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A NEW IRANIAN SPECIES OF *UROLEUCON* MORDVILKO, 1914 (HEMIPTERA, APHIDIDAE) FROM SPECIMENS IN THE NATURAL HISTORY MUSEUM COLLECTION

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ABSTRACT

Uroleucon (*Uromelan*) *helichrysi* **sp. n.** (Hemiptera, Aphididae, Aphidinae: Macrosiphini) is established from Iranian apterous and alate viviparous females caught on *Helichrysum* sp. (Asteraceae) and preserved in the collection of the Natural History Museum (BMNH) in London. The number of setae on the first tarsal segments (5), the number of caudal setae (20 to 28), the presence of abdominal marginal tubercles on abdominal segments 2 to 4, and the size of the cells of the siphuncular reticulation (relatively small) allow the new species to be distinguished from other Palaeartic species of the subgenus *Uromelan*. Blackman and Eastop's key to apterae on *Helichrysum* is modified to include the new species.

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Key words: Aphids; Macrosiphini; Iran; *Helichrysum*; Asteraceae.

RESUMEN

Nueva especie iraní de *Uroleucon* Mordvilko, 1914 (Hemiptera, Aphididae) descrita a partir de ejemplares de la colección del Natural History Museum

Se establece la especie *Uroleucon helichrysi* **n. sp.** (Hemiptera: Aphididae: Aphidinae: Macrosiphini) con la descripción de sus hembras vivíparas ápteras y aladas recogidas en Irán sobre *Helichrysum* sp. (Asteraceae), conservadas en la colección del *Natural History Museum* de Londres. La nueva especie se diferencia de otras especies paleárticas del subgénero *Uromelan* por la cantidad de setas en el primer segmento tarsal (5), la cantidad de setas caudales (20 a 28), por el tamaño de las celdillas de la reticulación cornicular (que son relativamente pequeñas) y por la presencia de papilas marginales (presentes en los segmentos abdominales 2 a 4) Se incluye una modificación a la clave de Blackman and Eastop para las ápteras que viven sobre *Helichrysum*.

Palabras clave: Pulgones; Áfidos; Macrosiphini; Irán; *Helichrysum*; Asteraceae.

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Introduction

It is well established that an significant part of the biodiversity is as yet undescribed, but it is not well known that an important portion of new species established by professional or non-professional (amateur) taxonomists is based on specimens preserved in the collections of museums, universities and other scientific institutions (Winston, 1999; Fontaine *et al*., 2012). Such collections also include many species that are still undescribed (Blackman & Eastop, 2006).

Specimens of two samples in the aphid collection of the Natural History Museum in London (BMNH) belonging to genus *Uroleucon* Mordvilko, 1914 (Hem. Aphididae Aphidinae Macrosiphini) have been studied, one from Lebanon and another from Iran. The slides of both samples had been labelled as new species by D. Hille Ris Lambers, and one of them is mentioned by Blackman & Eastop (2006, page 229).

Uroleucon currently includes 235 valid species and several subspecies (Favret, 2013; Nieto Nafría & Pérez Hidalgo, 2013), being one the largest genera of the tribe Macrosiphini.

Material and methods

The studied samples do not have a distinctive number; one is from Lebanon and the other from Iran.

Lebanese sample: "*Carthamus flavescens*, Arec, 26-XI-1971, Talhouk *leg*. (nr. 39)";14 apterous viviparous females, 4 alate viviparous females and 6 immature specimens. This sample is mentioned by Blackman & Eastop (2006 [2013], page 229) as *Uroleucon* sp. near *jaceae*. The locality of Arec is in the Bekaa valley.

Iranian sample: "*Helichrysum* sp., Demavend Village, 12-VI-1960, van den Bosch *leg*. (IR 132)"; 25 apterous viviparous females, 5 alate viviparous females and 22 immature specimens. This sample is not mentioned by Blackman and Eastop (*op. cit.*). We think that the locality "Demavend" is a misspelling for Damavand, a locality near Mount Damavand.

Measurements of the slide-mounted specimens were made according to Nieto Nafría & Mier Durante (1998) with an ocular micrometer. The measurements are lengths except when indicated that they are a width or diameter.

The photomicrographs were taken with a Leica DC digital camera with IM 1000 version 1.10 software.

Results and Discussion

The Lebanese specimens above mentioned have been identified as *Uroleucon jaceae* (Linnaeus, 1758). We do not put a subspecific name on these specimens, because the species is very variable and the subspecies are badly defined.

The specimens of the Iranian sample are different to the Lebanese specimens, mainly in the shape and ornamentation of the siphunculi. We consider that these aphids belong to a new species of the genus *Uroleucon*, subgenus *Uromelan*.

Uroleucon helichrysi sp. n.

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Types. Holotype: Apterous viviparous female, number 3 of the measurement series, IRAN, Mazanderan province, Damavand, 12-VI-1960, on *Helichrysum* sp., v.d.Bosch *leg*. (IR 132). Paratypes: 24 apterous viviparous females and 5 alate viviparous females, same data. Collection of the Natural History Museum (BMNH), London, United Kingdom.

Apterous viviparous females (Table 1, Fig. 1). From 39 apterous viviparous females. Metric and meristic features in Table 1. Colour in life unknown. When mounted mostly pale yellowish brown with striae on dorsum of thorax and abdomen. Marginal tubercles usually present in prothorax and abdominal segments 2-4; they are small, similar in size to neighbouring seta sockets. Setae thick and pale, most of them with blunt or evanescent apex. **Head** brown, and dorsally with very faint striae. Frontal sinus very deep and fronto-medial tubercle small or inconspicuous (Fig. 1A). Antennae brown to dark brown, usually with the proximal portion of segment III paler; proximal portion of segment III and most of IV delicately ornamented, segments V and VI imbricated. Secondary sensoria scattered on proximal 50-66% of segment III; they are circular, small and somewhat protuberant. Rostrum reaching hind coxae, dark brown; ultimate rostral segment triangular; proximal ones with spinules. **Thorax** with striate pale brown marginal sclerites in addition to the brown spinal and pleural setiferous scleroites. Coxae, distal 1/3-1/2 of femora, very proximal portion and distal 2/5-1/3 of tibiae, and tarsi dark brown. **Abdomen** with dorsal setiferous scleroites (Fig. 1B), with neighbouring scleroites on abdominal segment 7 and 8 sometimes coalescent; postsiphuncular and antesiphuncular (sometimes broken) patches; and spiracular sclerites small and usually paler than the setiferous scleroites; the intersegmental sclerites are inconspicuous. Siphunculi dark brown (Fig. 1C), cylindrical with enlarged base and curved outward, and without both preapical incision and flange; cells of the reticulate part very small (Fig. 1E); part proximal to reticulation densely covered with groups of spinules or scales. Genital plate light brown with brown spots. Anal plate similar in colour to cauda, which is lanceolate and as dark as siphunculi (Fig. 1D).

Table 1.– Metric and meristic features of apterous and alate viviparous females of *Uroleucon helichrysi* **sp. n.**

Tabla 1.– Características métricas y merísticas de las hembras vivíparas ápteras y aladas de *Uroleucon helichrysi* **n. sp.**

	apterous viviparae	**alate viviparae**
Body (cauda included) (mm)	3.775-4.625	3.550-4.500
Antenna (mm)	3.810-3.990	3.410-4.520
Antennal segment III [Ant.III] (mm)	0.98-1.08	0.88-1.12
Antennal segment IV (mm)	0.72-0.85	0.64-0.92
Antennal segment V (mm)	0.60-0.72	0.56-0.80
Antennal segment VI, base [Ant.VI base] (mm)	0.16-0.19	0.16-0.21
Antennal segment VI, terminal processus [Ant.VI.t.p.] (mm)	0.85-1.03	0.90-1.23
Ultimate rostral segment [U.r.s.] (mm)	0.19-0.21	0.19-0.21
Hind Femur [H.F.] (mm)	1.40-1.50	1.08-1.48
Hind Tibia [H.T.] (mm)	2.43-2.55	2.03-2.70
Second segment of hind tarsi [H.t.2] (mm)	0.15-0.17	0.13-0.16
Siphunculus [SIPH.] (mm)	1.00-1.13	0.82-1.18
Cauda (mm)	0.60-0.70	0.46-0.58
Body / H.F. (times)	2.60-3.25	2.91-3.30
Body / H.T. (times)	1.55-1.89	1.60-1.75
Antenna / Body (times)	0.87-1.00	0.96-1.11
Ant.III / Ant.VI base	5.44-6.31	5.33-5.94
Ant.III / U.r.s.	4.67-5.35	4.51-5.63
Ant.VI.t.p. / Ant.III (times)	0.81-1.01	1.02-1.12
Ant.VI.t.p. / Ant.VI base (times)	4.58-6.00	5.63-6.15
U.r.s. / basal width of U.r.s. (times)	2.67-3.15	2.79
U.r.s. / Antennal segment I (times)	0.87-1.05	0.95-1.08
U.r.s. / Ant.VI base (times)	1.08-1.31	0.98-1.22
U.r.s. / interocular dorsal distance (times)	0.43-0.53	0.46-0.49
U.r.s. / H.t.2 (times)	1.15-1.26	1.31-1.50
SIPH. / Body (times)	0.22-0.28	0.23-0.28
SIPH. / Ant.III (times)	0.93-1.12	0.93-1.17
SIPH. / interocular dorsal distance (times)	2.15-2.68	2.20-2.61
SIPH. / basal width of SIPH. (times)	3.89-4.74	4.56-5.62
SIPH. / minimal width of SIPH. (times)	7.14-9.64	6.83-12.42
Basal / minimal widths of SIPH. (times)	1.64-2.18	1.50-2.35
Basal width of SIPH. / diameter of Hind tibia at its middle (times)	1.22-2.00	1.46-2.00
Reticulated portion of SIPH. / SIPH. (times)	0.18-0.27	0.21-0.25
Cauda / SIPH. (times)	0.58-0.69	0.47-0.56
Cauda / basal width of Cauda (times)	2.36-2.65	1.96-2.33
Secondary sensoria on Ant.III (number)	31-52	60-82
Setae on U.r.s. (number)	7-10	6-8
Setae on abdominal segment 3rd, dorsum (number)	18-27	23-34
Setae on abdominal segment 7th, dorsum (number)	6-11	8-12
Setae on abdominal segment 8th (number)	4-6	4-6
Setae on cauda (number)	20-28	21-25
Setae on subgenital plate, discal (number)	4-8	5-12
Setae on subgenital plate, marginal (number)	18-23	16-18
Rows on reticulate portion of siphunculi	20-25	11-18

Table 1 (*continued*)

	apterous viviparae	alate viviparae
Longest seta on …		
… Antennal segment III (µm)	38-50	28-45
… Antennal segment III / basal width of Ant.III (times)	0.6-0.8	0.5-0.9
… Vertex (µm)	55-75	50-60
… Vertex / basal width of Ant.III (times)	0.8-1.2	0.9-1.1
… Hind trochanter, posterior (µm)	50-75	45-50
… Hind trochanter, posterior / (/) tr. (times)	0.5-0.7	0.5-0.6
… H.F., dorsum (µm)	40-55	30-40
… H.F., venter (µm)	45-100	40-60
… H.F., dorsum / basal width of Ant.III (times)	0.6-0.8	0.6-07
… H.F., venter / basal width of Ant.III (times)	0.8-1.5	0.7-1.2
… H.T., dorsum at middle (µm)	50-60	35-45
… H.T., dorsum / diameter of H.T at middle	0.5-0.8	0.6-0.7
… abdominal segment 3rd, spinal or pleural (µm)	38-80	48-55
… abdominal segment 3rd / basal width of Ant.III (times)	0.6-1.3	0.8-1.1
… abdominal segment 8th (µm)	60-83	60-80
… abdominal segment 8th / basal width of Ant.III (times)	0.9-1.3	1.1-1.6

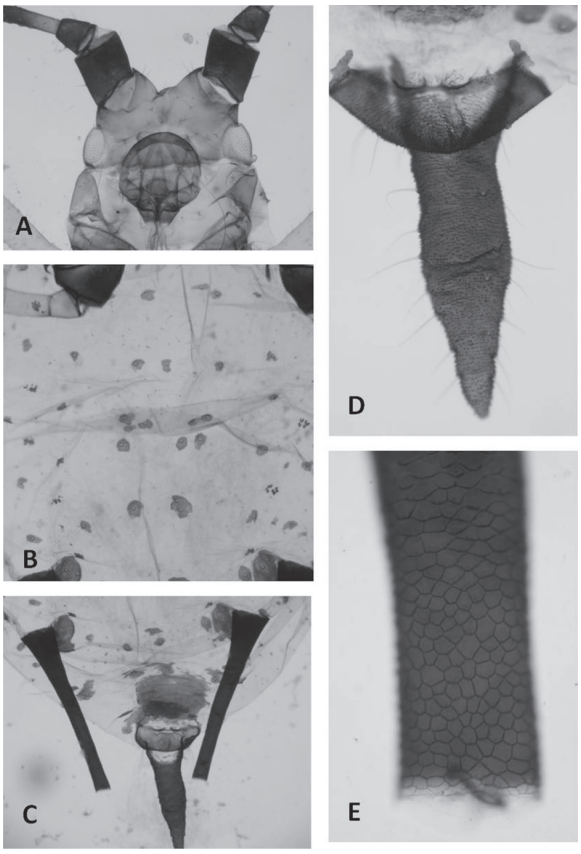

Fig. 1.— Apterous viviparous females: *Uroleucon* (*Uromelan*) *helichrysi* **sp. n.**: head (A), anterior abdominal segments (B), posterior abdominal segments (C), cauda (D), and apical part of siphunculi (F).

Fig. 1.— Hembras vivíparas ápteras: *Uroleucon* (*Uromelan*) *helichrysi* **sp. n.**: cabeza (A), segmentos anteriores del abdomen (B), parte posterior del abdomen (C), cola (D) y parte apical del cornículo (F).

Alate viviparous females (Table 1, Fig. 2). From 9 alate viviparous females. Metric and meristic features in Table 1. Colour in life unknown; when mounted similar to apterae (Figs. 2A, 2B). Antennae brown to dark brown, usually with the proximal portion of segment III paler (Fig. 2C). Secondary sensoria (60-82) circular small and somewhat protuberant (Figs. 2C, 2D). Abdomen with dorsal setiferous sclerites (Fig. 2B). Siphunculi dark brown (Fig. 2B), similar to those of the apterae, without both preapical incision and flange. Cauda is lanceolate and as dark as siphunculi.

Bionomics. The only known host plant of the aphid is an unidentified species of *Helichrysum* (Asteraceae); the capacity of this aphid to colonize other composites is unknown.

Distribution. The new species is only known from one Iranian locality, in Mazanderan province.

Etymology. The specific name *helichrysi* is the genitive of the name of the host plant of the new aphid species.

Taxonomic discussion. The assignment of the species to genus *Uroleucon* and subgenus *Uromelan* Mordvilko, 1914 is unquestionable, given the characteristics described above.

The principal characters involved in the comparison of *U. helichrysi* sp. n. (this work) to other Palaearctic species of *Uromelan* (original descriptions) are the tarsal formula (5.5.5), the number of caudal setae (20-28), the size of the siphuncular cells

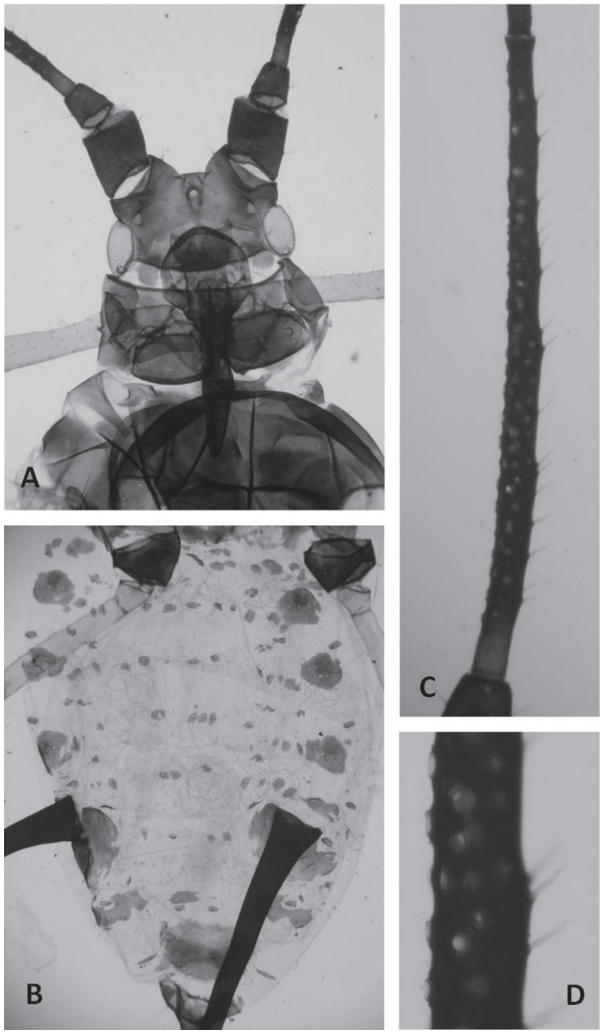

Fig. 2.— Alate viviparous females: *Uroleucon (Uromelan) helichrysi* **sp. n.**: head and thorax (A), abdominal segments (B), antennal segment III (C), and detail of secondary sensorial of antennal segment III (D).

Fig. 2.— Hembras vivíparas aladas: *Uroleucon (Uromelan) helichrysi* **sp. n.**: cabeza y parte del tórax (A), abdomen (B), antenómero III (C) y detalle de los sensorios secundarios del antenómero III (D).

and the presence of marginal tubercles on abdominal segments 2-4.

Most Palaearctic *Uromelan* species have 5 setae on the first tarsal segments, but only five of them have 20 or more caudal setae (Hille Ris Lambers, 1939; Miyazaki, 1971; Takahashi, 1962; Rezwani & Lampel, 1987; Heie, 1995; Lee *et al*., 2002): *U. aeneum* (Hille Ris Lambers, 1939), *U. caspicum* Rezwani & Lampel, 1987; *U. cephalonopli* (Takahashi, 1962), *U. giganteum* (Matsumura, 1918) and *U. jaceae* (Linnaeus, 1758).

U. caspicum and *U. giganteum* (Matsumura, 1918) have many more setae on the cauda than *U. helichrysi* (24-41 and 40-60 respectively). *U. cephalonopli* has, in comparison with *U. helichrysi*, a long and narrow ultimate rostral segment (0.22-0.30 mm and 1.4-1.6 times second segment of hind tarsus), and the siphunculi and cauda are different in shape (see Lee *et al*., 2002, fig. 227). *U. jaceae* lacks abdominal marginal tubercles, and the cells of the siphuncular reticulation are larger than those in *U. helichrysi*, as in *U. aeneum*. The metric and meristic characteristics of *U. aeneum* are very similar to those of the new species, but the shape and reticulation of the siphunculi are very different. In addition none of these species live on *Helichrysum*.

The "Key to apterae on *Helichrysum*" by Blackman & Eastop (2006, p. 510) can be modified to include *U. helichrysi* sp. n. as follows, respecting terminology, abbreviations and expressions.

15. [without modifications]..... *Uroleucon cichorii*
- SIPH 1.5-2.1× cauda, which is dark Antesiphuncular sclerites absent **15B**

16B. SIPH 1.8-2.1× cauda, which has 11-20 hairs .....*Uroleucon compositae* (or *gobonis*)
SIPH 1.5-1.7× cauda, which has 20-28 hairs..... ..... *Uroleucon helichrysi*

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