A NEW AFROTOPRICAL CERIOIDINE FLOWER FLY WITH AN OVERVIEW OF THE GROUP (DIPTERA: SYRPHIDAE, CERIOIDINI)

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ABSTRACT

A new species, *Ceriana ponti* (Cerioidini, Eristalinae, Syrphidae), is described and illustrated from Burkina Faso. Keys to the Afrotropical genera of the tribe Cerioidini and the species of *Ceriana* are given.

Keywords: Syrphidae, new species, Burkina Faso

INTRODUCTION

Cerioidine flower flies are among the most spectacular flies, being high-fidelity (perfect) mimics of wasps (see Rotheray & Gilbert, 2011: 131–152). As such, they are rare in nature and poorly known. Some 197 species (235 names) have been described worldwide with more than a hundred known species waiting to be described. In the Afrotropical region, 34 species have been described. The first key (Hervé-Bazin, 1913) to these species covered all the then known species (13), but the last key (Curran, 1938) covered only 17 of the then described species (23) and 11 species have been described since then. This is the first in a series of papers to revise the Afrotropical cerioidine fauna and lay the ground work for a revision of their high classification.

Cerioidine flower flies were known to Linnaeus (1758) who placed them in his broad group, the genus *Musca*. Fabricius (1794) was first to recognize a separate group (*Ceria*) for these flies and later Rondani (1850) created another genus to accommodate the diversity of the European species and a separate subfamily for them. Shannon (1927) was the last to revise the classification of cerioidine flower flies and placed them into 9 genera and 9 non-typic subgenera. The treatment of these species varies among the regional Diptera catalogs as some authors have recognized the Shannon classification (Nearctic (Wirth, Sedman & Weems, 1965: 615), Neotropical (Thompson, Vockeroth & Sedman, 1976: 93); Oriental (Knutson, Thompson & Vockeroth, 1975: 343); Palaearctic (Peck, 1988: 177); Afrotropical (Smith & Vockeroth, 1980: 499)) and others have only recognized one genus with subgenera (Australasian/Oceanian catalog (Thompson & Vockeroth, 1989: 455)). Also, to add to the situation, the nomenclature of the various taxa has been confused. For pragmatic reasons, I here follow the Shannon classification with the correct and proper nomenclature for my initial descriptive work, leaving the reassement of the higher groups until the full species diversity is documented.

Burkina Faso (formerly Upper or Haute Volta) is a medium-sized country in north central Africa whose biodiversity is little known,

especially for Diptera. Only 24 species (15 now valid) have ever been described from the country out of some 23,155 species described from the Afrotropical Region; and there are only 4 papers cited in the last bibliography of Afrotropical Diptera (Smith, Crosskey & Pont, 1980), which lists some 4,700 papers, that include the country name!

Terminology follows Thompson (1999), which is based on that used in the *Manual of Nearctic Diptera* (McAlpine, 1981) (as are the *Manual of Palaearctic Diptera* (Merz & Haenni, 2000) and *Manual of Central American Diptera* (Cumming & Wood, 2009)), except the more classic (Latin and Greek) terms are used instead of their English equivalents for a more universal terminology. Hence, pro- is used for fore, meso- for mid and meta- for hind in terms of the legs (following from prothorax, mesothorax and metathorax); likewise, fascia instead of band, vitta instead of stripe, pile or pilose for hairs or hairy; and basoflagellomere instead of first flagellomere. Antennifer is here used for the greatly elongated and narrow production of the frons or frontal prominence. The classification followed here is that of the *Systema Dipterorum* (Thompson, 2012) and follows from Vockeroth (1969) and Thompson (1972) and those used in the various regional catalogs, such as Smith & Vockeroth (1980) for the Afrotropical region.

For taxonomy of cerioidine flies, there are four important ratios. As all cerioidine flies are hymenopteran (wasp) mimics, their appearance / shape is critical. They must appear to have long antennae and petiolate abdomens. The following ratios document these features. These ratios are defined as: (1) antennifer ratio, the width at the base of the antennifer against the length, measured in dorsal view; (2) antennal ratio, the relative length of each segment including the length of the arista and antennifer, measured in lateral view; (3) abdominal segmental ratio, the relative lengths of the abdominal segments, usually male only, measured in lateral view; and (4) abdominal petiole ratio, the relative widths of the 2nd tergum basally, apically and at the narrowest, measured dorsally.

For new species, the type information is given in two statements: (1) for the type-locality, the proper political and geographic names for the location are given from the largest unit to the smallest (along with the geographic coordinates), and (2) for the type-specimen, the actual data on the specimen labels is quoted and the contents of each label are given separately within quotation marks ('…'), with each line of the label separated by a single slash (/).

Key to the genera of the Afrotropical cerioidine flower flies

A Postmetacoxal bridge complete or approximate, with metathoracic pleura fused or meeting . . . . . *Polybiomyia*

— Postmetacoxal bridge incomplete, with metathoracic pleura widely separated . . . . B

B 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 (Fig. 1) . . . C

C. Abdomen petiolate; 2nd segment at its narrowest much narrower than 1st and 3rd segments . . . . . *Monoceromyia*
— Abdomen not petiolate, elongate; 2nd segement as broad as or broader than the 1st (Fig. 1) . . . . . *Ceriana*

Notes on genera:

Genus *Ceriana* Rafinesque:

Antennifer distinct, much longer than broad basally, longer than scape; postmetacoxal bridge absent; abdomen elongate or only slightly petiolate, never strongly petiolate. *Ceriana* contains 55 species and is found in all regions except the Neotropics proper (18 Palaearctic, 6 Nearctic, 4 Afrotropic, 7 Oriental and 19 Australian species), with 1 species ranging south to Costa Rica.

Genus *Monoceromyia* Shannon:

Antennifer distinct, much longer than broad basally, longer than scape; postmetacoxal bridge absent; abdomen strongly petiolate, frequently with petiole long, longer than thorax. *Monoceromyia* contains 73 species and is found in all regions (8 Palaearctic, 1 Nearctic, 9 Neotropic, 22 Afrotropic, 25 Oriental and 8 Australian species).

Genus *Polybiomyia* Shannon:

Antennifer usually absent, present in the Afrotropical and the Australian species; postmetacoxal bridge complete or nearly so, usually continuous, rarely metathoracic pleurae separate by a narrow suture; abdomen petiolate. *Polybiomyia* contains 21 species, all Neotropical, except one Afrotropical, one Australian and one Papuan species. The Neotropical species undoubtedly form a monophyletic clade, but the other species probably do not, as the acquisition of the postmetacoxal bridge may be convergence.

Genus *Sphiximorpha* Rondani:

Antennifer absent or if present, shorter than wide at base; postmetacoxal bridge absent; abdomen petiolate. *Sphiximorpha* contains 55 species and is found in all regions (7 Palaearctic, 5 Nearctic, 23 Neotropic, 8 Afrotropic, 9 Oriental and 3 Australian species).

REVIEW OF AFROTROPICAL *CERIANA*

Key to the Afrotropic *Ceriana* species

1 Wing extensively dark, with dark coloration extending into posterior half of wing (Fig. 1); abdomen dark with a continuous sublateral broad yellow vitta, without apical segmental fasciae (Fig. 1) . . . . . ***ponti*** sp. n.
— Wing with anterior ½ dark, posterior ½ hyaline; abdomen dark with pale apical fascia 2

2 2nd tergum black without apical yellow fascia . . . . . *brunnea*
— 2nd tergum black with apical yellow fascia 3

3 Scutellum bicolorous, black with basal yellow fascia; antennifer as long as basoflagellomere; supra-alar yellow vitta present, narrow, but distinct; 2nd tergum slightly longer than 3rd; antenna mainly dark, pale basoventrally on basoflagellomere . . . . . *aurata*
— Scutellum unicolorous, pale, orange brown; antennifer twice as long as basoflagellomere; supra-alar vitta absent; 2nd tergum only about ⅔ as long as 3rd; antenna reddish brown, with basal segments paler . . . . . *dilatipes*

Ceriana aurata (Curran)

Cerioides aurata Curran, 1927: 83. Type-locality: Congo. Kisangani [as 'Stanleyville'], 00° 31' N, 025° 12' E (Holotype ♀, AMNH, New York). Curran, 1938: 3, (key references, Congo).

Sphiximorpha aurata. Smith & Vockeroth,1980: 500, (catalog citation).
Ceriana aurata. Dirickx, 1998: 25, (catalog citation); Whittington, 2004: 589, (citation, fauna assessment).

Material examined. An image of the holotype is available online in AMNH Invertebrate Zoology type specimen database: (http://research.amnh.org/in/types_db/images/cerioides_aurata.jpg).

Ceriana brunnea (Hull)

Tenthredomyia brunnea Hull, 1944: 23. Type-locality: Namibia [as 'S.W. Africa, Aus.'] (Holotype ♂, BMNH, London).
Ceriana brunnea. Smith & Vockeroth, 1980: 500, (catalog citation); Dirickx, 1998: 25, (catalog citation); Whittington, 2004: 589, (citation, fauna assessment).

Material examined. None. Species placed in the key on the basis of the original description and an image of the type.

Ceriana dilatipes (Brunetti)

Cerioides dilatipes Brunetti, 1929: 15. Type-locality: Zimbabwe [as 'South Rhodesia'], Saw Mills, 19° 35' S, 028° 12' E (Holotype ♂, BMNH, London).
Sphiximorpha dilatipes. Smith & Vockeroth, 1980: 500, (catalog citation).
Ceriana dilatipes. Dirickx, 1998: 26, (catalog citation); Whittington, 2004: 589, (citation, fauna assessment).

Material examined. A second specimen with the same label data as the Holotype, but collected on 12 December (USNM, ♂, USNMENT00037202).

Fig. 1. — *Ceriana ponti* Thompson, sp. n., holotype ♀. Dorsal view habitus.

Species misplaced in *Ceriana*:

Dirickx (1998: 26) incorrectly placed *maculipennis* Hervé-Bazin in *Ceriana*, but the species has a distinctly petiolate abdomen (see the figure in Hervé-Bazin's original description: 1913: 90, fig. 1). Hence, this species properly belongs to *Monoceromyia* as defined here.

Ceriana ponti sp. n.
(Fig. 1)

Description:

♀, length: body, 13.6mm, wing, 9.1mm.

Head. Reddish brown; face dark brown with broad yellow sublateral vitta and narrow reddish medial vitta, tubercle reddish; frons light reddish except small yellow macula laterad to junction of frons and face, sparsely white pilose; frontal prominence darker reddish brown; vertex reddish brown except small dark brown macula posterior to ocellar triangle, sparsely white pilose; occiput reddish brown, sparsely white pollinose and pilose; gena yellow except reddish brown on medial ⅓, white pilose. Antenna dark reddish brown, black pilose; arista yellow; antennal ratio: 3.3 : 2.2 : 1.8 : 2.5 : 1; antennifer ratio: 1.7.

Thorax. Postpronotum reddish brown, pale pilose; scutum black on medial ⅔, reddish brown laterally, sparsely grey pollinose, short appressed black pilose on dark areas, pale pilose laterally; pleuron reddish brown except pectus and posterior anepimeron darker and katatergum yellow; scutellum yellow on basal ⅓, black apically, pale pilose; calypter white with rim darker yellow; halter yellow with brown capitulum. Legs light reddish brown except coxae darker, black pilose except metafemur white pilose posteriorly. Wing: tricoloured, yellow along anterior margin on basal ½, brownish black except hyaline on basomedial ⅓ and along posterior margin; vein R4+5 sinuate but without a spur; microtrichose except bare cell R, anterobasal ⅔ of cell BM, anterobasal ¼ of cell CuP (Anal), alula and basal ½ of anal lobe.

Abdomen. Terga black on medial ⅔, broadly yellow laterally, black appressed short pile on dark areas, yellow short appressed pile on pale areas, with black area on 1st tergum narrowed to a point on basal margin; sterna black, black appressed short pilose; abdominal segmental ratio: 1.5 : 2.6 : 2.3 : 3.9 : 1; abdominal petiole ratio: 1.0 : 1.0 : 1.1.

Diagnosis: *Ceriana ponti* runs to *C. vespiformis* (Latreille) in the last key to Afrotropical cerioidines (Curran, 1938: 1), and is quite similar in stature to that species but is quite different in coloration. *Ceriana vespiformis* is a black and yellow species, whereas *C. ponti* is a brown and yellow species.

Etymology: Traditionally cerioidine species are named after distinguished dipterists. So, I am delighted to name this distinctive species after one of today's leading and most knowledgeable workers, Adrian Charles Pont (1941–), formerly of the old British Museum (Natural History) when there was a dedicated Diptera unit, he is now at the University Museum, Oxford.

Material Examined: Holotype ♀, pinned with the following labels: 'BURKINA FASO / 59 km E Ouagadougov / 12°21.5N, 1°02.4W / 9 August 2004' [printed on white card stock] and 'Holotype / Ceriana / ponti / Thompson 2011' [hand-written on orange card stock]. This label information represents all that is known about this species, and without any information about the collector there is no way to find out more.

Type Locality: BURKINA FASO, Ouagadougov, 59 kilometer east of, 12° 21.5' N, 001° 021.4' W.

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REFERENCES

Brunetti, E., 1929, New African Diptera, *Annals and Magazine of Natural History*, (ser. 10) **4**: 1–35.

Cumming, J.M. & Wood D.M., 2000, Adult morphology and terminology, pp. 9–50. *In*: Brown, B.V., Borkent, A., Cumming, J.M., Wood, D.M., Woodley, N.E. & Zumbado, M.A. (Eds), *Manual of Central American Diptera. Vol. 1*, Ottawa: NRC CNRC, NRC Research Press.

Curran, C.H., 1927, Diptera of the American Museum Congo Expedition, part I – Bibionidae, Bombyliidae, Dolichopodidae, Syrphidae and Trypaneidae, *Bulletin of the American Museum of Natural History*, **57**: 33–89.

——— 1938, Records and descriptions of African Syrphidae: I (Diptera), *American Museum Novitates*, **1009**: 1–15.

Dirickx, H.G., 1998, *Catalogue synonymique et géographic des Syrphidae (Diptera) de la région afrotropicale*, Muséum d'histoire naturelle Genéve, Instrumenta Biodiversitatis.

Fabricius, J.C., 1794, *Entomologia systematica emendata et aucta, Secundum classes, ordines, genera, species adjectis synonimis, locis, observationibus, descriptionibus. Vol. 4*, Hafniae [Copenhagen]: C.G. Proft.

Hervé-Bazin, J., 1913, Syrphidae (Dipt.) recueillis au Congo par le D' J. Bequaert, II, Genre *Cerioides* Ron., *Revue de Zoologie africaines*, **3**: 85–95.

Hull, F.M., 1944, Some flies of the family Syrphidae in the British Museum (Natural History), *Annals and Magazine Natural History*, (11) **11**: 21–61.

Linnaeus, C., 1758, *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Vol. 1*, 10th edition. Holmiae [Stockholm]: L. Salvii.

Knutson, L.V., Thompson, F.C. & Vockeroth, J.R., 1975, Family Syrphidae, pp. 307–374. *In*: Delfinado, M.D. & Hardy, D.E. (Eds), *A catalog of the Diptera of the Oriental Region. Vol. II, Suborder Brachycera through division Aschiza, suborder Cyclorrhapha*, 307–374, Honolulu: University Press of Hawaii.

McAlpine, J.F., 1981, Morphology and terminology: adults, pp. 9–63 (chapter 2). *In*: McAlpine, J.F., Peterson, B.V., Shewell, G.E., Teskey, H.J,. Vockeroth, J.R. & Wood, D.M. (Co-ordinators), *Manual of Nearctic Diptera. Vol. 1*, Research Branch, Agriculture Canada, Monograph 27.

Merz, B. & Haenni, J.-P., 2000, Morphology and terminology of adult Diptera (other than terminalia), pp. 21–51. *In*: Papp, L. & Darvas, B. (Eds), *Contributions to a manual of Palaearctic Diptera (with special reference to flies of economic importance). Vol. 1, (general and applied Dipterology)*.

Peck, L.V., 1988, Family Syrphidae, pp. 11–230. *In*: Soos, A. & Papp, L. (Eds), *Catalogue of Palaearctic Diptera. Vol. 8, Syrphidae – Conopidae*, Budapest: Akadémiai Kiadó.

Rondani, C., 1850, Nota sexta pro dipterologia italica de nova specie generis *Ceriae* Fabricii, *Annales de la Sociètè Entomologique de France* (ser. 2), **8**: 211–214.

Rotheray, G.E. & Gilbert, F., 2011, *The natural history of hoverflies*, Ceredigion: Forrest Text.

Shannon, R., 1927, Notes on and descriptions of syrphid flies of the subfamily Cerioidinae. *Journal of the Washington Academy of Sciences*, **17**: 38–53.

Smith, K.G.V., Crosskey, R.W. & Pont, A.C., 1980, Bibliography of cited literature, pp. 889–1196. *In*: Crosskey, R.W. (Ed.), *Catalogue of the Diptera of the Afrotropical Region*, London: British Museum (Natural History).

Smith, K.G.V. & Vockeroth, J.R., 1980, Family Syrphidae, pp. 488–510. *In*: Crosskey, R.W. (Ed.), *Catalogue of the Diptera of the Afrotropical Region*, London: British Museum (Natural History).

Thompson, F.C., 1972, A contribution to a generic revision of the Neotropical Milesinae (Diptera: Syrphidae), *Arquivos de Zoologia, São Paulo*, **23**: 73–215.

——— 1999, A key to the genera of the flower flies (Diptera: Syrphidae) of the Neotropical Region including the descriptions of genera and species and a glossary of taxonomic terms, *Contributions on Entomology, International*, **3**: 319–378.

——— 2012, Family Syrphidae. *In*: Thompson, F.C. & Pape, T., *Systema Dipterorum*, version http://www.diptera.org [accessed September 2012].

Thompson, F.C. & Vockeroth, J.R., 1989, Family Syrphidae, pp. 437–458. *In*: Evenhuis, N.L. (Ed.), Catalog of the Diptera of the Australasian and Oceanian Regions, *Bishop Museum Special Publication*, **86**: 1–1155.

Thompson, F.C., Vockeroth, J.R. & Sedman, Y.S., 1976, Family Syrphidae, *A catalogue of the Diptera of the Americas south of the United States*, **45**: 1–195.

Vockeroth, J.R., 1969, A revision of the genera of the Syrphini (Diptera: Syrphidae), *Memoirs of the Entomology Society of Canada*, **62**: 1–176.

Whittington, A.E., 2004, The Afrotropical Syrphidae fauna: an assessment, *Studia Dipterologica*, **10** [2003]: 599–607.

Wirth, W.W., Sedman, Y.S. & Weems, H.V. Jr., 1965, Family Syrphidae, pp. 557–625. *In*: Stone, A., Sabrosky,C.W., Wirth, W.W., Foote, R.H. & Coulson, J.R. (Eds), A catalog of the Diptera of America north of Mexica, *U.S. Department of Agriculture Agricultural Handbook*, **276**: 1–1696.

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