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THE MYTHICOMYIIDAE (INSECTA: DIPTERA) OF THE UNITED ARAB EMIRATES. PART 2: GENERA *CYRTOSIA* PERRIS, *DOLIOPTERYX* HESSE, *GLABELLULA* BEZZI, AND *LEYLAIYA* EFFLATOUN

NEAL L. EVENHUIS & BABAK GHARALI



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Cover photo: *Leylaiya deemingi* Evenhuis & Gharali, n. sp.

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## The Mythicomyiidae (Insecta: Diptera) of the United Arab Emirates. Part 2: Genera *Cyrtosia* Perris, *Doliopteryx* Hesse, *Glabellula* Bezzi, and *Leylaiya* Efferlatoun

NEAL L. EVENHUIS

*J. Linsley Gressitt Center for Entomological Research, Department of Natural Sciences, Bishop Museum, 1525 Bernice Street, Honolulu, Hawai'i 96817, USA; email: neale@bishopmuseum.org*

BABAK GHARALI

*Plant Protection Research Department, Qazvin Agricultural and Natural Resources Research and Education Center, AREEO, Qazvin, Iran; email: bgaharaei@yahoo.com*

**Abstract.** A supplement to the original 2009 review of the Mythicomyiidae of the United Arab Emirates and adjoining areas is presented and includes the genera *Cyrtosia* Perris, *Doliopteryx* Hesse, *Glabellula* Bezzi, and *Leylaiya* Efferlatoun. Nine new species are described and illustrated: *Cyrtosia certozia* Evenhuis & Gharali, n. sp., *C. charops* Evenhuis & Gharali, n. sp., *Doliopteryx xanthinton* Evenhuis & Gharali, n. sp., *Glabellula yemeni* Evenhuis & Gharali, n. sp., *Leylaiya citrina* Evenhuis & Gharali, n. sp., *L. deemingi* Evenhuis & Gharali, n. sp., *L. gharalii* Evenhuis, n. sp., *L. mediocciptalis* Evenhuis & Gharalii, n. sp., and *L. ochreatea* Evenhuis & Gharali, n. sp. Keys to species from the UAE and adjacent areas in the above genera are given.

### INTRODUCTION

Since the publication of the contribution on Mythicomyiidae to the first volume of the 'Arthropod fauna of the UAE' (Evenhuis, 2009), additional specimens have been examined including some genera previously not reported from the UAE. The second set of results is reported here and includes nine new species in *Cyrtosia* Perris (2), *Doliopteryx* Hesse (1), *Glabellula* (1), and *Leylaiya* Efferlatoun (5). In addition, two previously described species (*Cyrtosia gulperii* Efferlatoun and *Doliopteryx palaestinensis* Evenhuis & Theodor) are reported for the UAE for the first time. *Leylaiya aquilonia* Gharali & Evenhuis is reported from Iraq, Oman and the United Arab Emirates for the first time; *Leylaiya mimnermia* Efferlatoun is removed from the UAE faunal list. The third and final installment will include only the genus *Empidideicus* Becker, which is the most speciose genus of Mythicomyiidae in the region with more than a dozen new species to be described. For general information about UAE Mythicomyiidae, key to genera, and the methods used, the reader is referred to the chapter in the second volume (viz., Evenhuis, 2009).

### MATERIAL AND METHODS

Unless otherwise indicated, specimens derive from the United Arab Emirates (UAE). Holotypes from the UAE collections and most paratypes are deposited in the National Museum of Wales, Cardiff (NMWC). Holotype depositories from collections made in other countries are indicated under each species. Other specimens have been examined in,

are deposited in, or derive from the following collections: the Environment Agency of Abu Dhabi, United Arab Emirates (EAD), Bernice Pauahi Bishop Museum, Honolulu, USA (BPBM), California Academy of Sciences, San Francisco, California, USA (CAS), Iran Research Institute of Plant Protection, Tehran, Iran (IRIPP), Zoological Museum, University of Copenhagen, Denmark (ZMUC), Martin Ebejer personal collection, United Kingdom (ME), and Babak Gharali personal collection, Qazvin, Iran (BG). Abbreviations used in text: LT = light trap; MT = Malaise trap; PT = pitfall trap; ST = syntype(s), WT = water trap. Morphological terminology follows Cumming & Wood (2017).

## SYSTEMATIC ACCOUNT

### Genus *Leylaiya* Eflatoun, 1945

*Leylaiya* Eflatoun, 1945: 21. Type species: *Leylaiya mimnermia* Eflatoun, 1945, by original designation.

Since the original treatment of this genus (Evenhuis, 2009) additional material has been received from which five new species have been identified. They are described below. Also, since that original paper, Gharali & Evenhuis (2011) described a new species from nearby Iran and enumerated the world fauna. To incorporate the new species in this work, a revised key to species of *Leylaiya* from the Arabian Peninsula and Iran is given here. *Leylaiya mimnermia* Eflatoun, previously recorded (Evenhuis, 2009) from the UAE is here found to have been misidentified for the new species *Leylaiya citrina* Evenhuis & Gharali, n. sp. Described species of the genus in this region show characters which, with future study of other species, may prove to be synapomorphic. One of these is the presence of two appendages lateral to the aedeagal apex. The length of these appendages vary from long (in *L. aquilonia* Gharali & Evenhuis) to much shorter than the distiphallus (in *L. citrina* Evenhuis & Gharali, n. sp.). The other newly found character, a projecting dorsal process on the gonocoxa (cf. Figs. 22–26) has shown to be diagnostic for species in the genus in this region and is illustrated for those species that have had the male genitalia examined, in lieu of full drawings of male genitalia. Other features of male genitalia are illustrated where they are shown to be particularly diagnostic.

#### KEY TO SPECIES OF *LEYLAIYA* EFFLATOUN FROM THE ARABIAN PENINSULA AND IRAN

1. Vein  $M_1$  converging to  $R_{4+5}$ , straight toward wing margin (Fig. 16) ..... 2
- . Vein  $M_1$  diverging from  $R_{4+5}$ , curving downward at wing margin (Fig. 17) ..... 4
2. Occiput all black, no yellow laterally ..... *Leylaiya apostibes* Evenhuis
- . Occiput with yellow laterally ..... 3
3. Occiput laterally with brown on lower half; yellow admedian mesonotal stripes coalesced with postalar calli yellow; gonocoxal projection flat, rounded .....
- ..... *Leylaiya aquilonia* Gharali & Evenhuis
- . Occiput laterally yellow, no brown on lower half; yellow admedian mesonotal stripes not coalesced with post alar calli yellow color; gonocoxal projection long, tubular (Fig. 26) ..... *Leylaiya ochreata* Evenhuis & Gharali, n. sp.

4. Scutellum black, yellow, may be present laterally (e.g., Fig. 13); labrum longer than head height ..... **6**
- . Scutellum predominantly yellow, brownish spot may be present basomedially (e.g., Fig. 11); labrum shorter than or subequal to head height ..... **5**
5. Occiput yellow to yellowish orange, without distinct contrasting black medially (Fig. 11); pleura all yellow; gonocoxal projection short, rounded, with long setae apically (Fig. 22) ..... *Leylaiya citrina* Evenhuis & Gharali, **n. sp.**
- . Occiput with distinct black pattern medially from vertex to occipital foramen (Fig. 14); pleura with katepisternum and meron brown to black; gonocoxal projection long, slightly clubbed apically with fine hairs (Fig. 25) ..... *Leylaiya medioccipitalis* Evenhuis & Gharali, **n. sp.**
6. Occiput all black, no yellow laterally (Fig. 13); gonocoxal projection two-lobed (Fig. 24) ..... *Leylaiya gharalii* Evenhuis, **n. sp.**
- . Occiput with yellow laterally as thin line along posterior eye margin (Fig. 12); gonocoxal projection triangular (Fig. 23) ... *Leylaiya deemingi* Evenhuis & Gharali, **n. sp.**

*Leylaiya aquilonia* Gharali & Evenhuis  
(Fig. 16)

*Leylaiya aquilonia* Gharali & Evenhuis, 2011: 205. Holotype in IRIPP.

Previously known only from Iran, the following material expands its range into the UAE, Iraq, and Oman.

**Specimens examined.** **United Arab Emirates**, 1♂, 1♀, Wadi Shawkah, 25.06°N, 56.01°E, 25 May–12 Jun 2008, WT, A. van Harten, 9518; 4♂, 2♀, Wadi Wurayah farm, 25.23°N, 56.19°E, 16 Jun–12 Aug 2009, Malaise trap, A. van Harten, 11651; 1♀, Jebel Hafit, 24.03°N, 55.46°E, 27 Feb–3 Mar 2011, water trap, A. van Harten, 13011; 2♀, Wadi Madaq, 25.18°N, 56.07°E, 1 Feb–1 Apr 2011, water trap, A. van Harten, 13078; 3♂, 1♀, Jebel Jibir, 25.39°N, 56.07°E, 6 Mar–21 Apr 2011, water trap, A. van Harten, 13098 (NMWC). **Iraq**: 12♂♀, Baghdad, Victory Base Complex, Camp Victory, 3 Jul–15 Aug 2011, yellow pan traps, R.G. Lowen (BPBM). **Oman**: 1♀, 10 km S. Barka, gravel plain, 5 Oct 1992, M.D. Gallagher, J.C. Deeming (NMWC).

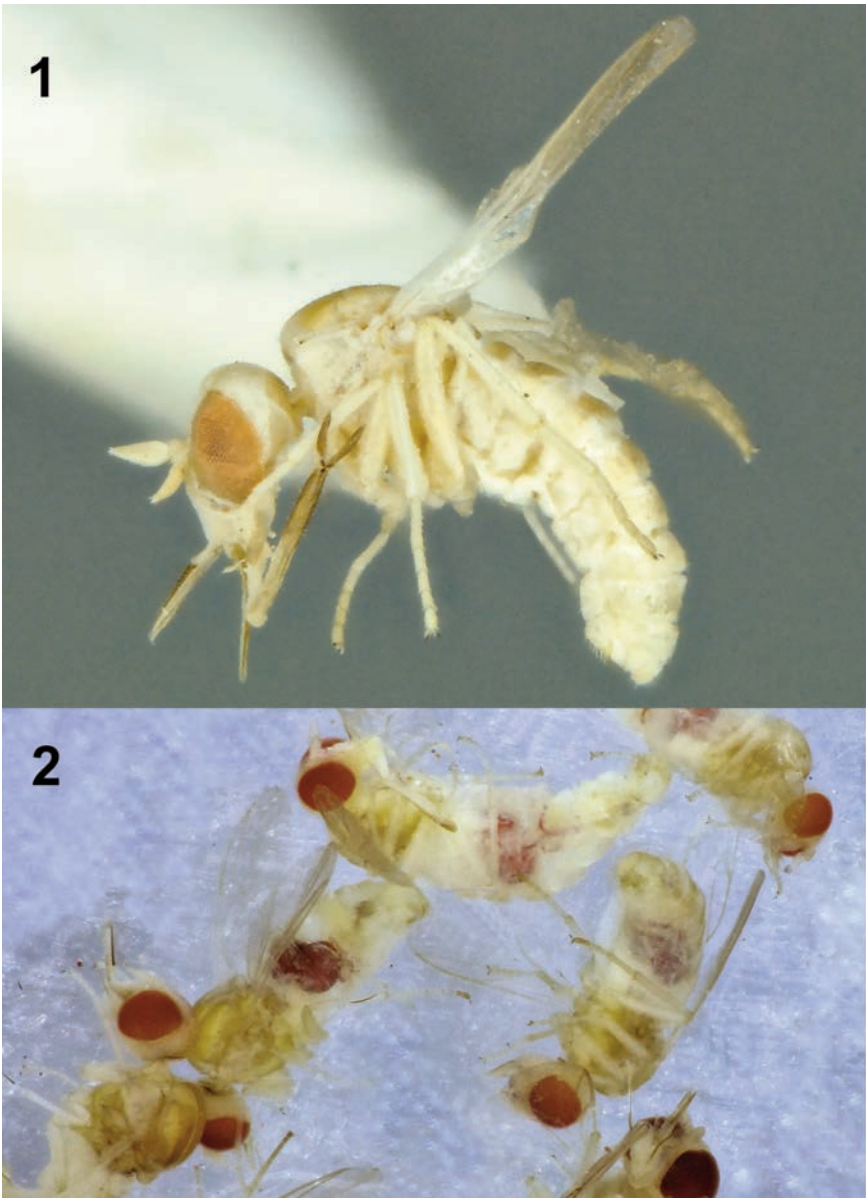
**Diagnosis.** *Leylaiya aquilonia* is similar to *L. apostibes* Evenhuis and *L. ochreata* Evenhuis & Gharali, n. sp. on the basis of the combination of a straight vein  $M_1$  converging with  $R_{4+5}$  at the wing margin and the occiput with yellow laterally and can be separated from *L. apostibes* by the presence of yellow laterally on the occiput (all black in *L. apostibes*) and from *L. ochreata* by the yellow color laterally extending from the vertex to the mentum (yellow color only on the lower half in *L. ochreata*).

**Distribution.** Iraq (**new record**), Iran, Oman (**new record**), United Arab Emirates (**new record**).

*Leylaiya citrina* Evenhuis & Gharali, **new species**  
(Figs. 1–2, 7, 11, 17, 22, 27, 30–33)

*Leylaiya mimnermia*. Evenhuis, 2009: 715 (misidentification).

**Specimens examined.** Holotype ♂ and 23♂, 3♀ paratypes from **United Arab Emirates**: Abu Dhabi, Al Bida'a Protected Area, 16 Aug 2018, Malaise trap, A. Saji & A. van Harten, AD1668 (NMWC).



**Figures 1–2.** *Leylaiya habituses*. 1: *L. citrina* Evenhuis & Gharali n. sp.; 2: *L. citrina* Evenhuis & Gharali n. sp. in fluid showing red testes *in situ*, visible through abdominal wall.

*Other paratypes.* **United Arab Emirates**, 1♂, 1♀, N. of Ajman, 25.26°N, 55.29°E, 8–9 Apr 2008, water trap, A. van Harten, 9375; 3♀, same data except, 18–22 May 2008, 9509; 11♂, 8♀, same data except, 25 May–12 Jun 2008, 9522; 7♂, 5♀, same data except, 23–26 Jun 2008, 9524; 30♂, 13♀, same data except, 5–15 Jul 2008, 9699; 18♂, 1♀, same data except, 25 Jun–5 Jul 2008, 9704; 35♂, 16♀, same data except, 23–30 Jul 2008, 9765; 1♀, 9807; 3♂, 1♀, same data except, 23–30 Jul 2008, 9880; 1♂, same data except, 5–16 Jul 2008, 9903; 8♂, 5♀, same data except, 25 Jun–5 Jul 2008, 9965; 35♂, 39♀, same data except, 16–23 Jul 2008, 10104; 1♂, Wadi Shawkah, 25.06°N, 56.0°E, 3–18 Feb 2018, water trap, A. van Harten, 9401; 1♀, same data except, 25 May–12 Jun 2008, 9518; 1♂, 1♀, S. of Ra's al-Khaimah, 25.43°N, 55.52°E, 27–30 Apr 2008, water trap, A. van Harten, 9504; 4♀, same data except, 18–22 May 2008, 9508; 7♂, 4♀, Wadi Madaq, 25.18°N, 56.07°E, 8–12 Jun 2008, water trap, A. van Harten, 9520; 1♂, Sharjah Desert Park, 25.17°N, 55.42°E, 25 May–16 Jun 2008, WT, A. van Harten, 9940; 1♂, Wadi Bih dam, 25°48'N, 56°04'E, 19 Feb–8 Mar 2009, light trap, 11362; 2♂, ar-Rafah, 25.43°N, 55.52°E, 1 Feb–1 Apr 2009, water trap, A. van Harten, 13086; 1♂, Jebel Hafit, 24.03°N, 55.46°E, 27 Feb–3 Mar 2011, water trap, A. van Harten, 13169; 1♂, Liwa, 5 km E. of Masseurah, 11–19 Mar 2009, WT, C. Schmid-Egger & E. Scheuchl, 13182; 11♂, 1♀, Abu Dhabi, Al Wathba Wetland Reserve, 1–30 Sep 2013, Malaise trap, A. Saji & A. van Harten, AD005; 2♀, Abu Dhabi same data except, 1–30 Jun 2015, AD431; 17♂, 21♀, Abdu Dhabi, same data except, 1–15 Aug 2015, AD475; 2♂, Abu Dhabi, Barqa Al Suqoor Protected Area, 6 Sep 2018, Malaise trap, A. Saji & A. van Harten, AD1909; (all NMWC). **Oman**: 1♀, Ghabar [Al Ghubar], 20°44.68'N, 56°53.14'E, 160 m, 8 Oct 1994, M.D. Gallagher, J.C. Deeming (NMWC); 1♀, Dhofar [Dhufar], [2 km W] Raysout [Raysut], [16°57'06"N, 53°55'50"E], 4 Sep 1989, M.J. Ebejer [corrected label locality information (in square brackets) from M.J. Ebejer, pers. comm. 2 May 2019] (NMWC). Holotype (in fluid) in NMWC. Paratypes in NMWC, EAD, BPBM, and BG.

**Diagnosis.** This species is most similar to *L. medioccipitalis* in having a yellow scutellum, but it can easily be separated from it by the all yellow occiput (rarely with yellowish orange) (occiput yellow with contrasting black pattern medially in *L. medioccipitalis*); the all yellow pleura (katapisternum and meron black in *L. medioccipitalis*); and the gonocoxal projection short, rounded (long, slightly clubbed apically in *L. medioccipitalis*).

**Description. Male.** Lengths: Body: 0.9–1.3 mm. Wing: 0.8–1.2 mm. Body generally all yellowish white.

*Head.* Eyes dichoptic, separated at vertex by two times distance between lateral ocelli; antennae white; pedicel cylindrical, slightly wider than long; first flagellomere lanceolate-conical, length about three times greatest width, with minute second flagellomere and clear apical style; proboscis white on basal half, brownish on apical half, thick, length ca. two times head height (extended from internal coiled condition); labrum brown, sclerotized, stiff, pointed apically, length subequal to head height.

*Thorax* (Fig. 11). Mesonotum white with yellowish dorsal pattern; scutellum white; pleura (except pale brown katapisternum and meron) yellow; mediotergite brownish black; halter stem and knob white.

*Legs.* Coxae and legs white.

*Wing* (Fig. 17). Hyaline; veins yellowish white; costa ends at end of R<sub>4+5</sub>; vein Sc incomplete, ending at level slightly before origin of Rs; M<sub>1</sub> thin, almost evanescent, curved downward at wing margin; M<sub>2</sub> fairly straight to wing margin; anal cell closed just before wing margin; fringe of hair on posterior margin of wing minute.

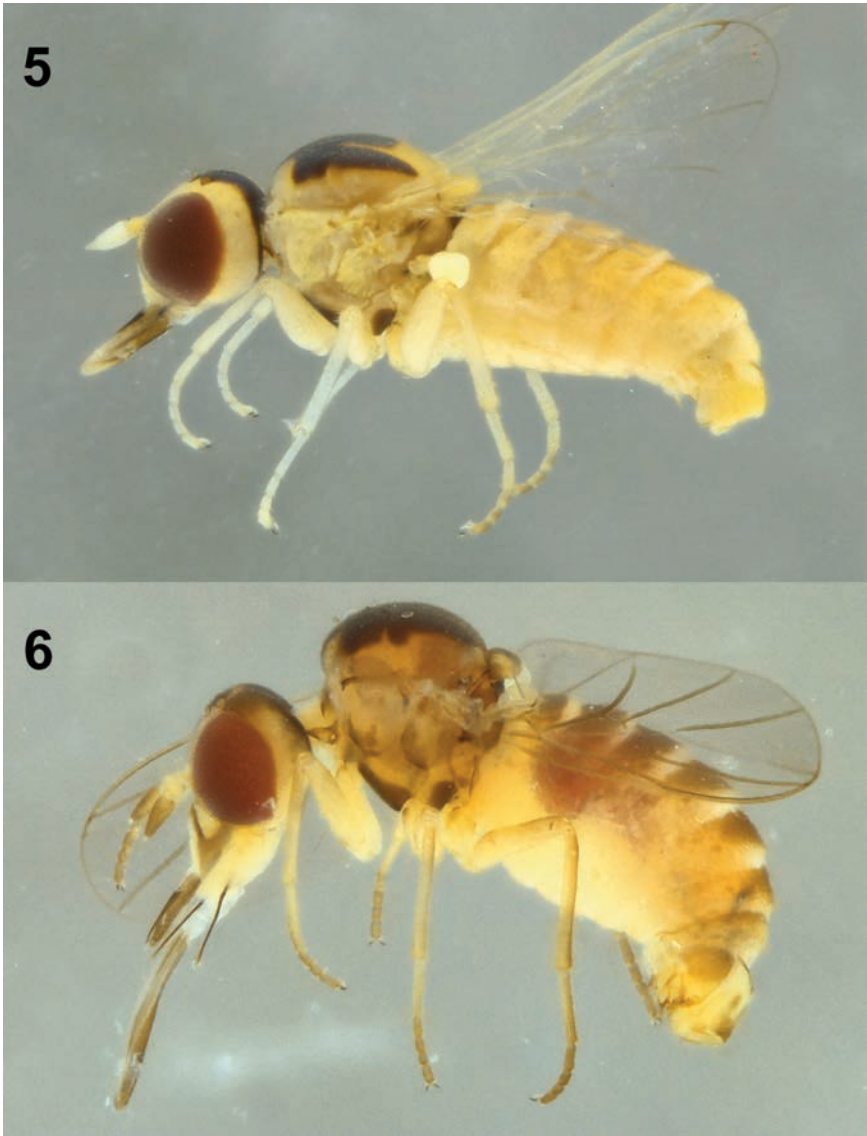
*Abdomen.* Tergites I–VI pale brown medially, yellowish white elsewhere; venter white.

*Genitalia* (Fig. 30) with pair of characteristic large spherical reddish testes located in anterior portion of abdomen (see below for details on these structures); gonocoxa with

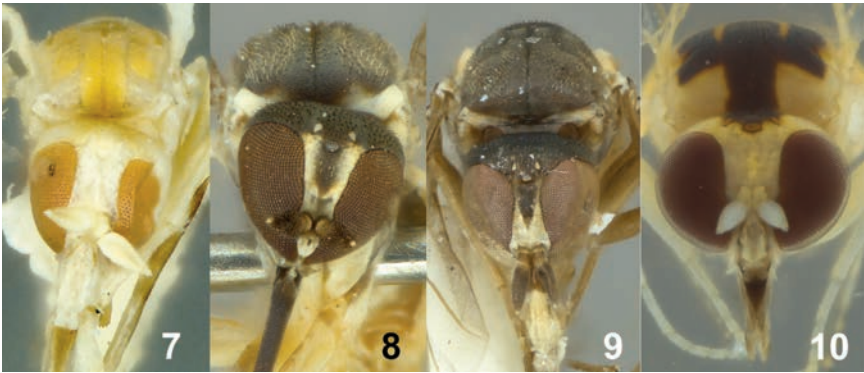


**Figures 3–4.** *Leylaiya* habituses. 3: *L. deemingi* Evenhuis & Gharali n. sp.; 4: *L. gharalii* Evenhuis n. sp.





**Figures 5–6.** *Leylaiya* habituses. **5:** *L. mediocipitalis* Evenhuis & Gharali n. sp.; **6:** *L. ochreata* Evenhuis & Gharali n. sp.



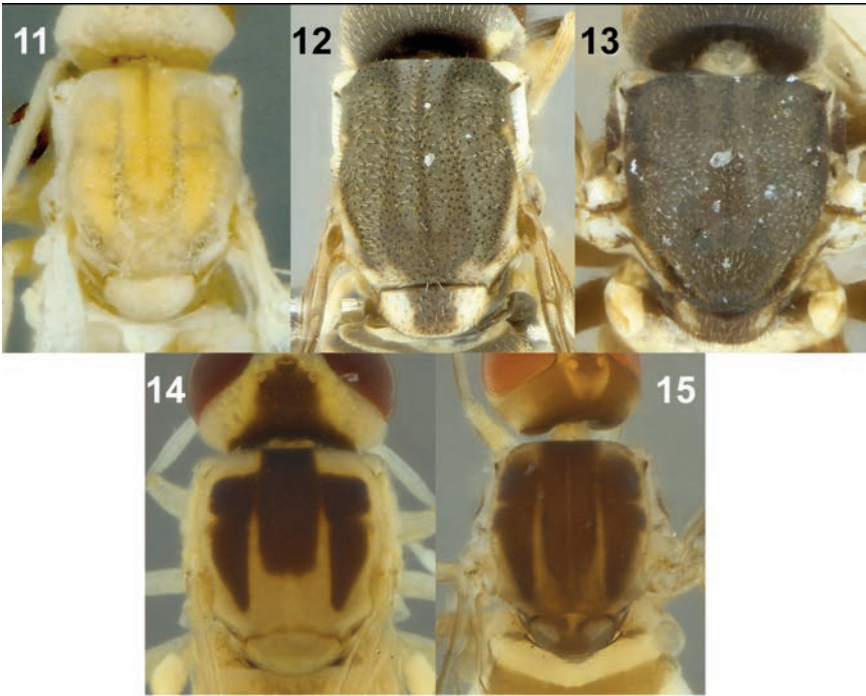
**Figures 7–10.** *Leylaiya* heads and anterior thoraces, frontal view. 7: *L. citrina* Evenhuis & Gharali n. sp.; 8: *L. deemingi* Evenhuis & Gharali n. sp.; 9: *L. gharalii* Evenhuis n. sp.; 10: *L. mediocapitalis* Evenhuis & Gharali n. sp.

dorsal process (Fig. 22) subtriangular with rounded apex bearing long hairs; gonostylus (Fig. 22A) subrectangular with apex angled.

**Female.** As in male; genitalia (Fig. 31) with furca V-shaped, lightly sclerotized laterally; spermathecal reservoirs subspherical (Fig. 32), wrapped within coiled thin spermathecal ducts; free part of apical spermathecal ducts long thin, length more than four times length of sperm pump; sperm pump with flared sclerotized apical valve and constricted subapical neck, medial portion of sperm pump, membranous; all three sperm pumps connected basally, without basal common duct.

**Remarks.** The specimens from the UAE and Oman previously recorded (Evenhuis 2009) as *Leylaiya mimnermia* were re-examined during this study, compared with photographs of some of the syntype series of *L. mimnermia*, and found to have been misidentified and in actuality belong to this species. Some amount of variation is seen in some specimens that are darker than normal; these have the ocellar tubercle brown, the occiput yellowish orange, the mesonotal pattern orange to pale brown, and the medial tergal coloration more brown. In a few specimens,  $M_2$  does not quite reach the wing margin.

**Note on the large pigmented testes and female genitalia.** Most males of *Leylaiya citrina* and a few of *L. ochreata* have large globular testes that are strongly reddish pigmented and thus easily seen in fluid-preserved specimens (Fig. 2). This is uncommon feature in mythicomyiids (seen elsewhere only in a few specimens of *Mnemomyia* sp. from southern Africa). The female genitalia are also peculiar in having extremely long and narrow spermathecal ducts that coil around the three delicate, very weakly sclerotized spermathecal reservoirs (cf. Fig. 33). The lumen of the ducts is in large parts so narrow, that they probably only fit one or a few spermatozoa at a time. Along some of their length they are lined by a glandular epithelium, each with a tiny cuticular end apparatus. Long, coiled spermathecae are found in a number of different genera of Bombyliidae and Asilidae, but no examples are known that have thin coiled ducts that surround a weakly sclerotized spermathecal reservoir. Much more work needs to be done on these unique structures to determine their function and relationship to similar genitalic features the senior author has found in some specimens of southern African *Mnemomyia* Bowden.



Figures 11–15. *Leylaiya* thoraxes, dorsal view. 11: *L. citrina* Evenhuis & Gharali n. sp.; 12: *L. deemingi* Evenhuis & Gharali n. sp.; 13: *L. gharalii* Evenhuis n. sp.; 14: *L. medioccipitalis* Evenhuis & Gharali n. sp.; 15: *L. ochreatea* Evenhuis & Gharali n. sp.

**Etymology.** The specific epithet derives from the Latin *citrina*, referring to the generally yellow color of the species.

**Distribution.** Known from the United Arab Emirates and Oman.

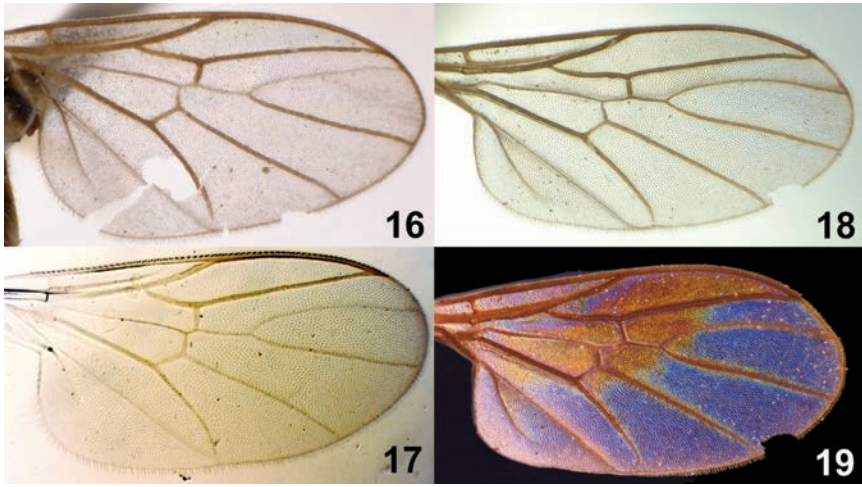
*Leylaiya deemingi* Evenhuis & Gharali, new species

(Figs. 3, 8, 12, 18–19, 23)

**Specimens examined:** Holotype ♂ from **Oman**, Dhofar, Hajayf (*Euphorbia* zone), [17°17'N, 54°3'E], 12 Oct 1990, J.C. Deeming (NMWC). Paratypes: **Oman**: 1♂, 2♀, Dhofar, Hajayf (*Euphorbia* zone), [17°17'N, 54°3'E], 12 Oct 1990, J.C. Deeming (NMWC). Holotype and paratypes in NMWC.

**Diagnosis.** This species can easily be separated from species of *Leylaiya* in this region that have the vein  $M_1$  diverging from  $R_{4+5}$  and curving downward at wing margin by the predominantly black scutellum, black occiput with yellow only laterally, and long proboscis with the labrum longer than the head height.

**Description. Male and female.** Lengths: body: 1.2–1.3 mm. wing: 1.1–1.2 mm. *Head.* Occiput (except lateral spot of white to yellow), vertex and ocellar tubercle grayish black



**Figures 16–19.** *Leylaiya* wings. **16:** *L. aquilonia* Gharali & Evenhuis; **17:** *L. citrina* Evenhuis & Gharali n. sp.; **18:** *L. deemingi* Evenhuis & Gharali n. sp.; **19:** *L. deemingi* Evenhuis & Gharali n. sp., Wing Interference Pattern.

to black; eyes dichoptic, separated at vertex by two times distance between lateral ocelli; frons white with long medial stripe of dark brown; face and clypeus white; antennae with scape and first flagellomere black, pedicel brown; scape minute; pedicel cylindrical, slightly wider than long; first flagellomere lanceolate, length about three times greatest width, with minute apical style; proboscis black, length ca. three times head height (extended from internally coiled condition); labrum sclerotized, stiff, pointed apically, length two times head height.

*Thorax* (Fig. 12). Mesonotum black with grayish pollinose dorsal pattern; metaphragma black; scutellum yellowish white laterally with broad black longitudinal stripe medially; scutum and scutellum with scattered minute pale hairs; humeral callus, notopleural line to wing base, thin supra alar spot, thin post alar callus yellowish white; pleura predominantly yellowish white with black on following: upper and lower margins of anepisternum and lower half of anepimeron, katapisternum, katatergite, and metepisternum. Halter stem yellow, knob white with yellow color ventrally.

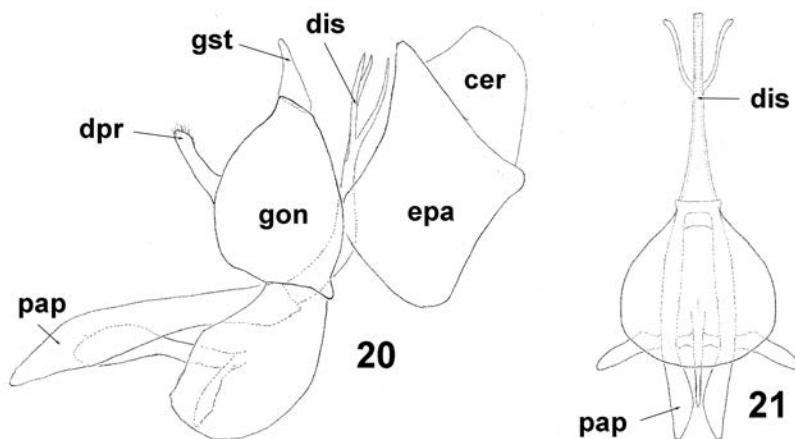
*Legs.* Coxae and legs yellow except tarsal segments 2–5 brown; claws black.

*Wing* (Figs. 18, 19). Hyaline; veins brown; vein Sc incomplete, ending at level slightly beyond origin of Rs; costa ends at end of  $R_{4+5}$ ; vein  $M_1$  curved downward at wing margin;  $M_2$  fairly straight to wing margin; anal cell open at wing margin for width equal to  $r-m$  crossvein; Wing Interference Pattern (Fig. 19) bronzy orange subbasally extending anterodistally to radial cells, indigo blue on distal half of wing; extreme base magenta.

*Abdomen.* Tergites II–VI dark brown, with thin yellowish white line posteriorly; tergites VII–VIII brown and yellow, yellowish brown laterally; tergite VIII all yellow; venter yellowish white.

*Genitalia.* Not dissected; gonocoxa with dorsal process triangular, pointed, bearing stiff setae (Fig. 23).

*Female genitalia* not dissected.



**Figures 20–21.** *Leylaiya medioccipitalis* Evenhuis & Gharali nov. spec, male genitalia. **20:** Lateral view; **21:** Ventral view of phallic complex. Abbreviations: cer = cercus; dis = distiphallus; dpr = dorsal process of gonocoxa; epa = epandrium; gon = gonocoxa; gst = gonostylus; pap = parameral apodeme.

**Remarks.** In some specimens the yellowish white color laterally on the occiput extends inward on the upper half.

**Distribution:** Known only from Oman.

***Leylaiya gharalii* Evenhuis, new species**

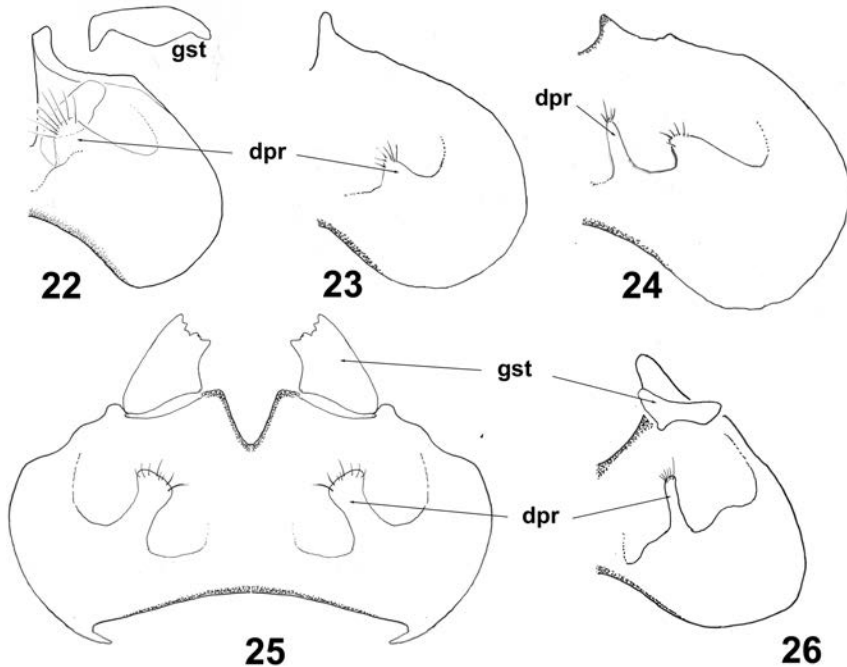
(Figs. 43, 9, 13, 24)

**Specimens examined:** Holotype ♂ from **United Arab Emirates:** Wadi Wurayah farm, 25.23°N, 56.19°E, 17–31 May 2009, Malaise trap, A. van Harten (NMWC).

**Diagnosis.** This species is closest in appearance to *Leylaiya deemingi* n. sp., but can be easily separated from it by the all black occiput laterally (with yellow spot in *L. deemingi*).

**Description. Male.** Lengths: body: 1.2 mm; wing: 1.3 mm. **Head.** Predominantly black; eyes dichoptic, separated at vertex by subequal to distance between lateral ocelli; frons with long black triangular mark medially extending downward from ocellar tubercle, yellow-white thinly along eye margin and broadly above antennae; face not evident, with antennal sockets at tip of oral margin, clypeus shining brown; antennae dark brown; scape minute; pedicel cylindrical, slightly wider than long; first flagellomere lanceolate, length about three times greatest width, with minute apical style; proboscis brown, length ca. six times head height (extended from internally coiled condition); labrum long, sclerotized, stiff, pointed apically, length three times head height.

**Thorax** (Fig. 13). Mesonotum black with faint gray pollinose dorsal pattern; scutellum black medially and posteriorly with small yellowish spots basolaterally; scutum and scutellum with minute scattered pale hairs; humeral callus (very small mark), thin noto-



**Figures 22–26.** *Leylaiya* gonocoxa, showing dorsal process. **22:** *L. citrina* Evenhuis & Gharali n. sp.; **23:** *L. deemingi* Evenhuis & Gharali n. sp.; **24:** *L. gharalii* Evenhuis n. sp.; **25:** *L. mediocipitalis* Evenhuis & Gharali n. sp.; **26:** *L. ochreata* Evenhuis & Gharali n. sp. Abbreviations: dpr = dorsal process; gst = gonostylus.

pleural line to wing base and thin post alar callus yellowish white; pleura dark brown. Halter stem and knob white, knob with spot of brown color dorsomedially.

*Legs.* Coxae, femora, and tarsi brown; tibiae yellow; claws black.

*Wing.* Hyaline; veins brown; vein Sc incomplete, ending at level slightly beyond origin of Rs; costa ends at end of  $R_{4+5}$ ; vein  $M_1$  curved downward at wing margin;  $M_2$  fairly straight to wing margin; anal cell open at wing margin for width equal to r-m crossvein.

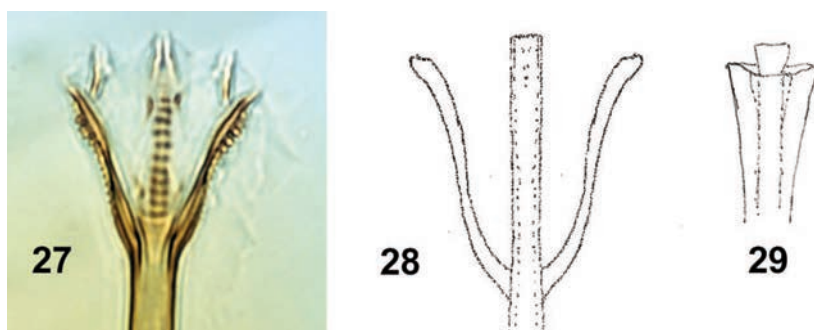
*Abdomen.* Tergites II–VI dark brown, with thin yellowish white line posteriorly; tergites VII–VIII brown and yellow, yellowish brown laterally; tergite VIII all yellow; venter yellowish white.

*Genitalia.* Not dissected; gonocoxal dorsal process (Fig. 24) bifid, lateral projection lobe like, mesal one pointed with fine hairs on bifid apex.

**Female.** Unknown.

**Etymology.** Named for my good friend and colleague, Babak Gharali, to thank him for many years of successful collaboration and to honor the work he has done to increase our knowledge of the Mythicomyiidae of Iran and adjacent areas.

**Distribution:** Known from the United Arab Emirates.



Figures 27–29. *Leylaiya* male genitalia, distiphalli, ventral view. 27: *L. citrina* Evenhuis & Gharali n. sp.; 28: *L. mediocipitalis* Evenhuis & Gharali n. sp.; 29: *L. ochreatea* Evenhuis & Gharali n. sp.

*Leylaiya mediocipitalis* Evenhuis & Gharali, new species

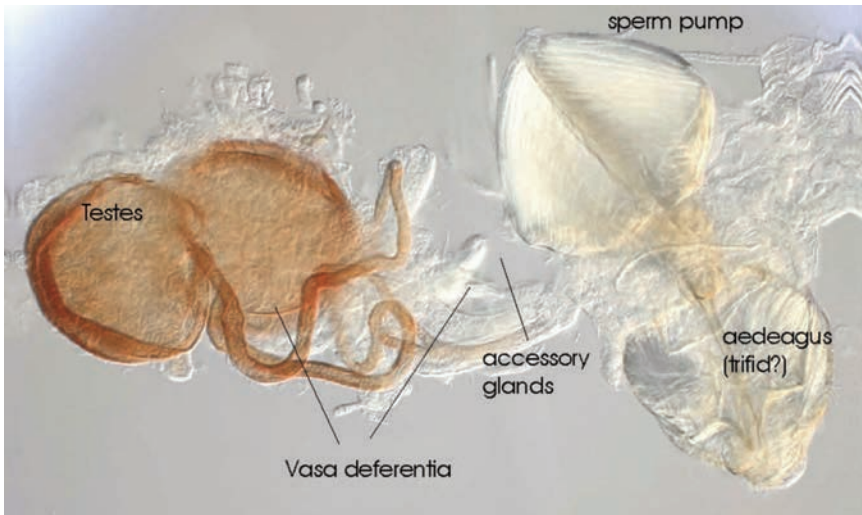
(Figs. 5, 10, 14, 20–21, 25, 28)

**Specimens examined.** Holotype: ♂ from United Arab Emirates: Liwa, 5 km E of Masseurah, 11–19 Mar 2009, water trap, C. Schmid-Egger & E. Scheuchl, 13182 (NMWC). *Paratypes*: 2♂, N of Ajman, 25.26°N, 55.29°E, 25 Jun–5 Jul 2008, water trap, A. van Harten, 9704; 5♂, 6♀, same data except 23–30 Jul 2008, 9765, 9880; 2♂, same data except, 22 Sep–17 Oct 2008, 9807; 8♂, 7♀, N. of Ajman, 25.26°N, 55.29°E, 16–23 Jul 2008, water trap, A. van Harten, 10104; 3♂, Ra'a al-Khaimah x Dibba, 25.36°N, 55.50°E, 17–22 Oct 2009, water trap, A. van Harten, 11140; 1♀, Wadi Bih dam, 25°48'N, 56°04'E, 16–31 Dec 2009, water trap, A. van Harten, 13120; 2♂, 2♀, Abu Dhabi, Al Bida'a Protected Area, 16 Aug 2018, Malaise trap, A. van Harten, AD1668; 1♂, Al Tawi Protected Area, 30 Aug 2018, Malaise trap, A. Saji & A. van Harten, AD1714; 1♀, Al Bida'a Protected Area, 30 Sep 2018, Malaise trap, A. Saji & A. van Harten, AD1911 (NMWC, BPBM, BG). *Non-paratype material*: **India**: Rajasthan: 1♀, Jodhpur district, 3 km W Bhinkinkor, 67 km E Palodi, 370 m, 26°50.30'N, 72°45.17'E, 29 Feb–5 Mar 2008, M.E. Irwin, D.R. Priyadarsanan, Malaise in vegetated dunes (CAS); 1♂, same data except 4 km Osiyan, 360 m, 26°43.48'N, 72°52.57'E (CAS). Holotype in NMWC. Paratypes in NMWC, EAD, and BPBM.

**Diagnosis.** This species is most similar to *L. citrina* n. sp. on the basis of its generally all yellow appearance but is easily separated from it by the black to brown medial pattern on the occiput (dark color medially not present in *L. citrina*) and the dark sclerotization on the lower pleural sclerites (all yellow in *L. citrina*).

**Description. Male.** Lengths: body and wing: 1.4–1.7 mm. *Head.* Predominantly white, occiput brown medially from vertex to mentum, white laterally; eyes dichoptic, separated at vertex by two times distance between lateral ocelli; face reduced with antennal sockets placed at tip of oral margin; antennae with scape and pedicel white, first flagellomere pale brown; scape minute; pedicel cylindrical, slightly wider than long; first flagellomere lanceolate-conical, length about two times greatest width, with minute clear apical style; proboscis white to pale brown, thick, length ca. two times head height; labrum sclerotized, stiff, brown, pointed apically, length about one-half head height.

*Thorax* (Fig. 14). Mesonotum white with brownish dorsal pattern; scutellum and prescutellar area yellow; scutum and scutellum with minute scattered pale hairs; humeral callus, broad notopleural line to wing base, supra alar area, post alar callus, and pleura (except brown katepisternum, meron and anepimeron) yellow. Halter stem and knob white.



**Figure 30.** *Leylaiya citrina* Evenhuis & Gharali n. sp., internal male genitalia, viewed via compound microscope with differential interference contrast showing different structures.

*Legs.* Coxae and legs white.

*Wing.* Hyaline; veins pale brown to white; vein Sc incomplete, ending at level slightly beyond origin of Rs; vein M<sub>1</sub> thin, almost evanescent, curved downward at wing margin; M<sub>2</sub> fairly straight to wing margin.

*Abdomen.* Tergites II–VII brown medially, yellow elsewhere; venter white.

*Genitalia.* In lateral view (Fig. 20) with gonocoxa subglobular, dorsal process long, lobe-like, with fine hairs apically (club-like apex best seen in dorsal view, Fig. 25); gonostylus subtriangular; apical dentate condition seen in dorsal view (Fig. 25); phallic complex with extremely large aedeagal bulb and small thin slightly clubbed aedeagal apodeme; parameral apodemes thick, flared apically; epandrium subtrapezoidal with pointed process dorsoapically; cercus very large (ca. one-half epandrium height), exerted; phallic complex in ventral view (Fig. 21) with long thin distiphallus, trident-shaped apically (Fig. 28).

**Female.** As in male; genitalia not dissected.

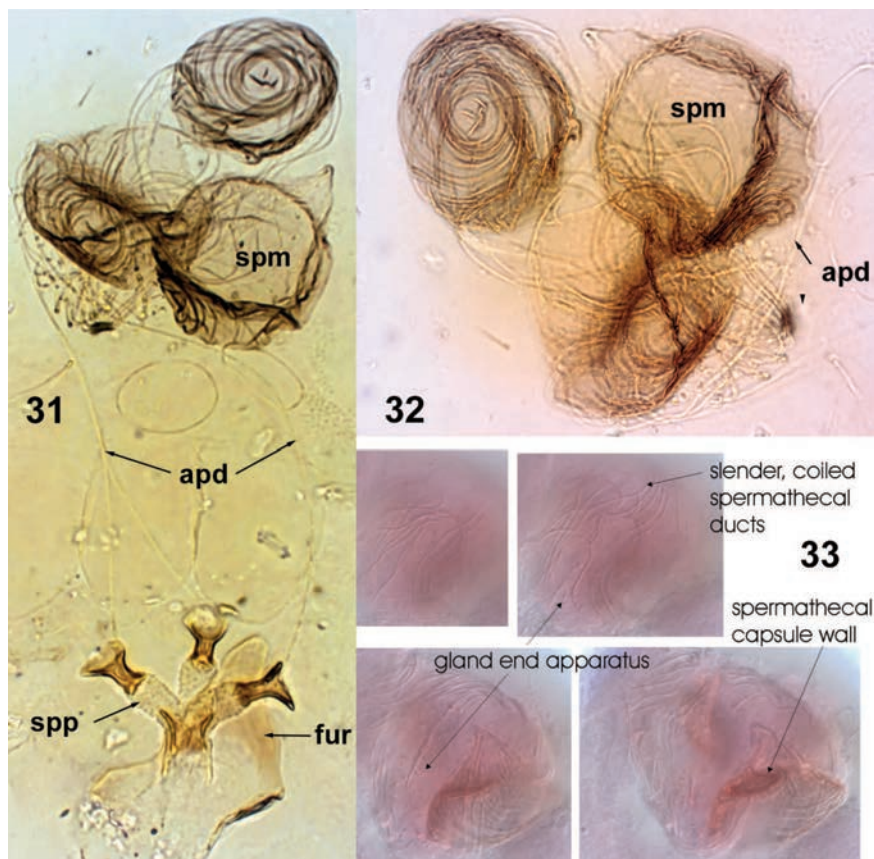
**Distribution:** Disjunct; known from the United Arab Emirates and western India.

***Leylaiya ochreata* Evenhuis & Gharali, new species**

(Figs. 6, 15, 26, 29)

**Specimens examined:** *Holotype* ♀ from **United Arab Emirates:** N of Ajman, 25.26°N, 55.29°E, 22 Sep–17 Oct 2008, water trap, A. van Harten, 9807 (NMWC). *Paratypes:* United Arab Emirates: 1♀, al-Abjan, 24.26°N, 55.01°E, 19–26 June 2006, Malaise trap, A. van Harten, 4450; 1♂, N. of Ajman, 25.26°N, 55.29°E, 5–16 Jul 2008, WT, A. van Harten, 9699; 1♂, Wadi Shawkah, 25.06°N, 56.01°E, 5–12 May 2007, water trap, A. van Harten, 9093; 2♂, 1♀, Wadi Shawkah, 25.06°N, 56.01°E, 25 May–12 Jun 2008, water trap, A. van Harten, 9518; 4♂, 4♀, Wadi Maidaq, 25.18°N, 56.078°E, 8–12 Jun 2008, water trap, A. van Harten, 9520; 2♀, N. of Ajman, 25.26°N, 55.29°E, 25 May–12 Jun 2008,





**Figures 31–33.** *Leylayia citrina* Evenhuis & Gharali nov. spec, internal female genitalia. **31:** Genitalic complex showing spermathecal reservoirs, ducts, sperm pumps, and furca; **32:** Spermathecal reservoirs; **33:** Spermathecal reservoir, differential interference contrasting various focal planes showing the delicate reservoir wrapped by thin spermathecal ducts. Abbreviations: apd = apical spermathecal duct; fur = furca; spm = spermathecal reservoirs; spp = sperm pump.

water trap, A. van Harten, 9522; 1♀, Sharjah Desert Park, 25.17°N, 55.42°E, 17–24 Jul 2008, light trap, A. van Harten; 1♂, 1♀, Qurayah, 25.14°N, 56.21°E, 5–30 Nov 2008, water trap, A. van Harten, 10138 (NMWC, BPBM, and BG).

**Diagnosis.** This species is similar to *Leylayia aquilonia* in having veins  $R_{4+5}$  and  $M_1$  converging at the wing margin, but it can easily be separated from it by the all yellow occiput laterally (brown spot in lower half in *L. aquilonia*) and the long, tubular gonocoxal projection (flat, rounded in *L. aquilonia*).

**Description. Male.** Lengths: body and wing: 1.3–1.4 mm. *Head.* Predominantly yellowish brown medially and dorsolaterally, ocellar tubercle brown to black yellow directly

posterior to ocellar tubercle; eyes dichoptic, separated at vertex by two times distance between lateral ocelli; frons brown medially, yellow-white along eye margin; face white, extremely reduced due to antennal sockets placed at tip of oral margin; antennae with scape and pedicel white, first flagellomere pale brown; scape minute; pedicel cylindrical, slightly wider than long; first flagellomere lanceolate, length about three times greatest width, with minute clear apical style; proboscis brown, length ca. three times head height (extended from internally coiled condition); labrum sclerotized, stiff, pointed apically, length slightly less than head height.

*Thorax* (Fig. 15). Mesonotum yellowish with black vittate dorsal pattern, vittae separated by thin admedian yellow stripe, flared posteriorly, prescutellar area brown in between admedian yellow stripes; scutellum yellowish brown laterally with median dark brown longitudinal stripe; scutum and scutellum with minute scattered pale hairs; humeral callus, broad notopleural line to wing base, supra alar area, and post alar callus, yellow; pleura yellow, except dark brown katapisternum and meron. Halter stem and knob yellowish white.

*Legs*. Coxae and legs yellowish white.

*Wing*. Hyaline; veins brown; vein Sc incomplete, ending at level slightly beyond origin of Rs; vein M<sub>1</sub> straight, converging with R<sub>4+5</sub> at wing margin; M<sub>2</sub> fairly straight to wing margin; anal cell closed slightly before wing margin.

*Abdomen*. Tergites I–II dark brown, with yellow as thin line posteriorly; tergites III–VII dark brown dorsomedially, yellowish brown laterally; tergite VIII all yellow; venter white.

*Genitalia*. Gonocoxa (Fig. 26) subglobular, dorsal process long, thin, with fine hairs on rounded apex; gonostylus subtriangular, rounded; distiphallus (Fig. 29) with tip of aedeagus tubular, trifid apex with lateral process apparently fused onto medial tube surrounding medial aedeagal tube.

**Female.** As in male; genitalia not dissected.

**Distribution:** Known from the United Arab Emirates.

### Genus *Doliopteryx* Hesse, 1956

*Doliopteryx* Hesse, 1956: 936. Type species: *Doliopteryx crocea* Hesse, 1956, by original designation.

The two species recorded here mark the first records of the genus from the UAE. The genus was included into the key to genera in Evenhuis (2009) anticipating its presence here. The genus was revised by Evenhuis (2000) is primarily an Afrotropical one but some species extend into the Arabian Peninsula, Israel, and Iran (Gharali & Evenhuis, 2017). The key to species of the genus given below encompasses the Middle East, Arabian Peninsula, and Iran in order to cover all the known the non-African species.

#### KEY TO SPECIES OF *DOLIOPTERYX* HESSE IN THE MIDDLE EAST (INCLUDING THE ARABIAN PENINSULA AND IRAN)

1. Mesonotum and abdomen yellow with orange pattern ..... 2
- . Mesonotum black or yellow with black pattern ..... 3
2. Scutellum white; occiput yellow to orangish, with at most thin brown stripes lateral to occipital foramen ..... *Doliopteryx omanae* Evenhuis

- . Scutellum yellow, dusky yellow posteriorly in some specimens; occiput white to yellow, with brown medially ..... *Doliopteryx palaestinensis* Evenhuis & Theodor
- 3. Occiput entirely black laterally ..... *Doliopteryx nodahaki* Gharali & Evenhuis
- . Occiput with white to yellow color laterally, not entirely black ..... 4
- 4. Postcranium well developed posteriorly making head longer than high .....  
..... *Doliopteryx fratris* Gharali & Evenhuis
- . Postcranium normal, head as long as high ..... 5
- 5. Scutellum black; anepimeron black on lower half; antennal pedicel black; hind tibia dark brown ..... *Doliopteryx arava* Evenhuis
- . Scutellum yellow (Fig. 36); anepimeron yellow, darker yellow on lower portion; antennal pedicel yellow; hind tibia yellow .....  
..... *Doliopteryx xanthinon* Evenhuis & Gharali, **n. sp.**

***Doliopteryx palaestinensis*** Evenhuis & Theodor

**Specimens examined.** United Arab Emirates: 1♀, Wadi Madaq, 8–12 Jun 2008, 25.18°N, 56.01°E, water trap, A. van Harten, 9520 (NMWC).

**Remarks.** *Doliopteryx palaestinensis* Evenhuis & Theodor appears to be a fairly widespread but localized species in the Middle East including the Arabian Peninsula. With the record here the species is now known from Egypt, Israel, and the United Arab Emirates.

**Distribution.** Egypt, Israel, United Arab Emirates (**new record**).

***Doliopteryx xanthinon*** Evenhuis & Gharali, **new species**

(Figs. 34, 36–37)

**Specimens examined.** *Holotype* ♂ from United Arab Emirates: Wadi Madaq, 8–12 Jun 2008, 25.18°N, 56.01°E, water trap, A. van Harten, 9520. *Holotype* (in alcohol) in NMWC.

**Diagnosis.** This species is closest in appearance to *D. arava* Evenhuis from Israel and *D. fratris* Gharali & Evenhuis from Iran on the basis of possessing a yellow lateral occiput and black and yellow markings on the mesonotum. It can be separated from *D. arava* by the all yellow scutellum (black with white medial stripe in *D. arava*), the yellow antennal pedicel (black in *D. arava*), the yellow hind tibia (dark brown in *D. arava*), and the predominantly yellow anepimeron (predominantly black in *D. arava*). It can be separated from *D. fratris* by the predominantly yellow anepimeron (predominantly black in *D. fratris*) and the normal shape of the postcranium with the head as long as high (postcranium produced posteriorly making the head longer than high in *D. fratris*).

**Description.** Male. Length: 1.01 mm. *Head.* Predominantly yellow, occiput brown with yellow laterally and posterior to ocellar tubercle, with sparse appressed white hairs; eyes dichoptic, width at vertex subequal to distance between lateral ocelli; frons slightly depressed medially, brown on upper half extending medially below median ocellus toward antennae, yellow to yellow-white on lower half; face and tip of oral margin yellowish white; antennae brown; scape minute; pedicel cylindrical, slightly wider than long; first flagellomere linear-lanceolate, length about four times greatest width; second flagellomere minute, with clear apical style; mentum concolorous with occiput; proboscis brown, tubular, length ca. two times head height; labrum sclerotized, stiff, pointed apically, length subequal to head height.



**Figures 34–35.** Mythicomyiidae habituses. **34.** *Doliopteryx xanthinon* Evenhuis & Gharali n. sp.; **35:** *Glbellula yemeni* Evenhuis & Gharali n. sp.

*Thorax* (Fig. 36). Mesonotum yellow with three longitudinal black vittae, medial vitta not extending to scutellum leaving yellow prescutellar area, dorsum with scattered white hairs anteriorly, bronzy hairs dorsally and posteriorly; scutellum yellow; humeral callus and broad notopleural line to post alar callus yellowish white; pleura yellow except for dark brown katepisternum and meron, thinly brown anteriorly on anepisternum. Halter stem and knob white.

*Legs*. Yellow with some brown basally on mid and hind femora; claws black.

*Wing*. Hyaline; costal, radial, and basal medial veins pale brown, remainder white to translucent; costa ends slightly beyond end of  $R_{4+5}$ ; vein Sc incomplete, ending at level about equal to origin of vein  $R_{2+3}$ ; vein  $R_{2+3}$  ends in wing margin equidistant between end of vein  $R_1$  and  $R_{4+5}$ ; cell dm open, without crossvein closing it apically; fringe of hair on posterior margin of wing minute.

*Abdomen*. Tergites brown anteriorly, yellow posteriorly; venter white.

*Genitalia*. Not dissected.

**Female**. Unknown.

**Etymology**. The specific epithet derives from the Greek *xanthos* (yellow) + *inion* (back of the head); referring to the yellow lateral occipital color.

**Distribution**. Only known from the UAE.

### Genus *Glabellula* Bezzi, 1908

*Glabellula* Bezzi, 1902: 191. Type species: *Platygaster arcticus* Zetterstedt, 1838, by subsequent designation (I.C.Z.N. 1989: 148 [Opinion 1545]).

Since Evenhuis (2009) a few additional specimens of *Glabellula* Bezzi have been examined, including a new species from Yemen: *G. yemeni*, n. sp., which is only the second species recorded from the Arabian Peninsula. A third species from Yemen in very poor condition represents a possible third species (easily identified by its generally brown coloration) but is not described here until specimens in better condition can be found. *Glabellula* continues to be rarely encountered in this area. One of the three new records of *Glabellula thespia* from the UAE is from the type locality but was missed in the original examination of specimens in Evenhuis (2009). A key to species in the Middle East is presented here to assist future workers in identification of species from this region.

#### KEY TO SPECIES OF *GLABELLULA* BEZZI, 1908 FROM THE MIDDLE EAST (INCL. ARABIAN PENINSULA AND IRAN)

1. Scutellum predominantly dark brown to black ... *Glabellula thespia* Evenhuis
- Scutellum largely yellow laterally and/or posteriorly, black color restricted to basomedial area ..... 2
2. Dark scutellar color medial stripe, extending from base to posterior margin ..... 3
- Dark scutellar color subtriangular, basal spot, posterior margin yellow (Iran) .....  
..... *Glabellula humeralis* Gharali & Evenhuis
3. Lateral yellow to white mesonotal stripes interrupted with black color between postpronotal lobe and notopleural area (Israel) ..... *Glabellula palaestinensis* Engel
- Lateral mesonotal stripes all yellow, no black color present ..... 4



**Figures 36–39.** Myticomyiidae heads and thoraces. **36:** *Dolipteryx xanthinion* Evenhuis & Gharali n. sp., thorax, dorsal view; **37:** *Dolipteryx xanthinion* Evenhuis & Gharali n. sp., head and thorax, frontal view; **38:** *Glabellula yemeni* Evenhuis & Gharali n. sp., thorax, dorsal view; **39:** *Glabellula yemeni* Evenhuis & Gharali n. sp., head and thorax, frontal view.

4. Mesonotum without admedian vittae; white color of postalar calli curved upward posteromedially (Fig. 38) (Yemen) ..... *Glabella yemeni* Gharali & Evenhuis, n. sp.  
 –. Mesonotum with admedian vittae; white color of postalar calli coalesced with posterior end of admedian vittae (Syria) ..... *Glabella nobilis* Kertész

*Glabella thespia* Evenhuis

(Fig. 40)

*Glabella thespia* Evenhuis, 2009: 718. Holotype in NMWC.

Additional female specimens of this species (previously known only from the unique holotype female) have been examined and are recorded here. Nothing new can be added to the original description except the additional specimens allowed us to dissect one in order to examine the female genitalia, which are described and illustrated here. *Glabella thespia* is a rarely encountered species in the UAE and males of *G. thespia* remain unknown.

**Specimens examined:** United Arab Emirates, Holotype ♀, al-Ajban, 2–22 Nov 2006, Malaise trap, A. van Harten (NMWC); 1 ♀, al-Ajban, 25.36°N, 55.01°E, 21 Aug–19 Sep 2006, Malaise trap, A. van Harten, 10051 (NMWC); 1 ♀, Abu Dhabi, Al Wathba Wetland Reserve, 1–30 Apr 2013, Malaise trap, A. Saji & A. van Harten, AD059 (BG); 1 ♀, Abu Dhabi, Al Wathba Wetland Reserve, 1 ♀, 31 Oct 2014, Malaise trap, A. Saji & A. van Harten, AD090 (BG); 1 ♀, Abu Dhabi, Houbara Protected Area, 1–31 May 2016, Malaise trap, A. Saji & A. van Harten, AD960 (BG).

**Female genitalia** (Fig. 40). Furca V-shaped with mesal projections originating medially on lateral arms; spermathecal reservoirs darkly sclerotized in apical half, apically recurved with clubbed apex; apical spermathecal duct, long thin, with dark swollen area with gland hairs basal to spermathecal reservoir; sperm pump large, conspicuous, with sclerotized tubular duct leading to short clear basal spermathecal duct, distal two-thirds with hyaline sheath making pump complex similar in appearance to the stinkhorn fungus genus *Phallus*; basal ducts converge to short sclerotized common duct leading to vaginal opening.

**Distribution:** United Arab Emirates including Abu Dhabi.

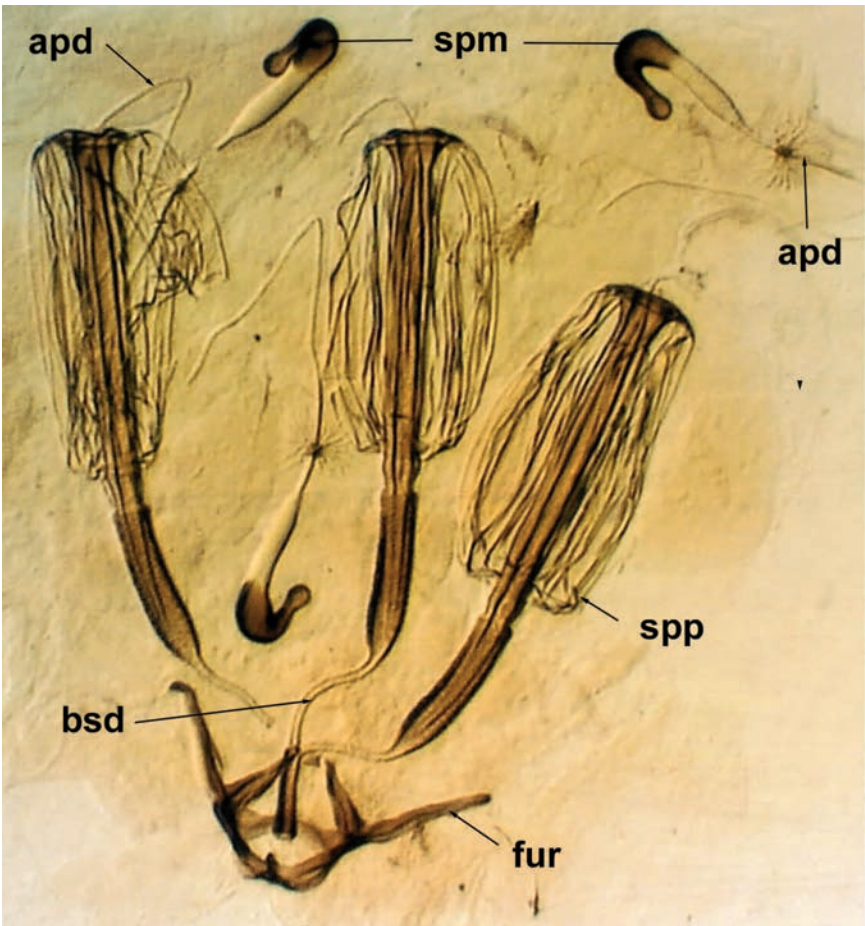
*Glabella yemeni* Evenhuis & Gharali, new species

(Figs. 35, 38–39)

**Specimens examined:** Holotype ♀ from Yemen: Al Kowd, Sep 1999, light trap, A. van Harten & S. Haruri, 4080. Holotype deposited in NMWC.

**Diagnosis.** *Glabella yemeni* n. sp. can be easily separated from its apparent closest related species, *G. nobilis* Kertész from Syria by the mesonotal pattern: in *G. nobilis*, the mesonotum possesses distinct yellow to white admedian vittae (these vittae are absent in *G. yemeni*, nov. spec).

**Description. Female.** Lengths: 1.5 mm; wing: 1.4 mm. **Head** (Fig. 39). Occiput, vertex, and mentum black; eyes dichoptic, separated at vertex by 1.5 times distance between lateral ocelli; frons depressed medially, white with tiny brown spot medially below median ocellus; face slightly projecting beyond eye in lateral view, white; tip of oral margin slightly darker yellow; antennae with scape brown, pedicel yellowish, flagellomeres brown; scape minute; pedicel tire-shaped; first flagellomere subelliptical, length about three times greatest width;



**Figure 40.** *Glabellula thespia* Evenhuis, female genitalia. Abbreviations: apd = apical spermathecal duct; bsd = basal spermathecal duct; fur = furca; spm = spermathecal reservoir; spp = sperm pump.

second flagellomere very small, about one-sixth length of first flagellomere, with minute apical style; proboscis short, yellowish brown, length one-half eye height; labrum sclerotized, stiff, pointed apically, very short, subequal in length to face.

*Thorax* (Fig. 38). Mesonotum black, with scattered white hairs; scutellum black medially, white laterally; large interhumeral marks (not coalesced with humeral calli), and very broad stripe from humeral callus to postalar calli white; prescutellar area of mesonotum with white admedian marks coalesced with white postalar calli and recurved anteriorly in a hook shape, medial portion of prescutellar area brown; pleura white except for black on lower anepisternum, katepisternum, meron, posterior katatergite, and katepisternum. Halter stem and knob white



*Legs.* Coxae and femora dark brown basally, yellowish white on apical half; tibia and tarsi yellowish white; claws black.

*Wing.* Hyaline; veins translucent; costa ends at end of  $R_{4+5}$ ; vein Sc incomplete, ending at level of origin of Rs; Rs evanescent at connection with  $R_1$ ;  $R_{2+3}$  ending in  $R_1$ , originating at about basal one-fourth of Rs;  $R_{4+5}$  angled sharply upward to costa, ending closer to end of  $R_1$  than to  $M_1$ , at about the level of the end on vein  $M_3$ ; vein  $M_1$  slightly curved toward wing margin;  $M_2$  fairly straight to wing margin; anal cell open in wing margin by about half width of crossvein r-m; fringe of hair on posterior margin of wing minute.

*Abdomen.* Brown and yellow-patterned; tergites II–VIII brown with admedian yellow hemispherical spots posteriorly, yellow laterally, with spot of brown surrounding spiracles; sternites yellowish white.

*Genitalia.* Not dissected.

**Male.** Unknown.

**Distribution.** Known only from Yemen.

### Genus *Cyrtosia* Perris, 1852

*Cyrtosia* Perris, 1839: 54. Type species: *Cyrtosia marginata* Perris, 1839, by monotypy.

Previously, three species of *Cyrtosia* had been reported from the UAE. With the new species described below and the new record of *Cyrtosia gulperii* Efflatoun, the total is now six. As it is a very common and widespread genus, there is still a possibility that more new species will be found in the UAE or adjacent areas with continued collecting efforts. Examination of specimens from neighboring Oman has resulted in the extension of the distribution there of *Cyrtosia panemplio* and *C. zygophrys*.

#### KEY TO SPECIES OF *CYRTOSIA* PERRIS IN THE ARABIAN PENINSULA

1. Second antennal flagellomere white to yellow (Fig. 45) ... *Cyrtosia gulperii* Efflatoun  
–. Second antennal flagellomere brown to black ..... **2**
2. Scutellum all yellow or with brown basomedially; frons predominantly yellow or with tiny brown to black spot medially; proboscis subequal in length to head height ..... **3**  
–. Scutellum black, grayish black, or dark brownish; frons with black color on at least upper half; proboscis length 1.5–2.5 times head height ..... **4**
3. Mesonotum broadly yellow laterally (Fig. 41); legs all yellow .....  
..... *Cyrtosia certozia* Evenhuis & Gharali, n. sp..  
–. Mesonotum predominantly black laterally; femora black on basal two-thirds .....  
..... *Cyrtosia panemplio* Evenhuis
4. Mesonotum without interhumeral marks (Fig. 44); frons with white laterally along inner eye margin, black medially ..... *Cyrtosia charops* Evenhuis & Gharali, n. sp..  
–. Mesonotum with interhumeral marks (indistinctly gray in *C. zygophrys*); frons all black or black above, yellow below ..... **5**
5. Interhumeral marks distinct, large, yellow; face yellow white; frons with upper half black, lower half yellow ..... *Cyrtosia arabica* Evenhuis  
–. Interhumeral marks indistinct, grayish; face grayish black; frons black except for small yellow spots immediately above antennal sockets .....  
..... *Cyrtosia zygophrys* Evenhuis



**Figures 41–42.** *Cyrtosia* habitus. 41: *C. certozia* Evenhuis & Gharali n. sp.; 42: *C. charops* Evenhuis & Gharali n. sp.

***Cyrtosia certozia* Evenhuis & Gharali, new species**

(Figs. 41, 43, 46)

**Specimens examined:** *Holotype* ♂ and 3♀ paratypes from **United Arab Emirates:** Sharjah Desert Park, 1–12 Feb 2009, 25.17°N, 55.42°E, pitfall traps, A. van Harten, 10231 (NMWC). *Other paratypes:* **United Arab Emirates,** 2♀, Wadi Madaqa, 3–17 Feb 2008, 25.06°N, 56.07°E, water trap, A. van Harten, 9397; 1♀, Sharjah Desert Park, 25.17°N, 56.42°E, 9 Aug–6 Sep 2008, LT, A. van Harten, 10338. **Oman:** 1♀, Ruwi, 13 Dec 1987, M.J. Ebejer (BPBM); Holotype (in fluid) deposited in NMWC; paratypes in NMWC and BPBM; vouchers in EAD.

**Diagnosis.** This species can be separated from the congeners in the UAE by the broad white to pale yellow stripe from the humeral callus to the postalar callus (this stripe narrow or interrupted in the congeners).

**Description. Male.** Length: 2.5 mm. *Head.* Black, occiput with sparse appressed white hairs; eyes dichoptic, width at vertex subequal to distance between lateral ocelli; frons slightly depressed medially, white; face and tip of oral margin white; antennae black; scape small, length subequal to width; pedicel cylindrical, slightly wider than long; first flagellomere linear-elliptical, length about four times greatest width; second flagellomere slightly more than one-third length of first, with minute apical style; mentum brown, slightly swollen; proboscis dark brown, tubular, length subequal to head height; labrum sclerotized, stiff, pointed apically, length subequal to proboscis.

*Thorax* (Fig. 46). Mesonotum matte black, with scattered white hairs; humeral callus, large interhumeral marks coalesced with humeral callus and broad notopleural line to scutellum white; prescutellar area black medially, white laterally as extensions of lateral mesonotal stripe; pleura (Fig. 41) white except for black on anteroventral corner of anepisternum, lower half of anepimeron, all of katapimeron, meron, and katapisternum. Halter stem and knob white.

*Legs.* Coxae pale brown to yellow basally, remainder of legs yellowish white; claws brown.

*Wing.* Hyaline; veins yellowish brown; costa ends slightly beyond end of  $R_{4+5}$ ; vein Sc incomplete, ending at level about equal to origin of r-m crossvein; vein  $R_{2+3}$  curving upward, ending in wing margin equidistant between end of vein  $R_1$  and  $R_{4+5}$ ; cell dm open, without crossvein closing it apically; anal cell open at wing margin, width subequal to r-m crossvein; fringe of hair on posterior margin of wing minute.

*Abdomen.* Yellow; tergites I–IV yellowish brown anteriorly, with scattered white hairs; venter with sternites II–III yellowish brown medially, yellow elsewhere.

*Male genitalia.* not dissected.

**Female.** As in male; genitalia not dissected

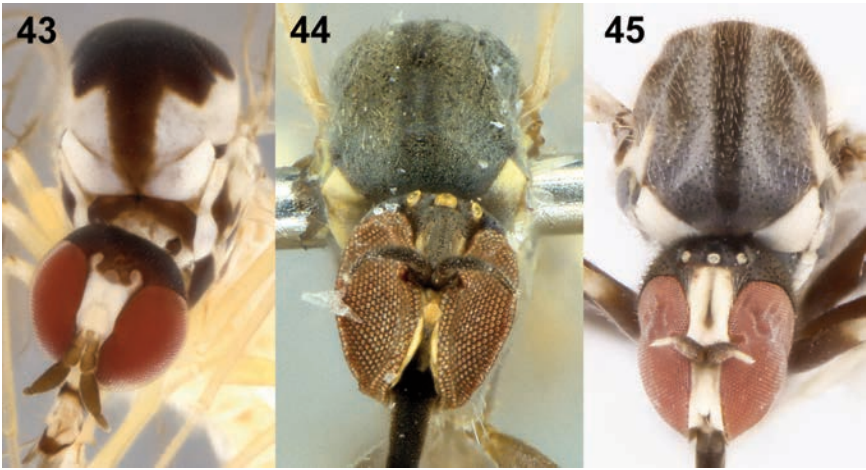
**Etymology.** The specific name is an arbitrary combination of letters and is treated as a noun in apposition.

**Distribution.** Known only from the UAE.

***Cyrtosia charops* Evenhuis & Gharali, new species**

(Figs. 42, 44, 47)

**Specimens examined:** Holotype ♀ from **United Arab Emirates,** Khor al-Khwair, 1–8 Mar 2007, 25°57'N, 56°03'E, LT, A. van Harten (NMWC). *Paratypes:* **United Arab Emirates,** 1♀, Hatta, 24.49°N, 56.07°E, 14–21 Jun 2008, light trap, A. van Harten, 10349 (NMWC); 1♂, Wadi Shawkah,



**Figures 43–45.** *Cyrtosia* heads, frontal view. 43: *C. certozia* Evenhuis & Gharali n. sp.; 44: *C. charops* Evenhuis & Gharali n. sp.; 45: *C. gulperii* Efflatoun.

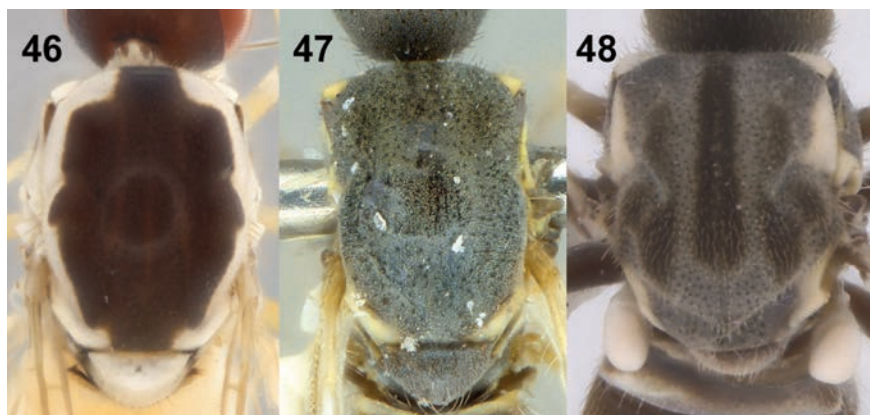
25.06°N, 56.01°E, 1–15 Mar 2011, water trap, A. van Harten, 13026 (NMWC); 3♀, ar-Rafah, 25.43°N, 55.52°E, 1 Feb–1 Apr 2011, water trap, A. van Harten, 13086 (NMWC); 2♂, Wadi Shawkah, 25.06°N, 56.01°E, 1–10 Nov 2010, water trap, A. van Harten, 13146 (NMWC); **Oman:** 2♀, Qurum al-Hamrah Beach, 21 Dec 1988, M.J. Ebejer (BPBM); 1♂, Aseefa nr. Muscat, 16 Dec 1988, M.J. Ebejer (BPBM); 1♂, same data except 4 Dec 1988 (BPBM). Holotype (in alcohol) deposited in NMWC. Paratypes in NMWC and BPBM.

**Diagnosis.** This species can be separated from the congeners in the Arabian Peninsula with black scutellum by the lack of mesonotal interhumeral marks and having white laterally on the frons.

**Description.** Male. Length: 1.78–1.82 mm. *Head.* Predominantly black, gray pollinose, occiput with sparse appressed white hairs; eyes dichoptic, narrowed below antennae, width at vertex subequal to distance between lateral ocelli; frons (Fig. 44) slightly depressed medially, predominantly black, thin yellow to yellow-white strip along inner eye margin; face and tip of oral margin yellowish white; antennae black; scape minute; pedicel cylindrical, slightly wider than long; first flagellomere linear-elliptical, length about two and one-half greatest width; second flagellomere slightly less than half length of first, with minute apical style; mentum concolorous with occiput, yellow surrounding oral margin; proboscis black, tubular, length ca. one and one-half times head height; labrum sclerotized, stiff, pointed apically, length subequal to head height.

*Thorax* (Fig. 47). Mesonotum and scutellum matte black, faint grayish pollinose, with scattered white hairs anteriorly; humeral callus, thin notopleural line to wing base, rounded mark extending anterodorsally from post alar callus and thin ridge to scutellum yellowish white; pleura black except for yellow on proepimeron, propleuron, and thin line along posterior edge of metakatepisternum. Halter stem and knob yellow.

*Legs.* Coxae and basal four-fifths of femora dark brown, apical fourth of femora, tibia, and basitarsi yellow; tarsomeres 2–5 brown; claws black.



**Figures 46–48.** *Cyrtosia* thoraxes, dorsal view. **46:** *C. certozia* Evenhuis & Gharali n. sp.; **47:** *C. charops* Evenhuis & Gharali n. sp.; **48:** *C. gulperii* Efflatoun.

*Wing.* Hyaline; costal, radial, and basal medial veins pale brown to brown, remainder white to translucent; costa ends slightly beyond end of  $R_{4+5}$ ; vein Sc incomplete, ending at level about equal to origin of vein  $R_{2+3}$ ; vein  $R_{2+3}$  ends in wing margin equidistant between end of vein  $R_1$  and  $R_{4+5}$ ; cell dm open, without crossvein closing it apically; anal cell open at wing margin, width one and one-half times r-m crossvein; fringe of hair on posterior margin of wing minute.

*Abdomen.* Concolorous with mesonotum, narrow yellow transverse band posteriorly on tergites II–VII; venter brown with yellow band posteriorly on segments.

*Genitalia.* Not dissected.

**Female:** As in male; genitalia not dissected.

**Etymology.** The specific epithet derives from the Greek “*charops*” = glad eyes; referring to the distinct white stripes along the inner eye margin on the frons.

**Distribution.** Known from the UAE and Oman.

### *Cyrtosia gulperii* Efflatoun, combination revived

(Figs. 45, 48)

*Cyrtosia gulperii* Efflatoun, 1945: 40. Type locality: Gebel Elba, Egypt [11 ST in CUE, 1 ST in ESEC (remainder of syntypes lost)]

*Cephalodromia gulperii* (Efflatoun). Evenhuis, 2009: 23.

**Specimens examined.** **United Arab Emirates:** 2♂, 1♀, near Um al-Quwain, 23–26 Jun 2008, 25.31°N, 55.36°E, A. van Harten (NMWC). **Oman:** 2♂, 2♀, Muscat, Al Khawair, 16 Oct 1990, J.C. Deeming (NMWC).

**Remarks.** The record here of this species is the first outside of Egypt and extends its distribution into the Arabian Peninsula. The description in Efflatoun (1945) is extremely detailed and is thus not repeated here. The thin white second antennal flagellomere (Fig. 45) easily separates this species from all other species in the genus (where it is black). Re-examination of characters in this species in comparison with other *Cyrtosia* and

*Cephalodromia* result in its being transferred in this study back to *Cyrtosia*. The bulge posteroventrally on the postmentum is concluded here not to be the same as the prominent ventral sulcus that typifies *Cephalodromia*, to which it had been mistakenly transferred in Evenhuis (2009).

**Distribution.** Egypt, Oman (**new record**), United Arab Emirates (**new record**).

*Cyrtosia panemplio* Evenhuis

*Cyrtosia panemplio* Evenhuis, 2009: 722. Type locality: United Arab Emirates: Wadi Safad. Holotype in NMWC.

**Specimens examined.** Oman: 7♂♀, Aseefa, nr. Muscat, 16 Dec 1988, M.J. Ebejer (BPBM); 1♀, Barka Batinah, 30 Oct 1987, M.J. Ebejer (BPBM).

**Distribution.** Oman (**new record**) and the United Arab Emirates.

*Cyrtosia zygophrys* Evenhuis

*Cyrtosia zygophrys* Evenhuis, 2009: 722. Type locality: United Arab Emirates: Sharjah Desert Park. Holotype in NMWC.

**Specimens examined.** Oman: 7♂♀, Qurum al-Hamrah Beach, 21 Dec 1988, M.J. Ebejer (BPBM); 3♂♀ Aseefa, nr. Muscat, 16 Dec 1988, M.J. Ebejer (BPBM).

**Distribution.** Oman (**new record**) and the United Arab Emirates.

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### REFERENCES

- Bezzi, M.** 1902. Neue Names für einige Dipteren-Gattungen. *Zeitschrift für Systematische Hymenopterologie und Dipterologie* 2: 190–192.
- Cumming, J.M. & Wood, D.M.** 2017. Adult morphology and terminology, pp. 89–133. In: Kirk-Spriggs, A.H. & Sinclair, B.J. (Eds.), *Manual of Afrotropical Diptera*. Vol. 1. Introductory chapters and keys to Diptera. Suricata 4. South African National Biodiversity Institute, Pretoria.
- Efflatoun, H.C.** 1945. A monograph of Egyptian Diptera. Part VI. Family Bombyliidae. Section I: Subfamily Bombyliidae Homeophthalmae. *Bulletin de la Société Fouad I<sup>er</sup> d'Entomologie* 29: 1–483.

- 
- Engel, E.O.** 1933. Bombyliidae, pp. 97–44. *In*: Lindner, E. (ed.), *Die Fliegen der palaearktischen Region*. Vol. 4, pt. 3. E. Schweizerbart, Stuttgart.
- Evenhuis, N.L.** 2000. A revision of the ‘microbombyliid’ genus *Doliopteryx* Hesse (Diptera: Mythicomysiidae). *Cimbebasia* **16**: 117–135.
- Evenhuis, N.L.** 2002. Catalog of the Mythicomysiidae of the world (Insecta: Diptera). *Bishop Museum Bulletins in Entomology* **10**: 1–85.
- Evenhuis, N.L.** 2009. Order Diptera, family Mythicomysiidae. *Arthropod Fauna of the UAE* **2**: 714–740.
- Gharali, B. & Evenhuis, N.L.** 2011. A new species of *Leylaiya* Efflatoun (Diptera: Mythicomysiidae) from Iran. *North-Western Journal of Zoology* **7**(2): 204–207.
- Hesse, A.J.** 1938. A revision of the Bombyliidae (Diptera) of Southern Africa. [I]. *Annals of the South African Museum* **34**: 1–1053.
- Hesse, A.J.** 1967. Additions to the Cyrtosiinae (Bombyliidae) of South Africa. *Annals of the South African Museum* **50**: 89–130.
- International Commission on Zoological Nomenclature [I.C.Z.N.]** 1989. Opinion 1545. *Glbellula* Bezzi, 1902 (Insecta: Diptera): *Platygaster arcticus* Zetterstedt, 1838 designated as type species. *Bulletin of Zoological Nomenclature* **46**: 148.
- Perris, E.** 1839. Notice sur quelques diptères nouveaux. *Annales de la Société Entomologique de France* **8**: 47–57.