

Order Orthoptera

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INTRODUCTION

The Orthoptera fauna of the UAE prior to 2007 was relatively well known. During the period 1980–2004, several authors published about collections made in the country (Popov, 1980, 1981, 1997; Walker & Pittaway, 1987; Gassouma, 1991, 2003; Wingate, 1992; Gorochov, 1993; Tigar & Osborne, 1999; Gillett, 2000, 2003; Gillett & Gillett, 2003; Gillett & Howarth, 2004). In total, 59 species in 7 families were recorded. Collecting data and localities of those records are summarized in van Harten (2005).

In 2006 Antonius van Harten invited us to come and collect Orthoptera in the United Arab Emirates in the framework of the UAE Insect Project. From 3rd to 12th March 2007, two of us, B. Massa and P. Fontana, collected specimens in the UAE. Some species not previously known from the country were collected and the calling songs of 4 species were recorded. The results of the trip are here published, as well as a few comments on species names used by former authors. A complete list of all species recorded so far is given in Annex 1. Habitus photographs of 26 species are also included

MATERIALS AND METHODS

The specimens studied were collected during a collecting trip (3–12 March 2007) made by B. Massa and P. Fontana, with additional specimens collected by A. van Harten (UAE Insect Project). They have been divided over the private collections of B. Massa and P. Fontana (Palermo, Italy, and Isola Vic, Italy, respectively), and the UAE Invertebrate Collection. Coordinates and altitudes of the localities are listed in the introduction of this volume. The habitats of the localities visited were following (from North to South): N of Ra's al-Khaimah – almost destroyed coastal place with cane field; Wadi Bih dam – moderately stony, grazed place & stony place with many grasses; 7 km S of al-Jazirat al-Hamra – stony area with some *Ipomoea pescaprae*; Between Um al-Quwain and al-Jazirat al-Hamra – saltpans; Um al-Quwain – coastal sand dunes; Ajman – mangroves; Road Masafi-Dibba – stony place; Near Masafi – stony place with scarce vegetation; Masafi, near Friday Market – stony place; Wadi Madaq – oasis & stony place; Wadi Safad – wadi with a small stream; Fujairah – saltpans & ponds behind coastal dunes; Khor Kalba road near 10th bridge – desert; E of Mahafiz – farm; Wadi Shawkah – wadi with a small stream and semicultivated area; Khor Kalba road, near tunnel – stones, *Ziziphus* and farm; Khor Kalba – mangrove and farm along the sea; Al-Samha, NE of Abu Dhabi – coastal area dominated by Chenopodiaceae; Al-Ajban – reforested dry place & irrigated meadow.

Male calling songs of some species were recorded with an Edirol R09 digital recorder, the songs obtained were sampled with CoolEdit 2.0.

Abbreviations used in the text: AvH = A. van Harten; BM = B. Massa; PF = P. Fontana; LT = light trap; WT = water trap.

SYSTEMATIC ACCOUNT

Family **Tettigoniidae**

Conocephalus (Anisoptera) maculatus (Le Guillou, 1841)

Plates 1–2

Specimens examined: Khor Kalba, 2♀, 4.iii.2007, leg. BM & PF. E of Mahafiz, 3♂, 2♀, 5.iii.2007, leg. BM & PF. Wadi Madaq, 3♂, 4♀, 7.iii.2007, leg. BM & PF.

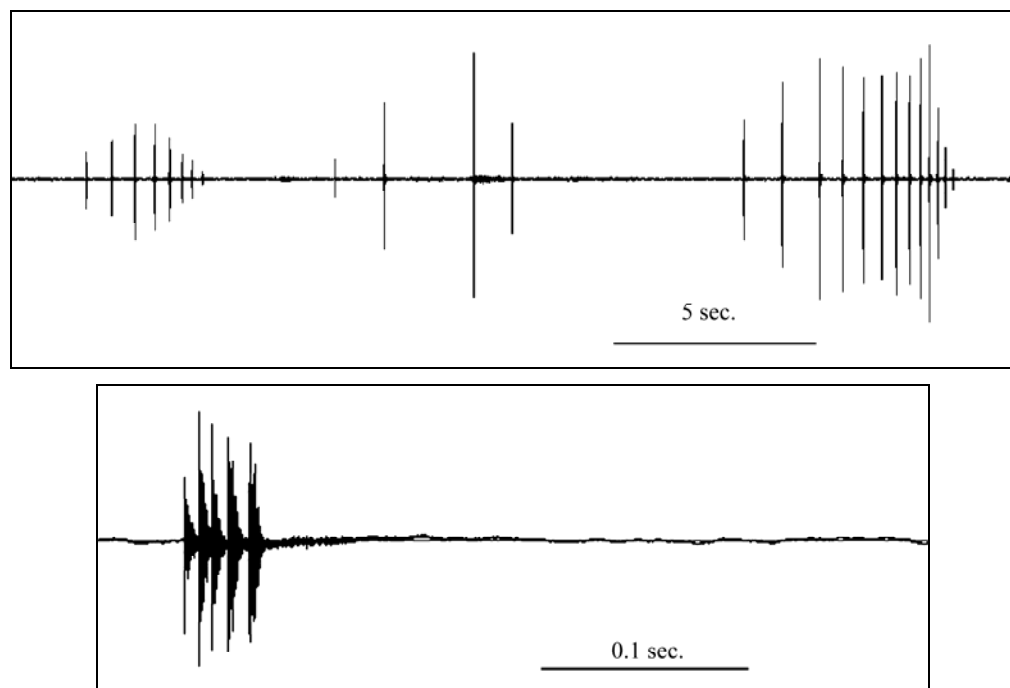
Distribution: Widespread in tropical afro-asiatic zones, Middle East, North Africa, Saudi Arabia, Yemen, India, Australia and Pacific. Previously unrecorded from the UAE.

Phaneroptera sparsa Stål, 1856

Plate 3, Figures 1–2

Specimens examined: Wadi Bih dam, 1♂, 8.iii.2007, leg. BM & PF. Wadi Safad, 2♂, 6.iii.2007, leg. BM & PF.

Calling song: The calling song of *Phaneroptera sparsa* (Fig. 1) is emitted mainly during the night and consists of syllables produced isolated or grouped in echemes containing up to 13 syllables. Single syllables last from 0.035 sec. to 0.05 sec. approximately, being separated by variably long pauses. Also, echemes (Fig. 2) are very variable in lasting and in number of syllables.



Figures 1–2. Calling song of *Phaneroptera sparsa*, from Wadi Safad, 6.iii.2007. 1: Song; 2: Echeme.

Distribution: Its distribution covers Africa S of Sahara, extending westwards to Morocco, Canary Islands and Spain, and eastwards from Arabia to Anatolia.

Family **Gryllidae*****Acheta confalonierii*** (Capra, 1929)

Specimens examined: Wadi Shawkah, 1♂, 3♀, 31.x–27.xi.2006, WT, leg. AvH.



Plates 1–2. *Conocephalus* (*Anisoptera*) *maculatus* (Le Guillou). 1: Female from Khor Kalba; 2: Male from E of Mahafiz.



Plate 3. *Phaneroptera sparsa* Stål, male from Wadi Safad.

Distribution: Described from Libya, recorded from Saudi Arabia by Gorochov (1993). Previously unknown from the UAE.

Acheta* cf. *arabica Gorochov, 1993

Plates 4–6

Specimens examined: Sharjah-Khor Kalba, near tunnel, 3♂, 1♀, 31.v–7.vi.2006, LT, leg. AvH.

Remarks: Due to the lack of referring identified material, specimens collected are tentatively identified as *A. arabica*, but wing veinlets are just a little bit different from the drawing of Gorochov (1993). This species was described by Gorochov (1993) based on a male collected in Saudi Arabia. If the identification is correct, this would be the second record of the species, which was previously unknown from the UAE.

Description of the previously unknown female: Measurements: Total body length from frons to tip of hind wings 25.8 mm, pronotum length along midline 2.85 mm, head length along midline 2.25 mm, right fore wing 10.7 mm, right hind wing 18.2 mm, ovipositor length (strongly curved) 8.3 mm, right hind femur length 18.3 mm. Body medium sized, limbs and abdomen strongly wrinkled due to killing and storing procedure (alcohol). General colour brownish.

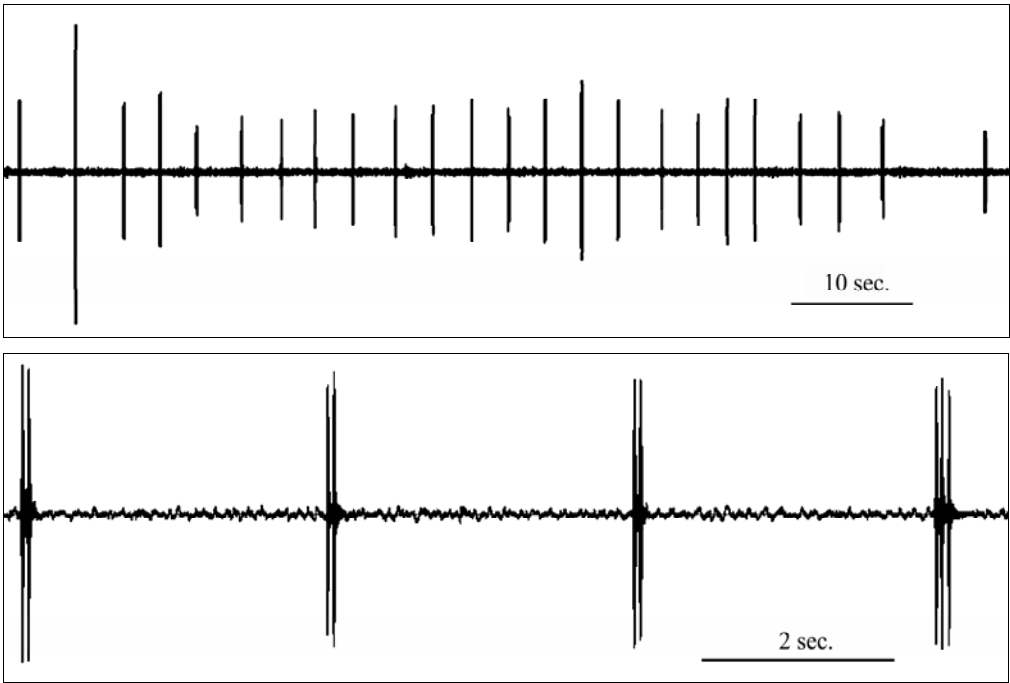
***Acheta* spec.**

Plate 7, Figures 3–4

Specimens examined: E of Mahafiz, 1♂, 5.iii.2007, leg. BM & PF.

Remarks: This specimen, not belonging to a species previously known from the Arabian Peninsula, probably belongs to a new species. Further material is necessary before final identification or description is possible.

Calling song: The calling song of *Acheta spec.* (Fig. 3) is produced during the night as a long (more than 1 min.) series of loud diplosyllabic echemes. Trisyllabic echemes (Fig. 4) are also emitted. Each syllable lasts for about 0.05 sec.



Figures 3–4. Calling song of *Acheta spec.*, from E of Mahafiz, 5.iii.2007. 3: Song; 4: Echemes.

Grylodes supplicans (Walker, 1859)

Plate 8, Figure 5

Specimens examined: E of Mahafiz, 1♂, 5.iii.2007, leg. BM & PF.

Remarks: The status of this species is unclear since the types have different data (Eades & Otte, 2009).

Calling song: The calling song of *Grylodes supplicans* (Fig. 5) is a continuous (more than 1 min. long) repetition of syllables.

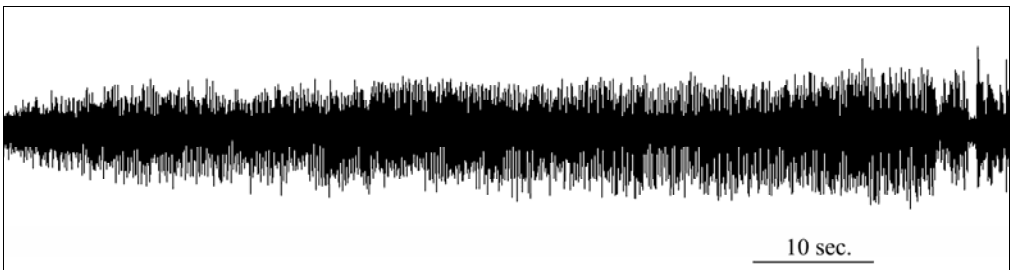


Fig. 5. Calling song of *Grylodes supplicans* (Walker), from E of Mahafiz, 5.iii.2007.



Plates 4–6. *Acheta cf. arabica* Gorochov. 4: Female, dorsally; 5: Female, laterally; 6: Male, wing venation.



Plates 7–8. 7: *Acheta* spec., male from E of Mahafiz; 8: *Grylloides supplicans* (Walker), male from E of Mahafiz.

Distribution: Reported from Saudi Arabia and Yemen (Gorochov, 1993), previously unknown from the UAE.

***Gryllopsis* spec.**

Plates 9–10

Specimens examined: Near Masafi, 1♂, 1♀, 11.iii.2007, leg. BM & PF.

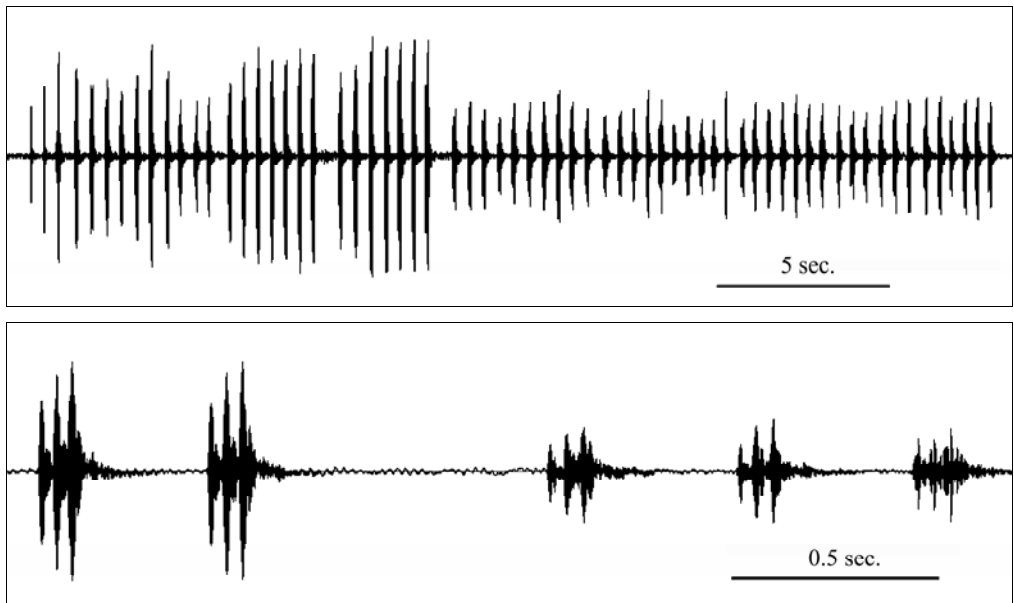
Remarks: The genus *Gryllopsis* Chopard, 1928, was not before known from the UAE. Due to availability of insufficient material, the identification of the species was impossible.

***Gryllus (Gryllus) bimaculatus* DeGeer, 1773**

Plate 11, Figures 6–7

Specimens examined: E of Mahafiz, 1♂, 1♀, 5.iii.2007, leg. BM & PF. Wadi Bih dam, 1♂, 8.iii.2007, leg. BM & PF. Wadi Madaq, 1♂, 1♀, 7.iii.2007, leg. BM & PF.

Calling song: The calling song of males of *Gryllus bimaculatus* from the UAE (Fig. 6) is identical to that of conspecific males from Europe, consisting of a long (up to 1 min) repetition of trisyllabic echemes (Fig. 7).



Figures 6–7. Calling song of *Gryllus (Gryllus) bimaculatus* DeGeer, from E of Mahafiz, 5.iii.2007. 6: Song; 7: Echemes.

Distribution: Widespread in Mediterranean Europe, Africa and Asia, including the UAE.

***Trigonidium cicindeloides* Rambur, 1839**

Plate 12

Specimens examined: Khor Kalba, 1♂, 1♀, 4.iii.2007, leg. BM & PF. Khor Kalba road, 1♀, 4.iii.2007, leg. BM & PF.

Distribution: Widespread in Asia, Africa, S Europe, Saudi Arabia and the Middle East. Previously unrecorded from the UAE.

Family **Gryllotalpidae**



Plates 9–10. *Gryllopsis* spec, from near Masafi. 9: Female; 10: Male.



Plates 11–12. 11: *Gryllus (Gryllus) bimaculatus* DeGeer, male from E of Mahafiz; 12: *Trigonidium cicindeloides* Rambur, female from Khor Kalba road, near tunnel.

Although species of the genus *Gryllotalpa* are common in the Arabian Peninsula (Plates 13–14), it is at the moment not very clear whether common African and European species are occurring or whether most species are geographically more restricted. Great caution should therefore be used when identifying.

Gryllotalpa africana Palisot de Beauvois, 1805

Remarks: Tigar & Osborne (1999) recorded this species from Abu Dhabi Emirate, but as species was not before recorded from the Arabian Peninsula (see Gorochov, 1993), there could be doubt about its true identity.

Gryllotalpa debilis Gerstäcker, 1869

Specimens examined: Sharjah Desert Park, 1♂, 6–28.xii.2006, LT, leg. AvH.

Distribution: Described from Tanzania. Gorochov (1993) recorded it from Saudi Arabia, UAE and Oman.

Gryllotalpa stepposa (Zhantiev, 1991)

Remarks: Gillett & Howarth (2004) reported this species from Jebel Hafit. According to Gorochov (1993), this species possibly is a complex of similar species which differ from each other by their karyotypes. Thus, he conditionally recorded it from Saudi Arabia, Oman and Iraq.

Gryllotalpa gryllotalpa (Linnaeus, 1758)

Remarks: Gillett & Howarth (2004) reported the European species *Gryllotalpa gryllotalpa* (Linnaeus, 1758) from Jebel Hafit. This identification could be considered doubtful as the species had not before been mentioned from the Arabian Peninsula.

Family **Tetrigidae**

Euparatettix histricus (Stål, 1861)

Plates 15–16

Specimens examined: Wadi Maidaq, 1♂, 2♀, 7.iii.2007, leg. BM & PF. Wadi Shawkah, 2♂, 4♀, 5.iii.2007, leg. BM & PF.

Remarks: Listed by Walker & Pittaway (1987) as *Euparatettix ocellatus* Uvarov, 1936, now considered as synonym of *E. histricus*.

Distribution: Widespread in Asia.

Hedotettix alienus Uvarov, 1936

Plates 17–19

Specimens examined: Khor Kalba, 4♂, 4♀, 4.iii.2007, leg. BM & PF. Khor Kalba road, 1♂, 4.iii.2007, leg. BM & PF. Wadi Maidaq, 1♀; 7.iii.2007, leg. BM & PF.

Distribution: Known from the Arabian Peninsula and W Asia. New to the UAE.

Family **Trydactylidae**

Asiotridactylus fasciatus (Guérin-Méneville, 1844)

Specimens examined: Near Mahafiz, 2♂, 7–14.ix.2006, LT, leg. AvH. Sharjah–Khor Kalba, near tunnel, 2♂, 3♀, 7–14.vi.2006, LT, leg. AvH.

Distribution: Known from E Africa to the Arabian Peninsula, including the UAE.



Plates 13–14. 13: *Gryllotalpa* spec., nymph, from N of Ra's al-Khaimah; 14: Excavations made by *Gryllotalpa* spec., Wadi Bih dam.



Plates 15–16. *Euparatettix histricus* (Stål). 15: Brown female from Wadi Shawkah; 16: Greenish female from Wadi Madaq.



Plates 17–18. *Hedotettix alienus* Uvarov. 17: Female from Khor Kalba; 18: Brown male from Khor Kalba road, near tunnel.



Plates 19–20. 19: *Hedotettix alienus* Uvarov, greenish male from Khor Kalba; 20: *Xya* spec., from Wadi Shawkah

Xya spec.

Plate 20

Specimens examined: Wadi Shawkah, 1 juv., 31.x–27.xi.2006, WT, leg. AvH; 1♂, 5.iii.2007, leg. BM & PF.

Remarks: It was not possible to identify the species, given that only two specimens were collected and that this genus systematically is difficult. They could belong to a new species, but further material is needed.

Family **Pyrgomorphidae**

Chrotogonus homalodemus homalodemus (Blanchard, 1836) Plates 21–24
 Specimens examined: 7 km S of al-Jazirat al-Hamra, 2♂, 3.iii.2007. leg. BM & PF. E of Mahafiz, 1♂, 1♀, 5.iii.2007, leg. BM & PF. Wadi Shawkah, 10♂, 10♀, 5.iii.2007. leg. BM & PF.
 Distribution: NE Africa, E Africa, SW Asia and the Arabian Peninsula. Quoted from the UAE by Gassouma (2003) as *Chrotogonus* spec.

Pyrgomorpha cognata minima Uvarov, 1943
 Cited from the UAE by Gillett (2000) and Gassouma (2003). Described from Africa. The systematics of *Pyrgomorpha cognata/conica* are not clear (see below).

Pyrgomorpha conica tereticornis (Brullé, 1840) Plates 25–30
 Specimens examined: Al-Ajban, 3♀, 10.iii.2007. 7 km S of al-Jazirat al-Hamra, 2♂, 5♀, 3.iii.2007. Khor Kalba, 1♂, 4.iii.2007. Khor Kalba road, 4♂; 7♀, 4.iii.2007. Masafi, 7♂, 9♀, 12.iii.2007. Masafi-Dibba road, 2♀, 12.iii.2007. Al-Samha, NE of Abu Dhabi, 8♂; 13♀, 10.iii.2007. Um al-Quwain, 1♂, 8.iii.2007; 1♀, 11.iii.2007. Wadi Bahai, 2♂, 3♀, 8.iii.2007. Wadi Madaq, 3♂, 7.iii.2007. Wadi Safad, 1♀, 6.iii.2007. Wadi Shawkah, 7♂, 10♀, 5.iii.2007. All leg. BM & PF.

Remarks: The genus *Pyrgomorpha* Serville, 1838, according to some authors comprises two subgenera, the nominal one and *Phymelloides* Kevan & Akbar, 1963, plus other species not assigned to any of these subgenera. Furthermore, the status of the species *P. conica* (Olivier, 1791) and *P. cognata* Krauss, 1977, is rather confused, since some authors (Mestre, 1988; Launois-Luong & Lecoq, 1989; Buzzetti et al., 2005) group some taxa of *P. conica* and *P. bispinosa* Walker, 1870, under *cognata*, others (Popov, 1980, 1997) consider all species of the genus as good species. Nevertheless, all agree that the morphology of these taxa is very similar and their distribution is partially overlapping so that specimens of *conica* and *cognata* are sometimes difficult to tell apart. In the present study we follow the status used by Popov (1997) in his studies on Arabian Orthoptera.

Distribution: Widely spread in the Arabian Peninsula, including the UAE. Cited as *Pyrgomorpha* spec. from the UAE by Gassouma (2003).

Tenuitarsus angustus (Blanchard, 1836) Plates 31–33
 Specimens examined: Um al-Quwain, 1♂, 2♀, 8.iii.2007, leg. BM & PF; 8♂, 11.iii.2007, leg. BM & PF. Al-Samha, NE of Abu Dhabi, 1♂, 1♀, 10.iii.2007, leg. BM & PF.
 Distribution: Sahara from Morocco to Egypt, Sudan, Somalia, Eritrea, SW Asia, Arabian Peninsula, including the UAE.

Family Acrididae

Heteracris annulosa annulosa Walker, 1870 Plates 34–36
 Specimens examined: 7 km S of al-Jazirat al-Hamra 1♂, 3.iii.2007. Khor Kalba, 2♀, 4.iii.2007.2007. Masafi, 3♂; 2♀, 6.iii.2007. Near Masafi, 2♂; 11.iii.2007. Masafi-Dibba road, 1♀, 12.iii.2007. N of Ra's al-Khaimah, 3♂, 12.iii.2007. Al-Samha, NE of Abu Dhabi, 2♀, 10.iii.2007. Wadi Madaq, 1♂, 3♀, 7.iii.2007. Wadi Safad, 1♂, 2♀, 6.iii.2007. Wadi Shawkah, 1♂, 3.iii.2007; 1♂, 1♀, 5.iii.2007. All leg. BM & PF.

Distribution: North and Central Africa, S Italy (islets of the Sicilian Channel), Middle East, including the UAE.

Schistocerca gregaria (Forskål, 1775)
 Specimens examined: Sharjah Desert Park, 1♂, 6–28.xii.2006, LT, leg. A. van Harten.
 Distribution: Widespread in Africa and Asia.



Plates 21–22. *Chrotogonus homalodemus homalodemus* (Blanchard). 21: Female from Wadi Shawkah, dorsally; 22: Female from E of Mahafiz, ventral pattern.



Plates 23–24. *Chrotogonus homalodemus homalodemus* (Blanchard), from Wadi Shawkah. 23: Male; 24: Male and female in copulation.



Plates 25–26. *Pyrgomorpha conica tereticornis* (Brullé). 25: Brown female from Khor Kalba road, near tunnel; 26: Green female from 7 km S of al-Jazirat al-Hamra.



Plates 27–28. *Pyrgomorpha conica tereticornis* (Brullé). 27: Yellowish female from Wadi Shawkah; 28: Grey male from al-Ajban.



Plates 29–30. *Pyrgomorpha conica tereticornis* (Brullé). 29: Yellowish male from Wadi Shawkah; 30: Brown male and green female, copulating.



Plates 31–32. *Tenuitarsus angustus* (Blanchard). 31: Female from Um al-Quwain; 32: Male from al-Samha.



Plate 33. Jumping tracks of *Tenuitarsus angustus* (Blanchard), Um al-Quwain.

Diabolocatantops axillaris (Thunberg, 1815)

Plates 37–38

Specimens examined: Masafi-Dibba road, 2♀, 12.iii.2007, leg. BM & PF.

Distribution: Africa (between 10° and 20°N), E Africa, Arabian Peninsula and S Iran.

Duroniella parallella Uvarov, 1950

Plates 39–41

Specimens examined: Dibba, 7♂, 12.iii.2007, leg. BM & PF. Fujairah, 1♂, 6.iii.2007, leg. BM & PF.

Khor Kalba, 5♂, 4.iii.2007, leg. BM & PF. N of Ra's al-Khaimah, 4♂, 1♀, 12.iii.2007, leg. BM & PF.

Wadi Shawkah, 3♂, 4♀, 3.iii.2007, leg. BM & PF.

Distribution: Described from Oman, also recorded from the UAE.

Locusta migratoria migratoria (Linnaeus, 1758)

Plate 42

Specimens examined: E of Sharjah, 2♂, 5.iii.2007, leg. BM & PF.

Distribution: Widespread in Africa, Asia and Europe.

Sphingonotus femoralis Uvarov, 1933

Plates 43–44

Specimens examined: Khor Kalba, 1♂, 1♀, 4.iii.2007, leg. BM & PF. Near Masafi, 1♂, 1♀, 11.iii.2007, leg. BM & PF. Wadi Safad, 1♂, 6.iii.2007, leg. BM & PF.

Distribution: Occurring in the Middle East, the Arabian Peninsula, NE Africa and the Horn of Africa.

Sphingonotus octofasciatus (Serville, 1838)

Plates 45–46

Specimens examined: Near Masafi, 1♂, 11.iii.2007, leg. BM & PF. Wadi Madaq, 3♂, 7.iii.2007, leg. BM & PF.

Distribution: Occurring from Algeria to Egypt, Middle East and C Asia.



Plates 34–35. *Heteracris annulosa annulosa* Walker. 34: Female from Khor Kalba mangroves; 35: Male from Wadi Safad.



Plates 36–37. 36: *Heteracris annulosa annulosa* Walker, grey male from 7 km S of al-Jazirat al-Hamra; 37: *Diabolocatantops axillaris* (Thunberg), female from Masafi-Dibba road.



Plates 38–39. *Duriella parallella* Uvarov. 38: Brown female; 39: Green female. Both from Wadi Shawkah.



Plates 40–41. *Duroniella parallella* Uvarov. 40: Male from Wadi Shawkah; 41: Grey male from N of Ra's al-Khaimah.



Plate 42. *Locusta migratoria migratoria* (Linnaeus), male from E of Mahafiz.

Sphingonotus rubescens rubescens (Walker, 1870)

Plates 47–49

Specimens examined: Dibba, 3♂, 1♀, 12.iii.2007. Masafi, 4♂, 3♀, 6.iii.2007. Near Masafi, 17♂, 8♀, 11.iii.2007. N of Ra's al-Khaimah, 1♀, 12.iii.2007. Wadi Bih dam, 12♂, 11♀, 8.iii.2007. Wadi Madaq, 9♂, 7♀, 7.iii.2007. Wadi Shawkah, 2♂, 3♀, 5.iii.2007. All leg. BM & PF.

Distribution: Widespread from the Canary Islands throughout N Africa, S Europe, Middle East, Asia Minor to Central Asia.

Acrotylus insubricus (Scopoli, 1786)

Plates 50–51

Specimens examined: Wadi Madaq, 1♂, 3♀, 7.iii.2007, leg. BM & PF. Wadi Bih dam, 1♀, 8.iii.2007, leg. BM & PF. Khor Kalba road, 2♀, 4.iii.2007, leg. BM & PF. Wadi Shawkah, 8♂, 3♀, 5.iii.2007, leg. BM & PF.

Remarks: Recorded from the UAE under its synonym *Acrotylus insubricus inficitus* (Walker, 1870) by Popov (1980), Gillett (2000), Gillett & Howarth (2004) and van Harten (2005).

Distribution: S Europe, SW Asia, much of Africa and Arabia (Ingrisch, 1999).

Acrotylus longipes (Charpentier, 1843)

Plate 52

Specimens examined: Masafi, 1♀, 6.iii.2007, leg. BM & PF. Al-Samha, NE of Abu Dhabi, 1♀, 10.iii.2007, leg. BM & PF. Um al-Quwain, 2♂, 4♀, 8.iii.2007; 4♂, 5♀, 11.iii.2007, leg. BM & PF.

Distribution: S Crimea, Ukraine, Carpathian Mountains, former Yugoslavia, Greece, Italy, S Spain, Africa and Middle East.



Plates 43–44. *Sphingonotus femoralis* Uvarov. 43: Brown male from al-Samha; 44: Grey male from Khor Kalba road, near tunnel.

***Truxalis fitzgeraldi* Dirsh, 1950**

Plates 53–57

Material examined: Al-Ajban, 2♀, 10.iii.2007, leg. BM & PF. Khor Kalba, 1♂, 1♀, 4.iii.2007, leg. BM & PF. E of Sharjah, 1♂, 1♀, 5.iii.2007, leg. BM & PF. Wadi Safad, 2♂, 2♀, 6.iii.2007, leg. BM & PF. Wadi Shawkah, 1♂, 5.iii.2007, leg. BM & PF.

Distribution: Known from Iran and the Arabian Peninsula.



Plates 45–46. *Sphingonotus octofasciatus* (Serville). 45: Female; 46: Male. Both from Wadi Maidaq.



Plates 47–48. *Sphingonotus rubescens rubescens* (Walker). 47: Female; 48: Male. Both from Wadi Bih dam.



Plates 49–50. 49: *Sphingonotus rubescens rubescens* (Walker), male and female courtship, Wadi Bih dam; 50: *Acrotylus insubricus* (Scopoli), female from Khor Kalba road, near tunnel.



Plates 51–52. 51: *Acrotylus insubricus* (Scopoli), male from Wadi Shawkah; 52: *Acrotylus longipes* (Charpentier), male from Um al-Quwain.



Plates 53–54. *Truxalis fitzgeraldi* Dirsh. 53: Green female from Khor Kalba road, near tunnel; 54: Brown male from Wadi Safad.



Plates 55–56. *Truxalis fitzgeraldi* Dirsh. 55: Green-brown male from Wadi Shawkah; 56: Wing pattern of male from Wadi Shawkah.



Plate 57. *Truxalis fitzgeraldi* Dirsh, nymph from Khor Kalba road, near tunnel.

Aiolopus thalassinus thalassinus (Fabricius, 1781)

Plates 58–59

Material examined: Al-Ajban, 5♂, 9♀, 10.iii.2007. Dibba, 1♀, 12.iii.2007. Khor Kalba, 6♂, 7♀, 4.iii.2007. Khor Kalba road, 4♂, 2♀, 4.iii.2007. E of Mahafiz, 2♂, 5♀, 5.iii./2007. Wadi Bahai, 3♀, 8.iii.2007. Wadi Madaqa, 6♂, 7♀, 7.iii.2007. Wadi Shawkah, 1♂, 2♀, 5.iii.2007.

Distribution: Occurs in Europe, Africa, Central and SW Asia, India and Arabia.

Ochrilidia geniculata (Bolivar, 1913)

Plates 60–61

Material examined: Wadi Madaqa, 6♂, 5♀, 7.iii.2007, leg. BM & PF.

Distribution: Widespread in N and E Africa, Middle East, India and the Arabian Peninsula.

Ochrilidia persica (Salfi, 1931)

Previously recorded by Tigar & Osborne (1999) from Abu Dhabi Emirate. This species occurs in E Africa and the Middle East; its presence in the UAE should be confirmed (see next species).

Ochrilidia tibialis (Fieber, 1853)

The record by Gillett (2000) is unlikely. *O. tibialis* is a Greek species. Following the species key to species of Jago (1977), all *Ochrilidia* with not much flattened antennal segments should belong to *O. tibialis* (Fieber), but Mistshenko (1986) considers that at least seven species listed by Jago (1977) as synonyms of *O. tibialis* have to be considered as valid species; among them *O. filicornis* (Krauss, 1902), a species widespread in North Africa and the Middle East (cf. also Harz, 1975).



Plates 58–59. *Aiolopus thalassinus thalassinus* (Fabricius). 58: Greenish female; 59: Reddish female. Both from Wadi Maidaq.



Plate 60–61. *Ochrilidia geniculata* (Bolivar). 60: Female from Wadi Madaq; 61: Male from Wadi Shawkah.

***Stenohippus mundus* (Walker, 1871)**

Plates 62–63

Specimens examined: Khor Kalba, 4♂, 1♀, 4.iii.2007, leg. BM & PF. Near Masafi, 1♂, 1♀, 11.iii.2007, leg. BM & PF. E of Sharjah, 1♂, 5.iii.2007, leg. BM & PF. Wadi Bahai, 1♂, 8.iii.2007, leg. BM & PF. Wadi Madaq, 6♂, 1♀, 7.iii.2007, leg. BM & PF. Wadi Shawkah, 11♂, 2♀, 5.iii.2007, leg. BM & PF.

Remarks: Doubtfully quoted from al-Ain by Gillett (2000).

Distribution: Described from India, recorded from several countries of Africa and Middle East, the Arabian Peninsula included.



Plates 62–63. *Stenohippus mundus* (Walker). 62: Female; 63: Male. Both from Khor Kalba road, near tunnel.



Plate 64. Mimetism of a grasshopper (*Tenuitarsus angustus* (Blanchard)) in the desert.

CONCLUSIONS

Orthoptera are not readily collected in insect traps and an inventory attempt of this group should better be carried out by netting specimens during field trips. The stay of B. Massa and P. Fontana resulted in a number of species being captured that before had not been collected from the UAE, including two species that might turn out to be new to science. However, the trip was too short to enable a more complete picture of the orthopteran fauna of the country. Orthoptera are well adapted to desert habitats (see Plate 64) and quite a number of further species will occur. Further collecting trips by specialists are therefore recommended.

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REFERENCES

- Buzzetti, F.M., M. Lecoq, P. Fontana & B. Odè (2005): Contribution to the orthopteroid (Insecta: Blattoptera, Orthoptera, Dermaptera) fauna of Sal island (Cape Verde). *Italian Journal Zoology*, 72: 311–315.
- Cunningham, P.L. & S. Aspinall (2001): The diet of Little Owl *Athene noctua* in the UAE, with notes on Barn Owl *Tyto alba* & Desert Eagle Owl *Bubo (b.) ascalaphus*. *Tribulus*, 11 (2): 13–17.
- Eades, D.C. & D. Otte (2009): Orthoptera Species File Online. Version 2.2. <http://www.osf2.orthoptera.org> (accessed 12 February 2009).
- Gassouma, M.S.S. (1991): [Agricultural pests in the United Arab Emirates. Part 1. Fruit trees] (in Arabic). UAE Ministry of Agriculture, 148 pp.

- Gassouma, M.S.S. (2003): [*Agricultural pests in the United Arab Emirates. Part 2. Vegetables*] (in Arabic). UAE Ministry of Agriculture, 102 pp.
- Gillett, M.P.T. (2000): Grasshopper biodiversity in the UAE. An annotated and illustrated list of short horned grasshopper species (Orthoptera – Acridoidea). *Tribulus*, 9 (1): 5–15.
- Gillett, M.P.T. & C.P.D.T. Gillett (2002): A winter survey of insects and other terrestrial invertebrates on Marawah Island, Abu Dhabi. *Tribulus*, 12 (2): 12–19.
- Gillett, M. & B. Howarth (2004): The insects of Jebel Hafit. Pp. 94–143 in: Aspinall S. & Hellyer P., *Jebel Hafit, a Natural History*. Emirates Natural History Group, Abu Dhabi.
- Gorochoy, A.V. (1993): Grylloidea (Orthoptera) of Saudi Arabia and adjacent countries. *Fauna of Saudi Arabia*, 13: 79–97.
- Harten, A. van (2005): *The Insects of the United Arab Emirates. A Checklist of Published Records*. 86 pp. Dar Al Ummah Printing, Abu Dhabi.
- Harten, A. van (2008): Collecting methods and localities. *Arthropod fauna of the UAE*, 1: 14–32.
- Harz, K. (1975): *Die Orthopteren Europas II/The Orthoptera of Europe II*. 944 pp. Junk Publishers, The Hague.
- Ingrisch, S. (1999): Orthopteroid Insects of Yemen. *Esperiana*, 7: 349–376.
- Jago, N.D. (1977): Revision of the genus *Ochrilidia* Stål, 1873, with comments on the genera *Sporobolius* Uvarov, 1941 and *Platypternodes* I.Bolivar, 1908 (Orthoptera, Acrididae, Gomphocerinae). *Acrida*, 6: 163–217.
- Launois-Luong, M.H. & M. Lecoq (1989): *Vade-mecum des criquets du Sahel*. 126 pp. Collection Acridologie Operationelle, n. 5, Cirad–Prifas, Montpellier.
- Mc Kevan, D.K.E. (1959): A study of the genus *Chrotogonus* Audinet–Serville, 1839 (Orthoptera: Acridoidea: Pyrgomorphidae). V. A revisional monograph of the Chrotogonini. *Publicações Culturais da Companhia de Diamantes de Angola*, 43: 1–199.
- Mestre, J. (1988): *Les acridiens des formations herbeuses d’Afrique de l’Ouest*. 330 pp. Cirad–Prifas, Montpellier.
- Mistshenko, L.L. (1986): On the knowledge of grasshoppers of the genus *Ochrilidia* Stål (Orthoptera, Acrididae). *Revue d’Entomologie de l’URSS*, 65: 709–718 (in Russian).
- Popov, G.B. (1980): Acridoidea of Eastern Arabia. *Journal of Oman Studies*, Special Report, 2: 113–148.
- Popov, G.B. (1981): Insects of Saudi Arabia. Orthoptera: Fam. Tettigoniidae (bush crickets). *Fauna of Saudi Arabia*, 3: 114–148.
- Popov, G.B. (1997): Arabian grasshoppers (Orthoptera): Families Pamphagidae (Eumastacoidea) and Pyrgomorphidae (Acridoidea). *Fauna of Saudi Arabia*, 16: 111–168.
- Tigar, B.J. & P.E. Osborne (1999): Patterns of biomass and diversity of aerial insects of Abu Dhabi’s sandy deserts. *Journal of Arid Environments*, 43: 159–170.

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Annex 1. List of Orthoptera recorded from the UAE

	1	2	3	4	5	6	7	8	9	10	11	12	13
Family Tettigoniidae													
<i>Conocephalus concolor</i> (Burmeister, 1838)	x	.	.	.	.
<i>Conocephalus maculatus</i> (Le Guillou, 1841)	x
<i>Diogena fausta</i> (Burmeister, 1838)	x	.	.	.	.
<i>Phaneroptera sparsa</i> Stål, 1856	x	x
<i>Trigonocorypha angustata</i> Uvarov, 1922	.	x	.	.	.	.	.	.	.	.	.	.	.
<i>Decticus albifrons</i> (Fabricius, 1775)	.	x	.	.	.	.	.	.	.	.	.	.	.
Family Gryllidae													
<i>Acheta confalonierii</i> (Capra, 1929)	x
<i>Acheta</i> cf. <i>arabica</i> Gorochov, 1993	x
<i>Acheta domesticus</i> (Linnaeus, 1758)	.	.	x	.	x	.	.	.	.	.	.	x	.
<i>Acheta</i> spec.	x
<i>Grylloides supplicans</i> (Walker, 1859)	x
<i>Gryllopsis</i> spec.	x
<i>Gryllus bimaculatus</i> DeGeer, 1773	.	.	x	.	x	.	.	.	.	.	.	x	x
<i>Trigonidium cicindeloides</i> Rambur, 1839	x
Family Gryllotalpidae													
<i>Gryllotalpa africana</i> Palisot de Beauvois, 1805	x?	.	.	.	.
<i>Gryllotalpa debilis</i> Gerstäcker, 1869	x	.	.	.	x
<i>Gryllotalpa stepposa</i> (Zhantiev, 1991)	x?
<i>Gryllotalpa gryllotalpa</i> (Linnaeus, 1758)	x?
Family Tetrigidae													
<i>Euparatettix histricus</i> (Stål, 1861)	.	.	x	.	.	.	.	.	.	.	.	.	x
<i>Hedotettix alienus</i> Uvarov, 1936	x
Family Trydactylidae													
<i>Asiotridactylus fasciatus</i> (Guérin-Méneville, 1829)	x	.	.	.	x
<i>Xya</i> spec.	x
Family Pyrgomorphidae													
<i>Chrotogonus homalodemus</i> (Blanchard, 1836)	x	.	.	.	.	.	.	x	.	x	.	x	x
<i>Pyrgomorpha cognata minima</i> Uvarov, 1943	x?	.	x?	.
<i>Pyrgomorpha conica tereticornis</i> (Brullé, 1840)	x	.	x	.	x	.	x	.	x	x	.	x	x
<i>Tenuitarsus angustus</i> (Blanchard, 1836)	x	.	.	.	.	.	.	x	x	x	.	.	x

Family **Acrididae**

<i>Acorypha glaucopsis</i> (Walker, 1870)	x	x x
<i>Heteracris adspersa adspersa</i> (Redtenbacher, 1889)	x . . . . .	. x
<i>Heteracris annulosa annulosa</i> Walker, 1870	. . . . .	x x x
<i>Heteracris littoralis</i> (Rambur, 1838)	x . x	x x x
<i>Dericorys albidula</i> Serville, 1838	x . . . . .	. x
<i>Dericorys cyrtosterna</i> Uvarov, 1933	x	x x
<i>Schistocerca gregaria</i> (Forskål, 1775)	. . x x . . . . .	. x
<i>Anacridium aegyptium</i> (Linnaeus, 1764)	. . . . .	. x
<i>Anacridium melanhorodon arabafum</i> Dirsh, 1953	x . . x . . . . .	. x
<i>Diabolocatantops axillaris</i> (Thunberg, 1815)	x . . x . . . . .	. x
<i>Duroniella laeviceps</i> Uvarov, 1938	. . . . .	. x
<i>Duroniella parallella</i> Uvarov, 1950	x . . . . .	. x
<i>Hilethera aelopoides</i> (Uvarov, 1922)	x . . . . .	. x
<i>Scintharista notabilis blanchardiana</i> (Saussure, 1888)	x . . . . .	. x
<i>Oedaleus senegalensis</i> (Krauss, 1877)	x . . . . .	. x
<i>Locusta migratoria migratoria</i> (Linnaeus, 1758)	. . . x x . . . . .	. x . x
<i>Morphacris fasciata</i> (Thunberg, 1815)	. . x . . . . .	. . . . .
<i>Hyalorrhypis canescens</i> (Saussure, 1888)	x . . . . .	. x
<i>Leptopternis gracilis</i> (Eversmann, 1848)	. . . . .	. x
<i>Sphingonotus femoralis</i> Uvarov, 1933	x . . . . .	. x
<i>Sphingonotus lavandulus</i> Popov, 1980	x . . . . .	. x
<i>Sphingonotus octofasciatus</i> (Serville, 1838)	x . . . . .	. x
<i>Sphingonotus rubescens rubescens</i> (Walker, 1870)	x . x . x . . . . .	. x
<i>Sphingonotus dentatus</i> (Predtetschensky, 1936)	x . . . . .	. x
<i>Sphingonotus paradoxus</i> (Bei-Bienko, 1948)	x . . . . .	. x
<i>Sphingonotus savignyi</i> (Saussure, 1884)	. . x . x . . . . .	. x
<i>Eusphingoderus predtetschenskyi</i> (Mistshenko, 1936)	x . . . . .	. x
<i>Acrotylus insubricus</i> (Scopoli, 1786)	x . . . . .	. x
<i>Acrotylus longipes</i> (Charpentier, 1843)	x . . . . .	. x
<i>Mioscirtus wagneri rogenhoferi</i> (Saussure 1888)	x . . . . .	. x
<i>Truxalis eximia eximia</i> Eichwald, 1830	x . . . . .	. x
<i>Truxalis fitzgeraldi</i> Dirsh, 1950	x . . . . .	. x
<i>Truxalis longicornis</i> (Krauss, 1902)	. . . . .	. x
<i>Truxalis procera</i> Klug, 1830	x . x . x . . . . .	. x
<i>Aiolopus simulatrix simulatrix</i> (Walker, 1870)	. . . . .	. x
<i>Aiolopus thalassinus thalassinus</i> (Fabricius, 1781)	x . x . x . . . . .	. x
<i>Ochrilidia geniculata</i> (Bolivar, 1913)	x . . . . .	. x x
<i>Ochrilidia pachypes</i> Chopard, 1950	. . . . .	. x
<i>Ochrilidia persica</i> (Salfi, 1931)	. . . . .	. x?
<i>Ochrilidia tibialis</i> (Fieber, 1853)	. . . . .	. x?
<i>Leva arabica</i> (Uvarov, 1936)	x . . . . .	. x
<i>Stenohippus mundus</i> (Walker, 1871)	. . . . .	. x?

[1 = Popov, 1980; 2 = Popov, 1981; 3 = Walker & Pittaway, 1987; 4 = Gassouma, 1991; 5 = Wingate, 1992; 6 = Gorochoy, 1993; 7 = Popov, 1997; 8 = Tigar & Osborne, 1999; 9 = Gillett, 2000; 10 = Gillett & Gillett, 2002; 11 = Gassouma, 2003; 12 = Gillett & Howarth, 2004; 13 = Present chapter. x? = Doubtful record]