5 Classification of the Microdontinae (Diptera: Syrphidae)

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Abstract. With 565 species group names available (excluding misspellings), the Microdontinae constitute the smallest of the three subfamilies of Syrphidae. Paradoxically, this subfamily is taxonomically the least organized of the three: 388 species names were previously classified in a single genus, *Microdon*. The present paper introduces a new generic classification of the Microdontinae, relying partly on the results of phylogenetic analyses of morphological and molecular data as published in the previous two chapters, and partly on examination of primary type specimens of 356 taxa, much additional material, and original descriptions. A total number of 70 genus group names (excluding misspellings) are evaluated, redescribed, diagnosed and discussed, with several implications for their taxonomic status. Of these, 43 names are considered as valid genera, 8 as subgenera, 17 as synonyms. Two generic names (*Ceratoconcha* Simroth, *Nothomicrodon* Wheeler) are left unplaced, because they are known from immature stages only and cannot be reliably associated with taxa known from adults. The following 11 new genera are described: *Domodon*, *Heliodon*, *Laetodon*, *Menidon*, *Mermerizon*, *Metadon*, *Mitidon*, *Peradon*, *Piruwa*, *Sulcodon* and *Thompsodon*. Two additional undescribed genera are recognized but left unnamed, pending the work of other entomologists. A key to all genera, subgenera and species groups is given. A total number of 27 new species are described in the following genera: *Archimicrodon*, *Ceratrichomyia*, *Domodon*, *Furcantenna*, *Heliodon*, *Indascia*, *Kryptopyga*, *Masarygus*, *Mermerizon*, *Metadon*, *Microdon*, *Mitidon*, *Paramixogaster*, *Piruwa*, *Pseudomicrodon*, *Rhopalosyrphus* and *Thompsodon*. Many new combinations of species and genera are proposed. New synonyms are proposed for 17 species group names. Three replacement names are introduced for primary and secondary junior homonyms: *Microdon shirakii* nom. nov. (= *Microdon tuberculatus* Shiraki, 1968, primary homonym of *Microdon tuberculatus* Meijere, 1913), *Paramixogaster brunettii* nom. nov. (= *Mixogaster vespiformis* Brunetti, 1913, secondary homonym of *Microdon vespiformis* Meijere, 1908), *Paramixogaster sacki* nom. nov. (= *Myxogaster variegata* Sack, 1922, secondary homonym of *Ceratophya variegata* Walker, 1852). An attempt is made to classify all available species names into (sub)genera and species groups. The resulting classification comprises 472 valid species and 93 synonyms (excluding misspellings), of which 17 valid names and three synonyms are left unplaced.

Introduction

Classification of the subfamily Microdontinae (Diptera: Syrphidae) has been both controversial and puzzling. Controverse has existed and continues to exist over the question whether to rank the group as family or subfamily. Puzzlement is caused by the difficulties previous researchers experienced in their attempts to produce a classification of the group at generic level. The issue of ranking the group has most recently been discussed by Reemer & Ståhls (Chapter 4), who prefer to treat the group as a subfamily. The classification of taxa, generic as well as specific, within the Microdontinae is the subject of the present paper. The phylogeny of Microdontinae has been analyzed in Chapters 3 and 4. The morphological characters are described and analyzed in Chapter 3, and an analysis of a new molecular dataset, both separately and in combination with the morphological dataset, is presented in Chapter 4. The phylogenetic hypotheses presented in those papers are used here for generating a classification, both at generic and specific levels.

In the present paper, many taxa of Microdontinae are studied and compared in detail, based on the morphological characters introduced in Chapter 3. In cases for which the phylogenetic hypotheses of Chapters 3 and 4 are not decisive, the morphological comparisons were used to build the new classifications. Although phylogenetic relationships are still unclear for many taxa, we prefer to employ an 'old-fashioned' method of classification based on detailed comparative morphology over a 'dustbin'-approach, in which all taxa are lumped together, despite their morphological differences. Here the view is taken that defining morphologically coherent groups creates taxa with a high probability of monophyly, even though their phylogenetic affinities remain unclear.

The next two paragraphs will summarize the history of the classification of the Microdontinae.

Classification of Microdontinae within Syrphidae

When Meigen (1803) introduced the generic name *Microdon*, there was no intrafamilial classification of the family Syrphidae. The first family group name proposed for *Microdon* and its allies was Aphritadae Fleming, 1821 (spelled Aphritidae by Fleming 1822), separated from the 'Syrphadae' based on the absence of a facial tubercle. The Aphritidae also included *Milesia* Latreille, 1804 and related genera, which are nowadays included in the Eristalinae. Although the family group name Aphritidae has priority over Microdontinae, the latter name is maintained because Aphritidae has not been used after 1899, whereas Microdontinae has been used by many authors since (ICZN 1999: article 23.9; Sabrosky 1999).

Ever since Rondani (1845) introduced the family group name Microdonellae, based on the dentate scutellum of the type species *Microdon mutabilis*, this group has been recognized as distinct from other Syrphidae, albeit under different spellings and taxonomic rankings. In early days (Lioy 1864, Brauer 1883, Williston 1886) and the single more recent case of Shatalkin (1975a, b), authors included genera which are nowadays considered to belong to other subfamilies. The placement of the group relative to other Syrphidae, however, has been far from stable. It would exceed the aim of the present paper to repeat here every author's argumentations for their subsequent classifications over more than one and a half century. Table 1 lists the many different historical taxonomic treatments (spellings and classifications) the group has received.

The first to regard the Microdontinae as "presumably an old group early differentiated from the family" was Hull (1949). Goffe (1952) extensively reviewed the prior classifications of Syrphidae, including Microdontinae. He placed the Microdontinae as a subtribe ('Microdontina') in the tribe Volucellini, together with the subtribe Volucellina, as part of the subfamily Sphixinae (more or less equivalent to the current Eristalinae). Thompson (1969) did not agree and treated the group again as basal within the Syrphidae. Then Thompson (1972) proposed to raise the group to family level. Shatalkin (1975a, b) did not follow this proposal, basing his argumentation only on the number of male pre-abdominal segments, but he agreed on the basal position of the group as a subfamily within the Syrphidae.

The proposal of Thompson (1972) to treat the Microdontinae as a separate family has not generally been followed. Speight (1987), however, based on his considerations of syrphid morphology, found *Microdon* to be aberrant from other Syrphidae to such an extent that he chose to follow Thompson's proposal. In the study of Rotheray & Gilbert (1999), based on characters of immature stages, Microdontinae were placed as follows: (Eristalinae + (Microdontinae + (Syrphinae + Pipizini)). Subsequently, a number of studies recovered the Microdontinae as the sister-group of all other Syrphidae: Skevington & Yeates (2000) (based on molecular data), Ståhls et al. (2003) (based on molecular data combined with larval and adult morphology), Hippa & Ståhls (2005) (based on an extended set of adult morphological characters) and Rotheray & Gilbert (2008) (based on characters of the larval head). All of these authors treated the group as a subfamily. Cheng & Thompson (2008) followed this prevailing usage of the name. Speight (2010) continued to use familial rank. Reemer & Ståhls (Chapter 4), evaluating previous phylogenetic results as well as their own, see no scientific reason for changing the prevailing ranking of the Microdontinae.

Classifications and phylogenetic relationships within Microdontinae

There have been few previous attempts to generate a tribal classification of Microdontinae. Apart from the names Aphritidae Fleming and Microdontinae Rondani (see previous paragraph), only three family-group names have been proposed: Masarygidae Brèthes, 1908, Ceratophyini Hull, 1949 and Spheginobacchini Thompson, 1972. See Chapter 4 for discussion on availability of these names. Application of the first two names is at present considered undesirable, as most phylogenetic relationships at suprageneric level are still too uncertain to recognize tribes, due to limited availability of taxa for molecular phylogenetic analysis and the obtained low support values for most of the resolved larger clades (Chapter 4). The tribe Spheginobacchini is the only name that continues to be recognized here, because the sister group relationship of this taxon to the remaining Microdontinae is considered well enough established.

Table 1. Chronological overview of spellings, classifications and rankings of the family group names Aphritadae Fleming, 1821 and Microdonellae Rondani, 1845. All known references introducing a novel spelling or classification are included, as well as all known works that explicitly deal with the classification of the group. Works merely using previously suggested classifications are omitted.

Author	Name / spelling	Ranking and remarks
Fleming 1821: 55	Aphritadae	Included *Milesia* Latreille and related genera.
Fleming 1822: 584	Aphritidae	See Fleming 1821.
Rondani 1845: 451	Microdonellae	One of eight 'lineas', equivalent to subfamilies.
Rondani 1856: 20, 54	Microdonina	One of seven lineages, equivalent to subfamilies.
Rondani 1857: 206	Microdoninae	See Rondani 1856.
Lioy 1864: 740	*Microdon* included in Psariti	One of five subdivisions of Syrphidae, equivalent to subfamilies, including genera *Chrysotoxum* Meigen, 1803 and *Psarus* Latreille, 1804.
Nowicki 1873: 24	Microdontina	One of eight subdivisions of Syrphidae.
Brauer 1883: 70	Microdinae	Euivalent to tribe within subfamily ('Gruppe') Chrysotoxinae, including genera *Chrysotoxum* Meigen, 1803, *Pipiza* Meigen, Orthonevra Macquart, 1829 among other.
Williston 1886: xvi	Microdonini	Tribe within subfamily Syrphinae, including genera *Chrysotoxum* Meigen, 1803 and *Psarus* Latreille, 1804.
Verrall 1901: 658	Microdontinae	One of seven subfamilies.
Shannon 1921: 67, 123; 1922: 35	Microdontinae	One of ten subfamilies.
Sack 1928-1932: 234	Microdontinae	One of 14 subfamilies.
Hull 1949: 305	Microdontinae	One of 14 subfamilies, related to Eumerinae and Nausigasterinae. *Spheginobaccha* included.
Goffe 1952: 112	Microdontina	Subtribe of tribe Volucellini, within subfamily Sphixinae (= Milesiinae of Wirth et al. 1965).
Wirth et al. 1965	Microdontini	Tribe within subfamily Milesiinae
Thompson 1969: 75	Microdontinae	*Spheginobaccha* excluded.
Thompson 1972: 85	Microdontidae	Family.
Shatalkin 1975, a,b	Microdontinae	Subfamily. *Spheginobaccha* included, as well as *Alipumilio* Shannon, 1927 and *Nausigaster* Williston, 1884.
Speight 1987: 172	Microdontidae	Family.
Ståhls et al. 2003: 449	Microdontinae	Subfamily. *Spheginobaccha* included. *Alipumilio* and *Nausigaster* excluded.
Cheng & Thompson 2008: 21	Microdontinae	Subfamily.

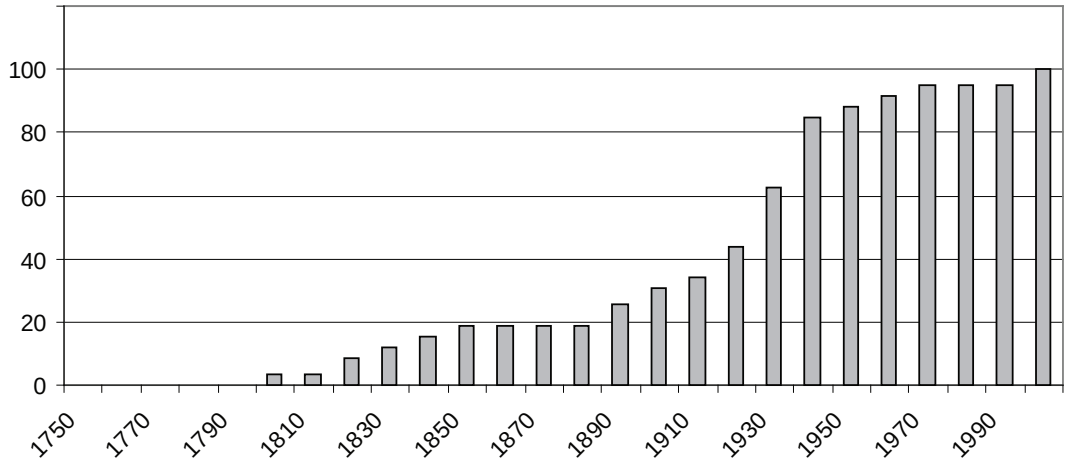

Fig. 1. Cumulative graph of introduced genus-group names of Microdontinae per decade (percentage of total).

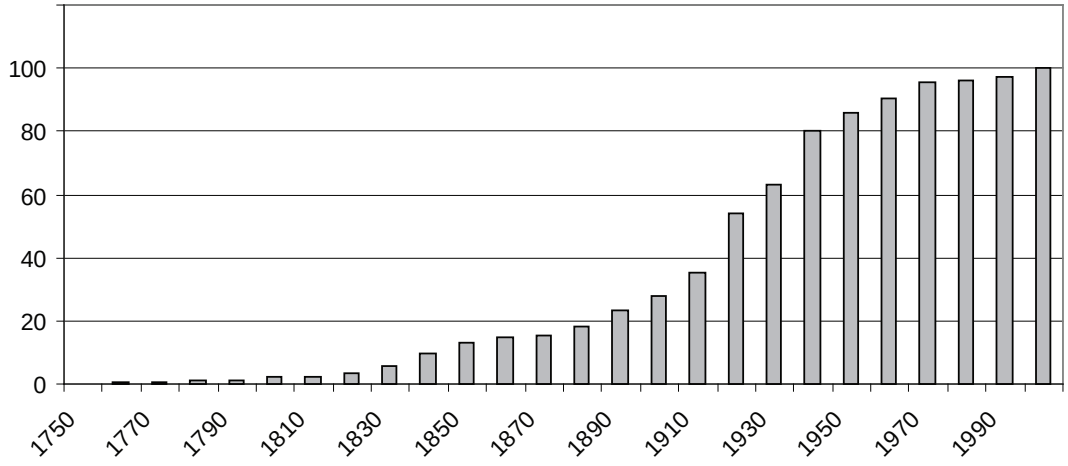

Fig. 2. Cumulative graph of introduced species-group names of Microdontinae per decade (percentage of total).

Cheng & Thompson (2008) gave an extensive overview of generic names of Microdontinae, which formed the starting point for the present paper. Since Meigen (1803) introduced the name *Microdon*, 59 genus-group names applicable to Microdontinae have been introduced (misspellings excluded) (fig. 1). This number increased most rapidly during the first half of the 20th century. Since then, only nine new genus-group names have been proposed.

The number of previously introduced species-group names in Microdontinae is 514 (including synonyms and unvalid names). The cumulative graph of the number of species names per decade is similar to the one for genus-group names (fig. 2). A majority of these species names (388) are currently classified into the genus *Microdon*. Most of the other (sub)genera contain only a few species. The very large genus *Microdon* thus constitutes one of the greatest taxonomic challenges of Syrphidae. The classification of so many species into one genus was a consequence of pragmaticism, as no comprehensive revisions were available.

Material and methods

Procedure

The phylogenetic results of the combined analysis of molecular and morphological characters of Chapter 4 are used as the first cue for the generic classification. Because not all supraspecific taxa are represented in that analysis, the results of the analysis of morphological characters only in Chapter 3 are also taken into consideration. When the evidence provided by these analyses is not conclusive or considered unconvincing (e.g. because of low support values), morphological characters are evaluated subjectively, and considerable weight is given to the structure of the male genitalia. Generally, a conservative approach is adopted towards changing the rank of taxa. Generic or subgeneric ranks as treated by Cheng & Thompson (2008) are mostly maintained, unless these are contradicted by the results of the phylogenetic analyses of Chapters 3 and 4. This is mainly relevant in the case of the genus *Microdon*. The species previously assigned to this genus were resolved as scattered over the phylogenetic trees of Chapters 3 and 4. For some of these groups, genus group names are available, for some there are none. In several cases, genus group names that were previously treated as subgenera, are now raised to generic level. In addition, new genus group names needed to be erected for several taxa that were previously included in *Microdon*. Given the uncertainties in the deeper branches of Microdontinae-phylogeny, these new group names could also have been given subgeneric rank within *Microdon*. However, this would suggest a close affinity with that genus, despite the fact that this is not indicated by the phylogenetic results.

Acronyms of collections

The following acronyms are used to indicate entomological collections.

AMNH	American Museum of Natural History, New York
AMS	Australian Museum, Sydney
ANIC	Australian National Insect Collection, Canberra
ANSP	Academy of Natural Sciences of Pennsylvania, Philadelphia
BMNH	British Museum of Natural History, London
CASB	Chinese Acadamy of Science, Bejing
CM	Carnegie Museum, Pittsburgh
CNC	Canadian National Collection, Ottawa
CSCA	California State Collection of Athropods, Sacramento
CSCS	Central South University of Forestry and Technology, Changsha, Hunan
CU	Cornell University, Ithaca
DEI	Deutsches Entomologisches Institut, Müncheberg
DZUP	Departamento de Zoologia da Universidade Federal do Paraná, Curitiba
HNHM	Hungarian Natural History Museum, Budapest
INBIO	Instituto Nacional de Biodiversidad, Heredia, Costa Rica
MACN	Museo Argentino de Ciencias Naturales, Buenos Aires
MCGD	Museo Civico di Storia Naturale 'G. Doria', Genova
MCSN	Museo Civico di Storia Naturale, Milan
MCZ	Museum of Comparative Zoology, Harvard
MNHN	Muséum National d'Histoire Naturelle, Paris
MRHNB	Musée Royal d'Histoire Naturelle de Belgique, Brussels
MRSN	Museu Regionale di Scienze Naturali, Turin
MZH	Finnish Museum of Natural History, Helsinki
MZLU	Museum of Zoology Lund University, Lund
MZM	Musuem of Zoology, University of Michigan, Ann Arbor
MZUN	Museo Zoologico di Università degli Studi, Naples
MZUSP	Museu de Zoologia da Universidade de São Paulo
NHRS	Naturhistoriska Riksmuseet, Stockholm
NIAS	Laboratory of Insect Systematics, National Institute of Agro-Environmental Sciences, Kannondai
NMB	Naturhistorisches Museum Basel
NMSA	Natal Museum, Pietermaritzburg
NMW	Naturhistorisches Museum Wien
NSMT	National Science Museum Tokyo
NZCS	National Zoological Collection of Surinam, Paramaribo

OHSU	Ohio State University, Columbus
OUMNH	Oxford University Museum of Natural History, Oxford
RBIN	Institut Royal des Sciences Naturelles, Brussels
RMCA	Musée Royal de l'Afrique Centrale, Tervuren
RMNH	National Museum of Natural History NCB Naturalis, Leiden
QMBA	Queensland Museum, Brisbane
QSBG	Queen Sirikit Botanical Gardens, Chiang Mai (Thailand)
SAMA	South Australian Museum, Adelaide
SAMC	South African Museum, Cape Town
SEHU	Systematic Entomology Hokkaido University, Sapporo
SEMC	Snow Entomological Collections, University of Kansas, Lawrence
SMF	Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt
SMNS	Staatliches Museum für Naturkunde, Stuttgart
SNSD	Senckenberg Naturhistorische Sammlungen Dresden
UFPR	Universidade Federal dor Paraná, Curitiba
UMSP	University of Minnesota, St. Paul
USNM	United States National Museum, Smithsonian Institutions, Washington D.C.
UTOR	Instituto e Museo di Zoologia di Torino, Turin
WSU	Washington State University, Pullman
ZFMK	Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn
ZISP	Russian Academy of Sciences, Zoological Institute, St. Petersburg
ZMAN	Zoological Museum of Amsterdam (now housed in RMNH)
ZMHU	Zoologisches Museum der Humboldt Universität, Berlin
ZMUC	Zoological Museum University of Copenhagen
ZSI	Zoological Survey of India, Calcutta
ZSM	Zoologische Staatssammlung, Munich

Dissection and microscopy

Male genitalia were dissected and macerated in an aqueous 10% KOH solution at ambient temperature for 12-24 hours, rinsed in water and stored in glycerol. Drawings of male genitalia were made with the aid of a drawing tube attached to a Wild M20 compound microscope. Photographs of (parts of) specimens were taken through an Olympus SZX12 motorized stereozoom microscope, using Analysis Extended Focal Imaging Software.

Morphology

Most of the morphological terminology used in this paper is derived from McAlpine (1981), as specifically applied to Syrphidae by Thompson (1999), who also introduced some new terms. Cheng & Thompson (2008) introduced a few more with special relevance to Microdontinae. For some characters used in the present paper, these works do not provide applicable terms. In these cases terminology is based on Hippa & Ståhls (2005) (e.g. antennal fossa, antetergite) and Speight (1987) (e.g. anterolateral callus of tergite 1, anterior sclerite of sternite 2). For the terminology of the male genitalia McAlpine (1981) was used, supplemented with some more recent considerations as summarized by Sinclair (2000). More details on morphology of the male genitalia of Microdontinae, including a few new terms, can be found in Chapter 3.

Key to genera and species groups of Microdontinae

Two keys to genera and generic groups of Microdontinae have been published previously: Hull (1949) and Cheng & Thompson (2008). Characters used in those keys have been considered and some are also used here, but many new characters were necessary to accomodate for new genera and redefined genera. Several taxa are keyed out more than once, either because they are borderline cases or because the key characters are variable between species within these groups. Although certain groups are characteristic in the male genitalia, external morphology can exhibit high intrageneric variability.

1. Postmetacoxal bridge incomplete (metapleura separated from each other)..... 99
– Postmetacoxal bridge complete (metapleura connected, often only narrowly).....2

2. Vein R4+5 without posterior appendix extending into cell R4+5..... 76
– Vein R4+5 with posterior appendix extending into cell R4+5.....3

3. Postpronotum bare 69
– Postpronotum pilose.....4

4. Abdomen constricted. 60
– Abdomen oval, parallel-sided or tapering.....5

5. Anepisternum with bare part limited to ventral half of the anepisternum, or entirely pilose 46
– Anepisternum extensively bare, with bare part reaching dorsad to above half the height of the anepisternum 6

6. Propleuron (proepimeron) bare 15
– Propleuron (proepimeron) pilose.....7

7. Postero-apical corner of wing cell R4+5 more or less rectangular or acute, always with small appendix (e.g. figs. 14, 17, 28, 55)..... 12
– Postero-apical corner of wing cell R4+5 widely rounded, sometimes with small appendix (e.g. figs. 69, 206, 210, 292).....8

8. Katepimeron more or less flat (may be a little elevated or with an ill-developed carina, but not convex), sometimes with rows of microtrichia..... 11
– Katepimeron convex, never with microtrichia. 9

9. Apical crossvein M1 with outward angle, usually with a small appendix, anteriorly recurrent (fig. 69) .....*Microdon* subg. *Chymophila*
– Apical crossvein M1 without outward angle..... 10

10. Lateral oral margins not or only slightly produced: anterolateral corners not angular (fig. 202, 207). ..... *Microdon* s.s.
– Lateral oral margins strongly produced: anterolateral corners angular (fig. 221). ....*Microdon* s.s.: *virgo*-group

11. Abdomen constricted basally. .....*Peradon: trivittatum*-group (in part)
– Abdomen not constricted. .....*Peradon: flavofasium*-group (in part)

12. Tergites 3 and 4 not fused, able to articulate independently..... *Ceratophya* (in part)
– Tergites 3 and 4 fused, not able to articulate independently, although a suture between the tergites is usually visible. Best to be judged at lateral margins. 13

13. Eye bare. 14
– Eye pilose. ..... *Laetodon*

14. Male genitalia: surstylus with long posterior process (fig. 237) (South America) ..... *Mitidon*
– Male genitalia: surstylus without posterior process (fig. 373, 374) (North America) ..... *Microdon* subg. *Serichlamys*

15. Sternites 2 and 3 (often also 1 and 2) separated by unusually wide membraneous part, about as wide as sternite 2 medially or wider (fig. 391, 392). Antetergite of tergite 1 enlarged, medially longer than tergite 1 medially, almost level with tergite 1. ..... *Stipomorpha*
– Sternites 2 and 3 not separated by unusually wide membraneous part. Antetergite small, often making a large angle with tergite 1..... 16

16. Postero-apical corner of wing cell R4+5 more or less rectangular or acute (usually with small appendix) (figs. 14, 17, 28, 55). 31
– Postero-apical corner of wing cell R4+5 widely rounded (sometimes with small appendix) (figs. 69, 206, 210, 292). 17

17. Basoflagellomere shorter than scape. 26
– Basoflagellomere as long as or longer than scape 18

18. Sternite 1 pilose..... 23
– Sternite 1 bare..... 21

19. Entire body with metallic green to bluish colouration, densely punctate. Mimics of chrysidid wasps (Hymenoptera: Chrysididae). ..... *Chrysidimyia*
– At most thorax with faint metallic hues. 20

20. Abdomen constricted basally. ..... *Peradon: trivittatum*-group (in part)
– Abdomen not constricted. 21

21. Male with bifurcate basoflagellomere. Female unknown, possibly with curved or sickle-shaped basoflagellomere. Australian taxon ..... *Cervicorniphora*
– Basoflagellomere unfurcate; oval or parallel-sided. Neotropical taxa..... 22

22. Tergites without golden or silver pile. Basoflagellomere less than twice as long as scape. ..... *Peradon*: *bidens*-group
– Tergites usually with golden or silver pile. If not, then basoflagellomere more than twice as long as scape..... *Peradon*: *flavofascium*-group (in part)

23. Tergite 2 with tubercle halfway at lateral margin (fig. 411)..... *Ubristes* s.s.
– Tergite 2 without tubercle at lateral margin..... 24

24. Antenna shorter than distance between antennal fossa and anterior oral margin. Basoflagellomere less than twice as long as wide. ..... *Microdon rieki* (Australia)

– Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere at least four times as long as wide. 25

25. Brownish species with long, bee-like pilosity. Scutellum without calcars. *Microdon* subg. *Myiacerapis*
– Metallic green, sparsely pilose species, reminiscent of chrysidid wasp. Scutellum with calcars. ..... *Microdon* s.s. (in part: *macquartii*)

26. Wings hyaline, at most subtly infuscated..... 28
– Wings with black and yellow colour pattern 27

27. Abdomen without conspicuous fasciae of long pile. Scutellum without calcars. < 20 mm..... *Microdon* s.l.: *mirabilis*-group
– Abdomen with conspicuous fasciae of long, white pile; apex long, orange pilose. Scutellum with large calcars. >20 mm. Mimics of *Eulaema* (Hymenoptera: Euglossidae) ..... *Syrphipogon*

28. Vertex convex and shining..... *Pseudomicrodon* (in part: *biluminiferus*)
– Vertex more or less flat, dull..... 29

29. Tergites 3 and 4 about equally wide, with lateral margins parallel ..... *Microdon waterhousei* Ferguson
– Tergites 3 wider than tergite 4, with lateral margins converging posteriad 30

30. Lateral oral margins strongly produced: anterolateral corners angular (fig. 221)..... *Microdon* s.s.: *virgo*-group (in part)
– Lateral oral margins not or only slightly produced: anterolateral corners not angular (figs. 202, 207). ..... *Microdon* s.l.: *erythros*-group

31. Antenna shorter than distance between antennal fossa and anterior oral margin. 43
– Antenna as long as or longer than distance between antennal fossa and anterior oral margin. 32

32. Scutellum with apical calcars..... 36
– Scutellum without apical calcars, but sometimes sulcate apicomedially or with small patches of microtrichia where calcars could be expected. 33

33. Tergites 3 and 4 not fused, able to articulate independently 35
– Tergites 3 and 4 fused, not able to articulate independently, although a suture between the tergites is usually visible..... 34

34. Sternite 1 bare..... *Menidon falcatus* (in part)
– Sternite 1 pilose..... *Microdon* subg. *Dimeraspis adventitus*
[The Australian *Archimicrodon browni* (Thompson) keys here too, but pilosity of sternite 1 unknown.]

35. Male basoflagellomere without long pile ..... *Ceratophya* (in part), South America
– Male basoflagellomere with long pile ..... *Kryptopyga* (in part), Southeast Asia

36. Occiput dorsally widened (even if only slightly): dorsal eye margin diverging from hind margin of head (fig. 221,) 38
– Occiput evenly narrow over entire length: dorsal eye margin parallel to hind margin of head (fig. 166). 37

37. Male: first tarsomere of hind leg dorsally without longitudinal groove; strongly swollen: about twice as wide as apex of hind tibia ..... *Microdon* s.l.: *tarsalis*
– Male: first tarsomere of hind leg dorsally with wide longitudinal groove; maximally 1.5 times as wide as apex of hind tibia..... *Megodon*

38. Scutellar calcars large and blunt (fig. 75). Male: first tarsomere of hind leg about twice as wide as apex of hind tibia. ..... *Microdon* subg. *Dimeraspis*: *globosus*
– Scutellar calcars either absent, very small or well-developed and pointed apically . Male: first tarsomere of hind leg maximally 1.5 times as wide as apex of hind tibia 39

39. Vertex convex and shining, bare or sparsely pilose only on posterior half (figs. 81, 82) ..... *Domodon*
– Vertex not convex and shining, entirely pilose 40

40. Basoflagellomere oval (figs. 234, 370, 372). 42
– Basoflagellomere sickle-shaped (fig. 173) 41

41. Abdomen largely or entirely yellow..... *Menidon falcatus* (in part)
– Abdomen black ..... *Archimicrodon* (in part: one undescribed African species)

42. Male genitalia: surstylus with long posterior process (fig. 237) (South America) ..... *Mitidon*
– Male genitalia: surstylus without posterior process (figs. 373, 374). (North America)..... ..... *Microdon* subg. *Serichlamys: M. rufipes*

43. Anepimeron bare on ventral half. Male with eye margins parallel at level of frons, not approaching... ..... *Mermerizon*
– Anepimeron entirely pilose. Male with eye margins approaching each other at level of frons..... 44

44. Scutellum with large, apically rounded and flattened calcars. ..... *Archimicrodon* subg. *Hovamicrodon*
– Scutellum without calcars or with calcars pointed apically..... 45

45. Male genitalia: surstylus in lateral view without long posterior process (fig. 9, 15). *Archimicrodon* s.s.
– Male genitalia: surstylus in lateral view with long posterior process (figs. 19-26). ..... *Archimicrodon* s.l.

46. Basoflagellomere more or less oval or parallel-sided, sometimes with acute apex (figs. 66, 258, 328). . 48
– Basoflagellomere sickle-shaped or flag-shaped (figs. 255, 415)..... 47

47. Basoflagellomere sickle-shaped: thickened basally, curved dorsad apically. Arista bare. Eye reduced, so gena, vertex and occiput wide (fig. 255) ..... *Oligeriops*
– Basoflagellomere flag-shaped: strongly widened and laterally flattened (fig. 415). Arista pilose (pile at least half as long as width of arista). Eyes of normal size. ...Undescribed genus #1, species AUS-01

48. Basoflagellomere shorter than scape 56
Basoflagellomere as long as or longer than scape..... 49

49. Antenna long as long as or longer than distance between antennal fossa and anterior oral margin.. 52
– Antenna shorter than distance between antennal fossa and anterior oral margin 50

50. Tergite 2 with pair of depressed areas (as in fig. 290); lateral margins subcircular; with widest point clearly before posterior margin ..... *Omegasyrphus*

– Tergite 2 without depresses areas. 51

51. Wing with conspcuous black markings in apical half. ..... *Microdon pictipennis*
– Wing without conspicuous black markings, only vaguely infuscated along crossveins. ..... *Microdon nigromarginalis*

52. Tergites 3 and 4 fused, not able to articulate independently, although a suture between the tergites is usually visible. Best to be judged at lateral margins 54
– Tergites 3 and 4 not fused, able to articulate independently 53

53. Dorsal half of occiput slightly widened: maximum width in lateral view less than 1/4 of width of eye. Tergite 4 in lateral view approximately perpendicular to tergite 2 ..... *Ceratophya*
– Dorsal half of occiput strongly widened: maximum width in lateral view about 1/2 of width of eye. Tergite 4 in lateral view not perpendicular to tergite 2 ..... *Microdon shirakii*
54. Metallic green species, mimics of chrysidid wasps ..... *Chrysidimyia*
– Brownish or partly orange species 55

55. Basoflagellomere more than three times as long as scape; in male with long pilosity. Tergite 2 orange, tergite 3 orange with round, black lateral macula ..... *Ptilobactrum*
– Basoflagellomere less than three times as long as scape; bare in male. Tergites brown. ..... *Microdon* subg. *Dimeraspis*

56. Abdomen about as long as wide. ..... *Microdon* subg. *Dimeraspis*: *abditus*
– Abdomen clearly longer than wide. 57

57. Metallic green or blue flies, mimics of chrysidid wasps ..... *Chrysidimyia*
– Not metallic green or blue flies 58

58. Tergite 1 long, with hind margin very rounded; length : width ratio 1:1.4 to 1:2 ..... *Heliodon*
– Tergite 1 shorter, with hind margin less rounded; length : width ratio 1:2.5 to 1:3 or less 59

59. Tergite 2 with pair of depressed areas (fig. 290). Abdomen more than 2.5 times as long as wide. Alula bare ..... *Parocyptamus*
- Tergite 2 without depressed areas. Abdomen less than 2.5 times as long as wide. Alula microtichose along margins ..... *Metadon*

60. Transverse suture incomplete: not visible medially on mesoscutum. 63
– Transverse suture complete: reaching from one notopleuron to the other. 61

61. Katepimeron pilose. Male basoflagellomere with long pile ..... *Ceratrichomyia*
– Katepimeron bare. Male basoflagellomere without long pile 62

62. Frons laterally without concave area; without sharply defined ridge from lunula to eye margin. ..... *Indascia* (in part)
– Frons laterally with concave area, covered with dense golden pilosity; ventrally this area is delimited by a sharply defined ridge, which runs from the lunula to the eye margin (figs. 428-431) ..... *Thompsodon conspicillifrons*

63. Tergites 3 and 4 not fused, able to articulate independently. Male: sternite 4 not visible in ventral view: completely covered by sternite 3 and lateral margins of tergites. Male basoflagellomere long pilose..... *Kryptopyga pendulosa*
– Tergites 3 and 4 fused, not able to articulate idependently (although a suture between these tergites is usually visible)..... 64

64. Basoflagellomere longer than scape..... 66
– Basoflagellomere shorter than or as long as scape..... 65

65. Tergite 2 maximally as long as width of anterior margin..... *Heliodon*
– Tergite 2 more than twice as long as width of anterior margin ..... *Rhopalosyrphus* (s.l.) *oreokawensis*

66. Vertex convex, shining, sparsely pilose to bare..... *Pseudomicrodon*
– Vertex more or less flat, dull and entirely pilose..... 67

67. Tergite 2 with anterior margin about as wide as posterior margin..... *Peradon*: *trivittatum*-group
– Tergite 2 with anterior margin at least 1.5 times as wide as posterior margin..... 68

68. Katepimeron pilose (sometimes only along anterior margin)..... *Rhopalosyrphus* s.s.
– Katepimeron bare..... *Rhopalosyrphus* s.l.

69. Abdomen oval or elongate, not constricted in dorsal view (fig. 35, 272, 296, 297)..... 71
– Abdomen constricted in dorsal view (fig. 274, 275, 279)..... 70

70. Postero-apical corner of wing cell R4+5 widely rounded. Segment 2 longer than thorax..... *Ceriomicrodon petiolatus*
– Postero-apical corner of wing cell R4+5 more or less rectangular or acute, with small appendix. Segment 2 usually shorter than or as long as thorax (except in one undescribed African taxon)..... *Paramixogaster* (in part)

71. Basoflagellomere about six times as long as scape..... *Bardistopus*
– Basoflagellomere maximally four times as long as scape..... 72

72. Abdomen about as long as wide, with tergite 2 about as long as tergites 3 and 4 together..... *Sulcodon*
– Abdomen at least 1.5 times as long as wide, with tergite 2 less than half as long as tergites 3 and 4 together..... 73

73. Face medially with vitta of transversely wrinkled texture (fig. 294)..... *Peradon: flavofascium*-group (in part)
– Face medially smooth..... 74

74. Basoflagellomere longer than scape..... *Paramixogaster* (in part: *P. acantholepidis, P. crematogastri*)
– Basoflagellomere shorter than scape..... 75

75. Tergite 2 twice as wide as long or wider; entirely black. ..... *Metadon* (in part: *Microdon bifasciatus*)
– Tergite 2 about 1.5 times as wide as long; with large yellow marking in shape of upside-down "V"..... *Microdon trigonospilus* Bezzi

76. Vein M anteriorly without small stump extending into cell R4+5 78
– Vein M anteriorly with small stump extending into cell R4+5 (fig. 28, 239, 241) 77

77. Crossvein rm located between basal 1/4 and 1/3 of cell DM ..... *Mixogaster*
– Crossvein rm located within basal 1/7 of cell DM ..... *Aristosyrphus* (in part: some specimens of *A. primus*)

78. Face with median tubercle on dorsal half (fig. 31) ..... *Aristosyrphus* subg. *Eurypterosyrphus*
– Face without median tubercle 79

79. Vein M1 more or less straight, not parallel to wing margin, making straight angle with vein R4+5 81
– Vein M1 at least in anterior half (sometimes also in posterior half) oblique, more or less parallel to wing margin, making acute angle with vein R4+5 80

80. Abdomen constricted or parallel-sided ..... *Aristosyrphus* s.s.
– Abdomen oval ..... *Afromicrodon*

81. Abdomen constricted or elongate and parallel-sided. 91
– Abdomen oval (figs. 7, 10, 20, 399) or tapering / triangular (figs. 386, 390). 82

82. Sternites 2 and 3 (often also 1 and 2) separated by unusually wide membraneous part, about as wide as sternite 2 medially or wider (figs. 391, 392). Antetergite of tergite 1 enlarge, medially longer than tergite 1 medially, almost level with tergite 1 ..... *Stipomorpha*
– Sternites 2 and 3 not separated by unusually wide membraneous part. Antetergite small, often making a large angle with tergite 1 83

83. Basoflagellomere shorter than or as long as scape (basoflagellomere never furcate). 95
– Basoflagellomere longer than scape (basoflagellomere sometimes furcate in male). 84

84. Antenna at least as long as distance between antennal fossa and anterior oral margin, furcate in male (figs. 39, 88, 149, 155, 361-363) 88
– Antenna shorter than distance between antennal fossa and anterior oral margin, never furcate 85

85. Thorax and abdomen black. ..... *Archimicrodon* s.l. (undescribed taxa from Papua New Guinea).
– Thorax and abdomen yellow and black. 86

86. Postpronotum bare ..... *Surimyia*
– Postpronotum pilose 87

87. Position of crossvein rm at same level as bm-cu (fig. 261). ..... *Paragodon*
– Position of crossvein rm more apical: approximately at basal 1/8 of cell dm ..... *Hypselosyrphus* (in part: *H. pseudorhoga*)

88. Vertex strongly produced (fig. 40). Scutellum always sulcate apicomedially ..... *Carreramyia*
– Vertex not strongly produced (fig. 89, 154, 363, 364). Scutellum sometimes sulcate apicomedially 89

89. Antenna inserted dorsally on head: at or above dorsal eye margin. Male basoflagellomere multifurcate ..... *Masarygus*

– Antenna inserted below dorsal eye margin. Male basoflagellomere bifurcate 90

90. Katepisternum pilose. Metasternum developed and pilose..... *Furcantenna*
– Katepisternum bare. Metasternum underdeveloped and bare ..... *Schizoceratomyia*

91. Postpronotum pilose 93
– Postpronotum bare 92

92. Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere more than 3 times as long as wide. ..... *Paramixogaster* (in part: *P. decipiens* (de Meijere) and undescribed Australian sp.)
– Antenna shorter than distance between antennal fossa and anterior oral margin. Basoflagellomere less than 2 times as long as wide..... *Piruwa*

93. Mesoscutum with transverse suture complete (reaching from one notopleuron to the other)..... *Indascia*
– Mesoscutum with transverse suture not complete (not visible medially)..... 94

94. Antenna longer than distance between antennal fossa and anterior oral margin. Male basoflagellomere bifurcate..... Undescribed genus #2, species MCR-02
– Antenna shorter than distance between antennal fossa and anterior oral margin. Male basoflagellomere not furcate ..... *Paramicrodon*

95. Katepimeron pilose..... *Hypselosyrphus* (*ulopodus*)
– Katepimeron bare 96

96. Occiput wide, both dorsally and ventrally (fig. 351)..... *Rhoga*
– Occiput narrow, at least on ventral half (fig. 5, 401, 411)..... 97

97. Postpronotum bare. ..... *Surimyia*
– Postpronotum pilose 98

98. Vertex not produced, more or less flat ..... *Afromicrodon*
– Vertex produced, more or less convex (fig. 110, 111)..... *Hypselosyrphus*

99. Abdomen oval, not constricted. Occiput without creases..... *Rhoga* (in part: *maculata*, *mellea*, *sepulchrasilva*)
– Abdomen elongate and constricted. Occiput with distinct creases 100

100. Proanepisternum without row of long stiff pile. Eye bare..... *Spheginobaccha*: *perialla*-group
– Proanepisternum with row of long stiff pile. Eye bare or pilose..... 101

101. Eye pilose. Alula microtrichose..... *Spheginobaccha* s.s.
– Eye bare. Alula partially bare..... *Spheginobaccha*: subgenus *Dexiosyrphus*

Genus accounts

Order and format

The genus accounts are presented in alphabetic order. Accounts are only given for taxa considered as valid genera or subgenera. Synonyms and misspelled names can be found under the valid genera to which they belong. Each group account starts with information on the original description and the type species. This is followed by the following components.

Description. – Body length – intended only as an approximation, as not all specimens have been measured. A short characterization of the habitus is given, followed by a general description, which is intended to give characters considered (potentially) useful for identification, and to indicate the variability of characters. Unless stated otherwise, all listed characters apply to both sexes. Illustrations are given to illustrate habitus, important external characters and male genitalia. Additional morphological characters can be found in the character matrix of Chapter 3.

Diagnosis. – The shortest possible enumeration of external characters considered sufficient to distinguish the genus from all other Microdontinae. Characters of the male genitalia are only given in a few cases. The combination of the given characters is necessary for the diagnosis, all characters not given are considered unnecessary for this purpose. In some cases this diagnosis will not add much to the characters given in the key, but in other cases it will provide a 'short-cut' to the recognition of the genus.

Diversity and distribution. – The number of described species is given, sometimes with a speculation on the possible number of undescribed species. When available, a reference to species keys is given. The known geographic range is indicated.

Etymology. – Only given for newly described genera.

Afromicrodon Thompson

Figs. 3-6

Afromicrodon Thompson, 2008: 26. Type species: *Microdon johannae* van Doesburg, 1957: 109, by original designation.

Description. – Body length: 6-9 mm. Relatively small flies with short antennae and oval abdomen. Head slightly wider than thorax. Face evenly convex; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput narrow over entire length. Eye bare. Eyes in male strongly approaching each other at level of frons; with mutual distance about equal to width of antennal fossa. Antennal fossa about as high as wide. Antenna shorter than distance between antennal fossa and anterior oral margin. Basoflagellomere approximately as long as scape; oval, short; bare. Postpronotum pilose. Anepisternum without sulcus; pilose, except bare on ventral 1/4. Anepimeron pilose on dorsal half, bare on ventral half. Katepimeron convex; bare. Scutellum semicircular; without calcars. Wing: vein R4+5 without appendix; vein M1 anteriorly directed somewhat outward, making acute angle with R4+5, posteriorly perpendicular to vein M; crossvein rm located around basal 1/4 of cell DM. Abdomen oval. Male genitalia: aedeagus straight, not furcate; hypandrium with bulb-like base and basolateral bulges; epandrium without ventrolateral ridge; surstylus large: about as long as hypandrium, somewhat sickle-shaped.

Diagnosis. – Vertex flat. Occiput narrow. Antenna shorter than distance between antennal fossa and anterior oral margin. Postpronotum pilose. Katepimeron bare. Vein R4+5 without posterior appendix. Abdomen oval.

Discussion. – This genus was recovered in a relatively basal position within the Microdontinae, as sister to *Schizoceratomyia flavipes*, in Chapter 4. Based on these results, there is no reason to revise the rank of this taxon.

Diversity and distribution. – Described species: 5. Restricted to Madagascar and the Comorean islands.

Archimicrodon Hull

Figs. 7-26

Archimicrodon Hull, 1945: 75. Type species: *Microdon digitator* Hull, 1937: 19, by original designation.

Subgenus:

Hovamicrodon Keiser, 1971: 248. Type species: *Hovamicrodon silvester* Keiser, 1971: 251, by original designation. Stat. nov.

Description. – Body length: 4-11 mm. Small to moderately sized flies with short antennae and oval abdomen. Head about as wide as thorax or slightly wider. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male strongly converging at level of frons, with mutual distance about as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter than distance between antennal fossa and anterior oral margin; basoflagellomere as long as or longer than scape, oval, sometimes with acute apex and concave dorsal margin; bare. Postpronotum pilose. Scutellum semicircular; with or without calcars, sometimes apicomedially sulcate; in subgenus *Hovamicrodon* calcars are spatulate (spoon-shaped). Anepisternum weakly sulcate; pilose anteriorly and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 with or without posterior appendix (this appendix only lacks in certain undescribed species from New Guinea); vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located around basal 1/5 to 1/4 of cell DM. Abdomen oval, about 1.5 to 2 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus furcate, with furcation point near apex; hypandrium with basal part bulb-like; epandrium without ventrolateral ridge; surstylus unfurcate.

Diagnosis. – Abdomen oval. Antenna shorter than distance between antennal fossa and anterior oral margin. Postpronotum pilose. Postero-apical corner of cell R4+5 rectangular. Proepimeron bare. Anepisternum widely bare medially, also on dorsal half. Anepimeron entirely pilose. Vein R4+5 usually with posterior appendix; if not: thorax and abdomen entirely black.

Discussion. – Three groups are recognized within this genus: *Archimicrodon* s.s., the subgenus *Hovamicrodon*, and a rest group, here called *Archmicrodon* s.l. *Archmicrodon* s.s. is based on *A. simplicicornis* (De Meijere), a subjective senior synonym of the type species of the genus, *Microdon digitator* Hull syn. nov. *Archimicrodon* s.s. is here defined by the shape of the surstylus: more or less oval, without a long posterior process (fig. 9, 15); scutellar calcars are either present or absent, but never spatulate. The subgenus *Hovamicrodon* is defined (following Keiser 1971) by the spatulate shape of the scutellar calcars (fig. 18); the surstylus has a long posterior process (fig. 19). *Archimicrodon* s.l. is here defined as containing all other species, in which the scutellar calcars are absent or - if present - not spatulate, and in which the surstylus has a long posterior process (fig. 22-26). As far as the African species are concerned, this group corresponds with the *brevicornis*-group of Bezzi (1915).

In the analysis of combined molecular and morphological characters of Chapter 4, only *Hovamicrodon* (unidentified species) and *Archimicrodon* s.l. (*clatratus* and *simplex*) are represented. These taxa were recovered as a clade. The analysis based on morphological characters (Chapter 3) also includes two species of *Archimicrodon* s.s.: *A. malukensis* spec. nov. and *A. simplicicornis*. These species are placed together in a clade within a large polytomous clade, which offers no hypothesis as to the relationships with *Archimicrodon* s.l. and *Hovamicrodon*.

The three groups are very similar in their morphology, except for the small differences as noted above. It seems likely that the groups are closely related. The subgenus *Hovamicrodon* is probably monophyletic, considering the spatulate scutellar calcars in combination with its restricted distribution (Madagascar). However, as the phylogenetic analysis in Chapter 4 indicate, it is so closely related to *Archimicrodon* s.l. (which is recovered as paraphyletic with respect to *Hovamicrodon*) that a separate generic status seems not warranted. Besides, a spatulate shape of the scutellar calcars can also be found in certain species of the New World groups *Laetodon* and *Mitidon*. The latter genus is recovered as sister to *Archimicrodon* in Chapter 4. As this character is not unique, it does not provide sufficient basis to base a genus on.

Especially in the African species of this group (including *Hovamicrodon*), sexual dimorphism can be pronounced. Females tend to be much larger than males, and are different in colouration (usually darker). As several species were described from one sex only (such as certain Madagascar species described by Keiser 1971), it is possible that some of these species are actually synonyms. However, as many taxa are represented by only one specimen, these matters cannot yet be resolved.

Hova is the name of one of the social castes of the Merina, an ethnic group indigenous to Madagascar.

Keiser (1971) used this name for his genus *Hovamicrodon*. Surprisingly, he did not include the Madagascar species *Microdon hova* Hervé-Bazin, 1913 in this genus, although this species clearly belongs to this group (spatulate scutellar calcars). Keiser (1971) does mention a specimen which he believes to be *M. hova*, based on the description, but for some reason this species is not listed under *Hovamicrodon*. However, when Keiser died in 1969, his paper was not finished yet. It was published posthumously, after the manuscript was finished and submitted by E. Lindner. Therefore, it is seems possible that Keiser intended to include *M. hova* in *Hovamicrodon*.

Notes on species. – In genitalia, *Microdon browni* Thompson is similar to *Archimicrodon* s.l.: aedeagus short, apically furcate, with dorsobasal projection; hypandrium with bulb-like base; surstylus with two elongate lobes; epandrium without ventrolateral ridge. In external morphology, the only difference with *Archimicrodon* seems to be that the antennae are longer than the distance between the antennal fossa and the anterior oral margin. This character alone is here considered not important enough for group definition, as antennal length is quite variable within many genera of Microdontinae. For these reasons, *Microdon browni* is here considered as a species of *Archimicrodon* s.l. The phylogenetic analysis of morphological characters in Chapter 3 provides no further clue as to the taxonomic affinities of this taxon.

Diversity and distribution. – Described species: 45. Widely distributed in the Afrotropical, Oriental and Australasian regions, with one species known from the Eastern Palaearctic (*A. simplex*). *Archimicrodon* s.s. is only known from the Oriental region. The subgenus *Hovamicrodon* (six species) is restricted to Madagascar.

***Aristosyrphus* Curran**

Figs. 27-34

Aristosyrphus Curran, 1941: 247. Type species: *Aristosyrphus primus* Curran, 1941: 252, by original designation.

Protoceratophya Hull, 1949: 314. Type species: *Ceratophya carpenteri* Hull, 1945: 76, by original designation. For synonymy see Cheng & Thompson (2008).

Paraceratophya Fluke, 1957: 38. Misspelling of *Protoceratophya* Hull.

Subgenus:

Eurypterosyrphus Barretto & Lane, 1947: 141. Type species: *Eurypterosyrphus melanopterus* Barretto & Lane, 142, by original designation.

Description. *Aristosyrphus* s.s. – Body length: 6-18 mm. Slender flies, often with constricted abdomen. Head wider than thorax. Face convex or almost straight in profile; about as wide as an eye or narrower. Lateral oral margins not produced. Vertex flat. Occiput narrow over entire length. Eye bare. Eyes in male weakly converging at level of frons, with mutual distance 2 to 3 times the width of antennal fossa. Antennal fossa about as wide as high. Antenna longer or shorter than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum without or with weak sulcus; anteriorly pilose or bare, posteriorly pilose, with pile limited to dorsal half. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 making acute angle with vein R4+5, anterior part or entire vein M1 parallel to wing margin; posteroapical corner of cell R4+5 angular, with small appendix; crossvein rm located within basal 1/7 of cell DM, often very close to base. Abdomen elongate: slightly oval, parallel-sided or constricted at segment 2; more than twice as long as wide. Tergites 3 and 4 fused. Male genitalia: aedeagus unfurcate; aedeagus straight or bent dorsad; ejaculatory hood apicodorsally separately developed from actual aedeagus into prong-like structure, which may be mistaken for dorsal aedeagal process, but does not contain a sperm-duct; apical part of hypandrium consists of two separate lobes (separated ventromedially); epandrium without ventrolateral ridge; surstylus furcate or unfurcate.

Description. *Eurypterosyrphus* – Body length: 8-14 mm. Slender flies with parallel-sided, constricted or kite-shaped abdomen. Head wider than thorax. Face more or less straight, with median tubercle on dorsal half; about as wide as an eye or narrower. Vertex flat. Occiput narrow over entire length. Eye bare. Eyes in male not or only slightly converging at level of frons, with mutual distance 4 to 5 times the width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa

and anterior oral margin; basoflagellomere shorter or longer than scape, oval, sometimes appearing swollen: more than twice as wide as scape; bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum without or with weak sulcus; pilose on dorsal half, bare ventrally. Anepimeron pilose on dorsal half, bare ventrally. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 making straight or acute angle with vein R4+5; postero-apical corner of cell R4+5 angular, with small appendix; crossvein rm located around basal 1/3 of cell DM. Abdomen parallel-sided, constricted or kite-shaped; more than twice as long as wide. Tergites 3 and 4 fused. Male genitalia: aedeagus unfurcate; aedeagus straight or bent dorsad; ejaculatory hood apicodorsally enveloping aedeagus; apical part of hypandrium consists of two separate lobes (separated ventromedially); hypandrium in some species with elongate ventromedian structure parallel to aedeagus (fig. 32, 34), resembling the lingula of certain taxa of the subfamily Syrphinae; epandrium without ventrolateral ridge; surstylus furcate or unfurcate.

Diagnosis. – Vein R4+5 without posterior appendix. Abdomen elongate and parallel-sided or constricted. Postpronotum pilose. Mesoscutum with transverse suture incomplete. Antenna longer than distance between antennal fossa and anterior oral margin.
Aristosyrphus s.s. – Vein M1 oblique, at least anterior half parallel to wing margin. Face evenly convex. Anepimeron entirely pilose. Crossvein rm located around basal 1/3 of cell DM. Ejaculatory hood apicodorsally developed into prong-like structure, separate from actual aedeagus (aedeagus may seem furcate under casual observation, but ejaculatory hood does not contain sperm duct).
Eurypterosyrphus. – Vein M1 oblique or straight. Face with median tubercle. Anepimeron bare on ventral half. Crossvein rm located within basal 1/7 of cell DM. Ejaculatory hood apicodorsally enveloping aedeagus, not developed into separate, prong-like structure.

Discussion. – Unfortunately, no representatives of this taxon could be included in the molecular dataset of Chapter 4. In the phylogenetic analysis of morphological characters of Chapter 3, *Aristosyrphus* and *Eurypterosyrphus* are recovered as sister groups. This does not contradict the present rank of *Eurypterosyrphus* as subgenus of *Aristosyrphus* (Cheng & Thompson 2008). Considering the large morphological variation within this genus, especially within the subgenus *Eurypterosyrphus*, both in external characters and male genitalia, the phylogenetic relationships of these taxa need to be examined in more detail, preferably with the aid of molecular characters. Examples of variation in characters of the male genitalia are given in figs. 29, 32-34.
Although *Aristosyrphus* and *Mixogaster* were not recovered as closely related groups in Chapter 3, certain morphological characters in common to these taxa may suggest a closer relationship. For instance, in some specimens of *Aristosyrphus primus* an anterior stump is present at vein M (figure 48 in Chapter 3). This character has always been used as diagnostic for *Mixogaster* (Hull 1954, Cheng & Thompson 2008). A facial tubercle similar to that of *Eurypterosyrphus* is also present in certain species of *Mixogaster*. In addition, the genera share an unfurcate aedeagus and a hypandrium with apical part consisting of two separate lobes (ventral view). The latter character also occurs in *Paramicrodon* and *Spheginobaccha*. Future studies employing molecular characters for extended taxon sets could help resolve the relationships between these taxa.

Diversity and distribution. – Described species: 7 (*Aristosyrphus* s.s.: 4; *Eurypterosyrphus*: 3). Several undescribed species are known to the first author. Central and South America.

Bardistopus **Mann**

Figs. 35-37.
Bardistopus Mann, 1920: 61. Type species: *Bardistopus papuanum* Mann, 1920: 61, by original designation.

Description. – Body length: 6-7 mm. Small, dark flies with very long antennae and oval abdomen, which in lateral view appears constricted. Head slightly wider than thorax. Face evenly convex. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow; dorsally slightly widened. Eye bare. Eyes in male not converging at level of frons; mutual distance much larger than width of antennal fossa. Antennal fossa about as high as wide. Antenna longer than height of head. Basoflagellomere about six times as long as scape. Postpronotum bare. Scutellum semicircular;

without calcars. Anepisternum without sulcus; pilose anteriorly and posteriorly, widely bare in between. Anepimeron pilose on dorsal half, bare on ventral half. Katepimeron flat; pilose. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5 and vein M; crossvein rm located around basal 1/7 of cell DM. Abdomen oval in dorsal view, but in lateral view appearing constricted due to flattened segment 2. Tergites 3 and 4 fused. Male genitalia: aedeagus furcate, with furcation point in apical half, strongly bent dorsad; epandrium without ventrolateral ridge; surstylus elongate, bent dorsad.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum bare. Abdomen in dorsal view oval; in lateral view constricted at segment 2. Basoflagellomere about six times as long as scape.

Discussion. – In the phylogenetic analysis of Chapter 3, based on morphological characters, *Bardistopus* is placed as sister to a clade containing several taxa in which the males have a bifurcate basoflagellomere: *Schizoceratomyia*, *Furcantenna* and *Carreramyia*. In *Bardistopus* the basoflagellomere is not furcate. Tentatively, a placement with *Paramixogaster* seems more plausible, because these taxa share the following characters: basoflagellomere much longer than scape, not furcate; postpronotum bare; vein R4+5 with posterior appendix; aedeagus strongly bent dorsad, relatively deeply furcate. Unlike *Paramixogaster* the abdomen is not constricted in dorsal view, but in lateral view tergite 2 is clearly flattened relative to tergites 3 and 4. Future studies employing molecular characters including these taxa could help eucidate the relationships among them.
According to Mann (1920) the type specimens of the type species are females, but actually both are males (coll. USNM).

Diversity and distribution. – Described species: 1. Solomon Islands: Ugi.

***Carreramyia* Doesburg stat. nov.**
Figs. 38-41.
Carreramyia Doesburg, 1966: 93. Type species: *Microdon megacephalus* Shannon, 1925: 213, by original designation.

Description. – Body length: 5-8 mm. Yellowish brown or black flies, tergites sometimes yellow with dark vittae. Mimics of stingless, *Trigona*-like bees (Apidae: Meliponini), due to the brush-like pilosity of the hind tibiae and the more or less triangular abdomen. Head wider than thorax. Face more or less straight in profile; wider than eye. Lateral oral margins not produced. Vertex strongly produced. Occiput ventrally narrow, dorsally widened. Eye bare. Eyes in male not approaching each other; separated over distance much wider than antennal fossa. Antennal fossa about as high as wide. Antenna longer than height of head. Antenna inserted below dorsal eye margin; basoflagellomere at least four times as long as scape, bifurcate in male, unfurcate in female; bare. Postpronotum pilose. Anepisternum without sulcus; continually pilose on dorsal half, bare on ventral half. Anepimeron pilose on dorsal half, bare on ventral half. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 perpendicular to R4+5 and M; crossvein rm located close to bm-cu. Abdomen more or less triangular, with tergites 3 and 4 narrower than tergite 2. Tergites 3 and 4 fused. Sternite 1 bare or pilose. Male genitalia: aedeagus straight, furcate near apex; hypandrium with bulb-like base and basolateral bulges; epandrium without ventrolateral ridge.

Diagnosis. – Hind tibia widened and with long, brush-like pilosity. Vein R4+5 without posterior appendix. Vertex strongly produced but not shining and convex. Basoflagellomere at least four times as long as scape, bifurcate in male.

Discussion. – *Carreramyia megacephalus* is one of the microdontine taxa in which the basoflagellomere of the male is bifurcate. When Shannon (1925) described this species, he attributed it to *Microdon*. In Shannon´s opinion, the furcate antenna did not warrant the erection of a new genus, as this condition is only found in the male sex. Doesburg (1966) did not agree and considered *Microdon megacephalus* to be very different from other Neotropical taxa with furcate basoflagellomere (*Masarygus* and *Schizoceratomyia*), and hence erected the genus *Carreramyia* for it. Cheng & Thompson (2008) considered *Carreramyia megacephalus* as a *Ubristes* species with furcate basoflagellomere, a character they considered to be of subgeneric value only. The phylogenetic analyses of Chapters 3 and 4 indicate that this taxon is not related to *Ubristes* (see notes under that genus), nor

is it related to any of the other groups previously synonymized with *Ubristes* (*Hypselosyrphus* and *Stipomorpha*). The combined analysis of molecular and morphological characters (Chapter 4) placed *Carreramyia* in a clade with *Masarygus*, with moderate support. As there are clear morphological differences between these two taxa, it is deemed not necessary to synonymize them with each other.

Diversity and distribution. – Described species: 4. A key to all species is given in Chapter 6. Only the type species, *Carreramyia megacephalus*, is known from more than one specimen (Panama & Costa Rica). The other species were found in Surinam and Peru. Apparently the genus is widespread in the Neotropical region.

***Ceratophya* Wiedemann**

Figs. 42-45.

Ceratophya Wiedemann, 1824: 14. Type species *Ceratophya notata* Wiedemann, 1824: 14, by subsequent designation of Blanchard (1846: 145).

Ceratophyia Osten Sacken, 1858: 46. Misspelling.

Description. – Body length: 7-9 mm. Relatively small, black and yellow flies with long antennae and oval abdomen. Face in profile straight, with anterior oral margin somewhat produced ventrad; laterally depressed, therefore slightly carinate medially; somewhat wider than an eye. Lateral oral margins not produced. Vertex flat. Occiput narrow ventrally, slightly widened dorsally. Eye bare. Eyes in male not approaching each other, eye margins parallel; mutual distance much larger than width of antennal fossa. Antennal fossa about as high as wide. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape; elongate, oval. Postpronotum pilose. Anepisternum with shallow sulcus; entirely short pilose, except bare on ventral 1/4. Anepimeron entirely pilose. Katepimeron weakly convex; bare. Scutellum semicircular or apicomedially sulcate; without calcars. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5 and vein M. Legs: hind tibia somewhat swollen; hind metatarsus enlarged, quadrate, sometimes with strong basoventral tooth. Abdomen with tergite 4 in lateral view more or less perpendicular to tergite 2. Tergites 3 and 4 not fused, able to articulate independently; in female with posterior margin of tergite 3 strongly overlapping tergite 4. Male genitalia: aedeagus strongly bent dorsally, furcate basally, with ejaculatory hood dorsally strongly elongate and thus forming a third process about equally long as two aedeagal processes; epandrium with ventrolateral ridges.

Diagnosis. – Tergites 3 and 4 not fused, strongly overlapping. Tergite 4 in lateral view more or less perpendicular to tergite 2. Basoflagellomere bare; longer than scape.

Discussion. – Cheng & Thompson (2008) point out the confused taxonomic history of *Ceratophya*. The present paper follows the definition of Cheng & Thompson (2008). Chapter 6 of this thesis revises the species, describing one species as new and excluding another.

The phylogenetic hypothesis presented in Chapter 4 placed *Ceratophya argentinensis* spec. nov. within *Stipomorpha*, as follows: (((*C. argentinensis* + (*S. inarmata* + *S. lanei*)) + (other *Stipomorpha* species)). However, considering the very low support values of the clade ((*C. argentinensis* + (*S. inarmata* + *S. lanei*)), the exact relationship between these genera remains unclear. As there are several important morphological differences (e.g. tergites 3-4 fused or not, sternites 2-3 widely separated or not, aedeagus furcate or not), there is no reason to reconsider their taxonomic status relative to each other.

Diversity and distribution. – Described species: 5. Known from Central and South America (Panama to northern Argentina).

***Ceratrichomyia* Séguy stat. nov.**

Figs. 46-58.

Ceratrichomyia Séguy, 1951: 14. Type species: *Ceratrichomyia behara* Séguy, 1951: 14, by original designation.

Description. – Body length: 7-10 mm. Slender, black flies with yellow markings and a constricted abdomen. Head wider than thorax, face and vertex wider than an eye. Face ventrally produced in profile; wider than an eye. Lateral oral margins not produced. Vertex swollen. Occiput narrow ventrally, strongly wide-

ned dorsally. Eye bare. Eyes in male not approaching each other; mutual distance much larger than width of antennal fossa. Antennal fossa about as high as wide. Antenna longer than height of head. Basoflagellomere at least three times as long as scape; with long pilosity. Postpronotum pilose or bare. Mesoscutum with transverse suture complete. Scutellum without calcars. Anepisternum with deep sulcus; entirely pilose. Anepimeron entirely pilose. Katepimeron convex; pilose or bare. Wing: vein R4+5 with posterior appendix; vein M1 straight, perpendicular to R4+5 and M; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located around basal 1/4 of cell DM. Abdomen constricted at segment 2. Tergites 3 and 4 not fused, able to articulate independently. Sternite 1 bare. Sternite 4 in male covered by genital capsule, therefore not visible without removing genitalia. Male genitalia: aedeagus straight or slightly bent dorsad, with spherical base very large, at least as long as remaining part of aedeagus; aedeagus furcate near apex; epandrium with or without ventrolateral ridge; surstylus deeply furcate.

Diagnosis. – The combination of a complete transverse suture on the mesoscutum and a constricted abdomen is only found in *Ceratrichomyia*, *Indascia*, *Thompsodon* and certain species of *Paramixogaster*. Males are easily distinguished from all these taxa by the long pilosity of the basoflagellomere, and also by sternite 4, which is covered by the genital capsule. From *Paramixogaster* this genus also differs by the unfused tergites 3 and 4. Females are unknown.

Discussion. – Séguy (1951) attributed one species to this genus. He designated a male and a female as 'types', and another male as 'cotype'. These are here all considered as syntypes. Examination of these three specimens made clear that they belong to three different species, which makes it necessary to designate a lectotype. The male with the following label data is here designated as lectotype. Label 1: "Madagascar, Behara"; label 2 (blue): "Museum Paris, III-38, A. Seyrig"; label 3 (red): "Type"; label 4: "*Ceratrichomyia behara* type du genre [male symbol] Séguy 50"; coll. MNHN. A redescription of the lecotype is given in the next section of the present paper. The other two syntypes are here designated as paralectotypes. The male collected in Bekily (Madagascar) belongs to *Ceratrichomyia*, but to a new species, which is described in the present paper as *C. bullabucca* spec. nov. The female paralectotype, collected in Bekily, is here considered to belong to a previously undescribed species of *Paramixogaster*, because it possesses all characters described as diagnostic for that genus (see genus account). A description of that species is given under the name *Paramixogaster piptotus* spec. nov. A third species attributed to this genus, *C. angolensis* spec. nov., is described from Angola.

The long pilosity of the male basoflagellomere was used by Séguy (1951) as a character to set his African genus *Ceratrichomyia* apart from other Microdontinae. This character is also present in *Ptilobactrum* Bezzi, another African taxon. Apparently Séguy was not aware of this, as he did not refer to *Ptilobactrum*. Cheng & Thompson (2008) did notice the similarity in antennal structure in both taxa and, based on the descriptions, proposed to regard *Ceratrichomyia* as a subjective junior synonym of *Ptilobactrum*.

Study of the type specimens of *Ceratricomyia* and *Ptilobactrum* revealed that these taxa are in fact very different. While *Ceratrichomyia* has, for instance, a constricted abdomen with unfused tergites 3 and 4, *Ptilobactrum* has a conical abdomen with fused tergites 3 and 4. The structures of the male genitalia are also very different (compare figs. 56-58 with 329), e.g. with a deeply furcate surstylus in *Ceratrichomyia* and an unfurcate one in *Ptilobactrum*. In the morphology-based phylogeny in Chapter 3, *Ceratrichomyia behara* and *Ptilobactrum neavei* are not recovered in the same clade. Considering these results and the morphological differences between the two taxa, *Ceratrichomyia* is here re-instated as a valid genus.

Diversity and distribution. – Described species: 3. Two species are known from Madagascar, one from the African mainland (Angola).

Ceriomicrodon Hull

Figs. 59-60.

Ceriomicrodon Hull, 1937: 25. Type species: *Ceriomicrodon petiolatus* Hull, 1937: 25, by original designation.

Description. – Body length: 11 mm. Very slender, wasp-like flies with long antennae and constricted abdomen. Face convex, somewhat produced on ventral half; narrower than an eye. Lateral oral margins

clearly produced. Vertex flat. Occiput ventrally narrow, dorsally somewhat widened. Eye bare; frontally with narrow, horizontal area of enlarged ommatidia at level of antenna. Eyes in male strongly convergent at level of frons. Antennal fossa about 1.5 times as wide as high. Antenna longer than height of head; basoflagellomere more than twice as long as scape; bare. Postpronotum bare. Anepisternum with shallow sulcus; pilose along posterior margin and (sometimes?) sparsely anterodorsally, widely bare in between. Anepimeron entirely pilose. Katepimeron flat; bare. Scutellum semicircular; without calcars. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded; crossvein rm located around basal 1/3 of cell DM. Abdomen very slender, constricted at tergite 2. Tergite 2 longer than thorax, about as long as tergites 3-5 together. Tergites 3 and 4 fused. Male genitalia: aedeagus furcate near apex, with dorsal process long and whip-like, ventral process very short; epandrium with ventrolateral ridge.

Diagnosis. – Postpronotum bare. Vein R4+5 with posterior appendix. Postero-apical corner of cell R4+5 widely rounded. Abdomen constricted. Tergite 2 longer than thorax.

Discussion. – This taxon is placed in the clade that also contains *Domodon*, *Pseudomicrodon* and *Rhopalosyrphus*, based on a phylogenetic analysis of morphological characters (Chapter 3). In male genitalia, *Ceriomicrodon* is very similar to those taxa. It also resembles *Rhopalosyrphus* in the ventrally bulging face, the antennal fossa being wider than high, the narrow area of enlarged ommatidia on the eye, and the constricted abdomen. The bare postpronotum and bare katepimeron distinguish *Ceriomicrodon* from *Rhopalosyrphus*, whereas the bare postpronotum and the flat vertex distinguish it from *Pseudomicrodon*. The relationships between these taxa need to be examined in further detail, based on molecular characters, with more species included.

Diversity and distribution. – Described species: 1. Known from Central (Mato Grosso) and Northern Brazil (Roraima).

***Cervicorniphora* Hull stat. nov.**

Figs. 61-62.

Cervicorniphora Hull, 1945: 75. Type species: *Microdon alcicornis* Ferguson, 1926a: 171, by original designation.

Description. – Body length: 8 mm. Broadly built flies with oval abdomen. Head wider than thorax. Face convex in profile; wider than an eye. Lateral oral margins not produced. Antennal fossa about as wide as high. Vertex flat. Occiput rather wide, dorsally strongly widened. Eye bare. Eye margins in male not converging at level of frons; with mutual distance about five times the width of antennal fossa. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, bare, bifurcate, with dorsal branch narrower and shorter than ventral branch, ventral branch strongly curved; arista well-developed. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum moderately sulcate; pilose anteriorly and posteriorly, bare medially. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded; crossvein rm located around basal 1/4 of cell DM. Abdomen oval, about 1.5 times as long as wide. Tergites 3 and 4 fused. Male genitalia: aedeagus unfurcate; epandrium without ventrolateral ridge; surstylus with long posterior process and wide anterior lamella. Female unknown.

Diagnosis. – Basoflagellomere bifurcate. Vein R4+5 with posterior appendix.

Discussion. – Although Ferguson (1926a) argued that the furcate antenna provides insufficient basis for erecting a new genus for *Microdon alcicornis*, Hull (1945) decided to erect *Cervicorniphora* for this species, as a subgenus of *Microdon*. Cheng & Thompson (2008) also considered this genus-group as a subgenus of *Microdon*. The phylogenetic analysis of morphological characters in Chapter 3 did not provide many clues as to the taxonomic affinities of this taxon, although it seems clear that it is not related to other taxa in which the male has a furcate basoflagellomere. As the characters of *Cervicorniphora* (e.g. aedeagus not furcate) do not fit in the concept of *Microdon* s.s. (aedeagus furcate near base) as defined in the current

paper, *Cervicorniphora* is here raised to genus rank, to avoid disrupting the monophyly of *Microdon*.

Diversity and distribution. – Described species: 1. Australia: New South Wales, Queensland and Tasmania (Ferguson 1926a).

***Chrysidimyia* Hull**
Figs. 63-67.
Chrysidimyia Hull, 1937: 116. Type species: *Chrysidimyia chrysidimima* 1937: 116, by original designation. Name emended by Thompson et al. (1976).

Description. – Body length: 8-10 mm. Metallic green to bluish flies (legs may be yellowish), entire body densely and coarsely punctate, mimics of Chrysididae (Hymenoptera). Head about as wide as thorax. Face convexly produced in profile; about as wide as an eye. Lateral oral margins produced. Vertex flat. Occiput ventrally narrow, dorsally strongly widened. Eye densely pilose. Eyes in male with mutual distance smaller than width of antennal fossa. Antennal fossa twice as wide as high, dorsally covered by 'shelf-like' extension of frons. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, oval; bare. Postpronotum pilose. Notal wing lamina strongly developed; partly overlapping membranes around wing implantation. Scutellum semicircular; with calcars. Anepisternum moderately sulcate; with bare part limited to ventral half. Anepimeron entirely pilose. Katepimeron flat; bare. Katatergum carinate. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded; crossvein rm located around basal 1/4 of cell DM. Abdomen oval, about 1.5 times as long as wide. Posterior margin of tergite 1 angular. Tergites 3 and 4 fused. Male genitalia: aedeagus unfurcate; epandrium without ventrolateral ridge; surstylus furcate, with anterior part short and wide, posterior part long and narrow.

Diagnosis. – Head, thorax and abdomen metallic green or blue. Antennal fossa twice as wide as high, dorsally covered by 'shelf-like' extension of frons.

Discussion. – The male genitalia of *Chrysidimyia* (fig. 65) resemble those of *Laetodon* (fig. 146); these taxa share an unfurcate aedeagus and a long posterior process on the aedeagus. These taxa also have their metallic body colouration and pilose eyes in common. These characters may suggest a phylogenetic relationship. The parsimony analysis of morphological characters presented in Chapter 3 places *Chrysidimyia* in a large polytomy, leaving its phylogenetic affinities unresolved.

Diversity and distribution. – Described species: 1. One additional, undescribed species is known to the first author. All known records are from the Amazon region of South America, including the Guyana shield.

***Chymophila* Macquart (subgenus of *Microdon*)**
Figs. 68-72.
Chymophila Macquart, 1834: 485. Type species: *Chymophila splendens* Macquart, 1834: 486, by monotypy.
Chimophila Osten Sacken, 1875: 46. Misspelling.
Eumicrodon Curran, 1925: 50. Type species: *Microdon fulgens* Wiedemann, 1830: 82, by original designation. See Cheng & Thompson (2008) for synonymy.

Description. – Body length: 10-16 mm. Broadly built flies with oval to round abdomen and long antennae. Head about as wide as to slightly narrower than thorax. Face convex in profile; slightly narrower to slightly wider than an eye. Lateral oral margins produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare or very short pilose. Eye margins in male converging at level of frons, with mutual distance 1-3 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter than scape; bare. Postpronotum pilose. Scutellum trapezoid; with calcars. Propleuron pilose. Anepisternum with sulcus; pilose anterodorsally and posteriorly, extensively bare ventrally and medially. Anepimeron entirely pilose. Katepimeron convex; smooth; bare. Katatergum uniformly microtrichose. Wing: vein R4+5 with posterior appendix; vein M1 with outward angle, often with outward appendix, anteriorly recurrent; postero-apical corner of cell R4+5 widely rounded, with or without appendix; crossvein rm lo-

cated between basal 1/5 and 1/3 of cell DM. Abdomen oval, 1-1.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus projecting far beyond apex of hypandrium, bent dorsad, furcate basally, with both processes equally long and very slender; epandrium with ventrolateral ridge; surstylus with two wide lobes; surstylar apodeme with elongate projection projecting well beyond susrtylus in lateral view.

Diagnosis. – Vein R4+5 with posterior appendix. Abdomen oval. Vein M1 of characteristic shape: with outward angle, usually with small outward appendix, anteriorly recurrent (fig. 69). In addition to this character, this subgenus also differs from *Microdon* s.s. in the aedeagal processes being longer and more slender, and in the surstylar apodeme projecting well beyond the surstylus in lateral view (fig. 70-72).

Discussion. – Species of this group are similar in overall habitus to *Microdon* s.s. Many species have metallic colours, but some are dull black or have a 'tiger-striped' abdomen. Previously, this group was considered to be exclusively Neotropical (Cheng & Thompson 2008). However, several Oriental and one Japanese species are very similar to the Neotropical species in both external characters and morphology of the male genitalia. The combined phylogenetic analysis of molecular and morphological characters (Chapter 4) included one Oriental and one Neotropical species, which are recovered as sister species within *Microdon*.

Diversity and distribution. – Described species: 33. Neotropical (25 species), Oriental (7 species), Nearctic (1 species) and Eastern Palaearctic (1 species from southern Japan).

***Dimeraspis* Newman (subgenus of *Microdon*)**
Figs. 73-78.
Dimeraspis Newman, 1838: 372. Type species: *Dimeraspis podagra* Newman, 1838, by monotypy.
Mesophila Walker, 1849: 1157. Type species: *Ceratophya fuscipennis* Macquart, 1834, by monotypy.

Description. – Body length: 8-12 mm. Broadly built flies with oval to round abdomen and long antennae. Head narrower than to about as wide as thorax. Face convex in profile; narrower to wider than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened or narrow (only in *M. abditus*). Eye bare. Eye margins in male converging at level of frons, sometimes only weakly so (*M. adventitius*, *M. fuscipennis*) with mutual distance 2-5 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than or as long as distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape; bare. Postpronotum pilose. Scutellum semicircular to trapezoid; without calcars, but large and blunt calcars may seem to be present due to strong apicomedian sulcus. Propleuron bare. Anepisternum without sulcus (or only a very weak one dorsally); pilose dorsally, extensively bare on slightly more or slighly less than ventral half. Anepimeron entirely pilose. Katepimeron more or less convex; smooth or with wrinkled texture (*M. fuscipennis*); bare. Katatergum uniformly microtrichose. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5, slightly recurrent; postero-apical corner of cell R4+5 rectangular, with appendix; crossvein rm located between basal 1/7 and 1/4 of cell DM. Abdomen oval, 1-1.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus projecting little beyond apex of hypandrium, bent dorsad, furcate apically, with both processes equally long; epandrium with ventrolateral ridge; surstylus with wide basal lobe and narrow posterior lobe.

Diagnosis. – Difficult to diagnose, because included species vary strongly in several key characters. See key and discussion.

Discussion. – This group was erected for the Nearctic *Dimeraspis podagra* Newman, a subjective synonym of *Mulio globosus* Fabricius (Thompson 1981b). This species differs from *Microdon* s.s. in the unsulcate anepisternum, the bare propleuron, the rectangular postero-apical corner of cell R4+5, and the male genitalia: aedeagus apically furcate, hypandrium with bulb-like base. Some other Nearctic (and one Cuban) species are very similar in morphology of the male genitalia: *M. abditus* Thompson, *M. adventitius* Thompson, *M. fuscipennis* (Macquart), *M. marmoratus* Bigot and *M. remotus* Knab. Thompson (1981b) also regarded these species as related, with the '*globosus* complex' (*M. abditus, M. globosus, M. marmora-*

tus) as sister to the *fuscipennis*-group (*M. adventitius*, *M. fuscipennis*, *M. remotus*). These species are also similar in their overall brownish colouration and in the wing venation. The morphological similarities are here taken as a reason to include all species in *Dimeraspis*. The phylogenetic analysis of morphology (Chapter 3) includes three of these species (*M. abditus, M. fuscipennis, M. globosus*), but the results offer little clues as to their relationships. Because of similarities in male genitalia this group might tentatively be considered related to *Archimicrodon, Mitidon* or *Menidon*. However, because of considerable uncertainty, the group is here treated as subgenus of *Microdon*.
Mesophila Walker, 1849 was erected for *Ceratophya fuscipennis* Macquart. As this species is here included in the older genus group *Dimeraspis*, *Mesophila* becomes a junior synonym of *Dimeraspis.*

Diversity and distribution. – Described species: 5. Nearctic (4 species) and West Indian (1 species from Cuba).

***Domodon* Reemer gen. nov.**
Figs. 79-84.
Type species: *Domodon zodiacus* Reemer spec. nov.

Description. – Body length: 6-8 mm. Moderately small flies with short antennae and oval abdomen. Head a little wider than thorax. Face convex; about as wide as or narrower than an eye. Lateral oral margins weakly produced. Vertex convexly produced, more or less shining, sparsely pilose, almost bare on anterior half. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male weakly converging at level of frons, with mutual distance 3-5 times width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere as long as or longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular; with calcars. Anepisternum sulcate; pilose anterodorsally and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron almost flat to convex; often with wrinkled texture; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located between basal 1/6 to 1/4 of cell DM. Abdomen oval, about 1.5 to 2 times as long as wide. Tergites 3 and 4 fused. Sternite 1 bare. Male genitalia: aedeagus furcate near apex, with dorsal process long and whip-like, ventral process very short; epandrium with ventrolateral ridge.

Diagnosis. – Vertex convexly produced. Abdomen oval. Vein R4+5 with posterior appendix. Tergites 3 and 4 fused. Membrane between sternites 2 and 3 much less wide than sternite 2.

Discussion. – All species assigned to this genus were previously undescribed or are still undescribed.
The phylogenetic analysis based on morphology places the type species (*D. zodiacus*) in the same clade as *Omegasyrphus*, *Pseudomicrodon* and *Rhopalosyrphus* (Chapter 3). In addition to this phylogenetic evidence, the male genitalia of these taxa are all similar in the structure of the aedeagus and the shape of the surstylus. Because of the oval, not constricted abdomen, *Domodon*-species superficially may seem most similar to *Omegasyrphus*, but differ from that genus by the convex and sparsely pilose vertex, a character shared with *Pseudomicrodon*, the long antenna, and the medially widely bare anepisternum. Instead of arbitrarily assigning the species in question to one of the mentioned genera, it is here considered preferable to erect a new genus, so as to emphasize the distinctive features of this group.

Diversity and distribution. – Described species: 1. Surinam. Four additional, undescribed species are known by the first author from French Guyana, Surinam and Costa Rica. Probably the group is widespread in Central and South America.

Etymology. – The generic name is a combination of *domus* and *odon*, with the latter used as a suffix derived from *Microdon*. The Latin word *domus* is here used in the meaning of 'dome' and refers to the convex (dome-shaped) vertex of the species in this genus. The name is to be treated as masculine.

***Furcantenna* Cheng**
Figs. 85-91.
Furcantenna Cheng, 2008: 29. Type species: *Furcantenna yangi* Cheng, 2008: 29, by original designation.

Description. – Body length: 9-10 mm. Broadly built

flies with very wide head, long antennae and widened hind tibiae, bee mimics. Head much wider than thorax. Face slightly convex in profile; wider than eye; laterally depressed; medially weakly carinate. Lateral oral margins not produced. Vertex produced. Occiput ventrally narrow, dorsally widened. Eye bare. Eyes in male not convergent at level of frons; separated over disance much larger than width of antennal fossa. Antennal fossa about as high as wide. Antenna much longer than height of head; basoflagellomere bifurcate at base, with ventral branch a little longer than dorsal branch, both branches entirely long pilose; arista absent. Postpronotum pilose. Anepisternum sulcate. Scutellum apicomedially sulcate. Katepisternum dorsally pilose. Metasternum developed and pilose. Wing: vein R4+5 without posterior appendix; vein M1 perpendicular to R4+5 and M; crossvein rm located around basal 1/5 of cell DM. Hind tibia and tarsus widened. Abdomen oval. Male genitalia: aedeagus slightly bent dorsad, with large spherical base; aedeagus furcate near apex; epandrium without ventrolateral ridge; surstylus approximately oval. Females unknown.

Diagnosis. – Male with bifurcate basoflagellomere. Katepisternum pilose. Metasternum pilose.

Discussion. – In the phylogenetic analysis based on morphological characters (Chapter 3), *Furcantenna nepalensis* spec. nov. was recovered in a clade that also contains *Carreramyia* and *Schizoceratomyia*. Although *Furcantenna* is very similar to *Schizoceratomyia* in both external morphology and male genitalia, but presently available evidence is not conclusive about the exact relationships between these taxa.

Diversity and distribution. – Described species: 2. The type species was found in a mountainous area in southeastern China. The second known species, *Furcantenna nepalensis* spec. nov., was collected in the Nepalese Himalaya at an altitude of approximately 1800 meters. The discovery of these species in these areas sheds an interesting light on the biogeography of the taxa with a furcate basoflagellomere in the male. Prior to the description of *Furcantenna*, such taxa were almost exclusively known from South America (except for the the apparently unrelated Australian *Cervicorniphora*). The occurrence of the obivously related *Furcantenna* in Oriental mountains on the Asian mainland could possibly be explained as a relict of a wider distribution in early eras.

***Heliodon* Reemer gen. nov.**
Figs. 92-107.
Type species: *Microdon tricinctus* de Meijere, 1908: 208. Type locality: Java.

Description. – Body length: 8-12 mm. Moderately slender to broadly built flies with long antennae; abdomen oval, slightly tapering or basally slightly constricted; often with fasciate patterns of golden pile on thorax and abdomen, sometimes with yellow abdominal markings. Head slightly wider or slightly narrowe than thorax. Face convex; narrower than to as wide as an eye. Lateral oral margins produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye short pilose or bare. Eye margins in male converging at level of frons, with mutual distance 1.5-2 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna about as long as distance between antennal fossa and anterior oral margin; basoflagellomere shorter than scape; bare. Postpronotum pilose. Scutellum semicircular; with calcars. Anepisternum sulcate; entirely pilose, except for small bare part ventrally. Anepimeron entirely pilose. Katepimeron convex or nearly flat; with or without wrinkled texture; bare or pilose. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 rounded or rectangular, with or without small appendix; crossvein rm located between basal 1/6 and 1/5 of cell DM. Abdomen oval or basally constricted, 1.5-3 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus projecting little beyond apex of hypandrium, bent dorsad, furcate with furcation point from halfway to near apex, with both processes about equally long; epandrium without ventrolateral ridge; surstylus with subbasal excavation, dividing surstylus into a basal lamella and a long posterior process.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum pilose. Propleuron bare. Anepisternum almost entirely pilose, at most ventrally with small bare part. Mesonotum with transverse suture incomplete. Basoflagellomere shorter than scape. Tergite 1 long: length/width ratio 1:1.4 to 1:2. Tergite 2: anterior margin less than 1.5 times as wide as poste-

rior margin. Body not entirely metallic green or blue.

Discussion. – Five species of *Heliodon* are included in the combined analysis of molecular and morphological characters of Chapter 4. These are recovered in a clade also containing *Indascia*, so *Heliodon* appears as paraphyletic with respect to that genus. However, support values for the subclade containing the *Indascia*-species are low. As morphology of *Heliodon* is distinct from that of *Indascia*, these taxa will here be considered as separate genera.
All previously described species included in this genus were originally described in the genus *Microdon*. In the most recent catalogue of Oriental Microdontinae these were listed under that genus (Knutson et al. 1975). As *Microdon* is defined more strictly in the present paper, the species can no longer be placed in that genus, hence a new genus is erected. Three new species are described in the present paper.

Diversity and distribution. – Described species: 8. Oriental, ranging from Sri Lanka to Thailand, Vietnam, Java and Borneo.

Etymology. – The generic name is composed of the Greek words *helios* (sun) and *odon*, with the latter part used as a suffix derived from *Microdon*. The first part was chosen to emphasize the Oriental ('where the sun rises') distribution of the genus.

***Hypselosyrphus* Hull stat. nov.**
Figs. 108-113.
Hypselosyrphus Hull, 1937: 21. Type species *Hypselosyrphus trigonus* Hull, 1937: 21, by original designation.

Description. – Body length: 7-10 mm. Stingless bee mimicking flies with short to moderately long antennae and oval to triangular abdomen. Head slightly wider than thorax. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex narrow, in most species convexly produced and shining, flat in some species. Occiput narrow over entire length, except ventrally strongly widened in *H. ulopodus*. Eye with short, sparse pile. Eye margins in male strongly converging at level of frons, with mutual distance smaller than width of antennal fossa, except 3 times as wide in *H. ulopodus*. Antennal fossa about as wide as high. Antenna as long as or shorter than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular, triangular or apicomedially sulcate; without calcars. Anepisternum without or with weak sulcus; pilose anterodorsally and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located between basal 1/8 to 1/4 of cell DM. Abdomen oval or kite-shaped, 1.2 to 2 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus furcate near apex, with dorsal process in some species a little longer than ventral process; epandrium with or without ventrolateral ridge.

Diagnosis. – Vein R4+5 without posterior appendix. Crossvein rm located between basal 1/8 and 1/4 of cell DM. Vein subcostal vein joins costal vein distal of crossvein rm. Postpronotum pilose. Abdomen oval or kite-shaped. Antenna as long as or shorter than distance between antennal fossa and anterior oral margin. Basoflagellomere not furcate. Occiput narrow in dorsal half (usually also in ventral half, except in *H. ulopodus*).

Discussion – When Hull (1937a) erected the genus *Hypselosyrphus* for his species *trigonus*, he mentioned its similarity to *Ubristes* species, without clearly stating the differences. In his key to the groups of Microdontinae, Hull (1949) separated these taxa by the absence (*Hypselosyrphus*) or presence (*Ubristes*) of an appendix on vein R4+5. This character serves well to separate *Hypselosyrphus* from *Ubristes* s.s. as defined in the present paper, but not from all specimens of *Stipomorpha*, which was until now included in *Ubristes.* In later keys and catalogues, *Hypselosyrphus* was treated as a junior synonym of *Ubristes* (Thompson 1969, Thompson et al. 1976). Cheng & Thompson (2008) also consider *Hypselosyrphus* (and *Stipomorpha*) synonymous with *Ubristes*, but nevertheless differentiate the groups in their key. They consider abdominal shape to be diagnostic: oval or rectangular in *Ubristes*, short, almost equilaterally triangular in *Hypselosyrphus*, much longer, isosceles triangular in *Stipomorpha*. As there are many varieties in abdomi-

nal shape among the the taxa involved, it is hard to decide where to draw the line. Other characters are necessary to distinguish these taxa satisfyingly (see key and diagnoses). For a discussion of relationships with *Ubristes* see there.
In the phylogenetic analysis in Chapter 4 *Hypselosyrphus* was recovered in a clade together with *Rhoga*, with high support values. The results suggest that *Hypselosyrphus* is paraphyletic with respect to *Rhoga*, a result also found in the analysis based on morphology of Chapter 3, in which more species were included. However, morphological variation within *Hypselosyrphus* is large, which could indicate a more complicated phylogeny. Before the intrageneric relationships are examined in detail, with molecular characters of a larger set of species included, it is deemed better to avoid the question of the intergeneric relationships by considering *Hypselosyrphus* and *Rhoga* as separate genera.

Diversity and distribution. – Described species: 11. *Hypselosyrphus* is known from Panama, the Amazon region and southern Brazil. Considering the small number of specimens known, it seems likely that the genus is widespread in tropical South America.

***Indascia* Keiser**
Figs. 114-129.
Indascia Keiser, 1958: 221. *Type species*: *Ascia brachystoma* Wiedemann, 1824: 33, by original designation.

Description. – Body length: 4-10 mm. Small, slender flies with more or less constricted abdomen. Head wider than thorax. Face convex in profile; narrower than to wider than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally strongly widened. Antennal fossa about as wide as high. Eye bare. Eye margins in male parallel, not converging at level of frons. Antenna shorter to longer than distance between antennal fossa and anterior oral margin. Basoflagellomere as long as to longer than scape, 1.5 to 5 times as long as wide; parallel-sided or with dorsal margin somewhat concave; bare. Postpronotum pilose. Mesoscutum with transverse suture complete. Scutellum semicircular, apex may be slightly acute; without or with very small calcars. Anepisternum convex or sulcate; entirely pilose or with bare part limited to ventral half. Anepimeron entirely pilose. Katepimeron (moderately) convex; bare. Wing: vein R4+5 with or without posterior appendix; vein M1 perpendicular to vein R4+5 and vein M; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located within basal 1/4 of cell DM, sometimes very close to base. Abdomen elongate, at least 3 times as long as wide; constricted, with narrowest point at posterior margin of tergite 2 and widest point at tergite 4. Tergites 3 and 4 not fused. Male genitalia: aedeagus furcate, with furcation point in distal half; epandrium without ventrolateral ridge; surstylus furcate, with anterior part short, posterior part about twice as long.

Diagnosis. – Abdomen constricted. Postpronotum pilose. Mesoscutum with transverse suture complete. Katepimeron bare. Frons laterally without concave area.

Discussion. – Originally this genus was included in the tribe Sphegini, as part of a subfamily Cheilosiinae (Keiser 1958). Thompson (1969) correctly recognized that it belongs to the Microdontinae, where it has remained since.
Three species of *Indascia* are included in the combined analysis of molecular and morphological characters in Chapter 4. These are recovered in a well-supported clade. This clade is part of a larger clade also containing *Heliodon*, which appears as paraphyletic with respect to *Indascia*. However, jackknife and GC values are low. As morphology of *Indascia* is distinct from that of *Heliodon*, these taxa will here be considered as separate genera.
Originally, *Indascia* was based on two species with short antennae and without a posterior appendix on vein R4+5 (Keiser 1958). In two of the species included in the phylogenetic analyses in Chapters 3 and 4 the antennae are long and the appendix on vein R4+5 is present (*Indascia gigantica* spec. nov. and *I. spathulata* spec. nov.). Both characters are also found in additional undescribed species known to the first author. Therefore, these characters are considered not to be of diagnostic value for this genus.
Superficially, species of *Indascia* look similar to those of *Paramicrodon* (as noticed by Cheng & Thompson 2008), but the available phylogenetic evidence provides no support for a close relationship between these taxa. For discussion on similarities with *Paramixogaster* see there.

Diversity and distribution. – Described species: 4. At least four undescribed species are known to the first author. The genus appears to be strictly Oriental, with species known from India, Sri Lanka, Pakistan, Thailand and Vietnam. The origin of the type specimens of the type species ('India orientalis') is not exactly known.

***Kryptopyga* Hull**

Figs. 130-142.

Kryptopyga Hull, 1944a: 129. Type species: *Kryptopyga pendulosa* Hull, 1944a: 130, by original designation.

Description. – Body length: 12-14 mm. Large flies with long antennae (pilose in male) and oval abdomen, which may be constricted basally. Head wider than thorax. Face in profile more or less straight, ventrally produced below eye margin; wider than eye. Lateral oral margins weakly produced. Vertex strongly swollen. Occiput narrow ventrally, strongly widened dorsally. Eye bare. Eyes in male not converging at level of frons; mutual distance about 5 times width of antennal fossa. Antennal fossa about as high as wide. Antenna longer than height of head. Basoflagellomere 3.5-4 (male) or 2.5 (female) times as long as scape; with long pilosity in male, bare in female. Postpronotum pilose. Mesoscutum with transverse suture incomplete. Scutellum semicircular, without calcars. Anepisternum with deep sulcus; pilose anterodorsally and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; with or without wrinkled texture; with rows of microtrichia. Wing: vein R4+5 with posterior appendix; vein M1 in anterior half with outward angle; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located between basal 1/6 and 1/5 of cell DM. Abdomen either oval or somewhat constricted at base, in the latter case with tergite 4 curved downward and more or less perpendicular to tergite 2. Tergites 3 and 4 not fused, able to articulate independently. In male *K. pendulosa*, sternite 4 is covered by the genital capsule and therefore not visible without removing genitalia, while the lateral margins of tergite 3 are strongly curved and 'tucked away' under sternite 3 (fig. 134). Male genitalia: aedeagus slender, furcate near apex, basally complexly bent into curves, interconnected by a membrane; epandrium without ventrolateral ridge; surstylus approximately oval.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum pilose. Propleuron bare. Mesonotal transverse suture incomplete Tergites 3 and 4 not fused, able to articulate independently. Anepisternum widely bare of pile (but with microtrichia) medially, also on dorsal half. Male basoflagellomere with long pile.

Discussion. – Hull (1944a) erected the genus and assigned one species to it: *K. pendulosa* Hull, 1944. He considered it close to the African genus *Ptilobactrum* Bezzi because of the long pile on the basoflagellomere, but considered it distinct because of the subpetiolate abdomen and the remarkable structure of the 3rd and 4th abdominal segments.

No evidence for a close relationship with *Ptilobactrum* was found in the phylogenetic analysis of morphological characters in Chapter 3; *Kryptopyga pendulosa* is placed as sister of *Ceratrichomyia*. These taxa share the pilose basoflagellomere in the male, the swollen vertex and dorsal occiput, and the unfused tergites 3 and 4. The male genitalia, however, are quite different, and in *Kryptopyga* the mesonotal transverse suture is incomplete.

Together with the Nearctic *Microdon craigheidi* Walton, *Kryptopyga* is the only known taxon of Microdontinae in which the aedeagus is not simply curved between base and apex, but complexly bent into a couple of curves basally, interconnected by a membrane (compare fig. 142 with fig. 224). Despite this common character, there is no reason to suspect a closer relationship between these taxa than recovered in Chapter 3.

The abdomen in *K. pendulosa* is much more modified than in *K. sulawesiana* spec. nov., but the latter species is nevertheless regarded as belonging to the genus based on the pilose basoflagellomere, the shape of the head, the wing venation and the structure of the male genitalia, in which it is all very similar to *K. pendulosa*.

Microdon tuberculatus Shiraki, 1968 might also belong in *Kryptopyga*, because of its unfused tergites 3 and 4 and similarity in head shape (strongly swollen vertex and dorsal occiput, face ventrally produced below eye margin). However, only the female of this species is known, so it is unknown whether the male has long pile on the basoflagellomere and the charac-

teristic genitalia of *Kryptopyga*. Therefore, this species is presently left unclassified. As De Meijere (1913) had already used the same species name, the replacement name *shirakii* is here proposed.

Diversity and distribution. – Described species: 2. Indonesia: Bangka, Java and Sulawesi.

***Laetodon* Reemer gen. nov.**
Figs. 143-146.
Type species: *Microdon laetus* Loew, 1864: 74, by original designation. Type locality: Cuba.

Description. – Body length: 6-9 mm. Small, metallic green to blue flies, black with long antennae and oval abdomen. Head about as wide as thorax or slightly wider. Face convex; narrower than an eye. Lateral oral margins weakly produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye pilose. Eye margins in male converging at level of frons, with mutual distance 2 to 4 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna about as long as to longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular; with calcars, which may be spatulate (widened and dorsoventrally flattened). Anepisternum weakly sulcate; pilose anteriorly and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; smooth; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located between basal 1/6 to 1/5 of cell DM. Abdomen oval, about 1.5 to 2 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus unfurcate, projecting slightly beyond apex of hypandrium; hypandrium with basal part bulb-like; epandrium without ventrolateral ridge; surstylus shallowly furcate, with long posterior process.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum pilose. Abdomen oval. Anepisternum widely bare medially. Propleuron pilose. Postero-apical corner of cell R4+5 rectangular. Eye pilose.

Discussion. – The species included in this genus used to be placed in *Microdon* (Thompson 1981b). In the phylogenetic analysis of molecular and morphological characters in Chapter 4, *Laetodon geijskesi* (Doesburg) is placed quite distant from *Microdon*, as sister group to *Peradon*, but with low support values. The analysis of only morphological characters includes an additional species, *L. laetus* (Loew), but provides no alternative hypothesis as to the relationship with *Microdon*. Morphology of the male genitalia, however, is quite distinct from that of *Microdon* as defined in the present paper: the aedeagus is short and unfurcate, the epandrium lacks the ventrolateral ridge. Based on these morphological differences and the phylogenetic results, *Laetodon* is here erected as a new genus. See *Chrysidimyia* for discussion on possible relationships with that genus.

Diversity and distribution. – Described species: 4. Nearctic (2 species) and Neotropical (2 species).

Etymology. – The generic name is composed of *laetus* and *odon*, with the first part derived from *Microdon laetus* Loew, 1864 (the type species of the genus), and the latter used as a suffix derived from *Microdon*.

***Masarygus* Brèthes**
Figs. 147-161.
Masarygus Brèthes, 1909: 441. Type species: *Masarygus planifrons* Brèthes, 1909: 442, by original designation.

Description. – Body length: 4-7 mm. Small, delicate flies with long antennae and flat abdomen. Head slightly to much wider than thorax. Face concave, either entirely or only laterally; wider than an eye. Mouth parts undeveloped: oral opening absent or hardly visible. Vertex more or less flat, not strongly produced or convex. Occiput ventrally narrow or widened, dorsally widened. Eye bare. Eyes in male not converging at level of frons, with mutual distance about 4 times the width of antennal fossa. Antennal fossa about as wide as high or about 1.5 times as wide as high. Antenna as long as or longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, multifurcate in male (3 to 14 branches), unfurcate in female; bare; arista absent in male, present in female. Postpronotum bare. Scutellum semicircular; without calcars.

Anepisternum convex; entirely with sparse, bristle-like pile. Anepimeron bare or pilose. Katepimeron convex; bare; with or without wrinkled texture. Wing: vein R4+5 without posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded or rectangular, with or without small appendix; crossvein rm located very close to base of cell DM (within basal 1/10). Abdomen dorsoventrally flattened; more or less trapezoid, with lateral margins gradually widening posteriad, with largest width at tergite 4; 1.5-2.5 times as long as wide. Tergites 3 and 4 fused. Male genitalia: aedeagus furcate near apex, straight, projecting not or hardly beyond apex of hypandrium; epandrium without ventrolateral ridge; surstylus unfurcate, more or less oval.

Diagnosis. – Vein R4+5 without posterior appendix. Postpronotum bare. Antenna at least as long as distance between antennal fossa and anterior oral margin. Antenna inserted on head above dorsal eye margin.

Discussion. – Originally, this genus was erected as the first known member of a new family, the Masarygidae (Brèthes 1908; but journal publication was 1909, see Sabrosky 1999). The author associated it with Conopidae and Scenopinidae because of the wing venation, and with Oestridae because of the reduced mouthparts. He also noted a superficial resemblance to certain Stratiomyidae. Bezzi (1910) was the first to recognize *Masarygus* as belonging to the Syrphidae and related to *Microdon*, by pointing out its resemblance to *Ceratophya* and the apparent relationship with ants (as noted by Brèthes 1908). Shannon (1925) considered *Masarygus* as a synonym *Microdon*. Brèthes (1928) objected by pointing out that *Masarygus* differs from *Microdon* in the distinct sexual dimorphism and also in wing venation. All subsequent authors have included *Masarygus* in the Microdontinae.

Masarygus was the first described syrphid taxon with a furcate basoflagellomere (in the male sex only). A few other taxa with this character would be described during the 20th century: *Schizoceratomyia* Carrera, Lopes & Lane, 1947, *Johnsoniodon* Curran, 1947 and *Carreramyia* Doesburg, 1966. The first three were considered synonymous by Hull (1949), who regarded *Masarygus planifrons* as a *Rhoga* species with a furcate antenna. Papavero (1962) also considered *Masarygus, Schizoceratomyia* and *Johnsoniodon* synonymous, because he found that the number of branches on the basoflagellomere (four in *Masarygus planifrons*, two in the other taxa) was a species-level character rather than a generic character. Van Doesburg (1966) did not agree and considered *Masarygus* and *Schizoceratomyia* (including *Johnsoniodon*) as distinct genera, because of distinct differences in shape of head, antenna and abdomen. Thompson et al. (1976) followed the opinion of Papavero (1962). Cheng & Thompson (2008) considered *Masarygus* and *Schizoceratomyia* as distinct groups.

The type species of *Masarygus*, *M. planifrons*, could not be included in the phylogenetic analysis of combined molecular and morphological characters in Chapter 4, because no fresh specimens were available. Instead, *Masarygus palmipalpus* spec. nov. was included. This species is considered related to *M. planifrons* because of the following shared characters: male basoflagellomere multifurcate; base of antenna in lateral view placed above dorsal eye margin; head strongly flattened; face concave; oral opening absent; abdomen dorsoventrally flattened; gradually widening hindward, with widest point at tergite 4; aedeagus furcate near apex, with both processes equally long. The results of a phylogenetic analysis of morphological characters (Chapter 3) supported the relationship between these two species, which were placed as sister taxa.

In the combined analysis, *Masarygus palmipalpus* was placed as sister of *Carreramyia tigrina*, with moderate support values. The clade including both taxa was placed as sister of *Paramixogaster*, but with very low support values. No close relationship with *Schizoceratomyia* was found, as that taxon was placed more basally. In the analysis of morphological characters only (Chapter 3), *Masarygus* and *Schizoceratomyia* were also not recovered as closely related (although both were recovered with different placements in the cladogram). These results support a classification in which *Masarygus* is treated as a distinct genus from *Schizoceratomyia*, despite the fact that these taxa share a furcate basoflagellmere.

In addition to *Masarygus planifrons* and *M. palmipalpus*, two undescribed species are considered to belong to this genus. These species are included in the phylogenetic analyses of Chapter 4 under the names *Masarygus* spec. 1 and spec. 2. The latter has three

branches on the basoflagellomere, the first approximately 14. Whereas spec. 1 is placed in the same clade as *M. planifrons* and *M. palmipalpus* in Chapter 3 (based on morphology), spec. 2 is placed in the clade containing *Schizoceratomyia* and *Carreramyia*. Species 2 is nevertheless included in *Masarygus*, because of the following characters: basoflagellomere multifurcate and bare (instead of bifurcate and pilose as in *Schizoceratomyia*); arista absent (present in *Schizoceratomyia*); base of antenna inserted on head above dorsal eye margin (not below as in *Schizoceratomyia*); vertex not strongly produced (in contrast with *Carreramyia*); crossvein rm located within basal 1/10 of cell DM (between basal 1/4 and 1/8 in *Schizoceratomyia*); hind tibia not swollen and without long, brush-like pile (in contrast with *Carreramyia*). Unfortunately, the genitalia of the only known specimen of *Masarygus* species 2 are lost: there is a microvial containing postabdominal segments attached to the pin, but there are no genitalia in it.

Diversity and distribution. – Described species: 2. Neotropical. At least two undescribed species are known to occur (see *Discussion*). All species known so far, including the undescribed ones, have only been collected on one occasion.

***Megodon* Keiser (subgenus of *Microdon*)**
Figs. 162-170.
Megodon Keiser, 1971: 252. Type species: *Megodon stuckenbergi* Keiser, 1971: 253, by original designation.

Description. – Body length: 8-13 mm. Broadly built flies with oval abdomen and long antennae. Head about as wide as thorax. Face convex in profile; narrower than an eye. Lateral oral margins slightly produced. Vertex flat. Occiput narrow and parallel-sided over entire length. Eye bare. Eye margins in male converging at level of frons, with mutual distance about equal to width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter than to as long as scape; bare. Postpronotum pilose. Scutellum trapezoid; with strongly developed calcars. Anepisternum weakly sulcate; pilose anterodorsally and along posterior margin, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; smooth; bare. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 angular to weakly rounded, with or without appendix; crossvein rm located around basal 1/6 of cell DM. Abdomen oval, around 1.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus furcate near base, with processes equally long and projecting well beyond apex of hypandrium; epandrium with ventrolateral ridge; surstylus unfurcate, elongate, curved dorsad.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum pilose. Abdomen oval. Anepisternum widely bare medially. Propleuron bare. Postero-apical corner of cell R4+5 more or less rectangular. Antenna longer than distance between antennal fossa and anterior oral margin. Occiput narrow and parallel-sided over entire length (not widened dorsally). First tarsomere of hind leg dorsally with wide longitudinal groove.

Discussion. – Keiser (1971) erected this genus to include a species with very large, cone-shaped scutellar calcars. Cheng & Thompson (2008) did not study this species and refrained from commenting on the status of the group. The first author was able to study the holotype of *Megodon stuckenbergi*, as well as some additional material.
Megodon stuckenbergi was included in the phylogenetic analysis of morphological characters of Chapter 3, which recovered it within a clade containing *Microdon* s.s. Exact relationships, however, remain unclear. *Megodon* is very similar in external morphology to *Microdon*. Their genitalia also share important characters, like the deeply furcate aedeagus, the long aedeagal processes and the presence of a ventrolateral ridge on the epandrium. There are also differences, most notably the entirely narrow and parallel-sided occiput, and the dorsal, longitudinal groove on the first tarsomere of the hind leg. The shared characters are here considered more important than the differences. Because of these considerations, combined with the phylogenetic results, *Megodon* is here treated as a subgenus of *Microdon*.
Microdon planitarsus Keiser is here also assigned to *Megodon*, because it agrees with the diagnostic characters as described above, and its male genitalia are

very similar to those of *M. stuckenbergi* (figs. 168, 170). In *M. planitarsis*, the scutellar calcars are not as large and cone-shaped as in *M. stuckenbergi*. This indicates that the size and shape of these calcars should not be regarded as group-defining.

Diversity and distribution. – Described species: 2. Madagascar. One undescribed species from Madagascar is known to the first author.

Menidon **Reemer gen. nov.**
Figs. 171-176.
Type species: *Microdon falcatus* Williston, 1887: 9. Type locality: Mexico.

Description. – Body length: 5-10 mm. Small, broadly built flies with long antennae and short, almost round abdomen. Head about as wide as thorax. Face convex; slighly narrower to slightly wider than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male parallel, not converging at level of frons, with mutual distance 4 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, sickle-shaped; bare. Postpronotum pilose. Scutellum semicircular; with small calcars or only with pair of small tufts of black microtrichiae posteriorly. Anepisternum without sulcus; pilose on slightly less than dorsal half, bare on slightly more than ventral half. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located between basal 1/8 and 1/10 of cell DM. Abdomen approximately round, 1 to 1.2 times as long as wide. Tergites 3 and 4 fused. Sternite 1 bare. Male genitalia: aedeagus straight, furcate near apex, with both processes about equally long; hypandrium without apical part; epandrium without ventrolateral ridge; surstylus furcate, with anterior lobe small and narrow, posterior lobe larger and wider.

Diagnosis. – Basoflagellomere sickle-shaped: curved upward. Anepisternum bare on ventral half. Cell R4+5 with postero-apical corner rectangular. Sternite 1 bare.

Discussion. – This is the only one known taxon among the Microdontinae in which the apical part of the hypandrium is entirely lacking (fig. 176). Among the Neotropical taxa, this taxon is unique in the sickle-shaped basoflagellomere. The latter character also occurs to some extent in some Nearctic (*Microdon adventitus, M. globosus*) and Old World taxa (some *Archimicrodon*, *Myiacerapis*, *Oligeriops*), but these differ from *Menidon* in several other important characters. The phylogenetic analysis of molecular and morphological characters in Chapter 4 placed *Menidon falcatus* in a clade with *Paramicrodon* and *Piruwa*, but support values for this clade are low. The analysis based on morphology alone (Chapter 3) offers no alternative solution. These phylogenetic results, combined with the morphological singularities, are reasons to place *Microdon falcatus* Williston in its own genus. Thompson (2007) clarifies the taxonomy of the type species, which has several synonyms.

Diversity and distribution. – Described species: 1. Central and South America. Unpublished molecular evidence suggests that more than one species is involved, but this needs further study.

Etymology. – The generic name is a combination of the Greek words *mene* (moon) and *odon*, with the latter used as a suffix derived from *Microdon*. The prefix *meni-* was chosen because of the crescent-shaped basoflagellomere in the type species.

Mermerizon **Reemer gen. nov.**
Figs. 177-182.
Type species: *Mermerizon inbio* spec. nov. Type locality: Costa Rica.

Description. – Stingless bee mimicking flies with moderately long antennae and elongate oval abdomen. Head slightly wider than thorax. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male parallel, not converging at level of frons, with mutual distance 3-4 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter than (may be almost as long as) distance between antennal fossa and anterior oral margin; basoflagellomere slightly shorter to longer than scape, oval; bare. Post-

pronotum pilose. Scutellum semicircular; without calcars. Anepisternum without sulcus; pilose on dorsal half, bare on ventral half. Anepimeron pilose on dorsal half, bare on ventral half. Katepimeron convex; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located around basal 1/10 of cell DM. Abdomen oval, 2 to 3 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus slightly bent dorsad, furcate near apex, with dorsal process at least twice as long as ventral process; hypandrium with bulb-like base; epandrium without ventrolateral ridge.

Diagnosis. – Vein R4+5 with posterior appendix. Postero-apical corner of cell R4+5 rectangular, with small appendix. Postpronotum pilose. Propleuron bare. Membrane between sternites 2 and 3 less wide than sternite 2. Abdomen oval. Anepisternum bare on ventral half, pilose on dorsal half, except for small median bare part on dorsal half. Anepimeron bare on ventral half. (Male: eye margins parallel at level of frons, not converging).

Discussion. – The species of this genus are obvious mimics of stingless, *Trigona*-like bees in their tawny colouration and long pilose hind tibiae. At first sight they may be confused with *Hypselosyrphus*, *Rhoga*, or *Stipomorhpa*. From the first two genera, *Mermerizon* can be distinguished by the presence of a poserior appendix on vein R4+5, from *Stipomorpha* by the absence of a wide membrane between sternites 2 and 3. A (presently undescribed) Argentinian species lacks the long pilosity of the hind tibiae and does not seem to mimic these bees. Instead, it resembles *Paragodon* and *Surimyia* in general habitus, but is easily told apart by the presence of a posterior appendix on vein R4+5 and the male genitalia, which are very similar to those of the other two *Mermerizon* species.
In the phylogenetic analysis of morphological characters of Chapter 3, *Mermerizon inbio* was recovered in a relatively basal clade containing no other taxa. Taxa to which the species of the genus are similar in certain characters, e.g. *Hypselosyrphus*, *Rhoga*, *Stipomorpha*, *Surimyia*, are placed in different clades. Considering these results and the combination of characters described above, it is deemed warranted to erect a new genus.

Diversity and distribution. – Described species: 1. Descriptions of two additional species are in preparation by the first author. Neotropical (presently known from Costa Rica and Argentina).

Etymology. – The generic name is derived from the ancient Greek verb *mermerizo*, meaning ′to deliberate′ or ′to ponder′. This name was chosen because it took some deliberation before making the decision that a new genus was to be erected for the involved species. The name is to be treated as masculine.

Metadon **Reemer gen. nov.**
Figs. 183-195.
Type species: *Microdon wulpii* Mik, 1899: 143. Replacement name for *Microdon apicalis* Wulp, 1892: 29 (preoccupied by Walker, 1859).

Description. – Body length: 7-21 mm. Slender to moderately broadly built flies with oval abdomen and long antennae. Head slightly wider than thorax. Face almost straight to convex in profile; narrower to wider than an eye. Lateral oral margins produced or not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male converging at level of frons, with mutual distance 2-3 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter than scape; bare. Postpronotum pilose. Scutellum semicircular; with or without calcars. Anepisternum sulcate; entirely pilose, except sometimes with small bare part ventrally (only known exception: *M. bifasciatus*, in which anepisternum is bare on entire ventral half). Anepimeron entirely pilose. Katepimeron flat to somewhat convex; smooth or with wrinkled texture; not pilose, but often with rows of microtrichia. Katatergum with oblique rows of microtrichia. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 angular to widely rounded, with or without appendix; crossvein rm located between basal 1/7 and 1/4 of cell DM. Abdomen oval, 1.5-2.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus projecting not or little beyond apex of hypandrium (except projecting well beyond apex of hypandrium in *M. bifasciatus*), bent dorsad,

furcate in apical half, with both processes about equally long (except ventral process much longer in *M. bifasciatus*); epandrium with or without ventrolateral ridge; surstylus unfurcate, sometimes with long posterior process.

Diagnosis. – Vein R4+5 with posterior appendix.

Discussion. – All included species (except the ones presently described) were originally described in the genus *Microdon*. In the combined analysis of molecular morphological characters (Chapter 4), the included species of *Metadon* were grouped in a clade with moderately high support values. The clade (*Metadon* + *Parocyptamus*) was placed as a sister to the clade containing *Microdon* s.s. The separate analysis of molecular data also recovered the same taxa of *Metadon* in a separate clade, but with an unresolved relationship to *Microdon*. In the analysis of morphological characters only (Chapter 3), a larger number of species was included (also from Africa), and *Metadon* is placed as sister to *Heliodon*.
Even though the exact phylogenetic affinities with *Microdon* are uncertain, the morphology of *Metadon* is distinct. Characters that separate these taxa in all examined species (except *M. bifasciatus*, see below) are: anepisternum (almost) entirely pilose; aedeagus projecting not or only little beyond apex of hypandrium; aedegus furcate in apical half. Additional characters for distinguishing *Metadon* from *Microdon* – that may not work for all species – are: katepimeron more or less flat, with wrinkled texture; katatergum with oblique rows of microtrichia. In general, the abdomen of *Metadon* species is more elongate than that of *Microdon* species.
The East Palaearctic species *M. bifasciatus* is aberrant in certain characters. In this species the bare part of the anepisternum reaches up to about half the height of the sclerite. Besides, the genitalia are aberrant in the fact that the dorsal aedeagal process is much longer than the ventral process (fig. 192), a character not known from any other species of Microdontinae. Nevertheless, this species is placed in *Metadon* because of the results of the phylogenetic analyses (Chapters 3 & 4), the elongate abdomen and the oblique rows of microtrichia on the katatergum. As the Chinese species *Microdon brunneipennis* and *M. pingliensis*, *M. spuribifasciatus*, described by Huo et al. (2007) are similar to *M. bifasciatus*, the characters as mentioned may also be valid for those species.
Considering the uncertain nature of the relationship with *Microdon*, in combination with the morphological characters, *Metadon* is erected as a new genus. This is done in order to facilitate distinction between these apparently monophyletic groups, and to break up the genus *Microdon* into pieces which are more manageable than a genus containing more than 300 species.

Diversity and distribution. – Described species: 42. About half of the species (22) are described from the Oriental region. Several undescribed species from this region were seen by the first author in different collections. From the Afrotropical region, 14 species are described, remarkably none of which is from Madagascar. Four species are known from the Palaearctic region. These seem to form a closely related species group, all related to *M. bifasciatus*, restricted to eastern China, Korea and Japan. Two species are known from the Aru Islands off the southwest coast of New Guinea (these were collected by Alfred Russel Wallace in 1857, to be described by Walker 1858). These are the only known records of this group from the Australian region.

Etymology. – The generic name is a combination of the ancient Greek words *meta* and *odon*, with the latter used as a suffix derived from *Microdon*. The prefix *meta* is used in the sense of 'near' or 'close', in order to indicate the resemblance in habitus to *Microdon* s.s. It is a masculine name.

***Microdon* Meigen**

Figs. 196-232 (for figures of subgenera see separate accounts).
Microdon Meigen, 1803: 275. Type species: *Musca mutabilis* Linnaeus, 1758: 592, by monotypy.
Aphritis Latreille, 1804: 193. Type species: *Aphritis auropupescens* Latreille, 1805, by subsequent monotypy. See Cheng & Thompson (2008) for synonymy.
Colacis Gistel, 1848: x. New name for *Microdon* Meigen. See Cheng & Thompson (2008) for synonymy.
Scutelligera Spix, 1824: 148. Type species: *Scutelligera ammerlandia* Spix, 1824: 124, by monotypy. See Cheng & Thompson (2008) for synonymy.
Parmula Heyden, 1825: 589. Type species: *Parmula cocciformis* Heyden, 1825: 589, by monotypy. See Cheng & Thompson (2008) for synonymy.

Scutigerella Haas, 1924: 148. Misspelling of *Scutelligera* Spix, 1824. See Cheng & Thompson (2008) for synonymy.

Subgenera
Chymophila Macquart, 1834. See separate account.
Dimeraspis Newman, 1838 (= *Mesophila* Walker, 1849, syn. nov.). See separate account.
Megodon Keiser, 1971. See separate account.
Microdon s.s. See below.
Myiacerapis Hull, 1949. See separate account.
Serichlamys Curran, 1925. See separate account.
Syrphipogon Hull, 1937. See separate account.

Species groups
craigheadii-group
erythros-group
mirabilis-group
tarsalis-group
virgo-group

Unplaced species (*Microdon* s.l.)
Microdon amabilis Ferguson, 1926
Microdon carbonarius Brunetti, 1923
Microdon macquariensis Ferguson, 1926
Microdon nigromarginalis Curran & Bryan, 1926
Microdon pagdeni Curran, 1942
Microdon pictipennis (Macquart, 1850)
Microdon rieki Paramonov, 1957
Microdon trimacula Curran, 1928
Microdon tsara Keiser, 1971
Microdon unicolor Brunetti, 1915
Microdon waterhousei Ferguson, 1926

Microdon s.s. – *Description* (*not applicable to subgenera and species groups*). – Body length: 7-14 mm. Broadly built flies with oval abdomen and long antennae. Head narrower to slightly wider than thorax. Face convex in profile; slightly narrower to wider than an eye. Lateral oral margins not or weakly produced. Vertex flat. Occiput ventrally narrow to wide, dorsally widened. Eye bare. Eye margins in male converging at level of frons, with mutual distance 2-4 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape; bare. Postpronotum pilose. Scutellum semicircular to trapezoid; with or without calcars. Propleuron pilose. Anepisternum sulcate; pilose anterodorsally and posteriorly, widely bare ventrally and medially. Anepimeron entirely pilose. Katepimeron convex; smooth; bare. Katatergum uniformly microtrichose. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5, sometimes with slight inward angle in anterior 1/3; postero-apical corner of cell R4+5 rounded, with or without appendix; crossvein rm located between basal 1/6 and 1/4 of cell DM. Abdomen oval, 1-1.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus projecting clearly beyond apex of hypandrium, bent dorsad, furcate in basal half, with both processes about equally long or dorsal process longer than ventral process; epandrium with ventrolateral ridge; surstylus with two short, wide lobes.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum pilose. Abdomen oval. Anepisternum extensively bare ventrally and medially. Postero-apical corner of cell R4+5 rounded. Katepimeron convex, without microtrichia. Apical crossvein M1 without outward angle. Lateral oral margins not or weakly produced.

Discussion. – As Cheng & Thompson (2008) put it, this genus has remained "somewhat a catch all for various unrelated species not placed in other genera". The phylogenetic analysis of morphological characters (Chapter 3) included many taxa which do not obviously belong to any of the previously recognized groups, nor to the genera erected in the present paper. The phylogenetic results for these taxa offer little or no clues as to their taxonomic affinities. As most of these taxa were originally described in *Microdon*, and were subsequently maintained in that genus, the pragmatic solution is here chosen to keep these taxa in *Microdon* s.l. This category should not be confused with the monophyletic *Microdon* s.s. as defined above, as *Microdon* s.l. is probably not monophyletic. For some of these taxa, genus group names are available, which are here treated as subgenera (see separate accounts). The other taxa are here placed in species groups, which are discussed below.

craigheadii-group. – Only one species is included in this group: *Microdon craigheadii* Walton, 1912. This slender, metallic green Nearctic species is similar in habitus to *Laetodon* and many species of *Microdon*

s.l. From these groups, *M. craigheadii* differs in the structure of the basal part of the aedeagus: the part of the aedeagus connecting the basal spherical part with the apical part is complexly curved (fig. 224). This is a very unusual structure in Microdontinae, only found in this species and in *Kryptopyga*. In other genitalic structures (aedeagus deeply furcate, epandrium with ventrolateral ridge) as well in external morphology, *M. craigheadii* is very similar to *Microdon* s.s. Because of the peculiar morphology of the genitalia, the species is placed in a separate species group within *Microdon* s.l.

erythros-group. – In overall habitus and many external characters, the species of this group remind of both *Microdon* s.s. and *Metadon*. Placement in *Microdon* s.s. is contradicted by the aedeagus being furcate apically (fig. 225), whereas placement in *Metadon* is contradicted by the extensively bare anepisternum. As the phylogenetic analysis of morphological characters (Chapter 3) provides no information on the affinities of *Microdon erythros* Bezzi, this species is placed in *Microdon* s.l., along with the similar *M. luteiventris* Bezzi.

mirabilis-group. – The species of this Neotropical group have contrasting yellow and black colour patterns on the wings, combined with remarkably long hind legs, evoking a resemblance to certain Pompilidae (Hymenoptera). Apart from this, they differ from *Microdon* s.s. in the bare propleuron and the aedeagal processes projecting hardly beyond the apex of the hypandrium. *Microdon mirabilis* Williston is included in the phylogenetic analysis of morphological characters in Chapter 3, but the results offer little insight in the relationships with other groups of *Microdon* s.l.
Apart from *Microdon mirabilis*, this group includes *M. bertonii* Bezzi (= *M. arcuatus* Curran, syn. nov.) and *M. iheringi* Bezzi. The species seem to differ only in colouration of wings, legs and abdomen. However, quick glances in museum collections (e.g. USNM) suggest that intermediate specimens exist. This indicates that species taxonomy of this group needs further attention.
Bezzi (1910) wrote that he had two male specimens *Microdon iheringi* in his collection, which he both considered as 'cotypes'. The collection of the MCSN (Milan) presently holds only one specimen (a male), which was examined by the first author. It is uncertain whether the other specimen still exists. In order to assure stability of this taxon, the specimen in the MCSN-collection is here designated as lectotype. Label information is as follows: label 1: "5695"; label 2: "S. Paulo / Brasile / 26.X.06 / Hering"; label 3: "iheringi"; label 4 (red): "LECTOTYPE / *Microdon iheringi* / Bezzi, 1910 / Des. M. Reemer 2009".

tarsalis-group. – This group only includes the Afrotropical species *Microdon tarsalis* Hervé-Bazin and its synonym *Microdon bequaerti* Curran (syn. nov.). In the phylogenetic analysis of morphological characters (Chapter 3) this species was recovered in the *Microdon* s.l.-clade, but its exact relationship with the other groups in this clade were unresolved. This group differs from *Microdon* s.l. in e.g. the entirely narrow occiput, the short and characteristically shaped aedeagus, and the absence of a ventrolateral ridge on the epandrium. Besides, there is a patch of pile with hook-shaped apexes on the hind basitarsus dorsally on its inner surface.
In overall habitus (including swollen hind basitarsus), *M. tarsalis* is remarkably similar to the Nearctic *Microdon* (*Dimeraspis*) *abditus* Thompson, but considering the differences in male genitalia this similarity is probably merely superficial.

virgo-group. – This group consists of Neotropical metallic green, blue or bronze flies, sometimes partly reddish. It is differentiated from *Microdon* s.s. in the key by the bare propleuron and the strongly produced lateral oral margins, of which the anterolateral corners are distinctly angular (fig. 221). The latter character is presented with some hesitation, as it is uncertain whether it works for all species. Possibly, certain species here placed in *Microdon* s.s. also belong in this group. Therefore, the *virgo*-group is here considered as a species group within *Microdon* s.s., instead of within *Microdon* s.l. As it is presently uncertain which species should be assigned to it, this group is not recognized in the species catalogue in this paper.

Unplaced species. – Several species of *Microdon* do not fit into any of the groups described above. In the phylogenetic analyses of Chapters 3 and 4, the following species belonging to this group were included: *Microdon amabilis* Ferguson, *Microdon carbonarius* Brunetti, *Microdon nigromarginalis* Curran & Bryan, *Microdon pictipennis* (Macquart), *Microdon rieki* Pa-

ramonov, *Microdon trimacula* Curran, *Microdon tsara* Keiser, *Microdon waterhousei* Ferguson. The results hardly offer solid clues as to their exact relationships with *Microdon* s.s. For examples of morphology of these species see figs. 222, 223, 229-232.

Diversity and distribution. – Described species: *Microdon* s.s.: 61. *Microdon* s.l.: 18 (excluding species classified into subgenera!). For species numbers of subgenera see separate accounts. *Microdon* is distributed worldwide, but *Microdon* s.s. is most strongly represented in the Holarctic.

***Mitidon* Reemer gen. nov.**
Figs. 233-237.
Type species: *Microdon mitis* Curran, 1940: 7.

Description. – Body length: 7-13 mm. Small to medium-sized flies, black, brownish or metallic green, with moderately short to long antennae and oval abdomen. Head about as wide as thorax or slightly wider. Face convex; about as wide as an eye or narrower. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male converging at level of frons, with mutual distance 2 to 3 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter to longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape, oval, with rounded apex; bare. Postpronotum pilose. Scutellum semicircular; with narrow, elongated calcars, often quite parallel and with small mutual distance, sometimes dorsoventrally flattened. Anepisternum weakly sulcate; pilose anteriorly and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular or weakly rounded, always with small appendix; crossvein rm located around basal 1/5 to 1/4 of cell DM. Abdomen oval, about 1.5 to 2 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus furcate, with furcation point near apex; hypandrium with basal part bulb-like; epandrium without ventrolateral ridge; surstylus unfurcate, with long posterior process.

Diagnosis. – Abdomen oval. Vertex flat. Occiput dorsally (slightly) widened. Eye bare. Postpronotum pilose. Scutellum with calcars. Vein R4+5 with posterior appendix. Postero-apical corner of cell R4+5 rectangular, with small appendix. Proepimeron pilose. Anepisternum widely bare medially, also on dorsal half. Anepimeron entirely pilose. Male genitalia: aedeagus furcate near apex; surstylus with long posterior process (difference with *Serichlamys*).

Discussion. – This Neotropical group was recovered as a sister to the Old World genus *Archimicrodon* in Chapter 4. Many species of these groups are very similar in general habitus and important morphological characters, including the male genitalia. Generally, the antennae of *Mitidon* are longer and the scutellar calcars are stronger developed (longer).
In several important morphological characters this genus is also similar to the North American *Serichlamys*: apart from the shape of the surstylus of the male genitalia, the diagnosis as stated above is valid for both groups. Based on this, the groups should probably be considered closely related (see discussion under *Serichlamys*). The phylogenetic analysis of morphological characters provides no clarity in this matter (Chapter 3).

Diversity and distribution. – Described species: 3. Several undescribed species are known to the first author. Central and South America.

Etymology. – The generic name is composed of *mitis* and *odon*. The first part means 'mild' in Latin, but in this case it is derived from *Microdon mitis*, the type species of the genus. The second part of the name is used as a suffix derived from *Microdon*.

***Mixogaster* Macquart**
Figs. 238-245.
Mixogaster Macquart, 1842: 14. Type species: *Mixogaster conopsoides* Macquart, 1872: 14, by original designation.
Myxogaster Kertesz, 1910: 351. Misspelling.
Myxogaster Shiraki, 1930: 8. Misspelling.

Description. – Body length: 9-15 mm. Slender flies with constricted abdomen, wasp-like. Head wider than thorax. Face convex or almost straight in pro-

file; about as wide as an eye or narrower. Lateral oral margins not produced. Vertex flat. Occiput narrow, except slightly widened dorsally. Eye bare. Eyes in male not or hardly converging at level of frons, with mutual distance 4 to 5 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer or shorter than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum with weak sulcus; entirely bare or pilose anterodorsally, or pilose anterodorsally and along posterodorsal margin. Anepimeron entirely pilose or bare on ventral half. Katepimeron convex; bare. Wing vein R4+5 without posterior appendix. Vein M1 either straight or with anterior part directed outward, with one or two angles, whether or not with small inward appendix and /or small outward appendix. Postero-apical corner of cell R4+5 angular. Crossvein rm located betwee basal 1/4 to 2/5 of cell DM. Abdomen constricted at base, with tergite 2 varying in length and width. Tergites 3 and 4 not fused. Male genitalia: aedeagus unfurcate, bent dorsad, with either lateral or dorsal and ventral lamellae, sometimes with apical spines; hypandrium with bulb-like base and apical part consisting of separate lobes, or hypandrium entirely consisting of two separate parts, which are not interconnected; epandrium without ventrolateral ridge; surstylus of varying shape.

Diagnosis. – Vein M with small anterior appendix into cell R4+5. Abdomen constricted. Metapleura connected, postmetacoxal bridge complete.

Discussion. – According to the phylogenetic hypothesis presented in Chapter 4, *Mixogaster* is the first taxon to branch off within the tribe Microdontini. Support values for this basal relationship are high. Interestingly, the most important diagnostic character of *Mixogaster*, the anterior appendix of vein M, is also found in *Spheginobaccha* and certain specimens of *Aristosyrphus primus*. These taxa also share the character of the apical part of the hypandrium consisting of two separate lobes. No close relationship between *Mixogaster* and *Aristosyrphus* was recovered by the analysis of morphological characters of Chapter 3, but see genus account of *Aristosyrphus* for discussion. The morphology of the male genitalia is remarkably diverse in this genus, much more so than in other groups of Microdontinae (except perhaps *Aristosyrphus* / *Eurypterosyrphus*). Some species have characters not known from any other Microdontinae. Some examples are illustrated in figs. 242-245. In *Mixogaster breviventris*, the aedeagus has wide dorsal and ventral lamellae (fig. 242). This type of genitalia is found in all Nearctic species, which also have a straight vein M1 in common. In *M. thecla* Hull (fig. 244), the hypandrium consists of two separate lobes, which are not interconnected ventrally to envelope the aedeagus, as is the case in all other studied Microdontinae. Besides, the surstylar apodeme is strongly developed in this species, and produced well beyond the epandrium in lateral view. In an undescribed species (fig. 245), the aedeagus is asymmetric in ventral view, with wide lateral lamellae, which are apically densely occupied with irregular spines. This is the only known case of asymmetric genitalia among Microdontinae. The spinose aedeagus is also a unique character.
The keys to the species by Hull (1954) and Carrera & Lenko (1958) (Brazilian species only) work reasonably well, but the existence of several undescribed species makes it necessary to check original descriptions or, preferably, type material in order to verify identifications. Considering the large interspecific variation in the male genitalia, these characters should be further explored in future (re)descriptions of species.

Diversity and distribution. – Described species: 21. Mainly Neotropical, with three species in the Nearctic. At least one Nearctic and a number of Neotropical species are undescribed.

***Myiacerapis* Hull (subgenus of *Microdon*)**
Figs. 246-251.
Myiacerapis Hull, 1949: 309. Type species: *Microdon villosus* Bezzi, 1915: 135, by original designation.

Description. – Body length: 12 mm. Broadly built flies with bee-like pilosity and long antennae. Head wider than thorax. Face convex; wider than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare or very short and sparsely pilose. Eye margins in male hardly converging at level of frons, with mutual distance about 5 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral mar-

gin; basoflagellomere longer than scape; bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum weakly sulcate; pilose anteriorly and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; with wrinkled texture; bare. Wing: vein R4+5 with posterior appendix; vein M1 slightly recurrent, but more or less perpendicular to vein R4+5; postero-apical corner of cell R4+5 rounded, without appendix; crossvein rm located around basal 1/4 of cell DM. Abdomen oval, about 1.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus furcate, with furcation point near base; epandrium with ventrolateral ridge; surstylus unfurcate.

Diagnosis. – Abdomen oval, about 1.5 times as long as wide. Vein R4+5 with posterior appendix. Postpronotum pilose. Proepimeron bare. Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere longer than scape. Anepisternum with bare ventromedian part extending to dorsal half. Sternite 1 pilose. Scutellum without calcars.

Discussion. – *Myiacerapis* was described as a subgenus of *Microdon*. The phylogenetic analysis based on morphological characters (Chapter 3) provides no insight in the nature of the relationship between these taxa. In morphology it is quite similar to *Microdon* s.s., also in the male genitalia (deeply furcate aedeagus with equally long processes, epandrium with ventrolateral ridge). However, the taxon does not fit into the concept of *Microdon* s.s. as described in this paper, e.g. because of the bare proepimeron (pilose in *Microdon* s.s.) and the wrinkled texture of the katepimeron. Therefore, its subgeneric status is maintained, in awaitance of better understanding of its phylogenetic affinities.

Diversity and distribution. – Described species: 1. Africa (Uganda). An undescribed species is known from South Africa (coll. BMNH).

***Oligeriops* Hull**

Figs. 252-256.

Oligeriops Hull, 1937: 26. Type species: *Microdon chalybeus* Ferguson, 1926a: 176, by original designation.

Description. – Body length: 7-10 mm. Dark-coloured, stout-legged flies with oval abdomen and moderately long antennae. Head about as wide as thorax. Face convex; wider than an eye. Lateral oral margins produced. Vertex flat. Occiput wide over entire length, narrowest point halfway. Eye bare. Eye margins in male not converging at level of frons, with mutual distance around 4 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape; with dorsal margin curved dorsad, more or less sickle-shaped; bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum weakly sulcate; pilose, with small bare part on ventral half. Anepimeron entirely pilose. Katepimeron convex; with wrinkled texture; bare. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located between basal 1/6 of cell DM. Abdomen oval, about twice as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus projecting not or little beyond apex of hypandrium, slightly bent dorsad, shallowly furcate, with both processes about equally long; epandrium without ventrolateral ridge; surstylus unfurcate.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum pilose. Abdomen oval. Anepisternum largely pilose, at most with small bare part on ventral half. Basoflagellomere sickle-shaped: dorsal margin curved upward.

Discussion. – Hull (1937a) described *Oligeriops* as a genus, with only *Microdon chalybeus* Ferguson included, without indicating its diagnostic generic characters. Hull (1949) used the reduced size of the eyes (due to widened occiput and gena) and the sickle-shaped antenna as key characters. Thompson & Vockeroth (1989) list *Oligeriops* as synonym of *Microdon*. Cheng & Thompson (2008) express their doubts about ranking *Oligeriops* as a genus, while referring to the antennae of Australian *Microdon* species as illustrated in Ferguson (1926b). These illustrations show that other species originally described in *Microdon* also have a curved basoflagellomere, just like *M. chalybeus*, but nevertheless these species were not included in *Oligeriops* by Hull (1937a, 1949). Cheng

& Thompson (2008) state that 'Whether these other species have reduced eyes remains to be seen!'. However, as Ferguson (1926a, b) already noticed, the four species he described are all 'close' and 'very similar'. Examination of type specimens, additional material and original descriptions, has confirmed this, and has made clear that all five species presently included in *Oligeriops* have reduced eyes and sickle-shaped basoflagellomeres indeed. Based on these and other morphological similarities, there is no doubt that they are closely related.

Based on an analysis of morphological characters (Chapter 3), the phylogenetic affinities of *Microdon dimorphon* Ferguson remain unresolved. However, it is not placed in the clade containing *Microdon* s.s. Moreover, it does not fit into the concept of *Microdon* s.s. as defined in the present paper. In addition to the reduced size of the eye and the curved basoflagellomere, the following characters distinguish *Oligeriops* from *Microdon*: anepisternum almost entirely pilose, at most with small bare part ventrally; propleuron bare; postero-apical corner of cell R4+5 rectangular; aedeagus projecting little beyond apex of hypandrium, furcate near apex. Considering these characters in combination with the results of the phylogenetic analysis, *Oligeriops* it is deemed not desirable to include this taxon in *Microdon*.

Diversity and distribution. – Described species: 5. Australia (incl. Tasmania).

***Omegasyrphus* Giglio-Tos**

Figs. 257-259.

Omegasyrphus Giglio-Tos, 1891: 4. Type species: *Microdon coarctatus* Loew, 1864: 74, by subsequent designation of Giglio-Tos (1892: 3).

Description. – Body length: 7-9 mm. Small, dark flies with relatively short antennae and characteristically shaped abdomen. Head slightly wider than thorax. Face convex; about as wide as or narrower than an eye. Lateral oral margins hardly produced. Vertex flat or slightly produced, densely pilose. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male slightly converging at level of frons, with mutual distance 2.5-3 times width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter than distance between antennal fossa and anterior oral margin; basoflagellomere as long as or longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular; with calcars. Anepisternum sulcate; entirely pilose. Anepimeron entirely pilose. Katepimeron moderately convex; with wrinkled texture; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular to weakly rounded, with small appendix; crossvein rm located between basal 1/6 to 1/5 of cell DM. Abdomen 2.5-3 times as long as wide; with characteristic shape: widest point about halfway tergite 2, which has strongly arcuate lateral margins and pair of depressed areas dorsally; tergites 3-4 narrower and almost parallel-sided. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus furcate near apex, with dorsal process long and whip-like, ventral process very short; epandrium with ventrolateral ridge.

Diagnosis. – Vein R4+5 with posterior appendix. Antenna shorter than distance between antennal fossa and anterior oral margin. Tergite 2 with strongly arcuate lateral margins, tergites 3-4 narrower and almost parallel-sided. Sternite 2 and 3 separated by membrane that is much less wide than sternite 2.

Discussion. – The phylogenetic analysis based on molecular and morphological characters in Chapter 4 places *Omegasyrphus pallipennis* Curran as sister to *Pseudomicrodon*, within a clade that also contains *Rhopalosyrphus* s.l. In an analysis of morphological characters (Chapter 3), also *Domodon* and *Ceriomicrodon* are included in the clade. Support values reported in Chapter 4 for this clade are low, but in addition to this phylogenetic evidence the male genitalia of these taxa are all similar in the structure of the aedeagus and the shape of the surstylus (fig. 259). This provides more confidence to the monophyly of the clade. Because of the oval, not constricted abdomen, *Omegasyrphus*-species superficially may seem most similar to *Domodon*, but see that genus for discussion. This group was treated as a subgenus of *Microdon* by Thompson (1981b). Based on the phylogenetic evidence referred to above, this ranking cannot be maintained. Instead, *Omegasyrphus* is treated as a distinct genus.

Thompson (1981b), who gives a key to the North American species, points out that species level taxonomy is necessary for this genus. This is still true.

Diversity and distribution. – Described species: 5. North and Central America, from South Dakota in the U.S.A. southward to Guatemala. The south border of this range is marked by *Microdon brunnipennis* Hull, which was described as a variety of *M. baliopterus* Loew by Hull (1944b). The assignment of this taxon to *Omegasyrphus* is based only on this description, as the type has not been examined.

***Paragodon* Thompson**

Figs. 260-264.

Paragodon Thompson, 1969: 74. Type species: *Paragodon paragoides* Thompson, 1969: 81, by original designation.

Description. – Body length: 4-5 mm. Small flies with short antennae and oval abdomen. Head slightly wider than thorax. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male not converging at level of frons, with mutual distance about 3 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, oval, about 1.5 times as long as wide, bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum convex; pilose anteriorly and posterodorsally, widely bare in between. Anepimeron bare or with a few thick, seta-like pile dorsally. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located very close to base of cell DM. Abdomen oval, about 1.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 bare. Male genitalia: aedeagus unfurcate, straight, projecting hardly beyond apex of hypandrium; hypandrium with bulb-like base; epandrium without ventrolateral ridge; surstylus unfurcate.

Diagnosis. – Abdomen oval; yellow and black. Vein R4+5 without posterior appendix. Crossvein rm almost at same level as base of cell DM. Antenna shorter than distance between antennal fossa and anterior oral margin. Postpronotum pilose.

Discussion. – When Thompson (1969) described this genus, he stated that it appeared to be the most primitive microdontine fly known. This was based on a number of presumed plesiomorphic characters: 1. unsclerotized ejaculatory apodeme and sac; 2. short antenna; 3. underdeveloped and bare metasternum; 4. lack of basal setal patches on hind femur; 5. lack of a spurious vein; 6. lack of appendix on vein R4+5; 7. presence of a double sustentacular apodeme; 8. unfurcate aedeagus. Now that a larger number of taxa of Microdontinae could be studied, all of these characters were also found in other taxa (Chapter 3), except for the unsclerotized ejaculatory apodeme.

In the phylogenetic analysis based on combined molecular and morphological characters of Chapter 4, *Paragodon* was not placed in the most 'primitive' position, albeit in a relatively basal one. As support values for this relationship were quite low, this cannot yet be considered definitive. Additional sampling of molecular characters of other taxa in the basal part of the tree will be necessary for further resolving these relationships.

Paragodon was recovered as sister to *Surimyia* in Chapter 4. For discussion see there.

Diversity and distribution. – Described species: 1. Central America (Mexico, Costa Rica and Panama).

***Paramicrodon* Meijere**

Figs. 265-271.

Paramicrodon Meijere, 1913: 359. Type species: *Paramicrodon lorentzi* Meijere, 1913: 360, by monotypy.

Syrphinella Hervé-Bazin, 1926: 73. Type species: *Syrphinella miranda* Hervé-Bazin, 1926: 74, by monotypy.

Myxogasteroides Shiraki, 1930: 9. Type species: *Myxogaster nigripennis* Sack, 1922: 275, by original designation.

Nannomyrmecomyia Hull, 1945: 75. Type species: *Paramicrodon delicatulus* Hull, 1937: 24, by original designation. Described as subgenus of *Spheginobaccha*.

Description. – Body length: 4-11 mm. Small, slender flies with short antennae and more or less parallel-sided abdomen. Head slightly wider than thorax. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally strongly widened. Eye bare. Eye margins in

male only slightly converging at level of frons, with mutual distance 1.5-2.5 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, oval, about 1.5 times as long as wide, bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum convex; pilose anteriorly and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located within basal 1/10 of cell DM. Abdomen elongate: more or less parallel-sided, may be subtly constricted at tergite 3 (male), or slightly oval (female); 2.5-4 times as long as wide. Tergites 3 and 4 fused (but distinct suture visible). Sternite 1 bare or pilose. Sternites 3-4 strongly narrowed; narrower than sternite 2, with wide membraneous parts laterally. Male genitalia: aedeagus furcate near apex, slightly bent dorsad, projecting well beyond apex of hypandrium; hypandrium with apical part consisting of two separate lobes; epandrium without ventrolateral ridge; surstylus of varying shape.

Diagnosis. – Vein R4+5 without posterior appendix. Postpronotum pilose. Antenna shorter than distance between antennal fossa and anterior oral margin. Vein M1 straight, not parallel to wing margin, perpendicular to both vein R4+5 and M. Mesonotum with transverse suture incomplete. Sternites 3-4 strongly narrowed; narrower than sternite 2, with wide membraneous parts laterally.

Discussion. – The phylogenetic analysis based on combined molecular and morphological characters in Chapter 4 placed two Neotropical and one Oriental species of *Paramicrodon* together in a well-supported clade. In the analysis based on morphology only (Chapter 3) two additional species (one Neotropical, one Oriental) are also resolved in a clade with the other species. Further relationships remain uncertain: according to the the combined analysis, *Paramicrodon* is the sister group of *Piruwa*, but support values are low. The clade (*Paramicrodon* + *Piruwa*) is placed as sister to *Menidon falcatus*, but with very low support. So, there is no doubt that the Neotropical and Oriental species belong in the same genus, but its phylogenetic affinities need further examination.
The synonymy of *Syrphinella* Hervé-Bazin with *Paramicrodon* was suspected by Hull (1937) and stated explicitly by Hull (1949). The first author confirms this subjective synonymy, based on examination of the type specimen of the type species. The synonymy of *Nannomyrmecomyia* and *Paramicrodon* was stated by Thompson (1969, 1981a) and is also confirmed here based on examination of the type specimens.

Diversity and distribution. – Described species: 8. The range of this genus is interestingly disjunct, with six species from the Oriental Region (Thailand to Moluccas), one from New Guinea and two from the Neotropical region. At least one additional species occurs in the Neotropical region (unpublished observations by the first author), but more species-level work is needed to sort this out.

***Paramixogaster* Brunetti**
Figs. 272-287.
Paramixogaster Brunetti, 1923: 319. Type species: *Paramixogaster vespiformis* Brunetti, 1923: 320, by original designation.
Paramixogasteroides Shiraki, 1930: 8. Type species: *Myxogaster variegata* Sack, 1922: 16, by original designation.
Tanaopicera Hul, 1945: 76. Type species: *Ceratophya variegatus* Walker, 1852: 220, by original designation.

Description. – Body length: 5-13 mm. Slender flies with constricted abdomen and long antennae, usually with black and yellow colour pattern, wasp mimics. Head wider than thorax. Face convex in profile; narrower than to wider than an eye. Lateral oral margins not produced. Vertex flat to strongly swollen. Occiput ventrally narrow, dorsally widened. Antennal fossa about as wide as high. Eye bare. Eye margins in male parallel, not converging at level of frons. Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere usually much longer than scape, except shorter in *P. illucens* (Bezzi) and *P. luxor* Curran (see Discussion); bare. Postpronotum bare. Mesoscutum with transverse suture usually incomplete, except complete in *P. contractus*, *P. conveniens* and *P. omeanus* (see Discussion). Scutellum semicircular; without or with small calcars. Anepisternum convex or sulcate; entirely pilose or partly

bare on ventral half. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 with or without posterior appendix; vein M1 perpendicular to vein R4+5 and vein M; postero-apical corner of cell R4+5 rectangular to somewhat acute, with small appendix; crossvein rm located within basal 1/4 of cell DM. Abdomen elongate, at least 3 times as long as wide; constricted, with narrowest point at tergite 2 and widest point at tergite 3 or 4. Tergites 3 and 4 fused. Male genitalia: aedeagus furcate, with furcation point in distal 1/3; epandrium without ventrolateral ridge; surstylus weakly furcate, only in *P. luxor* consisting of three distinct branches.

Diagnosis. – Postpronotum bare. Basoflagellomere at least three times as long as wide. Posterio-apical corner of wing cell R4+5 rectangular or somewhat acute. Abdomen usually constricted; if not: basoflagellomere 2-4 times as long as scape, tergite 2 less than half as long as tergites 3 and 4 together, face medially smooth (without vitta of transversely wrinkled texture).

Discussion. – Cheng & Thompson (2008) regarded *Paramixogasteroides* Shiraki and *Tanaopicera* Hull as subjective synonyms of *Paramixogaster*. Examination of the type species of *Tanaopicera*, *Ceratophya variegata* Walker, 1852, confirmed this opinion with regard to *Tanaopicera*. One of the characters Hull (1945) used to characterize *Tanaopicera* was 'the high, greatly developed vertex'. However, the vertex in the holotype of *C. variegata* is neither high nor greatly developed. This species is very similar to other *Paramixogaster*-species in all important characters. The type species of *Paramixogasteroides*, *Myxogaster variegata* Sack, was not examined, but its description by Sack (1922) is clear enough to include this taxon in *Paramixogaster*.

Three species of this genus were included in the phylogenetic analysis of combined molecular and morphological characters in Chapter 4. These are recovered as a monophyletic group. A larger number of species was included in the analysis based on morphology only (Chapter 3). The resulting phylogeny supports the inclusion of the following Afrotropical species in this genus, which was so far considered Oriental and Australian in its distribution: *Microdon acantholepidis* Speiser, *Microdon crematogastri* Speiser, *Microdon illucens* Bezzi, *Pseudomicrodon elisabethae* Keiser. *Paramixogaster piptotus* spec. nov. from Madagascar is also added to this genus. The phylogenetic analysis based on morphology (Chapter 3) also recovers *Ptilobactrum* within *Paramixogaster*. For a discussion on this subject see genus account of *Ptilobactrum*.

Morphological variation among the species presently included in *Paramixogaster* is large. Although most species have a constricted abdomen in dorsal view, this is not the case in the African taxa *P. acantholepidis* (Speiser) and *P. crematogastri* (Speiser), and the Australian species *P. praetermissus* (Ferguson). However, tergite 2 is dorsoventrally flattened in these species, so in lateral view their abdomen appears constricted. In all other important characters of external morphology and male genitalia these taxa belong in *Paramixogaster*, as corroborated by the results of the phylogenetic analysis based on morphology (Chapter 3).

Paramixogaster illucens (Bezzi) and *P. luxor* (Curran) are the only species included in this genus in which the basoflagellomere is shorter than the scape. In *P. luxor*, the shape of the surstylus also differs from the other species, as it consists of three separate branches (fig. 285). Nevertheless, both species are included in *Paramixogaster* because they fit the diagnosis.

Paramixogaster contractus (Brunetti), *P. conveniens* (Brunetti) and *P. omeanus* (Paramonov) are aberrant from all other known species of *Paramixogaster* in their complete transverse suture. This character is also found in *Indascia*, which includes species which look superficially similar to these *Paramixogaster*-species. However, these species are here assigned to *Paramixogaster*, based on the phylogenetic analysis of their morphology (Chapter 3). Besides, they posess a diagnostic character for *Paramixogaster*: the bare postpronotum. The first two species, *P. contractus* and *P. conveniens*, differ from all other studied species of Microdontinae in the presence of pile on the metaepisternum. It will be interesting to re-evaluate their taxonomic affinities when additional material becomes available. At present, the species are only known from the holotypes, which both are females, so no characters of male genitalia or DNA could be analyzed.

As a consequence of transferring some species from other genera to *Paramixogaster*, replacement names had to be chosen for two species. Examination of the type of *Microdon vespiformis* de Meijere, 1908 made clear that this is a species of *Paramixogaster*. As

Mixogaster vespiformis Brunetti, 1913 was later designated as the type species of *Paramixogaster*, these two names are now secondary homonyms. For the junior name, *vespiformis* Brunetti, the nomen novum *Paramixogaster brunettii* is proposed here. The other new name introduced here is *Paramixogaster sacki* for *Paramixogasteroides variegata* Sack, 1922, which is a junior secondary homonym of *Ceratophya variegata* Walker, 1852.

Diversity and distribution. – Described species: 24. Afrotropical (5 species), Oriental (10) and Australian region (9). Several additional species, from all three regions, await description.

***Parocyptamus* Shiraki**

Figs. 288-293.

Parocyptamus Shiraki, 1930: 11. Type species: *Parocyptamus sonamii* Shiraki, 1930: 12, by original designation.

Stenomicrodon Hull, 1937: 26. Type species: *Stenomicrodon purpureus* Hull, 1937: 26, by original designation.

Description. – Body length: 11-15 mm. Slender flies with elongate, tapering abdomen and long antennae, black with metallic hues, wings infuscated. Head about as wide as thorax. Face approximately straight in profile, except for slight bulge below antenna; narrower than eye. Lateral oral margins strongly produced. Vertex flat. Occiput ventrally narrow, dorsally slightly widened. Antennal fossa about as wide as high. Eye bare. Eye margins in male parallel, not converging at level of frons, mutual distance about three times width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere shorter than scape; oval; bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum deeply sulcate; almost entirely pilose, except bare on small part ventrally. Anepimeron entirely pilose. Katepimeron convex; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded; crossvein rm located around basal 1/6 of cell DM. Abdomen elongate, more than 3 times as long as wide; in male gradually tapering from anterior half of tergite 2 to apex; in female slightly constricted between tergites 3 and 4. Tergites 3 and 4 fused. Male genitalia: aedeagus furcate basally, with dorsal process much longer than ventral one, projecting far beyond apex of hypandrium; epandrium with ventrolateral ridge; surstylus weakly furcate, divided into two short lobes.

Diagnosis. – Vein R4+5 with posterior appendix. Postpronotum pilose. Anepisternum almost entirely pilose, except bare on small ventral part. Basoflagellomere shorter than scape. Abdomen at least 3 times as long as wide. Tergite 2 with pair of depressed areas (fig. 290).

Discussion. – *Parocyptamus* is recovered as sister to *Metadon* in the combined analysis of molecular and morphological characters in Chapter 4, but support for this relationship is low. As there are clear morphological characters to distinguish these taxa (tergite 2 with pair of depressed areas, abdomen at least 3 times as long as wide, aedeagus furcate near base), *Parocyptamus* is here maintained as distinct genus.

When Shiraki (1930) described *Parocyptamus*, this genus was diagnosed in a key by the following two characters: abdomen narrow and elongate, frons with antennal prominence ('Fühlervorsprung'). The latter character is of limited use, as the frons is more or less extended above the antennae in many other taxa of Microdontinae. Hull (1937a) did not state which characters he considered diagnostic in his description of *Stenomicrodon*. Judging from his remarks in Hull (1949), the shape of the abdomen and the presence of a patch of short, spinose setae at the base of the front and mid femora were considered important characters. Although the anterobasal patches of setae are well-developed, such patches are also found in several other taxa of Microdontinae. Perhaps the spines are somewhat stronger developed than in most taxa, but it is hard to describe this as a discrete character state. Therefore, this character is not used in the present key and diagnosis.

The abdomen is constricted (slightly) only in the female, not in the male, as might be erroneously concluded from the key of Cheng & Thompson (2008).

The synonymy of *Stenomicrodon* with *Parocyptamus* was already established by Hull (1949). Examination of the involved type specimens by the first author has confirmed this (subjective) synonymy. The type species of both genus group names are here also con-

sidered as synonyms (*Parocyptamus sonamii* Shiraki, 1930 = *Stenomicrodon purpureus* Hull, 1927 syn. nov.). *Microdon stenogaster* Curran also belongs to this genus, as it is almost identical to the type species in colouration, external morphology and male genitalia. Closer examination of available specimens, also from Sumatra and Thailand, is necessary to resolve species level taxonomy.

Shiraki (1930) based his description of *Parocyptamus sonamii* on three males. Two of these syntypes are kept in the NIAS collection. The third male (from Sokotsu) is apparently lost. Label information is as follows. Syntype 1:

label 1: "Formosa, Shinchiku, -18. VII 1-30. J. Sonan, K. Miyake"; label 2: "Parocyptamus sonamii"; label 3 (round, red-bordered): "Type". Syntype 2: label 1: "CIHpOn, 17.VII.1922, M. Yoshino"; label 2 (round, red-bordered): "Type". The date on the label of syntype 1 is a bit cryptic ("-18. VII 1-30"). It is unlikely to assume the specimen has been collected in July 1930, because Shiraki's work was published on the 30th of January 1930. It seems more plausible that the date was 1-30 July 1918. Shiraki (1930) only mentions the month (VII).

Diversity and distribution. – Described species: 2. Oriental: known from Taiwan, Thailand, Sumatra and Borneo.

***Peradon* Reemer gen. nov.**

Figs. 296-301.

Type species: *Mulio bidens* Fabricius, 1805. Type locality: "America Meridionalo".

Description. – Body length: 6-18 mm. Slender to moderately broadly built flies with oval or basally constricted abdomen and long antennae. Head wider than thorax. Face straight to slightly convex or slightly concave in dorsal half; gena ventrally produced clearly below eye; narrower to wider than an eye; medially with vitta of transversely wrinkled texture (except in some smaller species of the *flavofascium*-group). Lateral oral margins produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male converging at level of frons, with mutual distance 1.5-4 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape; bare. Postpronotum pilose or bare. Scutellum semicircular; with calcars. Anepisternum sulcate; pilose anterodorsally and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron flat; with wrinkled texture; bare. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded, without appendix; crossvein rm located between basal 1/6 and 1/3 of cell DM. Abdomen oval or basally constricted, 2-4 times as long as wide. Tergites 3 and 4 fused. Sternite 1 bare. Male genitalia: aedeagus projecting not or little beyond apex of hypandrium, slightly bent dorsad, shallowly furcate, with both processes about equally long and with their apexes wide at the furcation point but pointed apically; epandrium without ventrolateral ridge; surstylus unfurcate.

Diagnosis. – Vein R4+5 with posterior appendix. Postero-apical corner of cell R4+5 widely rounded. Katepimeron flat, with wrinkled texture, bare. Face in profile slightly convex, straight or slightly concave, but never bulged in ventral half. Vertex flat.

Three species groups are recognized here. These groups may not be monophyletic, but they may be useful for purposes of species identification. They are diagnosed as follows.

bidens-group – Abdomen oval or parallel-sided. Tergites without golden pile. Basoflagellomere less than twice as long as scape.

flavofascium-group – Abdomen oval. Tergite 4 often with golden or silver pile. If not, then basoflagellomere more than twice as long as scape.

trivittatus-group – Abdomen constricted basally.

Discussion. – Based on external characters this group is difficult to diagnose, although all species have long antennae and a more or less elongate abdomen. Despite this, morphology of the aedeagus is very constant: projecting not or little beyond apex of hypandrium, slightly bent dorsad, shallowly furcate, with both processes about equally long and with their apexes wide at the furcation point but pointed apically. The phylogenetic analysis in Chapter 4 included four species of this genus, belonging to all three different species groups (see diagnosis): *M. bidens* and *M. luridescens* (*bidens*-group), *M. chrysopygus* (*flavofascium*-group) and *M. trivittatus* (*trivittatus*-group). These species

are recovered in a monophyletic clade with high support values. The analysis of only morphological characters includes one additional species (*M. flavofascium*), which is also recovered in the same clade.
Most species assigned to this genus were included in *Microdon* in the most recent classification of Neotropical Microdontinae (Thompson et al. 1976), except *Ubristes chrysopygus* Giglio-Tos (see Chapter 6). In the phylogenetic analyses referred to above, this group is not recovered as part of or sister to *Microdon*. Nevertheless, it's a well-recognizable and apparently monophyletic group. For these reasons, a new genus is erected for it.

Diversity and distribution. – Described species: 24. Neotropical. Several undescribed species are known to the first author.

Etymology. – The generic name is a combination of the Greek words *peras* (west) and *odon*, with the latter used as a suffix derived from *Microdon*. The prefix *pera-* is used to emphasize that this genus is restricted in its distribution to the western hemisphere.

***Piruwa* Reemer gen. nov.**
Figs. 302-309.
Type species: *Piruwa phaecada* spec. nov.

Description. – Body length: 4 mm. Small, slender flies with short antennae and constricted abdomen. Head slightly wider than thorax. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput narrow over entire length. Eye bare. Eye margins in male not converging at level of frons, with mutual distance 3 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, oval, about twice times as long as wide, bare. Postpronotum bare. Scutellum semicircular; without calcars; with long bristly pile along margin, clearly longer and thicker than pile on rest of scutellum. Anepisternum convex; pilose anterodorsally and along posterodorsal margin. Anepimeron pilose along dorsal margin. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 straight, perpendicular to vein R4+5; posteroapical corner of cell R4+5 rectangular, with small appendix; crossvein rm located within basal 1/10 of cell DM. Abdomen constricted, narrowest at transition between tergites 1 and 2, widest at tergite 4; about 2.5 times as long as wide. Tergites 3 and 4 fused, no suture visible. Sternite 1 bare. Male genitalia: aedeagus furcate near apex, slightly bent dorsad, projecting hardly beyond apex of hypandrium; hypandrium with bulb-like base, with apical part entire, not consisting of two separate lobes; epandrium without ventrolateral ridge; surstylus consisting of two lobes, with basal lobe angular, apical lobe rounded.

Diagnosis. – Vein R4+5 without posterior appendix. Antenna shorter than distance between antennal fossa and anterior oral margin. Postpronotum bare. Abdomen constricted.

Discussion. – In the combined analysis of molecular and morphological characters, this taxon is placed as sister to *Paramicrodon*, but with low support values. Although there is a superficial similarity in habitus to *Paramicrodon* (small, slender, short antennae, vein R4+5 without posterior appendix), *Piruwa* differs from that genus in the following important characters: occiput narrow over entire length; postpronotum bare; scutellum with long bristly pile along margin; anepimeron pilose only along dorsal margin; sternites 3-4 about as wide as sternite 2; hypandrium with apical part not consisting of two separate lobes. Considering these differences, a close relationship between these taxa seems not likely. Because of these differences and the uncertainy of taxonomic affinities, this distinct taxon is given generic rank.

Diversity and distribution. – Described species: 1. Neotropical. Only known from Peru.

Etymology. – The name *Piruwa* is derived from Piruw, the word for Peru in Quechuan, a native Andean-Ecuadorian language. It is to be treated as feminine.

***Pseudomicrodon* Hull**
Figs. 310-323.
Pseudomicrodon Hull, 1937:24. Type species: *Microdon beebei* Curran, 1936: 4, by original designation.

Description. – Body length: 7-19 mm. Slender flies with long antennae and petiolate abdomen. Head a

little wider than thorax. Face more convex or straight in profile; narrower than to as wide as an eye. Lateral oral margins weakly produced. Vertex convex and shining; sparsely pilose, sometimes bare on anterior half. Occiput ventrally narrow, dorsally strongly widened. Eye bare or very short and sparsely pilose. Eye margins in male converging at level of frons, with mutual distance 1-2 times width of antennal fossa. Antennal fossa about as wide as high to 1.5 times as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular; with or without calcars. Anepisternum sulcate; entirely pilose or medially widely bare. Anepimeron entirely pilose. Katepimeron flat to convex; usually with wrinkled texture; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded to rectangular, with or without small appendix; crossvein rm located between basal 1/6 to 1/3 of cell DM. Abdomen elongate, more than 3 times as long as wide, constricted, with narrowest point between halfway tergite 2 and transition between tergites 2 and 3. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus furcate near apex, with dorsal process long and whip-like, ventral process very short; epandrium with ventrolateral ridge.

Diagnosis. – Vein R4+5 with posterior appendix. Vertex convex and shining, sparsely pilose to bare. Abdomen petiolate, except parallel-sided in *P. biluminiferus* Hull, but tergite 2 distinctly dorsoventrally flattened in that species.

Discussion. – Among Microdontinae with a petiolate abdomen, *Pseudomicrodon* species are recognized by their convex and shining vertex. *Microdon biluminiferus* Hull is the only included species without a petiolate abdomen. Instead, the abdomen is parallel-sided, but in lateral view appears constricted because of the dorsoventrally flattend segment 2. This species is assigned to *Pseudomicrodon* based on the convex vertex and the morphology of the male genitalia (fig. 322, 323), combined with the results of the phylogenetic analysis of morphological characters (Chapter 3).
Pseudomicrodon is placed in a clade with *Ceriomicrodon*, *Domodon*, *Omegasyrphus* and *Rhopalosyrphus* in the phylogenetic analyses of Chapters 3 and 4. Although support values for this clade are low, taxonomic affinities between these taxa are considered likely because of the similarities in morphology of the male genitalia.
At present, the basis for distinguishing *Ceriomicrodon*, *Pseudomicrodon* and *Rhopalosyrphus* is narrow. The groups are certainly related, but as presently defined it is doubtful whether they are monophyletic, considering the variation in several morphological characters.
Keiser (1971) described *Pseudomicrodon elisabethae* from Madagascar. This species is here included in *Paramixogaster*. Cheng & Thompson (2008) mention the similarity of the South African taxon *Microdon illucens* Bezzi to *Pseudomicrodon*, which is here also included in *Paramixogaster*.

Diversity and distribution. – Described species: 15. Neotropical.

***Ptilobactrum* Bezzi**
Figs. 324-329.
Ptilobactrum Bezzi, 1915: 136. Type species: *Ptilobactrum neavei* Bezzi, 1915: 137, by original designation.

Description. – Body length: 13 mm. Broadly built flies with very wide head, long antennae and orange markings on abdomen. Head wider than thorax. Face much wider than eye; dorsally with oblique groove from lunule to eye margin; convex in profile. Lateral oral margins weakly produced. Vertex not swollen, more or less flat, but much wider than eye. Occiput narrow ventrally, moderately widened dorsally. Eye bare. Eyes in male not approaching each other; mutual distance about seven times width of antennal fossa. Antennal fossa somewhat higher than wide. Antenna longer than height of head. Basoflagellomere five times as long as scape; with long pilosity. Postpronotum pilose. Mesoscutum with transverse suture incomplete. Scutellum without calcars. Anepisternum with deep sulcus; entirely pilose. Anepimeron entirely pilose. Katepimeron convex; smooth; bare. Wing: vein R4+5 with posterior appendix; vein M1 straight, somewhat recurrent; postero-apical corner of cell R4+5 angular, with small appendix; crossvein rm located around basal 1/3 of cell DM. Abdomen

oval, widest at posterior margin of tergite 2. Tergites 3 and 4 fused. Sternite 1 bare. Sternite 4 in male visible from below. Male genitalia: aedeagus bent dorsad, except extreme apex bent ventrad; aedeagus furcate near apex; epandrium without ventrolateral ridge; surstylus broad, unfurcate, with short posterior lobe. Female unknown.

Diagnosis. – Vein R4+5 with posterior appendix. Basoflagellomere with long pile. Abdomen oval. Tergites 3 and 4 fused.

Discussion. – Bezzi (1915) distinguished *Ptilobactrum* from *Microdon* species by the "breadth of the head, the face being furrowed, and by the unusual shape of the antennae." Indeed, the grooves on the face, running fom the lunula obliquely downward to the eye margins, are quite unusual among Microdontinae. They are reminescent of the ptilinal sutures of Diptera Schizophora. Similar grooves are found in certain species of *Furcantenna*, *Schizoceratomyia*, *Paramixogaster* and *Thompsodon*, but usually less distinct. The antennae are unusual in their long pilosity, a character shared with *Ceratrichomyia*, *Furcantenna*, *Kryptopyga* and *Schizoceratomyia*.
In the phylogenetic analysis of morphological characters in Chapter 3, *Ptilobactrum* is placed within the genus *Paramixogaster*. The differences with that genus, however, are considered too large to change the generic rank of *Ptilobactrum* to a subgeneric one within *Paramixogaster*. For instance, in contrast with *Paramixogaster*, the basoflagellomere is pilose, postpronotum is pilose, and the abdomen is oval. The phylogenetic affinities of *Ptilobactrum* can best be reassessed when molecular data are available.
See *Ceratrichomyia* for a discussion on synonymy of that genus with *Ptilobactrum*, as proposed by Cheng & Thompson (2008).

Diversity and distribution. – Described species: 1. Afrotropical, only known from Kenya.

***Rhoga* Walker**
Figs. 330-334.
Rhoga Walker, 1857: 157. Type species: *Rhoga lutescens* Walker, 1857: 157, by monotypy.
Papiliomyia Hull, 1937: 27. Type species: *Papiliomyia sepulchrasilva* Hull, 1937: 28, by original designation. For synonymy see Hull (1949).

Description. – Body length: 5-10 mm. Stingless bee mimicking flies with short to moderately long antennae and oval, kite-shaped or more or less parallel-sided abdomen. Head slightly wider than thorax. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex narrow, convexly produced and shining in most species, flat in some. Occiput wide and parallel-sided over entire length. Eye with short, sparse pile. Eye margins in male not converging at level of frons, with mutual distance 2 to 3 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna as long as or shorter than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular, in some species weakly sulcate apicomedially; without calcars. Anepisternum without sulcus; pilose anterodorsally and posteriorly, widely bare in between. Anepimeron entirely pilose. Katepimeron convex; bare. Metapleurae either separated or forming postmetacoxal bridge. Wing: vein R4+5 without posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located within 1/4 of cell DM, usually within basal 1/10. Abdomen oval or kite-shaped, 1.5 to 2.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus furcate near apex, with dorsal and ventral process equally long; epandrium without ventrolateral ridge.

Diagnosis. – Vein R4+5 without posterior appendix. Occiput widened and parallel-sided over entire length.

Discussion. – In the phylogenetic analysis in Chapter 4, *Rhoga* is recovered in a clade within *Hypselosyrphus*, with high support values, a result also found in the analysis based on morphology in Chapter 3, in which more species were included. These results suggest that *Hypselosyrphus* is paraphyletic with respect to *Rhoga*. For further discussion see genus account of *Hypselosyrphus*.
In some species (e.g. *R. mellea*, *R. maculata*) the metapleura are separated and do not form a postmetacoxal bridge. So far, this character state was known among Microdontinae only in the genus *Spheginobaccha* (Cheng & Thompson 2008).
The type specimen of the type species, *Rhoga lutes-*

cens Walker, is not present in the BMNH-collection (pers. comm. N. Wyatt), where it is supposed to be according to Thompson et al. (1976) and Thompson (2010). Apparently it is lost.

Diversity and distribution. – Described species: 5. Central and South America. Several undescribed species are known to the first author.

***Rhopalosyrphus* Giglio-Tos**

Figs. 335-358.

Rhopalosyrphus Giglio-Tos, 1891: 189. Type species: *Holmbergia guentherii* Lynch Arribalzaga, 1891, by subsequent designation of Giglio-Tos (1892: 2).

Holmbergia Lynch Arribalzaga, 1891: 196. Type species: *Holmbergia guentherii*, 1891: 195, by monotypy. See Weems et al. (2003) and Cheng & Thompson (2008) for synonymy.

Description. – Body length: 9-15 mm. Slender flies with long antennae and petiolate abdomen. Head a little wider than thorax. Face more or less convexly produced on ventral half; narrower than an eye. Lateral oral margins produced. Vertex flat, entirely pilose. Occiput ventrally narrow, dorsally strongly widened. Eye bare. Eye margins in male converging at level of frons, with mutual distance 1-2 times width of antennal fossa. Antennal fossa about 1.5 times as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular; with or without calcars, if present, then small and with mutual distance small. Anepisternum convex or with weak sulcus; entirely pilose. Anepimeron entirely pilose. Katepimeron flat to weakly convex; with wrinkled texture; bare, partly pilose or entirely pilose. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded to rectangular, with or without small appendix; crossvein rm located between basal 1/8 to 1/4 of cell DM. Abdomen elongate, more than 3 times as long as wide, constricted, with narrowest point between halfway tergite 2 and transition between tergites 2 and 3. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus furcate near apex, with dorsal process long and whip-like, ventral process very short; epandrium with ventrolateral ridge.

Diagnosis. – Vein R4+5 with posterior appendix. Abdomen petiolate. Vertex flat, entirely pilose. Postpronotum pilose. Mesonotal transverse suture incomplete. Tergites 3 and 4 fused. Anterior margin of tergite 2 at least twice as wide as posterior margin. *Rhopalosyrphus* s.s.: katepimeron pilose. *Rhopalosyrphus* s.l.: katepimeron bare.

Discussion. – Previous authors have defined this genus more strictly than is done in the present paper. Weems et al. (2003) and Cheng & Thompson (2008) only included species with a pilose katepimeron. A number of additional species are known from the Neotropical region which are similar to *Rhopalosyrphus* auct. in most characters, but which have a bare or almost bare katepimeron. In the phylogenetic analysis of combined molecular and morphological characters in Chapter 4 two other species were included, besides *Rhopalosyrphus ramulorum* Weems & Deyrup (a species previously also assigned to this genus). In both of these species, the katepimeron is only narrowly pilose along the anterior margin. In all other characters, these species have the diagnostic characters of *Rhopalosyrphus* as described by Weems et al. (2003): abdomen petiolate, antenna longer than face, scape and basoflagellomere elongate, face produced ventrally (variable), occiput strongly widened dorsally, metasternum developed, hind tibia flared apically. The male genitalia of these taxa are very similar to those *Rhopalosyrphus* auct., with an apically furcate aedeagus, of which the dorsal process is very long and whip-like (figs. 355-358). These two taxa are placed in the same clade as *R. ramulorum* in Chapter 4. *Microdon abnormis* Curran is also similar to *Rhopalosyrphus* in the characters mentioned above, but has a bare katepimeron. In the analysis of morphological characters in Chapter 3, a closely related species (*Rhopalosyrphus abnormoides* spec. nov.) is placed within *Rhopalosyrphus*.

Based on the results of the phylogenetic analyses and the (subjective) evaluation of external and genitalic characters, *Rhopalosyrphus* is here extended to include also the species with a bare or almost bare katepimeron, which includes species previously grouped in the *abnormis* group (see account of *Pseudomicrodon* in Cheng & Thompson 2008), as well as *Microdon cerioides* Hull. Species with a pilose katepimeron are included in *Rhopalosyrphus* s.s., while the other species are treated as *Rhopalosyrphus* s.l.

The inclusion of *Rhopalosyrphus oreokawensis* spec. nov. in this genus is to be regarded as preliminary. Unlike the other species included in *Rhopalosyrphus*, this species has very short antennae, an oblique vein M1 and a more slender tergite 2. Analysis of its morphological character (Chapter 3) places it near *Rhopalosyrphus*. Possibly, it would be better to erect a new genus for this species. This is nevertheless not done here, in awaitance of a better understanding of the relationships of the taxa included in the '*Rhopalosyrphus*-clade'.

Rhopalosyrphus is recovered in a clade with *Pseudomicrodon* and *Omegasyrphus* in Chapter 4. Support values are low, but close affinities between these taxa are deemed likely because of the similarities in structure of the male genitalia. In the morphological analysis, which includes more taxa, *Rhopalosyrphus* is also grouped with these genera, supplemented with *Ceriomicrodon* and *Domodon*, which have similar genitalia. The relationships between these taxa need further study, preferably based on molecular data.

Diversity and distribution. – Described species: 9. Mainly Neotropical, with two species in southern parts of the U.S.A. (Arizona, Texas, Florida).

***Schizoceratomyia* Carrera, Lopes & Lane**

Figs. 359-366.

Schizoceratomyia Carrera, Lopes & Lane, 1947: 245. Type species: *Schizoceratomyia barretoi* Carrera, Lopes & Lane 1947: 245, by original designation.

Johnsoniodon Curran, 1947: 1. Type species: *Johnsoniodon malleri* Curran, 1947: 1, by original designation.

Description. – Body length: 4-9 mm. Broadly built flies with long antennae (bifurcate in male) and oval abdomen. Head wider than thorax. Face slightly convex or medially concave; wider than an eye. Mouth parts weakly developed, small; oral opening small and round, with lateral margins not produced. Vertex more or less flat, not strongly produced or convex. Frontal ocellus normal, split in two medially or absent. Occiput ventrally narrow, dorsally weakly widened. Eye bare. Eyes in male not or only slightly converging at level of frons, with mutual distance 3-4 times the width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere longer than scape, bifurcate in male, in some species also in female; both branches long pilose, especially on inner side; in one (undescribed) species occupied with more than 20 long, narrow tubercles. Arista in male well-developed (longer than pedicel) or reduced to a small stump (shorter than pedicel); in female well-developed, sometimes almost as long as basoflagellomere and thickened. Postpronotum pilose or bare. Scutellum semicircular; without calcars. Anepisternum convex, sometimes with weak sulcus in dorsal 1/4; pilose on dorsal 2/3 to 3/4. Anepimeron pilose on dorsal 3/4 to 1/4, or only along posterior margin. Katepimeron convex; bare; smooth. Wing: vein R4+5 without posterior appendix; vein M1 straight and perpendicular to vein R4+5, or with weak outward angle in anterior 1/2; postero-apical corner of cell R4+5 rectangular to widely rounded, with or without small appendix; crossvein rm located between basal 1/8 and 1/4 of cell DM. Abdomen dorsoventrally flattened; more oval, with largest width at tergite 3; 1.5-2 times as long as wide. Tergites 3 and 4 fused. Male genitalia: aedeagus furcate near apex, straight or apically bent ventrad, projecting not or hardly beyond apex of hypandrium; hypandrium with bulb-like base; epandrium without ventrolateral ridge; surstylus unfurcate, elongate or wide.

Diagnosis. – Vein R4+5 without posterior appendix. Abdomen oval. Antenna longer than distance between antennal fossa and anterior oral margin. Antenna inserted below dorsal eye margin. Vertex more or less flat. Katepisternum bare. Metasternum bare.

Discussion. – Hull (1949) and Papavero (1962) treated *Schizoceratomyia* as a synonym of *Masarygus*. See *Masarygus* for discussion on this synonymy, which is not followed here. These authors, as well as Cheng & Thompson (2008) also consider *Johnsoniodon* as a synonym of *Schizoceratomyia*, as is also done in the present paper. Although in the two species originally included in *Schizoceratomyia* (*S. barretoi* and *S. flavipes*) the basoflagellomere is bifurcate in the male only, whereas in *Johnsoniodon* this character is found in the female, these taxa are otherwise very similar. Moreover, the phylogenetic analysis of morphological characters (Chapter 3) recovered *Johnsoniodon malleri* within *Schizoceratomyia*.

Apparently, Curran (1947) was unaware of this des-

cription when his description of *Johnsoniodon malleri* was published (Carrera et al. 1947a, b), as this happened almost simultaneously. According to Van Doesburg (1966), the name *Schizoceratomyia* was published on the 3rd of July 1947, and *Johnsoniodon* on 14th of July 1947. Cheng & Thompson (2008) stated that *Schizoceratomyia* was published on the 12th of July 1947. Regardless of whether the date is 3rd or 12th of July does *Schizoceratomyia* have priority over *Johnsoniodon*.

Besides *S. malleri* (Curran), another species is known in which the female basoflagellomere is furcate: *Masarygus carrerai* Papavero, 1962. This species is also included in *Schizoceratomyia*.

Remarkably, in some specimens of *Schizoceratomyia*, the frontal ocellus is split in two, strongly reduced or even absent, whereas the posterior ocelli are well-developed. Following present species definitions, different states for this character seem to occur within the same species. However, more taxonomic work at species-level is necessary to establish whether this character state variation is intra- or inter-specific. In most Diptera and other flying insects, all three ocelli are well-developed. Reduced or absent ocelli occur in certain terrestrial insects, like certain ants and cockroaches. Among Diptera, they are partly or entirely absent only in a few groups, apparently mainly in certain nematocerous families and some brachypterous or apterous taxa (Cumming & Wood 2009). It will be interesting to try to correlate the degree of development of the frontal ocellus to behaviour and life-history of *Schizoceratomyia*-species; aspects which are currently unknown, unfortunately.

Diversity and distribution. – Described species: 4. Neoptropical. A few undescribed species are known to the first author.

***Serichlamys* Curran (subgenus of *Microdon*)**

Figs. 367-374.

Serichlamys Curran, 1925: 50. Type species: *Aphritis rufipes* Macquart, 1842: 71, by monotypy.

Description. – Body length: 8-10 mm. Moderately broadly built flies with oval abdomen and long antennae. Head about as wide as thorax. Face convex in profile; about as wide as to narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow to wide, dorsally widened. Eye bare or pilose. Eye margins in male weakly converging at level of frons, with mutual distance about 4 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere about as long as scape; may be slightly sickle-shaped, with swollen base; bare. Postpronotum pilose. Scutellum semicircular; with calcars. Propleuron pilose. Anepisternum weakly or not sulcate; pilose anterodorsally and posteriorly, widely bare ventrally and medially. Anepimeron entirely pilose. Katepimeron more or less convex; smooth or with wrinkled texture; bare. Katatergum uniformly microtrichose. Wing: vein R4+5 with posterior appendix; vein M1 more or less straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with appendix; crossvein rm located between basal 1/4 and 1/3 of cell DM. Abdomen oval, 1.5-2 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose or bare. Male genitalia: aedeagus projecting not or hardly beyond apex of hypandrium, slightly bent dorsad, furcate apically, with both processes about equally long; hypandrium with bulb-like base; epandrium without ventrolateral ridge; surstylus with long anterior process, without posteror process.

Diagnosis. – Vein R4+5 with posterior appendix. Abdomen oval. Vertex flat. Occiput dorsally (slightly) widened. Postpronotum pilose. Scutellum with calcars. Postero-apical corner of cell R4+5 rectangular, with small appendix. Proepimeron pilose. Anepisternum widely bare medially, also on dorsal half. Anepimeron entirely pilose. Male genitalia: aedeagus furcate near apex; surstylus without posterior process, with long anterior process (difference with *Mitidon*).

Discussion. – Only two species are included: the Nearctic *Microdon rufipes* (Macquart), which is the type species, and *M. scutifer* Knab. Possibly *M. diversipilosus* Curran (no specimens examined) also belongs here. Curran (1925) erected *Serichlamys* as a subgenus of *Microdon*, without clearly stating the diagnostic characters. In his key, Curran keyed this species out by its eyes being pilose, which was based on a translation of the original description of *Aphritis rufipes*. Indeed, Macquart (1842) wrote that this species has 'yeux peu velus' (eyes little pilose). However, examination of the type specimen (coll. OUMNH)

revealed that its eyes are bare. Either pile have been wiped off or eroded in the course of time, or Macquart (1842) made an error in his description.
Whether *Aphritis rufipes* has pilose eyes or not, *Serichlamys* is here recognized as a subgenus as it differs in other characters from *Microdon* s.s. Most notably, the genitalia are distinctly different: aedeagus furcate apically, hypandrium with bulb-like base, surstylus with long, ventrally directed lobe. In these characters as well as in external morphology it is close to *Mitidon*, from which it only seems to differ in the shape of the surstylus. However, *Mitidon* is not recovered in a clade with *Microdon rufipes* or *M. scutifer* in the phylogenetic analysis of morphological characters in Chapter 3. For this reason, *Serichlamys* is here recognized as a distinct subgenus, provisionally within *Microdon* s.l.

Diversity and distribution. – Described species: 3. Nearctic.

***Spheginobaccha* de Meijere**
Figs. 375-385.
Spheginobaccha de Meijere, 1908: 327. Type species: *macropoda* Bigot, 1883: 331, by monotypy.
Dexiosyrphus Hull, 1944: 131. Type species: *Spheginobaccha funeralis* Hull, 1944: 131, by original designation. Described as subgenus of *Spheginobaccha*.

Description. – Body length: 7-19 mm. Slender flies with short antennae and constricted abdomen. Head about as wide as to wider than thorax. Face in profile straight to slightly concave in dorsal 2/3, with a faint convex tubercle in ventral 1/3; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput narrow ventrally, widening dorsally, with distinct crease in dorsal 2/3. Eye bare (African species) or short pilose (Oriental species). Eyes in male not (African species) or strongly (Oriental species) converging at level of frons, in one Oriental species (*S. chilcotti* Thompson) even nearly contiguous. Antennal fossa about twice as wide as high. Antenna shorter than distance between antennal fossa and anterior oral margin. Basoflagellomere longer than scape, oval, except more or less triangularly enlarged in males of some African species; bare. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum without sulcus; entirely sparsely pilose, sparsely pilose only posteriorly, or entirely bare. Anepimeron pilose on dorsal half or bare. Katepimeron flat; bare or pilose; smooth. Wing vein R4+5 without posterior appendix. Vein M1 oblique and more or less parallel to wing margin, in African species only so in anterior 1/2, while straight in posterior 1/2. Postero-apical corner of cell widely rounded and without appendix in Oriental species, rectangular and with appendix in African specis. Crossvein rm located between basal 1/6 to 1/3 of cell DM. Abdomen constricted, narrowest halfway or at posterior margin of tergite 2, widest at tergite 4. Tergites 3 and 4 fused. Male genitalia: aedeagus unfurcate, straight (African species) or bent dorsad (Oriental species), articulating with hypandrium apically (*perialla*-group) or basally (*macropoda*- and *rotundiceps*-group); hypandrium with apical part consisting of separate lobes; epandrium without ventrolateral ridge; surstylus unfurcate, oval or more or less rectangular to triangular.

Diagnosis. – Metapleura not connected, not forming a postmetacoxal bridge. Abdomen constricted. Occiput with deep crease on dorsal 2/3.

Discussion. – Hull (1949) was the first to include *Spheginobaccha* in the Microdontinae. Thompson (1969) excluded it, after which Ståhls et al. (2003) included it again. The latter placement was based on a sister-group relationship of *Spheginobaccha* to all other Microdontinae, as recovered in a phylogenetic analysis of combined molecular and morphological characters. This placement was also found in the analysis of Reemer & Ståhls (in Chapter 4), so the genus is here maintained in the Microdontinae.
Thompson (1974) recognized three species groups: the Oriental *macropoda*-group (*Spheginobaccha* sensu stricto in Cheng & Thompson 2008), the African *rotundiceps*-group (subgenus *Dexiosyrphus*) and the African *perialla*-group. Representatives of all three groups were included in the phylogenetic analysis of morphological characters in Chapter 3. The results suggest that the African species are plesiomorphic to the Oriental ones, as was already noted by Thompson (1974). This implies that these species are the most plesiomorphic extant Microdontinae.
Species can be identified using Thompson (1974), supplemented with Dirickx (1995).

Diversity and distribution. – Described species: 16.

Oriental (10 species) and Afrotropical (6 species). Oriental records range from Nepal through Burma, Thailand and Vietnam to Java and Borneo. Afrotropical records are from Malawi, South Africa and Madagascar.

***Stipomorpha* Hull**
Figs. 386-394.
Stipomorpha Hull, 1945: 74. Type species: *Microdon fraudator* Shannon, 1927, by original designation.

Description. – Body length: 6-11 mm. Stingless bee mimicking flies with moderately long antennae and more or less triangular abdomen. Head slightly wider than thorax. Face in profile straight to convex; narrower to wider than an eye. Lateral oral margins hardly to moderately produced. Vertex flat, convex or irregularly swollen. Occiput narrow ventrally, slightly widened dorsally. Eye bare. Eye margins in male converging at level of frons, with mutual distance 1-3 times width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter to longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape, oval; bare. Postpronotum pilose. Scutellum semicircular, sometimes weakly sulcate apicomedially; without calcars. Anepisternum convex, without sulcus; anterodorsally pilose, posteriorly pilose or bare, widely bare in between. Anepimeron with pile limited to dorsal half, if pilose on ventral half then only sparsely. Katepimeron convex; bare. Wing: vein R4+5 usually with posterior appendix (seldomly missing); vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded to rectangular, with or without small appendix; crossvein rm located between basal 1/5 to 1/3 of cell DM. Abdomen widest at tergite 2, with next tergites either gradually narrowing (kite-shaped abdomen) or more or less parallel-sided; 1.5 to 3.5 times as long as wide. Antetergite almost fused to tergite 1; in most species enlarged, concave and smooth. Tergites 3 and 4 fused. Sternite 1 bare. Male genitalia: aedeagus unfurcate, bent dorsad, in most species projecting beyond apex of hypandrium; hypandrium with bulb-like base; epandrium without ventrolateral ridge; surstylus in most species with two wide lobes, but other shapes also occur.

Diagnosis. – Sternites 2 and 3 separated by membraneous part as wide as or wider than sternite 2.

Discussion. – When Hull (1945) erected *Stipomorpha* as a subgenus of *Microdon*, he did so based on the shape of the abdomen: "...the first two abdominal segments greatly flared and flattened and wider than the thorax; remainder of the abdomen immediately compressed into a rounded, subcylindrical pipe-like form." Shortly after, Hull (1949) ranked *Stipomorpha* as a subgenus of *Paramixogasteroides* Shiraki, 1930, without stating a reason for this. Subsequent authors have regarded *Stipomorpha* as synonymous with *Ubristes*. See under *Ubristes* for a discussion on the relationship between these groups, which are here considered as separate genera. *Stipomorpha* as presently defined contains most species listed under *Ubristes* by Thompson et al. (1976).
The phylogenetic hypothesis presented in Chapter 4 placed *Ceratophya argentinensis* within *Stipomorpha*. However, considering the very low support values of the clade (*C. argentinensis* (*S. inarmata*, *S. lanei*), the exact relationship between these genera remains unclear. As there are several important morphological differences between *Stipomorpha* and *Ceratophya* (e.g. tergites 3-4 fused or not, sternites 2-3 widely separated or not, aedeagus furcate or not), there is no reason to reconsider their taxonomic status relative to each other.
The species are revised in Chapter 6.

Diversity and distribution. – Described species: 25. Neotropical, with records ranging from Costa Rica to Argentina.

***Sulcodon* Reemer gen. nov.**
Figs. 395-397.
Type species: *Microdon sulcatus* Hull, 1944. Type locality: Java, Soekaboemi.

Description. – Body length: 7-9 mm. Broadly built flies with moderately long antennae and short abdomen. Head about as wide as thorax or slightly wider. Face convex; about as wide as an eye. Lateral oral margins distinctly produced. Vertex irregularly swollen. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male converging at level of frons, with mutual distance 2.5 times as large as width of antennal fossa. Antennal fossa about as wide as high.

Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere about as long as to slightly longer than scape, parallel-sided; bare. Postpronotum bare. Scutellum semicircular; with large, blunt calcars, separated by deep sulcus. Anepisternum weakly sulcate; entirely pilose. Anepimeron entirely pilose. Katepimeron flat; bare. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located around basal 1/4 of cell DM. Abdomen heart-shaped, about as long as wide. Tergites 3 and 4 fused. Sternite 1 bare. Male genitalia: aedeagus furcate, with furcation point near apex; hypandrium with basal part bulb-like; epandrium without ventrolateral ridge; surstylus deeply furcate.

Diagnosis. – Postpronotum bare. Abdomen about as long as wide, with tergite 2 about as long as tergites 3 and 4 together.

Discussion. – The only species included in this group, the Oriental *Microdon sulcatus* Hull, does not have any obvious relatives. Because of the bare postpronotum, the rectangular postero-apical corner of cell R4+5, the entirely pilose anepisternum and the characters of the male genitalia, the species does not fit into *Microdon* s.s. The phylogenetic analysis of morphological characters (Chapter 3) provides no clues on its affinities, as it was placed in a large polytomy containing other species of *Microdon* as well as species of several other genera.

Diversity and distribution. – Described species: 1. Indonesia: Java. The species seems not to be uncommon, as specimens collected by different collectors in different years are present in several entomological collections (BMNH, KBIN, MZH, RMNH, ZMAN). Although entomological collectors have been active in other parts of the Sunda region, such as peninsular Malaysia, Sumatra and Borneo, this species has so far not been found there. This suggests that this singular species is endemic to Java.

Etymology. – The generic name is composed of *sulcus* and *odon*. The first part means 'furrow' or 'groove' in Latin, but in this case it is derived from *Microdon sulcatus*, the type species of the genus. The second part of the name is used as a suffix derived from *Microdon*.

***Surimyia* Reemer**

Figs. 398-403.

Surimyia Reemer, 2008: 179. Type species: *Surimyia rolanderi* Reemer, 2008: 180, by original designation.

Description. – Body length: 4-5 mm. Small flies with short antennae and oval abdomen. Head slightly wider than thorax. Face convex; narrower than an eye. Lateral oral margins not produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye bare. Eye margins in male not converging at level of frons, with mutual distance about 3 times as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna shorter than distance between antennal fossa and anterior oral margin; basoflagellomere shorter to longer than scape, oval, about twice as long as wide, bare. Postpronotum bare. Scutellum semicircular; without calcars. Anepisternum convex; dorsally with thick, setae-like pile, ventrally bare. Anepimeron bare dorsally with thick, setae-like pile, ventrally bare. Katepimeron convex; bare. Wing: vein R4+5 without posterior appendix; vein M1 straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with or without small appendix; crossvein rm located very close to base of cell DM. Abdomen oval, about 1.5 times as long as wide. Tergites 3 and 4 fused. Sternite 1 bare. Male genitalia: aedeagus furcate, with furcation point about halfway, curved dorsad, straight, projecting not or slightly beyond apex of hypandrium; hypandrium without bulb-like base; epandrium without ventrolateral ridge; surstylus unfurcate.

Diagnosis. – Abdomen oval; yellow and black. Vein R4+5 without posterior appendix. Postpronotum bare. Antenna shorter than distance between antennal fossa and anterior oral margin.

Discussion. – When *Surimyia* was described, a species previously assigned to *Paragodon* was included in it (*P. minutula* Doesburg). Several morphological characters were mentioned to indicate the differnces between these genera (Reemer 2008). In the phylogenetic analysis of molecular and morphological characters in Chapter 4, *Paragodon* and *Surimyia* are recovered as sister groups (with modest support values). The same results were obtained from separate analyses of molecular characters (Chapter 4). These results indicate no necessity to treat these groups as different genera. However, morphological differences

between the taxa seem quite fundamental. Especially the structure of the aedeagus is very different: short, straight and unfurcate in *Paragodon*, and long, curved and bifurcate in *Surimyia*. Other distinctive differences are the bare postpronotum in *Surimyia* (pilose in *Paragodon*) and the bare anatergum in *Surimyia* (microtrichose in *Paragodon*). So, even though these taxa appear to be closely related, they are here still considered as different genera.

Diversity and distribution. – Described species: 2. Neotropical (presently only known from Surinam).

Syrphipogon **Hull (subgenus of *Microdon*)**
Figs. 404-406.
Syrphipogon Hull, 1937: 120. Type species: *Syrphipogon fucatissimus* Hull, 1937: 120, by original designation.

Description. – Body length: 25-28 mm. Very large flies with oval abdomen and long, colourful pilosity. Mimics of orchid bees of the genus *Eulaema* (Euglossidae). Head about as wide as thorax. Face more or less straight in profile; narrower than an eye; on ventral half with very long, thick and dense pile, resembling a beard ('mystax'). Eye margins in male converging at level of frons, with mutual distance about twice as large as width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere shorter than scape, oval, about four times as long as wide, bare. Postpronotum bare. Scutellum trapezoid; with very large, cone-shaped calcars. Anepisternum sulcate; pilose anterodorsally and posteriorly, widely bare medially. Anepimeron entirely pilose. Katepimeron convex; smooth; bare. Wing: vein R4+5 with posterior appendix; vein M1 straight, perpendicular to vein R4+5; postero-apical corner of cell R4+5 widely rounded, without appendix; crossvein rm located around basal 2/7 of cell DM. Abdomen oval, about 1.3 times as long as wide. Tergites 3 and 4 fused. Sternite 1 pilose. Male genitalia: aedeagus furcate, with furcation point near base, both processes about equally long, curved dorsad, straight, projecting well beyond apex of hypandrium; epandrium without ventrolateral ridge; surstylus shallowly furcate, with two short and wide lobes.

Diagnosis. – Body length more than 20 mm. Face with very long, thick and dense pile, resembling a beard ('mystax').

Discussion. – Hull (1937b) erected *Syrphipogon*, mentioning that it is related to *Microdon*. Steyskal (1953) referred to Hull's description in his own description of an apparently very similar species, but he considered the differences with *Microdon* insufficient for generic status. The phylogenetic analysis of morphological characters in Chapter 3 places *Syrphipogon fucatissimus* in an unresolved clade which also contains *Microdon* s.s., but provides no clues as to the relationship between these taxa. In external characters and male genitalia these taxa are quite similar. For that reason, *Syrphipogon* is here continued to be treated as a subgenus of *Microdon*.
The differences between the two species of *Syrphipogon* are not very convincing, when comparing the description of Steyskal (1953), based on a female, with the holotype of *S. fucatissimus*, a male. The differences as noted by Steyskal (1953) may be due to sexual dimorphism, but in order to establish this, the type of *M. gaigei* needs to be examined.

Diversity and distribution. – Described species: 2. Neotropical Only two specimens are known: one from Panama and one from "South America".

Thompsodon **Reemer gen. nov.**
Figs. 423-433.
Type species: *Thompsodon conspicillifrons* spec. nov.

Description. – Body length: 8 mm. Moderately slender flies with long antennae and basally constricted abdomen. Face in profile slightly convex, almost straight; laterally weakly depressed, therefore slightly carinate dorsomedially; about as wide as an eye. Lateral oral margins not produced. Frons laterally with round, concave areas, filled with dense golden pile, ventrally delimited by a sharply defined ridge. Vertex irregularly swollen. Occiput narrow ventrally, strongly widened dorsally. Eye bare. Antennal fossa about as high as wide. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere about as long as scape; elongate, with dorsal margin straight and ventral margin convex, apex slightly acute. Postpronotum pilose. Anepisternum

with shallow sulcus; entirely long pilose. Anepimeron entirely pilose. Katepimeron weakly convex; bare; with wrinkled texture. Scutellum semicircular, weakly triangular; without calcars. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located around basal 1/7 of cell DM. Abdomen constricted at tergite 1, narrowest at tergite 1, widest at posterior margin tergite 3. Tergites 3 and 4 not fused, able to articulate independently.

Diagnosis. – Frons laterally with round, concave areas, filled with dense golden pile, ventrally delimited by a sharply defined ridge. Transverse suture complete. Tergites 3 and 4 not fused.

Discussion. – The only known specimen representing this genus has some characters that are not often found among Microdontinae: mesonotal transverse suture complete, tergites 3 and 4 not fused. The lateral concave and densely golden pilose areas on the frons, which are ventrally delimited by a sharply defined ridge, are even unique within the subfamily. The specimen came upon the first author's notice after the phylogenetic analyses had already been performed. As it's a female, morphology of the male genitalia cannot be used for assessing its phylogenetic relationships. The unfused tergites 3 and 4 may suggest affinity with *Ceratophya* (with which it also shares the laterally weakly depressed face) or *Kryptopyga*, whereas the complete transverse suture reminds of *Ceratrichomyia* and *Indascia*. Hopefully, male specimens will be collected in the near future, which can be used for study of the male genitalia and molecular analyses.

Diversity and distribution. – Described species: 1. Only known from Costa Rica.

Etymology. – This genus is dedicated to Dr. F. Christian Thompson, in acknowledgement of the valuable work he has done on the taxonomy of the Syrphidae in general, and the Microdontinae in particular.

***Ubristes* Walker**

Figs. 407-411.

Ubristes Walker, 1852: 217. Type species: *Ubristes flavitibia* Walker, 1852: 217, by original designation.

Description. – Body length: 10-11 mm. Slender flies with long antennae and long, brush-like pilosity on hind tibiae. Mimics of *Trigona*-like stingless bees. Head wider than thorax. Face slightly convex, almost straight in lateral view; wider than eye. Lateral oral margins produced. Vertex flat. Occiput ventrally narrow, dorsally widened. Eye very sparsely and short pilose, appearing bare under low magnification. Eye margins in male converging at level of frons; mutual distance about three times width of antennal fossa. Antennal fossa about as high as wide. Antenna longer than distance between antennal fossa and anterior oral margin; basoflagellomere longer than scape. Postpronotum pilose. Anepisternum sulcate; pilose anteriorly and posteriorly, widely bare in between. Katepimeron convex; bare. Scutellum semicircular; without calcars. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; cell R4+5 with postero-apical angle widely rounded; crossvein rm located between basal 2/5 and 1/2 of cell DM. Hind tibia with long, brush-like pilosity. Abdomen elongate: parallel-sided or somewhat triangular. Tergite 2 with lateral tubercle at half of length. Terites 3 and 4 fused. Sternites 1, 2 and 3 not separated by very wide membranes. Male genitalia: aedeagus furcate basally; epandrium with lateral 'fenestrae': well-defined, translucent, oval depressions; surstylus more or less oval.

Diagnosis. – Hind tibia with long, brush-like pilosity. Scutellum without calcars. Vein R4+5 with appendix. Tergite 2 with lateral tubercle at half of length.

Discussion. – Thusfar, *Ubristes* has been characterized by the brush-like pilosity of the hind tibia, giving the flies the appearance of stingless *Trigona*-like bees (Cheng & Thompson 2008, Thompson et al. 1976). Based on this definition, 31 species were assigned to this group by Thompson et al. (1976), including the type species of *Carreramyia*, *Hypselosyrphus* and *Stipomorpha*. The latter two groups were considered as 'subgroups' of *Ubristes* by Cheng & Thompson (2008), because the characters previously used to define the groups (abdominal shape) were considered of little taxonomic value.

In the phylogenetic analysis based on morphological characters (Chapter 3), *Ubristes flavitibia* is placed in a clade with (among other groups) *Microdon* s.s., but without *Carreramyia*, *Hypselosyrphus* and *Stipomor-*

pha, which are placed in very different parts of the tree. Closer examination of the morphology reveals several important differences between these taxa. The structure of the male genitalia of *Ubristes* is very different from those of the species here included in *Carreramyia*, *Hypselosyrphus* and *Stipomorpha*: the aedeagus is long and slender and furcate near its base, the base of the hypandrium is not bulged and there are well-defined, translucent, oval lateral depressions in the epandrium (here called 'fenestrae'). In external morphology *Ubristes* is readily distinguished from the mentioned genera by e.g. the lateral tubercles on tergite 2. For other differences see the accounts of the other taxa. Considering the phylogenetic results and the morphological differences between these taxa, *Ubristes* sensu Thompson et al. (1976) and Cheng & Thompson (2008) is here considered to be polyphyletic, with *Carreramyia*, *Hypselosyrphus* and *Stipomorpha* each as separate lineages. Besides the type species, two other species are assigned to *Ubristes* (for descriptions see Chapter 6).
Thompson et al. (1976) and Cheng & Thompson (2008) rank *Ubristes* as a subgenus of *Microdon*. The available phylogenetic hypothesis (Chapter 3) is not informative about the affinities between these two taxa. However, the species of *Ubristes* differ in several characters from the species of *Microdon* s.s., as defined in the present paper. Here, the view is taken that it is better to treat *Ubristes* as a genus instead of a subgenus, in order to make sure that *Microdon* comprises less heterogeneous groups with uncertain affinities.

Diversity and distribution. – Described species: 3. Central and South America.

Undescribed genus #1
Figs. 412-416.
Based on: Species AUS-01Thompson, in prep.

Description. – Body length: 6 mm. Small flies with long, flag-shaped antennae and oval abdomen. Head about as wide as thorax. Face convex in profile, medially elevated, laterally depressed; narrower than an eye. Mouthparts undeveloped: no oral opening present. Vertex flat. Occiput narrow, dorsally widened. Eye short pilose. Eye margins in male not converging at level of frons, with mutual distance about 3 times width of antennal fossa. Antennal fossa about as wide as high. Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere longer than scape, strongly enlarged, laterally flattened and more or less triangularly shaped; bare. Arista pilose. Postpronotum pilose. Scutellum semicircular; without calcars. Anepisternum without sulcus; entirely pilose. Anepimeron entirely pilose. Katepimeron convex; pilose; smooth. Wing: vein R4+5 with posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located within basal 1/10 of cell DM. Abdomen oval, about 2 times as long as wide. Tergites 3 and 4 not fused. Sternite 1 bare. Male genitalia: aedeagus furcate, with furcation point near apex, bent dorsad; aedeagus dorsobasally with long projection; hypandrium with basal part bulb-like; epandrium with ventrolateral ridge, and dorsolaterally also with a ridge that delimits a depressed araea; surstylus unfurcate, basally with small angular lamella.

Diagnosis. – Basoflagellomere strongly widened, more or less triangular. Arista pilose.

Discussion. – The phylogenetic analysis of morphological characters in Chapter 3 provides no indication of the relationships of the species on which this genus is based. As it posesses some unique characters not found in other Microdontinae, it is placed in a new genus. These characters are: basoflagellomere strongly widened and more or less triangular; arista pilose; aedeagus dorsobasally with long projection; epandrium with dorsolateral ridge. Other interesting characters are the undeveloped mouthparts (shared with *Masarygus*) and the lateral carinae on the face.

Diversity and distribution. – Described species: 1. Australia (Queensland).

Undescribed genus #2
Figs. 417-422.
Based on: Species MCR-2 Thompson, in prep.

Description. – Body length: 10 mm. Slender flies with long, furcate antennae and slightly constricted abdomen. Face in profile more or less straight; slightly wider than an eye. Lateral oral margins not produced. Vertex more or less flat. Occiput narrow ventrally, slightly widened dorsally. Eye bare. Antennal fossa

about as high as wide. Antenna longer than distance between antennal fossa and anterior oral margin. Basoflagellomere longer than scape; bifurcate, dorsal branch somewhat shorter than ventral branch; arista absent. Postpronotum pilose. Anepisternum with shallow sulcus; pilose anterodorsally and along posterodorsal margin. Anepimeron pilose dorsally, bare ventrally. Katepimeron convex; bare; smooth. Scutellum semicircular; without calcars. Wing: vein R4+5 without posterior appendix; vein M1 perpendicular to vein R4+5; postero-apical corner of cell R4+5 rectangular, with small appendix; crossvein rm located around basal 1/15 of cell DM. Abdomen slightly constricted between tergites 2 and 3. Tergite 2 somewhat dorsoventrally flattened. Tergites 3 and 4 fused, but suture clearly visible.

Diagnosis. – Basoflagellomere bifurcate. Abdomen more or less parallel-sided, slightly constricted between tergites 2 and 3.

Discussion. – This taxon resembles *Carreramyia* in the bifurcate antenna, the wing venation and the structure of the male genitalia. From that genus it differs by the more or less flat vertex (strongly produced in *Carreramyia*), the short pilose hind tibia (long pilose in *Carreramyia*), and the more or less parallel-sided, slightly constricted abdomen (triangular in *Carreramyia*).

Diversity and distribution. – Only known from one species, collected in Costa Rica.

Unplaced taxa

A small number of species is left unclassified. These are listed at the end of the following section on species classification. On a few of these taxa, comments are given below.

Microdon sharpii Mik, 1900
Figs. 434-435.
Based on external characters, no close relatives were recovered in the phylogenetic analysis (Chapter 3). The species is characterized by its metallic blue colouration and golden pilosity, a long basoflagellomere, a medially widely bare face, a rectangular postero-apical corner of wing cell R4+5, and unfused tergites 3 and 4. The latter character may indicate affinity with *Ceratophya*, *Kryptopyga* or *Thompsodon*, but the species lacks other diagnostic characters for these taxa. This species is left unplaced for now.

Nothomicrodon Wheeler, 1924
Whether this taxon belongs to Microdontinae or Syrphidae at all is uncertain. It was described from larvae found in an ants nest (Wheeler 1924). Cheng & Thompson (2008) suspect it belongs to another family, perhaps Phoridae.

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Appendix 1: Descriptions of new species

This section contains descriptions of 27 previously undescribed species. Most of these were included in the phylogenetic analyses of Chapters 3 and 4. In addition, some new species are described which were considered interesting for other reasons, for instance because they considerably extend the known range of a genus (e.g. *Ceratrichomyia* from mainland Africa, *Kryptopyga* from Sulawesi). *Ceratrichomyia behara* Séguy is redescribed, because the type series was found to consist of three different species (see genus account in previous section). Characters additional to those mentioned in the descriptions can be found in the morphological character matrix of Chapter 3.

Archimicrodon malukensis **Reemer spec. nov.**
Figs. 10-15.

Type specimens: HOLOTYPE. Adult male. INDONESIA. Label 1: "INDONESIA: HALMAHEIRA / near Payake. 115 m. / Mal. trap. 18.II-18.III.1995 / C. v. Achterberg & R. de Vries". Coll. RMNH.
PARATYPES. 1 male and one female from same locality and date as holotype. 1 male from Halmaheira, near Akeiamo, alt. 175 m., 18.II-18.III.1995, leg. C. van Achterberg & R. de Vries, coll. RMNH (this specimen used in morphological matrix of Chapter 3; voucher code MR124).

Description (based on holotype)

Adult male Body size: 8 mm.

Head: Face occupying about 1/5 of head width in frontal view; black; black pilose, except white pilose on ventral 1/4. Gena hardly developed; black; white pilose. Oral margin not produced. Frons black; black pilose, except white pilose along lateral margin. Vertex black; black pilose. Occiput black; black pilose dorsally, white pilose ventrally. Eye bare. Antennal fossa about as high as wide. Antenna black; antennal ratio approximately as 2:1:3.

Thorax: Thorax black, except pleurae brownish. Mesoscutum black pilose, except pale yellow pilose along anterior margin, laterally between postpronotum and notopleuron, and in posterolateral corners. Postpronotum pale yellow pilose. Postalar callus black pilose, except pale yellow pilose at posterior apex. Scutellum semicircular, without calcars; entirely pale yellow pilose. Anepisternum with shallow dorsomedian sulcus; white pilose anterodorsally and posterodorsally, widely bare in between. Anterior anepimeron entirely white pilose. Katepimeron sparsely white pilose along dorsal margin, otherwise bare. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter pale yellow.

Wing: Hyaline, slightly infuscated antero-apically; microtrichose, except bare on subcostal cell, basal 1/2 of costal cell, basal 2/5 of cell r1, most of cell R except microtrichose along vena spuria, posterobasal 1/5 of cell r4+5, basal 5/6 of cell BM, anterobasal 3/5 of cell CuP, basomedian 2/3 of alula and basal 1/6 of anal lobe.

Legs: Black, except fifth tarsomeres brown; black pilose, except femora posterobasally white pilose and tarsi ventrally golden yellow pilose. Coxae black; white pilose. Trochanters brown; white pilose.

Abdomen: Tergites black with faint metallic hues, except for a dull black fascia on anterior 2/5 of tergite 3 and a very narrow, medially interrupted dull black fascia along anterior margin of tergite 4. Tergites 1 and 2 yellowish white pilose. Tergites 3 and 4 black pilose, except white pilose posterolaterally. Sternites blackish brown; sternite 1 bare; sternite 2 yellow pilose; sternite 3 black pilose except yellow pilose along posterior margin; sternite 4 black pilose. Male genitalia as in fig. 15.

Female: 9,5 mm. As male, except for usual sexual differences. Tergite 5 black pilose, except white pilose posteriolaterally.

Diagnosis The entirely black head, thorax (including femora and tibiae) and abdomen (whether or not with metallic hues) are shared with five other described *Archimicrodon*-species of the Indo-Australian region (Australia excluded). *Archimicrodon boharti* (Curran, 1947) (Solomon Islands) differs from this species by the metallic blue shining scutellum, clearly contrasting with the non-metallic mesonotum (in *A. malukensis* mesonotum and scutellum are of the same black colour). The same character also applies to *A. limbinervis* (de Meijere, 1908) and *A. incisuralis* (Walker, 1865) from New Guinea, and *A. purpurescens* (Shiraki, 1963) from Micronesia, which also differ by the black pilose scutellum (white pilose in *A. malukensis*). *Archimicrodon grageti* (de Meijere, 1908) (New Guinea) differs by the brownish abdomen and reddish yellow pregenital segments (black in *A. malukensis*).

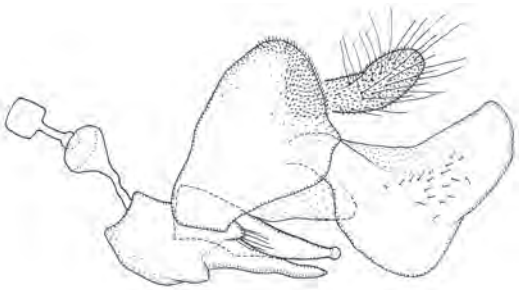
Etymology The specific epithet is derived from Maluku, the group of islands to which Halmaheira, where the species was found, belongs.

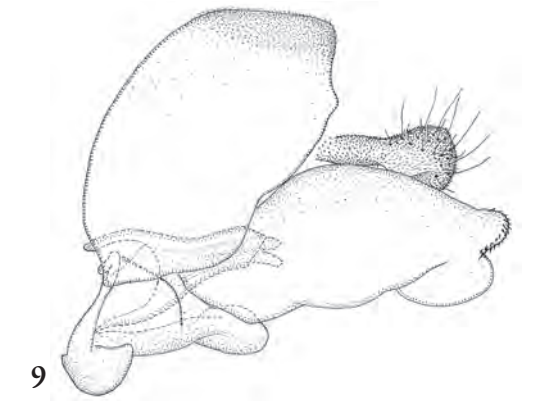
***Ceratrichomyia angolensis* Reemer spec. nov.**
Figs. 51-56.

Type specimens HOLOTYPE. Male. Label 1: "ANGOLA 30 km NE / Duque de Bragan - / za, Nov. / Dec. 1957"; label 2: "Collector / G.H. Heinrich". Coll. CNC.
Adult male Body size: 10 mm.
Head: Face occupying approximately 1/2 of head width in frontal view; yellowish brown, except for blackish marks dorsally along eye margin; entirely yellow pilose; with pit-like depressions on dorsal 1/3; face profile more or less straight, strongly produced ventrally below eye margin. Genae yellowish brown. Lateral oral margins not produced. Frons and vertex yellowish brown, a little blackish at and around ocellar triangle; yellow pilose. Occiput yellow; dorsally wide and yellow pilose, ventrally narrow and whitish pilose. Eye bare. Antennal fossa about as wide as high. Antenna orange brown, except basoflagellomere blackish brown; antennal ratio approximately as 6:1:18. Basoflagellomere very long, entirely covered with pile at least as long as 1.5 times diameter of basoflagellomere. Arista very small, shorter than pedicel; situated at about 1/3 from base of basoflagellomere.
Thorax: Mesonotum dorsally black, with margins widely yellowish brown, transverse suture yellowish brown and with pair of narrow submedian vittae, dividing black into three approximately equally wide parts; short, appressed yellow pilose. Postpronotum yellowish brown; bare. Postalar callus yellowish brown; yellowish pilose. Scutellum blackish brown; yellow pilose; without calcars. Pleurae orange brown. Anepisternum with deep sulcus separating anterior and posterior part; entirely yellow pilose. Anepimeron entirely yellow pilose. Katepisternum yellow pilose dorsally and ventrally. Katepimeron bare pilose. Katatergum with short microtrichia, anatergum bare. Calypter yellowish brown. Halter yellow.
Wing: hyaline; microtrichose, except bare on costal cells, basal 1/2 of cell R1, almost entirely on cells R, BM and CuP and on alula, posterobasal 1/5 of cell R4+5. Vein bm-cu shorter than basal section of CuA1.
Legs: Orange brown except femora blackish brown on basal 1/2; yellow pilose. Coxae and trochanters blackish brown; pale pilose.
Abdomen: Constricted at 2nd segment, with narrowest point at posterior margin, widest halfway tergite 4 (slightly wider than thorax). Tergites 1-3 fused. Tergite 1 dark brown; yellow pilose. Tergite 2 pale yellow; yellow pilose along lateral margin. Tergites 3 and 4 dark brown; yellow pilose. Sternite 1 yellow; bare. Sternite 2 yellow anteriorly, brown posteriorly; mixed yellow and black pilose. Sternite 3 dark brown; black pilose. Sternite 4 concealed behind genital capsule; brown; yellow pilose. Genitalia as in fig. 56.
Female unknown.
Diagnosis This species differs from both other known species of *Ceratrichomyia* by the bare postpronotum and katepimeron, the downward projecting face, and the absence of a ventrolateral ridge on the epandrium.

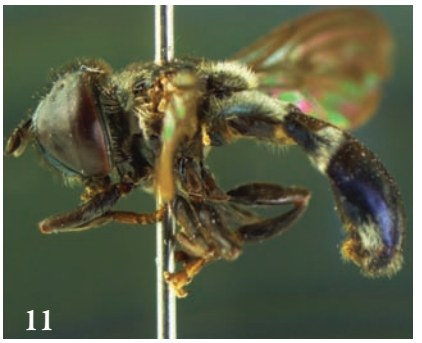
***Ceratrichomyia behara* Séguy, 1951 (redescription)**
Ceratrichomyia behara Séguy, 1951: 14. Type locality: Madagascar, Tananarivo. Coll. MNHN. Figs. 46, 47, 57.

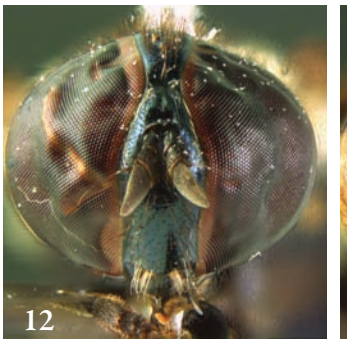
Type specimens LECTOTYPE. Male. Label 1: "Madagascar, Behara"; label 2 (blue): "Museum Paris, III-38, A. Seyrig"; label 3 (red): "Type"; label 4: "*Ceratrichomyia behara* type du genre [male symbol] Séguy 50". Coll. MNHN. See genus account of *Ceratrichomyia* for notes on lectotype designation.
Adult male Body size: 7 mm.
Head: Face occupying approximately 1/2 of head width in frontal view; yellow; entirely yellowish white pilose; depressed on lateral 1/3; face profile more or less straight. Genae yellow. Lateral oral margins not produced. Frons and vertex yellow; yellow pilose. Occiput yellow; dorsally wide and yellow pilose, ventrally narrow and whitish pilose. Eye bare. Antennal fossa about as wide as high. Antenna orange brown, getting dark brown towards apex of basoflagellomere; antennal ratio approximately as 1:0,2:3,5. Basoflagellomere very long, entirely covered with pile at least twice as long as diameter of basoflagellomere. Arista very small, shorter than pedicel.
Thorax: Mesoscutum, postpronotum, postalar callus and scutellum reddish brown; short, yellow pilose. Scutellum without calcars. Pleurae orange brown. Anepisternum with deep sulcus separating anterior and posterior part; entirely whitish pilose. Anepimeron entirely pale pilose. Katepisternum densely white pilose dorsally; sparsely pilose ventrally. Katepimeron white pilose. Katatergum with long microtrichia, arranged in oblique rows. Anatergum short microtri-

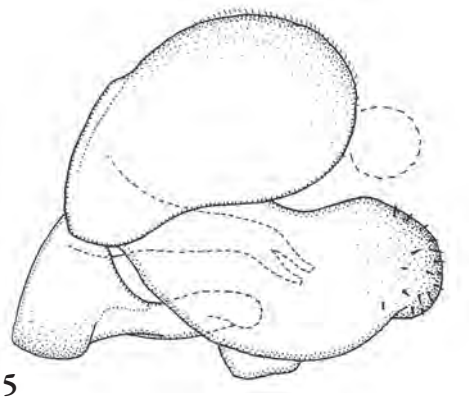


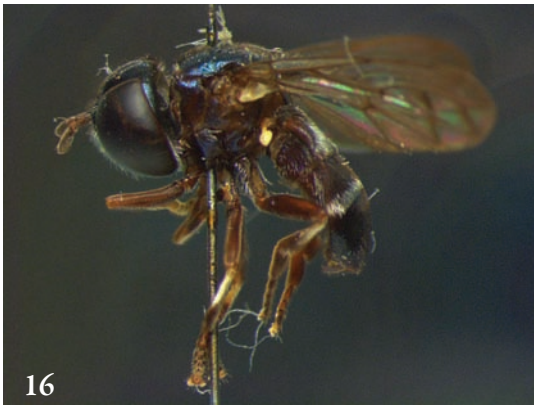


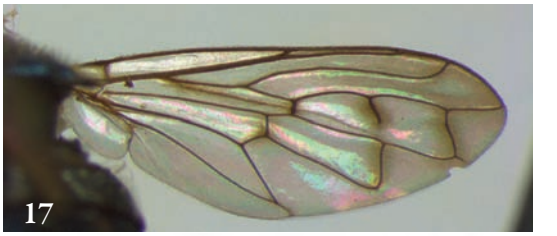
Figs 3-5. *Afromicrodon madecassa* male (holotype). – 3. habitus dorsal; 4. head frontal; 5. head lateral.
Fig. 6. *Afromicrodon johannae* male (paratype), genitalia lateral.
Figs 7-9. *Archimicrodon* (s.s.) *simplicicornis* male (holotype). – 7. habitus dorsal; 8. habitus lateral; 9. genitalia lateral.
Fig. 10. *Archimicrodon* (s.s.) *malukensis* male (holotype), habitus dorsal.

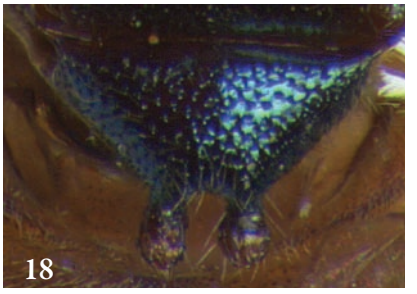


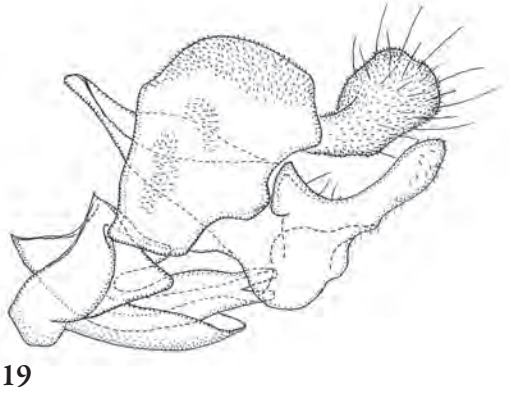












Figs 11-15. *Archimicrodon* (s.s) *malukensis*. – 10. male (holotype), habitus lateral; 11. male (holotype), head frontal; 12. female (paratype), head frontal; 13. male (holotype, wing; 14. male (paratype), genitalia lateral.
Figs 16-17. *Archimicrodon* (*Hovamicrodon*) *silvester* male (holotype). – 16. habitus lateral; 17. wing.
Figs 18-19. *Archimicrodon* (*Hovamicrodon*). – 18. *A. nubecula* female (holotype), scutellum; 19. *A. silvester* male (holotype), genitalia lateral.

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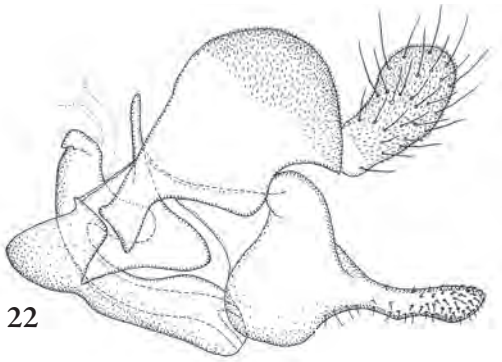

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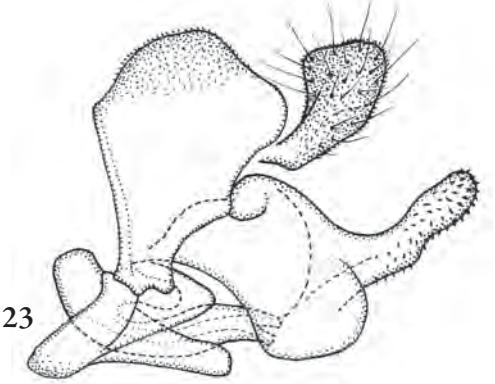

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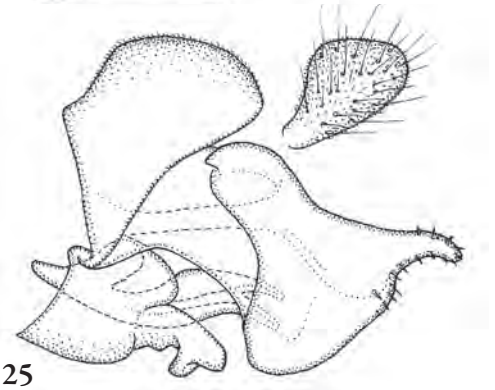

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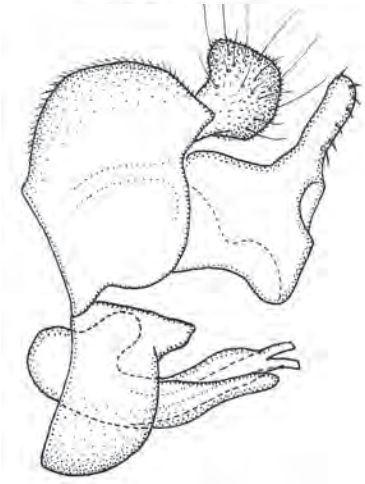

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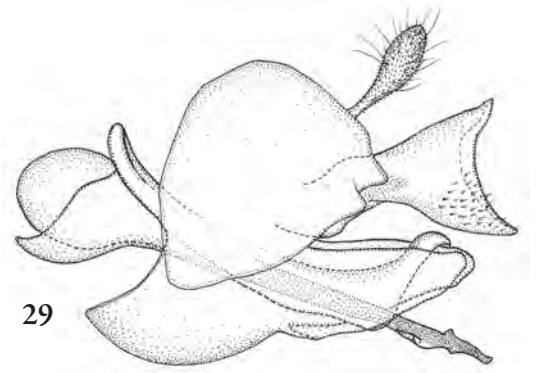
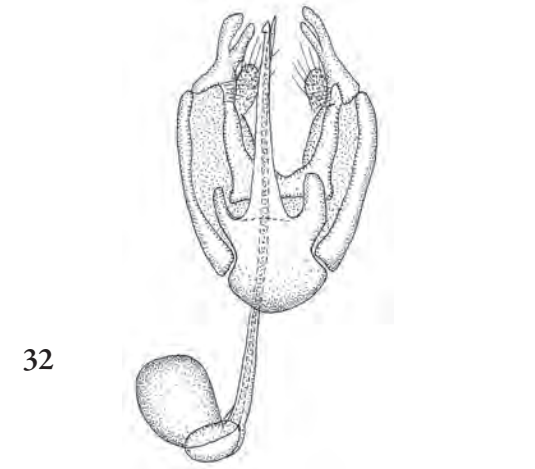
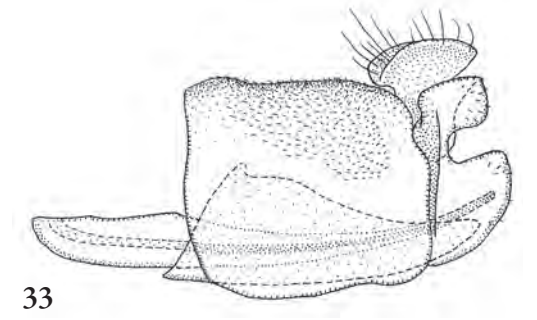
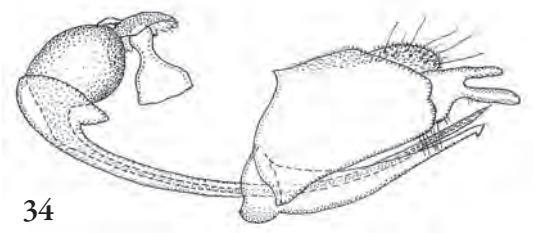
Figs 20-22. *Archimicrodon* (s.l.) *fenestrellatus* male (holotype). – 20. habitus dorsal; 21. habitus lateral; 22. genitalia lateral.
Figs 23-26. *Archimicrodon* (s.l.), male genitalia lateral. – 23. *A. brevicornis* (syntype); 24. *A. simplex* (South Korea, coll. RMNH); 25. *A. venosus* (holotype *Microdon papuanus* van Doesburg, jun. syn.); 26. *A.* cf. *fergusoni* (Australia, coll. CSCA).

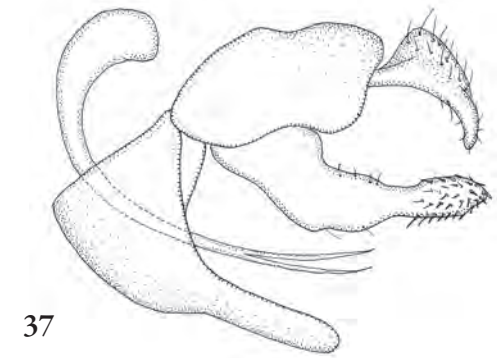


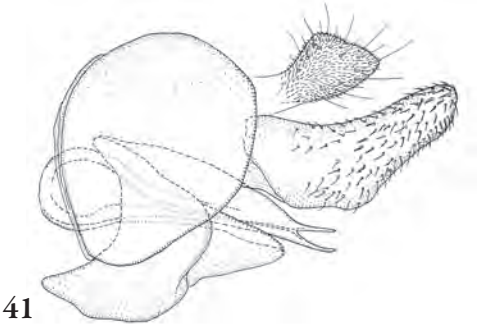




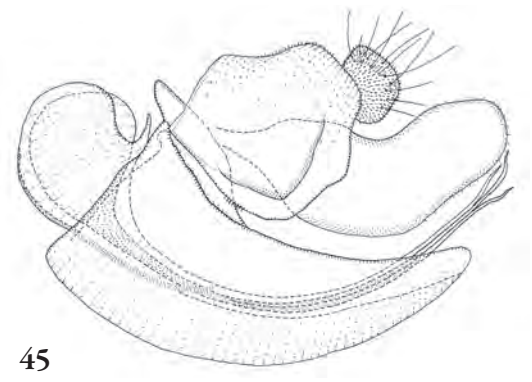


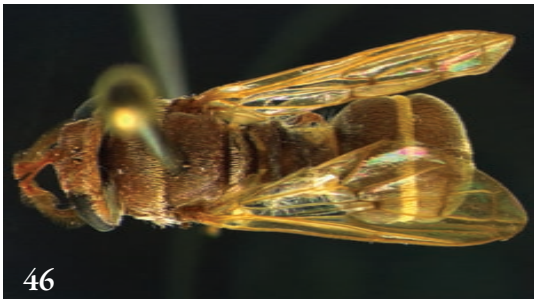
Figs 27-29. *Aristosyrphus primus* male. – 27. habitus dorsal (Brazil, coll. J.T. Smit); 28. wing (Brazil, coll. J.T. Smit); 29. genitalia lateral (Brazil, coll. SEMC).
Figs 30-34. *Aristosyrphus (Eurypterosyrphus)* males. – 30. *A. currani* male (holotype), habitus lateral; 31. *A.* spec. (Brazil, coll. ZMAN), head lateral; 32. *A.* spec. #1 (Costa Rica, coll. ZMAN), genitalia ventral; 33. *A.* spec. #2 (Brazil, coll. ZMAN), genitalia lateral; 34. *A.* spec. #1 (Costa Rica, coll. ZMAN), genitalia lateral.



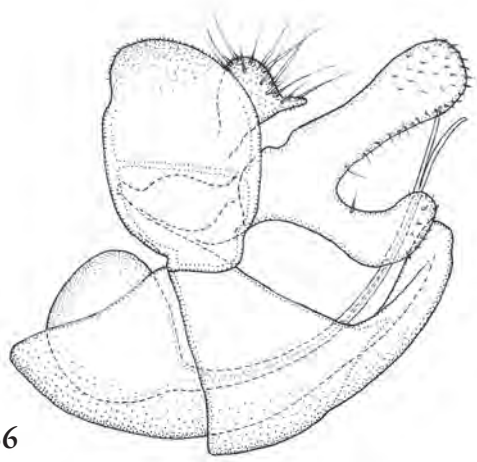


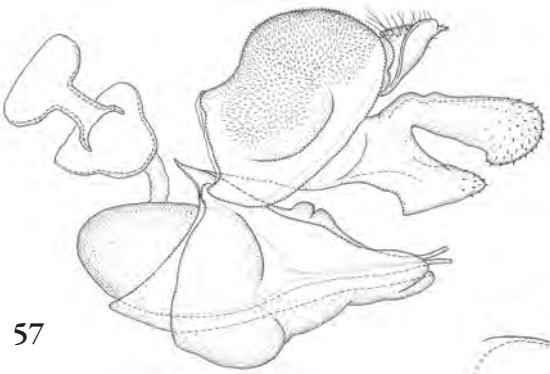
Figs 35-37. *Bardistopus papuanum* male (holotype). – 35. habitus dorsal; 36. habitus lateral; 37. genitalia lateral.
Figs 38-41. *Carreramyia megacephalus* male (Costa Rica, coll. M. Hauser). – 38. habitus dorsal; 39. head frontal; 40. habitus lateral; 41. genitalia lateral (Costa Rica, coll. RMNH).
Figs 42-43. *Ceratophya notata* male (holotype). – 42. habitus dorsal; 43. habitus lateral.

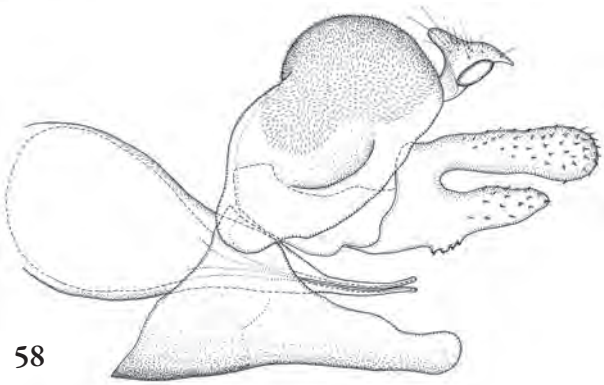




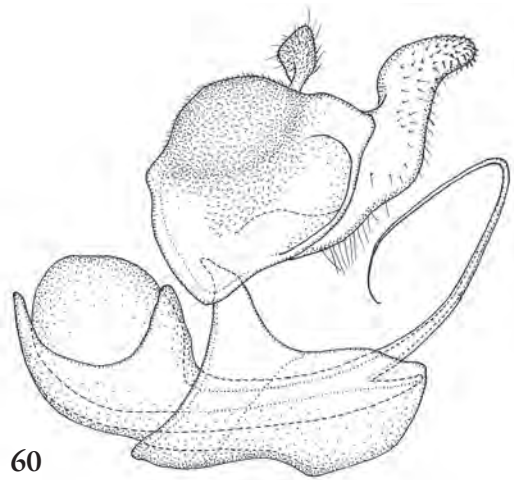
Figs 44-45. *Ceratophya*. – 44. *C. panamensis* female (paratype), abdomen lateral; 45. *C. notata* male (holotype), genitalia.
Figs 46-52. *Ceratrichomyia* males (holotypes). – 46. *C. behara*, habitus dorsal; 47. *C. behara*, habitus lateral; 48. *C. bullabucca*, habitus dorsal; 49. *C. bullabucca*; habitus lateral; 50. *C. bullabucca*, head frontal; 51. *C. angolensis*, habitus dorsal; 52. *C. angolensis*, habitus lateral.

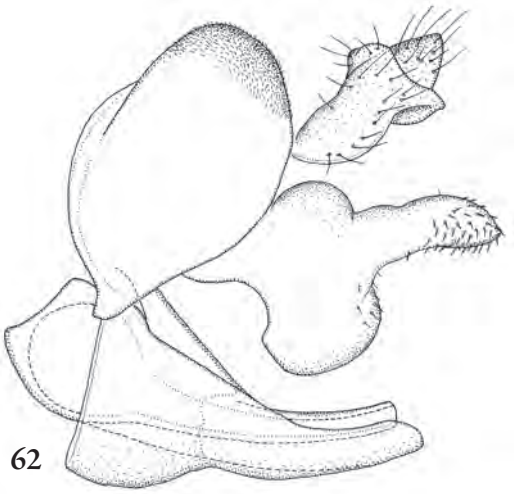


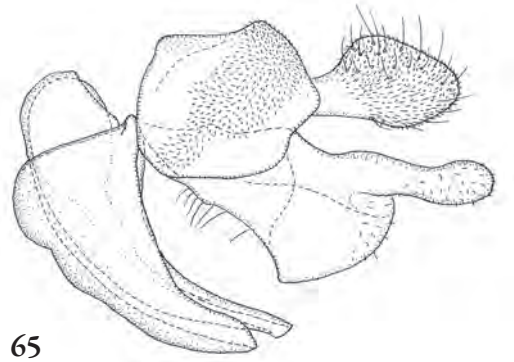




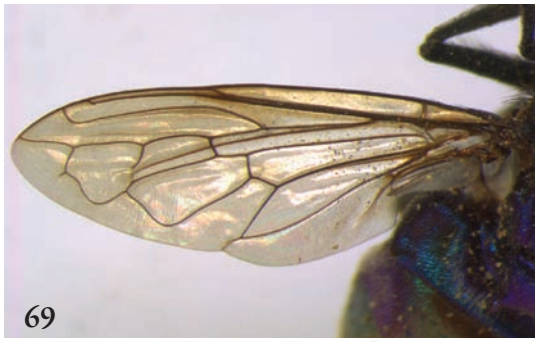
Figs 53-55. *Ceratrichomyia angolensis* male (holotype). – 53. head frontal; 54. head lateral; 55. wing.
Figs 56-58. *Ceratrichomyia* males (holotypes). – 56. *C. angolensis*; 57. *C. behara*; 58. *C. bullabucca*.

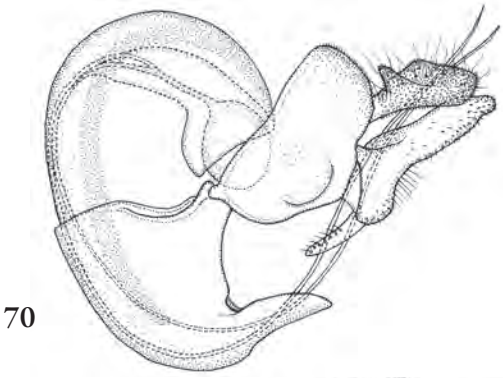


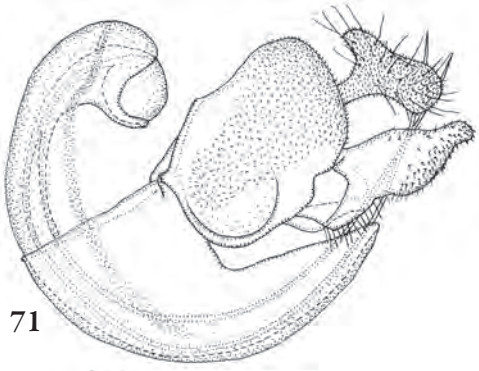


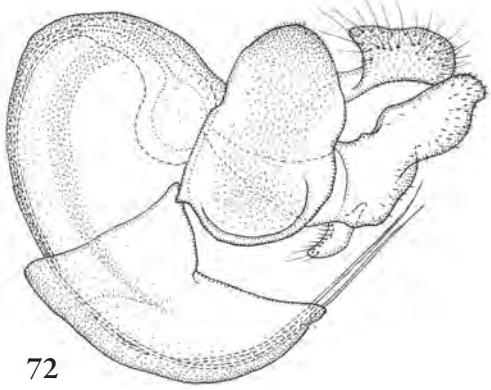


Figs 59-60. *Ceriomicrodon petiolatus* male (holotype). – 59. habitus lateral; 60. genitalia lateral.
Figs 61-62. *Cervicorniphora alcicornis* male (Australia, coll. USNM). – 61. habitus lateral; 62. genitalia lateral.
Figs 63-65. *Chrysidimyia chrysidimima* male (holotype). – 63. habitus dorsal; 64. habitus lateral; 65. genitalia lateral.

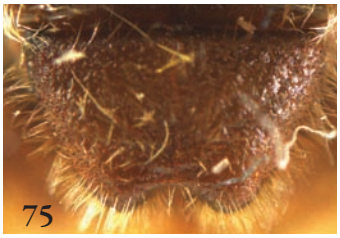


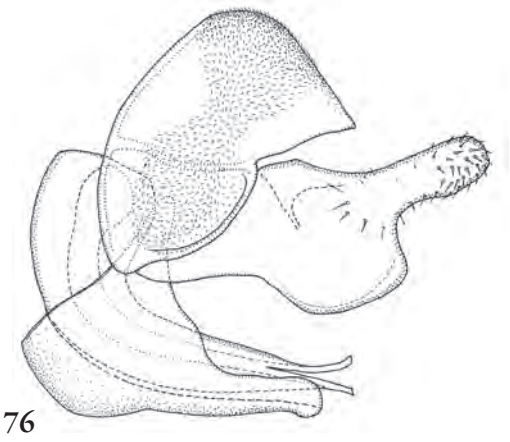


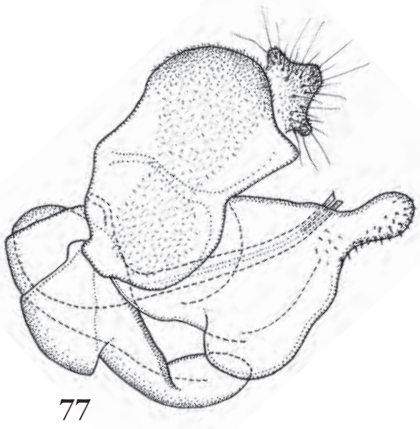


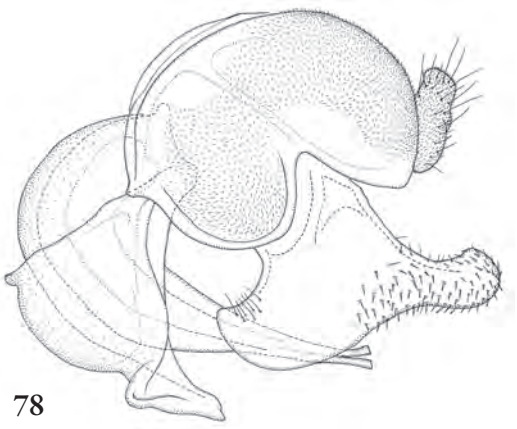


Figs 66-67. *Chrysidimyia chrysidimima* male (holotype). – 66. head frontal; 67. head lateral.
Figs 68-70. *Microdon (Chymophila) instabilis* (holotype). – 68. habitus dorsal; 69. wing; 70. genitalia lateral.
Figs 71-72. *Microdon (Chymophila)*, male genitalia. – 71. *M. lativentris* (holotype); 72. *M. stramineus* (Surinam, coll. RMNH).

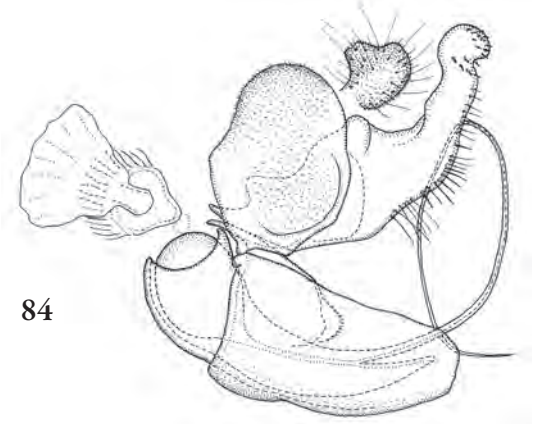




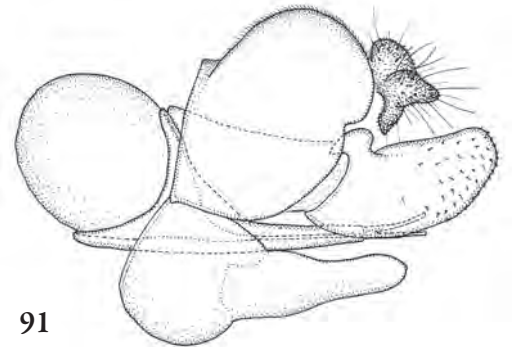




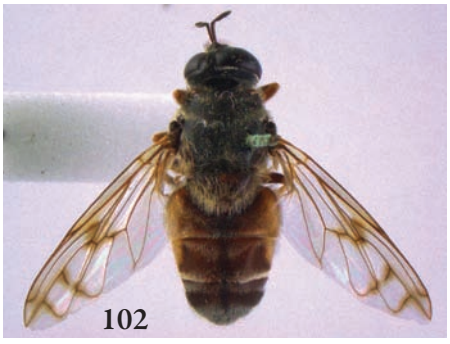
Figs 73-74. *Microdon (Dimeraspis) marmoratus* male (holotype). – 73. habitus dorsal; 74. habitus lateral.
Fig. 75. *Microdon (Dimeraspis) globosus* male (USA, Pennsylvania, coll. RMNH), scutellum.
Figs 76-78. *Microdon (Dimeraspis)*, male genitalia. – 76. *M. globosus* (USA, Pennsylvania, coll. RMNH); 77. *M. abditus* (paratype, USA, Queens, coll. RMNH); 78. *M. fuscipennis* (USA, N-Carolina, coll. RMNH).



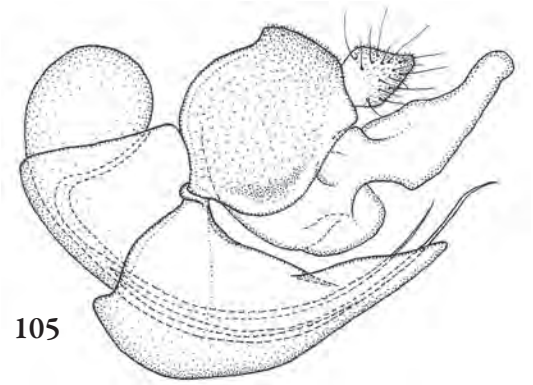
Figs 79-84. *Domodon zodiacus* male (holotype). – 79. habitus dorsal; 80. habitus lateral; 81. head frontal; 82. head lateral; 83. wing; 84. genitalia lateral.
Figs 85-86. *Furcantenna nepalensis* male (holotype). – 85. habitus dorsal; 86. habitus lateral.

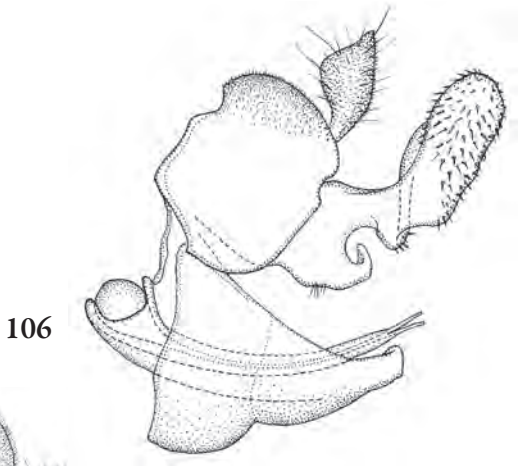


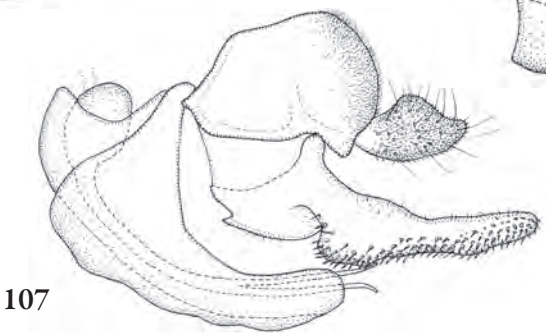
Figs 87-91. *Furcantenna nepalensis* male (holotype). – 87. abdomen dorsal; 88. head frontal; 89. head lateral; 90. wing; 91. genitalia lateral.
Figs 92-93. *Heliodon doris* male (holotype). – 92. habitus dorsal; 93. habitus lateral.
Figs 94-95. *Heliodon doris* female (paratype). – 94. habitus dorsal; 95. habitus lateral.



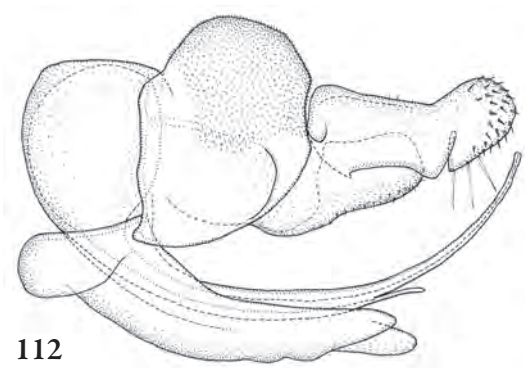
Figs 96-98. *Heliodon doris* male (holotype). – 96. head frontal; 97. head lateral; 98. wing.
Figs 99-101. *Heliodon elisabethanna* female (holotype). – 99. habitus dorsal; 100. habitus lateral; 101. head frontal.
Figs 102-103. *Heliodon tiber* male (holotype). – 102. habitus dorsal; 103. head frontal.
Fig. 104. *Heliodon tiber* female (paratype), habitus dorsal.

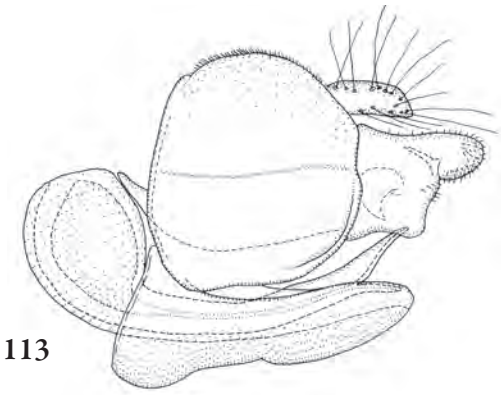


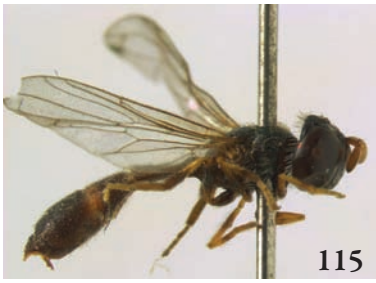


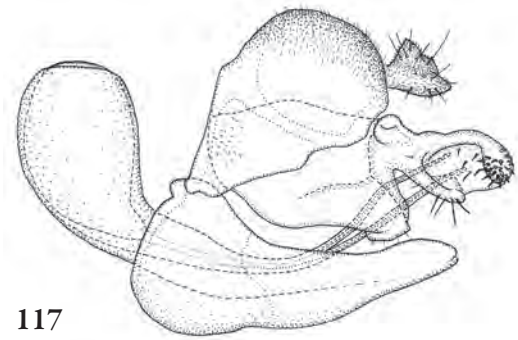


Figs 105-107. *Heliodon*, male genitalia. – 105. *H. doris* (holotype); 106. *H. tiber* (holotype); 107. *H. gloriosus* (holotype of *Microdon aurivesta* Hull, jun. syn.)
Figs 108-109. *Hypselosyrphus amazonicus* female (holotype *Microdon scutellaris* Shannon). – 108. habitus dorsal; 109. habitus lateral.
Figs 110-111. *Hypselosyrphus trigonus* male (holotype). – 110. head frontal; 111. head lateral.

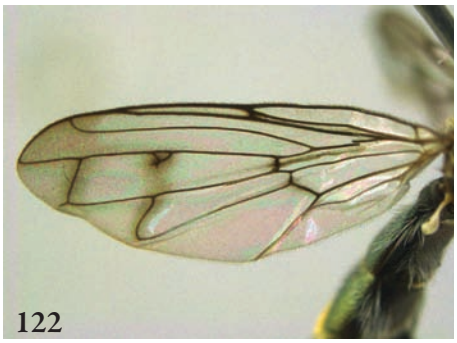


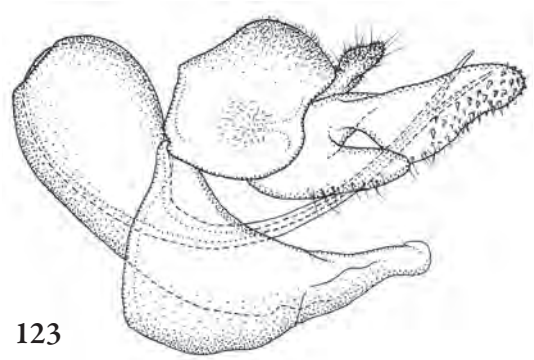


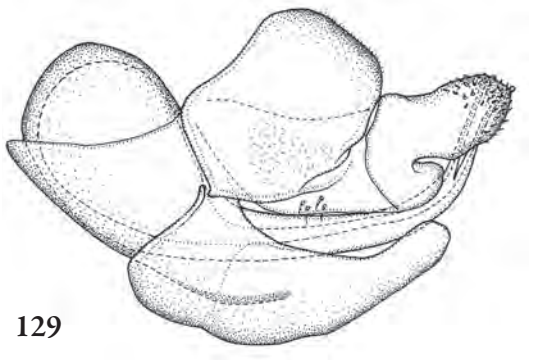




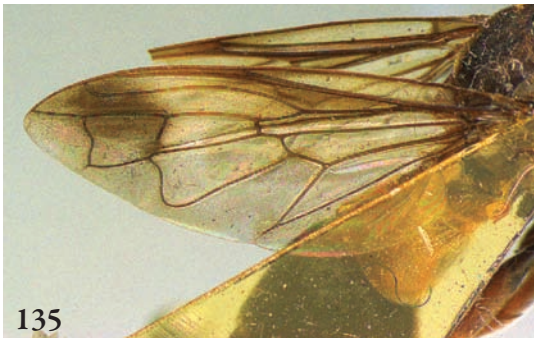
Figs 112-113. *Hypselosyrphus*, male genitalia. – 112. *H. amazonicus* (Peru, coll. RMNH) (cercus missing); 113. *H. analis* (holotype).
Figs 114-117. *Indascia gracilis* male (holotype). – 114. habitus dorsal; 115. habitus lateral; 116. wing; 117, genitalia.
Figs 118-119. *Indascia gigantica* male (holotype). – 118. habitus dorsal; 119. habitus lateral.



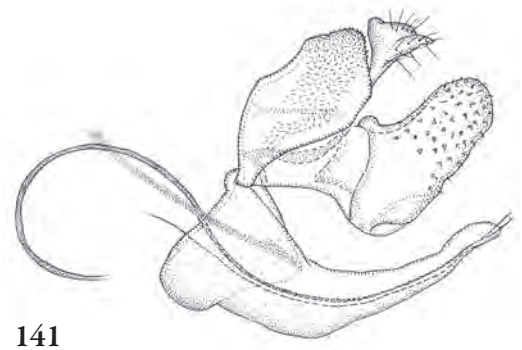


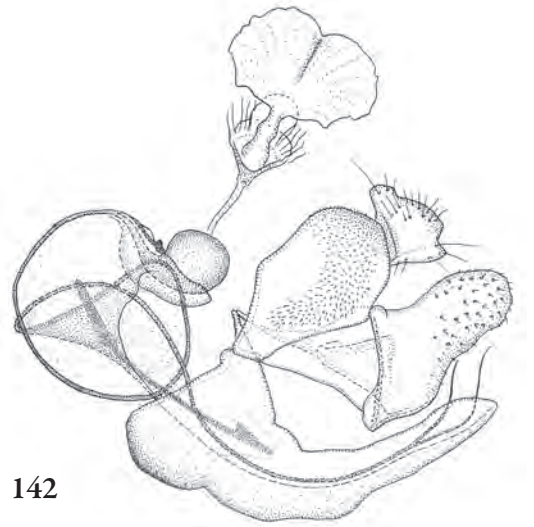


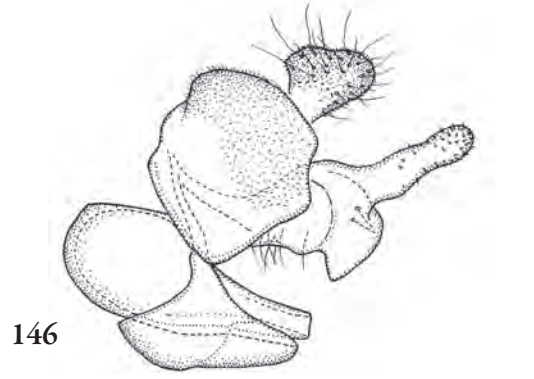
Figs 120-123. *Indascia gigantica* male (holotype). – 120. head frontal; 121. head lateral; 122. wing; 123. genitalia lateral.
Figs 124-129. *Indascia spathulata* male (holotype). – 124. habitus lateral; 125. habitus dorsal; 126. head frontal; 127. head lateral; 128. wing; 129. genitalia lateral.



Figs 130-135. *Kryptopyga pendulosa* male (holotype). – 130. habitus dorsal; 131. habitus lateral; 132. head frontal; 133. head lateral; 134. abdomen ventral; 135. wing.
Fig. 136. *Kryptopyga pendulosa* female (Indonesia, Bangka, coll. RMNH).
Fig. 137-138. *Kryptopyga sulawesiana* male (holotype). – 137. habitus dorsal; 138. habitus lateral.

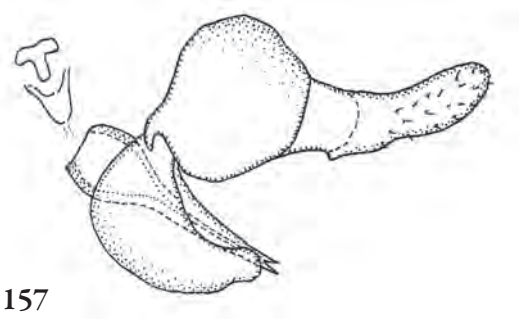




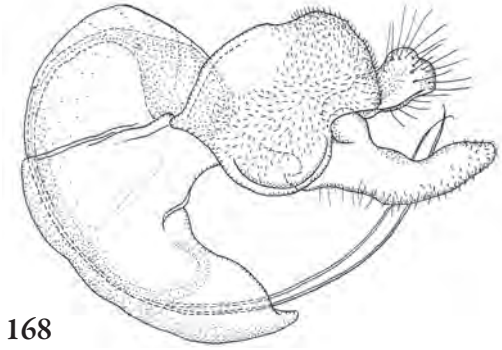


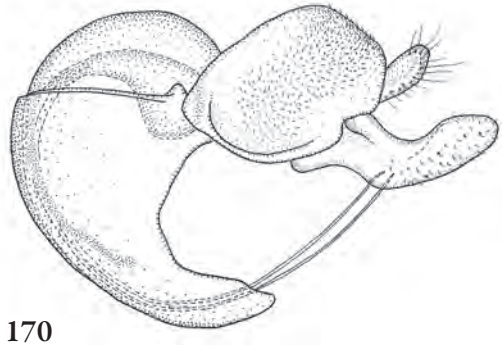
Figs 139-140. *Kryptopyga sulawesiana* male (holotype). – 139. head frontal; 140. wing.
Figs 141-142. *Kryptopyga*, male genitalia. – 141. *K. pendulosa* (holotype); 142. *K. sulawesiana* (holotype).
Figs 142-145. *Laetodon violens* male (Jamaica, coll. RMNH). – 143. habitus dorsal; 144. habitus lateral; 145. head frontal.
Fig. 146. *Laetodon laetus* male (USA, Georgia, coll. RMNH), genitalia lateral.

Figs 147-149. *Masarygus planifrons* male (syntype). – 147. habitus dorsal; 148. habitus lateral; 149. head frontal.
Fig. 150. *Masarygus planifrons* female (syntype), habitus dorsal.
Figs 151-155. *Masarygus palmipalpus* male (holotype). – 151. habitus dorsal; 152. habitus lateral; 153. head frontal; 154. head lateral; 155. antenna.

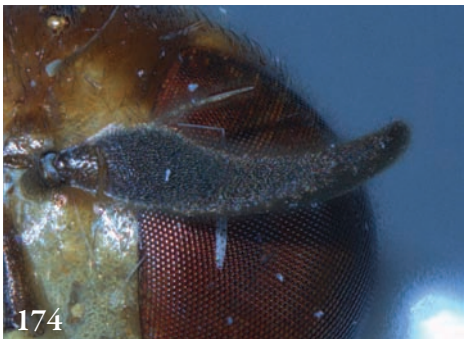


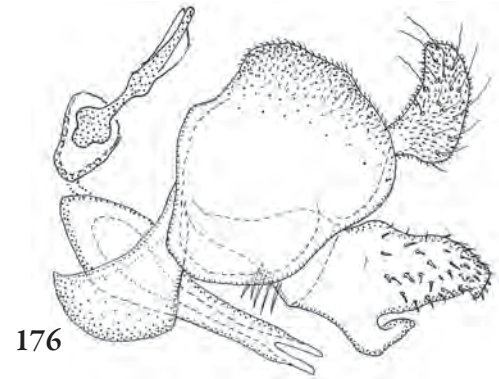
Figs 156-157. *Masarygus palmipalpus* male (holotype). – 156. wing; 157. genitalia lateral
Figs 158-160. *Masarygus* spec. 1 male (Brazil, coll. USNM); 158. habitus dorsal; 159. habitus lateral; 160. head frontal.
Fig. 161. *Masarygus* spec. 2 male (Brazil, coll. USNM), habitus lateral.
Figs 162-165. *Microdon (Megodon) stuckenbergi* male (holotype). – 162. habitus dorsal; 163. thorax dorsal; 164. habitus lateral; 165. head frontal.

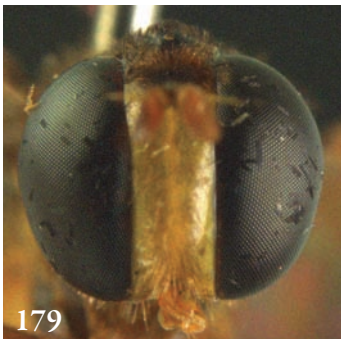


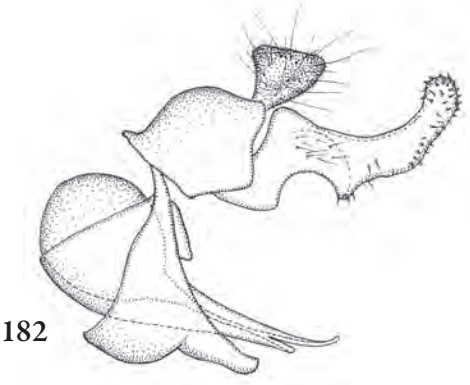


Figs 166-168. *Microdon (Megodon) stuckenbergi* male (holotype). – 166. head lateral; 167. wing; 168. genitalia.
Figs 169-170. *Microdon (Megodon) planitarsus* male (holotype). – 169. habitus dorsal; 170. genitalia.
Figs 171-173. *Menidon falcatus* male (Costa Rica, coll. ZMAN); 171. habitus dorsal; 172. habitus lateral; 173. head frontal.



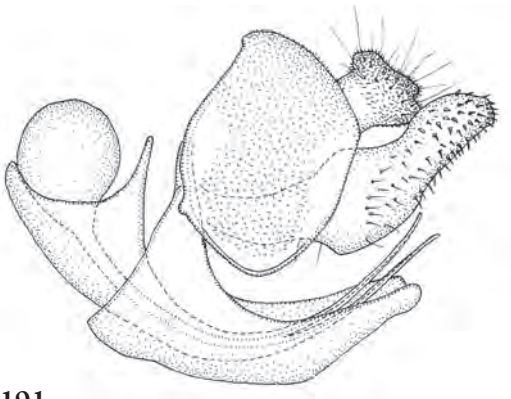






Figs 174-175. *Menidon falcatus* male (Costa Rica, coll. ZMAN). – 174. antenna; 175. wing.
Fig. 176. *Menidon falcatus* male (Costa Rica, coll M. Hauser), genitalia lateral.
Figs 177-182. *Mermerizon inbio* male (holotype). – 177. habitus lateral; 178. habitus dorsal; 179. head frontal; 180. head lateral; 181. wing; 182. genitalia lateral.

Figs 183-186. *Metadon achterbergi* female (holotype). – 183. habitus dorsal; 184. habitus lateral; 185. head frontal; 186. wing.
Figs 187-188. *Metadon*, habitus. – 187. *M. bifasciatus* (Japan, coll. RMNH); 188. *M. inermis* (holotype).
Figs 189-190. *Metadon wulpii* female (Borneo, coll. RMNH). – 189. habitus dorsal; 190. habitus lateral.



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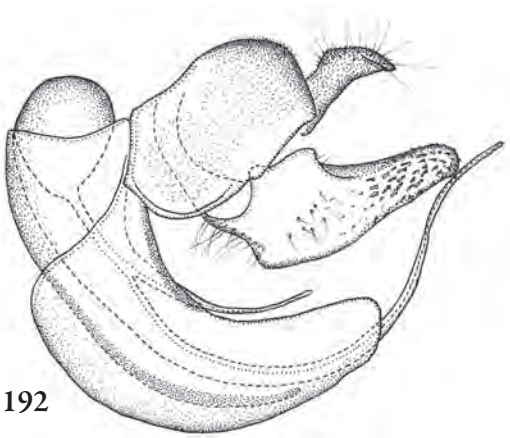

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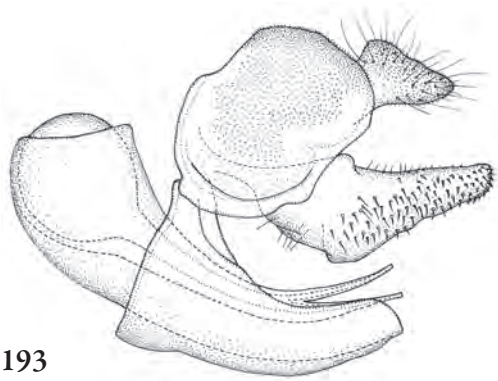

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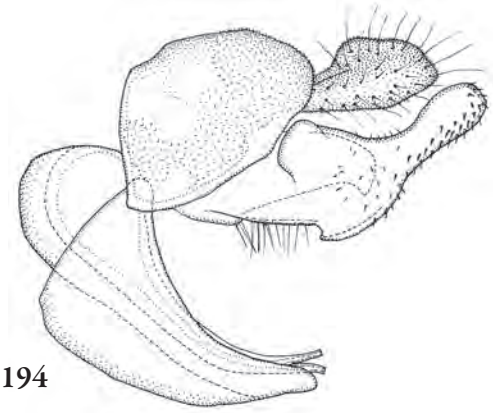

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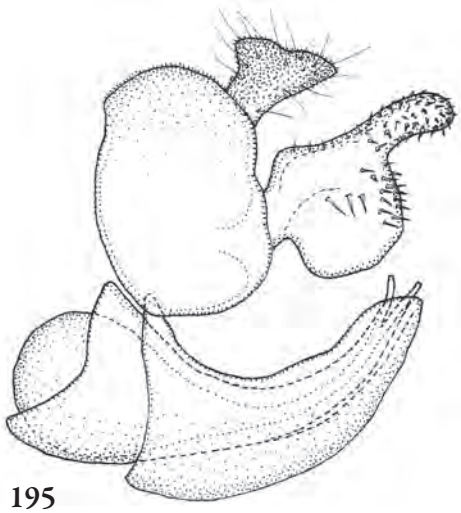

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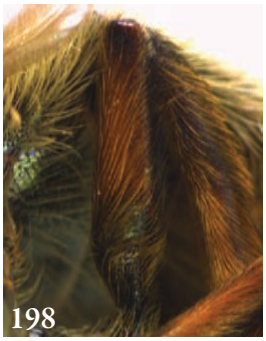
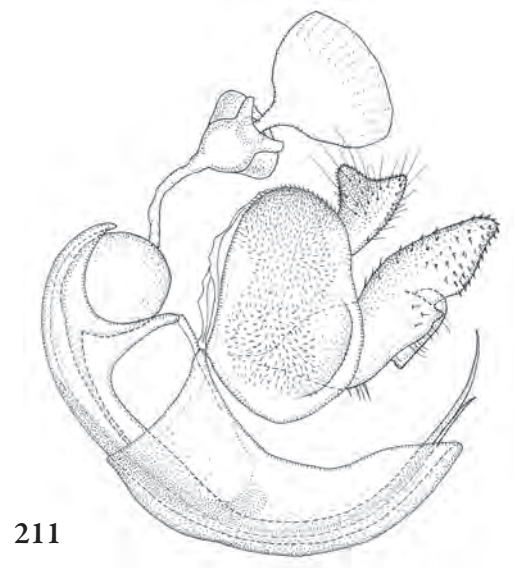
Figs 191-195. *Metadon*, male genitalia lateral. – 191. *M. bicoloratus* (holotype); 192. *M. bifasciatus* (China, coll. RMNH); 193. *M. inermis* (holotype); 194. *M. montis* (holotype); 195. *M. punctulatus* (holotype).



Figs 196-199. *Microdon hauseri* male (holotype). – 196. habitus lateral; 197. abdomen dorsal; 198. hind femur, frontal; 199. head frontal.
Figs 200-203. *Microdon mandarinus* male (holotype). – 200. habitus dorsal; 201. head frontal; 202. habitus lateral; 203. head dorsal.
Figs 204-205. *Microdon mandarinus* female (paratype). – 204. habitus dorsal; 205. habitus lateral.



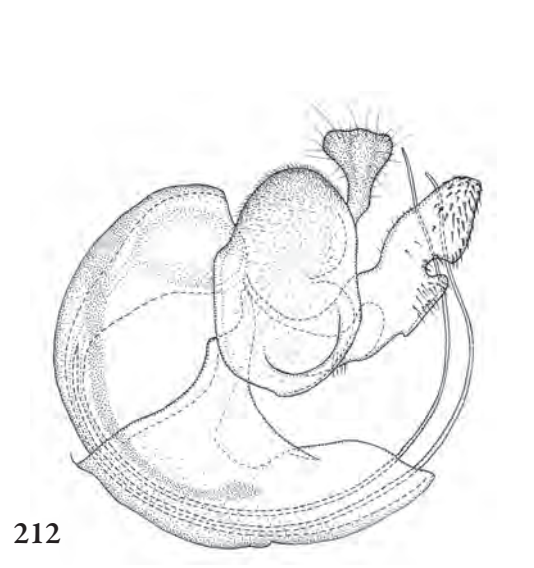
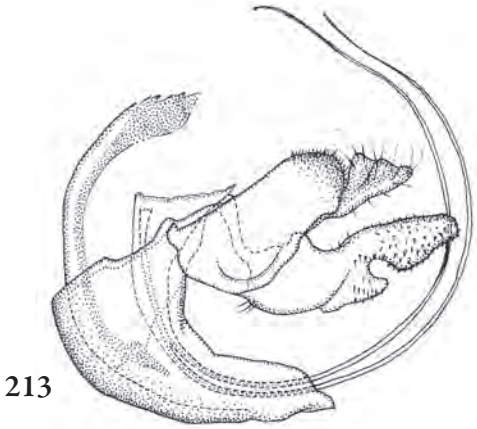
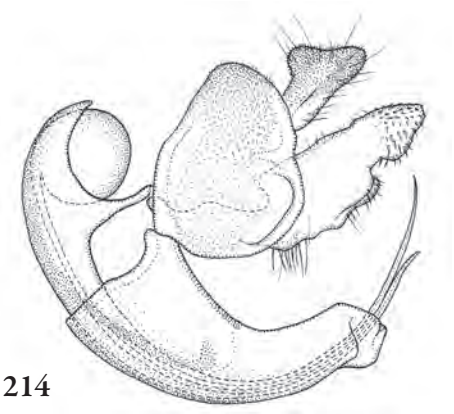
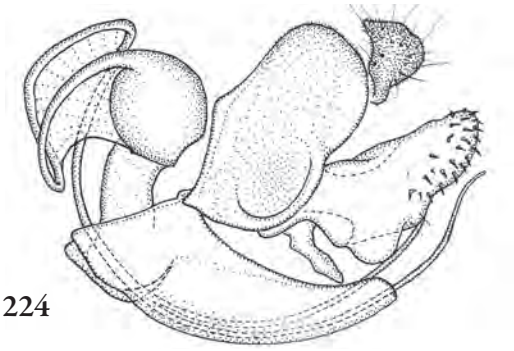


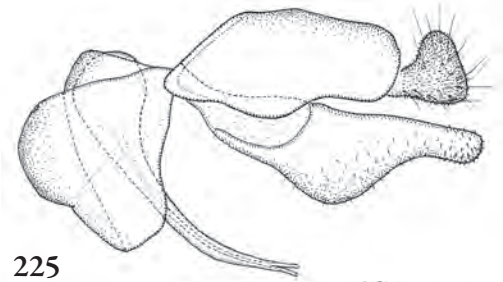
Fig. 206. *Microdon mandarinus* male (holotype), wing.
Figs 207-210. *Microdon yunnanensis* male (holotype). – 207. habitus lateral; 208. habitus dorsal; 209. head frontal; 210. wing.
Figs 211-212. *Microdon* s.s., male genitalia. – 211. *M. mutabilis* (Belarus, coll. M. Reemer); 212. *M. hauseri* (holotype).

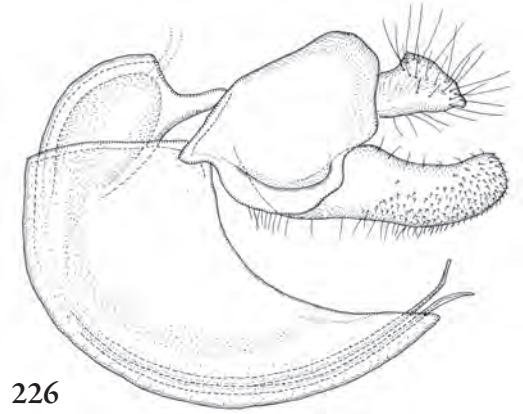


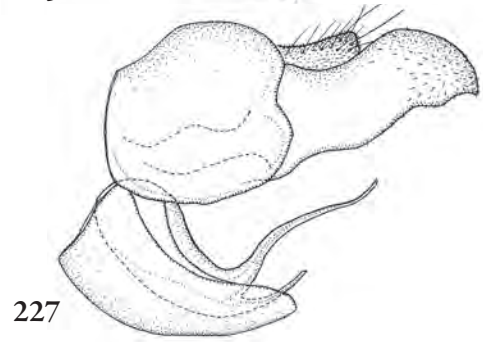


Figs 213-214. *Microdon* s.s., male genitalia. – 213. *M. mandarinus* (holotype); 214. *M. yunnanensis* (holotype).
Figs 215-220. *Microdon* s.l. males, habitus. – 215. *craigheadi*-group: *M. craigheadi* (USA, S-Carolina, coll. BMNH); 217. *erythros*-group: *M. luteiventris* (Kenya, coll. RMNH); 217. *mirabilis*-group: *M. bertonii* (Brazil, coll. RMNH); 218. *tarsalis*-group: *M. tarsalis* (holotype); 219. *M. tarsalis*; 220. *virgo*-group: *M. rufiventris* (Surinam, coll. RMNH).









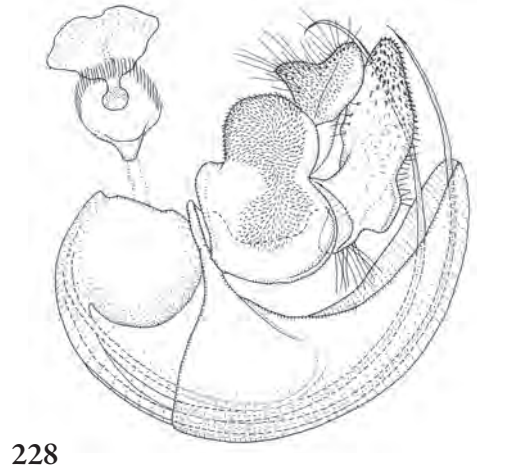
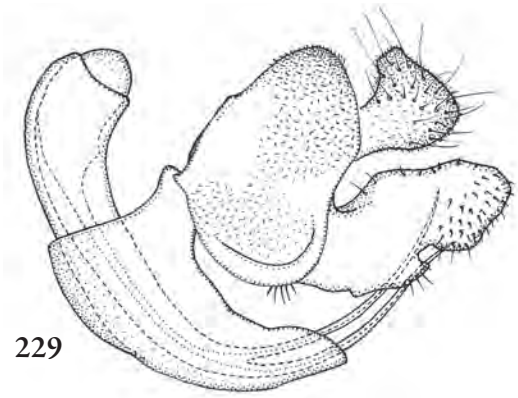
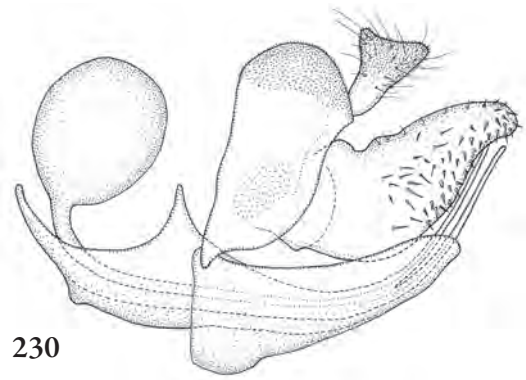
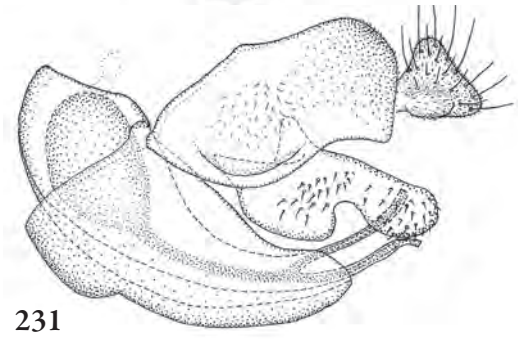
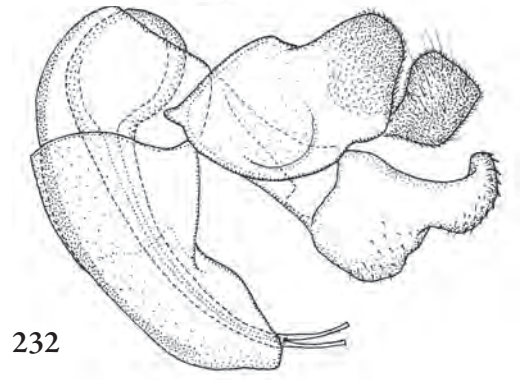


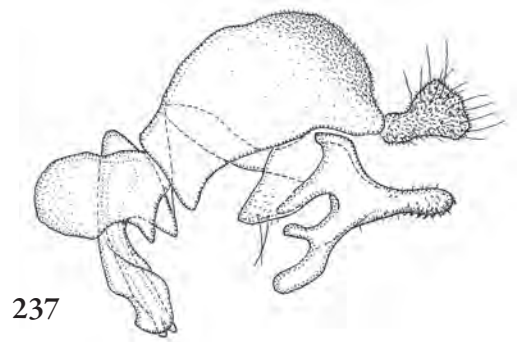
Fig. 221. *Microdon* (*virgo*-group) *rufiventris* (Surinam, coll. RMNH), head lateral.
Figs. 222-223. *Microdon* (s.l.), male, habitus. – 222. *M. pictipennis* (Australia, coll. MNHN); 223. *M. tsara* (holotype).
Figs 224-228. *Microdon* (s.l.), male genitalia. – 224. *M. craigheadi* (USA, Georgia, coll. RMNH); 225. *M. erythros* (Congo, coll. RMNH); 226. *M. bertonii* (Brazil, coll. RMNH); 227. *M. tarsalis* (holotype); 228. *M. rufiventris* (Surinam, coll. RMNH).



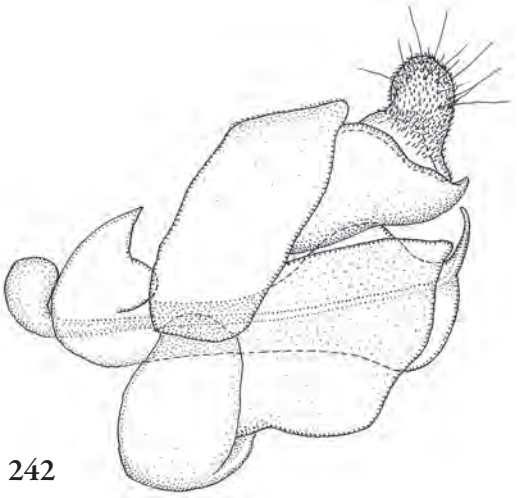


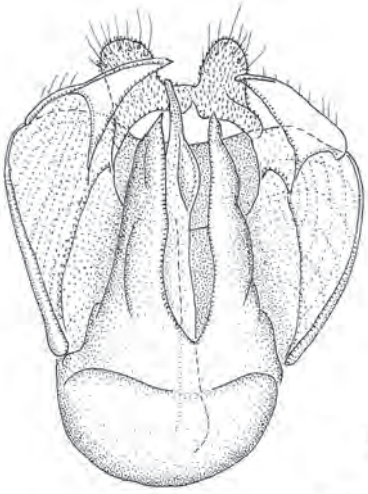


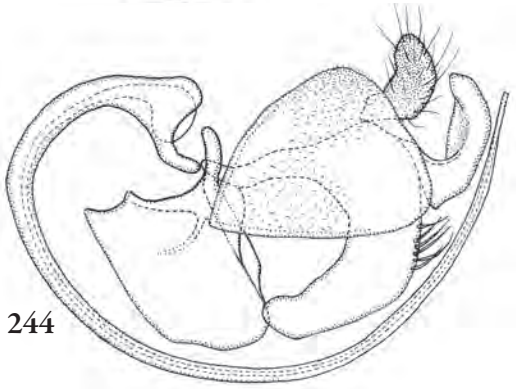


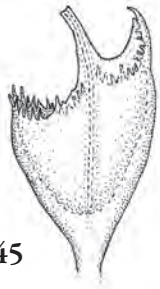


Figs 229-232. *Microdon* (s.l.), male genitalia. – 229. *M. carbonarius* (holotype); 230. *M. pictipennis* (Australia, coll. W. van Steenis); 231. *M. tsara* (holotype); 232. *M. waterhousei* (Australia, coll. M. Hauser).
Figs 233-234. *Microdon mitis* male (Brazil, coll. RMNH); 233. habitus dorsal; 234. habitus lateral.
Figs 235-236. *Mitidon* spec. – 235. male, scutellum (Brazil, coll. RMNH); 236. female, habitus (Ecuador, coll. RBIN).
Fig. 237. *Mitidon mitis* male (Brazil, coll. RMNH), genitalia lateral.

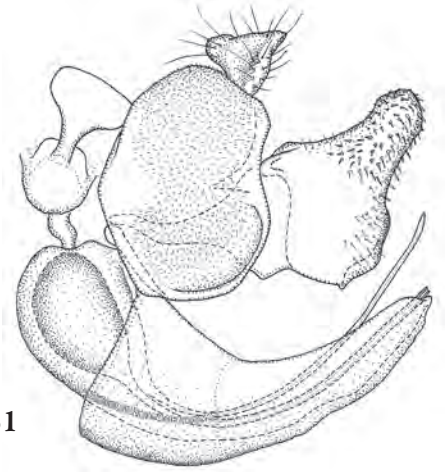




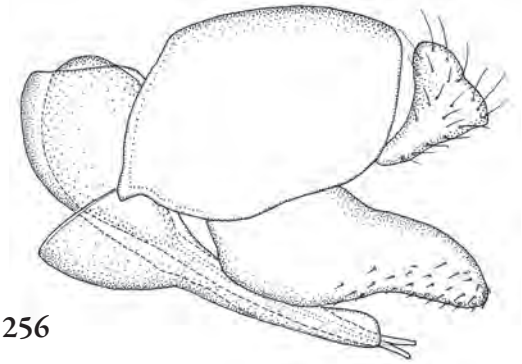


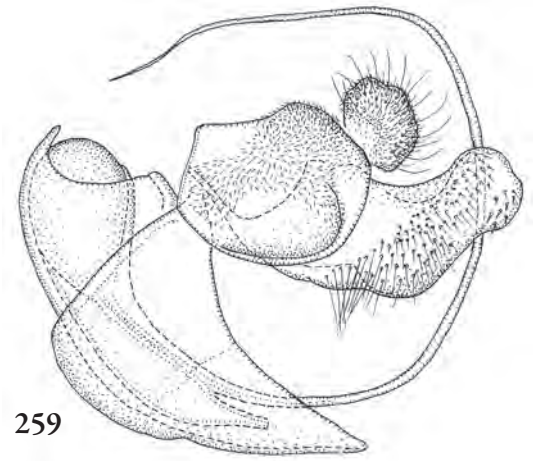


Figs 238-239. *Mixogaster breviventris* male (USA, coll. RMNH). – 238. habitus dorsal; 239. wing.
Figs 240-241. *Mixogaster thecla* male (Brazil, coll. J.T. Smit). – 240. habitus dorsal; 241. wing.
Figs 242-243. *Mixogaster breviventris* male (USA, coll. RMNH), genitalia. – 242. lateral; 243. ventral.
Fig. 244. *Mixogaster thecla* male (Brazil, coll. J.T. Smit), genitalia lateral.
Fig. 245. *Mixogaster* spec. nov. male (Colombia, coll. RMNH), aedeagus ventral.

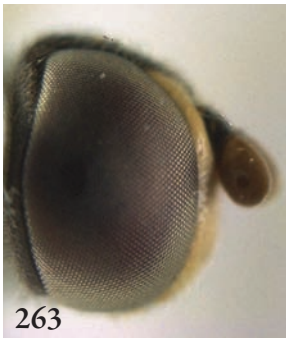


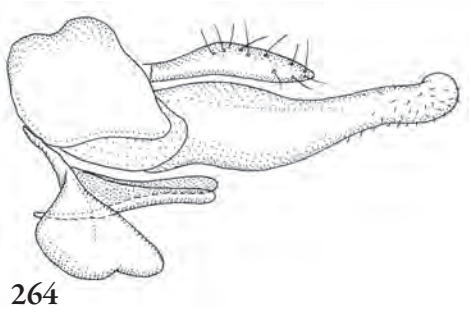
Figs 246-251. *Microdon (Myiacerapis) villosus* male (holotype). – 246. habitus dorsal; 247. habitus lateral; 248. head frontal; 249. head dorsal; 250. wing; 251. genitalia lateral.
Figs 252-253. *Oligeriops dimorphon* female (Australia, coll. BMNH). – 252. habitus dorsal; 253. habitus lateral.

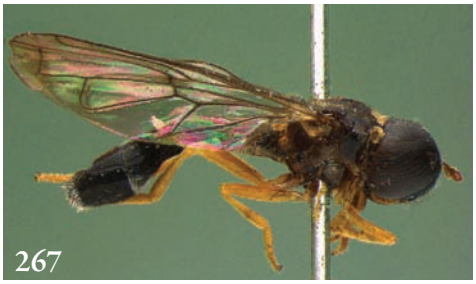


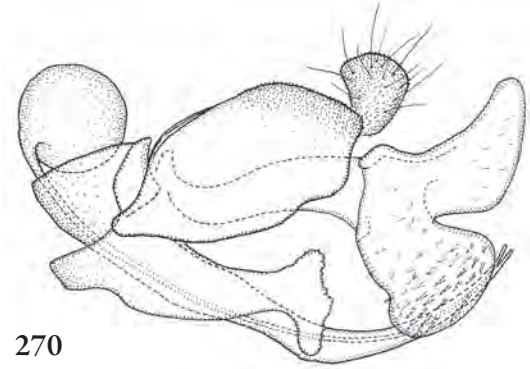


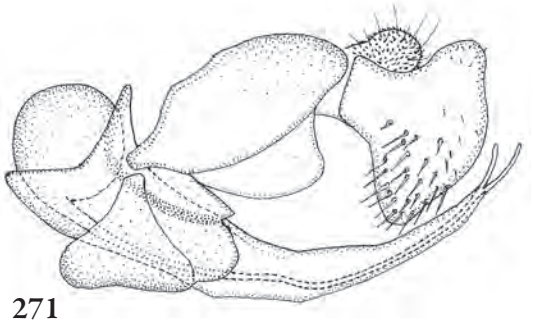
Figs 254-255. *Oligeriops iridomyrmex* female (syntype). – 254. head frontal; 255. head lateral.
Fig. 256. *Oligeriops dimorphon* male (Australia, coll. USNM), genitalia lateral.
Figs 257-258. *Omegasyrphus pallipennis* male (USA, California, coll. RMNH); 257. habitus dorsal; 258. habitus lateral.
Fig. 259. *Omegasyrphus coarctatus* male (USA, Virginia, coll. RMNH), genitalia lateral.
Figs 260-261. *Paragodon paragoides* female (Costa Rica, coll. RMNH). – 260. habitus lateral; 261. wing.





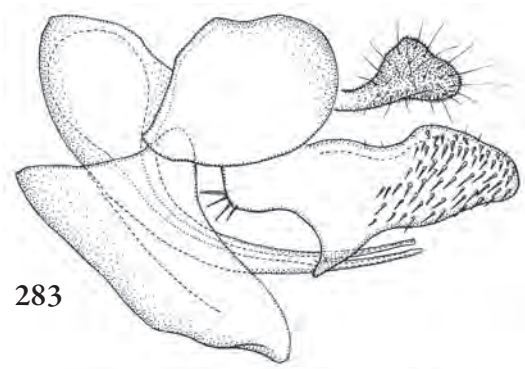


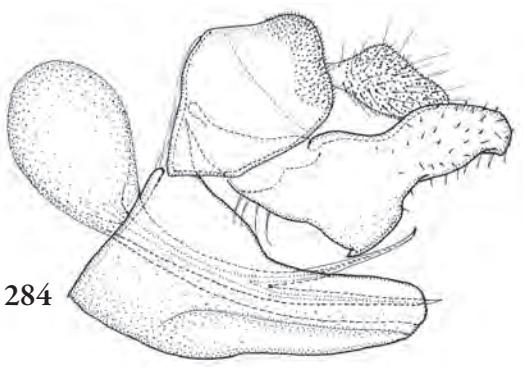


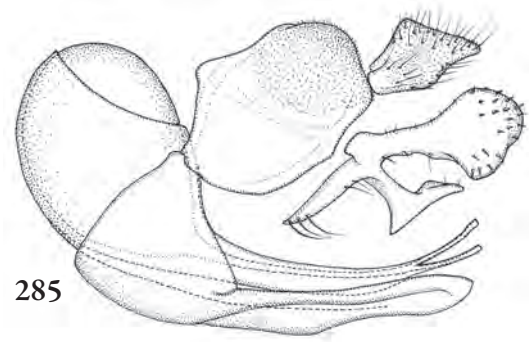


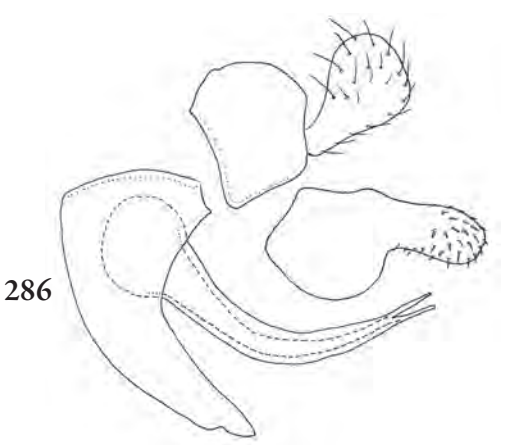
Figs 262-263. *Paragodon paragoides* female (Costa Rica, coll. RMNH). – 262. head frontal; 263. head lateral.
Fig. 264. *Paragodon paragoides* male (Panama, coll. SEMC), genitalia lateral.
Fig. 265. *Paramicrodon flukei* male (holotype), habitus dorsal. Photo: American Museum of Natural History.
Figs 266-269. *Paramicrodon toxopei* male (holotype). – 266. habitus dorsal; 267. habitus lateral; 268. head frontal; 269. head lateral.
Figs 270-271. *Paramicrodon*, male genitalia. – 270. *P.* cf. *flukei* (Peru, coll. RMNH); 271. *P. toxopei* (holotype).

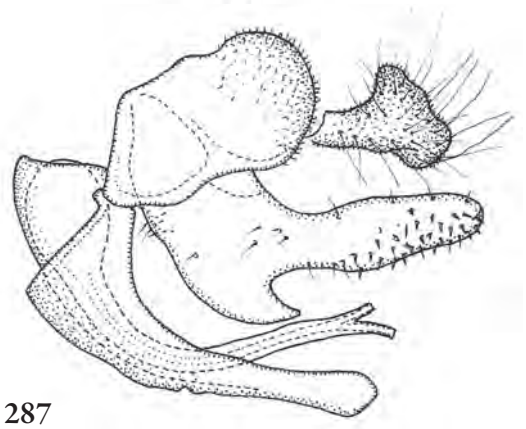
Figs 272-273. *Paramixogaster acantholepidis* male (holotype). – 272. habitus dorsal; 273. habitus lateral.
Fig. 274. *Paramixogaster luxor* male (holotype), habitus dorsal.
Figs 275-278. *Paramixogaster piptotus* female (holotype). – 275. habitus dorsal; 276. head frontal; 277. thorax dorsal; 278. habitus lateral.
Figs 279-280. *Paramixogaster*, habitus dorsal. – 279. *P. omeanus* male (holotype); 280. *P. vespiformis* female (syntype).



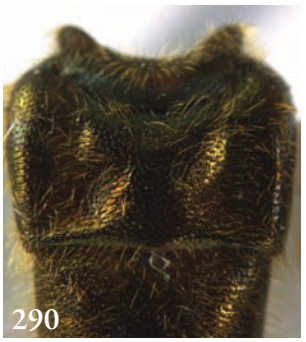


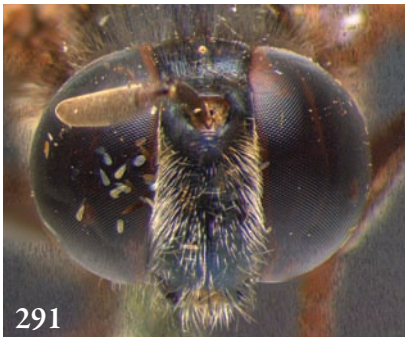


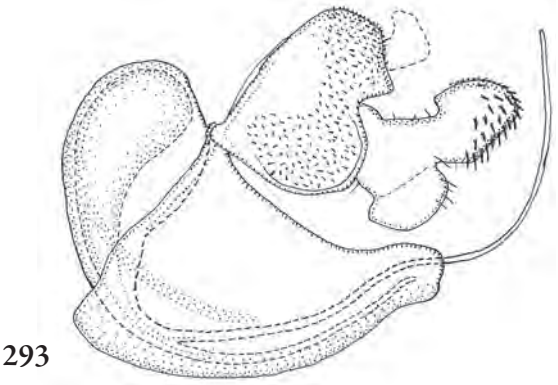


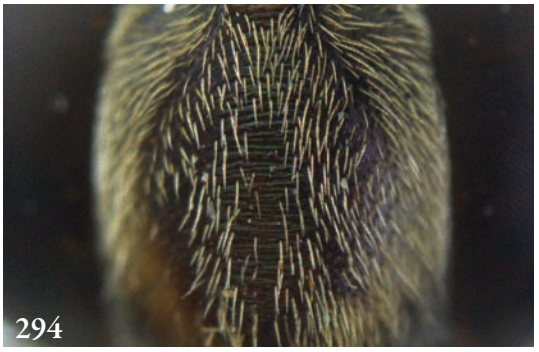


Figs 281-282. *Paramixogaster vespiformis* female (syntype). – 281. habitus lateral; 282; head frontal.
Figs 283-287. *Paramixogaster*, male genitalia. – 283. *P. acantholepidis* (holotype); 284. *P. illucens* (holotype); 285. *P. luxor* (holotype); 286. *P. omeanus* (Australia, coll. USNM); 287. *P.* cf. *vespiformis* (Vietnam, coll. RMNH).

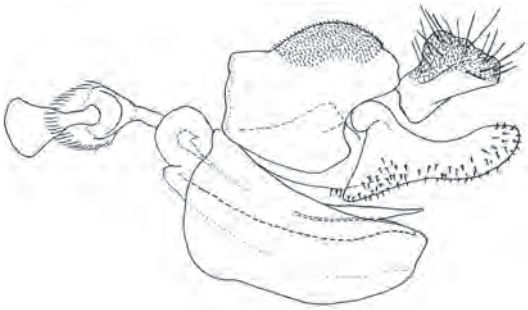


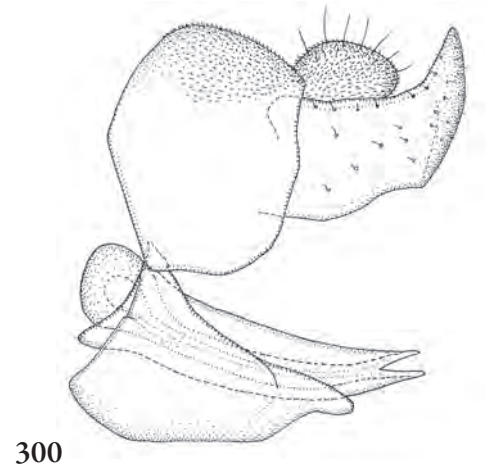






Figs 288-292. *Parocyptamus sonamii* male (syntype, except 290 Thailand, coll. RMNH). – 288. habitus dorsal; 289. habitus lateral; 290. tergite 2 dorsal; 291. head frontal; 292. wing.
Fig. 293. *Parocyptamus stenogaster* male (holotype), genitalia lateral.
Figs 294-295. *Peradon bidens* male (Surinam, coll. RMNH). – 294. face frontal; 295. head lateral.





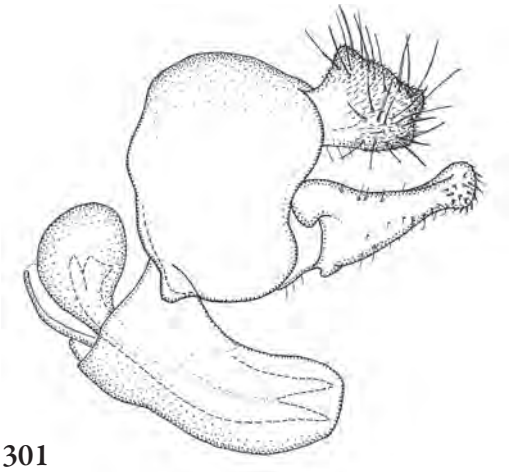
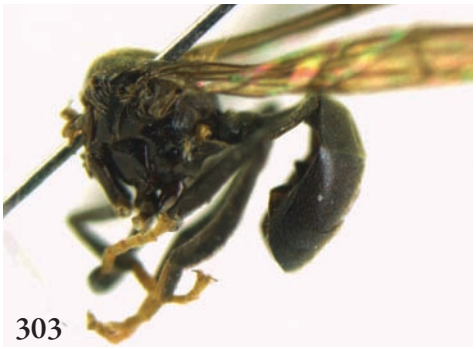
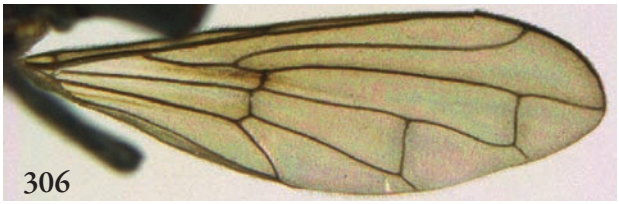
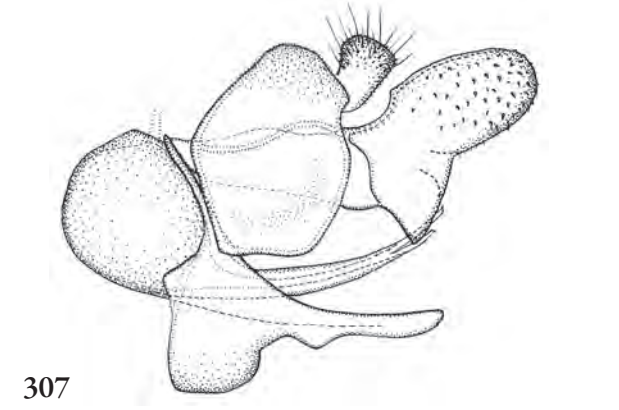


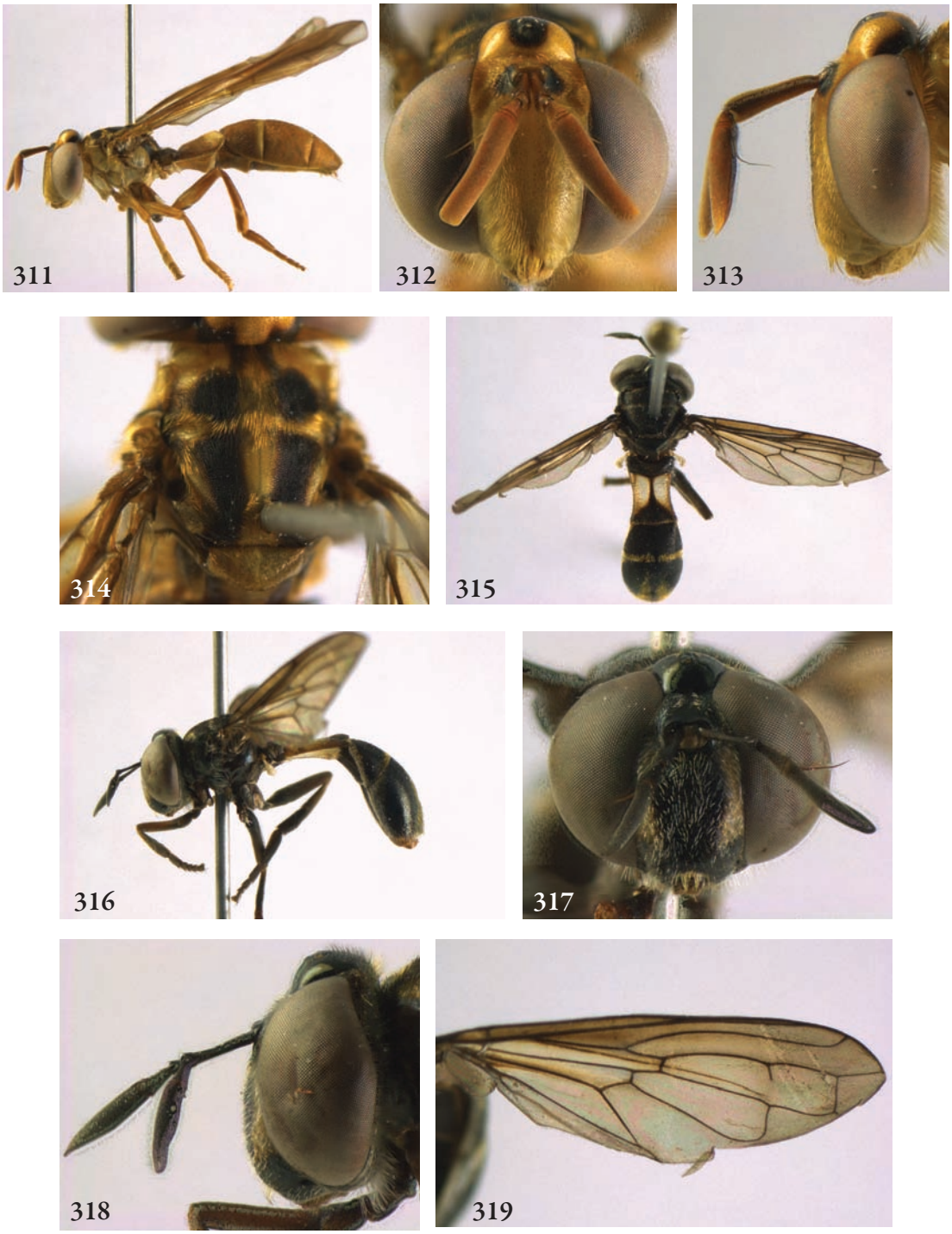
Fig. 296. *Peradon bidens* (Surinam, coll. RMNH), habitus dorsal.
Fig. 297. *Peradon flavofascium* female (Surinam, coll. RMNH), habitus dorsal.
Fig. 298. *Peradon trivittatum* male (Surinam, coll. RMNH), habitus dorsal.
Figs 299-301. *Peradon*, male genitalia lateral. – 299. *P. bidens* (Surinam, coll. RMNH); 300. *P. flavofascium* (holotype); 301. *P. trivittatum* (Surinam, coll. RMNH).



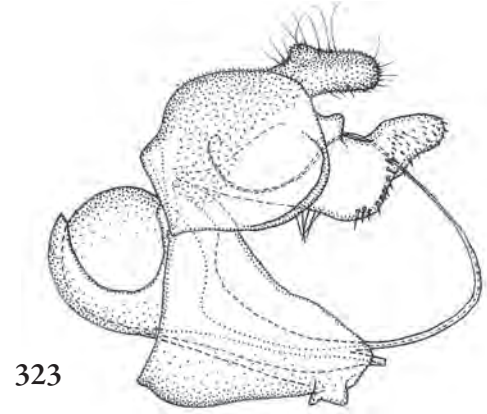




Figs 302-307. *Piruwa phaecada* male (holotype). – 302. habitus dorsal; 303. habitus lateral; 304. head frontal; 305. head lateral; 306. wing; 307. genitalia lateral.
Figs 308-309. *Piruwa phaecada* female (paratype). – 308. habitus dorsal; 309. habitus lateral.
Fig. 310. *Pseudomicrodon polistoides* female (holotype), habitus dorsal.



Figs 311-314. *Pseudomicrodon polistoides* female (holotype). – 311. habitus lateral; 312. head frontal; 313. head lateral; 314. thorax dorsal.
Figs 315-319. *Pseudomicrodon smiti* male (holotype). – 315. habitus dorsal; 316. habitus lateral; 317. head frontal; 318. head lateral; 319. wing.



Figs 320-322. *Pseudomicrodon biluminiferus* male (holotype). – 320. habitus dorsal; 321. habitus lateral; 322. genitalia lateral.
Fig. 323. *Pseudomicrodon smiti* male (holotype), genitalia lateral.
Figs 324-327. *Ptilobactrum neavei* male (holotype). – 324. habitus dorsal; 325. habitus lateral; 326. head frontal; 327. wing.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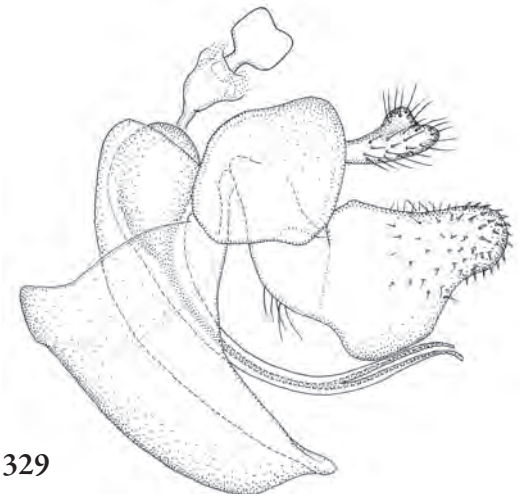
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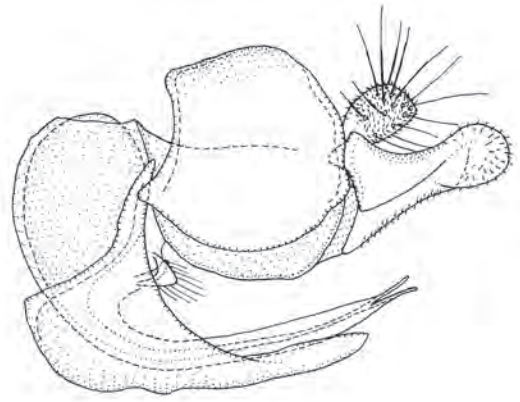
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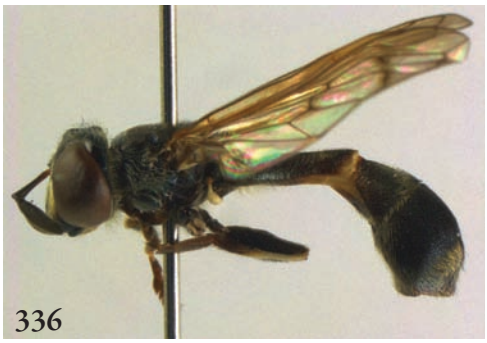
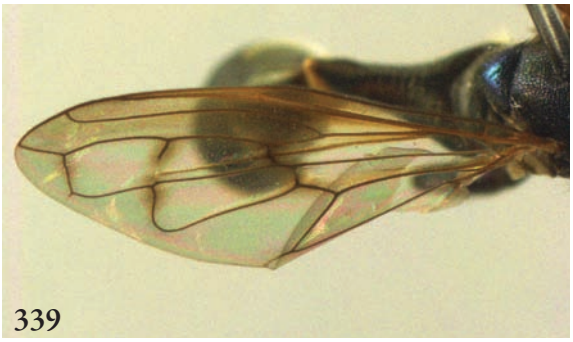
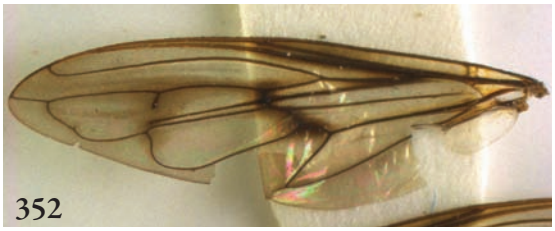
Figs 328-329. *Ptilobactrum neavei* male (holotype). – 328. antennae; 329. genitalia lateral.
Figs 330-331. *Rhoga sepulchrasilva* male (Brazil, coll. USNM). – 330. head frontal; 331. head lateral.
Figs 332-333. *Rhoga mellea* male (holotype). – 332. habitus lateral; 333. habitus dorsal.
Fig. 334. *Rhoga sepulchrasilva* male (Brazil, coll. USNM), genitalia lateral.





Figs 335-339. *Rhopalosyrphus ecuadoriensis* male (holotype). – 335. habitus dorsal; 336. habitus lateral; 337. head lateral; 338. head frontal; 339. wing.
Figs 340-344. *Rhopalosyrphus robustus* female (holotype). – 340. habitus dorsal; 341. habitus lateral; 342. head lateral; 343. head frontal; 344. wing.



Figs 345-348. *Rhopalosyrphus* (s.l.) *abnormoides* male (holotype). – 345. habitus dorsal; 346. habitus lateral; 347. head lateral; 348. head frontal.
Fig. 349. *Rhopalosyrphus* (s.l.) *cerioides* male (holotype), habitus dorsal.
Figs 350-353. *Rhopalosyrphus* (s.l.) *oreokawensis* male (holotype). – 350. habitus dorsal; 351. habitus lateral; 352. wing; 353. head frontal.

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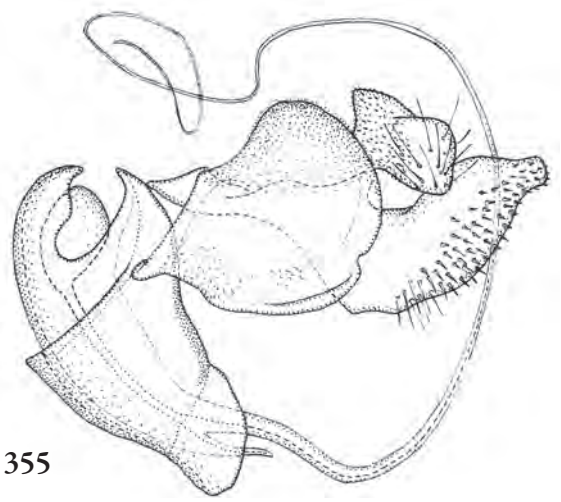

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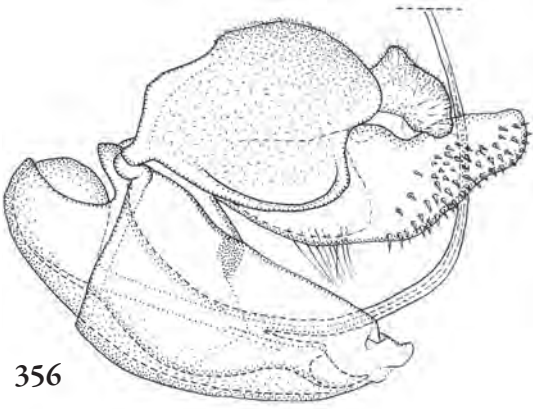

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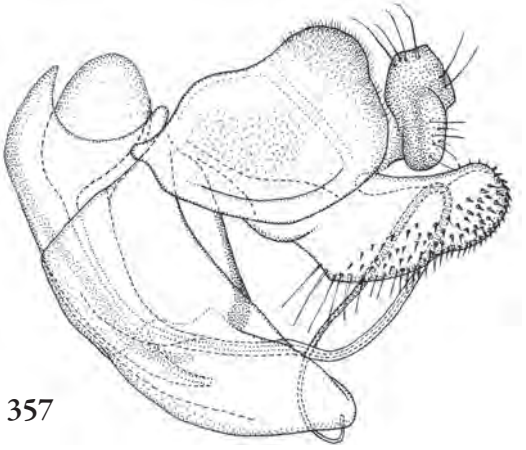

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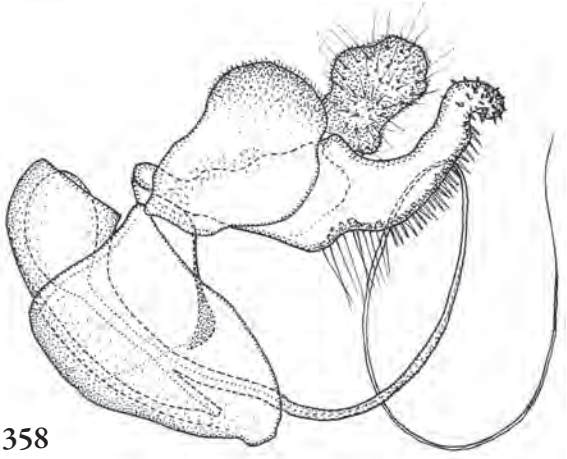

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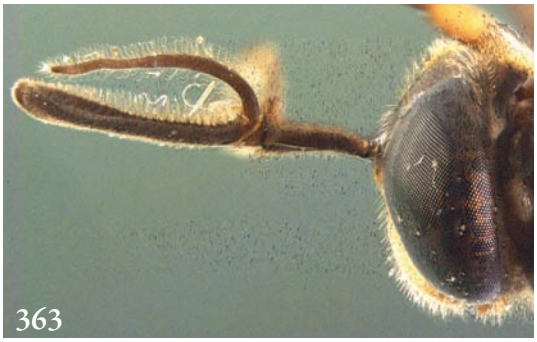
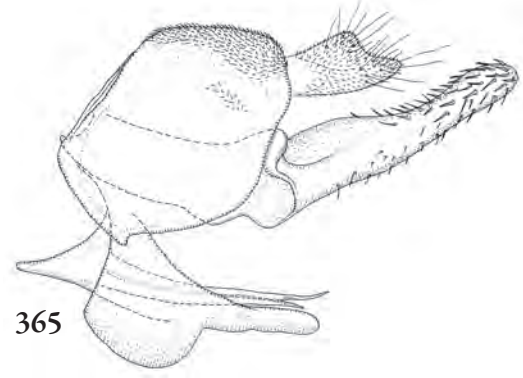
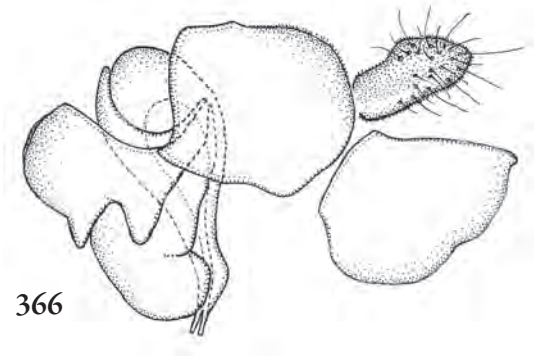
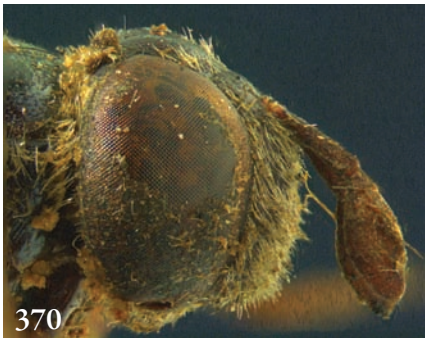
Figs 354. *Rhopalosyrphus* (s.l.) *oreokawensis* male (holotype), head lateral.
Figs 355-358. *Rhopalosyrphus*, male genitalia. – 355. *R. ecuadoriensis*; 356. *R. abnormoides*; 357. *R. cerioides*; 358. *R. oreokawensis*.

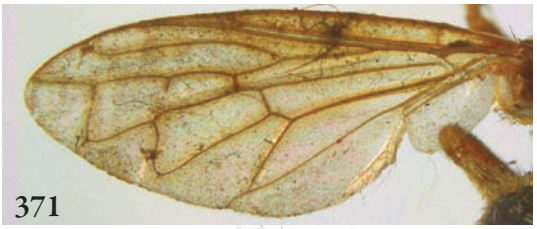


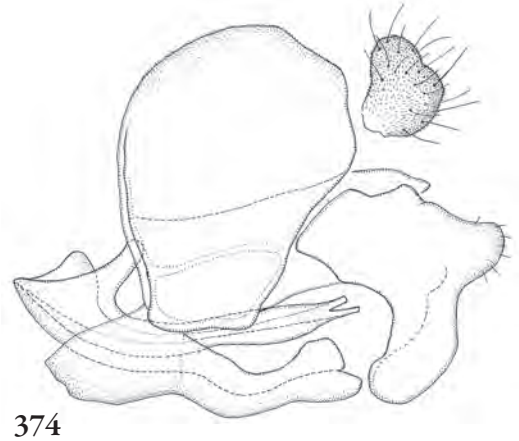




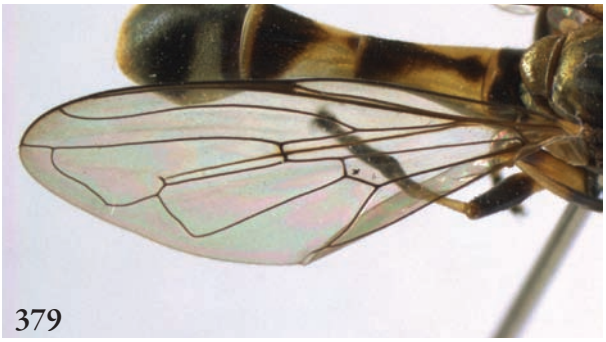
Figs 359-363. *Schizoceratomyia barretoi* male (Surinam, coll. RMNH). – 359. habitus dorsal; 360. habitus lateral; 361. antenna; 362. head frontal; 363. head lateral.
Fig. 364. *Schizoceratomyia barretoi* female (Brazil, coll. RMNH), head lateral.
Fig. 365. *Schizoceratomyia barretoi* male (Surinam, coll. RMNH), genitalia lateral.
Fig. 366. *Schizoceratomyia flavipes* male (Surinam, coll. RMNH), genitalia lateral.

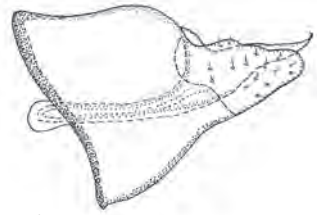


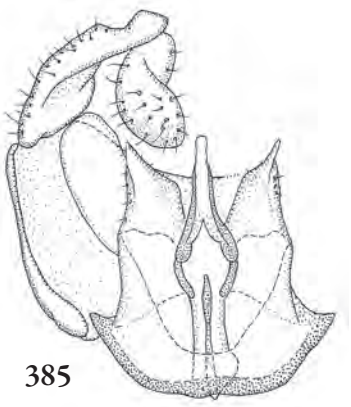




Figs 367-371 & 373. *Microdon (Serichlamys) rufipes* male (holotype). – 367. habitus dorsal; 368. habitus lateral; 369. head frontal; 370. head lateral; 371. wing. – 373. genitalia lateral.
Figs 372 & 374. *Microdon (Serichlamys) scutifer* (USA, Texas, coll. RMNH). – 372. habitus lateral; 374. genitalia lateral.







Figs 375-379. *Spheginobaccha macropoda* male (Vietnam, coll. RMNH). – 375. habitus dorsal; 376. habitus lateral; 377. head lateral; 378. head frontal; 379. wing.
Figs 380-382. *Spheginobaccha guttula* male (holotype). – 380. habitus dorsal; 381. head frontal; 382. head lateral.
Figs 383-384. *Spheginobaccha*, male genitalia. – 383. *S. macropoda* (Vietnam, coll. RMNH), lateral; 384. *S. guttula* (holotype), hypandrium, including aedeagus, lateral; 385. *S. guttula* (holotype), ventral.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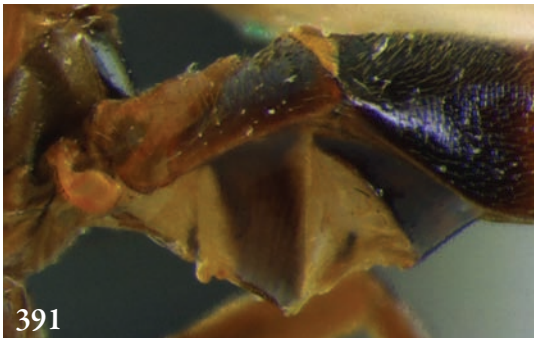
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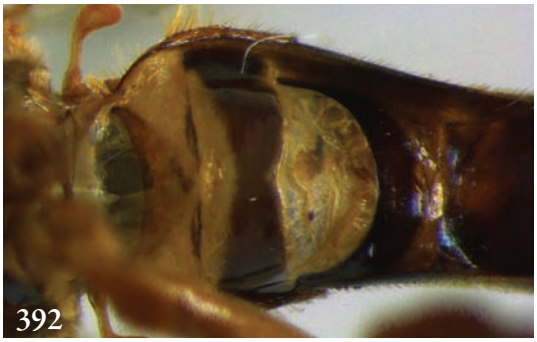
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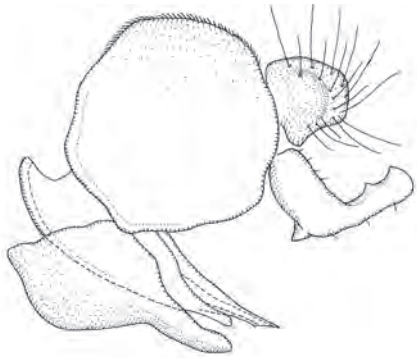
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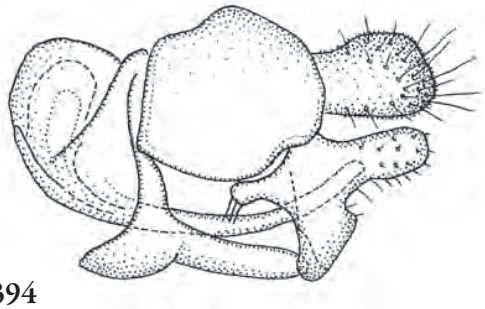
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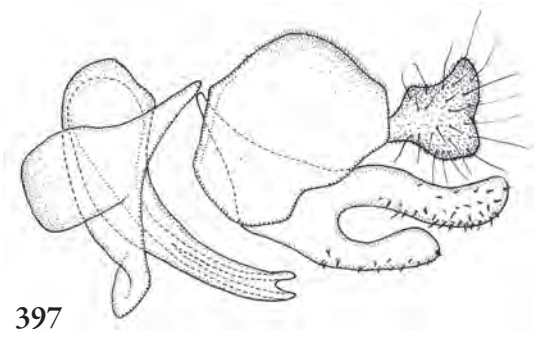
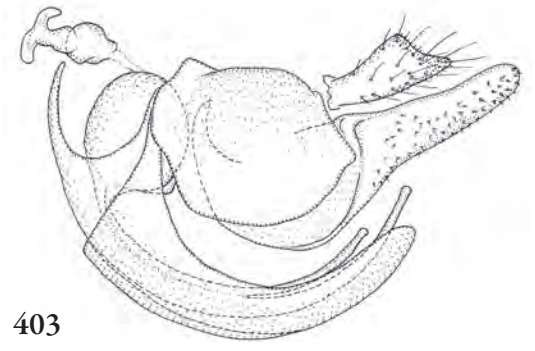
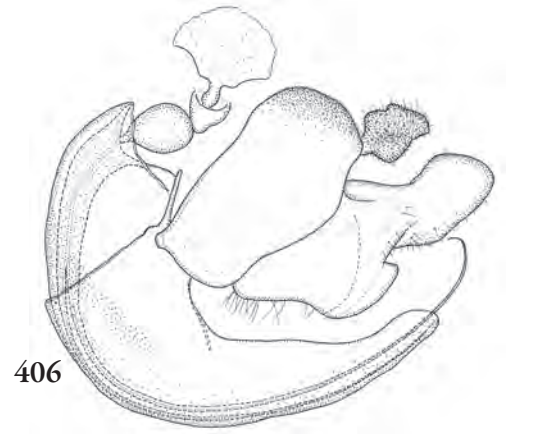
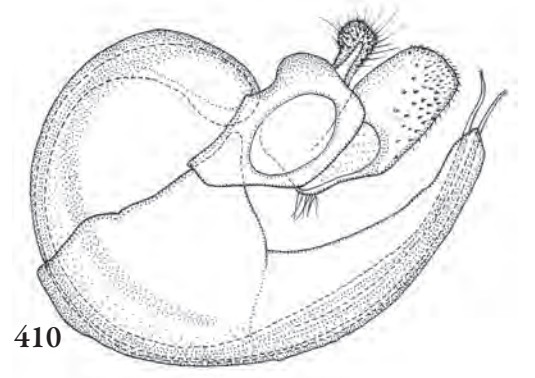
Figs 386-389. *Stipomorpha tenuicauda* female (holotype). – 386. habitus dorsal; 387. habitus lateral; 388. head frontal; 389. head lateral.
Fig. 390. *Stipomorpha lacteipennis* male (holotype), habitus dorsal.
Figs 391-392. *Stipomorpha goettei* male (Surinam, coll. RMNH), base of abdomen. – 391. lateral; 392. ventral.
Figs 393-394. *Stipomorpha*, male genitalia. – 393. *S. tenuicauda* (Bolivia, coll. M. Hauser); 394. *S. lacteipennis* (Surinam, coll. RMNH).

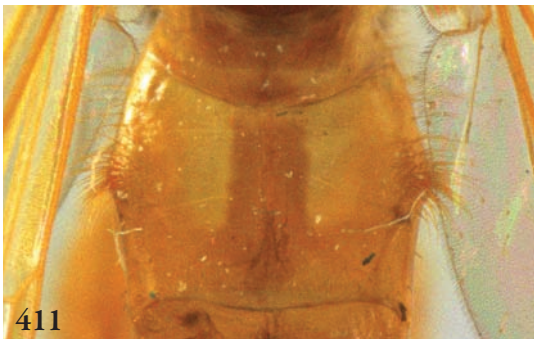




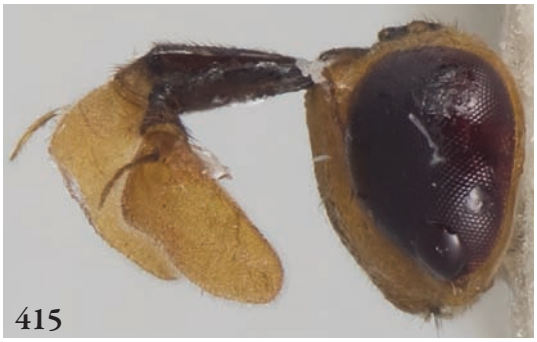
Figs 395-397. *Sulcodon sulcatus* female (Indonesia, Java, coll. RMNH). – 395. habitus dorsal; 396. habitus lateral; 397. genitalia lateral.
Figs 398-402. *Surimyia rolanderi* female (Surinam, coll. RMNH). – 398. habitus lateral; 399. habitus dorsal; 400. head frontal; 401. head lateral; 402. wing.
Fig. 403. *Surimyia rolanderi* male (holotype).

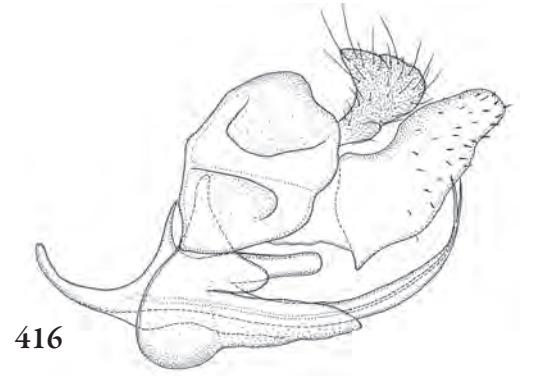




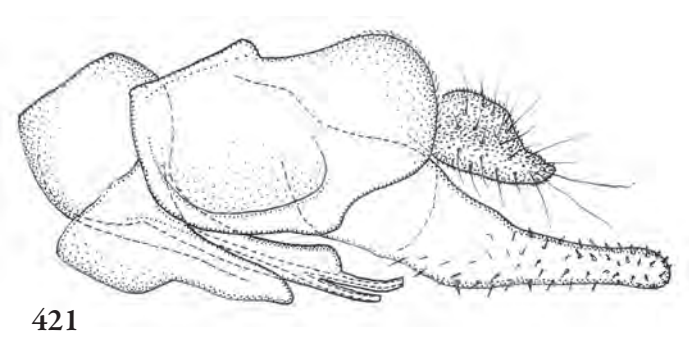


Figs 404-406. *Microdon (Syrphipogon) fucatissimus* male (holotype). – 404. habitus dorsal; 405. habitus lateral; 406. genitalia lateral.
Figs 407-410. *Ubristes flavitibia* male (holotype). – 407. habitus dorsal; 408. habitus lateral; 409. head frontal; 410. genitalia lateral.
Fig. 411. *Ubristes* spec. female (Brazil, coll. USNM), tergite 2 dorsal.

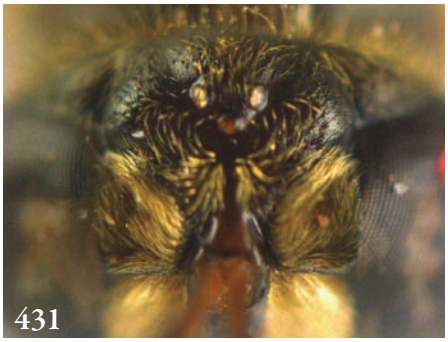


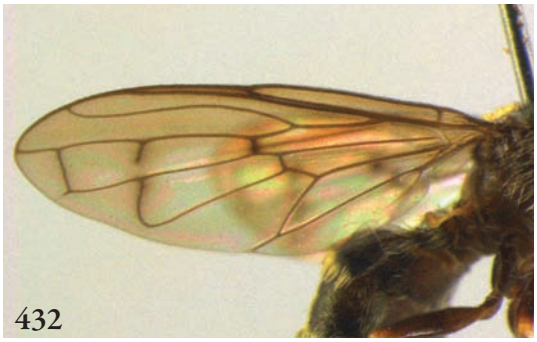


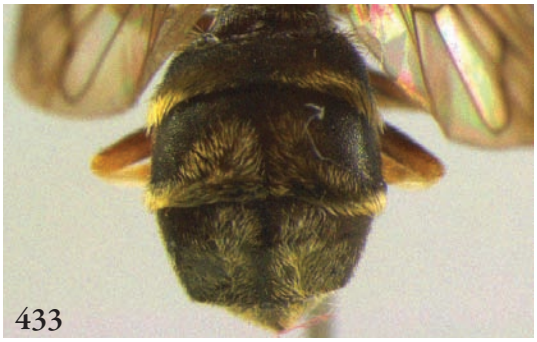
Figs 412-416. Undescribed genus #1 species AUS-01 Thompson in prep., male (Australia, coll. USNM). – 412. habitus dorsal; 413. habitus lateral; 414. head frontal; 415. head lateral; 416. genitalia lateral.
Figs 417-419. Undescribed genus #2 species MCR-2 Thompson in prep., male (Costa Rica, coll. RMNH). – 417. habitus dorsal; 418. wing; 419. habitus lateral.



Figs 420-422. Undescribed genus #2 species MCR-2 male (Costa Rica, coll. RMNH). – 420. head frontal; 421. genitalia lateral; 422. head lateral.
Figs 423-428. *Thompsodon conspicillifrons* female (holotype). – 423. habitus dorsal; 424. thorax lateral; 425. habitus lateral; 426. thorax dorsal; 427. head frontal; 428. head dorsal.







Figs 429-433. *Thompsodon conspicillifrons* female (holotype). – 429. head lateral; 430. frons lateral; 431. frons frontal; 432. wing; 433. abdomen dorsal.
Figs 434-435. *Microdon sharpii* female (New Guinea, coll. BMNH, compared with holotype). – 434. habitus dorsal; 435. habitus lateral.

chose. Calypter brownish. Halter yellow.
Wing: hyaline; microtrichose, except bare on 1st costal cell, basally on cell R1 along vein RS, on most of cell R except microtrichose along vena spuria, on most of cell BM except apical 1/8, basal 1/2 of cell CuP. Vein bm-cu shorter than basal section of CuA1.
Legs: Orange except femora blackish with orange apical 1/4; pale pilose, except tarsae dorsally black pilose. Coxae and trochanters blackish brown; pale pilose.
Abdomen: Constricted at 2nd segment, with tergite 2 parallel-sided, widest at tergite 3 and 4 (slightly wider than thorax). Tergite 1 dark brown; white pilose. Tergite 2 dorsoventrally flattened, dark brown with large, triangular yellow maculae along lateral margin, posteriorly interconnected and reaching posterior margin, which is entirely yellow; white pilose. Tergite 3 and 4 dark brown with yellow posterior margins; white to yellow pilose. Tergite 4 with two faint submedian grooves from anterior margin to just before posterior margin. Sternite 1 bare Sternite 1 yellow; bare. Other sternites brown; white pilose. Genitalia as in fig. 57.
Female unknown.
Diagnosis This species differs from *C. angolensis* spec. nov. by the pilose postpronotum and katepimeron. From *C. bullabucca* spec. nov. it differs by the straight face profile and the parallel-sided tergite 2.

Ceratrichomyia bullabucca **Reemer spec. nov.**
Figs. 48-50, 58.

Type specimens HOLOTYPE. – [this specimen is one of the paratypes of *C. behara* Séguy]. Male. Label 1: "Madagascar, Bekily, Rég. sud de l'ile"; label 2 (blue): "Museum Paris, X.36, A. Seyrig"; label 3: "*Ceratrichomyia behara* cotype, male, Séguy 1950". Coll. MNHN.
Description: As *C. behara*, except for differences listed below.
Adult male Body size: 8,5 mm.
Head: Face occupying almost 3/5 of head width in frontal view. Face profile clearly convex.
Thorax: Katepisternum bare ventrally. Calypter yellow.
Wing: cell R1 entirely microtrichose, cell R bare on posterobasal 3/5. Vein bm-cu longer than basal section of CuA1. **Abdomen:** Tergite 2 not parallel-sided: narrowest point at about half its length; lateral yellow macula yellow, not connected posteriorly. Genitalia as in fig. 58.
Female unknown.
Etymology: The specific epithet contaminates the Latin words *bulla* (bubble, knob) and *bucca* (cheek) and refers to the swollen face, a character to distinguish the species from *C. behara*. The name is a noun in apposition.
Diagnosis This species differs from *C. angolensis* spec. nov. by the pilose postpronotum and katepimeron. From *C. behara* it differs by the convex face profile and the anteriorly widened tergite 2.

Domodon zodiacus **Reemer spec. nov.**
Figs. 79-84.

Holotype. – Male, SURINAM, Paramaribo Zoo, 05°50'30"N-55°09'29"W, malaise trap, 18-27. II.2006, leg. M. Reemer. Coll. RMNH.
Description
Male Body size: 7 mm. Wing: 6 mm.
Head Dichoptic. Face occupying about 1/3 of total head width in frontal view; pale yellow with brown median vitta of 1-5 of facial width; entirely yellow pilose; not pollinose; eye margins slightly converging at level of frons, with smallest distance approximately equal to three times width of antennal fossa. Gena black. Oral margin laterally produced; black. Antennal fossa about as wide as high. Frons black with metallic green shine; golden pilose. Vertex convexly produced; shining black; sparsely short pilose. Ocellar triangle not elevated; frontal angle about 100°. Occiput narrow; black; golden yellow pilose dorsally, white pilose ventrally. Eye bare. Antenna dark brown; antennal ratio approximately 4:1:4; basoflagellomere parallel-sided with rounded apex, with small sensory pit located at about 1/3 from base; arista slender, about 2/3 of length of basoflagellomere.
Thorax Mesoscutum black with faint metallic hues; black pilose, except for a narrow sutural and a wide prescutellar fascia of golden pilosity. Postpronotum blackish; yellow pilose. Postalar callus brown; yellow pilose. Scutellum with two apical calcars of 1/4 of length of scutellum; brown with faint metallic hues. Pleurae blackish brown. Anepisternum with anterior and posterior part separated by clear sulcus; anterior part short black pilose, posterior part long yellow pilose, with bare area in between. Anterior anepimeron entirely pale yel-

low pilose. Katepisternum yellow pilose dorsally, bare ventrally. Katatergum with long black microtrichia. Anatergum short pale microtrichose. Other pleurae bare. Calypter and halter yellow.

Wing. – Hyaline, faintly darker around crossvein RM; microtrichose, except bare on 1st costal cell, posterobasal 1/2 of 2nd costal cell, basally on cell R1 along vein RS, on cell R except along vena spuria and extreme apex, on posterobasal 1/2 of cell BM, on anterobasal 1/2 of cell CuP.

Legs – Anterior four legs pale brown, with vaguely defined darker and paler parts; femora black pilose except mid-femur pale pilose posteriorly; tibiae pale pilose dorsally, black pilose ventrally; tarsae black pilose except last tarsomere yellow pilose. Hind femur blackish with apical 1/3 yellow; black pilose anteriorly, pale pilose posteriorly. Hind tibia dark brown with pale apex; black pilose dorsally, pale pilose ventrally. Hind tarsus brown with last tarsomere yellowish; black pilose, except last tarsomere yellow pilose.

Abdomen Ratio of median tergal lengths approximately as 1:2:3:5. Tergites 3 and 4 not clearly fused, only laterally. Tergite 1 black; pale pilose. Tergite 2 pale yellow with lateral 1/4 black and with posteriomedian black macula; yellow parts yellow pilose, black parts black pilose. Tergite 3 pale yellow with extreme lateral margins black, with sublateral oblique black maculae of slightly less than 1/3 of tergal width, with narrow median black vitta on anterior 2/3; black pilose except yellow pilose along posterior margin. Tergite 4 black except yellow along lateral and posterior margins; black pilose except yellow pilose on yellow parts. Sternite 1 black; bare. Other sternites yellow, sparsely pilose. Genitalia as in 84.

Female Unknown.

Diagnosis Three undescribed species belonging to this genus are known. From those, M. zodiacus spec. nov. can be distinguished by the following combination of characters: face with black median vitta, alula entirely microtrichose, tergites 3 and 4 partly yellow.

Etymology The name *zodiacus* (Gr., of animals) was chosen because the type specimen was collected at the Paramaribo Zoo.

***Furcantenna nepalensis* Reemer spec. nov.**
Figs. 85-91.

Type specimens: HOLOTYPE. Adult male. NEPAL. Label 1: "NEPAL, Ktmd. / Godavari 6000' / 13 Aug. 1967 / Can. Nepal Exped.". Coll. CNC.

Description (based on holotype)

Adult male Body size: 10 mm.

Head: Blackish brown. Face occupying about 1/2 of head width in frontal view; laterally depressed and dull, medially with shining carina; white pilose. Gena white pilose. Oral margin not produced. Frons, vertex and occiput golden pilose. Eye bare. Antennal fossa slightly higher than wide. Antenna: scape pale brown, pedicel and basoflagellomere black; antennal ratio approximately as 5:1:17.5; basoflagellomere bifurcate at base, both branches entirely long pilose; arista absent.

Thorax: Mesoscutum black, except pale brown along margins; golden pilose. Postpronotum and postalar callus brown; golden pilose. Scutellum trapezoid, although slightly sulcate apicomedially; without calcars; brown; golden pilose. Pleurae brown. Anepisternum with deep median sulcus; golden pilose, except bare on ventral 1/5. Anterior anepimeron entirely golden pilose. Katepisternum white pilose dorsally, bare ventrally. Katepimeron white pilose. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter pale yellow.

Wing: Hyaline, tinged with brown, especially on anterior half. Microtrichose, except bare on basal 2/3 of first costal cell, posterobasal 1/2 of cell R, anterobasal 1/2 of cell BM.

Legs: Brown. Front leg golden yellow pilose, except tarsus dorsally black pilose. Mid and hind legs black pilose, except femora largely golden yellow pilose and tarsi ventrally golden pilose. Coxae and trochanters brown; whitish pilose.

Abdomen: Tergites dark brown, a little paler along lateral margins and entirely on tergite 4. Tergite 1 yellow pilose. Tergites 2 and 3 golden yellow pilose anteriorly and laterally, black pilose medially and posteriorly. Tergite 4 entirely golden pilose. Sternites dark brown; all sternites yellowish white pilose. Male genitalia as if 91.

Female: Unknown.

Diagnosis Three characters are mentioned by Cheng & Thompson (2008) to distinguish *Furcantenna* Cheng from the Neotropical genus *Schizoceratomyia* Carrera, Lopes & Lane, 1947: scutellum apicomedially sulcate, katepisternum pilose, metasternum developed and pilose. All three characters are found in the species described here. Only one other species of *Furcantenna* is known (*F. yangi* Cheng). From that species, *F. nepalensis* spec. nov. differs by the follo-

wing characters (characters of *F. yangi* in parentheses, based on Cheng & Thompson 2008): body colour brownish, without violet shine (black, with violet shine); mesoscutum entirely golden pilose (black and white pilose); katepimeron pilose (bare); tergite 2 with ratio of median length : width of posterior margin approximately as 1:3 (1:6).

Etymology The name *nepalensis* refers to the type locality.

***Heliodon doris* Reemer spec. nov.**

Figs. 92-98, 105.

Type specimens: HOLOTYPE. Adult male. THAILAND. Label 1: "THAILAND Ubon Ratchathani, Pha Taem / NP, west of Huay Pok substation, 438 m, / Malaise trap, 15°37.212'N, 105°36.903'E, / 25.iv-2.v.2007, Bunlu Sapsiri leg. T2173"; label 2: "Voucher code M. Reemer / 314 / DNA voucher G. Ståhls / Y1074". Coll. QSBG.

PARATYPES. THAILAND: Adult female; label 1: "THAILAND, Loei, T485 / Phu Kradueng NP, Malaise / 16°51.958'N 101°50.668'E / 16.VIII-23. VIII.2006. 280 m / Sutin Khonglasae leg."; coll. RMNH. MALAYSIA: Adult male; label 1: "G.6722 / Malaya / Selangor / F.E.S. Serdang / 22.3.1956"; label 2: "COM INST ENT. / COLL NO 14927"; label 3: "Microdon / [female sign] not in B.M. / van Emdendet. 1956"; label 4: "Pres. by / Com. Inst. Ent. / B.M. 1956-712"; label 5: "Microdontini / ? new genus / N.P. Wyatt det. 1985". Coll. BMNH.

Description (based on holotype)

Adult male Body size: 9 mm.

Head: Face occupying slightly more than 1/4 of head width in frontal view; yellow; yellow pilose. Gena yellow; yellow pilose. Oral margin weakly produced. Frons blackish brown; golden pilose. Vertex blackish; golden pilose. Occiput black; golden yellow pilose dorsally, whitish yellow pilose ventrally. Eye bare. Antennal fossa about as high as wide. Antenna brown, except scape and pedicel yellow ventrally; antennal ratio approximately as 3.5:1:2.5.

Thorax: Mesoscutum black with metallic hues, except yellow around postpronotum, anteriad of notopleuron and around postalar callus; golden pilose. Postpronotum, postalar callus and scutellum yellow; golden pilose. Scutellum semicircular; with pair of apical calcars with mutual distance slightly larger than length of scutellum. Pleurae yellow, except anepisternum dark brown along anterior margin, katepisternum dark brown ventrally, meron and metanotum dark brown; all pilosity golden yellow. Anepisternum enitrely pilose, except narrowly bare along ventral margin; with shallow sulcus separating anterior from posterior part. Anepimeron entirely pilose. Katepisternum pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter pale yellow.

Wing: Hyaline, subtly darkened around apical crossveins; microtrichose, except bare on subcostal cell, basal 3/4 of costal cell, basal 1/3 of cell R1, entirely on cell R except microtrichose along vena spuria, basal 1/4 of cell R4+5, basal 3/4 of cell BM, anterobasal 3/4 of cell CuP and basomedian 1/2 of alula.

Legs: Front leg yellow; yellow pilose. Other legs missing in holotype. [Paratype male: mid leg yellow, yellow pilose; hind femur dark brown except yellow on basal 1/4 and apical 1/10, yellow pilose; hind tibia yellow on basal 3/5, dark brown on apical 2/5, yellow pilose; hind tarsus with first tarsomere dark brown dorsally, otherwise yellow, yellow pilose.] Front and mid coxae yellow; yellow pilose. Hind coxa dark brown basally, yellow apically; yellow pilose. Trochanters yellow; yellow pilose.

Abdomen: Slightly constricted, with narrowest point at posterior margin of tergite 2. Tergite 1 dark brown; yellow pilose. Tergite 2 yellow with dark brown, triangular median macula, with narrowest part at anterior margin and widest part close to posterior margin; yellow pilose, except dark pilose laterally. Tergite 3 yellow with median dark brown vitta and pair of oblique, lateral, dark brown maculae; yellow pilose, except dark pilose on and around lateral dark maculae. Tergite 4 with colour pattern similar to tergite 3, but lateral maculae anteriorly confluent with median vitta; golden yellow pilose, except dark pilose on lateral maculae. Sternites yellow, slightly darkened on sternite 1, 3 and 4; yellow pilose. Male genitalia as in fig. 105.

Female: As male, except for following differences. Dark maculae on tergite 4 not confluent anteriorly. Tergite 5 yellow with dark brown median vitta and pair of small, round, submedian dark brown spots; golden yellow pilose, except for black pile anteromedially and sublaterally. Sternite 3 dark brown medially. Sternites 4 and 5 dark brown.

Diagnosis Within *Heliodon*, no other species has tergites 3 and 4 predominantly yellow.

Etymology This species is named after my daughter Doris.

***Heliodon elisabethanna* Reemer spec. nov.**
Figs. 99-101.

Type specimens: HOLOTYPE. Adult female. THAILAND. Label 1: "THAILAND / 2007"; label 2: "Voucher code M. Reemer / 316 / DNA voucher G. Ståhls Y1062". Coll. QSBG. No further locality data available.

Description (based on holotype)

Adult female Body size: 12 mm.

Head: Face occupying about 1/3 of head width in frontal view; black; entirely golden pilose. Gena black; golden pilose. Oral margin produced. Frons black; black pilose, except golden pilose posterolaterally. Vertex black; black pilose, except golden pilose along anterior margin and white pilose along posterior margin. Occiput black; black pilose on dorsal 1/3, white pilose on ventral 2/3. Eye pale pilose, with pile approximately as long as half the diameter of frontal ocellus. Antennal fossa about as high as wide. Antenna brown; antennal ratio approximately as 3:1:2.5.

Thorax: Mesoscutum black; black pilose, with inconspicuous pale pile along anterior margin and along lateral 1/3 of transverse suture. Postpronotum brownish; pale pilose. Postalar callus black on anterior 3/4, brown on posterior 1/4; black pilose dorsally, pale pilose laterally. Scutellum semicircular; with pair of distinct apical calcars with mutual distance about 1/3 of width of scutellum at base; black; black pilose anteriorly and dorsally, long golden pilose posteriorly. Pleurae black. Anepisternum black pilose, except white pilose on ventral 1/3 and narrowly along anterior margin; with very small bare patch ventrally on anterior part; with deep sulcus separating anterior from posterior part. Anepimeron black pilose on dorsal 1/3, white pilose on ventral 2/3. Katepisternum white pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter greyish. Halter white.

Wing: Hyaline, except vaguely infuscated around apical crossveins, around spur on vein R4+5, around base of R2+3 and crossvein RM; microtrichose, except bare on 1st costal cell, basal 1/2 of 2nd costal cell, basally on cell R1 along vein RS, entirely bare on cell R except microtrichose along vena spuria, on basal 1/2 of cell r4+5, basal 1/2 of cell BM, basal 1/3 of cell CuP, basomedian 2/3 of alula.

Legs: Black, except front femur brown anteriorly; white pilose, except golden pilose basoventrally on front and mid femur and apicoventrally on frond and mid tibia, and golden pilose ventrally on tarsi. Coxae and trochanters black; white pilose.

Abdomen: Tergites black, except for large yellow maculae posterolaterally on tergite 2, and narrow, medially interrupted yellow fasciae along posterior margins of tergites 3 and 4. Tergite 1 inconspicuously pale pilose. Tergite 2 with thick, conspicuous, appressed golden pile (tomentum), except narrowly black pilose along anterior margin. Tergite 3 with medially interrupted fascia of golden tomentum on posterior 2/5, inconspicuous golden pile on lateral 1/3 and incospicuous black pile anteriorly. Tergite 4 with medially interrupted fascia of golden tomentum on posterior 1/2, inconspicuous golden pile on lateral 1/4 and incospicuous black pile anteriorly. Tergite 5 medially with pair of large, medially connected patches of golden tomentum, mixed black and golden pilose otherwise. Sternites brownish; sternites 1-3 yellowish pilose; sternites 4 and 5 black pilose.

Female: Unknown.

Diagnosis No other species of *Heliodon* has entirely black legs.

Etymology This species is named after my partner Elisabeth (Liesbeth) Anna.

***Heliodon tiber* Reemer spec. nov.**
Figs. 102-104, 106.

Type specimens: HOLOTYPE. Adult male. INDONESIA (Sumatra). Label 1: "Fort de Kock / (Sumatra) 920 M. / 1924 / leg. E. Jacobson". Coll. ZMAN. PARATYPE. Adult male. INDONESIA (Sumatra). Label 1: "Fort de Kock / (Sumatra) 920 M. / 1925 / leg. E. Jacobson"; label 2: "Microdon / fascipennis / Sack". Coll. ZMAN.

Additionally studied specimens: MALAYSIA: 2 males, Selangor, Gombak Field Stn., 14.XI.1977, leg. B. Bendell; 1 male, Pahang, Frazer's Hill, 27.X-3.XI.1977, leg. B. Bendell. THAILAND: 1 female, Loei, T1108, Phu Ruea NP, 17°29.652'N 101°21.020'E, 1167 m., 5-6.xi.2006, pan trap, leg. Patikhom Tumtip, coll. M. Hauser; 1 female, Phetchabun, Nam Nao NP, Heliport, 16°43.156'N 101°35.118'E, 890 m., 18-25.xii.2006, leg. Noopean Hongyothi, coll. RMNH. VIETNAM: 1 female, Chu Yang Sin Nat. Park, 1-10.VI.2007, mal. trap, leg. C. van Achterberg & R. de Vries; DNA voucher G. Ståhls Y1072, coll. RMNH.

Description (based on holotype)
Adult male Body size: 12 mm (paratype 10 mm).
Head: Face occupying about 1/3 of head width in frontal view; black, except brownish yellow on lateral 1/6; entirely white pilose. Gena black; white pilose. Oral margin weakly produced. Frons and vertex black; white pilose. Occiput black; white pilose. Eye pilose, with pile approximately as long as diameter of ocelli. Antennal fossa about as high as wide. Antenna brown; antennal ratio approximately as 3.5:1:2.
Thorax: Mesoscutum black; yellow pilose, with pile thicker and more appressed along anterior margin, along transverse suture and along posterior margin, forming three transverse fasciae. Postpronotum and postalar callus brown; yellow pilose. Scutellum semicircular; with pair of distinct apical calcars with mutual distance about 1/4 of width of scutellum at base; brown; yellow pilose. Pleurae shining black; all pilosity yellowish white. Anepisternum pilose, except anterior part bare ventromedially; with deep sulcus separating anterior from posterior part. Anepimeron entirely pilose. Katepisternum pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter pale yellow.
Wing: Hyaline, except infuscated around apical crossveins, around spur on vein R4+5 and around base of R2+3, crossvein RM and bm-cu; microtrichose, except bare on first costal cell, posterobasal 1/10 of 2nd costal cell, basally on cell R1 along vein RS, basal 3/4 of cell R, anterobasal 1/5 of cell CuP, basomedian 2/3 of alula.
Legs: Brownish yellow, with tibiae slightly infuscated medially; entirely yellow pilose. Coxae blackish brown; yellow pilose. Trochanters yellow; yellow pilose.
Abdomen: Tergites dark brown, except tergites 2-3 yellow laterally. Tergite 1 yellowish pilose. Tergite 2 yellowish pilose, except silvery white pilose along posterior margin. Tergite 3 silvery white pilose along anterior and posterior margins, yellow pilose along lateral margins, black pilose medially. Tergite 4 silvery white pilose along anterior margin and on posterior 1/2, black pilose medially. Sternites brown. Sternite 1 and 2 white pilose, sternite 3 and 4 black pilose. Male genitalia as in fig. 106.
Variation: In the paratype and in all additionally studied specimens, the pilosity of thorax and abdomen is more golden yellow, also in the parts which are silvery white in the holotype. In most specimens the legs are entirely yellow, without infuscated parts.
Female: As male, except for following differences. Body size 8-12 mm. Overall colouration paler: whereas pale parts are brownish in the examined males, these parts are yellowish in the examined females. The scutellar spines are less strongly developed, and in one of the examined females from Thailand even totally absent.
Diagnosis This is the only known species of *Heliodon* in which the hind femur is entirely yellow.
Etymology This species is named after my son Tiber.
Notes: The paratype has a label stating "*Microdon fascipennis* Sack" (or possibly *fuscipennis*) in what seems to be the handwriting of J.C.H. De Meijere (judged by comparison with figures in De Jong 2000). However, no such name is known to have been given to any Microdontinae, neither by Sack nor by any other author. Either De Meijere was mistaking, or the name is an unpublished manuscript name.

***Indascia gigantica* Reemer spec. nov.**
Figs. 118-123.

Type specimens: HOLOTYPE. Adult male. THAILAND. Label 1: "THAILAND: Chiang Mai, Doi Inthanon NP / Checkpoint 2, 18°31.554'N 98°29.94'E 1700 m / Malaise trap 8-15.v.2007, Y. Areeluck leg. T1832"; label 2: "Syrphidae / T1832 / W. Porras, 08"; label 3: "Voucher code M. Reemer / 319 / DNA voucher G. Ståhls / Y0909". Coll. QSBG.
Description (based on holotype)
Adult male Body size: 9,5 mm.
Head: Face occupying about 1/4 of head width in frontal view; black; entirely silvery white pilose. Gena black, white pilose. Oral margin not produced. Frons and vertex black; golden pilose, except for few black pile at ocellar triangle. Occiput black; yellowish pilose dorsally, white pilose ventrally. Eye bare. Antennal fossa about as high as wide. Antenna black; antennal ratio approximately as 4:1:4.
Thorax: Thorax black, except postalar callus and metanotum yellowish and posterior pleurae narrowly brownish along margins. Mesoscutum mixed golden and black pilose, with white pile at and around notopleuron. Postpronotum whitish pilose. Postalar callus black pilose anteriorly, yellow pilose posteriorly. Scutellum somewhat triangula, without calcars; black pilose dorsally, golden pilose along lateral and posterior margins. Anepisternum with deep sulcus separating anterior and posterior part; entirely long white pilose. Anepimeron entirely long white pilose. Katepisternum

long white pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter greyish. Halter pale yellow.

Wing: Hyaline, subtly darkened around apical crossveins and appendix of vein R4+5; microtrichose, except bare on subcostal cell, posterobasal 2/3 of costal cell, basal 1/4 of cell r1, most of cell R except microtrichose along vena spuria, basal 5/6 of cell BM and basal 1/2 of cell CuP.

Legs: Mid femur blackish, gradually turning yellow at apical 1/4; black pilose. Mid tibia yellow at basal 1/2, blackish at apical 1/2; black pilose. [Mid tarsus and other legs missing in holotype.] Coxae and trochanters black.

Abdomen: Tergites bronze-black. Tergite 1 long white pilose laterally, short black pilose sublaterally, bare medially. Tergite 2 long white pilose laterally on anterior 1/2, short black pilose over dorsal surface, short golden pilose narrowly along posterior margin. Tergite 3 long white pilose laterally on anterior 1/2, short black pilose over dorsal surface, long golden pilose on posterior 1/3. Tergite 4 with pilosity more or less as tergite 3, but much more sparse. Sternites blackish brown; sternite 1 bare; sternites 2-4 short black pilose anteriorly, long white pilose posteriorly. Male genitalia as in fig. 123.

Female: Unknown.

Diagnosis Within *Indascia*, this exceptionally large species shares the presence of a posterior appendix on vein R4+5 only with *I. spathulata* spec. nov. From that species, *I. gigantica* differs by tergite 2 being about 1.5 times as long as wide, and the basoflagellomere being 2 times as long as wide. In the holotype, the only specimen available, this appendix is composed of two short vein stumps, which are confluent at their apices, forming a triangle with part of vein R4+5. This is unusual, although similar aberrations can be found in single specimens of Microdontinae from different genera and species groups. Whether the venation as found in the holotype is representative of this species remains uncertain.

Etymology The specific epithet refers to the large size of this species in comparison with other known species of *Indascia*.

***Indascia spathulata* Reemer spec. nov.**

Figs. 124-129.

Type specimens: HOLOTYPE. Adult male. VIETNAM. Label 1: "C. VIETNAM: Ha Tinh / Vu Quang N.P., 166 m, N 18° / 17'39" E 105°25'27", 24.ix. - / 5.x.2009, Mal. tr. 12, RMNH'09 / C. v. Achterberg & R. de Vries"; label 2: "Voucher code M. Reemer / 285 / DNA voucher G. Ståhls / Y1100". Coll. RMNH.

Description (based on holotype)

Adult male Body size: 6 mm.

Head: Face occupying slightly less than 1/3 of head width in frontal view; black; entirely silvery white pilose. Gena black, white pilose. Oral margin not produced. Frons and vertex black; yellowish white pilose, except for few black pile at ocellar triangle. Occiput black; black pilose dorsally, yellowish pilose laterally and ventrally. Eye bare. Antennal fossa about as high as wide. Antenna black; basoflagellomere with dorsal margin somewhat concave; antennal ratio approximately as 5:1:9.

Thorax: Thorax black, except postalar callus and postpronotum yellowish brown and ventral pleurae brown. Mesoscutum black pilose, except yellow pilose laterally. Postpronotum and postalar callus yellow pilose. Scutellum semicircular, without calcars; yellow pilose. Anepisternum weakly sulcate; dorsal 3/5 yellowish pilose, ventral 2/5 bare. Anepimeron entirely long yellowish white pilose. Katepisternum long white pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter greyish. Halter yellowish white.

Wing: Hyaline; microtrichose, except bare on subcostal cell, basally on cell r1 along vein RS, basal 1/2 of cell R, basal 3/4 of cell BM, anteriorly on cell CuP along vein CuA.

Legs: pale yellow, except blackish brown on basal 1/3 of front, basal 3/4 of mid and most of hind femur (except extreme base and apex yellow in the latter), and distal 2/3 of hind tibia; yellow pilose, except black pilose on 4th and 5th tarsomere of front and mid leg, and on dark parts of hind femur and tibia. Coxae blackish brown; yellow pilose. Trochanters yellow; yellow pilose.

Abdomen: Tergites black, except anterior 1/4 of tergite 3 yellow and narrow anterior margin of tergite 4 yellow. Tergites 1 and 2 white pilose. Tergite 3 white pilose on yellow part, black pilose on black part. Tergite 4 black pilose, except white pilose in anterolateral corners and along posterior margin. Sternites black, except sternite 3 yellow on anterior 1/4. Sternite 1 bare. Sternite 2 white pilose. Sternite 3 white pilose on yellow part and along lateral margins. Sternite 4 black pilose, except white pilose along anterior margin. Male genitalia as in fig. 129.

Female: Unknown.
Diagnosis Within *Indascia*, this species only shares the presence of an appendix on vein R4+5 with *I. gigantica* spec. nov. From that species, *I. spathulata* differs by tergite 2 being more than twice as long as wide, and the basoflagellomere being 5 times as long as wide.
Etymology: Even more so than its congenerics, this species has a spoon-shaped abdomen, due to the strongly constricted second segment. This character inspired its name: *spathulata* (Latin for 'spatulate', spoon-shaped).

Kryptopyga sulawesiana **Reemer spec. nov.**
Figs. 137-140, 142.

Type specimens: HOLOTYPE. – Male. Label 1: "INDONESIA; N. Sulaw.; / 20 km N. Bitung: Tang- / koko N.P.; 0-200 m; / 1°N, 125°12 E; 19 / IV 1988; R. Hensen." Coll. RMNH.
Adult male Body size: 14 mm.
Head: Face occupying about 2/5 of head width in frontal view; black on median 1/2, pale brown on lateral 1/4; entirely long appressed yellowish pilose, golden on ventral half. Genae widely developed; blackish; long yellow pilose. Oral margin anteriorly notched, laterally produced. Frons black; short golden pilose. Vertex strongly swollen; black; short golden pilose anteriorly, long black pilose posterior to ocellar triangle. Ocellar triangle not elevated. Occiput strongly swollen dorsally, narrow laterally; black; black pilose dorsally, golden pilsoe ventrally. Eye bare. Antennal fossa about as high as wide. Antenna blackish brown, scape a little paler basally; ratio of lengths of scape and basoflagellomere approximately as 1:4, pedicel very short; basoflagellomere very long (4 mm), parallel-sided, with very long black pilosity, about 1,5 times as long as width of basoflagellomere. Arista absent.
Thorax: Mesoscutum black; black pilose, except for some golden pile along transverse suture and along lateral margins. Postpronotum and postalar callus brown, black pilose. Scutellum yellow; black pilose. Pleurae blackish brown. Anepisternum with deep sulcus separating posterior from anterior part; mixed yellow and black pilose anteriorly, black pilose posterodorsally, yellow pilose posteriorly. Anepimeron entirely long yellow pilose. Katepisternum long pale yellow pilose dorsally and ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter greyish yellow. Halter yellow.
Wing: hyaline, slightly darkened anteroapically; microtrichose, except bare on 1st and 2nd costal cell, basal 1/3 of cell R1, basal 1/4 of cell R2, basal 1/2 of cell R4+5, basal 1/2 of cell DM, entirely on cells R and BM, entirely on cell R and BM, anterobasally on cell DM, most of cell CuP and most of alula (only microtrichose along margins).
Legs: Brown, more blackish on femora and fore- and mid-tibiae; femora pale pilose anteriorly, black pilose posteriorly; tibiae and tarsae yellow pilose.
Abdomen: Elongate, more or less oval, with widest point at posterior margin of tergite 2; high in lateral view; tergites 3 and 4 not fused, with posterior margin of tergite 3 strongly overlapping tergite 4. Tergites blackish, except terigte 1 yellowish brown and other tergites narrowly yellowish brown along margins; short black pilose, except longer yellowish pilose along lateral margins of all tergites and posterolateral margins of tergites 3-4. Sternite 1 blackish; bare. Sternites 2-4 dark brown on anterior 2/3, yellow on posterior 1/3; entirely long yellow pilose. Genitalia as in fig. 142.
Female unknown.
Etymology The specific epithet is derived from the Indonesian island Sulawesi, the type locality.
Diagnosis This species differs from *K. pendulosa* by the less modified abdomen: tergite 4 is not perpendicular to tergite 3 and sternite 4 is well visible in ventral view.

Masarygus palmipalpus **Reemer spec. nov.**
Figs. 151-157.

Type specimens: HOLOTYPE. Adult male. PERU. Label 1: "PERU. Madre de Dios, Rio / Tambopata, Sachavacayoc Centre / 12°51'S-69°22'W. Mal. trap / 28-30.X.2008. Leg. J.T. Smit". Coll. RMNH.
Description (based on holotype)
Adult male Body size: 4 mm.
Head: Head unusually flat. Face wide: occupying about 3/4 of head width in frontal view; somewhat concave laterally; yellow; yellow pilose, except black pilose laterally on dorsal 1/2. Gena yellow; yellow pilose. Oral margin not produced; oral opening barely visible; mouth parts undeveloped. Frons brown; black pilose;

very short; distance between frontal ocellus and antennal fossa shorter than height of antennal fossa. Vertex blackish brown medially, yellow laterally; black pilose; ocelli arranged almost in a straight line, with frontal ocellus weakly developed, much smaller than the other two. Occiput yellow; black pilose dorsally, yellow pilose ventrally. Eye bare. Antennal fossa about 1,5 times as wide as high. Antenna black; black pilose; ratio of scape:basoflagellomere approximately as 1:8; pedicel very short. Basoflagellomere furcate into five branches, four of which about equally long, the fifth branches off from one of the other at about ¼ from the base of the segment, with a length of about 2/5 of the other branches. Arista absent.

Thorax: Mesoscutum black, except narrowly pale yellow along margins; black pilose. Postpronotum pale yellow; bare. Postalar callus pale yellow; black pilose. Scutellum black; black pilose; semicircular; without calcars; flat, appearing even slightly concave; smooth and shining along margins, dull dorsally due to micropunctation; black pilose. Anepisternum pale yellow along dorsal margin, brown otherwise; with sparse long black pile, also ventrally; without sulcus. Other pleurae yellowish to brown; bare (also without microtrichia). Calypter pale yellow. Halter pale yellow with greyish margin.

Wing: Hyaline; microtrichose, except bare on subcostal cell and basal 1/4 of cell CuP.

Legs: Front and mid leg pale yellow, except dark brown on basal 3/4; black pilose. Hind leg dark brown, except fifth tarsomere yellow; black pilose. Front coxa exceptionally long: about 4/5 of length of femur, longer than tibia; pale brown; bare. Other coxae and trochanters shorter; pale brown; very sparsely black pilose.

Abdomen: Strongly flattened dorsoventrally. Tergite 1 blackish; black pilose; medially interrupted by the whitish antetergite, which is almost entirely fused with the tergite. Tergites 2 and 3 whitish, except black on lateral 1/5, the black part most narrow at posterior margin; black pilose. Tergite 4 black, except for a pair of whitish, submedian, oval maculae at posterior 1/2. Sternite 1 whitish; bare. Sternite 2 whitish; yellow pilose. Sternite 3 whitish, except for lateral dark brown, round macula at anterior 1/2, of about 1/4 of tergite width; yellow pilose, except black pilose anteromedially. Sternite 4 whitish, except for pair of dark brown, oval maculae, almost confluent medially; black pilose anteriorly, yellow pilose posteriorly. Male genitalia as in fig. 157.

Female: Unknown.

Diagnosis This is the only known species of Microdontinae in which the antenna of the male is furcate into five branches.

Etymology The specific epithet (noun in apposition) is composed of the Latin words *palma* (hand) and *palpus* (feeler, here interpreted as antenna). The name refers to the hand-like antenna of the male of this species.

Mermerizon inbio **Reemer spec. nov.**
Figs. 177-182.

Type specimen. 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.

Description (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. 182.
Female. Unknown.
Etymology. InBio is an acronym of Instituto Nacional de Biodiversidad, the Costa Rican institute which holds the holotype of this species. Noun in apposition.
Diagnosis. Distinguished from the other two known species of *Mermerizon* by the black pilose mesoscutum.
Distribution. Only known from Costa Rica.

***Metadon achterbergi* Reemer spec. nov.**
Figs. 183-186.

Type specimens: HOLOTYPE. Adult female. VIETNAM. Label 1: "C. VIETNAM: Ha Tinh / Vu Quang N.P., 53 m, N 18° / 20'50" E105°26'37.8", 22.ix.- / 6.x.2009, Mal. trap 1, RMNH-09 / C. v. Achterberg & R. de Vries". Coll. RMNH. Voucher code M. Reemer: 284. DNA voucher G. Ståhls: MZH-Y1086.
Description (based on holotype)
Adult female Body size: 13 mm.
Head: Face occupying about 1/3 of head width in frontal view; dark brown; golden pilose, very narrowly bare medially on ventral half. Gena brown, golden pilose. Lateral oral margin produced. Frons, vertex and occiput brown; golden pilose., except occiput ventrally white pilose. Eye bare. Antennal fossa about as high as wide. Antenna black; antennal ratio approximately as 4:1:3.
Thorax: Mesoscutum blackish brown; golden pilose, with transverse fasciae of thicker golden pile along anterior margin, transverse suture (medially interrupted) and posterior margin. Postpronotum and postalar callus yellow; golden pilose. Scutellum semicircular; blackish brown; golden pilose. Anepisternum with deep sulcus; yellowish brown; entirely golden pilose. Anepimeron yellowish brown; entirely pilose. Katepisternum blackish brown; golden pilose dorsally, very sparsely pilose and ventrally. Other pleurae yellowish brown. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellowish.
Wing: Yellow on basal 2/3m, blackish on apical 1/3, with colouration in posterior half less conspicuous. Microtrichose, except bare on 1st costal cell, narrowly along vein RS in cell R1, basal 3/4 of cell R, basomedian 3/4 of cell BM, anterobasal 1/4 of cell CuP, basomedian 9/10 of alula.
Legs: Yellow; yellow pilose. Front coxa yellow, mid and hind coxae blackish brown; yellowish pilose. Trochanters blackish brown; yellowish pilose.
Abdomen: Tergites black. Tergites 1 and 2 golden pilose. Tergite 3 golden pilose anterolaterally; black pilose otherwise. Tergite 4 with fascia of golden pile along anterior margin, laterally widening and expanding along lateral margin, and with pair of sublateral oblong maculae of golden pile, black pilose in between. Tergite 5 golden pilose anterolaterally, black pilose otherwise. Sternites blackish brown; pale pilose, except sternite 5 mostly black pilose.
Male: Unknown.
Diagnosis Within *Metadon*, five other described Oriental species have a dark (sub)apical wingspot. These species are listed here (in parentheses a character is given that distinguishes them from *M. achterbergi* spec. nov.): *Microdon auricinctus* Brunetti (tergite 4 red); *M. bicoloratus* Hull (thorax and abdomen without fasciae of golden pile); *M. fuscicornis* Sasakawa (wing infuscated at entire apical half); *M. pendleburyi* Curran (thorax and abdomen without fasciae of golden pile); *M. wulpii* Mik (mesoscutum without fascia of golden pile along transverse suture, scutellum reddish brown).
Etymology This species is named after its collector, Dr. C. van Achterberg, in acknowledgment of the many ways in which he has been helpful to the author during his PhD work.

***Microdon hauseri* Reemer spec. nov.**
Figs. 196-199, 212.

Type specimens: HOLOTYPE. Adult male. CHINA. Label 1: "Yunnan. Tengchong / 50 km NNW: Houqiao / N25.388° E 98.211° / 1700 m / 01.VI.2009 leg. / Blank, Liston, Taeger / 008 China"; label 2: "Voucher code M. Reemer / 302 / DNA voucher G. Ståhls / Y 1096". Coll. CSCS.
Description (based on holotype)

Adult male Body size: 12,5 mm.
Head: Face occupying about 1/3 of head width in frontal view; black; entirely yellowish pilose. Gena black, yellowish pilose. Oral margin not produced. Frons black; black pilose, except narrowly yellow pilose along lateral and posterior margins. Vertex black; black pilose, except narrowly yellow pilose along all margins. Occiput black; yellow pilose. Eye bare. Antennal fossa about as high as wide. Antenna black; antennal ratio approximately as 3.5:1:2.5.
Thorax: Entire thorax blackish with bronze hues. Mesoscutum black pilose medially, widely yellow pilose along margins. Postpronotum, postalar callus and scutellum yellow pilose. Scutellum trapezoid with slightly concave posterior margin; without calcars. Anepisternum yellow pilose anteriorly, mixed black and yellow pilose posteriorly, with widely bare part in between; with shallow sulcus separating anterior from posterior part. Anepimeron entirely yellow pilose. Katepisternum yellow pilose dorsally, very sparsely yellow pilose ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter pale yellow.
Wing: Hyaline, subtly darkened around apical crossveins; microtrichose, except bare on basal 3/5 of cell R and basomedian 1/3 of alula.
Legs: Orange, except basal 1/4 of femora blackish, apex of femora narrowly darkened and tibiae dorsally darkened. Front femur black pilose, except for patch of orange-golden pile anterobasally; mid femur orange-golden pilose anteriorly and posteriorly on basal 2/3, with patch of orange-golden pile anteroventrally on basal 1/4, black pilose dorsally and ventrally; hind femur with long orange-golden pile anterodorsally and posteriorly, with orange-golden pile on basal 1/3, black pilose otherwise. Front and mid tibia orange-golden pilose, except black pilose dorsally. Hind tibia orange-golden pilose (long dorsally, short ventrally), except black pilose laterally. Tarsi black pilose. Coxae and trochanters black; pale pilose.
Abdomen: Tergites black with bronze hues. Tergites 1 and 2 golden pilose. Tergite 3 golden pilose on lateral 1/4, orange-golden pilose medially (colour transition gradual). Tergite 4 orange-golden pilose, except for pair of submedian patches of black pile on anterior 1/2; each about as wide as 1/4 of the tergite. Sternites black with bronze hues; entirely whitish to golden pilose. Male genitalia as in fig. 212.
Female: Unknown.
Diagnosis In the keys of Shiraki (1968), Huo et al. (2007) and – depending on how characters are interpreted –Hironaga & Maruyama (2004), this species keys to *M. auricomus* Coquillet, 1898, from which it differs by the largely orange legs and the long, orange-golden pilosity on the anterodorsal part of the hind femur. These characters also apply for distinguishing M. ## spec. nov. from *M. murayamai* Hironaga & Maruyama, 2004, to which specimens of the species will key in the key of Hironaga & Maruyama (2004). The same characters apply for separating it from *Microdon lateus* Violovitsh, 1975, to which it keys using Violovitsh (1983). In the key of Shiraki (1930) this species keys to *M. formosanus* Shiraki, 1930, from which it differs by the black pilosity medially on the mesoscutum (entirely pale in *M. formosanus*).
Etymology This species is named after Martin Hauser, in acknowledgement for the many interesting specimens of Microdontinae he sent to the author.

***Microdon mandarinus* Reemer spec. nov.**
Figs. 200-205, 213.

Type specimens: HOLOTYPE. Adult male. CHINA. Label 1: "Yunnan: Deqin / 10 km SW: Meili mts. / N28.423° E98.868° / 2700 m / 20.VI.2009 leg. / Blank, Liston, Taeger / 048 China"; label 2: "Voucher code M. Reemer / 299 / DNA voucher G. Ståhls / Y1093". Coll. CSCS.
PARATYPE. CHINA. Label 1: "Yunnan: / Deqin 33 km SE / N28.282° E 99.162° / 3200 m / 18.VI.2009 leg. / Blank, Liston, Taeger / 040 China". Coll. CSCS.
Description (based on holotype)
Adult male Body size: 11 mm.
Head: Face occupying about 1/3 of head width in frontal view; orange yellow; entirely yellow pilose. Gena black, yellow pilose. Oral margin laterally weakly produced. Frons black; yellow pilose. Vertex yellow; yellow pilose. Occiput black; yellow pilose. Eye almost bare, sparse and short pile visible only under high magnification. Antennal fossa about as high as wide. Antenna pale brown; antennal ratio approximately as 3:1:2.5.
Thorax: Mesoscutum blackish bronze with green metallic hues, except yellow along lateral margins; entirely yellow pilose. Postpronotum, postalar callus and scutellum yellow; yellow pilose. Scutellum trapezoid with slightly concave posterior margin; with minute, barely discernable posterolateral calcars, their mutual distance

about equal to 1/3 of width of scutellum. Pleura blackish, except anepisternum anterodorsally with small yellow spot and katatergum medially with small yellow spot; all pilosity yellow. Anepisternum with deep sulcus separating anterior from posterior part; pilose anteriorly and posteriorly, with widely bare part in between. Anepimeron entirely pilose. Katepisternum pilose dorsally; bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellowish white.

Wing: Hyaline; microtrichose, except bare on posterobasal 1/4 of cell R.

Legs: Yellow, except narrowly blackish around basal cicatrix on femora; yellow pilose. Coxae and trochanters yellow, except hind coxa black on basal half; yellow pilose.

Abdomen: Tergite 1 black; yellow pilose. Tergite 2 black, except orange yellow on lateral 1/6; erect yellow pilose , except for fascia of appressed golden pile along posterior margin. Tergite 3 medially with semicircular black mark, anteriorly as wide as the black part on tergite 2, posteriorly narrow and just reaching posterior margin; laterally orange yellow; short black pilose on most of anterior half, except yellow pilose along lateral margins, with fascia of appressed golden pile along posterior margin. Tergite 4 largely orange yellow, except for vaguely defined blackish mark anteromedially; largely short yellow pilose, except for anterolateral patches of black pile. Sternite 1 black; yellow pilose. Sternite 2 and 3 yellow, except blackish near lateral margins; yellow pilose. Sternite 4 yellow; yellow pilose. Male genitalia as in fig. 213.

Female: As male, except for the following differences. Body size: 14 mm. Frons largely yellow, except for small triangular black area posteriad of lunula. Antenna: scape and pedicel yellowish. Mesoscutum with pair of small submedian yellow spots at posterior margin. Scutellum without any sign of calcars. Anepimeron, dorsal part of katepisternum, katepimeron, katatergum and anatergum yellow. Tergite 4 with fascia of appressed golden pile on posterior half. Tergite 5 largely orange yellow, except blackish anteromedially; entirely appressed golden pilose.

Diagnosis: The orange colouration of large parts of this species' body, most notably its head, legs and the lateral parts of the tergites, precludes confusion with any other known Palaearctic or Oriental species of *Microdon* s.s.

Etymology The species name refers to 'mandarin', which has a number of meanings. It's an orange citrus fruit, it's the most spoken language in China, and it used to be a high governmental function in imperial China. The name is considered appropriate for this species because of the characteristic orange colour of several body parts and the Chinese origin of the type material.

***Microdon yunnanensis* Reemer spec. nov.**

Figs. 207-210, 214.

Type specimens: HOLOTYPE. Adult male. CHINA. Label 1: "Yunnan: Tengchong / 25 km NNW / N25.189° E98.333° / 1900 m. / 01.VI.2009 leg. / Blank, Liston, Taeger / China 010"; label 2: " Voucher code M. Reemer / 301 / DNA voucher G. Ståhls / Y1095". Coll. CSCS.

Description (based on holotype)

Adult male Body size: 11 mm.

Head: Face occupying a little less than 1/2 of head width in frontal view; black; entirely golden yellow pilose. Gena black, golden yellow pilose. Oral margin not produced. Frons, vertex and occiput black; golden yellow pilose. Eye bare. Antennal fossa about as high as wide. Antenna black; antennal ratio approximately as 2.5:1:1.5.

Thorax: Entire thorax blackish with bronze hues, except scutellum brownish; all pilosity yellow. Scutellum trapezoid with slightly concave posterior margin; with slender calcars as long as 1/5 of length of scutellum, their mutual distance about equal to 1/3 of width of scutellum. Anepisternum with shallow sulcus separating anterior from posterior part; pilose anteriorly and posteriorly, with widely bare part in between. Anepimeron entirely pilose. Katepisternum pilose dorsally and ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellowish white.

Wing: Hyaline, subtly darkened around apical crossveins; microtrichose, except bare on basal 1/2 of cell R.

Legs: Black, except basal 3/5 of tibiae and ventral side of tarsae yellow; yellow pilose. Coxae and trochanters black; yellow pilose.

Abdomen: Tergites black. Tergites 1 and 2 yellow pilose. Tergite 3 black pilose, except narrowly whitish pilose along lateral and posterior margins. Tergite 4 black pilose, except narrowly whitish pilose along lateral margins and whitish pilose on posterior 1/3. Sternites

black; whitish pilose. Male genitalia as in fig. 214.
Female: Unknown.
Diagnosis: This species keys to *Microdon japonicus* Yano, 1915 in the keys of Huo et al. (2007) and Shiraki (1930, 1968). From that species it is distinguished by the entirely yellow pilose mesoscutum (with patches of black pile in *M. japonicus*). In the key of Hironaga & Maruyama (2004) it keys to *M. kidai* Hironaga & Maruyama, 2004, from which it differs by its partly yellow legs (entirely black in M. *kidai*). In the key of Violovitsh (1983) this species keys to *M. eggeri* Mik, 1897 (= *M. analis* (Macquart, 1842)), from which it differs by its pale brown scutellum (black in *M. analis*) and the shape of tergite 2, which is at its widest clearly before the posterior margin (widest at posterior margin in *M. analis*).
Etymology: This species is named after the Chinese province of Yunnan, in which it was found.

***Paramixogaster piptotus* Reemer spec. nov.**
Figs. 275-278.

Type specimens: HOLOTYPE. Female. Label 1: "Madagascar / Bekily / Reg sud de l'ile"; label 2 (blue): "Museum Paris / I.37 / A. Seyrig"; label 3: "Ceratrichomyia / behara type du genre [female sign] Séguy 1950". Coll. MNHN.
Adult female Body size: 7 mm.
Head: Face occupying about 3/5 of head width in frontal view; yellow; entirely yellow pilose. Genae yellow. Lateral oral margins hardly produced. Frons and vertex yellow; yellow pilose. Occiput yellow; dorsally wide and yellow pilose, ventrally narrow and whitish pilose. Eye bare. Antennal fossa about as wide as high. Antenna orange; antennal ratio approximately as 1:0,25:6. Basflagellomere elongate; with sensory pit at apical 1/7. Arista yellow, about 2/5/ of length of basoflagellomere.
Thorax: Postpronotum yellow; bare. Mesoscutum reddish brown; short yellow pilose, with lateral fasciae of dense golden pile along transverse suture and with two vittae of dense golden pile on posterior half. Postalar callus and scutellum reddish brown; short yellow pilose. Scutellum without calcars. Pleurae reddish brown. Anepisternum with deep sulcus separating anterior and posterior part; white pilose, except with golden pilosity along posterior margin, as an extension of the golden fascia along mesonotal transverse suture. Anepimeron entirely white pilose. Katepisternum white pilose dorsally; bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Other pleurae bare. Calypter and halter yellow.
Wing: hyaline; microtrichose, except bare on 1st costal cell, basal 1/2 of 2nd costal cell, basally on cell R1 along vein RS, almost entirely on on cells R, BM andl CuP, on alula except along margins.
Legs: Yellow, except: front femur brownish on basal half, middle and hind femur dark brown on basal 4/5. Legs entirely pale pilose. Coxae and trochanters brown; pale pilose.
Abdomen: Constricted at 2nd segment, narrowest at anterior margin of tergite 2, widest at tergite 3 (slightly wider than thorax). Ratio of tergal lengths approximately as 1:4:3:3:3. Tergite 1 dark brown; pale pilose. Tergite 2 dorsoventrally flattened, dark brown with large, oblique yellow maculae over entire length, which are interconnected anteriorly, leaving anterolateral corners and a large posteriomedian triangle dark brown; yellow pilose. Tergite 3 and 4 dark brown and short yellow pilose; with fasciae of golden pile along posterior margins; tergite 4 also with posterolateral margins yellow in ground colour. Tergite 5 brown with posterior 2/5 and median part yellow; yellow pilose. Sternite 1 dark brown; bare. Sternite 2 yellow; yellow pilose. Other sternites brown; yellow pilose.
Male unknown.
Etymology The specifec epithet is derived from the Greek word *piptotos* (that which has fallen). This name refers to the fact that this species 'fell' out of the genus *Ceratrichomyia*, for the holotype is also part of the paratype series of *Ceratrichomyia behara* Séguy, 1951.
Notes This description is based on the female paratype of *Ceratrichomyia behara* Séguy. For discussion see genus account of *Ceratrichomyia*.

***Piruwa phaecada* Reemer spec. nov.**
Figs. 302-309.
Type specimens: HOLOTYPE. Adult male. PERU. Label 1: "PERU. Madre de Dios, Rio / Tambopata, Sachavacayoc Centre / 12°51'S-69°22'W. Mal. trap / 4-10.IX.2009. Leg. J.T. Smit"; label 2: "Voucher code M. Reemer / 287". Coll. RMNH.
PARATYPES. 2 adult females with label data as

holotype, but collection dates are 28-30.X.2008 and VIII.2009. Coll. RMNH & J.T. Smit.

Description (based on holotype)

Adult male Body size: 4 mm.

Head: Face occupying about 1/6 of head width in frontal view; black; entirely white pilose. Gena hardly developed; black, white pilose. Oral margin not produced. Frons, vertex and occiput black; white pilose. Eye bare. Antennal fossa about as high as wide. Antenna: scape black, pedicel and basoflagellomere pale brown; antennal ratio approximately as 2.5:1:3.

Thorax: Black. Mesoscutum short appressed yellowish pilose, except for sparse bristly black pile anterolaterally. Postpronotum bare. Postalar callus black pilose dorsally, pale pilose laterally. Scutellum semicircular; without calcars; black; short pale pilose and with a few long, bristly, pale setae along posterior margin. Anepisternum convex, without sulcus; pale pilose on dorsal half. Katatergum and anatergum short pilose. All other pleurae bare. Calypter grey. Halter yellow with blackish knob.

Wing: Hyaline. Microtrichose, except bare on first costal cell, basal 1/2 of cell R and cell BM, basal 1/3 of cell CuP. Legs: Tibiae and femora black. Tarsi whitish yellow, except first tarsomere of hind leg black. Legs black pilose, except tarsi of front and mid leg dorsally yellow pilose. Coxae and trochanters blackish brown. Coxae white pilose apically. Trochanters bare.

Abdomen: Tergites black. Tergites yellowish pilose, except tergite 4 laterally and posteriorly mixed black and yellow pilose. Sternites blackish brown; sternite 1-2 bare; sternites 3-4 short black pilose. Genitalia as in fig. 307.

Female: As male, except for following differences (based on paratype collected VIII.2009). Face golden yellow pilose. Mesoscutum and scutellum mixed golden yellow and black pilose. Pleurae partly brownish. Anepisternum black pilose dorsally. Anepimeron with bristly black pile along dorsal margin. Coxae apically black pilose. Sternite 5 blackish; short black pilose, withlong, bristly black pile along posterior margin. The other female paratype is apparently a teneral specimen, as parts of its body are yellowish brown.

Etymology The specific epithet *phaecada* is derived from the Greek word phaikas, which is a kind of white shoe. The name refers to the whitish yellow tarsi of the species, that contrast with the entirely black rest of the body.

***Pseudomicrodon polistoides* Reemer spec. nov.**
Figs. 310-314.

Type specimens: HOLOTYPE. Adult female. PERU. Label 1: "PERU. Madre de Dios, Tambopata / Sachavacayoc Centre, Quebrada / trail. S 12°51'20.1" - W 69°22'20.1". / Alt. 166 m. Malaise trap / 14-25. VI.2010. Leg. J.T. Smit". Label 2: "Voucher code M. Reemer / 346 / DNA voucher G. Ståhls / Y1319". Coll. RMNH.

Description (based on holotype)

Adult female Body size: 12.5 mm.

Head: Face occupying approximately 1/3 of head width in frontal view; yellow; yellow pilose on lateral 1/3, black piloseon median 1/3. Gena yellow; yellow pilose. Lateral oral margins weakly produced. Frons yellow, except for black markings directly laterad of antennal fossa; yellow pilose, except for sparse black pile at black markings. Vertex yellow, except for black markings at and around ocellar triangle and posterolaterally; bare on anterior 1/3, black pilose on posterior 2/3. Occiput yellow, except black adjacent to black markings on vertex; yellow pilose, except black pilose directly posteriad of vertex. Eye almost bare, with very sparse and short white pile. Antennal fossa about as wide as high. Antenna orange yellow, scape a little darker; antennal ratio approximately as 5:1:6; longer than distance between antennal fossa and anterior oral margin.

Thorax: Mesoscutum black with widely yellow margins and wide median yellow vitta over entire length, also narrowly yellow along transverse suture. Black pilose, except for fasciae of orange golden pile along anterior margin, transverse suture and posterior margin, as well as along posterolateral margin. Postpronotum and postalar callus yellow; black pilose. Scutellum semicircular; yellow; black pilose, except sparsely golden pilose anterolaterally; with out calcars. Pleurae yellow, except dorsomedial and posterior parts of anepisternum partly blackish, and anatergum and lateral margins of meditergite blackish. Anepisternum sulcate; mixed orange and black pilose anterodorsally, black pilose posteriorly, widely bare in between. Anepimeron entirely yellow pilose. Katepisternum yellow pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellowish white.

Wing: Yellowish to brown in costal cells, cell R, R1, R2+3, anteriorly in cell R4+5, hyaline in other parts. Microtrichose, except bare on first costal cell, posterobasal 1/4 of cell R, posterbasal 1/4 of cell BM and basal

1/10 of cell CuP.
Legs: Yellow; yellow pilose, except femora posteriorly black pilose and hind tarsus dosally black pilose. Front and mid coxae and trochanters yellow; yellow pilose. Hind coxa yellow anteriorly, blackish brown laterally and posteriorly; yellow pilose, except black pilose apically and laterally. Hind trochanter brownish, mixed yellow and black pilose.
Abdomen: Constricted, about as wide as thorax, with narrowest point in posterior 3/4 of tergite 2. Tergites orange, except tergite 1 laterally and tergite 2 anterolaterally dark brown, and tergites 2 and 3 with posterior margins yellow. Tergite 1 black pilose laterally, yellow pilose medially. Tergites 2-4 black pilose, except yellow pilose posteriorly. Tergite 5 yellow pilose, except black pilose medially. Sternite 1 brownish; bare. Other sternites yellow; yellow pilose.
Male: Unknown.
Diagnosis: In three other described *Pseudomicrodon* species the alula is completely microtrichose: *P. chrysostypus* (Thompson, 2004), *P. pilosops* (Marinoni, 2004) and *P. smiti* spec. nov. From these species, *P. polistoides* spec. nov. differs by the entirely orange coloured abdomen, as well as by the yellow median vitta on the mesoscutum.
Etymology The specific epithet emphasizes the resemblance of this species to certain Polistinae (Hymenoptera: Vespidae).

***Pseudomicrodon smiti* Reemer spec. nov.**
Figs. 315-319, 323.

Type specimens: HOLOTYPE. Adult male. PERU. Label 1: "PERU. Madre de Dios, Tambopata / Sachavacayoc Centre, Bridge / Condonado trail, S 12°51'25.7" - / W 69°22'23.1". Alt. 184 m. / 5.VI.2010. Leg. J.T. Smit". Label 2: "Voucher code M. Reemer / 345 / DNA voucher G. Ståhls / Y1318". Coll. RMNH.
PARATYPES. A male and a female from same locality as holotype, collected on 10.VI and 8.VI.2010, respectively. Male in coll. J.T. Smit, female in coll. RMNH.
Description (based on holotype)
Adult male Body size: 9.5 mm.
Head: Face occupying a little more than 1/4 of head width in frontal view; black, except yellow on lateral 1/5 in dorsal 2/3; entirely yellow pilose; medially with vitta of transversely wrinkled texture. Gena black; yellow pilose. Lateral oral margins weakly produced. Frons black; white pilose. Vertex black; bare on anterior half, black pilose on posterior half. Occiput black; golden pilose on dorsal half, silvery white pilose on ventral half. Eye almost bare, with very sparse and short white pile. Antennal fossa about 1.5 times as wide as high. Antenna black; antennal ratio approximately as 2.5:1:3.5; longer than distance between antennal fossa and anterior oral margin.
Thorax: Blackish brown with bronze and green metallic hues. Mesoscutum appressed black pilose, except for medially interrupted fasciae of appressed golden pile along anterior margin and transverse suture. Postpronotum and postalar callus black pilose. Scutellum semicircular; black pilose, except golden pilose posterolaterally; with calcars about as long as 1/3 of length of scutellum, with mutual distandce approximately 1/4 of scutellar width. Anepisternum sulcate; black pilose anterodorsally, white pilose posteriorly, widely bare in between. Anepimeron entirely silvery white pilose. Katepisternum silvery white pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellowish white.
Wing: Hyaline, brownish in costal and subcostal cells and cell R1. Microtrichose, except bare on first costal cell, posterobasal 3/4 of cell R, basal 2/3 of cell BM and basal 1/6 of cell CuP.
Legs: Blackish brown, except whitish on basal 1/3 of mid tibia and basal 2/5 of hind tibia, paler brown on apical half of femora. Femora black pilose, except hind femur white pilose posteriorly and anterobasally. Tibiae white pilose, except black pilose ventrally, and mid tibia black pilose on apical 2/5. Tarsi dorsally black pilose. Coxae brown; front and mid coxae black pilose, hind coxa white pilose. Trochanters brown; black pilose.
Abdomen: Constricted, narrower than thorax, with narrowest point halfway tergite 2. Tergites black, except tergite 2 largely occupied by pair of rectangular yellow maculae on basal 3/4. Tergite 1 long yellowish white pilose laterally, black pilose dorsally. Tergite 2 black pilose, except narrowly golden pilose along posterior margin. Tergite 3 black pilose, except white pilose along lateral margin and with medially interrupted fascia of golden pile along posterior margin. Tergite 4 black pilose, except white pilose anterolaterally and along lateral margin, and with pair of submedian vittae of golden pile on posterior 3/4, widening towards apex. Sternite 1 black; bare. Sternite 2 whitish yellow; bare. Sternites 3 and 4

black; black pilose. Male genitalia as in fig. 323.
Female: 11 mm. As male, except for usual sexual differences. Tergite 5 golden pilose medially, white pilose laterally.
Diagnosis: In three other described *Pseudomicrodon* species the alula is completely microtrichose: *P. chrysostypus* (Thompson, 2004), *P. pilosops* (Marinoni, 2004) and *P. polistoides* spec. nov. From these species, *P. smiti* spec. nov. differs by the combination of the black postpronutum and the partly black hind tibia.
Etymology This species is named after John T. Smit, who collected this species in Peru, along with several other interesting Microdontinae.

***Rhopalosyrphus* (s.s.) *ecuadoriensis* Reemer spec. nov.**
Figs.335-339, 355.

Type specimens: HOLOTYPE. Adult male. ECUADOR. Label 1: "ECUADOR: Orellana Province / Yasuni Research Station, / Trap, Canopy - 27 m / Malaise M7-1, AT934 / 11-18.vii.2008, A. Tishechkin"; label 2: "Voucher code M. Reemer / 294 / DNA voucher G. Ståhls / Y1089". Coll. RMNH.
Description (based on holotype)
Adult male Body size: 9 mm.
Head: Face occupying slightly less than 1/3 of head width in frontal view; black, except yellow on lateral 1/4 on dorsal 2/3; golden yellow pilose, most densely at yellow lateral parts. Gena black, yellow pilose. Lateral oral margins produced. Frons black; yellow pilose. Vertex black; yellow pilose, except black pilose posteriad of ocelli. Occiput black; yellow pilose. Eye bare; with narrow, horizontal area frontally at level of antenna with enlarged ommatidia. Antennal fossa about 1.5 times as wide as high. Antenna black; antennal ratio approximately as 5:1:8; longer than distance between antennal fossa and anterior oral margin.
Thorax: Black with faint metallic hues. Mesoscutum black pilose, except narrowly white pilose along anterior margin and with small patches of white pile at notopleuron. Postpronotum and postalar callus white pilose. Scutellum semicircular; black pilose dorsally, white pilose along margins; with small apical calcars, with mutual distance about 1/5 of basal width of scutellum. Anepisternum without sulcus; entirely white pilose, except for small patch of black pile posterodorsally. Anepimeron entirely white pilose. Katepisternum white pilose dorsally, bare ventrally. Katepimeron white pilose anteriorly. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellowish white.
Wing: Hyaline, except faintly infuscated around spur on vein R4+5, vein dm-cu, r-m and bm-cu. Microtrichose, except bare on first costal cell, basal 1/2 of second costal cell, basally on cell R1 along vein RS, entirely on cell R, basal 3/4 of cell BM, anterobasal 1/2 of cell CuP and basomedian 1/10 of alula.
Legs: Front and mid femora blackish brown, except narrowly yellow at apex; white pilose, except for sparse long, black pile posterodorsally. Front and mid tibiae pale yellow basally, dark yellow apically; white pilose, except for sparse black pile postero-apically. Front and mid tarsi yellow; black pilose dorsally, yellow pilose ventrally. Hind femur black; white pilose anteriorly and dorsally, black pilose posteriorly and with dense, bristly to spiny black pile ventrally. Hind tibia pale yellow on basal 3/5; yellow pilose, except black pilose posteriorly at apical 1/4. Hind tarsus brown; black pilose dorsally, yellow pilose ventrally. Coxae and trochanters brown to blackish; white pilose.
Abdomen: Constricted, about as wide as thorax, with narrowest point just before posterior margin of tergite 2. Tergites black with bronze hues, except tergite 2 yellow along posterior margin. Tergite 1 white pilose, except white pilose on median 1/4. Tergite 2 white pilose, except black pilose dorsomedially on apical 1/2. Tergite 3 white pilose, except for dorsomedian triangle of black pile over entire length, which is widest at posterior margin; white pile posterolaterally thicker and more conspicuous, thus forming medially interrupted fascia at posterior margin. Tergite 4 black pilose, except white pilose along lateral margins and with fascia of golden yellow pile on posterior 1/3, which is partly interrupted by black pile anteromedially. Sternite 1 dark brown; bare. Sternite 2 brown on anterior 2/3, yellow on posterior 1/3; white pilose. Sternite 3 yellow anteriorly and along posterior margin, brown medially; white pilose. Sternite 4 brown; black pilose, except white pilose along posterior margin. Male genitalia as in fig. 355.
Female: Unknown.
Diagnosis: In the key of Weems et al. (2003) this species keys to *R. australis* Thompson, 2003 because tergite 3 is short: a little more than half as long as tergite 2. However, in *R. australis* tergite 3 is about 1/3 as long as tergite 2, which places *R. septentrionalis* somewhat intermediate between *R. australis* and the other two known species of *Rhopalosyrphus*, as

far as this character is concerned. Other differences with *R. australis* are (character state in *R. australis* in parentheses): antennal ratio approximately as 5:1:8 (5:1:10), mesoscutum almost entirely black pilose (white pilose), tergite 3 black (yellow).

Etymology The specific epithet refers to the country where the type has been collected.

***Rhopalosyrphus* (s.s.) *robustus* Reemer spec. nov.**
Figs. 340-344.

Type specimens: HOLOTYPE. Adult female. FRENCH GUYANA. Label 1: "FRENCH GUYANA. Patawa, / 4°32.658'N-52°9.132'W / VIII.2008. Malaise trap in / pine forest. Leg. O. Morvan"; label 2: "J. Skevington / mol. specimen no / JS3616 - CNC coll."; label 3: "Voucher code M. Reemer / 271 / DNA voucher G. Ståhls / Y1066". Coll. CNC.

Description (based on holotype)

Adult female Body size: 14.5 mm.

Head: Face occupying about 1/4 of head width in frontal view; black, except yellow on lateral 1/6 on dorsal 2/3 entirely silvery white pilose. Gena black, white pilose. Lateral oral margins produced. Frons black; silvery white pilose. Vertex black; black pilose, except white pilose along eye margin. Occiput black; white pilose, except black pilose dorsolaterally. Eye bare; with narrow, horizontal area frontally at level of antenna at which ommatidia are partly absent; the ommatidia present in this area are larger than elsewhere on the eye. Antennal fossa about 1.5 times as wide as high. Antenna black; antennal ratio approximately as 5:1:9; longer than distance between antennal fossa and anterior oral margin.

Thorax: Black with faint metallic hues. Mesoscutum anteriad of transverse suture appressed white pilose, except for three patches of appressed black pile, and narrowly erect white pilose along anterior margin; mesoscutum posteriad of transverse suture appressed black pilose, except erect white pilose on posterior 1/3. Postpronotum and postalar callus white pilose, except postalar callus laterally black pilose. Scutellum semicircular; white pilose dorsally, golden pilose along margins; without calcars. Anepisternum with shallow sulcus; entirely silvery white pilose. Anepimeron entirely silvery white pilose. Katepisternum silvery white pilose dorsally, bare ventrally. Katepimeron almost bare: with very sparse white pile along anterior margin. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellow.

Wing: Hyaline, faintly infuscated on anterior 1/3. Microtrichose, except bare on first costal cell, basal 1/3 of cell R1, entirely on cell R, posterobasally on cell R4+5 posteriad of vena spuria, posterior 1/2 of cell BM, anterior 1/2 of cell CuP, basomedian 3/5 of alula.

Legs: Front femur brown dorsally, black ventrally; white pilose, except for sparse black pile posteriorly. Front tibia black, except brown anteriorly on basal 1/4 and apical 1/3; white pilose, except black pilose ventrally. Front tarsus black, except fifth tarsomere brown; yellow pilose. Mid femur black, except brown anteriorly on basal half; white pilose. Mid tibia black, except yellowish on basal 1/6; white pilose. Mid tarsus black on basal three tarsomeres (other tarsomeres missing in holotype); yellow pilose. Hind femur strongly swollen, about 5 times as wide as mid femur; black; white pilose, except sparsely black pilose dorsally and densely occupied with short, bristly, black pile ventrally. Front coxa and trochanter brown; white pilose. Mid coxa black; white pilose. Mid trochanter brown; white pilose. Hind coxa and trochanter black; white pilose.

Abdomen: Constricted, about as wide as thorax, with narrowest just before posterior margin of tergite 2. Tergites black with faint metallic hues, except tergite 2 with pair of large, elongate yellow maculae from anterior 1/4 to posterior 1/3. Tergite 1 white pilose. Tergite 2 white pilose, except for patch of black pile dorsally between middle of tergite and posterior 1/6. Tergite 3 black pilose, except narrowly white pilose along posterior and lateral margins. Tergite 4 pilose as tergite 3, but with sparse yellowish pile intermixed among the black pile on posterior 2/3. Tergite 5 mostly yellowish white pilose, with sparsee black pile intermixed anteriorly, and colour of pile more whitish near posterior and lateral margins. Sternite 1 brown; white pilose. Sternite 2 yellow; white pilose. Sternite 3 brown; white pilose. Sternite 4 brown; white pilose, on anterior half, mostly black pilose on posterior half, yellowish pilose along posterior margin. Sternite 5 brown; mixed yellowish and black pilose.

Male: Unknown.

Diagnosis: Care should be taken in assessing the presence of pile on the katepimeron: in this species this pilosity is very sparse and limited to the anterior margin. Within *Rhopalosyrphus* s.s. this species is readily distinguished by the pair of large yellow maculae on tergite 2.

Etymology The Latin adjective *robustus* (strong as

oak – *Robur*) was chosen as the specific epithet because of the size, robustness and stout hind femora of this species, which evoke the impression of a strong animal.

***Rhopalosyrphus* (s.l.) *abnormoides* Reemer spec. nov.**
Figs. 345-348, 356.

Type specimens: HOLOTYPE. Adult male. PARAGUAY. Label 1: "Paraguay / Fiebrig"; label 2: "S. Bernar- / dino"; label 3: "Myxogaster"; label 4: "Ropalosyrphus [male symbol] / ? auricinctus Sack / det. v. Doesburg"; label 5: "Voucher code M. Reemer / 289". Coll. RMNH.
Description (based on holotype)
Adult male Body size: 11 mm.
Head: Face occupying a little less than 1/3 of head width in frontal view; yellow, with narrow, vaguely defined brown median vitta; entirely golden yellow pilose. Gena black, white pilose. Lateral oral margins produced. Frons black; silvery white pilose. Vertex black; black pilose, except yellow pilose along anterior and lateral margins. Occiput black; black pilose dorsally, golden pilose dorsolaterally, silvery white pilose on ventral half. Eye bare; with narrow, horizontal area frontally at level of antenna at which ommatidia are partly absent; the ommatidia present in this area are larger than elsewhere on the eye. Antennal fossa about 1.5 times as wide as high. Antenna black; antennal ratio approximately as 4:1:9; longer than distance between antennal fossa and anterior oral margin.
Thorax: Blackish brown with bronze and green metallic hues. Mesoscutum appressed black pilose, except for fasciae of appressed golden pile along anterior margin, transverse suture and posterior margin. Postpronotum and postalar callus white pilose. Scutellum semicircular; golden pilose; without calcars. Anepisternum with shallow sulcus; golden pilose anterodorsally, silvery white pilose posteriorly, widely bare anteroventrally. Anepimeron entirely silvery white pilose. Katepisternum silvery white pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter and halter yellow.
Wing: Hyaline. Microtrichose, except bare on first costal cell, basal 5/6 of cell R, basal 1/6 of cell CuP.
Legs: Yellow, except hind femur dark brown and hind tibia medially dark brown. Front and mid legs white to yellow pilose, except mid femur dorsally, anteriorly and ventrally black pilose. Hind leg white to yellow pilose, except femur ventrally densely occupied with short, black, bristly pile. Front coxa orange, mid and hind coxae brown; all coxae white pilose. Front and mid trochanters yellow, hind trochanter brown; all trochanters white pilose.
Abdomen: Constricted, narrower than thorax, with narrowest point halfway tergite 2. Tergites brown with faint metallic hues, except tergite 2 with pair of large rectangular yellow maculae on basal 3/5. Tergite 1 white pilose. Tergite 2 yellow pilose, except sparsely black pilose medially and white pilose along posterior margin. Tergite 3 black pilose, except white pilose anterolaterally and along lateral margin, and with fascia of golden pile along posterior margin; this fascia medially interrupted and gradually narrowing towards lateral margins. Tergite 4 black pilose, except golden pilose anterolaterally and along lateral margin, and with pair of large triangular patches of golden pile over posterior 2/3. Sternite 1 brown; bare. Sternite 2 yellow; short yellow pilose. Sternites 3 and 4 brown; white pilose. Male genitalia as in fig. 356.
Female: Unknown.
Diagnosis: Within *Rhopalosyrphus* s.l. this species is closely related to *Microdon abnormis* Curran. From that species it differs by the following characters (with character state in *M. abnormis* in parentheses): eye bare (pilose); antennal ratio approximately as 4:1:9 (2:1:2.5); scutellum without calcars (with calcars); anterior margin of tergite 2 clearly wider than posterior margin (about as wide).
Etymology The name *abnormoides* was chosen to underline the similarity of this species to *Microdon abnormis* Curran.

***Rhopalosyrphus* (s.l.) *oreokawensis* Reemer spec. nov.**
Figs. 350-354, 358.

Type specimens: HOLOTYPE. Adult male. FRENCH GUYANA. Label 1: "FRENCH GUYANA / Kaw Mountains / 04°32.893'N-52°10.245'W / 27.XI.2002. leg. V. Soon". Coll. RMNH.
Description (based on holotype)
Adult male Body size: 13 mm.
Head: Face occupying a little more than 1/3 of head width in frontal view; black; entirely white pilose;

ventral part of face anteriad of oral margin with lateral bulges, medially separated by shallow, smooth sulcus. Gena black, white pilose. Lateral oral margins slightly produced. Frons, vertex and occiput black; white pilose, except for sparse black pile on frons. Eye bare. Antennal fossa about as high as wide. Antenna brown; antennal ratio approximately as 4:1:3; slightly shorter than distance between antennal fossa and anterior oral margin.

Thorax: Black. Mesoscutum black pilose, except for fasciae of white pile along anterior margin and transverse suture, and patches of white pile posterolaterally. Postpronotum and postalar callus white pilose. Scutellum semicircular; white pilose; with small calcars with mutual distance about equal to 1/4 of width of scutellum. Anepisternum with deep sulcus; black pilose anterodorsally, white pilose posteriorly, widely bare in between. Anepimeron entirely white pilose. Katepisternum white pilose dorsally, bare ventrally. Katatergum long microtrichose, anatergum short microtrichose. Calypter yellow. Halter brown.

Wing: Hyaline, but infuscated at apical 1/2 of 2nd costal cell, subcostal cell, around vein RM, around veind R4+5 and posterior appendix of that vein, around vein dm-cu and around bm-cu. Microtrichose, except bare on first costal cell, basal 1/2 of second costal cell, basal 1/2 of cell R1, basal 1/3 of cell R2+3, posterobasal 1/4 of cell R4+5, entirely bare on cell R, basal 9/10 of cell BM, basal 2/3 of cell CuP, entirely on alula.

Legs: Front and mid legs orange brown, except mid femur blackish brown on basal 2/5; white pilose, except front tibia black pilose on apicodorsal 1/4, tarsi dorsally black pilose and mid femur on apical 1/2 posterodorsally with sparse bristle-like pile among long white pile. Hind leg black, except basal 1/2 of tibia and apical four tarsomeres dark brown; white pilose, except tarsus dorsally black pilose and femur on apical 1/5 with row of short, black, bristle-like pile anteroventrally; femur swollen: about 2.5 times as wide as mid femur. Front coxa brown, mid and hind coxae black; all coxae white pilose. Front and mid trochanters brown, hind trochanter black; all trochanters white pilose.

Abdomen: Constricted, narrower than thorax, with narrowest point at transition between segments 2 and 3. Tergites black, except tergite 2 with pair of large elongate yellow maculae on basal 3/5 and narrowly yellow along posterior margin, and tergite 3 vaguely brownish yellow along anterior margin. Tergite 1 white pilose. Tergite 2 short black pilose, except with long white pile anterolaterally and with thick, appressed white pile along posterior margin. Tergite 3 short black pilose, except for medially interrupted fasciae of thick, appressed white pile along anterior and posterior margins. Tergite 4 yellow pilose on lateral 1/4 and posterior 3/5, black pilose anteromedially and on narrow median vitta on posterior 3/5. Sternite 1 black; bare. Sternite 2 yellow except black along posterior margin; with sparse long white pile. Sternite 3 yellow at anterior 3/5, black posteriorly; short black pilose on posterior 1/2 to 3/5, long, thick white pilose along posterior and posterolateral margins. Sternite 4 brown; black pilose medially, yellow pilose laterally. Male genitalia as in fig. 358.

Female: Unknown.

Diagnosis: Within *Rhopalosyrphus* s.l. this species is singular because of its short antenna (slightly shorter than distance between antennal fossa and anterior oral margin) and the shape of the ventral part of the face.

Etymology The specific epithet is composed of the Greek *oreos* (mountain) and Kaw, the name of the French Guyanan mountain region in which the species was found.

Notes This species is very aberrant from other known species of *Rhopalosyrphus* because of the short antenna, the straight facial profile, the bare katepisternum and the long and slender second abdominal segment. These characters suggest that the species may not belong in *Rhopalosyrphus*. However, it is certainly related to that genus, considering the structure of the male genitalia and the constricted abdomen. If a new genus were to be erected for this species, more evidence on its phylogenetic affinities to *Rhopalosyrphus* and other related genera (e.g. *Pseudomicrodon*) should be available.

Thompsodon conspicillifrons **Reemer spec. nov.**
Figs. 423-433.

Type specimens: HOLOTYPE. Female. Label 1: "COSTA RICA, Prov. Limón, / A.C.L.A.C., Talamanca, San Miguel, / Albergue, CASACODE, Send Cerillos. / 10-30 m. 23-26 FEB 1999. M. Lobo. / L_S_391000_612000 #52454"; label 2: "MCR-12"; label 3 (barcode): "INB0003024775 / INBIOCRI COSTA RICA". Coll. INBIO.

Adult male Body size: 8 mm.

Head: Face occupying about 1/3 of head width in frontal view; yellow with black median vitta, which is dor-

sally about as wide as the antennal fossa and gradually narrows downward, becoming absent in ventral 1/4; yellow pilose, except for sparse black pile submedially, narrowly bare medially. Genae blackish; yellow pilose. Lateral oral margins not produced. Frons black; golden pilose; laterally with round, concave areas, filled with dense golden pile, ventrally delimited by a sharply defined ridge. Vertex irregularly swollen; black; short golden pilose. Ocellar triangle not elevated. Occiput narrow ventrally, strongly widened dorsally; black; golden pilose. Eye bare. Antennal fossa about as high as wide. Antenna with scape pale brown, pedicel and basoflagellomere blackish brown; antennal ratio approximately as 4:1:4.

Thorax: Mesoscutum black; golden pilose, except for pair of black pilose patches anteriad of transverse suture and wide fascia of black pile posteriad of trensverse suture. Postpronotum and postalar callus brown, golden pilose. Scutellum black; golden pilose. Pleurae yellowish brown, except anepisternum and anepimerond blackish. Anepisternum with deep sulcus separating posterior from anterior part; entirely mixed yellow and black pilose. Anepimeron entirely mixed yellow and black pilose. Katepisternum long yellow pilose dorsally, bare ventrally. Katatergum short microtrichose, anatergum bare. Calypter dark greyish. Halter yellow.

Wing: hyaline, slightly brownish, especially anteriorly; microtrichose, except bare on 1st costal cell, posterobasal 1/6 of 2nd costal cell, basal 1/6 of cell R1, entirely on cell R except microtrichose on vena spuria, basal 1/2 of cell BM, basal 1/2 of cell CuP.

Legs: Femora blackish brown, except yellow apically; black pilose. Tibiae and tarsi yellow. Tibiae yellow pilose, except black pilose apically. Tarsi black pilose. Coxae and trochanters blackish brown; black pilose.

Abdomen: More or less oval, but tergite 1 very narrow, so appears constricted basally. Tergites 3 and 4 not fused, able to articulate independently. Tergites blackish. Tergite 1 yellow pilose. Tergite 2 short black pilose, with medially interrupted fascia of longer golden pile along posterior margin. Tergite 3 with similar pattern of pile as tergite 2, but fascia of golden pile medially strongly extended over median part of tergite. Tergite 4 largely golden pilose, except for narrow median vitta of black pile and sublateral oblique vittae of black pile. Tergite 5 golden pilose. Sternites black. Sternite 1 bare, other sternites golden pilose.

Male unknown.

Etymology: The specific epithet is composed of the Latin words *conspicillum* (spectacles) and *frons* (forehead). The name refers to the concave lateral areas on the frons, which – in the eyes of susceptible beholders – evoke the impression of glasses on a forehead. To be treated as noun in apposition.

Diagnosis: This is the only known species of *Thompsodon*.

Notes: This species was first recognized as an undescribed taxon by F.C. Thompson, who gave it the preliminary code-name *Microdon* MCR-12.

Appendix 2: Species classification of Microdontinae

In total, 565 species group names (excluding misspellings) applying to Microdontinae are currently known, including 93 synonyms and 26 species described in the present paper. Based on the generic diagnoses and discussions in the preceding section of this paper, the classification of all but a few of these species is re-evaluated. This has resulted in a new species classification, partly based on examination of type material. Of 356 specific taxa the primary types (or, in seven of these cases, photographic images of those) were examined. In addition, the classification of six species is based on paratypes. In several cases, no type material was examined, e.g. in the case of well-known taxa from temperate regions, in the case of groups that have been revised by other authors (*Mixogaster, Spheginobaccha*), in the case of recently described species of which good illustrations are available, and in cases of species of which the types could not be found. For these cases, original descriptions, additional material and literature have been consulted. For each taxon, the source of the information on which the classification was based is indicated (for legend see below).
Of all 565 available species group names, 472 are here considered as valid, 93 as synonyms (17 of which are new synonyms proposed here). 20 species names (including three synonyms) are left unclassified.

The following format is used:

species name Author, Year: page (*Original genus*). COLLECTION: KIND_OF_TYPE SEX/STAGE. [**SOURCE**] Remarks.

*: An asterisk denotes information which supplements or corrects information in Systema Dipterorum (Thompson 2010).
Acronyms for type information follow Systema Dipterorum (Thompson 2010):
KIND_OF_TYPE: HT = holotype; LT = lectotype; NT = neotype; ST = syntype(s); T = unspecified.
SEX/STAGE: A = adult; F = female; L = larva; M = male; P = puparium.
[SOURCE]: This indicates the source of the information on which the classification is based. The following codes are used:
1a = primary type(s) studied
1b = photograph(s) of primary type(s) studied
1c = paratype(s) studied
2 = description studied
3 = non-type specimens studied
4 = additional literature studied

Synonymies are based on Thompson (2010), unless they are marked with "**Syn. nov.**". In the latter case, they are based on the judgement of the first author. Information on the type locality and a full reference to the description is omitted, as this can be found in Thompson (2010) and the regional Diptera catalogues.

Genus *Afromicrodon* Thompson, 2008

Afrotropical

comoroensis De Meyer, De Bruyn & Janssens, 1990: 571 (*Ceratophya*). RMCA*: HT* M*. [**1a**]
johannae Doesburg, 1957: 109 (*Ceratophya*). MNHN*: HT* M*. [**1a**] Paratypes in RMNH.
luctiferus Hull, 1941: 320 (*Microdon*). ANSP: T F*. [**3: RMCA**]
madecassa Keiser, 1971: 256 (*Ceratophya*). MNHN*: HT* M*. [**1a**] Possible junior synonym of *Afromicrodon luctiferus* (Hull, 1941).
stuckenbergi Keiser, 1971: 258 (*Ceratophya*). MNHN*: HT* F*. [**1a**]

Genus *Archimicrodon* Hull, 1945

Afrotropical

ampefyanus Keiser, 1971: 239 (*Microdon*). MNHN*: HT* M*. [**1a**]

brevicornis Loew, 1858: 376 (*Microdon*). NHRS*: ST* MF*. [**1a**]
caeruleomaculatus Keiser, 1971: 241 (*Microdon*). MNHN*: HT* F*. [**1a**]
clatratus Keiser, 1971: 240 (*Microdon*). MNHN*: HT* F*. [**1a**]
fenestrellatus Keiser, 1971: 242 (*Microdon*). MNHN*: HT* M*. [**1a**]
kavitahaius Keiser, 1971: 243 (*Microdon*). MNHN*: HT* F*. [**1a**]
liberiensis Curran, 1929: 4 (*Microdon*). AMNH: HT F*. [**1c**] Paratypes (1 male & 1 female) in RMCA.
malagasicus Keiser, 1971: 244 (*Microdon*). MNHN*: HT* F*. [**1a**]
nigrocyaneus Hull, 1964: 460 (*Microdon*). MZLU: HT* F*. [**1a**]
obesus Hervé-Bazin, 1913: 100 (*Microdon*). RMCA*: HT* M*. [**1a**] Holotype (male) & allotype (female) in RMCA.
ranavalonae Keiser, 1971: 246 (*Microdon*). MNHN*: HT* F*. [**1a**]
sudanus Curran, 1923: 146 (*Microdon*). BMNH: HT F*. [**1a**]
tenuifrons Curran, 1929: 5 (*Microdon*). AMNH: HT M. [**1a**]
testaceus Walker, 1857: 152 (*Microdon*). BMNH (lost)*: T A. [**3: RMNH & ZMAN**]
wainwrighti Curran, 1938: 6 (*Microdon*). AMNH: HT M*. [**1a**]

Australian / Oceanian

barringtonensis Ferguson, 1926: 180 (*Microdon*). ANIC*: HT* M*. [**1b**]
boharti Curran, 1947: 2 (*Microdon*). AMNH: HT F. [**1a**]
brachycerus Knab & Malloch, 1912: 235 (*Microdon*). USNM*: HT* M. [**1a**] type with empty puparium
browni Thompson, 1968: 44 (*Microdon*). MCZ: HT M. [**1b, 2**]
fergusoni Goot, 1964: 220 (*Microdon*). QMBA*: T M*. [**1a**] Replacement name for *M. modestus* Ferguson, 1926.
= *modestus* Ferguson, 1926: 179 (*Microdon*). Preocc. Knab, 1917.
= *fergusoni* Thompson, 1968: 44 (*Microdon*). Preocc. Goot, 1964.
grageti Meijere, 1908: 207 (*Microdon*). HNHM (lost)*: T M. [**2**] Type lost (de Jong 2000).
incisuralis Walker, 1865: 113 (*Paragus*). BMNH: HT* F. [**1a**]
limbinervis Meijere, 1908: 208 (*Microdon*). HNHM (lost)*: T F. [**3: ZMAN, ID by De Meijere**]. Type lost (de Jong 2000). Non-type female identified by de Meijere in ZMAN.
luctiferus Walker, 1865: 113 (*Paragus*). BMNH: T F. [**1a**]
malukensis Reemer, spec. nov. (*Archimicrodon*). RMNH: HT M. [**1a**]
nicholsoni Ferguson, 1926: 173 (*Microdon*). ANIC*: HT* F. [**1b**]
novaeguineae Meijere, 1908: 206 (*Microdon*). ZMAN*: ST* F*. [**1a**]
purpurescens Shiraki, 1963: 147 (*Microdon*). USNM: HT F. [**2**]
tabanoides Hull, 1944: 246 (*Microdon*). BMNH: HT* F. [**1a**]
venosus Walker, 1865: 112 (*Paragus*). BMNH: T M*. [**1a**]
= *papuanus* Doesburg, 1959: 234 (*Microdon*). RMNH: HT* [**1a**] **Syn. nov.**
vittatus Macquart, 1850: 433 (*Aphritis*). OUMNH*: T F. [**1a**]
= *transiens* Walker, 1852: 225 (*Eumerus*). BMNH: T F. [**1a**]
= *pachypus* Bigot, 1884: 541 (*Paragus*). BMNH: HT* [**1a**]

Oriental

caeruleus Brunetti, 1908: 92 (*Microdon*). ZSI*: HT F. [**2**]
clavicornis Sack, 1926: 592 (*Microdon*). USNM*: HT* F. [**1a**]
investigator Hull, 1937: 20 (*Microdon*). MCZ: HT M. [**1b**]
lanka Keiser, 1958: 213 (*Microdon*). NMB Basel: HT* F. [**1a**]
minuticornis Curran, 1931: 342 (*Microdon*). BMNH: HT F*. [**1c: USNM**]
simplicicornis Meijere, 1908: 205 (*Microdon*). ZMAN: HT* M. [**1a**]
= *digitator* Hull, 1937: 19 (*Microdon*). MCZ: HT M. [**1b**] **Syn. nov.**
varicornis Sack, 1926: 594 (*Microdon*). USNM*: HT* F. [**1a**]

Palaearctic

simplex Shiraki, 1930: 15 (*Microdon*). NIAS: T A. [**3: RMNH & coll. M. Hauser**] Described as var. of the Oriental *Microdon caeruleus* Brunetti, 1908.

Subgenus *Hovamicrodon* Keiser, 1971

Aftotropical

flavifacies Keiser, 1971: 248 (*Hovamicrodon*). MNHN*: T F*. [**1a**]
fuscipennis Keiser, 1971: 249 (*Hovamicrodon*). MNHN*: T F*. [**1a**]
hova Hervé-Bazin, 1913: 398 (*Microdon*). MNHN*: ST* MF*. [**1a**] **Comb. nov.**
nubecula Keiser, 1971: 250 (*Hovamicrodon*). MNHN*: T F*. [**1a**]
silvester Keiser, 1971: 251 (*Hovamicrodon*). MNHN*: HT* M*. [**1a**]
vulpicolor Hull, 1941: 321 (*Microdon*). ANSP: T F*. [**3: RMCA**] **Comb. nov.**

Genus *Aristosyrphus* Curran, 1941

Neotropical

boraceiensis Papavero, 1962: 319 (*Ceratophya*). MZUSP: HT F. [**2**]
carpenteri Hull, 1945: 76 (*Ceratophya*). MCZ: HT F. [**1b**]
minutus Thompson, 2004: 567 (*Aristosyrphus*). DZUP: HT* M*. [**2**]
primus Curran, 1941: 252 (*Aristosyrphus*). AMNH: HT M. [**1a**]

Subgenus *Eurypterosyrphus* Barretto & Lane, 1947

currani Goot, 1964: 214 (*Microdon*). BMNH*: F*. [**1a**] Replacement name for *Microdon clavicornis* Curran, 1940.
= *clavicornis* Curran, 1940: 6 (*Microdon*). BMNH: T F. Preocc. Sack, 1926.
macropterus Curran, 1941: 254 (*Ceratophya*). AMNH: HT F. [**1a**]
melanopterus Barretto & Lane, 1947: 142 (*Eurypterosyrphus*). MZUSP: HT F. [**1a**]

Genus *Bardistopus* Mann, 1920

Australian / Oceanian

papuanum Mann, 1920: 61 (*Bardistopus*). USNM: HT M. [**1a**]

Genus *Carreramyia* Doesburg, 1966

Neotropical

flava Sack, 1941: 117 (*Ceratophya*). SNSD*: HT* F*. [**1a**]
megacephalus Shannon, 1925: 213 (*Microdon*). USNM: HT M. [**1a**]
megacera Reemer, in prep. (*Carreramyia*). RMNH: HT F. [**1a**] [*see disclaimer below*]
tigrina Reemer, in prep. (*Carreramyia*). RMNH: HT F. [**1a**] [*see disclaimer below*]
[*Disclaimer*: Descriptions of *C. megacera* and *C. tigrina* are in preparation. The inclusion of these names in the present paper is disclaimed for purposes of zoological nomenclature, in reference to article 8.3 in ICZN 1999.]

Genus *Ceratophya* Wiedemann, 1830

Neotropical

argentinensis Reemer, in prep. (*Carreramyia*). RMNH: HT F. [**1a**] [*see disclaimer below*]
carinifacies Curran, 1934: 376 (*Microdon*). AMNH: T F. [**1a**]
notata Wiedemann, 1824: 14 (*Ceratophya*). NMW*: M*. [**1a**]
panamensis Curran, 1930: 6 (*Microdon*). AMNH: HT M. [**1a**]
scolopus Shannon, 1927: 20 (*Microdon*). BMNH: T M. [**1a**]
[*Disclaimer*: Description of *C. argentinensis* is in preparation. The inclusion of this name in the present paper is disclaimed for purposes of zoological nomenclature, in reference to article 8.3 in ICZN 1999.]

Genus *Ceratrichomyia* Séguy, 1951

Afrotropical

angolensis Reemer spec. nov. (*Ceratrichomyia*). CNC: HT M. [**1a**]
behara Séguy, 1951: 14 (*Ceratrichomyia*). MNHN: LT* M*. [**1a**]
bullabucca Reemer spec. nov. (*Ceratrichomyia*). MNHN: HT M. [**1a**]

Genus *Ceriomicrodon* Hull, 1937

Neotropical

petiolatus Hull, 1937: 25 (*Ceriomicrodon*). USNM: T M*. [**1a**]

Genus *Cervicorniphora* Hull, 1945

Australian

alcicornis Ferguson, 1926: 171 (*Microdon*). ANIC*: HT* M. [**1b**]

Genus *Chrysidimyia* Hull, 1937

Neotropical

chrysidimima Hull, 1937: 116 (*Chrysidimyia*). CM*: M*. [**1a**]
= *chrysidiformis* Hull, 1944: 241 (*Chrysidimyia*). Misspelling of *C. chrysidimima*.
= *granulatus* Curran, 1940: 9 (*Microdon*). BMNH: HT F. [**1a**] **Syn. nov.**
= *lazuli* Hull, 1944: 241 (*Chrysidimyia*). BMNH: HT F. [**1a**] **Syn. nov.**

Genus *Domodon* Reemer gen. nov.

Neotropical

zodiacus Reemer spec. nov. (*Domodon*). RMNH: HT M. [**1a**]

Genus *Furcantenna* Cheng, 2008

Oriental

nepalensis Reemer spec. nov. (*Furcantenna*). CNC: HT M. [**1a**]
yangi Cheng, 2008: 29 (*Furcantenna*). CASB: HT M. [**2**]

Genus *Heliodon* Reemer gen. nov.

Oriental

chapini Hull, 1941: 438 (*Microdon*). USNM: HT M. [**1a**]
doris Reemer spec. nov. (*Heliodon*). RMNH: HT M. [**1a**]
elisabeth Keiser, 1958: 211 (*Microdon*). NMB Basel: HT M. [**1a**]
elisabethanna Reemer spec. nov. (*Heliodon*). QSBG: HT F. [**1a**]
gloriosus Hull, 1941: 439 (*Microdon*). USNM: HT M. [**1a**]
= *aurivesta* Hull, 1950: 611 (*Microdon*). BMNH: HT M. [**1a**] **Syn. nov.**
klossi Curran, 1931: 343 (*Microdon*). BMNH: HT M. [**1a**]
tiber Reemer spec. nov. (*Heliodon*). ZMAN: HT M. [**1a**]
tricinctus Meijere, 1908: 208 (*Microdon*). ZMAN: ST* MF*. [**1a**]

Genus *Hypselosyrphus* Hull, 1937

Neotropical

amazonicus Reemer, in prep. (*Hypselosyrphus*). Replacement name for *Microdon scutellaris* Shannon, 1927. . [*see disclaimer below*]
= *scutellaris* Shannon, 1927: 20 (*Microdon*). BMNH: T F. [**1a**] Preocc. Schummel, 1842
anax Thompson, 1976: 61 (*Microdon*). Replacement name for *Microdon analis* Curran, 1940.
= *analis* Curran, 1940: 3 (*Microdon*). AMNH: HT M. [**1a**] Preocc. Macquart, 1842.
corbiculipes Papavero, 1962: 320 (*Hypselosyrphus*). MZUSP: HT F. [**1a**]
helvus Reemer, in prep. (*Hypselosyrphus*). USNM: HT F. [**1a**] [*see disclaimer below*]
maurus Reemer, in prep. (*Hypselosyrphus*). RMNH: HT M. [**1a**] [*see disclaimer below*]
pingo Reemer, in prep. (*Hypselosyrphus*). ZMAN: HT F. [**1a**] [*see disclaimer below*]
plaumanni Curran, 1940: 3 (*Microdon*). AMNH: T F. [**1a**]
pseudorhoga Reemer, in prep. CNC: HT F. [**1a**] [*see disclaimer below*]
trigonus Hull, 1937: 21 (*Hypselosyrphus*). MCZ: T M. [**1a**]
ulopodus Hull, 1944: 34 (*Ubristes*). CU: T F. [**1a**]
vexillipennis Reemer, in prep. (*Hypselosyrphus*). USNM: HT F. [**1a**] [*see disclaimer below*]
[*Disclaimer*: Descriptions of *H. amazonicus, H. helvus, H. maurus, H. pingo, H. pseudorhoga* and *H. vexillipennis* are in preparation. The inclusion of these names in the present paper is disclaimed for purposes of zoological nomenclature, in reference to article 8.3 in ICZN 1999.]

Genus *Indascia* Keiser, 1958

Oriental

brachystoma Wiedemann, 1824: 33 (*Ascia*). ZMUC: LT M. [**1a**]
gigantica Reemer spec. nov. (*Indascia*). QSBG: HT M. [**1a**]
gracilis Keiser, 1958: 223 (*Indascia*). NMB: HT M. [**1a**]

spathulata Reemer spec. nov. (*Indascia*). RMNH: HT M. [**1a**]

Genus *Kryptopyga* Hull, 1944

Oriental

pendulosa Hull, 1944: 130 (*Kryptopyga*). BMNH: HT M. [**1a**]
sulawesiana Reemer spec. nov. (*Kryptopyga*). RMNH: HT M. [**1a**]

Genus *Laetodon* Reemer gen. nov.

Nearctic

laetoides Curran, 1935: 3 (*Microdon*). AMNH: HT F. [**1a**]
laetus Loew, 1864: 74 (*Microdon*). MCZ (lost): ST MF. [**3: USNM**]
= *scitulus* Williston, 1887: 10 (*Microdon*). USNM: HT M. [**4: Thompson 1981b**]
solitarius Curran, 1930: 8 (*Microdon*). AMNH*: F*. [**1a**]
violens Townsend, 1895: 34 (*Microdon*). SEMC*: T F. [**3: USNM**]

Neotropical

geijskesi Doesburg, 1966: 80 (*Microdon*). RMNH*: T M. [**1a**]

Genus *Masarygus* Brèthes, 1908

Neotropical

palmpipalpus Reemer spec. nov. (*Masarygus*). RMNH: HT M. [**1a**]
planifrons Brèthes, 1908: 442 (*Masarygus*). MACN: ST MF*. [**1a**]

Genus *Menidon* Reemer gen. nov.

Neotropical

falcatus Williston, 1887: 9 (*Microdon*). USNM: LT M. [**3: RMNH & USNM**]
= *aquilinus* Giglio-Tos, 1892: 2 (*Microdon*). MRSN: HT F. [**4: Thompson 2007**]
= *hondurania* Hull, 1940: 247 (*Microdon*). CNC*: HT* M*. [**4: Thompson 2007**]
= *mellogutta* Hull, 1943: 104 (*Microdon*). BMNH: HT F. [**4: Thompson 2007**]

Genus *Mermerizon* Reemer gen. nov.

Neotropical

inbio Reemer, spec. nov. (*Mermerizon*). INBIO: HT M. [**1a**]
mellosus Reemer, in prep. (*Mermerizon*). INBIO: HT M. [**1a**] [*see disclaimer below*]
mesmerizus Reemer, in prep. (*Mermerizon*). RMNH: HT M. [**1a**] [*see disclaimer below*]
[*Disclaimer*: Descriptions of *M. mellosus* and *M. mesmerizus* are in preparation. The inclusion of these names in the present paper is disclaimed for purposes of zoological nomenclature, in reference to article 8.3 in ICZN 1999.]

Genus *Metadon* Reemer gen. nov.

Afrotropical

aethiopicus Rondani, 1873: 282 (*Microdon*). MCGD*: T F*. [**3: BMNH**]
apis Speiser, 1913: 145 (*Microdon*). Type lost?*: T F*. [**2**] Type not in NMSA, not in SAMC.
appendiculatus Curran, 1929: 6 (*Microdon*). AMNH*: HT* M*. [**1a**] Paratype female in RMCA.
aureomagnificus Hull, 1944: 242 (*Microdon*). BMNH: HT* M*. [**1a**]
captum Speiser, 1913: 146 (*Microdon*). T F*. [**3: ZMAN & coll. M. Hauser**] Male described by Van Doesburg 1956, but this description seems to apply better to the male of *M. punctulatus* Wiedemann.
erythrocephalus Bezzi, 1915: 130 (*Microdon*). BMNH: T F*. [**1a**]
inappendiculatus Curran, 1929: 7 (*Microdon*). AMNH: HT M. [**1a**]
inermis Loew, 1858: 376 (*Microdon*). NHRS*: T M*. [**1a**]
modesticolor Hull, 1944: 251 (*Microdon*). BMNH*: HT* M*. [**1a**]
mydas Bezzi, 1915: 128 (*Microdon*). BMNH: ST* MF*. [**1a**]
mynthes Seguy, 1953: 157 (*Microdon*). MNHN: T M*. [**1a**]
pallidus Bezzi, 1915: 133 (*Microdon*). BMNH: ST* MF*. [**1a**]
punctulatus Wiedemann, 1824: 32 (*Microdon*). ZMUC*: HT* M*. [**1a**]
= *microtuberculatus* Hull, 1964: 459 (*Microdon*). MZLU: HT* F*. [**1a**] **Syn. nov.** Paratype female also in MZLU.
rugosus Bezzi, 1915: 126 (*Microdon*). BMNH: HT* M*. [**1a**]
= *concolor* Bezzi, 1923: 349 (*Microdon*). MNHN*: HT* M*. [**1a**] Described as subspecies of *Microdon rugosus* Bezzi, 1915.
= *fuscus* Bezzi, 1921: 21 (*Microdon*). T M*. [**2**] Described as var. of *Microdon rugosus* Bezzi, 1915. Junior primary homonym of *Microdon fuscus* Meijere, 1908.
= *melas* Bezzi, 1921: 21 (*Microdon*). T M*. [**2**] Described as var. of *Microdon rugosus* Bezzi, 1915.
= *minor* Bezzi, 1921: 20 (*Microdon*). T M*. [**2**] Described as var. of *Microdon rugosus* Bezzi, 1915.

Australian / Oceanian

apicalis Walker, 1858: 94 (*Microdon*). BMNH: T F. [**1a**]
fulvicornis Walker, 1858: 94 (*Microdon*). BMNH: HT* F*. [**1a**]
= *tuberculatus* Meijere, 1913: 359 (*Microdon*). ZMAN: T M. [**1a**] **Syn. nov.**

Oriental

achterbergi Reemer spec. nov. (*Metadon*). RMNH: HT F. [**1a**]
albofascia Hull, 1944: 253 (*Microdon*). BMNH: HT F. [**1a**]
annandalei Brunetti, 1907: 13 (*Microdon*). ZSI: HT M. [**3: BMNH & SEMC**]
auricinctus Brunetti, 1908: 93 (*Microdon*). BMNH: HT M*. [**1a**]
auroscutatus Curran, 1928: 152 (*Microdon*). BMNH: HT M*. [**1a**]
= *variventris* Curran, 1928: 154 (*Microdon*). BMNH: HT F. [**1a**] Described as var. of *Microdon auroscutatus* Curran, 1928.
bicolor Sack, 1922: 272 (*Microdon*). DEI*: T M*. [**1a**]
bicoloratus Hull, 1944: 254 (*Microdon*). BMNH: HT M. [**1a**]
flavipes Brunetti, 1908: 92 (*Microdon*). ZSI: HT F. [**2**]
fulvipes Meijere, 1908: 203 (*Microdon*). RMNH*: T F. [**1a**]
= *aurilinea* Hull, 1944: 258 (*Microdon*). BMNH: HT M*. [**1a**] **Syn. nov.**
fuscicornis Sasakawa, 1960: 451 (*Microdon*). T M. [**2**]
fuscus Meijere, 1908: 204 (*Microdon*). ZMAN*: T F. [**1a**]
montis Keiser, 1958: 214 (*Microdon*). NMB Basel: HT M. [**1a**]
pendelburyi Curran, 1931: 305 (*Microdon*). BMNH*: HT* F*. [**1a**]

pretiosus Curran, 1931: 304 (*Microdon*). BMNH: HT M. [**1a**]
robinsoni Curran, 1928: 154 (*Microdon*). BMNH: HT F. [**1a**]
ruficaudus Brunetti, 1907: 93 (*Microdon*). BMNH: HT F. [**1a**]
rutiliventris Vockeroth, 1975: 371 (*Microdon*). AMNH*: T F*. [**1b**] Replacement name for *Microdon rufiventris* Curran, 1942.
= *rufiventris* Curran, 1942: 4 (*Microdon*). BMNH: HT F. [**1b**] Preocc. Rondani, 1848.
rutilus Keiser, 1952: 173 (*Microdon*). NMB Basel: HT M. [**1a**]
sacki Goot, 1964: 220 (*Microdon*). USNM?*: HT M*. [**3: type of var. *nigritus* Hull**] Replacement name for *Microdon flavipennis* Sack, 1926.
= *flavipennis* Sack, 1926: 593 (*Microdon*). USNM?*: T M. [**2**] Preocc. Curran, 1925.
= *nigrita* Hull, 1944: 257 (*Microdon*). BMNH: HT M. [**1a**] Described as var. of *Microdon flavipennis* Sack, 1926.
squamipennis Brunetti, 1923: 316 (*Microdon*). ZSI: HT F. [**2**]
taprobanicus Keiser, 1958: 212 (*Microdon*). NMB Basel: HT M. [**1a**]
wulpii Mik, 1899: 143 (*Microdon*). RMNH*: T F*. [**1a**] Replacment name for *Microdon apicalis* Wulp, 1892.
= *apicalis* Wulp, 1892: 29 (*Microdon*). RMNH*: HT* F. Preocc. Walker, 1859. Knutson et al. (1975) erroneously cite publication year as 1881.
= *wulpii* Brunetti, 1908: 93 (*Microdon*). RMNH*: T F*. Unnecesary replacement name for *Microdon apicalis* Wulp, 1881. Preocc. Mik, 1899.

Palaearctic

bifasciatus Matsumura, 1916: 254 (*Microdon*). SEHU*: T F. [**3: RMNH**]
brunneipennis Huo, Ren & Zheng, 2007: 398 (*Microdon*). HU*: HT* F*. [**2**]
pingliensis Huo, Ren & Zheng, 2007: 401 (*Microdon*). HU*: HT* M*. [**2**]
spuribifasciatus Huo, Ren & Zheng, 2007: 403 (*Microdon*). HU*: HT* M*. [**2**]

Genus *Microdon* Meigen, 1803

Subgenus *Chymophila* Macquart, 1834

Nearctic

fulgens Wiedemann, 1830: 82 (*Microdon*). ZMHU: LT F. [**1a**]
= *euglossoides* Gray, 1832: 779 (*Microdon*). OUMNH: T A. [**4: Thompson et al. 1976**]
= *splendens* Macquart, 1834: 486 (*Chymophila*). OUMNH: LT M. [**1a**]

Neotropical

angulatus Hull, 1943: 715 (*Microdon*). BMNH: T M. [**1a**]
argentinae Hull, 1937: 18 (*Microdon*). MCZ: T M. [**1b**]
aurifacius Hull, 1937: 169 (*Microdon*). USNM*: M*. [**1a**]
aurifex Wiedemann, 1830: 85 (*Microdon*). NMW: T M*. [**1a**]
= *trochilus* Walker, 1852: 216 (*Microdon*). BMNH: T M*. [**1a**]
barbiellinii Curran, 1936: 6 (*Microdon*). AMNH: T M. [**1a**]
bruchi Shannon, 1927: 38 (*Microdon*). USNM: ST F. [**1a**]
cyaneiventris Macquart, 1846: 249 (*Aphritis*). OUMNH: ST* F. [**1a**]
= *cyanoventris* Williston, 1886: 310 (*Aphritis*). Misspelling.
cyaneus Perty, 1833: 186 (*Microdon*). ZSM*: A. [**2**]
emeralda Hull, 1943: 719 (*Microdon*). BMNH: HT* M. [**1a**]
flavoluna Hull, 1943: 718 (*Microdon*). BMNH: HT* M. [**1a**]
histrio Wiedemann, 1830: 83 (*Microdon*). ZMHU: T F. [**1a**]
inaequalis Loew, 1866: 40 (*Microdon*). MCZ (lost)*: T M. [**3: USNM**]
instabilis Wiedemann, 1830: 83 (*Microdon*). ZMHU: T F. [**1a**]

= *dives* Rondani, 1848: 72 (*Aphritis*). UTOR*: T M. [**2**]
limbatus Wiedemann, 1830: 85 (*Microdon*). ZMHU: T A. [**1a**]
marceli Curran, 1936: 7 (*Microdon*). AMNH: T M. [**1a**]
nero Curran, 1936: 6 (*Microdon*). AMNH: T M. [**1a**]
nestor Curran, 1940: 11 (*Microdon*). AMNH: T M. [**1a**]
opulentus Bigot, 1883: 319 (*Microdon*). BMNH*: HT* M*. [**1a**]
pulcher Williston, 1887: 5 (*Microdon*). USNM: LT* F. [**1a**]
shannoni Curran, 1940: 8 (*Microdon*). AMNH: T F. [**1a**]
splendens Wiedemann, 1830: 84 (*Microdon*). NMW: T M. [**3: USNM**]
stramineus Hull, 1943: 703 (*Microdon*). BMNH: HT* F. [**1a**]
superbus Wiedemann, 1830: 82 (*Microdon*). SMF: HT* F. [**1a**]
tigrinus Curran, 1940: 11 (*Microdon*). AMNH: T M. [**1a**]
willistoni Mik, 1899: 143 (*Microdon*). AMNH*: HT* M*. [**1a**] Replacement name for *Microdon inermis* Williston, 1888.
= *inermis* Williston, 1888: 258 (*Microdon*). AMNH: T M. Preocc. Loew, 1858.

Oriental

aenoviridis Curran, 1931: 302 (*Microdon*). BMNH: HT M. [**1a**]
baramus Curran, 1942: 3 (*Microdon*). AMNH*: HT F. [**1a**]
beatus Curran, 1942: 4 (*Microdon*). AMNH*: HT F*. [**1a**]
latiscutellaris Curran, 1931: 341 (*Microdon*). BMNH: HT F. [**1a**]
lativentris Meijere, 1921: 52 (*Microdon*). ZMAN: T M. [**1a**]
= *grandis* Curran, 1928: 159 (*Microdon*). BMNH: HT M. [**1a**] **Syn. nov.**
lundura Curran, 1942: 3 (*Microdon*). AMNH*: HT M. [**1a**]
stilboides Walker, 1849: 538 (*Microdon*). BMNH: HT* M*. [**1a**]

Subgenus *Dimeraspis* Newman, 1838

Nearctic

abditus Thompson, 1981: 732 (*Microdon*). USNM: HT M. [**1a**]
adventitius Thompson, 1981: 735 (*Microdon*). USNM: HT M. [**1a**]
fuscipennis Macquart, 1834: 488 (*Ceratophya*). OUMNH: LT F. [**3: USNM**]
= *agapenor* Walker, 1849: 539 (*Microdon*). BMNH: ST F. [**1a**] Thompson 1981.
= *pachystylum* Williston, 1887: 8 (*Microdon*). USNM: HT M. [**1a**] Thompson 1981.
globosus Fabricius, 1805: 185 (*Mulio*). MNHN: LT F. [**1a**] Original type lost (see Zimsen 1964); lectotype designation by Thompson 1981b.
= *albipilis* Curran, 1925: 54 (*Microdon*). CNC: HT M. [**4: Thompson 1981b**]
= *conflictus* Curran, 1925: 58 (*Microdon*). CNC*: LT M. [**4: Thompson 1981b**]
= *hutchingsi* Curran, 1927: 89 (*Microdon*). CNC: HT F. [**4: Thompson 1981b**]
= *marmoratus* Bigot, 1883: 320 (*Microdon*). BMNH*: ST* MF*. [**1a**]
= *podagra* Newman, 1838: 373 (*Dimeraspis*). BMNH: HT M. [**1a**]
= *pseudoglobosus* Curran, 1925: 57 (*Microdon*). SEMC*: HT* M*. [**4: Thompson 1981b**]

Neotropical

remotus Knab, 1917: 142 (*Microdon*). USNM: T M. [**4: Thompson 1981a**]
= *banksi* Hull, 1942: 91 (*Microdon*). MCZ: T F. [**4: Thompson 1981a**]

Subgenus *Megodon* Keiser, 1971

Afrotropical

planitarsus Keiser, 1971: 245 (*Microdon*). MNHN*: HT* M*. [**1a**]

stuckenbergi Keiser, 1971: 253 (*Megodon*). MNHN*: HT* M*. [**1a**]

Subgenus *Microdon* Meigen, 1803 s.s.

Nearctic

abstrusus Thompson, 1981: 735 (*Microdon*). USNM*: HT M. [**1a**]**.** Paratype male in BMNH.
albicomatus Novak, 1977: 664 (*Microdon*). WSU: HT M*. [**3: ZMAN**]
aurulentus Fabricius, 1805: 185 (*Mulio*). MNHN: LT F. [**1a**]
cothurnatus Bigot, 1883: 320 (*Microdon*). BMNH*: HT* M*. [**1a**]
= *cockerelli* Jones, 1922: 17 (*Microdon*). USNM: ST M. [**4: Thompson 1981b**]
lanceolatus Adams, 1903: 222 (*Microdon*). SEMC: HT M*. [**3: USNM**]
= *coloradensis* Cockerell & Andrews, 1916: 53 (*Microdon*). USNM: HT M*. [**1a**]
= *modestus* Knab, 1917: 139 (*Microdon*). USNM: HT M*. [**1a**]
= *senilis* Knab, 1917: 139 (*Microdon*). USNM: HT F*. [**1a**]
= *similis* Jones, 1917: 219 (*Microdon*). USNM: LT F*. [**1a**] Described as var. of *Microdon cothurnatus* Bigot, 1883.
manitobensis Curran, 1924: 227 (*Microdon*). CNC: LT M*. [**1a**]
megalogaster Snow, 1892: 34 (*Microdon*). SEMC: HT M*. [**3: BMNH & RMNH**]
= *bombiformis* Townsend, 1895: 33 (*Microdon*). SEMC: HT F*. [**4: Thompson 1981b**]
newcomeri Mann, 1924: 94 (*Microdon*). USNM: HT M*. [**1a**]
ocellaris Curran, 1924: 227 (*Microdon*). USNM: LT F*. [**1a**]
piperi Knab, 1917: 136 (*Microdon*). USNM: LT M*. [**1a**]**.** Holotype with empty puparium.
ruficrus Williston, 1887: 7 (*Microdon*). USNM: HT M*. [**1a**] Described as var. of *Microdon tristis* Loew, 1864.
= *basicornis* Curran, 1925: 79 (*Microdon*). CNC: HT M*. [**4: Thompson 1981b**]
= *champlaini* Curran, 1925: 71 (*Microdon*). USNM: HT M*. [**1a**]
tristis Loew, 1864: 73 (*Microdon*). MCZ (lost)*: T F*. [**3: CNC, RMNH, USNM**]
= *robusta* Telford, 1939: 14 (*Microdon*). UMSP: HT F*. [**4: Thompson 1981b**]
xanthopilis Townsend, 1895: 611 (*Microdon*). SEMC: LT M*. [**3: USNM**]

Neotropical

aureopilis Marinoni, 2004: 569 (*Microdon*). CNC: HT* M*. [**2**]
barbouri Hull, 1942: 89 (*Microdon*). MCZ: T F. [**1b**]
bassleri Curran, 1940: 10 (*Microdon*). AMNH: T F. [**1a**]
bonariensis Lynch Arribalzaga, 1891: 194 (*Microdon*). MACN: HT F. [**2**]
brutus Hull, 1944: 37 (*Microdon*). CU: T M. [**1a**]
caesar Curran, 1940: 10 (*Microdon*). AMNH: T M. [**1a**]
crassitarsis Macquart, 1848: 198 (*Aphritis*). OUMNH: HT* M. [**1a**]
eutristis Curran, 1925: 74 (*Microdon*). SEMC: T M. [**2**]
macquartii Lynch Arribalzaga, 1891: 126 (*Microdon*). OUMNH*: HT* F*. [**1a**] Replacement name for *Aphritis angustus* Macquart, 1848.
= *angustus* Macquart, 1848: 198 (*Aphritis*). OUMNH*: HT* F*. [**1a**] Preocc. Macquart, 1846.
= *angustatus* Fluke, 1957: 29 (*Microdon*). Misspelling of *Microdon angustatus* (Macquart, 1848).
mourei Marinoni, 2004: 569 (*Microdon*). CNC: HT* M*. [**2**]
remus Curran, 1941: 250 (*Microdon*). AMNH: T F. [**1a**]
rufiventris Rondani, 1848: 73 (*Aphritis*). MZUN: T F. [**3: BMNH & RMNH**]
violaceus Macquart, 1842: 13 (*Aphritis*). MNHN: ST* M*. [**1a**] The description by Macquart (1842) was based on a male from Chili, collected by M. Gay, which corresponds with the data on the label of a specimen in the Macquart collection of the MNHN. There is also a female in the same collection, but without a data label. There are also 12 specimens among the Macquart material in the OUMNH, but these too are without data labels (pers. comm. Z. Simmons).
virgo Curran, 1940: 7 (*Microdon*). AMNH: T M. [**1a**]

Oriental

aeneus Keiser, 1952: 172 (*Microdon*). NMB*: HT* M*. [**1a**]
alboscutatus Curran, 1931: 303 (*Microdon*). AMNH*: HT M*. [**1a**]. There is a specimen labelled as 'holotype' in the BMNH-collection, but locality information of that specimen is not right. The real holotype is in AMNH.
bellus Brunetti, 1923: 315 (*Microdon*). BMNH: HT F. [**1a**]
formosanus Shiraki, 1930: 22 (*Microdon*). NIAS: ST* MF*. [**2**]
fulvopubescens Brunetti, 1923: 313 (*Microdon*). BMNH: HT F. [**1a**]
fumipennis Hull, 1944: 259 (*Microdon*). BMNH: HT M. [**1a**]
metallicus Meijere, 1904: 98 (*Microdon*). ZMAN: T M. [**1a**]
sumatranus Wulp, 1892*: 29 (*Microdon*). RMNH*: HT* F. [**1a**]. Publication year wrong in Knutson et al. 1975.
sumbanus Keiser, 1952: 174 (*Microdon*). NMB: HT F. [**1a**]

Palaearctic

analis Macquart, 1842: 72 (*Aphritis*). MNHN: HT* M*. [**1a**]
= ?*ammerlandia* Spix, 1824: 124 (*Scutelligera*). L. [**2**] **Syn. nov.** Described as mollusc.
= *brevicornis* Egger, 1862: 783 (*Microdon*). NMW: ST B. [**4: Doczkal & Schmid 1999**] Preocc. Loew, 1857.
= *eggeri* Mik, 1897: 66 (*Microdon*). NMW: T A. [**3: several coll.**] Replacement name for *Microdon brevicornis* Egger, 1862.
= *fuscitarsis* Schummel, 1842: 115 (*Microdon*). Lost*: T A [**4: Doczkal & Schmid 1999**]
= *latifrons* Loew, 1856: 599 (*Microdon*). Lost*: T A. [**4: Doczkal & Schmid 1999**]
= ?*reticulata* Torrez Minguez, 1924: 108 (*Buchanania*). HT* L*. [**2**] **Syn. nov.** Described as mollusc.
auricomus Coquillett, 1898: 320 (*Microdon*). USNM: HT* M*. [**1a**]
devius Linnaeus, 1761: 446 (*Musca*). Lost: T A. [**3: several coll.**]
= *anthinus* Meigen, 1822: 165 (*Microdon*). MNHN: HT M. [**4: Doczkal & Schmid 1999**]
= *conica* Panzer, 1793: 21 (*Stratiomys*). SNSD?: T A. *Musca devius* Linnaeus, 1761 [**4: Doczkal & Schmid 1999**]
= *micans* Wiedemann in Meigen, 1822: 165 (*Microdon*). MNHN: ST A [**4: Doczkal & Schmid 1999**]
= *picticornis* Mik, 1897: 66 (*Microdon*). A. [**4: Doczkal & Schmid 1999**] Described as var. of *Microdon devius* (Linnaeus, 1761).
= *pigra* Schrank, 1803: 97 (*Stratiomys*). A. [**4: Doczkal & Schmid 1999**]
= *viridescens* Villers, 1789: 463 (*Musca*). Coll. Villers: T A. [**4: Doczkal & Schmid 1999**]
hauseri Reemer spec. nov. (*Microdon*). CSCS: HT M. [**1a**]
ignotus Violovitsh, 1976: 160 (*Microdon*). ZISP: HT M. [**2**]
japonicus Yano, 1915: 5 (*Microdon*). T A. [**3: BMNH & RMNH**]
= *jezoensis* Matsumura, 1916: 255 (*Microdon*). NIAS: ST F [**3: BMNH**]
kidai Hironaga & Maruyama, 2004: 90 (*Microdon*). SEHU: HT M. [**2**]
lateus Violovitsh, 1976: 160 (*Microdon*). A. [**4: Doczkal & Schmid 1999**]
lehri Mutin, 1999: 360 (*Microdon*). HT* M*. [**2**]
macrocerus Hironaga & Maruyama, 2004: 88 (*Microdon*). NSMT, Toyko: HT M. [**2**]
major Andries, 1912: 307 (*Microdon*). ZFMK*: NT* P*. [**3, 4: Schmid 2004**]
mandarinus Reemer spec. nov. (*Microdon*). CSCS: HT M. [**1a**]
maritimus Violovitsh, 1976: 161 (*Microdon*). ZISP: HT M. [**3: USNM**]
miki Doczkal & Schmid, 1999: 48 (*Microdon*). SMNS*: HT* M*. [**2**] Paratypes in SMNS and ZMHU.
murayamai Hironaga & Maruyama, 2004: 97 (*Microdon*). SEHU: HT M. [**2**]
mutabilis Linnaeus, 1758: 592 (*Musca*). BMNH: LT F. [3: several coll.]
= *apiarius* Fabricius, 1805: 46 (*Mulio*). Lost: T A. [**4: Doczkal & Schmid 1999**] Type lost, only name label remains (Zimsen 1964).
= *apiformis* De Geer, 1776: 128 (*Musca*). NHRS: T A. [**4: Doczkal & Schmid 1999**]
= *auropubescens* Latreille, 1805: 358 (*Aphritis*). T A. [**4: Doczkal & Schmid 1999**]
= ?*cocciformis* von Heyden, 1825: 589 (*Parmula*). HT* L*. [**2**] Described as mollusc.
= *rhenanus* Andries, 1912: 307 (*Microdon*). ZFMK*: LT* P*. [**4: Schmid 2004**]

= *scutellatus* Schummel, 1842: 116 (*Microdon*). [**4: Doczkal & Schmid 1999**]
novus Schrank, 1776: 93 (*Musca*). A. [**4: Peck 1988**]
myrmicae Schönrogge, Barr, Wardlaw, Napper, Gardner, Breen, Elmes & Thomas, 2002: 315 (*Microdon*). BMNH: HT F. [**3: several coll.**]
mysa Violovitsh, 1971: 62 (*Microdon*). ZISP: HT M. [**2**]
nigripes Shiraki, 1930: 22 (*Microdon*). NIAS: ST MF. [**2**] Described as var. of *Microdon auricomus* Coquillett, 1898.
oitanus Shiraki, 1930: 18 (*Microdon*). NIAS: HT F. [**2**]
podomelainum Huo, Ren & Zheng, 2007: 402 (*Microdon*). HU*: HT* F*. [**2**]
ursitarsis Stackelberg, 1926: 90 (*Microdon*). A. [**2**]
yokohamai Hironaga & Maruyama, 2004: 94 (*Microdon*). HUS: HT M. [**2**]
yunnanensis Reemer spec. nov. (*Microdon*). CSCS: HT M. [**1a**]

Subgenus *Myiacerapis* Hull, 1949

Afrotropical

villosus Bezzi, 1915: 135 (*Microdon*). BMNH: HT* M*. [**1a**]

Subgenus *Serichlamys* Curran, 1925

Nearctic

?diversipilosus Curran, 1925: 76 (*Microdon*). SEMC: HT M. [**2**]
rufipes Macquart, 1842: 71 (*Aphritis*). OUMNH: HT* M*. [**1a**]
= *limbus* Williston, 1887: 8 (*Microdon*). USNM: HT F*. [**4: Thompson 1981b**]
scutifer Knab, 1917: 141 (*Microdon*). USNM: HT F*. [**3: RMNH & USNM**]

Subgenus *Syrphipogon* Hull, 1937

Neotropical

fucatissimus Hull, 1937: 120 (*Syrphipogon*). CM: HT M. [**1a**]
gaigei Steyskal, 1953: 1 (*Microdon*). MZM: HT F. [**2**]

Species groups of *Microdon* s.l.

***craigheadii*-group (Nearctic)**

craigheadii Walton, 1912: 463 (*Microdon*). USNM: HT M. [**1a**]

***erythros*-group (Afrotropical)**

erythros Bezzi, 1908: 382 (*Microdon*). T M*. [**3: RMCA & RMNH**]
= *erytherus* Bezzi, 1921: 21 (*Microdon*). M*. Misspelling.
luteiventris Bezzi, 1915: 132 (*Microdon*). BMNH: ST* MF*. [**1a**]

***mirabilis*-group (Neotropical)**

bertonii Bezzi, 1910: 319 (*Microdon*). MCSN: ST* MF*. [**1a**]
= *arcuata* Curran, 1941: 250 (*Microdon*). AMNH: T M. [**1a**] **Syn. nov.**
iheringi Bezzi, 1910: 320 (*Microdon*). MCSN: LT* M. [**1a**] For lectotype designation see genus accounts.
mirabilis Williston, 1888: 257 (*Microdon*). AMNH: ST* MF*. [**1a**]

***tarsalis*-group (Afrotropical)**

tarsalis Hervé-Bazin, 1913: 98 (*Microdon*). RMCA*: HT* M*. [**1a**] Holotype in RMCA, not in MNHN. See also Hervé-Bazin (1913: 69).
= *bequaerti* Curran, 1929: 3 (*Microdon*). AMNH: HT M. [**1a**] **Syn. nov.** Paratype female in RMCA.

Unplaced species of *Microdon* s.l.

Afrotropical

tsara Keiser, 1971: 247 (*Microdon*). MNHN*: HT* M*. [**1a**]

Australian / Oceanian

amabilis Ferguson, 1926: 175 (*Microdon*). QMBA: T F. [**3: CNC**]
macquariensis Ferguson, 1926: 174 (*Microdon*). ANIC*: HT* M. [**1b, 3: USNM**]
nigromarginalis Curran & Bryan, 1926: 132 (*Microdon*). ANIC*: HT* F*. [**1b, 3: RMNH**]
pictipennis Macquart, 1850: 433 (*Aphritis*). MNHNP: HT* F. [**1a**]
= *pictulipennis* Hull, 1944: 249 (*Microdon*). BMNH: HT* M. [**1a**] **Syn. nov.**
rieki Paramonov, 1957: 815 (*Microdon*). ANIC*: HT* M. [**1b, 1c: USNM**]
waterhousei Ferguson, 1926: 174 (*Microdon*). AMS: T F. [**3: coll. M. Hauser**]

Oriental

carbonarius Brunetti, 1923: 314 (*Microdon*). ZSI: HT M. [**1c**] Paratype and three additional specimens in BMNH.
pagdeni Curran, 1942: 6 (*Microdon*). AMNH*: HT F. [**1a**] Type not found in BMNH. Specimen labelled as such in AMNH.
trimacula Curran, 1928: 156 (*Microdon*). BMNH: ST* M. [**1a**]
unicolor Brunetti, 1915: 255 (*Microdon*). ZSI*: HT M. [**2**]

Genus *Mitidon* Reemer gen. nov.

mitis Curran, 1940: 7 (*Microdon*). AMNH: T M. [**1a**]
mus Curran, 1936: 5 (*Microdon*). AMNH: T M. [**1a**]

Genus *Mixogaster* Macquart, 1842

Nearctic

breviventris Kahl, 1897: 137 (*Mixogaster*). CU: F*. [**2**]
delongi Johnson, 1926: 301 (*Mixogaster*). MCZ: A. [**2**]
johnsoni Hull, 1941: 162 (*Mixogaster*). CNC: HT* A. [**2**]

Neotropical

anthermus Walker, 1849: 547 (*Ascia*). BMNH: ST* M*. [**1a**]
cicatrix Hull, 1954: 9 (*Mixogaster*). CU: T M. [**2**]
conopsoides Macquart, 1842: 14 (*Mixogaster*). MNHN: T F. [**1a**]
= *conopoides* Kertesz, 1910: 351 (*Mixogaster*). A. [**2**] Emendation.
= *conopseus* Williston, 1886: 309 (*Mixogaster*). A. [**2**] Misspelling.
cubensis Curran, 1932: 1 (*Mixogaster*). AMNH: T M. [**1a**]
currani Hull, 1954: 5 (*Mixogaster*). AMNH: T M. [**1a**]

dimidiata Giglio-Tos, 1892: 1 (*Mixogaster*). MRSN: HT F. [**2**]
= *dimitiata* Fluke, 1957: 37 (*Mixogaster*). A. [**2**] Misspelling.
flukei Hull, 1954: 15 (*Mixogaster*). AMNH: T M. [**1a**]
imitator Thompson, 2004: 572 (*Mixogaster*). USNM: HT* M*. [**1c: BMNH**]
lanei Carrera & Lenko, 1958: 473 (*Mixogaster*). MZUSP: T M. [**2**]
lopesi Carrera & Lenko, 1958: 477 (*Mixogaster*). MZUSP: T M. [**2**]
mexicana Macquart, 1846: 251 (*Mixogaster*). MRHNB: T F*. [**2**]
orpheus Hull, 1944: 36 (*Mixogaster*). MCZ: T F. [**2**]
pithecofascia Hull, 1944: 512 (*Mixogaster*). CNC: HT M. [**2**]
polistes Hull, 1954: 4 (*Mixogaster*). AMNH: T F. [**1a**]
rarior Shannon, 1925: 111 (*Mixogaster*). USNM: T M. [**1a**]
= *rarissima* (var.) Shannon, 1925: 111 (*Mixogaster*). USNM*: M*. [**1a**] Described as var. of *Mixogaster rarior* Shannon, 1925.
sartocrypta Hull, 1954: 8 (*Mixogaster*). AMNH: T F. [**1a**]
strictor Hull, 1941: 1 (*Mixogaster*). AMNH: T M. [**1a**]
thecla Hull, 1954: 6 (*Mixogaster*). AMNH: T F. [**1a**]

Genus *Oligeriops* Hull, 1937

Australian / Oceanian

chalybeus Ferguson, 1926: 176 (*Microdon*). Coll. Hardy: T M. [**2**]
dimorphon Ferguson, 1926: 177 (*Microdon*). ANIC*: HT* A. [**1b**]
iridomyrmex Shannon, 1927: 85 (*Microdon*). BMNH: ST* F. [**1a**]
moestus Ferguson, 1926: 518 (*Microdon*). ANIC: T F. [**2**]
occidentalis Ferguson, 1926: 176 (*Microdon*). SAMA: T F. [**2**]

Genus *Omegasyrphus* Giglio-Tos, 1891

Nearctic

baliopterus Loew, 1872: 86 (*Microdon*). MCZ (lost)*: ST MF*. [**3: USNM**]
= *brunnipennis* Hull, 1944: 400 (*Microdon*). NMW: HT M. [**2**] Described as var. of *Microdon baliopterus* Loew, 1872.
coarctatus Loew, 1864: 74 (*Microdon*). MCZ (lost)*: ST MF*. [**3: USNM**]
gracilis Bigot, 1883: 320 (*Microdon*). BMNH*: HT* M*. [**1a**] **Comb. nov.**
painteri Hull, 1922: 370 (*Microdon*). CNC: HT M*. [**1b**]
pallipennis Curran, 1925: 89 (*Microdon*). SEMC: ST A. [**3: USNM**]

Genus *Paragodon* Thompson, 1969

Neotropical

paragoides Thompson, 1969: 81 (*Paragodon*). CNC: HT M. [**2**]

Genus *Paramicrodon* Meijere, 1913

Australian / Oceanian

lorentzi Meijere, 1913: 360 (*Paramicrodon*). ZMAN: T F. [**1a**]
toxopei Meijere, 1929: 410 (*Paramicrodon*). ZMAN: T M. [**1a**]

Neotropical

delicatulus Hull, 1937: 24 (*Paramicrodon*). MCZ: T M. [**1a**]
flukei Curran, 1936: 2 (*Paramicrodon*). AMNH: T M. [**1a**]

Oriental

cinctellus Sack, 1926: 590 (*Myxogaster*). DEI?*: T F. [**2**]
miranda Hervé-Bazin, 1926: 74 (*Syrphinella*). MNHN*: HT* F*. [**1a**]
nigripennis Sack, 1922: 275 (*Myxogaster*). T M. [**2**]
novus Hull, 1937: 22 (*Paramicrodon*). MCZ: T F. [**2**]

Genus *Paramixogaster* Brunetti, 1923

Afrotropical

acantholepidis Speiser, 1913: 141 (*Microdon*). NMSA*: HT* M*. [**1a**]
crematogastri Speiser, 1913: 143 (*Microdon*). NMSA*: HT* F*. [**1a**]
elisabethae Keiser, 1971: 254 (*Pseudomicrodon*). MNHN*: T F*. [**1a**]
illucens Bezzi, 1915: 121 (*Microdon*). BMNH: T M*. [**1a**]
piptotus Reemer spec. nov. (*Paramixogaster*). MNHN: HT M. [**1a**]

Australian / Oceanian

aphritinus Thomson, 1869: 491 (*Mixogaster*). NHRS: HT* M*. [**1a**] **Stat. nov.**
daveyi Knab & Malloch, 1912: 233 (*Microdon*). USNM: T F. [**1a**]
gayi Paramonov, 1957: 814 (*Microdon*). ANIC*: HT* F. [**1b**]
odyneroides Meijere, 1908: 213 (*Microdon*). HNHM (lost)*: T A. [**2, 4: Sack 1926**] Type lost (de Jong 2000).
omeanus Paramonov, 1957: 813 (*Microdon*). ANIC: HT* F. [**1b, 1c: USNM**]
petiolata Hull, 1944: 248 (*Microdon*). BMNH: HT* F. [**1a**]
praetermissus Ferguson, 1926: 182 (*Microdon*). SAMA?: T F. [**2**]
variegatus Walker, 1852: 220 (*Ceratophya*). BMNH*: F*. [**1a**]
wegneri Keiser, 1964: 84 (*Paramixogaster*). NMB Basel*: HT* M*. [**2**]

Oriental

brunettii New replacement name for *Mixogaster vespiformis* Brunetti, 1913.
= *vespiformis* Brunetti, 1913: 169 (*Mixogaster*). ZSI: HT M*. [**2**] Preocc. De Meijere, 1908.
contractus Brunetti, 1923: 310 (*Microdon*). BMNH: HT F. [**1a**]
conveniens Brunetti, 1923: 311 (*Microdon*). BMNH: HT F. [**1a**]
decipiens Meijere, 1917: 242 (*Paramicrodon*). ZMAN*: HT* F*. [**1a**] Puparia also in ZMAN.
icariiformis Pendlebury, 1927: 38 (*Paramixogaster*). BMNH (lost)*: T F. [**2**] Type not in BMNH.
indicus Doleschall, 1857: 404 (*Ceratophya*). HNHM (lost)*: T A. [**2**]
luxor Curran, 1931: 306 (*Microdon*). BMNH: HT M. [**1a**]
sacki New replacement name for *Myxogaster variegata* Sack, 1922.
= *variegata* Sack, 1922: 274 (*Myxogaster*). F*. [**2**] Preocc. Walker, 1852.
vespiformis Meijere, 1908: 210 (*Microdon*). ZMAN*: ST* F*. [**1a**]
wegneri Keiser, 1964: 84 (*Paramixogaster*). NMB Basel*: HT* F*. [**2**]

Genus *Parocyptamus* Shiraki, 1930

Oriental

sonamii Shiraki, 1930: 12 (*Parocyptamus*). NIAS*: ST M. [**1a**]
= *purpureus* Hull, 1937: 26 (*Stenomicrodon*). CNC*: HT F. [**1b**] **Syn. nov.**
stenogaster Curran, 1931: 344 (*Microdon*). BMNH: HT M*. [**1a**]

Genus *Peradon* Reemer gen. nov.

***bidens*-group (Neotropical)**

angustiventris Macquart, 1855: 105 (*Aphritis*). OUMNH: HT* M. [**1a**]
angustus Macquart, 1846: 250 (*Aphritis*). MNHN (lost)*: T M. [**2**] Type not found in MNHN.
aurifascia Hull, 1944: 245 (*Microdon*). BMNH: HT* M. [**1a**]
bidens Fabricius, 1805: 185 (*Mulio*). UZMC: HT* M. [**1a**]
= *bicolor* Walker, 1857: 151 (*Ceratophya*). BMNH: HT* F*. [**1a**] **Syn. nov.**
bispina Hull, 1943: 707 (*Microdon*). BMNH: HT* M. [**1a**]
elongata Hull, 1943: 706 (*Microdon*). BMNH: HT M. [**1a**]
flavipennis Curran, 1925: 342 (*Microdon*). MCZ: T F. [**1b**]
flavomarginatum Curran, 1925: 245 (*Microdon*). CU: T M. [**1a**]
langi Curran, 1925: 341 (*Microdon*). AMNH*: T M. [**1a**]
luridescens Walker, 1857: 151 (*Ceratophya*). BMNH: T F. [**1a**]
niger Williston, 1891: 4 (*Microdon*). BMNH: HT* M. [**1a**]
= *manni* Shannon, 1923: 80 (*Microdon*). USNM: T F. [**1a**]
normalis Curran, 1925: 343 (*Microdon*). AMNH: T F. [**1a**]
oligonax Hull, 1944: 35 (*Microdon*). CU: T F. [**1a**]

***flavofascium*-group (Neotropical)**

aurigaster Hull, 1941: 160 (*Microdon*). MCZ: T M. [**1b**]
chrysopygus Giglio-Tos, 1892: 1 (*Ubristes*). MRSN*: HT* F*. [**1b**]
flavofascium Curran, 1925: 346 (*Microdon*). CU: T M. [**1a**]

***trivittatus*-group (Neotropical)**

aureoscutus Hull, 1943: 709 (*Microdon*). BMNH: HT* M. [**1a**]
aureus Hull, 1944: 35 (*Microdon*). MCZ: T F. [**1b**]
diaphanus Sack, 1921: 146 (*Microdon*). DEI: T M. [**3: USNM**]
fenestratus Hull, 1943: 712 (*Microdon*). BMNH: HT* M. [**1a**]
hermetia Curran, 1936: 3 (*Microdon*). AMNH: HT* M. [**1a**]
hermetoides Curran, 1940: 8 (*Microdon*). BMNH: HT* M. [**1a**]
trilinea Hull, 1943: 710 (*Microdon*). BMNH: HT* M. [**1a**]
trivittatus Curran, 1925: 344 (*Microdon*). AMNH: T M. [**1a**]

Genus *Piruwa* Reemer gen. nov.

Neotropical

phaecada Reemer spec. nov. (*Piruwa*). RMNH: HT M. [**1a**]

Genus *Pseudomicrodon* Hull, 1937

Neotropical

auricinctus Sack, 1931: 148 (*Rhopalosyrphus*). DEI*: F*. [**3: RMNH & USNM**]
batesi Shannon, 1927: 22 (*Microdon*). BMNH: HT* F. [**1a**]
beebei Curran, 1936: 4 (*Microdon*). AMNH: T F. [**1a**]
bellulus Williston, 1891: 1 (*Mixogaster*). BMNH: HT* M. [**1a**]
biluminiferus Hull, 1944: 399 (*Microdon*). NMW: T M. [**1a**]
chrysostypus Thompson, 2004: 571 (*Microdon*). USNM: HT* M*. [**2**]
claripennis Hine, 1914: 334 (*Mixogaster*). OHSU: T M. [**2**]
conops Curran, 1940: 4 (*Microdon*). AMNH: T M. [**1a**]
corona Curran, 1940: 9 (*Microdon*). AMNH: T M. [**1a**]
nigrispinosus Shannon, 1927: 21 (*Microdon*). BMNH: ST* M. [**1a**]
pilosops Marinoni, 2004: 572 (*Microdon*). BMNH: HT* M*. [**1a**]
polistoides Reemer spec. nov. (*Pseudomicrodon*). RMNH: HT F. [**1a**]
rheochryssus Hull, 1944: 38 (*Microdon*). CU: T M. [**2**]
seabrai Papavero, 1962: 317 (*Pseudomicrodon*). Seabra*: T M. [**2**]
smiti Reemer spec. nov. (*Pseudomicrodon*). RMNH: HT M. [**1a**]

Genus *Ptilobactrum* Bezzi, 1915

Afrotropical

neavei Bezzi, 1915: 137 (*Ptilobactrum*). BMNH: HT* M*. [**1a**]

Genus *Rhoga* Walker, 1857

Neotropical

lutescens Walker, 1857: 157 (*Rhoga*). BMNH (lost)*: T F. [**2**] Type not present in BMNH, probably lost.
maculatus Shannon, 1927: 21 (*Microdon*). BMNH: HT F*. [**1a**]
melleus Curran, 1940: 5 (*Microdon*). BMNH: T M. [**1a**]
sepulchrasilvus Hull, 1937: 28 (*Papiliomyia*). NMW: T M. [**1a**]
xanthoprosopus Barretto & Lane, 1947: 145 (*Rhoga*). MZUSP: HT M. [**2**]

Genus *Rhopalosyrphus* Giglio-Tos, 1891

Sensu stricto (Nearctic and Neotropical)

australis Thompson, 2003: 188 (*Rhopalosyrphus*). AMNH: HT F. [**1c: BMNH**]
ecuadoriensis Reemer spec. nov. (*Rhopalosyrphus*). RMNH: HT M. [**1a**]
guentherii Lynch Arribalzaga, 1891: 195 (*Holmbergia*). MACN: T A. [**3: RMNH & USNM**]
= *carolae* Capelle, 1956: 174 (*Rhopalosyrphus*). SEMC: HT F. [**4: Weems et al. 2003**]
ramulorum Weems & Deyrup, 2003: 189 (*Rhopalosyrphus*). USNM: HT M. [**1c: BMNH**]
robustus Reemer spec. nov. (*Rhopalosyrphus*). CNC: HT M. [**1a**]

Sensu lato (Neotropical)

abnormis Curran, 1925: 345 (*Microdon*). MCZ: HT* F. [**1b**]
abnormoides Reemer spec. nov. (*Rhopalosyrphus*). RMNH: HT M. [**1a**]
cerioides Hull, 1943: 716 (*Microdon*). BMNH: T M. [**1a**]

oreokawensis Reemer spec. nov. (*Rhopalosyrphus*). RMNH: HT F. [**1a**]

Genus *Schizoceratomyia* Carrera, Lopes & Lane, 1947

Neotropical

barretoi Carrera, Lopes & Lane, 1947: 245 (*Schizoceratomyia*). MZUSP*: M*. [**1a**]
carrerai Papavero, 1962: 324 (*Masarygus*). MZUSP: HT M. [**1a**]
flavipes Carrera, Lopes & Lane, 1947: 247 (*Schizoceratomyia*). MZUSP: HT M. [**1a**]
malleri Curran, 1947: 1 (*Johnsoniodon*). AMNH: HT M*. [**1a**]

Genus *Spheginobaccha* de Meijere, 1908

Afrotropical

dexioides Hull, 1944: 131 (*Spheginobaccha*). BMNH*: M*. [**1a**]
dubia Thompson, 1974: 280 (*Spheginobaccha*). NMSA*: HT* M*. [**2**]
guttula Dirickx, 1995: 155 (*Spheginobaccha*). MNHN*: M*. [**1a**]
perialla Thompson, 1974: 284 (*Spheginobaccha*). BMNH*: HT* M*. [**2**]
rotundiceps Loew, 1858: 376 (*Ocyptamus*). NHRS*: HT* F*. [**4: Thompson 1974**]
= *funeralis* Hull, 1944: 131 (*Spheginobaccha*). BMNH*: HT* M*. [**4: Thompson 1974**]
ruginosa Dirickx, 1995: 152 (*Spheginobaccha*). MNHN*: F*. [**1a**]

Oriental

aethusa Walker, 1849: 559 (*Xylota*). BMNH*: HT* F*. [**4: Thompson 1974**]
chillcotti Thompson, 1974: 274 (*Spheginobaccha*). CNC*: HT* M*. [**2**]
demeijerei Doesburg, 1968: 161 (*Spheginobaccha*). RMNH*: HT* M*. [**1a**]
duplex Walker, 1857: 18 (*Syrphus*). BMNH*: HT* M*. [**4: Thompson 1974**]
humeralis Sack, 1926: 571 (*Doros*). USNM*: LT* M*. [**1a**]
knutsoni Thompson, 1974: 271 (*Spheginobaccha*). USNM*: HT* F*. [**2**]
lieftincki Doesburg, 1968: 160 (*Spheginobaccha*). RMNH*: HT* M*. [**1a**]
macropoda Bigot, 1883: 331 (*Sphegina*). BMNH*: F*. [**4: Thompson 1974**]
= *robusta* Brunetti, 1907: 11 (*Baccha*). ZSI*: A. [**4: Thompson 1974**]
melancholica Hull, 1937: 174 (*Spheginobaccha*). F*. [**4: Thompson 1974**]
vandoesburgi Thompson, 1974: 273 (*Spheginobaccha*). BMNH*: HT* M*. [**2**]

Genus *Stipomorpha* Hull, 1945

Neotropical

apicula Curran, 1930: 5 (*Microdon*). AMNH: HT M. [**1a**]
crematogastri Reemer, in prep. (*Stipomorpha*). BMNH: HT F. [**1a**] [*see disclaimer below*]
dichromata Reemer, in prep. (*Stipomorpha*). CNC: HT F. [**1a**] [*see disclaimer below*]
elcopala Reemer, in prep. (*Stipomorpha*). INBIO: HT M. [**1a**] [*see disclaimer below*]
fallax Reemer, in prep. (*Stipomorpha*). ZMAN: HT M. [**1a**] [*see disclaimer below*]
fraudator Shannon, 1927: 20 (*Microdon*). BMNH: T M. [**1a**]
goettei Shannon, 1927: 19 (*Microdon*). BMNH: T F. [**1a**]
guianica Curran, 1925: 340 (*Microdon*). MCZ: T F. [**1a**]
inarmata Curran, 1925: 5 (*Microdon*). MCZ: T M. [**1a**]
lacteipennis Shannon, 1927: 18 (*Microdon*). BMNH: T M. [**1a**]
= *triangularis* Curran, 1940: 6 (*Microdon*). AMNH: T M. [**1a**]

lanei Curran, 1936: 5 (*Microdon*). AMNH: HT F. [**1a**]
litoralis Papavero, 1964: 21 (*Ubristes*). MZUSP: T M. [**1a**]
mackiei Curran, 1940: 5 (*Microdon*). AMNH: HT F. [**1a**]
maculipennis Reemer, in prep. (*Stipomorhpa*). BMNH: HT M. [**1a**] [*see disclaimer below*]
mendax Reemer, in prep. (*Stipomorpha*). RMNH: HT M. [**1a**] [*see disclaimer below*]
micromidas Shannon, 1925: 112 (*Microdon*). USNM: HT F. [**1a**]
mixta Curran, 1940: 6 (*Microdon*). BMNH: T F. [**1a**]
panamana Reemer, in prep. (*Stipomorpha*). USNM: HT M. [**1a**] [*see disclaimer below*]
puerilis Doesburg, 1966: 86 (*Ubristes*). RMNH*: T F. [**1a**]
simillima Hull, 1950: 611 (*Microdon*). BMNH: T M. [**1a**]
spuria Reemer, in prep. (*Stipomorpha*). RMNH: HT M. [**1a**] [*see disclaimer below*]
tenuicauda Curran, 1925: 339 (*Microdon*). CU: T F. [**1a**]
trigoniformis Shannon, 1927: 19 (*Microdon*). BMNH: T M. [**1a**]
wheeleri Mann, 1928: 168 (*Microdon*). USNM: T M. [**1a**]
zophera Reemer, in prep. (*Stipomorpha*). RMNH: HT M. [**1a**] [*see disclaimer below*]

[*Disclaimer*: Descriptions of *S. crematogastri*, *S. dichromata*, *S. elcopala*, *S. fallax*, *S. maculipennis*, *S. mendax*, *S. panamana*, *S. spuria* and *S. zophera* are in preparation. The inclusion of these names in the present paper is disclaimed for purposes of zoological nomenclature, in reference to article 8.3 in ICZN 1999.]

Genus *Sulcodon* Reemer gen. nov.

Oriental

sulcatus Hull, 1944: 256 (*Microdon*). BMNH: HT F. [**1a**]

Genus *Surimyia* Reemer, 2008

Neotropical

minutula Doesburg, 1966: 89 (*Ceratophya*). RMNH: HT* M*. [**1a**]
rolanderi Reemer, 2008: 180 (*Surimyia*). RMNH*: HT* M*. [**1a**]

Genus *Thompsodon* Reemer gen. nov.

Neotropical

conspicillifrons Reemer spec. nov. (*Thompsodon*). INBIO: HT F. [**1a**]

Genus *Ubristes* Walker, 1852

Neotropical

flavitibia Walker, 1852: 217 (*Ubristes*). BMNH: T M. [**1a**]
= *procteri* Curran, 1941: 251 (*Microdon*). AMNH: T M. [**1a**]
= *procedens* Curran, 1941: 251 (*Microdon*). AMNH: T M. [**1a**]
ictericus Reemer, in prep. (*Ubristes*). USNM: HT M. [**1a**] [*see disclaimer below*]
jaguarinus Reemer, in prep.(*Ubristes*). INBIO: HT M. [**1a**] [*see disclaimer below*]

[*Disclaimer*: Descriptions of *U. ictericus* and *U. jaguarinus* are in preparation. The inclusion of these names in the present paper is disclaimed for purposes of zoological nomenclature, in reference to article 8.3 in ICZN 1999.]

Unplaced Microdontinae

Afrotropical

schultzei Simroth, 1907: 796 (*Ceratoconcha*). T A. Described as mollusc. Only known from larva. Preocc. Kramberger-Gorjanovic, 1889.

Australian / Oceanian

hardyi Ferguson, 1926: 171 (*Microdon*). Coll. Hardy: T M. [**2**]
obscurus Wulp, 1898: 421 (*Microdon*). HNHM (lost)*: T F. [**2**] Type lost. Van der Wulp (1898) states that the type was a female, but this is doubtful, considering his description of the head.
sharpii Mik, 1900: 148 (*Microdon*). BMNH: HT* F*. [**1a**] Replacement name for *Microdon pictipennis* Sharp, 1899.
= *pictipennis* Sharp, 1899: 390 (*Microdon*). BMNH: HT* A. Preocc. Macquart, 1850.

Neotropical

aeolidiformis Wheeler, 1924: 239 (*Microdon*). USNM: HT* A. [**2**] Described from larva.
aztecarum Wheeler, 1924: 243 (*Nothomicrodon*). USNM: T L*. [**1a**] Described from larva. Uncertain whether it belongs to Syrphidae.
bruesi Hull, 1945: 77 (*Microdon*). MCZ: HT* F. [**1b**]
ignobilis Rondani, 1848: 73 (*Aphritis*). MZUN: ST MF. [**2**]
longicornis Wiedemann, 1824: 14 (*Ceratophya*). NMW (lost)*: T F. [**2**] Type not in NMW (pers. comm. P. Sehnal). See Reemer in prep. (Chapter 6) for comments.
pauper Rondani, 1848: 74 (*Aphritis*). MZUN: T M. [**2**]
rubriventris Lynch Arribalzaga, 1891: 128 (*Microdon*). MACN: T A. [**2**]
viridis Townsend, 1895: 610 (*Microdon*). Lost*: HT F*. [**4: Thompson 1981b**] See Thompson (1981b).

Oriental

apidiformis Brunetti, 1925: 78 (*Microdon*). ZSI*: M*. [**2**] Replacement name for *Microdon apiformis* Brunetti, 1923.
= *apiformis* Brunetti, 1923: 314 (*Microdon*). ZSI: HT M. Preocc. De Geer, 1776.
dimidiatus Curran, 1942: 3 (*Microdon*). BMNH (lost)*: HT M. [**2**] Type not found in AMNH and BMNH.
laxiceps Curran, 1942: 2 (*Microdon*). BMNH (lost)*: HT F. [**2**] Type not found in AMNH and BMNH.
shirakii New replacement name for *Microdon tuberculatus* Shiraki, 1968. See notes under genus account of *Kryptopyga*.
= *tuberculatus* Shiraki, 1968: 11 (*Microdon*). NIAS: HT F. [**1a**] Preocc. de Meijere, 1913.
trigonospilus Bezzi, 1927: 4 (*Microdon*). MCSN*: HT* F*. [**1a**]

Taxa previously considered to belong to Microdontinae

Afrotropical

varius Walker, 1849: 540 (*Microdon*). F*. [**4: Thompson 2010**] Species of *Graptomyza* (Syrphidae).

Neotropical

grandis Lynch Arribalzaga, 1892: 255 (*Argentinomyia*). MACN*: A. [**4**]
testaceipes Lynch Arribalzaga, 1891: 199 (*Argentinomyia*). MACN*: A. [**4**]

Palaearctic

apiarius Fabricius, 1781: 422 (*Syrphus*). A [**4: Thompson et al. 1982**] Synonym of *Mesembrina mystacea* (Linneaus) (Muscidae). Wrongly listed by Peck (1988) as synonym of *Microdon mutabilis* (Linnaeus).

sophianus Drensky, 1934: 122 (*Microdon*). Lost?: T F. [**4: Doczkal & Schmid 1999**] Probably a species of *Chrysotoxum* Meigen (Syrphidae).

The worst of human narrowness pours forth in the negative assessment of monographic work as merely descriptive.

Stephen Jay Gould 1990: Wonderful Life, chapter 3.