



**University of  
Zurich**<sup>UZH</sup>

**Zurich Open Repository and  
Archive**

University of Zurich  
Main Library  
Strickhofstrasse 39  
CH-8057 Zurich  
[www.zora.uzh.ch](http://www.zora.uzh.ch)

---

Year: 2014

---

**Order Diptera, family Dolichopodidae, Two new genera of the subfamily  
Diaphorinae**

Naglis, Stefan

Posted at the Zurich Open Repository and Archive, University of Zurich  
ZORA URL: <https://doi.org/10.5167/uzh-109651>  
Book Section

Originally published at:

Naglis, Stefan (2014). Order Diptera, family Dolichopodidae, Two new genera of the subfamily Diaphorinae. In: van Harten, A. Arthropod fauna of the United Arab Emirates. United Arab Emirates: s.n., 725-731.

# Order Diptera, family Dolichopodidae

## Two new genera of the subfamily Diaphorinae

Stefan Naglis

### INTRODUCTION

The Dolichopodidae is a large family comprising some 7500 described species world-wide which are distributed in all zoogeographical regions. Adults and larvae are known as predators of soft-bodied invertebrates, although members of the genus *Thrypticus* Gerstäcker, 1864, are phytophagous stem miners. Recently, some authors (Sinclair & Cumming, 2006) include the empidoid subfamilies Microphorinae and Parathalassiinae in the Dolichopodidae (sensu lato). We follow here Grichanov's (2011) opinion who did not accept this systematic concept and placed both subfamilies together with the Dolichopodidae in the epifamily Dolichopodoidae.

The Arabian Peninsula is an important traditional zone encompassing elements of the Afrotropical, Palaearctic and Oriental faunas, and the boundaries of these realms are not yet clearly defined (Kirk-Spriggs & Stuckenberg, 2009). Crosskey (1980) used northern boundaries of the modern state of Yemen for separating Afrotropical and Palaearctic Regions. More recently, Oman and the United Arab Emirates are regarded as part of the Afrotropical Region (Kirk-Spriggs et al., 2012). No records of Dolichopodidae are known from the United Arab Emirates (van Harten, 2005).

### MATERIALS AND METHODS

The study is based on material from the United Arab Emirates collected by A. van Harten, if not otherwise indicated. The original text from the labels is given for each specimen examined. Most material including holotypes will be deposited in the collection of the Zoological Museum of the University of Zurich, Switzerland (ZMUZ), and some paratypes in the private collection of the author and in the collection of the National Museum of Wales, Cardiff, UK.

Body length is measured from the base of the antennae to the tip of abdominal segment 6; wing length from wing base to wing apex. The positions of features on elongate structures, such as leg segments, are given as a fraction of the total length, starting from the base. The following ratios are used: relative podomere ratios: femur, tibia, tarsomere 1/2/3/4/5; length of cross-vein dm-cu to distal section of CuA (= CuAx ratio); distance between veins  $R_{2+3}$  and  $R_{4+5}$  to distance between  $R_{4+5}$  and M at costal margin (= RMx ratio). In describing the hypopygium, dorsal and ventral refers to the position prior to rotation and flexion, i.e. in figures top is morphologically ventral and bottom is dorsal; for each species the left side of the hypopygium is figured and described. The coloration of hairs and setae is black if not otherwise indicated. General morphological terminology mainly follows McAlpine (1981) and Merz & Haenni (2000), except for the genitalia where the terminology of Cumming et al. (1995) and Sinclair (2000) is followed.

The following abbreviations are used: ad = anterodorsal; av = anteroventral; pd = posterodorsal; pv = posteroventral; MSSC = male secondary sexual character.

## SYSTEMATIC ACCOUNT

Subfamily **Diaphorinae** Schiner, 1864

Genus *Emiratomyia* Naglis **gen. nov.**

Type species: *Emiratomyia arabica* Naglis sp. nov.

Description: Relatively small species with body length of 1.8–1.9 mm.

Head: Face narrow in males and females; eyes not contiguous in males; frons broad; antennae inserted above middle of head; male first flagellomere triangular, elongated and acute, twice as long as basal height, in female subovate and as long as basal height; male arista apicodorsal, in female dorsal; occiput concave; postvertical setae absent. Thorax with 4 pairs of dorsocentral setae; acrostichal setae in one row; 1 pair of scutellar setae, lateral setae not present. Legs lacking strong setae; hind coxa with 1 strong lateral seta; male mid tarsomeres with modified setation (MSSC); male fore tarsomere 5 with only 1 claw (MSSC); pulvilli small. Wing: Costa reaching vein M; veins  $R_{2+3}$ ,  $R_{4+5}$  and M very closely approximated near costa;  $R_{3+4}$  and M subparallel, curved anteriorly; M complete, joining costa anteriorly of wing apex; cross-vein dm-cu very short and weak, at basal 1/4 of wing. Abdomen: Male tergite 6 bare; sternite 8 with 2 strong and 2 smaller projecting setae. Hypopygium: Surstylus divided in dorsal and ventral arms; postgonite present; epandrial lobe distinct. Oviscapt: Hemitergites of tergite 10 with 4–5 thick and blunt spines; cercus well developed.

Etymology: The name refers to the country where the type species was collected.

Remarks: The new genus can be distinguished from other diaphorine genera by the following combination of characters: occiput concave; postvertical setae absent; male first flagellomere elongated and triangular; arista apicodorsal; 4 pairs of dorsocentral setae; acrostichal setae uniseriate; 1 pair of scutellar setae, without lateral setae; male mid tarsomeres modified; male fore tarsomere 5 with only 1 claw. *Emiratomyia* is closely related to the genus *Shamshevia* Grichanov, 2012. Members of both genera are relatively small sized, with a body length of less than 2 mm. *Shamshevia* and *Emiratomyia* show the following similar characters: cross-vein dm-cu located in basal fourth of wing; veins  $R_{4+5}$  and M displaced anteriorly and closely approximated to costa with vein M ending before wing apex. A differential diagnosis is given in the respective section below.

*Emiratomyia arabica* Naglis **sp. nov.**

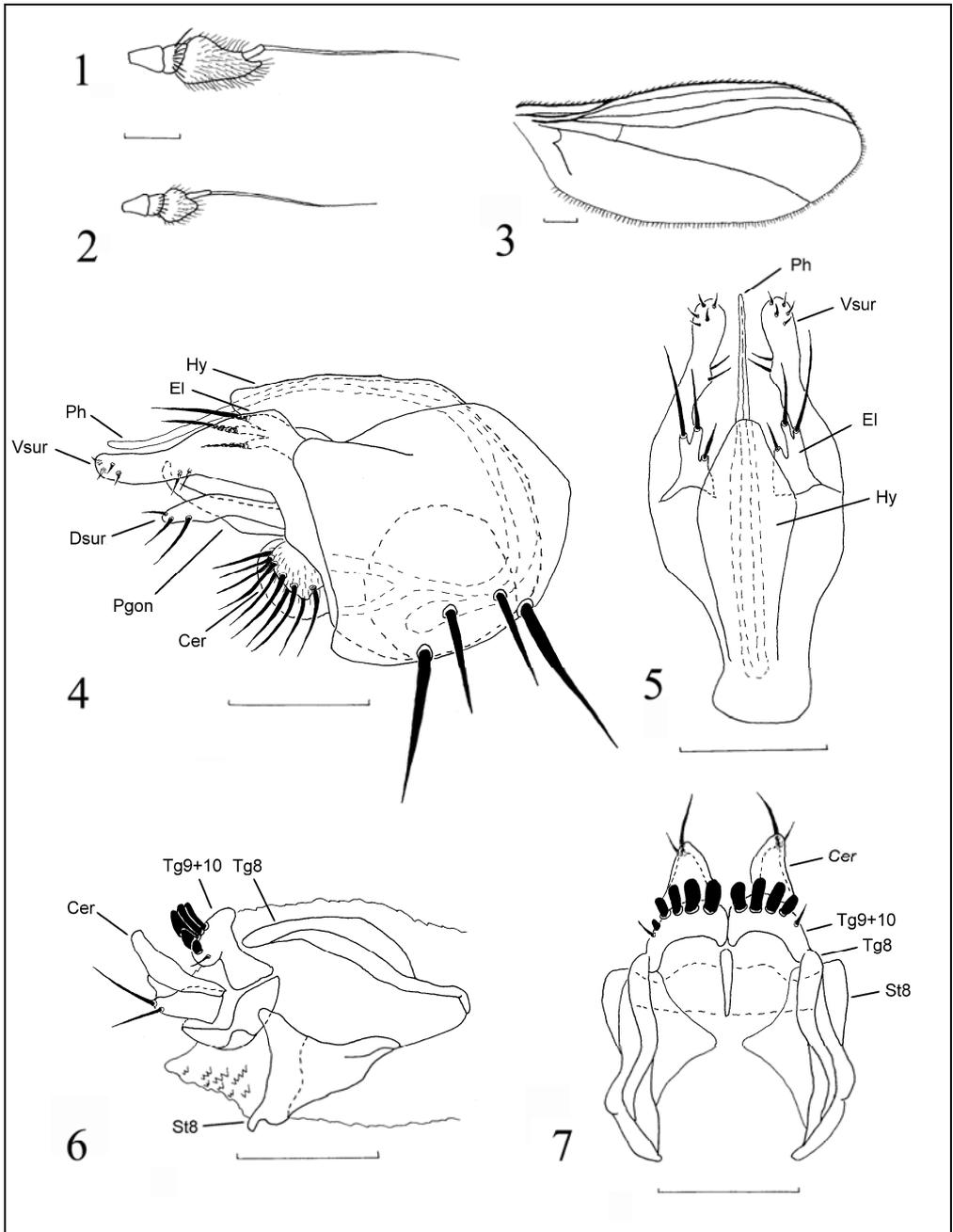
Figures 1–7

Specimens examined. Holotype: ♂, United Arab Emirates, N. of Ajman, 16.ix–22.x.2006, water trap (ZMUZ). Paratypes: 1♂, same data as holotype; 1♂, 2♀, same data as holotype, but 16.ix–12.x.2006. 2♂, 1♀, Wadi Shawkah, 31.x–27.xi.2006, water trap. 1♂, Um al-Quwain, 18.iv.2010, K. Mahmood.

Description: Male. Length (holotype): Body 1.9 mm, wing 1.7 mm.

Head: Frons broad, metallic green, with blue-violet reflections; pair of strong vertical setae on level of ocellar setae; pair of strong ocellar setae, longer than vertical setae; occiput concave; postvertical setae absent; postocular setae uniseriate, yellow in ventral part; face narrow, at narrowest part as wide as distance between ocellar setae, with dense silvery-white pruinosity; eyes converging below antennae; palp short. Antenna (Figs. 1, 2) with scape yellow, twice as long as pedicel, bare; pedicel yellow, ovate, with apical circle of short setae; first flagellomere dark brown, with basoventral yellow spot, triangular, with acute apex, twice as long as high basally, with dense hairs; arista apicodorsal, bare, 3 times as long as first flagellomere, first segment short, second segment 9 times as long as first segment.

Thorax: Mesonotum and scutellum metallic green shining, with blue-violet reflections laterad of dorsocentral setae; 4 pairs of strong dorsocentral setae; acrostichal setae very small,



Figures 1–7. *Emiratomyia arabica* Naglis gen. nov. et sp. nov.. 1: Male antenna; 2: Female antenna; 3: Male wing; 4: Male hypopygium, left lateral; 5: Male hypopygium, ventral; 6: Female oviscapt left lateral; 7: female oviscapt dorsal. Cer = cercus; Dsur = dorsal surstylus; El = epandrial lobe; Hyp = hypandrium; Pgon = postgonite; Ph = phallus; St = sternite; Tg = tergite; Vsur = ventral surstylus; (scale bars = 0.1 mm).

irregular, uniseriate; scutellum with 2 strong marginal setae, without additional lateral setae; pleura dark metallic green; lower proepisternum with 1 small pale seta.

Legs including coxae yellow. Fore leg coxa with 3–4 strong pale anterior setae; femur and tibia bare; tarsomere 5 with only 1 claw, with rounded pulvillus at place of lacking claw (MSSC); relative podomere ratios: 36, 38, 18/6/4/3/3. Mid leg coxa with 1 strong pale ad seta basally in addition to the smaller setae; femur bare; tibia with small ad setae at 1/4 and 2/3, and 3 strong apical setae; tarsomere 3 dorsally with a long and fine sinuate projecting apical seta, as long as entire segment, and with a row of 2–3 additional smaller projecting setae in same line; tarsomere 4 dorsally with 4–5 curved projecting setae, as long as diameter of tarsomere (all MSSC); relative podomere ratios: 44, 44, 24/6/6/5/4. Hind leg coxa with 1 strong lateral seta basally; femur and tibia bare; relative podomere ratios: 49, 58, 15/13/7/5/4.

Wings (Fig. 3) hyaline;  $R_{2+3}$ ,  $R_{4+5}$  and M very closely approximated near costa;  $R_{2+3}$  straight;  $R_{4+5}$  and M subparallel and curved anteriorly in distal half; vein M joining costa distinctly anteriorly of wing apex; cross-vein dm-cu at 1/4 from base of CuA, very short; CuAx ratio: 0.06; RMx ratio: 1.5; lower calypter whitish with whitish setae; halter pale yellow.

Abdomen dark brown shining, segments 2 and 3 yellow, segment 1 with strong marginal setae; sternite 8 with 2 strong and 2 smaller projecting setae. Hypopygium (Figs. 4, 5) with epandrium dark brown; surstylus pale yellow, ventral arm prolonged and pear-shaped, with two ventral and 4–5 short apical setae, dorsal arm slender, with 1 strong ventral and 2 smaller apical setae; epandrial lobe with 3 projecting finger-like lobes bearing each a strong seta; hypandrium broad and short; postgonite slender and curved ventrally; cercus pale, short and round, with strong and long apical setae.

Female: Similar to male, but lacking MSSC's; face broader, about twice the distance between ocellar setae; first flagellomere as long as high. Oviscapt as in Figures 6 and 7. Hemitergites of tergite 10 with 4–5 thick and blunt spines; cercus with 2 strong apical setae.

Etymology: The name refers to the geographical region where the species was collected.

### Genus *Arabshamshevia* Naglis **gen. nov.**

Type species: *Arabshamshevia ajbanensis* Naglis sp. nov.

Description: Male. Relatively small species with body length of 1.8 mm.

Head: Face relatively broad; eyes well separated; frons broad; antennae inserted above middle of head; scape bare, with short ventral projection; first flagellomere strongly elongate, triangular and pointed, 4 times as long as basal height; arista bare, basodorsal; occiput convex; postvertical setae present. Thorax with 5 pairs of dorsocentral setae; acrostichal setae absent; 1 pair of median scutellar setae and 1 smaller seta laterad. Legs lacking strong setae, except mid tibia with 1 strong ad seta; hind coxa with 2 lateral setae; pulvilli small; all claws present. Wing: Costa reaching vein M; veins  $R_{2+3}$ ,  $R_{3+4}$  and M closely approximated near costa;  $R_{3+4}$  straight; M complete, with distinct anterior bend at 1/2 beyond cross-vein dm-cu, becoming subparallel with  $R_{4+5}$  before wing margin, joining costa anteriorly of wing apex; cross-vein dm-cu short and weak, at basal 1/4 of wing. Abdomen: Male tergite 6 bare; sternite 8 with 7–8 short projecting setae. Hypopygium: Surstylus divided into dorsal and ventral arms; postgonite present; epandrial lobe distinct and projecting.

Female: Unknown.

Etymology: The name is a combination of 'Arab' from Arabian Peninsula and '*Shamshevia*'.

Remarks: The new genus can be distinguished from other diaphorine genera by the following combination of characters (males): Antennal scape with ventral projection; first flagellomere strongly elongated and triangular; arista basodorsal; 5 pairs of dorsocentral setae; acrostichal setae absent; hind coxa with 2 lateral setae. *Arabshamshevia* is closely related to the genus *Shamshevia* Grichanov. Members of both genera are relatively small sized with a body length

of less than 2 mm. *Shamshevia* and *Arabshamshevia* show the following similar characters: Cross-vein dm-cu located in basal fourth of wing; veins  $R_{4+5}$  and M displaced anteriorly and closely approximated to costa, with vein M ending before wing apex; male first flagellomere strongly elongated with basodorsal arista. A differential diagnosis is given in the respective section below.

***Arabshamshevia ajbanensis* Naglis sp. nov.**

Figures 8–11

Specimens examined. Holotype: ♂, United Arab Emirates, al-Ajban, 26.iii–4.iv.2006, Malaise trap (ZMUZ). Paratype: 1♂, same data as holotype.

Description. Male. Length (holotype): Body 1.8 mm, wing 1.7 mm.

Head: Frons broad, metallic green, with faint white pruinosity; pair of strong vertical setae on level of ocellar setae; pair of strong ocellar setae, longer than vertical setae; occiput convex; short postvertical setae present; postocular setae uniseriate, yellow in ventral part; face relatively broad, at narrowest part about twice as wide as distance between ocellar setae, with dense silvery-white pruinosity; eyes slightly converging below antennae; palp large, ovate and elongate. Antenna (Fig. 8) entirely black: scape bare, with short acute ventral projection; pedicel short, with apical circlet of short setae; first flagellomere strongly elongated, 4 times as long as high basally, with acute apex and dense hairs; arista basodorsal, bare, as long as first flagellomere, second segment 3 times as long as first segment.

Thorax: Mesonotum and scutellum metallic green, with faint white pruinosity; 5 pairs of strong dorsocentral setae; acrostichal setae absent; scutellum with 2 strong median and 2 smaller lateral setae; pleura dark metallic green with faint white pruinosity; lower proepisternum with 2 small pale setae.

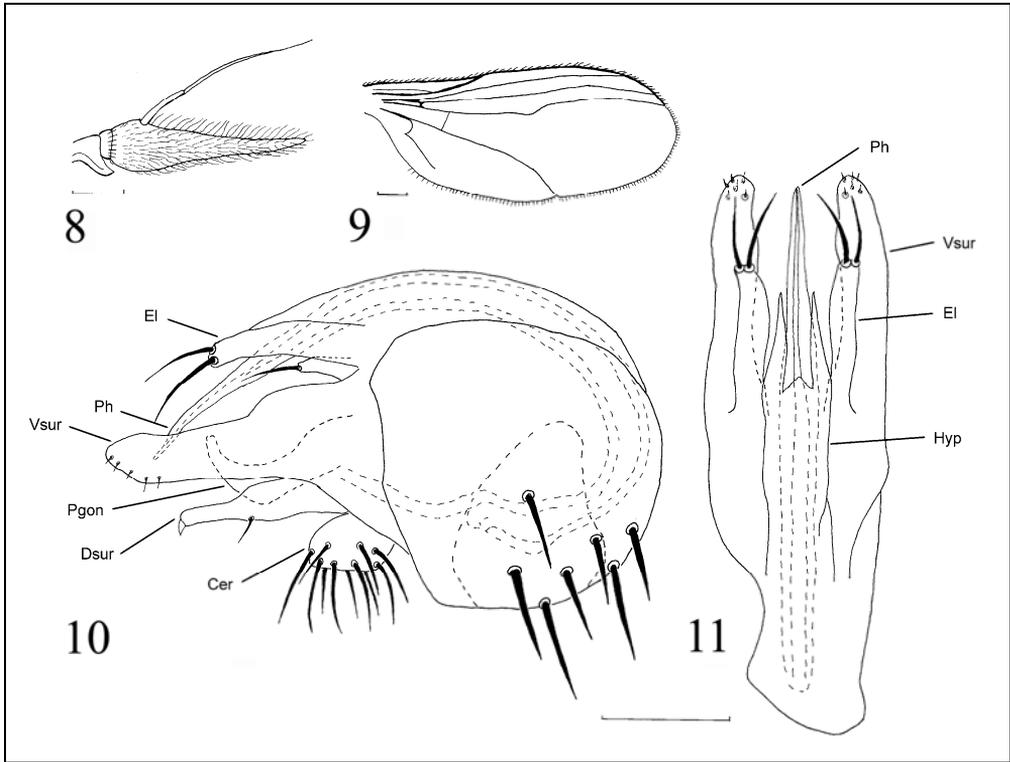
Legs and fore coxa yellow, mid and hind coxae dark brown; hind tarsomeres infuscated. Fore leg coxa with some pale anterior setae; femur and tibia bare; tarsomeres simple; relative podomere ratios: 34, 34, 16/7/6/5/4. Mid leg coxa with 1 strong pale ad seta basally; femur bare; tibia with 1 strong ad seta at 1/4, and 3 strong apical setae; tarsomeres simple; relative podomere ratios: 46, 46, 22/10/8/5/5. Hind leg coxa with 1 strong lateral seta at basal 1/5, and 1 smaller seta at 4/5; femur bare; tibia with 3–4 small dorsal setae; tarsomeres simple; podomere ratios: 51, 51, 15/12/8/6/6. All claws simple.

Wings (Fig. 9) hyaline;  $R_{2+3}$ ,  $R_{4+5}$  and M very closely approximated near costa;  $R_{2+3}$  straight;  $R_{4+5}$  slightly bowed posteriorly in distal half; M with distinct anterior bend at 1/2 beyond cross-vein dm-cu, becoming subparallel with  $R_{4+5}$  before wing apex; cross-vein dm-cu at 1/4 from base of CuA, very short and weak; CuAx ratio: 0.13; RMx ratio: 3.0; lower calypter whitish with whitish setae; halter pale yellow.

Abdomen dark metallic green; segment 1 with strong white marginal setae; sternite 8 with 7–8 short projecting setae. Hypopygium (Figs. 10, 11) with epandrium dark brown; surstylus pale yellow, ventral arm prolonged and subrectangular, with 4–5 short apical setae, dorsal arm slender, with beak-like apical spine and 1 strong ventral seta; epandrial lobe slender and projecting, with 2 strong apical setae, and with a short basal lobe bearing 1 strong seta; hypandrium with two pointed lateral projections; cercus pale yellow, short and ovate, with strong and long apical setae.

Female: Unknown.

Etymology: The name refers to the geographical region where the species was found.



Figures 8–11. *Arabshamshevia ajbanensis* Naglis gen. nov. et sp. nov. 8: Male antenna; 9: Male wing; 10: Male hypopygium, left lateral; 11: Male hypopygium, ventral. Cer = cercus; Dsur = dorsal surstylus; El = epandrial lobe; Hyp = hypandrium; Pgon = postgonite; Ph = phallus; Vsur = ventral surstylus; (scale bars = 0.1 mm).

### Differential diagnosis

*Emiratomyia* gen. nov. and *Arabshamshevia* gen. nov. are closely related to *Shamshevia* Grichanov based on the modified wing venation: cross-vein dm-cu located in basal fourth of wing; veins  $R_{4+5}$  and M displaced anteriorly and closely approximated to costa. The genera can be separated by the characters given in the key below.

### Key to *Shamshevia*, *Arabshamshevia* and *Emiratomyia*

- 1 Veins  $R_{4+5}$  and M diverging in distal part; cross-vein dm-cu located at level of r-m; mesonotum dark brown, with flattened area on posterior slope; pedicel with conus concealed within first flagellomere; acrostichal setae biseriatae ..... *Shamshevia* Grichanov
- Veins  $R_{4+5}$  and M subparallel in distal part (Figs. 3, 9); cross-vein dm-cu located at distinct distance from r-m (Figs. 3, 9); mesonotum metallic green, without flattened area on posterior slope; pedicel without conus concealed within first flagellomere; acrostichal setae uniseriate or absent ..... **2**

- 2 Acrostichal setae uniseriate; occiput concave; postvertical setae absent; scutellum with only 2 setae; hind coxa with 1 lateral seta; male arista apicodorsal (Fig. 1) ..... *Emiratomyia* gen. nov.
- Acrostichal setae absent; occiput convex; postvertical setae present; scutellum with 2 strong setae and 2 smaller lateral setae; hind coxa with 2 lateral setae; male arista basodorsal (Fig. 8) ..... *Arabshamshevia* gen. nov.

#### ACKNOWLEDGEMENTS

I am grateful to Tony van Harten (Portugal) and John Deeming (Cardiff) for providing the material, and to Dan Bickel (Sydney), Scott Brooks (Ottawa) and Renato Capellari (São Paulo) for useful comments on an earlier draft of the manuscript.

#### REFERENCES

- Crosskey, R.W. (1980): *Catalogue of the Diptera of the Afrotropical Region*. British Museum (Natural History), London, 1437 pp.
- Cumming, J.M., B.J. Sinclair & D.M. Wood (1995): Homology and phylogenetic implications of male genitalia in Diptera-Eremoneura. *Entomologica Scandinavica*, 26, 121–151.
- Grichanov I.Y. (2011): *An illustrated synopsis and keys to afrotropical genera of the epifamily Dolichopodoidae (Diptera: Empidoidea)*. Priamus Serial Publication of the Centre for Entomological Studies, Ankara. Supplement 24: 1–99.
- Harten, A. van (2005): *Insects of the UAE. A checklist of published records*. Dar al Ummah Publishing, Abu Dhabi, 85 pp.
- Kirk-Spriggs, A. & B. Stuckenberg (2009): *Afrotropical Diptera – Rich savannas, poor rainforests*. Pp. 155–196 in: T. Pape, D. Bickel & R. Meier (eds.), *Diptera Diversity: Status, Challenges and Tools*. Koninklijke Brill NV.
- Kirk-Spriggs, A., M. Mostovski & B. Muller, (2012): *Manual of Afrotropical Diptera*. Internetsite: [www.afrotropicalmanual.net](http://www.afrotropicalmanual.net)
- McAlpine, J.F. (1981): Morphology and terminology – Adults. In: J.F. McAlpine, B.V. Peterson, G.E. Shewell, H.J. Teskey, J.R. Vockeroth & D.M. Wood (coords.), *Manual of Nearctic Diptera*, Volume 1. *Agriculture Canada Monograph*, 27, 9–63.
- Merz, B. & J.-P. Haenni, (2000): Morphology and terminology of adult Diptera (other than terminalia). Pp. 21–51 in: L. Papp & B. Darvas (eds.), *Contributions to a Manual of Palaearctic Diptera (with special reference to flies of economic importance)*. Volume 1. *General and Applied Dipterology*. Science Herald, Budapest.
- Sinclair, B.J. (2000): Morphology and terminology of Diptera male terminalia. Pp. 53–74 in: L. Papp & B. Darvas (eds.), *Contributions to a Manual of Palaearctic Diptera (with special reference to flies of economic importance)*. Volume 1. *General and Applied Dipterology*. Science Herald, Budapest.
- Sinclair, B.J. & J.M. Cumming (2006): The morphology, higher-level phylogeny and classification of the Empidoidea (Diptera). *Zootaxa*, 1180: 1–172.

#### Author's address:

Stefan Naglis, Institute of Evolutionary Biology and Environmental Studies, University of Zurich, Winterthurerstrasse 190, CH-8057 Zurich, Switzerland; e-mail: [s.naglis@bluewin.ch](mailto:s.naglis@bluewin.ch)