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Dilophus tridentatus Walker, 1848, first report of family Bibionidae from Kuwait (Diptera)

Jean-Paul Haenni[1] & Mohammad A. J. Marafi[2]

[1] Muséum d'histoire naturelle, rue des Terreaux, 14, CH – 2000 Neuchâtel, Suisse / 70 impasse de la Belle-Laitière, F – 12100 Millau <jean-paul.haenni@unine.ch>

[2] Central Region Section, Department of Restoration of Terrestrial and Marine Ecosystems, Public Authority of Agriculture Affairs and Fish Resources, P. O. Box 21422, Safat, 13075, Kuwait City, State of Kuwait <mohammadam@paaf.gov.kw>

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Abstract. – *Dilophus tridentatus* Walker, 1848, is reported for the first time from Kuwait (Ahmadi, Farwaniyah, Hawalli, and Jahra Governorates), representing the first record of family Bibionidae from the country. Distinctive characters for the identification of this species are given and figured.

Résumé. – ***Dilophus tridentatus* Walker, 1848, premier représentant de la famille des Bibionidae au Koweït (Diptera)**. *Dilophus tridentatus* Walker, 1848, est signalé pour la première du Koweït (Gouvernorats de Ahmadi, Farwaniyah, Hawalli et Jahra), représentant la première mention pour ce pays de la famille des Bibionidae dans son ensemble. Les caractères permettant la reconnaissance de cette espèce sont présentés et illustrés.

Keywords. – New record, bibionid flies, Middle East.

The dipterous fauna of Kuwait is still poorly known and accounts for 106 species only, belonging to 26 families according to Amr (2021); however, the actual list of Diptera from Kuwait should be 107 species representing 27 families since Amr (2021) missed to include the only Tipulidae species recorded and identified to genus, *Tipula sp*., by Al-Houty (1989). His work, nonetheless, summarizes the knowledge resulting from the contributions of former authors, among them Al-Houty (1989, 1997) who produced the first checklist of the insect fauna of Kuwait. Among these, 25 species of nematocerous Diptera have been recorded, belonging to four families, Culicidae, Psychodidae, Chironomidae and Tipulidae (Hussien & Behbehani, 1976; Lane & Al-Taqi, 1983; Al-Houty, 1989, 1997; Cranston & Judd, 1989; Salit *et al.,* 1994, 1996; Andersen & Mendes, 2010; Reeves & Epler, 2016; Reeves *et al.,* 2016; Colton *et al*., 2019). However, our knowledge of this fauna remains incomplete. In this article, we contribute a new record representing a new family for the entomofauna of Kuwait.

Material and methods

The material was collected by the second author (MAJM) between 2020 and 2023 from seven localities in four Kuwaiti governorates: Farwaniyah Equestrian Club (FEC) in Ahmadi Governorate, Jahra Pools Reserve (JPR) in Jahra Governorate, Native Plants Conservation Center at Ardiya Nursery (NPCC-AN) in Farwaniyah Governorate, Research Station at the Public Authority of Agriculture Affairs and Fish Resources (PAAFR) in Farwaniyah Governorate, Sulaibiya Agricultural Area and Sulaibiya Industrial Area in Jahra Governorate, and the Winter Games Club in Hawalli Governorate. An aspirator was used to capture the specimens. Most of the material is point-mounted while a few specimens are double-mounted and deposited in the collection of Mohammad AJ Marafi in the Entomology Laboratory, Native Plants Conservation Center at Ardiya Nursery (EL-NPCC-AN). Some specimens are deposited in the collection of

the first author at Muséum d'histoire naturelle, Neuchâtel, Switzerland (MHNN). Field photography was acquired with a Panasonic Lumix FZ80 4K 60X Zoom 20-1200 mm lens, F2.8-5.9 Camera. An Olympus SZ61 stereomicroscope and camera operated by Olympus cellSens Entry 3.1.1 (Build 21264) software were used to photograph the specimens. Identification was made by the first author (JPH) based on examination of the specimens and photographs of male terminalia cleared in KOH by the second author (MAJM).

Results

Dilophus tridentatus Walker, 1848 (fig. 1-8)

Syn. *Dilophus africanus* Becker, 1903.
Dilophus tenuis ?Meig.: Lundström, 1913: 390, Plate 17, Fig. 17 (misidentification).

Material studied. – Kuwait: Ahmadi Governorate: FEC, 29°11'3.703"N 47°48'55.696"E, 1 m, 15.III.2020, 1 ♂; 4.II.2022, 1 ♂; 18.II.2022, 2 ♂; 21.II.2022, 1 ♂; 3.III.2022, 1 ♂. Farwaniyah Governorate: NPCC-AN, 29°16'53.386"N 47°55'31.486"E, 2 m, 11.II.2021, 28 ♂, 2 ♀; 16.II.2021, 10 ♂, 2 ♀; 21.II.2021, 29 ♂, 1 ♀; 9.II.2022, 2 ♀; 14.II.2022, 22 ♂. Research Station at PAAFR,

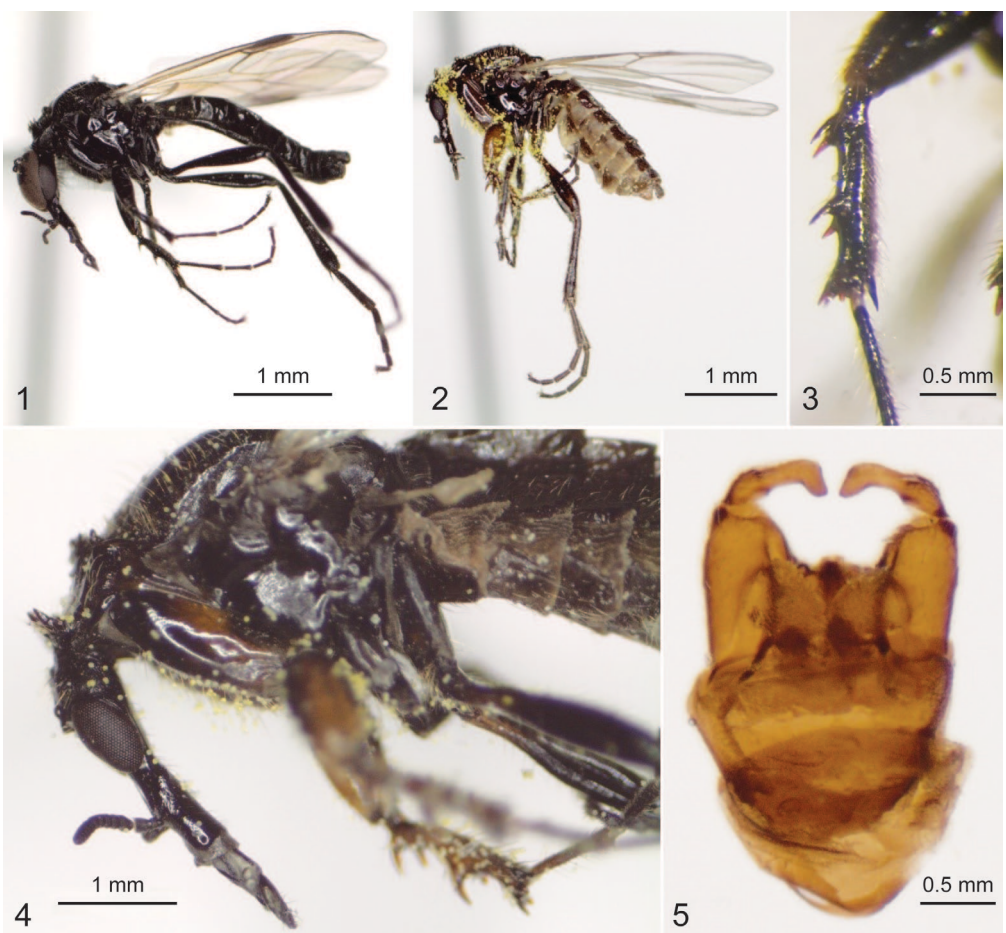

Fig. 1-5. – *Dilophus tridentatus* Walker, 1848. – **1-2**, Habitus : **1**, male; **2**, female. – **3**, Right anterior tibia of male (inner anterior view). – **4**, Head of female (lateral view). **5**, Male hypopygium (dorsal view). *[Photographs M. A. J. Marafi (fig. 1-2, 4-5) and J.-P. Haenni (fig. 3].*

29°17'45.434"N 47°56'39.772"E, 2 m, 23.I.2022, 4 ♂; 18.I.2023, 1♂, 1♀; 24.I.2023, 1 ♂. Hawalli Governorate: Winter Games Club: 29°18' 8.885"N 48°03'40.187"E, 1 m, 25.II.2020, 1 ♂. Jahra Governorate: JPR, 29°21'25.006"N 47°41'22.614"E, 10 m, 13.III.2021, 3 ♂. Sulaibiya Agricultural area, 29°15'59.184"N 47°45'26.600"E, 8 m, 13.III.2020, 5 ♂; 29°15'58.075"N 47°45'24.336"E, 8 m, 29.I.2021, 1 ♂; 29°15'59.364"N 47°45'18.7452"E, 8 m, 5.II.2021, 1 ♂; 29°16'01.46"N 47°45'40.78"E, 8 m, 11.II.2022, 4 ♀; 29°15'52.56"N 47°44'39.88"E, 8 m, 20.I.2023, 2 ♀. Sulaibiya Industrial area, 29°15'58.248"N 47°51'14.472"E, 2 m, 11.II.2022, 2 ♂. New species for the fauna of Kuwait.

Dilophus tridentatus can be recognized from other West Palaearctic species of *Dilophus* Meigen, 1803, by the shape of male gonostyles (fig. 5), which are very distinctive, elongate, swollen and pilose at base and nearly right angled near apex. Other associated diagnostic characters include:

– in both sexes, the elongate rostrum ("snout", part of the head in front of the eyes), about as long as inferior eye in side view in male (fig. 1), as long as the rest of the head in female (fig. 2, 4);

– in both sexes, the arrangement of spines on anterior tibia with one basal and one submedian row of two strong spines each (fig. 3) and an apical crown of six spines;

– in male, the elongate hind metatarsus, longer than mid length of hind tibia and only weakly and regularly thickened (fig. 1).

In both sexes the wing membrane is very slightly tinged with yellowish, with faintly contrasting hind veins and well-marked brown pterostigma (fig. 6, 8).

Dilophus tridentatus emerges during the country's favourable climatic conditions (mid-January and as late as May), that is during midwinter through spring when the ornamental and wildflowers bloom. The species can be extremely abundant in the field during this period with thousands of individuals observed on a given day. Swarms were observed to be particularly attracted by the following bright yellow Asteraceae flowers: *Launaea capitata* (Spreng.) Dandy, *L. mucronata* (Forssk.) Muschl.,

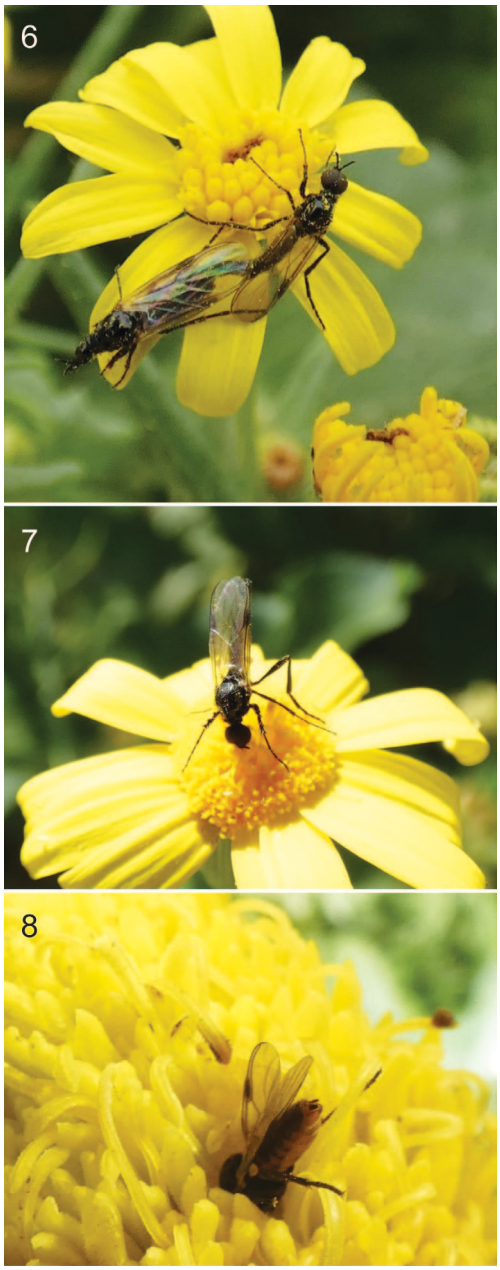

Fig. 6-8. – *Dilophus tridentatus* Walker, 1848. – **6**, Mating pair on a flower of *Senecio glaucus*, Native Plants Conservation Center at Ardiya Nursery (NPCC-AN), 29°16'53.386"N 47°55'31.486"E, 2.II.2021. – **7**, Male feeding on flower of *S. glaucus*, same locality and date. – **8**, Female feeding on flower of *Tagetes sp*., Farwaniyah Equestrian Club, 29°11'03.7032"N 47°48'55.6956"E, 4.II.2022. *(Photographs: M. A. J. Marafi).*

Picris babylonica Hand.-Mazz, *Rhanterium epapposum* Oliv., *Senecio glaucus* L., and *Sonchus oleraceus* L. (fig. 6-7). Specimens of *D. tridentatus* were also seen on ornamental flowers of *Helianthus* sp. L. (Asteraceae), *Ocimum basilicum* L. (Lamiaceae), *Petunia axillaris* (Lam.) Britton, Stern & Poggenb. (Solanaceae), and *Tagetes* sp. L. (Asteraceae) (fig. 8).

Discussion

Dilophus tridentatus has a wide distribution extending from the Middle East to Northwest Africa and the Canary Islands, but published records are not numerous. The species was described from "Tripoli" (but there is no way to know if this is the capital of Libya or a town in Lebanon), and the type from the junior synonym name *D. africanus* was caught in Egypt (Luxor). The presence of *D. tridentatus* in Kuwait is not surprising as the species had already been recorded from countries in the vicinity such as Iraq (near Bagdad) (Hardy, 1956), south-west (Al-Baha Province) and Riyadh Region of Saudi Arabia (Haenni, 1985; El-Hawagry *et al*., 2019), Israel (Skartveit & Kaplan, 1996) and the United Arab Emirates (Fujeira: Jebel Jibir) (Deeming, 2009). *Dilophus tridentatus* has also been reported from Tunisia (Lundström, 1913: Plate 17, Fig. 17, under the erroneous identification "*Dilophus tenuis* ?Meig."), Algeria (Haenni, 1985), Morocco (Ebejer *et al.,* 2019) and the Canary Islands (Fuerteventura) (Báez, 1984).

There are scattered records from all these countries, except for Israel where *D. tridentatus* is the most common and widespread *Dilophus* species in the spring, especially common on flowers of *Senecio* sp. according to Skartveit & Kaplan (1996); this is in accordance with our observations in Kuwait, where numerous specimens were caught on flowers of *S. glaucus* in addition to *Launaea capitata* and *L. mucronata* by the second author (MAJM). The striking elongate snout of both sexes of *D. tridentatus* allow them to reach deeply in flowers, particularly in the tubular flowers of Asteraceae (fig. 7-8) and specimens caught in such locations are frequently covered with pollen (fig. 2).

The larvae of Bibionidae are mainly phytosaprophagous and those of subfamily Bibioninae (genera *Bibio* Geoffroy, 1762, and *Dilophus*) are generally found in open or semi open habitats, where they live gregariously in the upper layers of the soil, with most species favouring wet conditions for their development (e.g. Skartveit, 1997). Indeed, the aridity of Kuwait seems not very favourable to the development of the terricolous larvae of bibionids. It should be noted, however, that the rainy season begins in early November and ends in late April with a yearly precipitation average of 110 millimetres (Marcella & Eltahir, 2008). The immature stages of *D. tridentatus* are still undescribed and their location is unknown. Further research will be planned to discover the larvae and elucidate the life-cycle of this species. On the other hand, further faunistic surveys may possibly allow the discovery of other representatives of the family, e.g. *Bibio hortulanus* (Linnaeus, 1758), recorded from Israel, Lebanon, Syria (Skartveit & Kaplan, 1996) and Iran (Duda, 1930; Alikhani & Arkani, 2016), despite the limiting climatic conditions.

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