

## SCIENTIFIC NOTE

### A NEW SPECIES OF THE GENUS *ORTHOPODOMYIA* FROM OTOTOMO, CAMEROON, WITH NOTES ON OTHER *ORTHOPODOMYIA* GROUP-SPECIES

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**ABSTRACT.** A new species belonging to the new Ototomoensis Group, *Orthopodomyia ototomoensis* Huang and Rueda, is described from Ototomo, Cameroon. Diagnostic features for separating members of Nkolbissonensis Group and Ototomoensis Group from other *Orthopodomyia* groups are provided. Two supplemental keys are presented: “A Pictorial Key to the Species of the Genus *Orthopodomyia* Ototomoensis Group in the Afrotropical Region (Diptera: Culicidae)” and “A Pictorial Key to the Species of the Genus *Orthopodomyia* Nkolbissonensis Group in the Afrotropical Region (Diptera: Culicidae).”

**KEY WORDS** *Orthopodomyia ototomoensis*, Ototomoensis Group, Nkolbissonensis Group, morphology, Cameroon

The genus *Orthopodomyia* Theobald is widely distributed in the tropical and temperate regions of the world. It comprises 35 species (WRBU 2013), including 15 species from Africa (Madagascar, 8; Comoros, 2; Mauritius, 1; Reunion Island, 1; Cameroon, 3, including the new species). The immature stages of *Orthopodomyia* are found in various habitats including plant containers, tree holes, bamboo stumps and internodes, bromeliad leaf axils, heliconia flower spathes, and artificial containers (Zavortink 1968). Knowledge of the feeding habits of *Orthopodomyia* adults is very limited. Zavortink (1968) reported that 2 species (*Orthopodomyia albipes* Leicester and *Or. andamanensis* Barraud) bite humans, while 3 species (*Or. alba* Baker, *Or. signifera* (Coquillett), and *Or. kummi* Edwards) feed on avian blood. Edwards (1932) provided the diagnostic characters of the genus *Orthopodomyia* from the whole world. Solely on the basis of adult ornamentation, he arranged and cataloged the species into 2 groups: Group A (*Orthopodomyia*) and Group B (*Bancroftia*). Based on the comparative morphology of the adults, male genitalia, pupae, and larvae, Zavortink (1968) divided the genus *Orthopodomyia* into 8 distinct groups, with each group representing a faunal region, as follows: 1) Oriental *Albipes* Group, 2) Holarctic *Signifera* Group, 3) Neotropical *Thomasina* Group, 4) Madagascan *Vernoni* Group, 5) African *Nkolbissonensis* Group, 6) South American *Albicosta* Group, 7) Mauritian *Arboricollis* Group, and 8) Middle American

*Folicolae* Group. These groups were placed provisionally into 4 Sections: 1) *Orthopodomyia* Section consisting of *Albipes*, *Vernoni*, *Nkolbissonensis*, and *Arboricollis* groups; 2) *Bancroftia* Section consisting of *Signifera* and *Albicosta* groups; 3) *Thomasina* Section; and 4) *Folicolae* Section. Zavortink (1968) recognized 24 valid *Orthopodomyia* species (sp. 12a and sp. 24a as *nomen dubia*), and he arranged them into 8 groups in 4 sections (as above). The African Nkolbissonensis Group (with 2 species, *Or. nkolbissonensis* and *Orthopodomyia* species 14) is placed in the *Orthopodomyia* Section. Zavortink (1968) tentatively placed *Orthopodomyia* species 14 in the *Nkolbissonensis* Group. Service (1990) noted that the identity of *Orthopodomyia* species 14 will remain unknown until the original material is examined, if it still exists.

*Orthopodomyia nkolbissonensis* Rickenbach and Hamon was the 1st *Orthopodomyia* species described in 1965 from Africa, based on specimens collected in Nkolbisson, Cameroon. The 2nd species, *Or. aureoantennata* Ferrara, was described in 1973, based on specimens from Nkolbisson, Cameroon, while the 3rd species, *Or. ototomoensis* n. sp., as reported here, was collected from Ototomo, Cameroon. Other African species are found in Madagascar, Mauritius, Reunion, and the Comoros Islands.

While working on African *Aedes* (*Diceromyia*) mosquitoes, we discovered a new species of the genus *Orthopodomyia* from Ototomo, Cameroon. It was misidentified as *Aedes* (*Dic.*) *mefouensis* Ferrara, a species known also from Cameroon. Inaccurate identifications may be common because the ornamentation of the adult specimen of the new species apparently is similar to African members of the *Aedes* (*Diceromyia*), particularly *Ae. (Dic.) flavicollis* Edwards and *Ae. (Dic.)*

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*mefouensis*. In this paper we aim to describe this new species and to determine the major diagnostic characters that are useful for distinguishing it from other *Orthopodomyia* mosquitoes. Supplemental pictorial keys are also provided to identify the species of *Ototomoensis* and *Nkolbissonensis* Groups in the Afrotropical Region.

To assist entomologists and other field workers in identifying African mosquitoes, Huang (2002) published a key entitled "A Pictorial Key to the Mosquito Genera of the World, Including Subgenera of *Aedes* and *Ochlerotatus*." In this paper we provided 2 supplementary keys, namely, "A Pictorial Key to the Species of the Genus *Orthopodomyia* *Ototomoensis* Group in the Afrotropical Region (Diptera: Culicidae)" (Fig. 1) and "A Pictorial Key to the Species of the Genus *Orthopodomyia* *Nkolbissonensis* Group in the Afrotropical Region (Diptera: Culicidae)" (Fig. 2). These supplementary keys can be merged with the Huang (2002) key by adding the following: (1) Page 28A (1st page), and Page 28B (2nd page), to key out to *Orthopodomyia* (in part) *Ototomoensis* Group, *Or. ototomoensis* n. sp.; and (2) Page 50A (1st page), and Page 50B (2nd page), to key out to *Orthopodomyia* (in part) *Nkolbissonensis* Group, *Or. nkolbissonensis*. The challenging species of *Orthopodomyia* in the Afrotropical Region are *Or. nkolbissonensis*, *Or. ototomoensis*, *Or. aureoantennata*, and *Orthopodomyia* species 14; however, no specimens are available for the last 2 species, and they are excluded from the keys. A few characters, indicated by a double asterisk (\*\*), were added wherever necessary to facilitate a more accurate identification. Images of the diagnostic morphological structures of the adult head, thorax, abdomen, leg, and wing are included in the keys. The terminology follows Harbach and Knight (1980, 1982) with the exception of "tarsal claws," which is retained for "ungues." The wing venation follows Belkin (1962).

*Orthopodomyia ototomoensis* Huang and Rueda, new species (Fig. 1-1-1-8): *Brief description* (based on type specimen): *Head*: Proboscis (Fig. 1-4) with a pale band at middle and with pale scales speckled on apical half; vertex with erect forked scales numerous, not restricted to occiput. *Thorax*: Acrostichal setae present; paratergite without scales; prespiracular setae absent; postspiracular setae absent; lower prealar scale patch absent; subspiracular area without scales; lower mesepimeral setae absent; scutellum with white broad, flat scales on all lobes. *Wing*: Vein 1A ending well beyond base of fork of vein Cu; alula (Fig. 1-1) without scales; plume scales all broad (scales broad, mixed dark brown and white on all veins). *Legs*: Fore- and midtarsomere 1 (Fig. 1-2) distinctly longer than tarsomeres 2-5 combined; fore- and midtarsomere 4 (Fig. 1-3)

shorter than tarsomere 5; hindtibia (Fig. 1-5) dark, with scattered yellow scales; hindtarsomere 1 (Fig. 1-6) with yellow scales in distinct basal, median, and apical bands; hindtarsomeres 2 and 3 (Fig. 1-7), and hindtarsomere 4 (Fig. 1-8) with yellow scales in basal and apical bands; hindtarsomere 5 (Fig. 1-8) with all yellow scales, and pulvillus absent, or not well developed (hair-like). *Type data*: A single male adult specimen (holotype male), in the Institut de Recherche pour le Développement (IRD), Montpellier, France, with four labels: "(1) Cameroun, Ototomo, 30-8-66, A. Rickenbach ORSTOM, (2) 2903, (3) Ne allotype male, and (4) *Ae. (Dic.) mefouensis* Rickenbach det." (This is misidentified as *Aedes (Diceromyia) mefouensis*.) *Distribution*: Presently known only from Ototomo (3°39'N, 11°19'E), Cameroon. *Bionomics and medical importance*: Unknown. The new group, *Ototomoensis* Group, can be distinguished from other *Orthopodomyia* based on the combined diagnostic characters of *Or. ototomoensis*, namely, 1) wing alula and subspiracular area without scales, 2) plume scales all broad, and 3) scutellum with white broad, flat scales on all lobes.

*Orthopodomyia nkolbissonensis* Rickenbach and Hamon (Fig. 2-1-2-7): This species is similar to *Or. ototomoensis*, except the following combined diagnostic characters, namely: 1) wing alula (Fig. 2-1) with narrow fringe scales; 2) wing plume scales (Fig. 2-2) not all broad; 3) subspiracular area (Fig. 2-3) with scales; 4) scutellum (Fig. 2-4) with yellow narrow scales on all lobes; 5) hindtibia (Fig. 2-5) with 3 distinct dark bands mixed with yellow bands; 6) hindtarsomere 1 (Fig. 2-6) with a broad median yellow band, and with basal and apical yellow bands; 7) hindtarsomere 4 (Fig. 2-7) with basal yellow band; and 8) hindtarsomere 5 (Fig. 2-7) with apical pale band. These characters are also useful to distinguish the *Nkolbissonensis* Group from other *Orthopodomyia*. *Type data*: Holotype male, with 3 labels: "(1) CAMEROUN N'KOLBISSON, 18-1-65, A. RICKENBACH ORSTOM, (2) T 3477, and (3) ORTHOPODOMYIA *nkolbissonensis* n. sp., A. Rickenbach ORSTOM det." Paratype female, with 2 labels: "(1) CAMEROUN N'KOLBISSON, 25-1-65, A. RICKENBACH ORSTOM, and (2) ORTHOPODOMYIA *nkolbissonensis* n. sp., A. Rickenbach ORSTOM det." and Holotype male genitalia slide (T 3477), with 2 labels: "(1) T 3477, *Orthopodomyia nkolbissonensis* sp. n., NKOLBISSON 18. 1. 65, Yaounde, Cameroun, A. Rickenbach rec. det., and (2) 'HOLOTYPE' (red rectangular paper, printed), are in [IRD] France; type locality: Nkolbisson (3°51'N, 11°37'E), Cameroun." *Distribution*: This species is known from the forested area of southern Cameroon (Rickenbach and Hamon 1965). *Bionomics*: Adults were caught from the vegetation in a forest 8 km from

(add Page 28A) 1<sup>st</sup> page

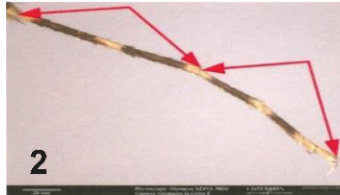
Page 28A (1<sup>st</sup> page)

Page 28a

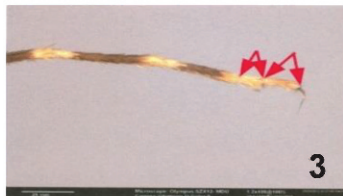
\*\* 1  
Wing. Alula without scales



\*\* 2  
Leg. Fore- and midtarsomere 1 distinctly longer than tarsomeres 2-5 combined



\*\* 3  
Leg. Fore- and midtarsomere 4 shorter than tarsomere 5



\*\* 4  
Head. Proboscis with a pale band at middle and with pale scales speckled on apical half



*Orthopodomyia* (in part)

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\*\* 5  
Leg. Hindtibia dark, sprinkled with yellow scales



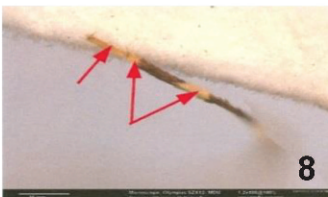
\*\* 6  
Leg. Hindtarsomere 1 with yellow scales in distinct basal, median and apical bands



\*\* 7  
Leg. Hindtarsomeres 2 and 3 with yellow scales in basal and apical bands



\*\* 8  
Leg. Hindtarsomere 4 with yellow scales in basal and apical bands; tarsomere 5 with all yellow scales



*Orthopodomyia* (in part)  
Ototomoensis Group  
*ototomoensis* n. sp.

Fig. 1. A Pictorial Key to the Species of the Genus *Orthopodomyia* Ototomoensis Group in the Afrotropical Region (Diptera: Culicidae). *Orthopodomyia ototomoensis* Huang and Rueda. (1) Wing, alula, dorsal view. (2) Foretarsomeres 1–5, anterodorsal view. (3) Foretarsomeres 4 and 5, anterodorsal view. (4) Proboscis, dorsal view. (5) Hindtibia, anterodorsal view. (6) Hindtarsomere 1, anterodorsal view. (7) Hindtarsomeres 2 and 3, anterodorsal view. (8) Hindtarsomeres 4 and 5, anterodorsal view.

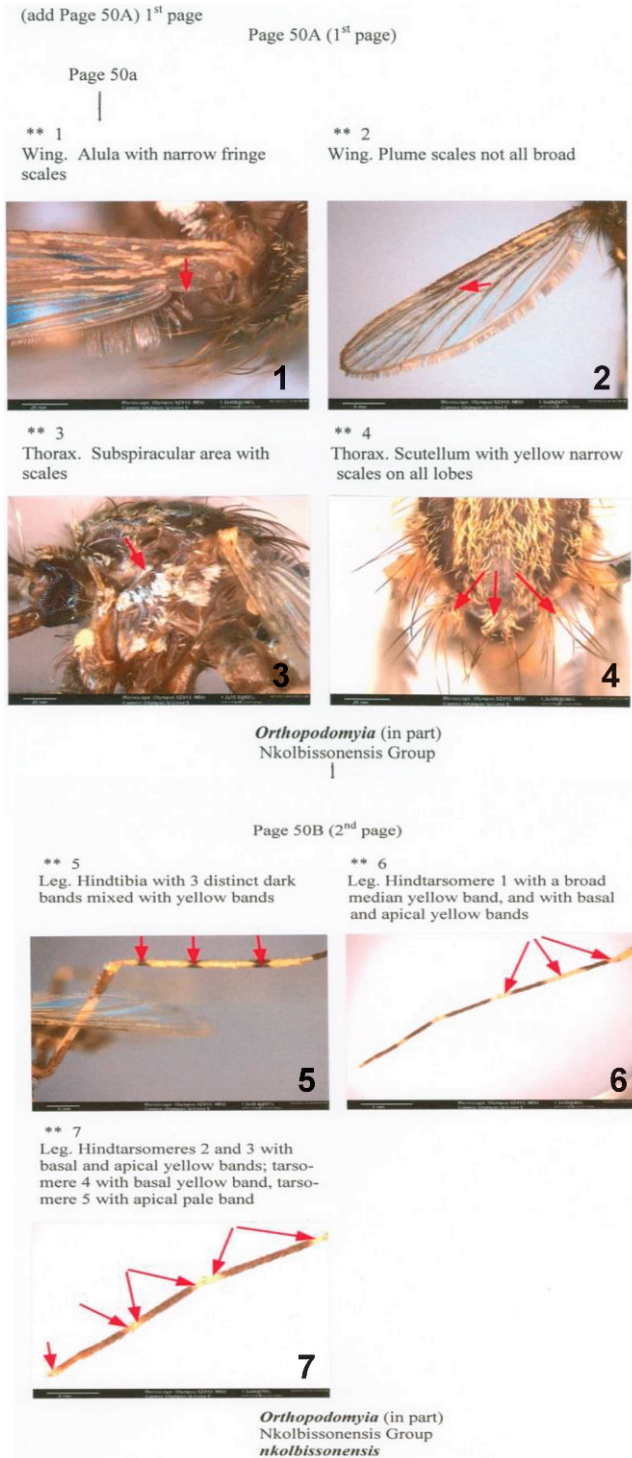


Fig. 2. A Pictorial Key to the Species of the Genus *Orthopodomyia* Nkolbissonensis Group in the Afrotropical Region (Diptera: Culicidae). *Orthopodomyia nkolbissonensis* Rickenback and Hamon. (1) Wing, alula, dorsal view. (2) Wing, vein plume scales, dorsal view. (3) Thorax, subspiracular area, lateral view. (4) Thorax, scutellum, dorsal view. (5) Hindtibia, anterodorsal view. (6) Hindtarsomere 1, anterodorsal view. (7) Hindtarsomeres 2–5, anterodorsal view.

Yaounde. In Cameroon, a single blood-fed female that was collected had fed on birds (Rickenbach et al. 1974). *Medical importance:* Unknown. Service (1990) noted that *Orthopodomyia* species are not considered to be disease vectors. It is possible that *Orthopodomyia* may transmit arboviruses among birds and possibly mammals. Vargas (1960) reported that eastern equine encephalitis virus has been isolated from *Or. signifera* in Mexico.

Presently, the African *Orthopodomyia* consists of 2 distinct groups: Nkolbissonensis Group and Ototomoensis Group. Misidentifications of African *Orthopodomyia* species maybe common due to limited availability of keys to separate species within the genus *Orthopodomyia* or even with other *Aedes* species. In this paper we showed some diagnostic characters to separate *Or. ototomoensis* from *Or. nkolbissonensis* and other mosquitoes. When additional specimens of *Or. ototomoensis*, particularly male genitalia, females, larvae, and pupae, become available, further morphological descriptions should be done. Additional specimens of *Or. nkolbissonensis* and related species are also needed to clarify the taxonomy of African *Orthopodomyia*.

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