibia*.

Distribution. Known from southern parts of Brazil.

***Ubristes ictericus* spec. nov.**

Figs 254–258.

Studied type specimens. HOLOTYPE. BRAZIL. Male. Label 1: "Belem, Para / Brazil / 1-VI-1967 / Coll. Y. Sedman"; label 2 : "IN APEG"; label 3 (red): "HOLOTYPE [male sign] / Ubristes ictericus / M. Reemer"". Coll. USNM.

PARATYPE. BRAZIL. Female. Same label data as holotype, except label 3: "new species 3"; label 4 (yellow): "PARATYPE [female sign] / Ubristes ictericus / M. Reemer". Coll. USNM.

PARATYPE. ECUADOR. Female. Label 1: "ECUADOR: Sucumbios / Sacha Lodge, 0.5°S. / 76.5°W. 270 m. 27VIII-10XI / 1994, Hibbs, ex: malaise"; label 2: "PARATYPE [female sign] / Ubristes ictericus / M. Reemer". Coll. SEMC.

Description (based on holotype)

Adult male. Body size: 10 mm.

Head. Face occupying about 1/2 of head width in frontal view; yellow, with very narrow, brown median line on lower 2/3; entirely white pilose. Gena yellow. Lateral oral margins produced. Frons and vertex yellow, except darkened posterior to lunula and on ocellaer triangle; yellow pilose, except black pilose on ocellar triangle. Occiput black dorsally, yellow ventrally; yellow pilose dorsally, white pilose ventrally; whitish pollinose. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna brown, except scape yellowish; antennal ratio 6:1:9; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 5/6 from base, within a groove that ranges from the base of the arista to close to the apex. Arista slender, about 2/3 of length of basoflagellomere.

Thorax. Scutum black, except margins widely yellowish brown; medially appressed golden yellow pilose, except for pair of black pilpose patches on anterior 1/4, erect yellow pilose along margins. Postpronotum and postalar callus and scutellum yellow; yellow pilose. Scutellum yellow; yellow pilose basally, black pilose apically. Anepisternum yellowish brown; yellow pilose anteriorly and along posterior margin. Anepimeron yellow pilose on dorsal half. Katatergum and anatergum long and short microtrichose, respectively. Other pleurae bare. Calypter and halter yellow. Wing: hyaline, with faint yellowish tinge. Microtrichose, except bare on 1st costal cell, basal 1/10 of 2nd costal cell, basally on cell R1 along vein RS, entirely on cell R except microtrichose along vena spuria, basal 2/3 of cell BM, basal 1/5 of cell CuP, almost entirely on alula (only a narrow basal strip with microtrichia).

Legs: yellow, except basal 3 tarsomered of hind leg dark brown; yellow to white pilose, except black pilose on anteroventral part og hind femur, apical 1/2 of hind tibia and dorsal part of hind tarsus.

Coxae and trochanters yellow; yellowish white pilose, except for sparse black pile apically on hind coxa.

Abdomen. Yellowish brown; yellow pilose, except black pilose posterolaterally on tergite 3 and on posterior 1/4 of tergite 4. Tergite 2 about as wide as thorax, with two lateral ′bulges′ halfway, which mark the maximum width of the abdomen; with long yellow pile anterolaterally, rather long yellow pile on the lateral 'bulges' and short, appressed pale pile on posterior half of tergite. Sternites with long yellow pile. Hypopygium yellowish.

Female. Body size: 9-10 mm. The female is very similar to the male, except for usual sexual differences. The paratype from Ecuador is slightly darker in colouration, with the posterior margin of the vertex dark and the hind femur and tibia somewhat darkened.

Diagnosis. Within *Ubristes* s.s. this is the only known species with an entirely yellow abdomen.

***Ubristes jaguarinus* spec. nov.**
Figs 259–262, 264.
Studied type specimens. HOLOTYPE. COSTA RICA. Male. Label 1: "COSTA RICA. Prov. Guanacaste, Z.P. / Nosara. Hojancha, R.F. Monte Alto, / Send. La Ceiba, 500-600 m., 17 AUG / 2001. I. Jimenez, Libre / L_N_221650_382750#64060"; label 2: "INB0003350605 / INBIOCRI COSTA RICA"; label 3 (red): "Ultimo especimen en / B.D. A. Lépiz / 2.7.2002" / other side: "?MCR-10". Coll. INBIO.
Description (based on holotype)
Adult male. Body size: 10 mm.
Head. Face occupying slightly less than 1/2 of head width in frontal view; yellow, with narrow, brown median line on lower 1/2; yellow pilose laterally and ventrally, black pilose medially and dorsally, except narrowly bare medially; narrowly pollinose along eye margin. Gena yellow, except for narrow brown line from eye margin to oral margin. Lateral oral margins produced. Frons yellow; mixed yellow and black pilose laterally. Vertex yellowish brown, blackish at and anteriad of ocellar triangle; black pilose. Occiput yellow; black pilose dorsally, yellow pilose laterally and ventrally. Eye very sparsely and short pilose, with pili about as long as ommati diameter, appearing bare under low magnification. Antennal fossa about as wide as high. Antenna yellowish; antennal ratio 6:1:7; basoflagellomere parallel-sided with narrowly rounded apex, with sensory pit located at 3/4 from base, within a vague groove that ranges from the base of the arista to close to the apex. Arista slender, about 2/3 of length of basoflagellomere.
Thorax. Scutum black, except margins widely yellow; appressed golden pilose along anterior margin, along transverse suture and on median vitta as wide as 1/3 of width of scutum; black pilose on other parts. Postpronotum yellow; yellow pilose. Postalar callus yellow; black pilose. Scutellum brownish; black pilose along margins, yellow pilose medially. Anepisternum dark brown anteriorly, yellow posteriorly; yellow pilose anteriorly and along posterior margin. Anepimeron yellow pilose on dorsal half. Katatergum and anatergum long and short microtrichose, respectively. Other pleurae bare. Calypter and halter yellow.
Wing: hyaline, veins in anterior half yellowish brown. Microtrichose, except bare on 1st costal cell, basal 1/3 of 2nd costal cell, basally on cell R1 along vein RS, on basal 3/4 of cell R, anterobasal 1/2 of cell BM, basal 1/6 of cell CuP, almost entirely on alula (only a narrow basal strip with microtrichia).
Legs: yellow; yellow pilose, except hind leg mixed black and yellow pilose. Front and mid coxae and trochanters yellow; yellow pilose. Hind coxa and trochanter dark brown; yellow pilose, except coxa black pilose apically.
Abdomen. Tergite 1 brown medially, yellow laterally; yellow pilose. Tergite 2 halfway with lateral bulge-like tubercles; yellow with median brown vitta on anterior 3/4 and lateral brown vittae on anterior 3/4; long yellow pilose laterally on anterior half, short black pilose on posterior half, long black pilose on lateral tubercles. Tergite 3 narrowly yellow along anterior margin and on posterior 1/3, brown in between; black pilose. Tergite 4 brown on anterior 3/5 and on narrow median line extending almost to posterior margin, yellow on posterior 2/5; yellow pilose on much of brown parts, black pilose on yellow parts. Sternite 1 yellow; bare. Sternite 2 yellow; yellow pilose. Sternite 3 and 4 brown; yellow pilose. Genitalia as in fig. 264.
Female. Unknown.
Diagnosis. Within *Ubristes* s.s. this is the only known species with a maculate abdomen.
Etymology. With a little imagination, the maculate colour pattern of *Ubristes jaguarinus* reminds of that of the jaguar, a large, feline carnivore occurring in the new world tropics.
Distribution. Only known from Costa Rica.

Rest group

The species below were placed in *Microdon* subgenus *Ubristes* s.l. by Thompson et al. (1976), but do not fit into the concepts of the species groups treated in the present paper. They are classified into other genera following the classification as introduced in Chapter 5. Redescriptions and notes are given below.

***Microdon* (*Chymophila*) *angulatus* Hull, 1943**
Figs 265–267.
Microdon angulatus Hull, 1943: 715.
Studied type specimens (see notes below). HOLOTYPE. Male. Label 1 (round, blue): "Ega"; label 2: "PARATYPE / Microdon / angulata / Hull"; label 3: "HOLOTYPE / Microdon angulatus / Hull, 1943". Coll. CNC.
PARATYPE. BRAZIL. Male. Label 1: "Paratype"; label 2: "Amazon 66 53"; label 3: "Holotype *Micro-*

don angulata Hull". Coll. BMNH.
PARATYPE. BRAZIL. Male. Label 1: "Paratype"; label 2: "Amazon 66 53"; label 3: "Paratype *Microdon angulata* Hull". Coll. BMNH.
Notes on type specimens. The description of Hull (1943) was based on a male holotype, labelled "Ega" and two male paratypes, labelled "Amazon, 66 53". The holotype is now in the CNC collection, carrying a yellow label stating that it's a paratype. The BMNH collection holds the two paratypes, one of which is labelled as holotype. As Hull (1943) stated that the holotype is from Ega, the specimen in the BMNH collection labelled as holotype can not be regarded as such. A new red label with the text "HOLOTYPE / Microdon angulatus / Hull, 1943" has been added to the CNC specimen by the present author.
Redescription
Adult male. Body size: 11 mm.
Head. Face occupying 1/3 of head width in frontal view; shining dark brown; white pilose, except for a dense brush of black pile at anterior oral margin. Gena blackish brown. Oral cavity with lateral margins produced. Frons blackish, white pilose; vertex blackish, black pilose. Occiput black; black pilose dorsally, white pilose ventrally. Eye sparsely but clearly pilose. Antennal fossa about as wide as high. Antenna with scape dark brown, pedicel pale brown except for dark brown base; ratio of scape:pedical as 4:1. [N.B.: in the specimen labelled as 'holotype' the antennae are missing, while in the other paratype the basoflagellomeres are missing. Hull (1943) describes the antennae as follows: "Antennae very slender, a little longer than the depth of the face. Third joint about as long as the first joint and two-and-one-half times as long as the second; all of the antennae brown in colour, except blackish base of the second joint. Arista slender, not quite as long as third joint."]
Thorax. Scutum black with dark bronw lateral margins; black pilose, with pale pile along transverse suture. Postpronotum and postalar callus dark brown, black pilose. Scutellum dark brown, black pilose basally, pale pilose apically; with two apical pale brown calcars about 1/3 as long as length of the scutellum, with mutual distance about ½ the width of the scutellum; scutellum concave between calcars, but not sulcate. Anterior and posterior part of anepisternum divided by a clear sulcus; black pilose anteriorly and posteriorly, these patches of pilosity dorsally connected. Anepimeron black pilose. Katepisternum black pilose dorsally. Katatergum and anatergum pilose and microtrichose, respectively. Other pleurae bare. Calypter greyish yellow, halter brownish.
Wing: brown infuscated, especially in and posterior to costal cell, with pales part in apical 1/4. Entirely microtrichose.
Legs: Blackish, with tarsi brown: first tarsomeres dark brown, last two tarsomeres yellowish brown. Legs black pilose, except yellow pilose dorsally on last two tarsomeres and ventrally on all tarsomeres. Hind tibia and first tarsomeres of hind tarsus very dense and long pilose, with longest pile longer than width of tibia. Coxae and trochanters brownish, with mostly pale and some black pile.
Abdomen. Blackish brown. Tergite 1 with anterior half concave, laterally with black pile. Tergite 2 wider than thorax; with long pale pile laterally and anteriorly, shorte black pile posteriorly. Tergites 3 and 4 fused, with suture vaguely visible over most of width; wider than thorax; short black pilose, except longer pale pilose laterally. Abdomen laterally strongly depressed between 3rd and 4th tergite. Tergite 4 with very large lateral bulges. Sternites blackish brown and pale pilose. Genitalia as in fig. 267 (based on the paratype in the BMNH collection labelled as 'holotype').
Female. Unknown
Notes. In its wing venation (shape of vein M1; fig. 255) and structure of the male genitalia (fig. 257), this species clearly fits into the concept of *Chymophila* Osten Sacken, 1875, a subgenus of *Microdon* (see Chapter 5). As far as currently known, this is the only stingless bee mimicking species belonging to this subgenus.

***Ubristes chrysopygus* Giglio-Tos, 1892**
Fig. 268.
Ubristes chrysopygus Giglio-Tos, 1892: 1.
Studied type specimens. HOLOTYPE. MEXICO. Female. Label 1: "836."; label 2 (green): "Orizaba"; label 3: "Ubristes chrysopyga / Giglio-Tos". Coll. MRSN. [only photographs of the holotype were studied]
Notes. Following the classification of Chapter 5, this species belongs to the *flavofascium*-group of the genus *Peradon* Reemer. A photograph of the holotype is given in fig. 268.

Discussion

Of the 51 species treated in this paper, 23 are described as new. When comparing this ratio of described vs. undescribed species with those found in other recent revisions of Neotropical Syrphidae, it is somewhat intermediate. Rotheray et al. (2007) also described 22 new species for species of *Copestylum* with larvae that develop in bromeliads, but among a total number of 23. In contrast, Morales & Marinoni (2009) revise 24 species of *Palpada*, only one of which they describe as new. These varying ratios result from differences per genus in average numbers of available specimens per species: the more specimens of a genus are collected, the higher the proportion of described species. Generally, species of Microdontinae are represented in collections by far fewer specimens than, for instance, species of *Palpada*. To illustrate this: for 31 out of 51 species treated in the present paper only one or two specimens are known. This suggests that there may be many additional species awaiting description. Therefore, it is important that identification of newly collected specimens is verfied in as many ways as possible, not only by using the key, but also by checking thoroughly the descriptions and figures. The male genitalia differ distinctly between all species of which the males are known, so these provide a good aid in identification.

As it now appears, *Stipomorpha* is the most speciose group of Microdontinae mimicking stingless bees, containing many highly similar (but morphologically distinct) species. It contains (by subjective judgement) very good mimics of Neotropical Meliponini, especially of the genera *Trigona* and *Tetragona*. These mimics bear close resemblance to their supposed models, not only in colouration of wings, colour patterns of head, thorax and abdomen, patterns of pilosity, but also in their flight behaviour, sticking up their abdomens and leaving their corbiculate hind legs dangling. Several species of these bee groups seem to be specifically mimicked by certain *Stipomorpha* species. For instance, *Stipomorpha goettei* and *S. guianica* are good mimics of certain *Tetragona* species, *S. mackiei* seems to mimic *Tetragona dorsalis*, while *S. lacteipennis* possibly mimics certain *Trigona* species (pers. comm. D. Roubik upon showing him pictures of these taxa). This suggests that the mimicry is Batesian rather than Müllerian (following the definitions in e.g. Gilbert 2005); the appearance of the harmless mimics seems to match that of the noxious models near-perfectly, instead of the mimics being noxious themselves and resembling each other in a more general way. The apparent rarity of the adult mimics (most species are known from few or even single specimens) also supports a Batesian model of evolution; Mullerian mimics usually are more abundant (Gilbert 2005).

A question that arises upon considering this group of flies, is whether mimicry has stimulated speciation. Would there have been as many *Stipomorpha*-species if there had been fewer species of stingless bees? In general terms: does the number of mimicking species depend on the number of possible models? A possible mechanism for mimicry-driven speciation, a version of standard allopatric speciation, could be as follows: 1. mimic A resembles model A; 2. mimic A disperses and founds an isolated population in an area where model A does not occur, so selective advantage of mimicking model A no longer exists for this population; 3. restricted gene flow results in mimic A in the new population gradually developing a resemblance to model B; 4. if population come into contact again, members of the original population of mimic A no longer recognize members of the second population as sexual partners, so the populations are reproductively isolated, thus two species have evolved.
Alternatively, the scenario could involve the host specialization of the immature stages of (some or all?) Microdontinae, as discovered in the European species *Microdon mutabilis* (Linnaeus, 1758) and *M. myrmicae* Schönrogge et al., 2002 by Schönrogge et al. (2002, 2006). When species A evolves into two cryptic species, each developing in the nests of different ant species, both species might get exposed to different selective pressures, eventually resulting in different appearances, resembling different models.
A case in which mimicry indeed seems to be the drive for speciation was described by Naisbit et al. (2003) in *Heliconius* butterflies. Apart from butterflies, very little is known about mimetic relationships of tropical insects (Gilbert 2005). The many microdontine mimics of stingless bees offer an interesting case for further examination of 'tropical mimicry'. In order to do this, it will be necessary to link the species to supposed models, examine the question whether they are Batesian or Müllerian mimics, estimate the intra-generic phylogeny by DNA-sequencing (of both mim-

ics and models), and analyze their biogeography. This will possibly be the subject of a future paper.

The observations on flower-visiting specimens of *Stipomorpha guianica*, and possibly also of *S. fallax*, suggest that the common idea that Microdontinae do not visit flowers (e.g. Cheng & Thompson 2008) is not true for all species. Another Neotropical species, *Microdon tigrinus* Curran, 1940, has also been reported to visit flowers (Morales & Köhler 2006). Obviously, the subject of feeding by adult Microdontinae needs further attention. Perhaps investigation of gut contents could provide a first clue as to whether they feed on pollen or not.

Acknowledgements

I am grateful to Kees van Achterberg (RMNH) for allowing me to use his photographic and microscopic equipment and for his kind assistance while using it. The following persons are thanked for providing me with material or for helping me with examining specimens from the collections they are responsible for: Ben Brugge (ZMAN), Rune Bygebjerg (MZLU), David Grimaldi (AMNH), Z.H. Falin (SEMC), Martin Hauser, E. Richard Hoebeke (CU), Uwe Kallweit (SNSD), Ximo Mengual Sanchis, Tam Nguyen (AMNH), Philip Perkins (MCZ), Luca Picciau (MRSN), Peter Sehnal (NMW), Jeff Skevington (CNC), John T. Smit, Villu Soon (Museum of Zoology, Tartu), Wouter van Steenis, F. Christian Thompson (USNM), Rob de Vries (RMNH), Nigel Wyatt (BMNH), Manuel Zumbado (INBIO). Thanks are also due to Koos Biesmeijer and Francis Gilbert, who commented on an earlier version of the manuscript. Chris Thompson had recognized earlier that some of the species described in this paper were new, so I thank him for his generosity in sharing these specimens with me. He also commented on the manuscript in an early stage. Finally, a word of gratitude to Gunilla Ståhls for all her help and critical comments.

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Go to the ant, thou sluggard.

Bible: Proverbs 6:6.