Order Sternorrhyncha, superfamily Psylloidea

Daniel Burckhardt

INTRODUCTION

The superfamily Psylloidea comprises some 3500 described species world-wide grouped in the families Calophyidae, Carsidaridae, Homotomidae, Phacopteronidae, Psyllidae and Triozidae. They are plant-sap feeders – mostly phloem – and are generally very host specific. Some species are inducing galls on their host plants.

Up to now only a single species of Psyllidae, viz. *Diaphorina lamproptera* Burckhardt, had been reported from the UAE (Burckhardt & Mifsud, 1988), whereas Gassouma (1991) recorded a species of Triozidae (*Pauropsylla wilcocksi* Dçbski) as a pest of fig trees. Identification keys exist for the jumping plant-lice of the Arabian Peninsula (Burckhardt & Mifsud, 1998; Burckhardt & van Harten, 2006). The fauna of the UAE resembles that of Yemen though it is distinctly less rich.

MATERIALS AND METHODS

If not otherwise stated the specimens were collected by A. van Harten; additional specimens were collected by A. Stark. The material was collected in light traps (LT), Malaise traps (MT), water traps (WT), or was hand collected. The specimens are preserved in 70% alcohol or are dry mounted on card points. The material is, where no depository is mentioned, deposited in the United Arab Emirates Invertebrate Collection (UAEIC) or in the Naturhistorisches Museum Basel (NHMB).

Key to species

Adult:

1 Forewing (Plates 1-10) with vein R+M+Cu_1 bifurcating into veins R and M+Cu_1; costal break and pterostigma often present; anal break close to apex of vein Cu_{1b}. Metabasitarsus with 1 or 2 black spurs.....(Psyllidae) **2**

- Forewing (Plates 11-12) with vein R+M+Cu_1 trifurcating or, rarely, bifurcating; costal break and pterostigma always absent; anal break in distance of apex of vein Cu_{1b}. Metabasitarsus without apical black spurs.....(Triozidae) **12**

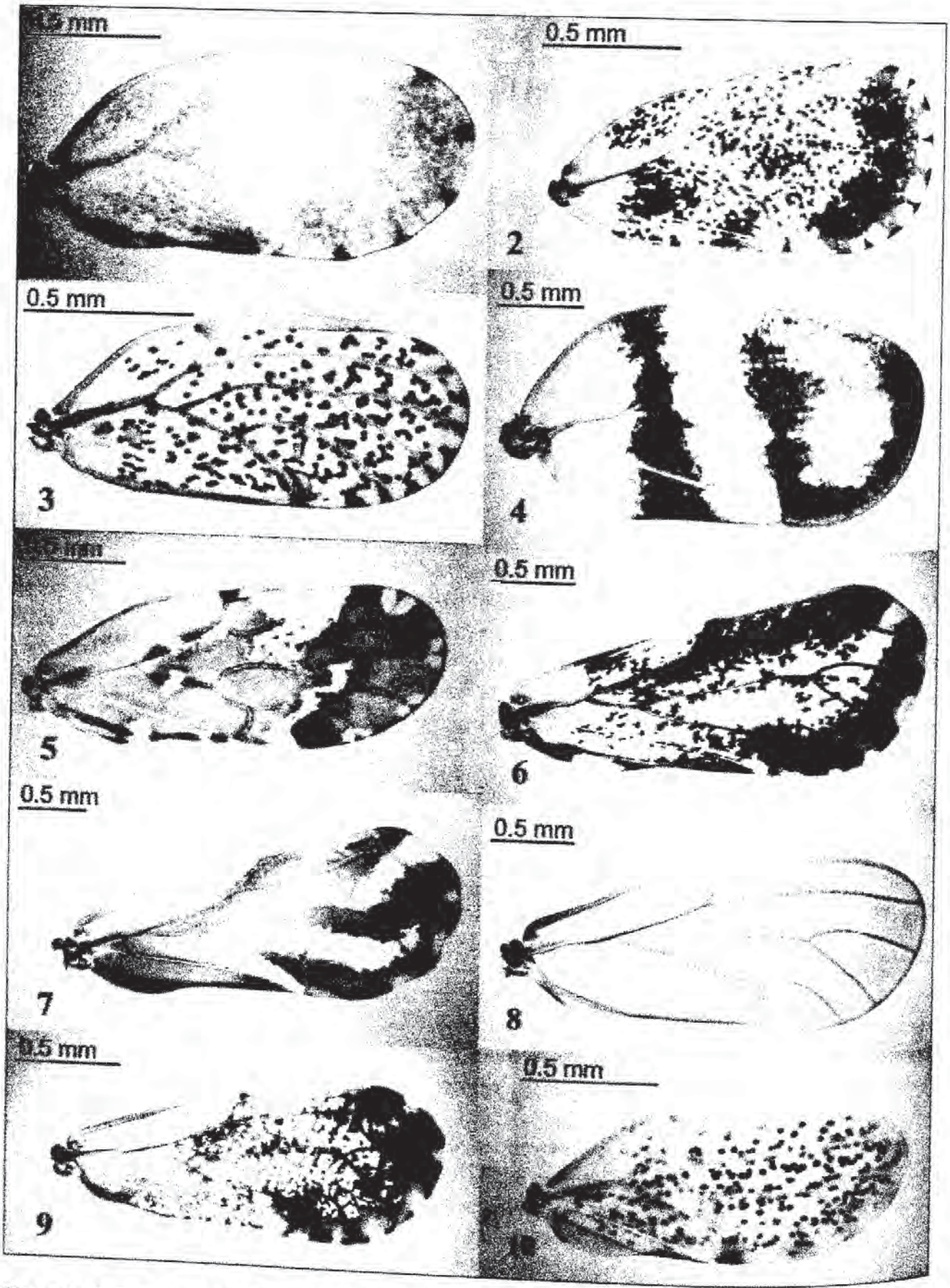
2 Apical spurs of metatibia forming an open crown, if grouped then head bearing preocular sclerite (Fig. 13) **3**

- Apical spurs of metatibia always grouped. Head without preocular sclerite (Figs 1-2) **9**

3 Head without conical genal processes; occipital margin distant from forewing base (Fig. 12). Male proctiger with large wing-like posterior processes (Fig. 14).....(Aphalarinae) **4**

- Either head bearing conical genal processes (Fig. 31) or occipital margin adjacent to forewing base. Male proctiger straight or weakly produced posteriorly, lacking large wing-like processes (Figs 21, 25, 28, 32, 35).....(Diaphorinae) **5**

4 Head weakly inclined from longitudinal body axis. Forewing without crossvein between veins Rs and M_{1+2} (Plate 5) ..... ***Colposcenia aliena*** Löw



Plates 1-10. Forewing. 1: *Acizzia bona* Loginova; 2: *A. exculta* Burckhardt & van Harten; 3: *A. indica* Heslop-Harrison; 4: *Caillardia dilutata* Loginova; 5: *Colposcenia aliena* Löw; 6: *Diaphorina citri* Kuwayama; 7. *D. enormis* Loginova; 8. *D. lamproptera* Burckhardt; 9. *D. luteola* Loginova; 10: *Peripsyllopsis dodonaeae* Burckhardt & Mifsud.

- Head strongly inclined downwards in an angle of about 90° to longitudinal body axis. Forewing with one or several crossveins between veins Rs and M_{1+2} (Plate 4) ..... ***Caillardia dilatata*** Loginova

5 Occipital margin of head adjacent to forewing base. Forewing (Plate 10) subelliptical, widest in the middle; pterostigma large; vein R and $M+Cu_1$ of subequal length. Metacoxae with two tubercles on the outer face in addition to meracanthus. Aedeagus 2-segmented (Fig. 21) ..... ***Peripsyllopsis dodoneae*** Burckhardt & Mifsud

- Occipital margin of head distant to forewing base. Forewing (Plates 6-9) oval, usually widest in apical third to fifth; pterostigma narrow; vein R about twice as long as $M+Cu_1$. Metacoxae without tubercles on the outer face. Aedeagus 3-segmented (Figs 25, 28, 32, 35) .....(*Diaphorina*) **6**

6 Genal processes > 1.0 times as long as vertex along mid-line, slender. Forewing pattern consisting of each a band of confluent brown spots along vein Rs and along outer margin, the two areas are well-separated by a white gap in the subapical region of Rs, membrane whitish (Plate 6) ..... ***Diaphorina citri*** Kuwayama

- Genal processes < 0.8 times as long as vertex along mid-line, more massive. Forewing pattern different (Plates 7-9).....**7**

7 Forewing without distinct pattern (Plate 8) ..... ***Diaphorina lamproptera*** Burckhardt

- Forewing with pattern consisting of stripes along the veins or of dark spots (Plates 7, 9).....**8**

8 Forewing pattern restricted to apical half of wing, consisting of stripes along the veins (Plate 7) ..... ***Diaphorina enormis*** Loginova

- Forewing pattern consisting of well-defined brown to dark brown spots which are also present in basal half of wing (Plate 9) ..... ***Diaphorina luteola*** Loginova

9 Forewing strongly angular apically ..... ***Acaerus*** spec. cf. ***A. negevensis*** Burckhardt & Halperin

- Forewing rounded apically (Plates 1-3) **10**

10 Metabasitarsus with 1 spur. Male proctiger bearing a thumb-like process on the posterior margin (Fig. 9). Female proctiger relatively short, dorsal margin distinctly bent downwards distal to the circumanal ring (Fig. 11) ..... ***Acizzia indica*** Heslop-Harrison

- Metabasitarsus with 2 spurs. Male proctiger lacking thumb-like process on the posterior margin (Figs 3, 6). Female proctiger relatively long, dorsal margin straight or weakly sinuate (Figs 5, 8) **11**

11 Forewing pattern consisting of a dark subapical band, apices of veins dark (Plate 2) ..... ***Acizzia exculta*** Burckhardt & van Harten

- Forewing pattern lacking a subapical dark band, apices of veins light (Plate 1) ..... ***Acizzia bona*** Loginova

12 Forewing broadly rounded apically; vein $R+M+Cu_1$ bifurcating into R and $M+Cu_1$ (Plate 11). Genae broadly rounded ..... ***Pauropsylla willcocksi*** Dobski

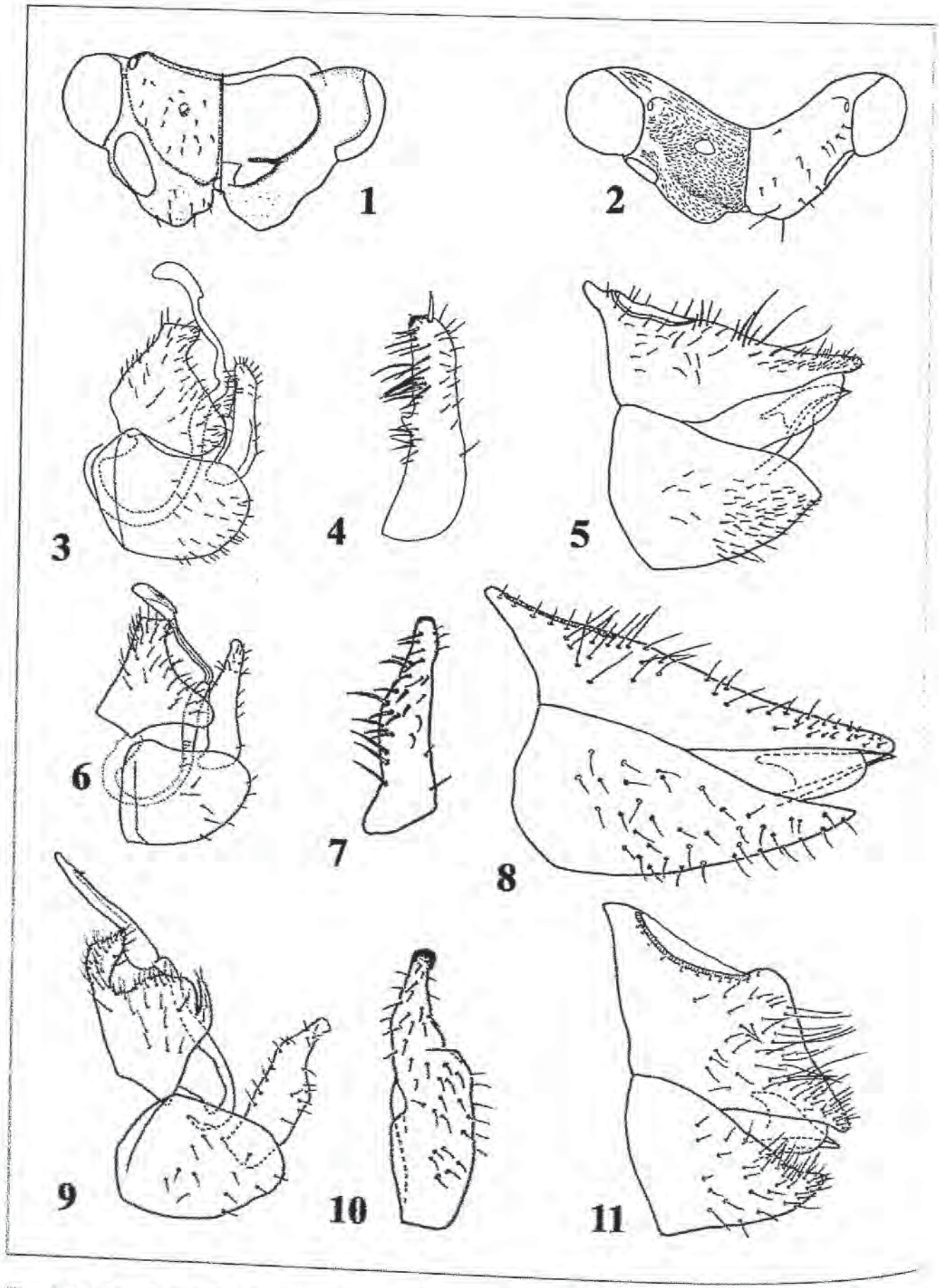
- Forewing angular apically; vein $R+M+Cu_1$ of forewing trifurcating into R, M and Cu_1 (Plate 12). Genae forming conical processes..... ***Trioza chenopodii*** Reuter

Fifth instar larva (*Acizzia exculta* unknown):

1 Forewing pads without truncate marginal sectasetae. Caudal plate with, at most, 4+4 marginal sectasetae.....(Psyllidae) **2**

- Truncate marginal sectasetae present on wing pads and abdomen; if absent from wing pads then more than 4+4 sectasetae present on abdomal margin .....(Triozidae) **11**

2 Tarsal arolium membranous, without unguitractor.....**3**



Figs 1-11. *Acizzia* spp. 1, 3-5: *Acizzia bona* Loginova; 2, 6-8: *A. exculta* Burckhardt & van Harten; 9-11: *A. indica* Heslop-Harrison. 1, 2: Head; 3, 6, 9: ♂ terminalia; 4, 7, 10: Paramere, inner surface; 5, 8, 11: ♀ terminalia.

- Tarsal arolium with well-developed unguitractor 4
3 Margin of forewing pad with deep notch in the middle ..... ***Colposcenia aliena*** Löw
- Margin of forewing pad not notched ..... ***Caillardia dilatata*** Loginova
4 Antennae 9-segmented. ..... (*Acizzia*) **5**
- Antennae 3 to 8-segmented **6**
5 Caudal plate lacking long dorsal capitate setae ..... ***Acizzia bona*** Loginova
- Long capitate setae present on dorsum of caudal plate ..... ***Acizzia indica*** Heslop-Harrison
6 Margin of forewing pad with deep notch in the middle ..... ***Acaerus*** spec. cf. ***A. negevensis*** Burckhardt & Halperin
- Margin of forewing pad not notched **7**
7 Antenna 7 to 8-segmented ..... ***Peripsyllopsis dodonaeae*** Burckhardt & Mifsud
- Antenna 3-segmented ..... (*Diaphorina*) **8**
8 Margins of head, wing buds and/or caudal plate with small but distinct club-shaped setae (magification 200 x) ..... ***Diaphorina enormis*** Loginova
- Margins of head, wing buds and caudal plate without visible club-shaped setae (magification 200 x) **9**
9 Antennal flagellum dark brown to black, strongly contrasting with basal segments ..... ***Diaphorina citri*** Kuwayama
- Antennal flagellum light, dark at apex only **10**
10 On *Zygophyllum* spp. ..... ***Diaphorina lamproptera*** Burckhardt
- On *Solanum* spp. ..... ***Diaphorina luteola*** Loginova
11 Claws absent ..... ***Pauropsylla willcocksi*** Dçbski
- Claws well-developed ..... ***Trioza chenopodii*** Reuter

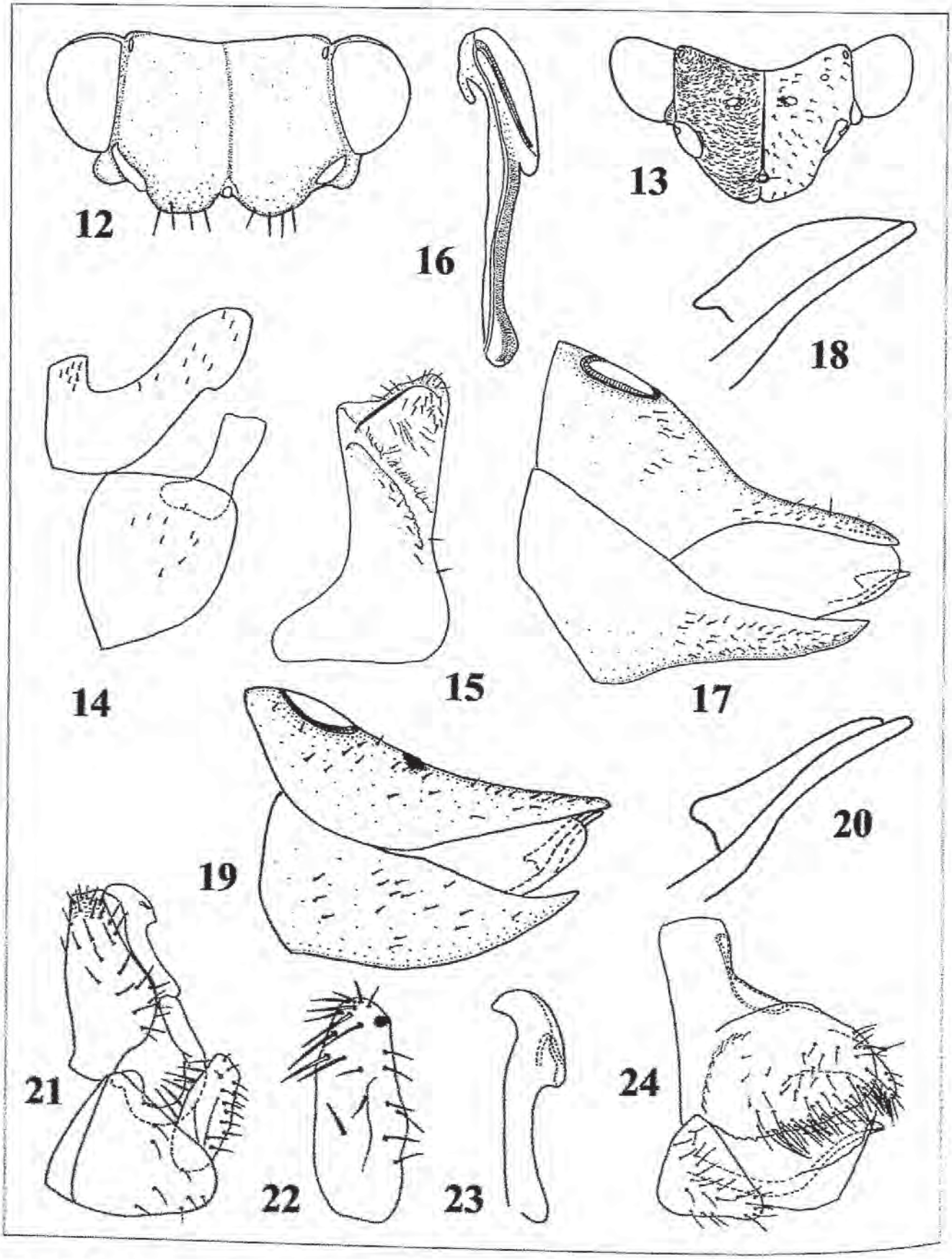
SPECIES ACCOUNT

Family **Psyllidae**

Acaerus spec. cf. ***Acaerus negevensis*** Burckhardt & Halperin, 1992
Specimens examined: Al-Ajban, 1♀, 26.ii-02.iv.2006, MT.
Biology: Host plant is *Calligonum comosum* (Polygonaceae).
Distribution: Reported from Israel (Burckhardt & Halperin, 1992). New record for the UAE.
Comments: The identification of the single female at hand is provisional. Additional specimens, particularly males, are required to confirm the identification.

Acizzia bona Loginova, 1967 (Plate 1, Figs 1, 3-5)
Specimens examined: NARC, near Sweihan, 1♂, 2-30.iv.2005, LT.
Biology: Host plants are *Acacia ehrenbergiana* and *A. seyal* (Fabaceae).
Distribution: Reported from Sudan (Loginova, 1967), Saudi Arabia (Burckhardt, 1986; Burckhardt & Mifsud, 1998) and Yemen (Burckhardt & van Harten, 2006). New record for the UAE.

Acizzia exculta Burckhardt & van Harten, 2006 (Plate 2, Figs 2, 6-8)
Specimens examined: Fujairah, 3♀, 2.v-5.vi.2005; 2♀, 5.vi-2.vii.2005; 1♂, 2♀, 20-27.v.2006, LT. Wadi Maidaq, 1♀, 1-8.vii.2006, LT. Wadi Safad, 2♀, 31.i-21.ii.2006, LT.
Biology: Host plant unknown.



Figs 12-24. 12, 19, 20. *Colposcenia aliena* (Löw); 13, 21-24. *Peripsyllopsis dodonaeae* Burckhardt & Mifsud; 14-18. *Caillardia dilatata* Loginova. – 12, 13: Head; 14, 21: ♂ terminalia; 15, 22: Paramere, inner surface; 16, 23: Apical portion of aedeagus; 17, 24: ♀ terminalia; 18, 20: Dorsal and ventral valvula.

Distribution: Reported from Yemen (Burckhardt & Mifsud, 1998 as *?Acizzia* sp. 2; Burckhardt & van Harten, 2006). New record for the UAE.

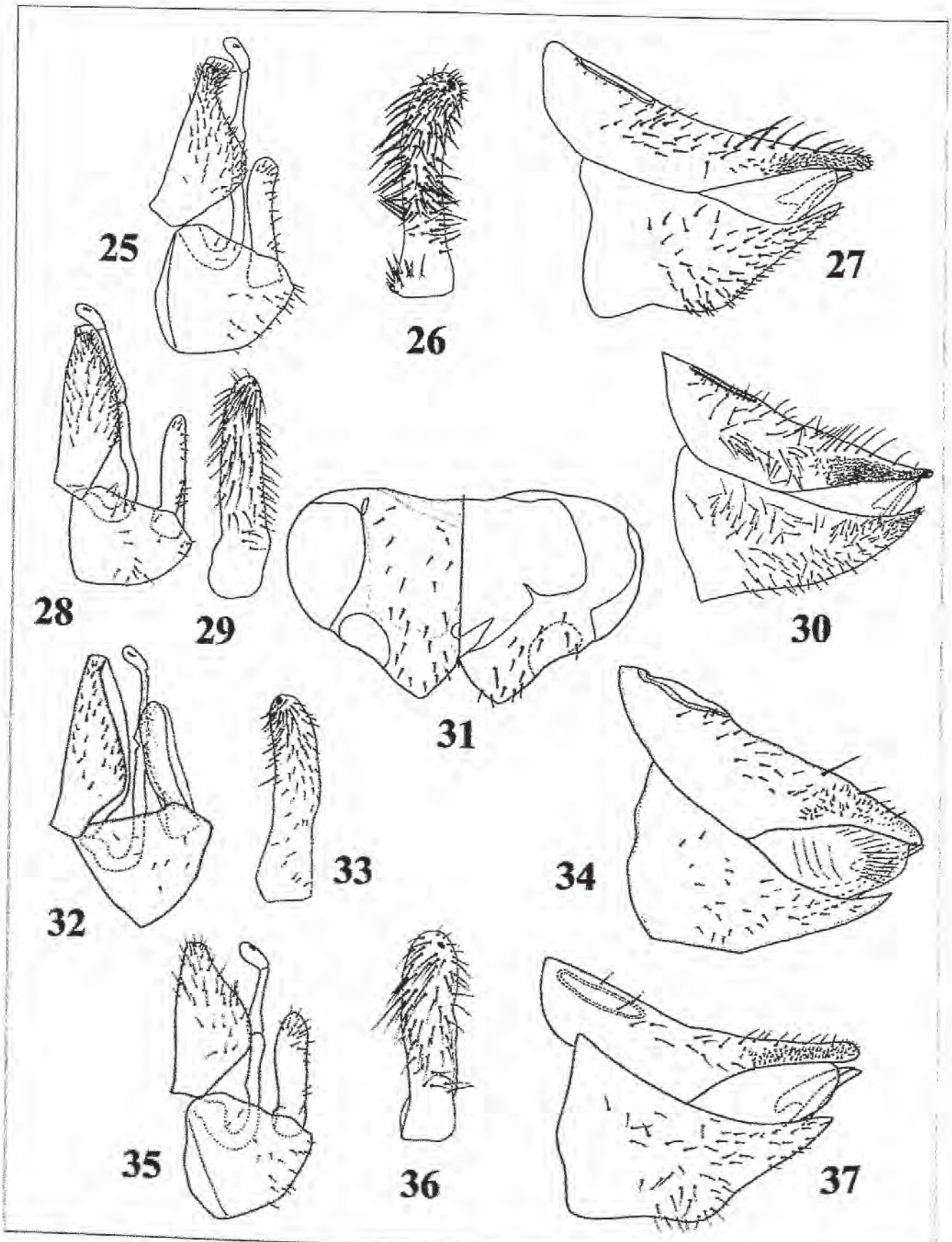
Acizzia indica Heslop-Harrison, 1949 (Plate 3, Figs 9-11)
Specimens examined: Fujairah, 1♂, 2.v-5.vi.2005, LT. Sharjah, 2♀, 1-31.i.2005, LT; 1♂, 1-10.ii.2005, LT; 10♀, 27.iv-5.vi.2005, LT; 4♂, 25♀, 12-28.vi.2005, LT; 1♂, 3♀, 28.vi-23.vii.2005, LT. Sharjah Desert Park, 1♀, 18.i-25.ii.2006, LT.
Biology: Host plant is *Albizia procera* (Fabaceae).
Distribution: Reported from India (Mathur, 1975), Taiwan (Fang, 1990) and Yemen (Burckhardt & van Harten, 2006). New record for the UAE.

Caillardia dilatata Loginova, 1978 (Plate 4, Figs 14-18)
Specimens examined: Al-Ajban, 1♂, 1.iv-2.v.2006, MT. N of Ajman, 1♂, 16.ix-18.x.2006, WT. Wadi Wurayah, 1♂, 25.iii-1.iv.2007, MT.
Biology: Host plants are *Hammada elegans*, *H. salicornica*, *Hammada* spec. (Chenopodiaceae). The larvae form galls on the leaves.
Distribution: Reported from Egypt and Iran (Loginova, 1978b), Saudi Arabia (Burckhardt, 1981, 1986) and Israel (Burckhardt & Halperin, 1992). New record for the UAE.

Colposcenia aliena (Löw, 1882) (Plate 5, Figs 12, 19-20)
Specimens examined: Al-Ajban, 1♂, 2♀, 1.iv-2.v.2006, MT.
Biology: Host plants are *Tamarix* spp. (Tamaricaceae).
Distribution: Widely distributed throughout the Mediterranean, the Middle East and Central Asia to Mongolia and China, Ethiopia and Sudan (Gegechkori & Loginova, 1990). From the Arabian Peninsula reported from Oman and Yemen (Burckhardt & Mifsud, 1998; Burckhardt & van Harten, 2006). New record for the UAE.

Diaphorina citri Kuwayama, 1908 (Plate 6, Figs 25-27)
Specimens examined: Fujairah, 1♀, 6.iv-2.v.2005, LT. Hatta, 1♂, 2♀, 08-26.iv.2006, LT. Sharjah, 1♂, 27.iv-5.vi.2005, LT; 2♂, 12.vi-28.vi.2005, LT. Wadi Maidaq, 1♂, 1-8.vii.2006, LT.
Biology: Host plants are *Murraya* spp. and *Citrus* spp. (Rutaceae).
Distribution: Originating from tropical and subtropical Asia where it has been reported from China, India, Myanmar, Taiwan, Philippine Islands, Malaysia, Indonesia, Sri Lanka, Pakistan, Thailand, Nepal, Hong Kong, Ryukyu Islands and Afghanistan (Mead, 2005). It is also known from Reunion, Mauritius, the Middle East (Wooler et al., 1974; Halbert & Manjunath, 1998; Mead, 2005) and the New World where it has considerably increased its range of distribution recently (Halbert & Núñez, 2004). It was reported for the first time from the Arabian Peninsula (Saudi Arabia) by Wooler et al. (1974) and from Yemen by Burckhardt & Mifsud (1998). New record for the UAE.

Diaphorina enormis Loginova, 1978 (Plate 7, Figs 28-30)
Specimens examined: Al-Ajban, 14♂, 7♀, 6-22.v.2006, LT; 5♂, 3♀, 27.v-26.vi.2006, LT. Al-Aslab, 18♂, 28♀, 19.ix.2004, at light. Sharjah Desert Park, 12♂, 17♀, 14.x.2004, at light: 2♂, 6♀, 29.iii-6.iv.2005, LT; 5♂, 10♀, 6-30.iv.2005, LT; 7♂, 8♀, 30.iv-31.v.2005, LT; 2♂, 6♀, 31.v-30.vi.2005, LT; 6♂, 12♀, 30.vi-21.vii.2005, LT; 3♂, 3♀, 21.vii-5.viii.2005, LT; 2♀, 18.i-25.ii.2006, LT. NARC, near Sweihan, 1♀, 2-30.iv.2005, LT.



Figs 25-37. *Diaphorina* spp. 25-27. *Diaphorina citri* Kuwayama; 28-30. *D. enormis* Loginova; 31-34. *D. lamproptera* Burckhardt; 35-57. *D. luteola* Loginova. 25, 28, 32, 35: ♂ terminalia; 26, 29, 33, 36: Paramere, inner surface; 27, 30, 34, 37: ♀ terminalia; 31: Head.

Biology: Burckhardt & van Harten (2006) mentioned *Leptadenia* sp. (Asclepiadaceae) as possible host.
Distribution: Recorded from Iran, Sudan (Loginova, 1978a), Saudi Arabia (Burckhardt, 1981), Oman and Yemen (Burckhardt & Mifsud, 1998). New record for the UAE.

Diaphorina lamproptera Burckhardt, 1981 (Plate 8, Figs 31-34)
Specimens examined: N of Ajman, 47♂, 28♀, 16.ix-18.x.2006, WT. Fujairah, 1♀, 5.iii-6.iv.2005, LT. 7 km S al-Jazirat al-Hamra, 2♂, 1.xii.2004, WT; 1♂, 22.xii.2004, WT; 1♂, 29.xii.2004, WT. Sharjah Desert Park, 1♀, 20.xi.2004, WT; 2♂, 1♀, 22.xi.2004, WT; 2♀, 4-8.xii.2004, WT; 2♂, 20.xii.2004, WT; 1♀, 25.i-22.ii.2005, LT; 1♀, 29.iii-6.iv.2005, LT. NARC, near Sweihan, 3♀, 2-30.iv.2005, LT. Wadi Maidaq, 1♀, 5.iii.2005; 2♀, 7-14.iii.2006, WT; 2♂, 2♀, 29.iii-10.iv.2006, WT; 1♂, 1♀, 24.ix-22.x.2006, WT; 2♀, 26.x-9.xi.2006, WT. Wadi Shawkah, 5♂, 4♀, 31.x-27.xi.2006, WT. Wadi Siji, 17♂, 7♀, 24.ix-22.x.2006, WT.
Biology: Host plants are *Zygophyllum* spp. (Zygophyllaceae).
Distribution: Recorded from Saudi Arabia, Egypt (Burckhardt, 1981, 1985), Israel (Burckhardt & Halperin, 1992), Bahrain, Kuwait, United Arab Emirates and Yemen (Burckhardt & Mifsud, 1998; Burckhardt & van Harten, 2006).

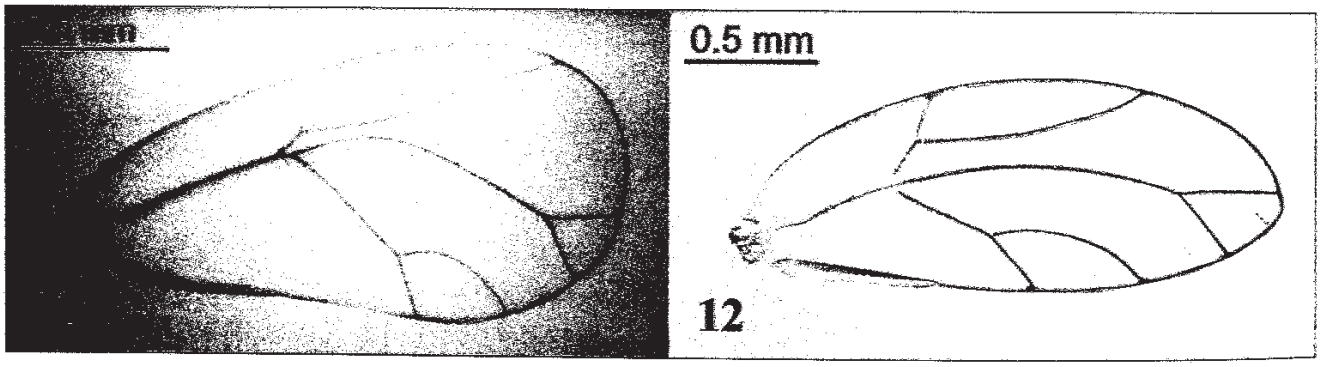
Diaphorina luteola Loginova, 1978 (Plate 9, Figs 35-37)
Specimens examined: Fujairah, 1♂, 6.iv-2.v.2005, LT; 1♂, 2.v-5.vi.2005, LT; 1♂, 20-27.v.2006, LT. Jebel Jibir, 1360 m, 3♂, 10♀, 27.iii.2007, hand-collected, leg. A. Stark. Wadi Maidaq, 1♀, 29.iii-10.iv.2006, WT.
Biology: Host plants are *Solanum* spp. (Solanaceae).
Distribution: Recorded from Sudan, Iran (Loginova, 1978; Burckhardt & Lauterer, 1993), Bahrain, Israel and Yemen (Burckhardt & Mifsud, 1998; Burckhardt & van Harten, 2006). New record for the UAE.

Peripsyllopsis dodonaeae Burckhardt & Mifsud, 1998 (Plate 10, Figs 13, 21-24)
Specimens examined: Jebel Jibir, 1♀, 27.iii.2007, hand-collected, leg. A. Stark.
Biology: Host plant is *Dodonaea viscosa* (Sapindaceae).
Distribution: Recorded from Yemen (Burckhardt & Mifsud, 1998). New record for the UAE.

Family **Triozidae**

Pauropsyla willcocksi Dçbsky, 1918 (Plate 11)
Specimens examined: Sharjah, 1♂, 12-28.vi.2005, LT. Sharjah Desert Park, 2♂, 30.iv-31.v.2005, LT.
Biology: The larvae induce pit-galls on the leaves of *Ficus sycomorus*, *F. gnapholocarpa* and *F. pseudo-sycomorus* (Moraceae).
Distribution: Reported from Saudi Arabia (Martin, 1972), Cape Verde Islands, Senegal, Egypt, Sudan (Hollis, 1984; Burckhardt, 1986) and Yemen (Burckhardt & van Harten, 2006). New record for UEA.

Trioza chenopodii Reuter, 1876 (Plate 12)
Specimens examined: Wadi Maidaq, 16♂, 15♀, 29.iii-10.iv.2006; 1♂, 7-14.iii.2006, WT. Jebel Jibir, 1♀, 27.iii.2007, hand-collected, leg. A. Stark.
Biology: The species is oligophagous on various Chenopodiaceae.



Plates 11-12. Forewing. 11: *Pauropsylla willcocksi* Dçbsky; 12: *Trioza chenopodii* Reuter.

Distribution: Widely distributed throughout the Palaearctic, introduced into the New World (Ossiannilsson, 1992; Burckhardt, 1994; Wheeler & Hoebecke, 1997). From the Arabian Peninsula reported from Kuwait, Oman and Yemen (Burckhardt & Mifsud, 1998; Burckhardt & van Harten, 2006). New record for the UAE.

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