

## Order Hemiptera, families Dictyopharidae and Fulgoridae

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### INTRODUCTION

The families Dictyopharidae Spinola, 1839, and Fulgoridae Latreille, 1807, were formally noted for the UAE by Wilson and Turner (2010) – they recorded the genera *Dictyophara* Germar, 1833, and *Dorysarthrus* Puton, 1895, with no species mentioned. However, actually the authors published the photos of *Raivuna iranica* (Linnavuori, 1962) and *Dorysarthrus mobilicornis* Puton, 1895. Below we list the material on these 2 species from UAE and Oman. Thus the record of the genus *Dictyophara* is incorrect for UAE.

The very arid climate of the UAE determines its faunal poorness – only one species from each family mentioned above is represented here. Thus, the fauna of the families Dictyopharidae and Fulgoridae of the UAE has so-called ‘palaeartic character’ – both recorded species are limited in their distribution by the Sethian desert Region of the Palaearctic and are not known outside the subtropics.

### MATERIALS AND METHODS

The nomenclature of zoogeographical regions follows Semenov-Tian-Shanskij (1936), Emeljanov (1974), and Krivokhatsky & Emeljanov (2000).

Photographs of the specimens were made using a Leica MZ95 microscope with a Leica video camera DFC290; images are produced using the software Helicon Focus 4.61 and Photoshop. The materials are divided between the Zoological Institute of the Russian Academy of Sciences (St. Petersburg, Russia), the Hemiptera collection of the National Museum of Wales (Cardiff, UK), and the UAE Invertebrate Collection.

### SYSTEMATIC ACCOUNT

Family **Dictyopharidae** Spinola, 1839

Subfamily **Dictyopharinae** Spinola, 1839

Tribe **Dictyopharini** Spinola, 1839

Genus ***Raivuna*** Fennah, 1978

The genus *Raivuna* currently includes more than 40 species, mostly known only after the type specimens. When Fennah (1978) described the genus *Raivuna* he designated *Raivuna micida* Fennah, 1978, described by him in the same paper, as the type species of the genus and included in the genus 10 other previously described species – all from Oriental Regnum. The genus is in need of revision based on the study of male genitalia, because the species identification is impossible using only external morphological features. In previous time on the one hand many species names were incorrectly placed in synonymy and on the other hand some species were described several times under the different names. The male genitalia have been studied and illustrated for a few species – mainly by Linnavuori (1962), Synave (1965), Dlabola (1986), and Yang and Yeh (1994). However Yang and Yeh (1994) did not identify the



Plate 1. Collecting locality in the UAE: Wadi Maidaq (Photograph © Vladimir Gnezdilov).

illustrated species and even incorrectly placed the material examined in the genus *Philotheria* Melichar.

The type species of the genus, *R. micida*, described from Vietnam, apparently is a junior synonym of *Raivuna sinica* (Walker, 1851), described from China (Walker, 1851). The most northern record of *R. sinica* is from Northern Korea (Democratic People's Republic of Korea); *Raivuna insculpta* (Walker, 1858) (ZIN collection, unpublished) and *Raivuna nakanonis* (Matsumura, 1910) are also present in the Central part of the Korean Peninsula (Lee, 1979). Most species of the genus are limited to the Oriental Regnum, except for 5–7 species distributed in so-called Palaearchaeartic Regnum which is a combination of Stenopean and Orthrian Regions of the Palaeartic Regnum; 2–3 species are known from Ethiopian Regnum and from Madagascar, and 3–4 closely related species are distributed in the desert areas of the Palaeartic. These species occur in saline biotopes usually with Poaceae, as known for the better studied *R. striata* (Oshanin, 1879) (Emeljanov, unpublished). The observations of the first author in Vietnam also indicate that species of the genus *Raivuna* occur on grasses and bamboo (Emeljanov, unpublished).

***Raivuna iranica*** (Linnavuori, 1962)

Plates 1–2

Specimens examined: UAE: Wadi Warayah, Farm, 1♀, 25°24'N 56°17'E, 17–24.iii.2009, Malaise trap, A. van Harten. Wadi Maidaq, 25°18'N 56°07'E, 1♂, 29.vii–2.viii.2006, Malaise trap, A. van Harten. Wadi Maidaq, 25°20'66"N 56°05'59"E, 443 m, 1♀, 6.iv.2010, V.M. Gnezdilov. Hatta, 24°49' N 56°08' E,

1♂, 1♀, 8–26.iv.2006, light trap, A. van Harten. Um al-Quwain, 25°29'63"N 55°33'36"E, 1♂, 1♀, 7.iv.2010, V.M. Gnezdilov. Sharjah–Khor Kalba, 24°59'N 56°09'E, 2♂, 1♀, 31.v–7.vii.2006, light trap, A. van Harten. Fujairah, 25°08'N 56°21'E, 5♂, 4♀, 15–22.iv.2006, A. van Harten. OMAN: Nakhl, 1♀, 18.x.1990, M.D. Gallagher & J.C. Deeming. Hayl al-Ghaf, 23°10'N 58°55'E, 2♂, 1♀, 6.ix.1992, weedy cultivation under palms, M.D. Gallagher & J.C. Deeming. Saiq, 22°30'N 59°06'E, 2♂, 5.vii.1995, B. Scule.

Distribution: *Raivuna iranica* (Linnavuori, 1962) was described from Southern Iran (Linnavuori, 1962) and discovered for the first time in UAE and Oman. It replaces *R. striata* at the Southern margin of the Palaearctic deserts.

In the UAE, *R. iranica* is a common species of mountain biotopes (Wadi Warayah, Wadi Madaq) (Plate 1) and is also recorded from saline biotopes of the sea coast (Um al-Quwain).

Family **Fulgoridae** Latreille, 1807

Subfamily **Dichopterinae** Melichar, 1912

Tribe **Dorysarthrini** Emeljanov, 1979

Genus *Dorysarthrus* Puton, 1895

The genus *Dorysarthrus* was established by Puton (1895) as a monotypical genus in the family Dictyopharidae. Later, Emeljanov (1979) erected the monotypic subfamily Dorysarthrinae for the genus and transferred it to the family Fulgoridae. Recently Emeljanov (2013) downgraded Dorysarthrinae to the tribe Dorysarthrini and added the genus *Pibrocha* Kirkaldy, 1902; he placed the tribe in the subfamily Dichopterinae Melichar of the family Fulgoridae.

The genus *Dorysarthrus* is a characteristic representative of the desert fauna of the Palaearctic Regnum. This genus is distributed in zonal desert biotopes. The type species of the genus, *Dorysarthrus mobilicornis* Puton, 1895, was described from the Dead Sea coast (Puton, 1895) and later recorded from Syria (Puton, 1899). Some years later, Oshanin described another species of the genus, *Dorysarthrus sumakovi* from Turkestan (Oshanin, 1908); after that Melichar described *Dorysarthrus simonyi* from the vicinity of Aden (Melichar, 1912), and finally Bergevin described a fourth species of the genus, *Dorysarthrus alfierii*, from Egypt (Bergevin, 1924).

Dlabola (1979, 1980) recorded *D. simonyi* Melichar and *D. alfierii* from the south of the Arabian Peninsula. The Northern part of the distribution of the genus *Dorysarthrus* is covered by *D. sumakovi* Oshanin, known from the Southturkic Province and from some places of the Iranian Province of Palaearctic Regnum. There are no data on the distribution of the genus in the Southern Palaearctic. Probably, the genus will be found also in the Saharo-Arabian Subregion of Palaearctic Regnum up to the Atlantic coast in the West and up to the Sindian Province in the East.

The biotopes and host plants of *D. sumakovi* are well known in Middle Asia. This species develops and occurs as imago only on succulent shrubs of the family Chenopodiaceae, mainly of the genera *Xylosalsola*, *Haloxylon*, *Aellenia*, and *Hammada* (Emeljanov, unpublished). *D. simonyi* was also collected on *Hammada articulata* (Melichar, 1912).

*Dorysarthrus mobilicornis* Puton, 1895

Plates 3–5

Specimens examined: UAE: Jebel Jibir, 25°38'23"N 56°06'88"E, 1272 m, 1♀, 8.iv.2010, V.M. Gnezdilov. Sharjah Desert Park, 25°17'N 55°42'E, 2♂, 14.x.2004, at light + hand collecting, A. van Harten. Sharjah Desert Park, 25°16'86"N 55°41'42"E, 1♀, 2 larvae, 10.iv.2010, V.M. Gnezdilov. Wadi



Plates 2-4. Habitus. 2: *Raivuna iranica* (Linnavuori), dorsal view (from UAE). 3-4. *Dorysarthrus mobilicornis* Puton. 3: Dorsal view (from Oman); 4: Lateral view (from UAE).



Plate 5. Collecting locality in the UAE: Jebel Jibir (Photograph © Vladimir Gnezdilov).

Maidaq, 25°18'N 56°07'E, 2♂, 1♀, 26.x–9.xi.2006, water trap, A. van Harten. Wadi Maidaq, 25°20'66"N 56°05'89"E, 443 m, 1♂, 10.iv.2010, V.M. Gnezdilov. Al-Ajban, 24°36'N 55°01'E, 2♂, 2♀, 6–22.v.2006, light trap, A. van Harten. OMAN: Wahiba Sands, SE of al-Wasil, 22°26'N 58°45'E, 1♂, 25.x.1990, on *Calligonum comosum*, M.D. Gallagher & J.C. Deeming.

Host plants: There exists little information about the host plants of *D. mobilicornis*. Thus, Linnavuori (1962) recorded this species on *Ochradenus baccatus* (Resedaceae) – data on the label. In Oman it was collected on *Calligonum comosum* (Polygoniaceae). In the UAE, *D. mobilicornis* is a common species of mountain areas (Jebel Jibir, Wadi Maidaq) (Plates 1, 5) and sand biotopes (Sharjah Desert Park).

Distribution: The known distribution of *D. mobilicornis* covers the territory from the Dead Sea coast to the Gulf of Aqaba in the Red Sea area and now the species is recorded for the first time from the UAE and Oman. *D. alferii* Bergevin, known also from Northern Sudan (near to the confluence of Blue and White Niles), is closely related to *D. mobilicornis* and probably is its junior synonym.

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