Entomologist's Monthly Magazine **151**: 13–24

New Papuan cerioidine flower flies (Diptera: Syrphidae, Cerioidini), with descriptions of new subgenera and species

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Accepted: *September* 12*th*, 2014

ABSTRACT

Two new species and one new subgenus of flower flies are described and illustrated from Papua New Guinea: *Ceriana* (*Oculovillosa,* subgen. n., type-species, *ismayi* sp. n.) and *Ceriana wyatti* sp. n. Also a new subgenus, *Polybiomyia* (*Pseudopolybiomyia* subgen. n., type-species, *Cerioides ablepta* Riek) is described to include the Australian and Afrotropical species related to the Neotropical subgenus *Polybiomyia*. *Ceriathrix* Hull (= *Monoceromyia*) and *Polistoceria* Hull (= *Sphiximorpha*) are here considered synonyms. An overview of the classification of these flies is presented with a key to the included groups.

Keywords: Diptera, Syrphidae, Cerioidine, new subgenus, new species, Papua New Guinea

INTRODUCTION

Cerioidine flower flies are among the most spectacular flies, being high-fidelity (perfect) mimics of wasps (as noted before, Thompson, 2013: 71). As such, they are rare in nature and poorly known. This is the second in a series of papers in EMM to add to our knowledge of these flies by synthesizing previous work along with new discoveries. Here within, the cerioidine flower fly fauna of the Papuan [New Guinea] subregion is reviewed and two new subgenera are described along with two new species. The introductory material on the group as well as my working methods are all outlined in the first paper of this series and are not repeated here (see Thompson, 2013: 71–72).

Broad generic concepts with subgenera for specialists are also useful for all naturalists. Naturally, as our knowledge of biodiversity expanded beyond Europe where Linnaean taxonomy was first established, there was a need for an expanded classification to properly order that knowledge of biodiversity. Unfortunately, today other factors affect one's view of classification. Many scientists are measured and rewarded by productivity metrics, such as impact factors, which favor the 'discovery' of new ideas and things, and in taxonomy that means especially those things of higher categorical rank (new genera, families and orders). This leads, in many cases, to excessive splitting of well-known groups into smaller ones that are not well known and frequently not distinctive (for example, based on characters of male genitalia [see Sarcophagidae (Verves / Souza Lopes versus Pape] or DNA sequences). And such splitting leads eventually to the abandonment of scientific nomenclature and to the use of common names instead. For example, look at Ornithology, where there are some ten thousands species now divided among some eight thousand genera. Users no longer use scientific names as they are meaningless, and follow common names which reflect a broader and more useful classification.

However, users frequently employ common names for well-known species, like Elephant (*Elephas*) or Giraffe (*Giraffa*) or Hippopotamus (*Hippopotamus*), so scientific names can be the basis of common names. Hence, I recommend that the name 'cerioidine flower flies' (from Cerioidini) be used for the clade and 'ceriana' (from *Ceriana*) be used as the common name for the group.

CLADE / TRIBE CERIOIDINI

Diagnosis: eristaline flower flies (postpronotum pilose); wasp mimics with terminal arista, apical crossvein r-m, and very short appressed pile.

Description

Head: face straight, with a low medial tubercle near oral margin; gena broad, as broad or broader than long; oral margin notched anteriorly; facial grooves elongate extending about half way to frontal prominence; facial stripes indistinct; antennal pits confluent; frontal prominence at dorsal ⅓ or higher; male frons excluding frontal prominence short, about as long as eye contiguity; female frons excluding frontal prominence short, less than half as long as face, broad, with convergent sides dorsally; vertical triangle, short, equilateral; ocellar triangle anterior to posterior margin of eye; occiput thickened posteriorly to ocellar triangle; male holoptic. Antenna long, at least as long as face; pedicel and scape long, always longer than broad, usually twice as long as broad; basoflagellomere triangular, tapering to a point; arista terminal, as thick style.

Thorax: longer than broad; mesoanepisternum with anteroapical portion pilose; mesokatepisternum with broadly separated dorsal and ventral pile areas; mesoanepimeron with posterior area bare; metathoracic pleuron bare; metasternum always developed, with short pile; plumula usually absent, present only in a few Australian species; scutellum without ventral pile fringe, without apical emarginate rim. Legs: simple, except metafemur slightly swollen and with apicoventral spines. Wing: long, pointed, with anterior margin broadly darkened; stigmatic cross vein present; cell R_1 broadly open; cell R_{4+5} closed at wing margin; crossvein r-m always beyond middle of cell DM.

Abdomen: elongate or petiolate, never oval; male with only four unmodified pregenitalic segments; aedeagus simple.

Remarks: The cerioidine flower flies have been recognized as a monophyletic group (clade) ever since Fabricius (1794: 277) first segregated the typic species from *Musca* in his new genus *Ceria*. Rondani (1845: 451) was the first to propose a family-group name for the clade. Since then the group has always been recognized as either a tribe or subfamily.

NEW TAXA

***Ceriana* (*Oculovillosa*)** subgen. n.

Type-species: *Ceriana ismayi* sp. n.

Diagnosis: With typical cerioidine characters, and: face straight except slight indentation on ventral fifth; eye long pilose; male narrowly holoptic; male eye contiguity about as long as ocellar triangle; antennifer long about ⅕ as long as face, slightly longer than basal two antennal segments; postmetacoxal bridge complete; metafemur swollen, spinose on ventro-apical half; vein R_{4+5} slightly sinuate, without appendix; crossvein r-m oblique, at apical ⅔ of cell DM; plumula very short; abdomen distinctly petiolate; 2nd segment about ⅓ as wide basally as basal width of 1st segment and about ¼ as wide apically.

Etymology: The genus-group name is derived from the combination of 'oculo', from the Latin for eye and 'villosa' from the Latin for hairy (pilose) and is to be treated as feminine.

Remarks: *Oculovillosa* differs from all other cerioidine flower flies in having the combination of pilose eyes, long antennifer and a complete metacoxal bridge. The only other group with pilose eyes is *Primocerioides*, from which *Oculovillosa* differs by having a petiolate abdomen and postmetacoxal bridge. Of those groups with a postmetacoxal bridge, *Oculovillosa* differs from *Polybiomyia* by the long antennifer and from *Pseudopolybiomyia* by the pilose eyes.

Ceriana* (*Oculovillosa*) *ismayi sp. n.
(Figs 3–4)

Recommended common name: Ismay's Ceriana.

Description

♂, length: body, 10.9mm; wing: 6.7mm.

Head: face yellow with black sublateral triangular vitta and light brown yellow medial vitta, sparsely white pollinose and pilose laterally, shiny medially; frons yellow except black triangular macula dorsad of antenna, white pilose; antennifer brownish black; antenna black; pedicel expanded ventrally, so pedicel about ½ broader than scape; vertex equilateral, yellow except ocellar triangle black, white pilose; eye white pilose; holoptic; eye contiguity about half as long as vertical triangle; gena yellow except black anteriorly, shiny, white pilose; occiput yellow on ventral ⅓, black dorsally, white pilose. Antennal ratio (antennifer : pedicel : scape : basoflagellomere : arista): 2.9 : 1.9 : 1.6 : 1.0 : 0.5.

Thorax: black except postpronotum yellow, postalar callus brownish yellow and katatergum with yellow fascia, sparsely grayish pollinose, short white pilose; scutellum black with narrow yellow apical margin, short white pilose; calypter white; plumula very short, almost absent, brown; halter yellow. Legs: brownish black except femoral-tibial joints yellowish, white pilose except pro- and mesofemora black pilose dorsally; femora with apicoventral black spinose setae in anterior and ventral rows. Wing: hyaline except light brown in area between vein Sc and R and R_{4+5}, extensive bare, microtrichose only in dark areas and on apical ½ cell R_{4+5}, apical ⅓ of cells M and CuP and along wing margin; with vein R_{4+5} slightly sinuate but without spur vein; alula bare.

Abdomen: dark brownish black except petiole yellow and genitalia brownish orange, appressed pale pilose. Abdominal segmental ratio (1st : 2nd : 3rd : 4th terga : male genitalic segments): 1.0 : 3.1 : 3.8 : 3.0 : 1.3; abdominal petiole ratio (2nd tergum – basal width : narrowest width : apical width : length): 1.3 : 1.0 : 4.1 : 3.7.

Material examined:

Holotype, ♂, labelled: 'PAPUA NEW GUINEA / National Cap. Dist. / Konedobu, Aug. 1977 / coll. T. Fenner / dead on Office Desk [all handwritten]', '30630 / C. I. E. / A. 10757 [red label]', 'Monoceromyia sp.? / det. / R.A. Hayman 1979', 'Holotype / Oculovillosa / ismayi Thompson 2013' [orange handwritten label] and deposited in the Smithsonian Institution, National Museum of Natural History (USNM), Washington, D.C.

Type Locality: Papua New Guinea. National Capital District: Konedobu, 9°28′11″S, 147°9′35″E.

Diagnosis: *Oculovillosa ismayi* is similar to *Pseudopolybiomyia ablepta* (Riek, 1954: 119), the only other regional species with a postmetacoxal bridge, except for the long pilosity on the eyes, black notopleuron (not yellow), dark anepimeron (not yellow vittate), scutellum black with yellow margin (not reddish apically), and short abdominal petiole (not long).

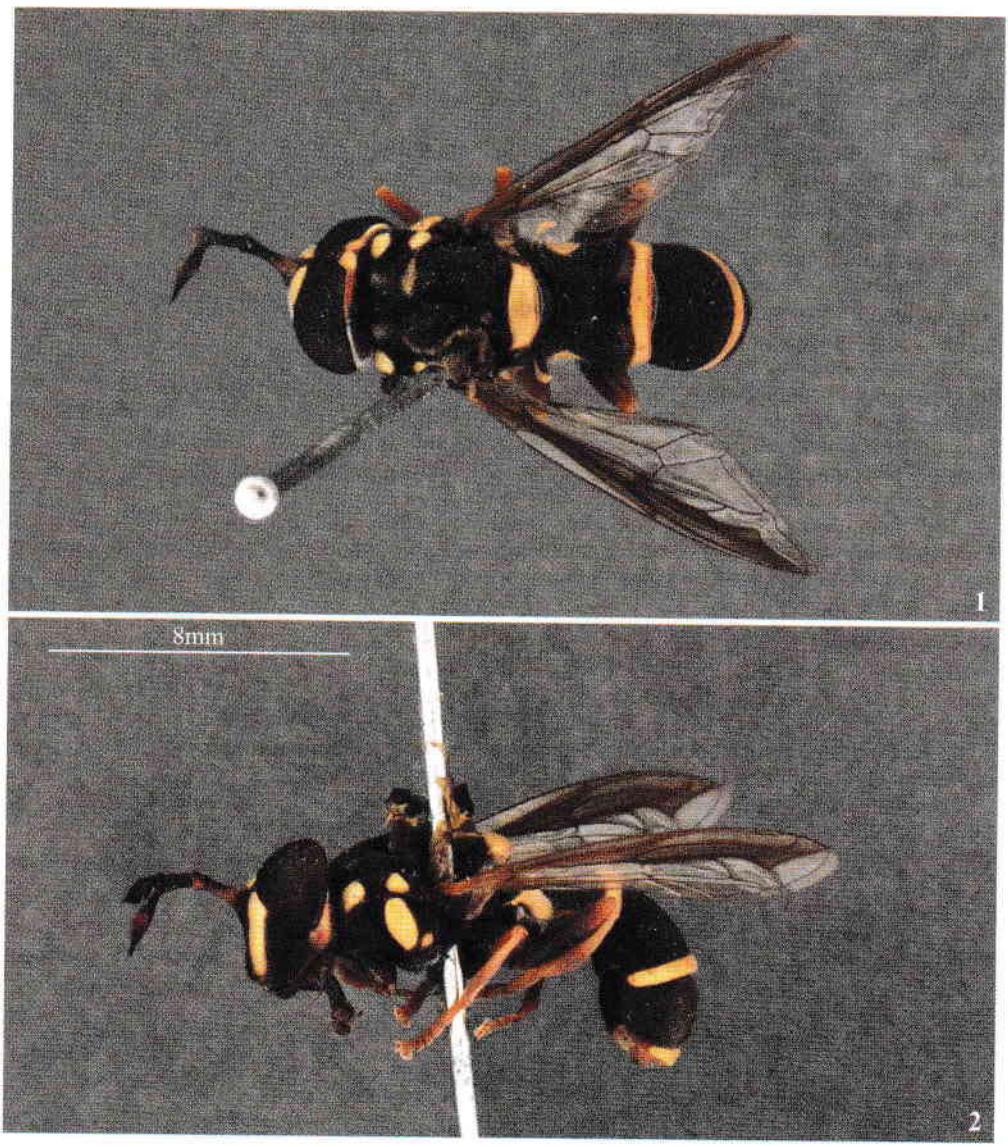
Remarks: As an irrelevant but interesting comment, one must be amazed at this fly's decision to die upon the desk of an Entomologist, ensuring that his body would, therefore, be forever enshrined in the Smithsonian Institution!

Etymology: I am pleased to name this unique fly after John Ismay, an unique dipterist and friend.

***Ceriana* (*Pseudopolybiomyia*)** subgen. n.
(Figs 7–8)

Type-species: *Cerioides ablepta* Riek, 1954.

Diagnosis: With typical cerioidine characters (see above), and: face straight except slight indentation on ventral fifth; eye bare or very short pilose, with pile only about as long as ommatidium diameter; ♂ unknown but assumed to be holoptic; antennifer long about ⅕ as long as face, slightly longer than basal 2 antennal segments; postmetacoxal bridge complete; metafemur swollen, spinose on ventro-apical half; vein R_{4+5} straight, not sinuate, with appendix; crossvein r-m oblique, at apical ⅔ of

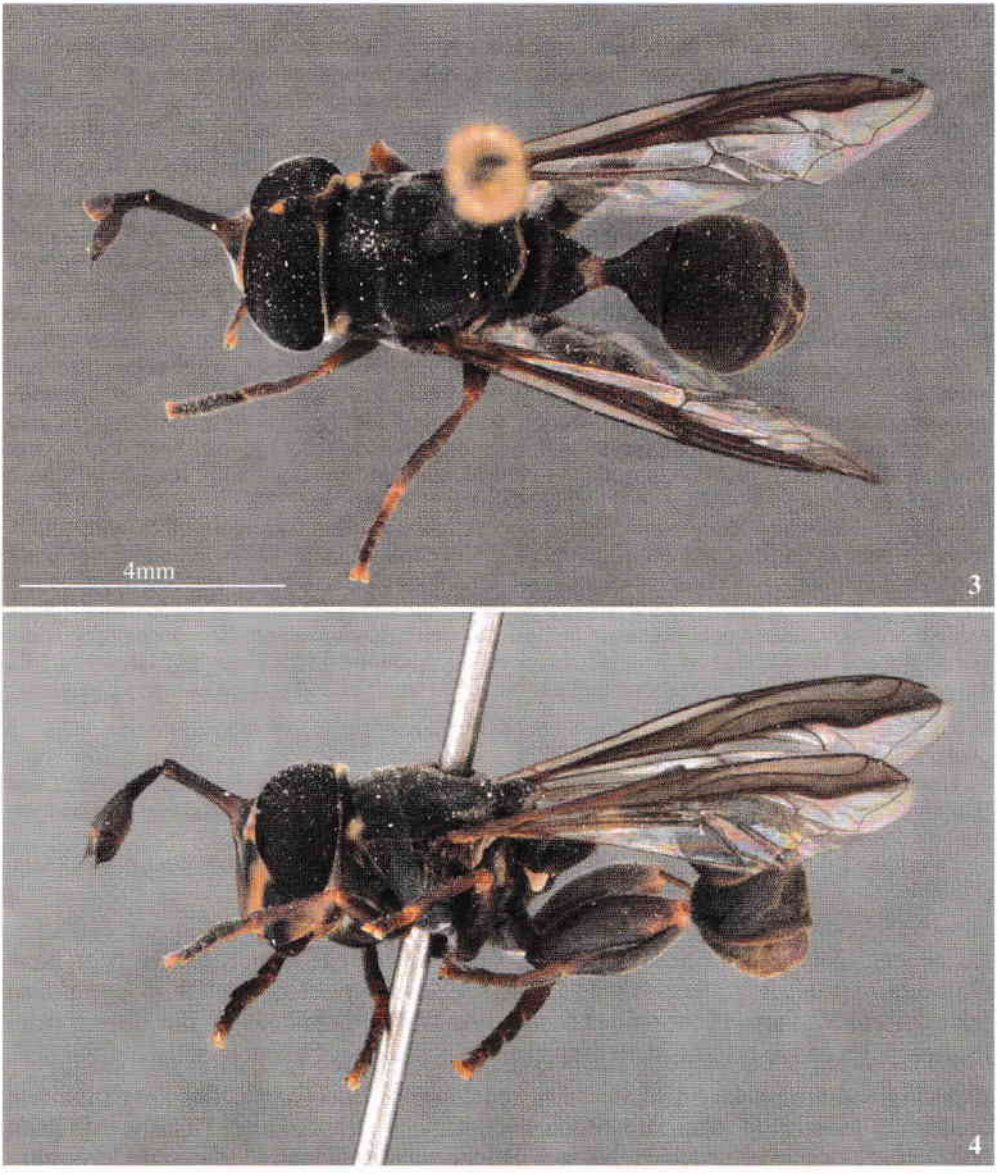


Figs 1–2. — *Ceriana* (*Ceriana*) *wyatti* sp. n., ♂: 1, dorsal view; 2, lateral view.

cell DM; plumula very short; abdomen distinctly petiolate; 2nd segment about ⅓ as wide basally as basal width of 1st segment and about ¼ as wide apically.

Etymology: The genus-group name is derived from the combination of '*Pseudo*' from the Latin for false and '*Polybiomyia*' from the genus named by Shannon, and is to be treated as feminine.

Remarks: This group may be merely a phenetic concept as perhaps are all the other cerioidine groups. Phenetic concepts are very useful for classifications and identification. Obviously for the first two centuries of taxonomy (given that



Figs 3–4. — *Ceriana* (*Oculovillosa*) *ismayi*, sp. n., ♂: 3, dorsal view; 4, lateral view.

taxonomy dates from Linnaeus, but one could say the first two millennia if you date taxonomy from Aristole!) no one really considered the monophyly of groups as a significant criterion. So while some of the characters used to delimit cerioidine groups may be due to convergent evolution, these groups recognized here are useful for identification and organization of biotic information.

Ceriana* (*Ceriana*) *wyatti sp. n.
(Figs 1–2)

Recommended common name: Wyatt's Ceriana

Description

♂, face yellow except for broad black medial and lateral vittae, sparsely pale pilose; gena black except dark narrowly posteriorly; frontal triangle yellow except with black triangular medial macula; antennifer black; vertex yellow except ocellar triangle black; occiput yellow except medial ⅓ black, sparsely white pollinose dorsally and ventrally, densely white pollinose on medial ⅓, white pilose. Antenna black, black pilose. Antennal ratio [antennifer : pedicel : scape : basoflagellomere : arista]: 2.1 : 1.3 : 1.0 : 1.3 : 5.0.

Thorax: postpronotum yellow, yellow pilose; propleuron black; mesonotum black except notopleuron yellow on posterior half, dull pollinose except pale greyish yellow pollinose along transverse suture, short black pilose, with some intermixed yellow pili; pleuron black except with large yellow macula on posterior anepisternum and smaller anteroventral yellow macula on anepimeron, dull pollinose except silvery-white pollinose on dorsal ½ of katepisternum, pale pilose; scutellum yellow, yellow pilose; plumula very short, black; calypter yellow; halter yellow. Legs: coxae black, grey pollinose, pale pilose; trochanters brownish black, white pilose; pro- and mesofemora black on basal ⅓, orange apically, pale pilose; metafemur black on basal ⅗, orange apically, pale pilose; tibiae and tarsi orange, pale pilose. Wing: hyaline except dark in area between vein Sc and R and R_{4+5}, (costal cell hyaline), extensive bare, microtrichose only in dark areas and on apical ½ cell R_{4+5}, apical ⅗ of cells M and CuP and along wing margin; with vein R_{4+5} slightly sinuate but without spur vein; alula bare.

Abdomen: elongate, not petiolate, black with yellow maculae; 1st tergum black with yellow lateral ¼, pale pilose; 2nd tergum black on basal ⅗, yellow apically, yellow pilose except black pilose apicolaterally; 3rd tergum black on basal ⅓, yellow apically, black pilose; 4th tergum black on basal ¾, yellow apically, sparsely grey pollinose on lateral ⅓, black pilose; male genitalia reddish brown, sparsely pale pollinose and pilose; sterna black; 1st and 2nd sterna long white pilose; 3rd and 4th sterna short depressed black pilose. Abdominal ratio [length of 1st : 2nd : 3rd : 4th terga]: 1.0 : 1.4 : 2.6 : 2.0; abdominal petiole ratio [width of 2nd tergum at base : narrowest : apex]: 1.0 : 1.1 : 1.0.

Material examined:

Holotype, ♂, labelled: 'Konedobu / Central Dist. / Papua 27: 4: 67 / T. L. Fenuer', and 'Holotype / Ceriana / fergusoni / Thompson 2013'; deposited in USNM, Washington. Holotype slightly damaged where pin has broken through mesonotum.

Paratype, 1 ♀ from Port Moresby, Paga Hill, July 1965, collected by Siral An H Mann (USNM).

Type locality: Papua New Guinea. Central District: Konedobu, 9°28′1″S, 147°9′35″E.

Diagnosis: Only one species of the subgenus *Ceriana* has been recorded from New Guinea (*annulifera* Walker (1861: 238)). *Ceriana wyatti* is similar to *annulifera* (also *relicta* Walker (1858: 94) and *relictura* Walker (1858: 93)), but differs from these species in having the scutellum entirely yellow, not black basally.

Etymology: I am pleased to name this species for Nigel Wyatt, the long time and dedicated curator of the Diptera collections at The Natural History Museum (BMNH), London. For years he has helped me and many others by promptly answering our numerous requests for loans and information about type specimens.

Ceriana (*Monoceriomyia*) *smaragdina* (Walker) stat. rev.
(Figs 5–6)

Recommended common name: Smaragdine Ceriana

When Shannon (1925: 56) originally described his genus *Polybiomyia* it was based on a lack of an antennifer and the presence of a postmetacoxal bridge (PMBC), also all the included species were restricted to the New World (southwestern Nearctic and northern Neotropics). Later he (Shannon, 1927: 41, 53) included an Afrotropical species (*divisa* Walker) and Papuan species (*smaragdina* Walker). The inclusion of *smaragdina* was unusual as that species lacks the postmetacoxal bridge.

The status of *smaragdina* has not been clear as Shannon (1927: 41) placed it as a *Polybiomyia* species, (where it remained in the last regional Diptera catalog (Thompson & Vockeroth, 1989: 456)), but the lectotype is without a complete postmetacoxal bridge and the abdomen is distinctly petiolate, hence, the species belongs to *Monoceromyia*. Here within the present paper, the one specimen of this species known to have been studied by Walker is designated lectotype and is figured with its labels as per the recommendations of the International Code of Nomenclature (ICZN, 1999, recommendation 73F).

KEYS

Key to the groups of cerioidine flower flies

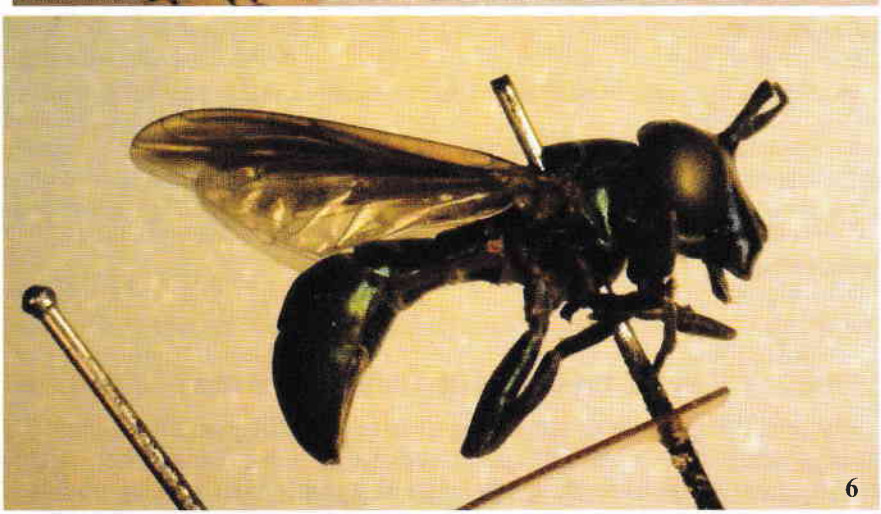
1 Eye bare . . . 3
– Eye pilose. Antennifer present . . . 2
2 Postmetacoxal bridge complete; abdomen petiolate, at its narrowest about ½ as wide as mesonotum . . . ***Oculovillosa*** subgen. n.
– Postmetacoxal bridge incomplete; abdomen elongate, not petiolate, about as broad as mesonotum . . . *Primocerioides*
3 Postmetacoxal bridge incomplete . . . 5
– Postmetacoxal bridge complete . . . 4
4 Antennifer absent . . . *Polybiomyia*
– Antennifer present . . . ***Pseudopolybiomyia*** subgen. n.
5 Antennifer absent or very short, broader than long basally and less than half as long as scape . . . *Sphiximorpha*
– Antennifer present, longer than broad, as long as or longer than scape . . . 6
6 Abdomen petiolate; 2nd segment at its narrowest much narrower than 1st and 3rd segments. . . . *Monoceromyia*
– Abdomen elongate, not petiolate; 2nd segment as broad as or broader than the 1st . . . 7
7 Plumula absent . . . *Ceriana*
– Plumula present . . . *Pterygophoromyia*

Key to the Papuan cerioidine flower flies

No key to the Papuan cerioidines has ever been published. De Meijere (1908) published a key to the 'Oriental' species which included Papuan and Australian species. Kertész (1913) likewise published a key to Oriental species in that broad sense of Oriental. The last published key to Australian cerioidines was Paramonov (1955).

1. Shiny metallic green species, only face and postpronotum partially yellow (*Monoceromyia*) 6
– Not metallic green; black, or pale yellowish to reddish species 2
2. Eye pilose; postmetacoxal bridge present ..... (***Oculovillosa***) ***ismayi*** sp. n.
– Eye bare; postmetacoxal bridge absent (*Ceriana*) 3
3. Postpronotum dark, brownish black; legs orange; 1st tergum entirely black ..... *relicta*
Ceria relicta Walker (1858: 94) Aru Islands
– Postpronotum pale, yellow; femora mostly black; 1st tergum yellow laterally 4

5



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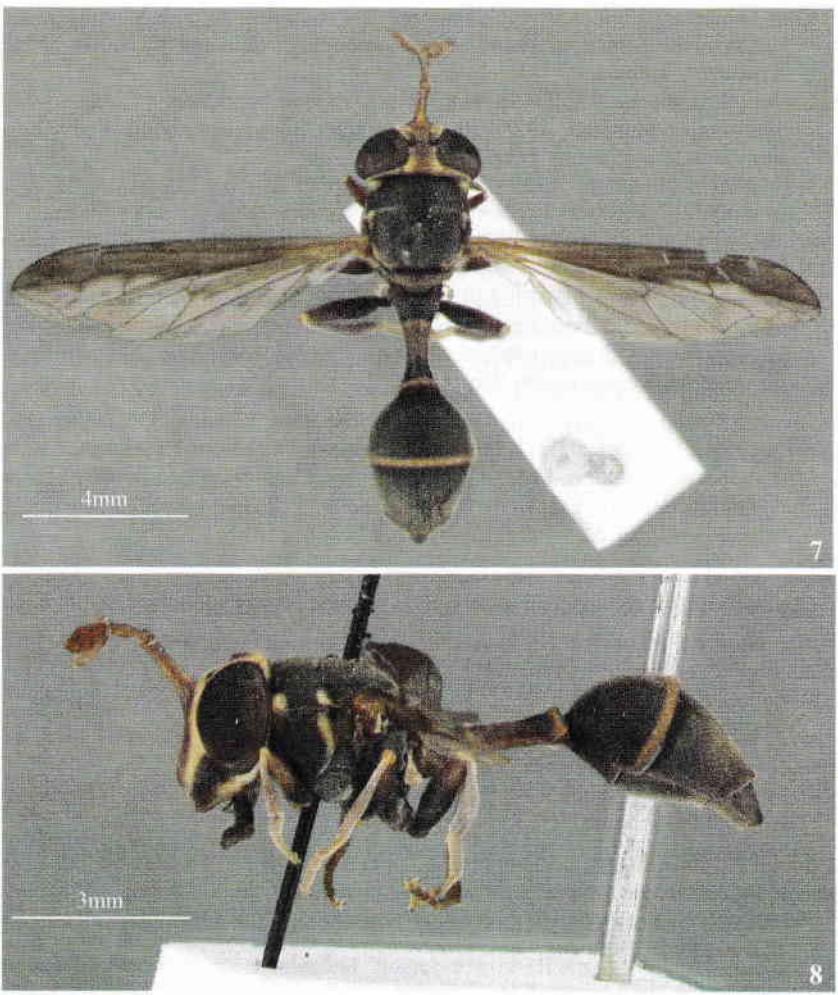
Figs 5–6. — *Ceriana* (*Monoceromyia*) *smaragdina* (Walker), lectotype, ♂: 5, dorsal view; 6, lateral view (wing length = 10mm).

4. Scutellum black with narrow yellow apical margin; abdomen distinctly constricted at junction of 1st and 2nd terga ..... *annulifera*
Ceria annulifera Walker (1861: 238) New Guinea
– Scutellum entirely yellow; abdomen not constricted at junction of 1st and 2nd terga 5
5 2nd tergum black; 1st tergum broadly yellow laterally, yellow on lateral ½; arista white; anepimeron yellow anteroventrally ..... *relictura*
Ceria relicta Walker (1858: 93) renamed as
Ceria relictura Walker (1861: 238) Aru Island
– 2nd tergum with broad apical yellow margin; 1st tergum narrowly yellow laterally, yellow on about lateral ½; arista black; anepimeron black ..... ***wyatti*** sp. n.
6 Postpronotum yellow ..... *metallica*
Ceria metallica Wulp (1898: 420) New Guinea, Australia
– Postpronotum metallic green ..... *smaragdina*
Ceria smaragdina Walker (1858: 93) Aru Islands



Figs 7–8. — *Ceriana* (*Pseudopolybiomyia*) *ablepta* (Riek), holotype, ♂: 7, dorsal view; 8, lateral view.

GROUPS: DISTRIBUTION, SPECIES COUNTS AND NOMENCLATURAL DETAILS

Notes: The nomenclature of the cerioidine flower flies has been greatly confused with numerous misspellings, and objective and subjective synonyms. Only two need specific mention here as they appear to represent distinctive groups. Hull (1949: 380–381) described two new subgenera in the genus *Polybiomyia*, that is, a group based on the presence of a complete postmetacoxal bridge (PMCB) (Hull, 1949: 379, couplet #4). Neither of these new groups, however, have complete PMCB in their type species and are merely synonyms of other groups (*Ceriathrix* Hull = *Monoceromyia* and *Polistoceria* Hull = *Sphiximorpha*; new synonyms).

Ceriana: Afrotropic (5 species), Australian (14 species, 19 names), Nearctic (6 species, 7 names), Oriental (8 species), Palaearctic (11 species, 20 names).

Ceria Fabricius, 1794: 277, type-species: *clavicornis* Fabricius by subsequent designation of Weber (1795: 161) = *conopsoides* Linnaeus.

Cina Fabricius, 1798: 557, type-species, *Ceria clavicornis* Fabricius by monotypy = *conopsoides* Linnaeus. Published in synonymy, validated by Goffe (1945: 122). Synonymy automatic.

Ceriana Rafinesque, 1815: 131, new name for *Ceria* Fabricius.

Tenthredomyia Shannon, 1925: 50, type-species, *Ceria abbreviata* Loew by original designation. Synonymy unknown.

Vespidomyia Shannon, 1925: 52, type-species, *Musca conopsoides* Linnaeus by monotypy. Published in synonymy, not subsequently validated by usage.

Styloceria Enderlein, 1934: 185, new name for *Ceria* Fabricius. Synonymy by Peck (1988: 178).

Styloceria Enderlein, 1936: 127, type-species, *Musca conopsoides* Linnaeus by monotypy. Preoccuppied by Enderlein, 1934. Synonymy by Peck (1988: 178).

Hisamatsumyia Shiraki, 1968: 148, type-species, *japonica* Shiraki by original designation. Synonymy by Peck (1988: 177).

Monoceromyia: Afrotropic (22 species), Australian (10 species, 13 names), Nearctic (1 species), Neotropic (9 species), Oriental (28 species, 31 names), Palaearctic (5 species, 6 names).

Monoceromyia Shannon, 1922: 41, type-species: *Ceria tricolor* Loew by monotypy.

Sphyximorphoides Shiraki, 1930: 6, type-species: *Sphiximorpha pleuralis* Coquillett by original designation. Synonymy by Peck (1988: 178).

Oculovillosa: Australian (1 species, New Guinea).

Oculovillosa subgen. n. (this paper), type-species, ***ismayi*** sp. n. by original designation.

Polybiomyia: Nearctic (southern USA, 6 species), Neotropic widespread except absence in Chilean region (14 species, 15 names).

Polybiomyia Shannon, 1925: 56, type-species: *schwarzi* Shannon by original designation.

Primocerioides: Palaearctic (2 species, 3 names).

Primocerioides Shannon, 1927: 41, type-species, *Cerioides petri* Hervé-Bazin by original designation.

Primoceriodes Shannon, 1927: 41, incorrect original spelling; by current revision.

Pseudopolymyia: Afrotropic (1 species), Australian (1 species).

Pseudopolymyia subgen. n. (this paper), type-species, *Cerioides ableta* Riek by original designation.

Ptergophoromyia: Australian (4 species).

Ptergophoromyia Shannon, 1927: 42, type-species, *Tenthredomyia saundersi* Shannon by monotypy.

Sphiximorpha: Afrotropic (8 species), Australian (3 species, 4 names), Nearctic (5 species, 9 names), Neotropical (23 species, 25 names), Oriental (11 species, 12 names), Palaearctic (7 species, 9 names).

Cerioides Rondani, 1850: 211, type-species, *Ceria subsessilis* Illiger by monotypy. Published in synonymy, validated by subsequent usage of Bezzi & Stein (1907: 156).

Sphiximorpha Rondani, 1850: 213, type-species *Ceria subsessilis* Illiger by original designation.

Sphyximorpha Rondani, 1856: 55, subsequent misspelling of *Sphiximorpha* Rondani.

Spiximorpha Rondani, 1857: 12, emendation of *Sphyximorpha* Rondani.

Sphixiomorpha Hagen, 1863: 90, subsequent misspelling of *Sphiximorpha* Rondani.

Sphecomorpha Bezzi, 1906: 51, emendation of *Sphiximorpha* Rondani.

Sphinimorpha Shannon, 1925: 51, subsequent misspelling of *Sphiximorpha* Rondani.

Ceriodes Shannon, 1925: 61, subsequent misspelling of *Cerioides* Rondani.

Ceriathrix Hull, 1949: 381, type-species, *Cerioides bulbosa* de Meijere by original designation. Synonymy Knutson *et al.* (1975: 346).

Shambalia Violovitsh, 1981: 85, type-species, *rachmaninovi* Violovitsh by original designation. Synonymy by Peck (1988: 180).

ACKNOWLEDGMENTS

I thank John Ismay for sending these interesting flies and others for identification years ago. Thanks also to Nigel Wyatt, Life Sciences Department, The Natural History Museum (BMNH), London, for making images of various types and providing other critical information on them; and Rachel Osborn for taking the images of the new species. The images of *smaragdina* Walker were provided by the Natural History Museum and it holds the copyright to them. The production of the other images was funded by the Smithsonian Institution (Williston Diptera Research Fund) and it holds the copyright to them. Finally, I thank Ximo Mengual and Jeffrey Skevington for their review of and corrections to the manuscript.

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