

Discovery of *Dytomyia* Bickel (Diptera: Dolichopodidae) on the African continent with description of a new peculiar species from Kenya

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ABSTRACT

A new species of the genus *Dytomyia* from coastal Kenya is described, and a new identification key to males of Afrotropical species is provided. *Dytomyia flavicaudata* n. sp. differs from all other species of the genus in the mostly yellow abdomen and entirely yellow hypopygium. The male of *D. lutescens* (Vanschuytbroeck, 1952) is reliably illustrated for the first time. *Sciapus nubilis* Parent, 1935 is regarded as a *nomen dubium*.

KEYWORDS: Sciapodinae, *Dytomyia*, Afrotropical, Kenya, biodiversity, identification key, long-legged flies, new species, taxonomy.

INTRODUCTION

The genus *Dytomyia* Bickel, 1994 was established for five eastern and northern Australian species and an undescribed species from lowland Papua New Guinea. These species are known from coastal habitats including small nearby islands, although the type species, *D. sordida* (Parent, 1928), is also adapted to dry sclerophyllous, monsoonal and semi-arid habitats in central Australia (Bickel 1994). Three additional species were described from Madagascar, i.e. *D. deconinckae* Grichanov, 1998, *D. elenae* Grichanov, 1998 and *D. paulyi* Grichanov, 1998, and an identification key to those species was provided by Grichanov (1998). Later, the Madagascan *D. lutescens* (Vanschuytbroeck, 1952) and *D. nubilis* (Parent, 1935) were included into the genus after the study of the type material (Grichanov 1999, 2003). As a result, the Afrotropical species have been found in three localities on eastern coast of Madagascar, though *D. lutescens* was also reported from a beach on Nosy Be, a small island at the northwestern coast of Madagascar, and (one male) from Saint Helena island in the Atlantic Ocean (Grichanov 1999). *D. lutescens* specimen from Saint Helena, if not mislabelled, should be considered accidental introduction in the fauna of the island until additional material of this species is discovered from the island.

In this paper a new species of the genus *Dytomyia* from coastal Kenya is described, and a new identification key to males of Afrotropical species is provided. The male of *D. lutescens* is reliably illustrated for the first time.

MATERIALS AND METHODS

The holotype of the new species is housed at the Finnish Museum of Natural History, Helsinki, Finland (MZH). A male of *D. lutescens* was borrowed from the Royal Belgian Institute of Natural Sciences in Brussels, Belgium (RBINS) in exchange and will be deposited at the Zoological Institute of the Russian Academy of Sciences, St Petersburg (ZIN). A female of *D. nubilis* was examined in the National Museum of Natural History, Paris, France (MNHN).

The specimens have been studied and photographed with a ZEISS Discovery V-12 stereomicroscope and an AxioCam MRc5 camera. Morphological terminology and abbreviations follow Cumming and Wood (2017) and Grichanov and Brooks (2017). The lengths of the podomeres are given in millimetres. The body length is measured from the base of the antenna to the tip of abdominal segment 6. The wing length is measured from the base to the wing apex. The hypopygia in the lateral view (i.e. Figs 1E and 1G) are shown as they appear on the intact specimens, with the morphologically ventral surface of the genitalia facing upwards, dorsal surface downwards, anterior end facing right and posterior end facing left.

TAXONOMY

Subfamily Sciapodinae Becker, 1917

Tribe Sciapodini Becker, 1917

Genus *Dytomyia* Bickel, 1994

Bickel (1994) and Grichanov and Brooks (2017) provided the diagnosis of the genus. Adults can be distinguished by the following characters (Grichanov & Brooks 2017): head with vertex not strongly excavated; vertical seta strong in both sexes; face and clypeus broad in both sexes; thorax with 4 strong dorsocentral setae in both sexes; lateral scutellar setae absent; female fore femur with 3–4 short pale basoventral setae; male fore tarsomere 1 swollen, with dense pale pile; male hind tibia sometimes with irregular swelling, or callus at middle; male terminalia with cercus with short ventral lobe articulated at base. Grichanov and Brooks (2017) provided a key to all Afrotropical genera of the subfamily Sciapodinae as part of their key to the genera of the Afrotropical Dolichopodidae. *Dytomyia* is remarkable in having symmetrical male abdominal segments 7 and 8 and basal epandrial foramen in almost all species (except for Australian *D. flaviseta* Bickel, 1994); in other Sciapodinae, the hypopygial foramen is left lateral in position (Bickel 1994; Grichanov 1998). Females of close *Dytomyia* species are hardly distinguishable (Bickel 1994). The coloration and other characters used by Parent (1935) in his description of *Sciapus nubilis* Parent, 1935 are similar to those in all other Madagascan species of *Dytomyia*. Their females are now unknown or indeterminable. *Sciapus nubilis* (MNHN, examined in 1999) was described from a single female. It is regarded as unrecognizable and here declared to be a *nomen dubium*. This species had been referred to *Dytomyia nubilis* in Grichanov (2003).

Key to Afrotropical *Dytomyia* species (males)

- 1 All coxae yellow; abdominal segments 1–5 entirely yellow (Figs 1A–F); body length 3.8 mm (Kenya) *D. flavicaudata* n. sp.
 - Mid and hind coxae brown-black; abdomen entirely blackish green 2
- 2 Male fore femur with 3 or 4 long posteroventral setae in middle, the longest seta half as long as femur; male genitalia as in Grichanov (1998: figs 4, 5); body length 3.6 mm (Madagascar: Anosy Region)..... *D. deconinckae* Grichanov
 - Fore femur without long setae; male genitalia not as above..... 3
- 3 Male fore tibia with long posteroventral seta just before middle; outer lobe of male cercus bifurcated at middle, with several short setae (Grichanov 1998: fig. 6); body length 3.4 mm (Madagascar: Atsinanana Region)..... *D. elenae* Grichanov
 - Male fore tibia with long posteroventral seta in basal third; cercus various 4
- 4 Outer lobe of male cercus 2× as long as epandrium, approximately 5× as long as wide at base, 5× as long as basoventral lobe, slightly enlarged at apex, with spade-like ventral projection at basal 1/3 (Fig. 1G); body length about 4 mm (Madagascar: Atsinanana Region, Diana Region, Vatovavy-Fitovinany Region; St Helena)..... *D. lutescens* (Vanschuytbroeck)
 - Outer lobe of male cercus with 2 short arms; dorsal arm with apical brush of long yellow undulate setae; ventral arm 2× as long as dorsal arm, shorter than epandrium, slightly widened and truncate apically (Grichanov 1998: fig. 7); body length 3.3 mm (Madagascar: Atsinanana Region) *D. paulyi* Grichanov

Dytomyia flavicaudata n. sp.

(Figs 1A–F)

LSID: urn:lsid:zoobank.org:act:58036DC8-A60B-4DA3-85C7-887DFCFA8637.

Etymology: From Latin *flavus* (yellow) and *cauda* (tail), in the reference to the yellow colour of the hypopygium.

Diagnosis: *Dytomyia flavicaudata* n. sp. differs from all other species of the genus mostly in its yellow abdomen and entirely yellow hypopygium. The abdomen and hypopygium are entirely brown to green-black, with metallic reflections in other Afrotropical species. The outer lobe of the male cercus in the new species is unusually long and thin, 1.7× as long as epandrium, whereas most other species of the genus (except for *D. lutescens*) have a short cercus, not longer than the epandrium. Males of *D. lutescens* also have a long cercus, 2× as long as epandrium, but its outer lobe bears a large spade-like ventral projection in basal 1/3.

Description: Male (Fig. 1A). *Head* (Fig. 1B): Frons shining greenish blue, densely covered with short white hairs; 1 vertical bristle (broken) and 1 short white post-vertical seta; postocular setae white, uniserial; ventral postcranium covered with long

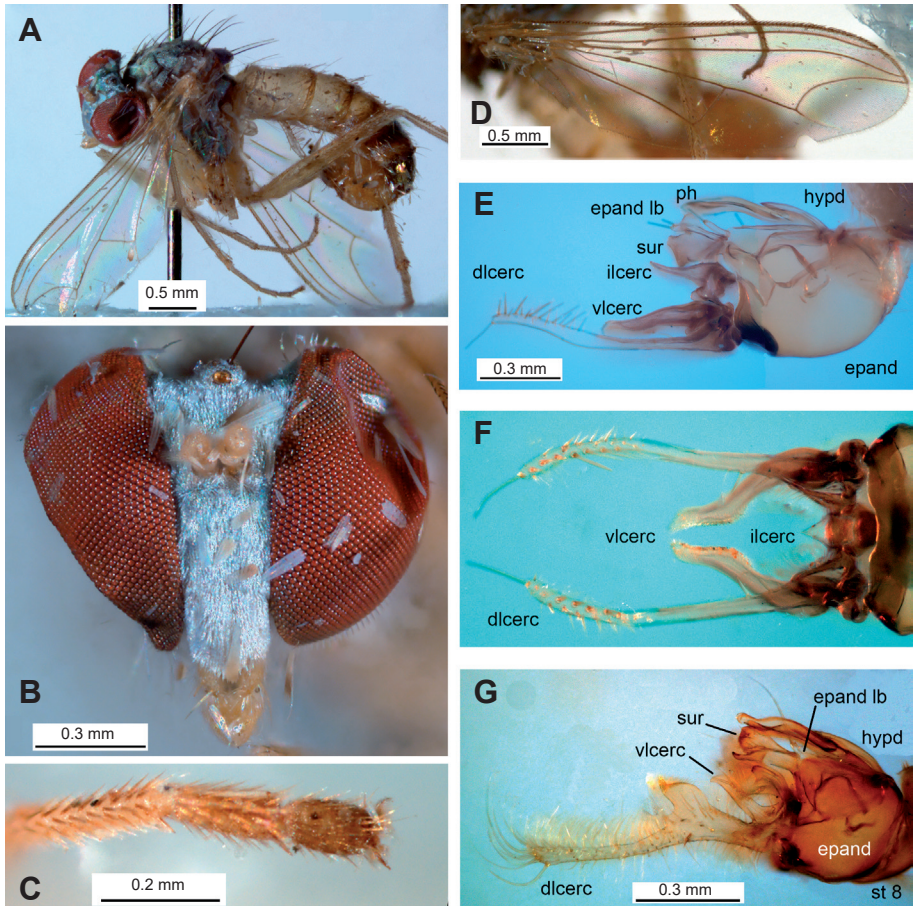


Fig. 1: *Dytomyia* spp.: (A–F) *Dytomyia flavicaudata* n. sp. (holotype): (A) habitus, (B) head, (C) hind tarsomeres 3–5, dorsal view, (D) wing, (E) hypopygium, lateral view; (F) cerci, dorsal view; (G) *Dytomyia lutescens* (Vanschuytbroeck, 1952), hypopygium, lateral view. Abbreviations: dlcerc – dorsal lobe of cercus, epand – epandrium, hypd – hypandrium, ilcerc – inner lobe of cercus, ph – phallus, st 8 – sternite 8, sur – surstylus, vlcerc – ventral lobe of cercus.

irregular white hairs; face and clypeus densely covered with short white hairs; face broad, 1.3× as high as wide under antennae, inconspicuously narrowed downward; clypeus as high as wide, separated from eyes; antenna with scape and pedicel small, simple, light yellow; pedicel with ring of short white setae and 1 short black dorsal bristle; postpedicel broken; palpus yellow with white hairs and 2 yellow bristles; proboscis yellow with white hairs.

Thorax: Metallic bluish green with black bristles; metepimeron yellow; mesonotum and scutellum weakly pollinose, pleura densely white pollinose; 4 strong

dorsocentral bristles decreasing in length anteriorly; acrostichals inconspicuous; scutellum with 2 strong bristles.

Legs including coxae yellow, segments 4 and 5 of hind tarsus brown (mid legs broken off); fore and mid coxae with white hairs and 2–4 white subapical bristles; hind coxa with 1 yellow seta at base and 2 short hairs; fore and mid femora without remarkable setae or hairs; fore tibia with 1 brown posterior seta at middle, $2\times$ as long as diameter of tibia; fore basitarsus slightly thickened, with ventral pad of short white hairs along entire length; hind tibia with several short light dorsal setae, 1 black apical seta dorsally; hind basitarsus with short basoventral seta; tarsomeres 4–5 slightly widened and flattened; tarsomere 5 $2\times$ as long as wide (Fig. 1C); femur, tibia and tarsomere (from first to fifth) lengths (mm): fore leg: 1.36/1.24/0.84/0.36/0.19/0.16/0.16, hind leg: 1.77/2.06/0.93/0.65/0.37/0.2/0.17.

Wing (Fig. 1D): Widest at middle, almost hyaline, veins yellow-brown; costa with simple setulae; R_{4+5} gently curved to M_1 in apical third; M_{1+2} almost straight; M_1 with strong elbow, forming nearly right angle with M_{1+2} ; ratio of parts of costa between R_{2+3} and R_{4+5} to those between R_{4+5} and M_1 , 6/1; crossvein dm–m straight; ratio of crossvein dm–m to apical part of M_{1+2} (fork-handle) to apical part of M_4 , 0.38/0.56/0.23; anal vein not reaching wing margin; anal lobe well developed and alula small; anal angle acute; lower calypter yellow with white cilia; haltere light yellow.

Abdomen: Mostly yellow with white hairs and short brown marginal setae; tergites 5 and 6 mostly shining blue-green; pregenital segments combined at most $2\times$ as long as thorax; segment 7 short, concealed; hypopygium massive and globular, yellow; hypopygial foramen basal in position and covered by cap-like sternum 8 (Fig. 1E); surstylus broad, flattened and fused to epandrium, with deep incision distally; outer lobe of cercus long and narrow, light yellow, glabrous on middle $\frac{1}{3}$, with several ventral setae on basal $\frac{1}{3}$ and ventral rows of brown setae on distal $\frac{1}{3}$ (Fig. 1F); adjacent cercal lobe slightly curved, half as long as outer lobe, with inner pad of microscopic hairs; short ventral section of cercus arising basally and freely articulated with main cercal body, consisting of free outer stick-shaped arm covered with setae and short subtriangular glabrous arm, which fused with the same arm of another cercus; 2 epandrial lobes long, finger-like, each with 1 long and 1 short apical setae; 1 short epandrial seta.

Measurements (mm): Body length 3.8, wing length 3.3, wing width 1.

Female. Unknown.

Holotype: ♂ **Kenya:** former *Coast Province*: Kilifi County, Kikambala [written as Kikabalu; 3.9°S 40°E], at light, 11–12.ii.1981, E. Räsänen (MZH).

Remarks: Unfortunately, the antennal postpedicels and mid legs are absent in the unique holotype. However, the other known *Dytomyia* species have no specific diagnostic characters on those body parts (Bickel 1994; Grichanov 1998).

Dytomyia lutescens (Vanschuytbroeck, 1952)

(Fig. 1G)

Chrysosoma lutescens Vanschuytbroeck, 1952: 139. Type locality: Madagascar: Ambila-Lemaitso.*Ethiosciapus lutescens*: Bickel, 1994: 142*Bickeliolus lutescens*: Grichanov, 1998: 82*Dytomyia lutescens*: Grichanov, 1999: 114.

Diagnosis: Scape yellow, other antennomeres dark brown dorsally; postpedicel triangular, with rounded apex; legs mostly yellow; fore coxa yellow, black at extreme base, with yellow setae; mid and hind coxae black; femora almost bare; fore tibia with 1 dorsal seta at base, 1 long posterior seta at basal $\frac{1}{3}$; mid tibia with 1 dorsal, 2 anterior setae; hind tibia with 1 anterodorsal, 2 posterodorsal, 1 anterior setae; fore basitarsus enlarged and ventrally flattened, with pile of hairs; tarsomere 5 of the same tarsus black, slightly flattened; hind basitarsus with 1 short basoventral seta; cross-vein dm–m nearly straight, slightly sinuous, approximately equal to fork-handle M; distal part of M_4 approximately $\frac{2}{3}$ as long as dm–m; alula developed; anal angle acute; hypopygial foramen basal in position and covered by cap-like sternum 8 (Fig. 1G); surstylus broad, flattened and fused to epandrium, with long setae and finger-like process; outer lobe of male cercus yellow, much longer than epandrium, approximately $5\times$ as long as wide at base, $5\times$ as long as basoventral lobe, slightly enlarged at apex, with spade-like ventral projection at basal $\frac{1}{3}$; with rows of long yellow setae, especially long at apex; adjacent cercal lobe straight, with row of strong setae; very short ventral section of cercus arising basally and freely articulated with main cercal body, consisting of 2 free outer arms with few setae and short subtriangular arm with few setae, which fused with the same arm of another cercus; 2 short epandrial lobes, each with 1 long and 1 short apical setae; 1 short epandrial seta.

Material examined: Madagascar: 1♂ Foulpointe [=Mahavelona], xi.1995, plage, bac jaune [beach, yellow pan trap], A. Pauly [ZIN, ex coll. RBINS].

Distribution: Madagascar, St Helena.

CONCLUSION

As a result of this study, a new species of the genus *Dytomyia* is described and illustrated from the former Coast Province of Kenya. It is the westernmost point of the distribution range of the genus and its first record on the African continent. An updated key to the Afrotropical species of the genus is compiled. *Dytomyia flavicaudata* n. sp. and the other known species inhabit the coastal habitats of Indian Ocean in Kenya and in Madagascar. Most Australian *Dytomyia* species are also found in coastal areas; although some, such as *D. sordida* (Parent), are widespread across inland semi-arid habitats (Bickel 1994). It is well known that the coastal habitats are subject to anthropogenic impact including the increasing urbanisation and recreational activities. It seems that most species are rare (except *D. sordida* and *D. lutescens*). They might be locally common but rarely collected. Therefore, *Dytomyia*

species may be included as bioindicators in nature conservation programmes aimed at prevention of biodiversity loss in coastal ecosystems.

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