

## Two new Palaearctic species of *Uroleucon* (Hemiptera: Aphididae) from the collection of the *Muséum National d'Histoire Naturelle* de Paris

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### ABSTRACT

Two new Palaearctic species of *Uroleucon* Mordvilko (Hemiptera: Aphididae: Aphidinae: Macrosiphini) are described. *Uroleucon (Uroleucon) teheranense* n. sp. is described from apterous viviparous females caught on *Lapsana* sp. near Tehran (Iran) and *Uroleucon (Uromelan) ariegense* n. sp. is described from both apterous and alate viviparae caught on *Campanula* sp. in southern France. *U. teheranense* is compared with the few species belonging to subgenus *Uroleucon* that present 3 setae on first segment of tarsi, and with the species included in the key to apterae on *Lapsana* by BLACKMAN & EASTOP (2006), which is modified. *U. ariegense* is compared with the species of *Uroleucon* living on Campanulaceae species, mainly with the species included in BLACKMAN & EASTOP's key to apterae on *Campanula*, which is modified.

**Key words:** Aphids, Macrosiphini, Iran, France, *Lapsana*, Campanulaceae.

### RESUMEN

**Dos nuevas especies paleárticas de *Uroleucon* (Hemiptera: Aphididae) de la colección del *Muséum National d'Histoire Naturelle* de París**

Se establecen dos nuevas especies de *Uroleucon* Mordvilko (Hemiptera: Aphididae: Aphidinae: Macrosiphini). *Uroleucon (Uroleucon) teheranense* n. sp. se describe a partir de hembras vivíparas ápteras recogidas sobre *Lapsana* sp. en las proximidades de Teherán (Irán) y *Uroleucon (Uromelan) ariegense* n. sp. se describe a partir de vivíparas ápteras y aladas recogidas sobre *Campanula* sp. en el sur de Francia. *U. teheranense* se compara con las pocas especies del subgénero *Uroleucon* que presentan 3 setas en el primer artejo de los tarsos y con las especies de la clave para los pulgones de *Lapsana* de BLACKMAN & EASTOP (2006). *U. ariegense* se compara con las especies de *Uroleucon* que viven en

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Campanuláceas y especialmente con las incluidas en la clave de BLACKMAN & EASTOP para los pulgones de *Campanula*. Ambas claves se modifican en consecuencia.

**Palabras clave:** Pulgones, Áfidos, Irán, Francia, *Lapsana*, Campanulaceae.

## INTRODUCTION

*Uroleucon* Mordvilko, 1914 is one of the largest genera of Macrosiphini, the exact numbers of species and subspecies included depends on the taxonomical criteria applied. FAVRET (2013) includes 233 subjectively valid species, and 17 subjectively valid subspecies belonging to 12 of those species. The genus evidently needs a wide revision, but the task is difficult of achieving because of its very wide distribution.

Most of the species in the genus live exclusively or habitually on Asteraceae species and another 9 were described and live exclusively on Campanulaceae species.

The genus *Uroleucon* is very well represented in the aphid collection of the *Muséum National d'Histoire Naturelle* in Paris, with 148 species or subspecies and several unidentified samples. These samples have been studied; most of them belong to known species, but others belong to non-described taxa; 11 new species from Mexico were described by NIETO NAFRÍA *et al.* (2011); two Palearctic new species are now described, one from Iranian specimens caught on *Lapsana* sp. (Asteraceae) and another from French specimens caught on *Campanula* sp. (Campanulaceae).

## MATERIAL AND METHODS

The type specimens reside in the collection of the *Muséum National d'Histoire Naturelle* (Paris, France); they are preserved in microscopic slides with a water-soluble mounting medium, and the current condition of the slides is good; data on the capture can be seen in the “Types” section in the description of the new species.

Measurements of the slide-mounted specimens were made according to NIETO NAFRÍA & MIER DURANTE (1988) with an ocular micrometer. The measurements are lengths except when indicated that they are a width or diameter.

We consulted works by BLACKMAN & EASTOP (2006), BÖRNER (1933), HEIE (1995), HILLE RIS LAMBERS (1939), HOLMAN (1965, 1969, 1974, 1975, 1980, 1991, 2009), MIYAZAKI (1966), MÜLLER &

STEINER (1989), NEVSKY (1928), REZWANI & LAMPEL (1987), SZELEGIEWICZ (1962, 1982) and VERMA (1966).

A camera lucida fitted to the microscope was used for the drawings, and the photomicrographs were taken with a Leica DC digital camera with IM 1000 version 1.10 software.

## RESULTS AND DISCUSSION

### *Uroleucon teheranense* n. sp.

Types. Holotype: Apterous viviparous female, IRAN, Tehran province, Roodak, 2-V-1966, on *Lapsana* sp., G. Remaudière leg. Paratypes: 2 apterous viviparous females, same data. Collection of the *Muséum National d'Histoire Naturelle*, Paris, France.

Etymology. The type locality is in Tehran province (Iran), and the specific name refers to the name of this province, with latinization from the name of the Chaldean Catholic Archdiocese of Tehran.

Apterous viviparous females (Table I; Fig. 1: A, C, E; Fig. 2: A, C, E, G, J, L).

**Table I.** Metric and meristic features of apterous viviparous females of *Uroleucon teheranense* n. sp. and apterous and alate viviparous females of *Uroleucon ariegense* n. sp.

**Tabla I.** Características métricas y merísticas de las hembras vivíparas ápteras de *Uroleucon teheranense* n. sp. y de las hembras vivíparas ápteras y aladas de *Uroleucon ariegense* n. sp.

	<i>U. teheranense</i>	<i>U. ariegense</i>	
	apterous viviparae	apterous viviparae	alate viviparae
Body (cauda included) (mm)	2.663–2.825	2.688–2.950	2.675–3.200
Antenna (mm)	2.230–2.640	3.365–3.620	3.875–4.430
Antennal segment III [Ant.III] (mm)	0.70–0.85	0.93–1.13	1.08–1.41
Antennal segment IV (mm)	0.34–0.46	0.45–0.67	0.58–0.76
Antennal segment V (mm)	0.34–0.41	0.47–0.58	0.51–0.69
Antennal segment VI, base [Ant.VI base] (mm)	0.15–0.17	0.15–0.17	0.15–0.18
Antennal segment VI, terminal processus [Ant.VI.t.p.] (mm)	0.48–0.58	0.89–0.94	1.06–1.28

**Table I.** (Continuation)**Tabla I.** (Continuación)

	<i>U. teheranense</i>	<i>U. ariegense</i>	
	<b>apterous viviparae</b>	<b>apterous viviparae</b>	<b>alate viviparae</b>
Ultimate rostral segment [U.r.s.] (mm)	0.16–0.17	0.21–0.22	0.21–0.23
Hind Femur [H.F.] (mm)	0.80–0.93	0.95–1.01	1.03–1.23
Hind Tibia [H.T.] (mm)	1.43–1.65	1.90–2.05	2.23–2.60
Second segment of hind tarsi [H.t.2] (mm)	0.14	0.11–0.13	0.12–0.14
Siphunculus [SIPH.] (mm)	0.51–0.55	0.66–0.74	0.70–0.93
Cauda (mm)	0.37–0.42	0.37–0.43	0.33–0.44
Body / H.F. (times)	2.97–3.33	2.688–3.026	2.435–2.695
Body / H.T. (times)	1.69–1.87	1.361–1.494	1.143–1.326
Antenna / Body (times)	0.84–0.96	1.16–1.27	1.30–1.50
Ant.III / Ant.VI base	4.52–5.48	5.78–7.03	6.75–8.38
Ant.III / U.r.s.	4.52–5.03	4.40–5.23	5.02–6.56
Ant.VI.t.p. / Ant.III (times)	0.65–0.71	0.83–1.02	0.86–0.91
Ant.VI.t.p. / Ant.VI base (times)	3.10–3.38	5.35–6.17	6.26–7.53
U.r.s. / basal width of U.r.s. (times)	2.36–2.58	3.31–3.58	2.87–3.46
U.r.s. / Antennal segment I (times)	1.21–1.32	1.24–1.54	1.19–1.41
U.r.s. / Ant.VI base (times)	0.97–1.10	1.26–1.43	1.19–1.48
U.r.s. / interocular dorsal distance (times)	0.43–0.47	0.55–0.58	0.57–0.74
U.r.s. / H.t.2 (times)	1.15–1.26	1.65–1.91	1.56–1.79
SIPH. / Body (times)	0.18–0.20	0.23–0.27	0.25–0.30
SIPH. / Ant.III (times)	0.64–0.72	0.64–0.78	0.56–0.75
SIPH. / interocular dorsal distance (times)	1.40–1.51	1.76–1.96	2.22–3.03
SIPH. / basal width of SIPH. (times)	3.52–3.61	4.73–6.41	5.45–7.42
SIPH. / minimal width of SIPH. (times)	7.48–10.00	11.31–16.00	12.73–18.74

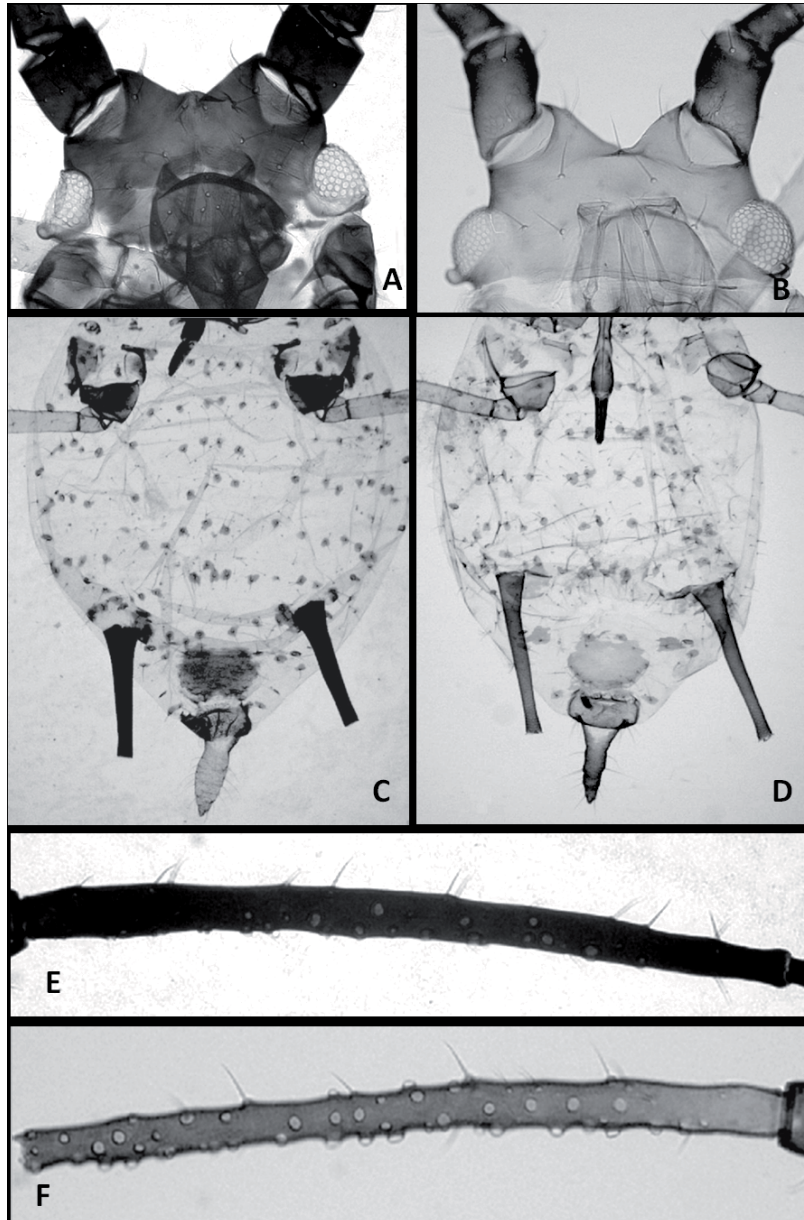
**Table I.** (Continuation)**Tabla I.** (Continuación)

	<i>U. teheranense</i>	<i>U. ariegense</i>	
	<b>apterous viviparae</b>	<b>apterous viviparae</b>	<b>alate viviparae</b>
Basal / minimal widths of SIPH. (times)	2.07–2.82	1.92–3.00	2.17–2.90
Basal width of SIPH. / diameter of Hind tibia at its middle (times)	0.89–1.13	0.48–1.22	1.00–1.56
Reticulated portion of SIPH. / SIPH. (times)	0.22–0.27	0.17–0.27	0.18–0.26
Cauda / SIPH. (times)	0.72–0.81	0.53–0.61	0.45–0.54
Cauda / basal width of Cauda (times)	2.05–2.33	1.77–2.00	1.84–2.22
Secondary sensoria on Ant.III (number)	11–22	28–63	92–135
Setae on Ant.III (number)	16–21	18–27	20–29
Setae on U.r.s. (number)	7–9	7–8	8–10
Setae on abdominal segment 3 <sup>rd</sup> , dorsum (number)	8–9	8–11	9–10
Setae on abdominal segment 7 <sup>th</sup> , dorsum (number)	6–8	6–8	6–8
Setae on abdominal segment 8 <sup>th</sup> (number)	4–6	4–4	3–5
Setae on cauda (number)	16–17	11–14	10–18
Setae on subgenital plate, discal (number)	6–7	2–3	2–4
Setae on subgenital plate, marginal (number)	14–17	9–13	9–15
Tarsal formula	3.3.3(4)	5.5.5	5.5.5
Rows on reticulate portion of siphunculi	8–12	8–14	11–18
Longest seta on ...			
... Antennal segment III (µm)	35–43	38–48	28–40
... Antennal segment III / basal width of Ant.III (times)	0.9–1.1	1.0–1.3	0.7–1.0
... Vertex (µm)	55–63	58–70	40–50

**Table I.** (Continuation)**Tabla I.** (Continuación)

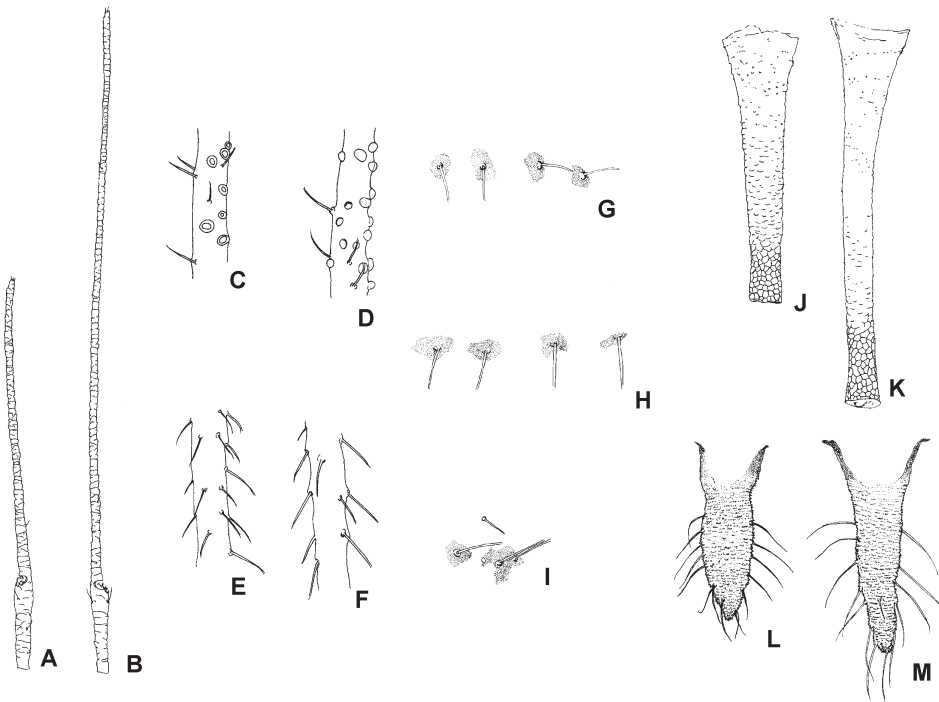
	<i>U. teheranense</i>	<i>U. ariegense</i>	
	<b>apterous viviparae</b>	<b>apterous viviparae</b>	<b>alate viviparae</b>
... Vertex / basal width of Ant.III (times)	1.2–1.6	1.4–1.9	1.1–1.4
... Hind trochanter, posterior ( $\mu\text{m}$ )	38–55	58–70	40–50
... Hind trochanter, posterior / (/) tr. (times)	0.5–0.7	0.6–1.1	0.5–0.8
... H.F., dorsum ( $\mu\text{m}$ )	38–48	43–53	35–48
... H.F., venter ( $\mu\text{m}$ )	35–43	40–55	33–43
... H.F., apex ( $\mu\text{m}$ )	23–35	28–35	30–35
... H.F., dorsum / basal width of Ant.III (times)	0.9–1.3	1.1–1.4	0.9–1.2
... H.F., venter / basal width of Ant.III (times)	0.8–1.1	1.0–1.5	0.9–1.2
... H.F., apex / basal width of Ant.III (times)	0.5–0.9	0.8–1.0	0.8–1.0
... H.T., dorsum at middle ( $\mu\text{m}$ )	48–68	48–60	40–48
... H.T., dorsum / diameter of H.T at middle	0.7–1.2	1.0–1.2	0.8–1.1
... abdominal segment 3 <sup>rd</sup> , spinal or pleural ( $\mu\text{m}$ )	65–73	75–85	55–80
... abdominal segment 3 <sup>rd</sup> / basal width of Ant.III (times)	1.6–1.8	2.0–2.3	1.4–2.0
... abdominal segment 8 <sup>th</sup> ( $\mu\text{m}$ )	55–78	68–75	70–90
... abdominal segment 8 <sup>th</sup> / basal width of Ant.III (times)	1.2–1.9	1.8–2.1	1.8–2.6

Description based on 3 specimens. Metric and meristic features in Table I. Colour in life unknown. Mostly pale yellowish brown when mounted; ornamentation absent in the most part of the cuticular surface; other pigmentation or ornamentation will be indicated. Without spinal and marginal papillae. Setae thick, pale and with pointed or evanescent apex.



**Fig. 1.** Apterous viviparous females: *Uroleucon (Uroleucon) teheranense* n. sp. (A, C, E) and *Uroleucon (Uromelan) ariegense* n. sp. (B, D, F); head (A, B), abdomen (C, D) and antennal segment III (E, F).

**Fig. 1.** Hembras vivíparas ápteras: *Uroleucon (Uroleucon) teheranense* n. sp. (A, C, E), y *Uroleucon (Uromelan) ariegense* n. sp. (B, D, F); cabeza (A, B), abdomen (C, D) y antenómero III (E, F).



**Fig. 2.** Apterous viviparous females: *Uroleucon (Uroleucon) teheranense* n. sp. (A, C, E, G, J, L) and *Uroleucon (Uromelan) ariegense* n. sp. (B, D, F, H, I, K, M); antennal segment VI (A, B), part of antennal segment III (C, D), part at middle of hind tibia (E, F), spinal sclerites of abdominal segment 3<sup>rd</sup> (G, H), marginal sclerites of abdominal segment 3<sup>rd</sup> (I), siphunculus (J, K) and cauda (L, M).

**Fig. 2.** Hembras vivíparas ápteras: *Uroleucon (Uroleucon) teheranense* n. sp. (A, C, E, G, J, L) y *Uroleucon (Uromelan) ariegense* n. sp. (B, D, F, H, I, K, M); antenómero VI (A, B), parte del antenómero III (C, D), porción intermedia de la tibia posterior al medio de longitud (E, F), escleritos espinales del segmento abdominal 3 (G, H), escleritos marginales del segmento abdominal 3 (I), cornículo (J, K) y cola (L, M).

Head dark brown, and with dorsal very slight striae. Frontal sinus marked but not very deep and fronto-medial tubercle small. Antennae dark brown; proximal portion of segment III with very slight spinules on the ventral face; other antennal segments more or less imbricated. Secondary sensoria only present on antennal segment III, ventrally aligned on proximal 51–81% of segment; small, circular, not protruding and with double lined margin. Rostrum reaching hind coxae, dark brown; ultimate rostral segment triangular; proximal ones with spinules. Thorax membranous with marginal, setiferous and intersegmental brown sclerites; the marginal sclerites are ornamented with spinules. Coxae, distal 1/3–1/2 of femora, very proximal portion and



distal 1/4–1/3 of tibiae, and tarsi dark brown. Abdomen membranous with brown sclerites: setiferous on all segments (on 7<sup>th</sup> and 8<sup>th</sup> with spinules), postsiphuncular and spiracular; antesiphuncular sclerites absent; intersegmental sclerites inconspicuous. Siphunculi dark brown, cylindrical with enlarged base; pre-reticulated part covered with spinules or scales; flange absent. Genital and anal plates brown. Cauda lanceolate with a marked constriction, dusky and paler than siphunculi and genital plate, but darker than trochanters; caudal setae slightly curved.

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

**Distribution.** The new species is only known in one locality belonging to Tehran province (Iran). It could well be very infrequent as it is only represented by one sample in the large collection of Iranian aphids caught by Prof. Remaudière and conserved in the Museum of Paris collection.

**Taxonomic discussion.** The shape, size, reticulation and ornamentation of the pre-reticulated portion of the siphunculi, the shape of the head, the sclerotization, ornamentation and chaetotaxy of the thorax and abdomen, the shape of the ultimate rostral segment, the general shape of cauda, and other features of the new species enable it to be included in the genus *Uroleucon* Mordvilko, 1914. It is also included in the nominotypical subgenus because the cauda is conspicuously paler than the siphunculi, tarsi and distal portions of the femora and tibia, which are dark brown or black.

The tarsal chaetotaxy formula in both the genus and nominotypical subgenus is habitually 5.5.5 and exceptionally 3.3.3. In *U. teheranense* n. sp. the tarsal formula is 3.3.3, like another eight Palaearctic species included in the nominotypical subgenus: *U. bielawskii* (Szelegiewicz, 1962), *U. iranicum* Holman, 1980, *U. kashmiricum* (Verma, 1966), *U. mongolicum* Holman, 1975, *U. mulgedii* (Nevsky, 1928), *U. pilosellae* (Börner, 1933), *U. telekiae* (Holman, 1965) and *U. tortuosissimae* Rezwani & Lampel, 1987. The host-plants of *U. kashmiricum* are species of *Campanula* and the host-plants of the other mentioned species belong to Asteraceae. Three of these species are solely or mainly recorded from European countries, *U. mongolicum* is known from Mongolia, east Russia and Korea, and *U. iranicum*, *U. kashmiricum*, *U. mulgedii* and *U. tortuosissimae* have been recorded from diverse Central Asian countries (including the Palaearctic portion of north-west of India).

*U. teheranense* n. sp. differs from the eight mentioned species in the siphunculus/body ratio, and it differs from one or another species in other characteristics, the most useful and frequent of which are shown in Table II.

**Table II.** Comparative table of the eight Palaearctic species of *Uroleucon* with 3 setae on first segment of tarsi, including *U. teheranense* n. sp.

**Tabla II.** Tabla comparativa de las 8 especies paleárticas del subgénero *Uroleucon* que presentan 3 setas en el primer artejo de los tarsos, *U. teheranense* n. sp. incluida.

	Siphunculus / Body	Siphunculus / Cauda	Ultimate rostral segment	Reticulated portion of siphunculus / siphunculus	Setae on cauda	Secondary sensoria on Ant. segment III
<i>U. teheranense</i> n. sp.	0.18-0.20	1.23-1.39	0.16-0.17	0.22-0.27	16-17	11-22
<i>U. bielawskii</i>	<b>0.23-0.27</b>	<b>1.78-1.93</b>	~ <b>0.15</b>	<b>0.27-0.37</b>	12-17	<b>42-69</b>
<i>U. iranicum</i>	<b>0.22-0.27</b>	<b>1.70-2.40</b>	<b>0.19-0.22</b>	<b>0.34-0.45</b>	<b>8-12</b>	<b>27-51</b>
<i>U. kashmiricum</i>	<b>0.22-0.26</b>	<b>1.33-1.70</b>	<b>0.13-0.16</b>	0.20-0.33	<b>6-9</b>	10-30
<i>U. mongolicum</i>	<b>0.25-0.33</b>	<b>1.80-2.60</b>	<b>0.18-0.20</b>	0.23-0.30	<b>7-11</b>	18-57
<i>U. mulgedii</i>	<b>0.30-0.36</b>	<b>2.0-2.5</b>	0.15-0.18	<b>0.12-0.19</b>	14-21	<b>6-11</b>
<i>U. pilosellae</i>	<b>0.23-0.29</b>	<b>1.35-1.60</b>	<b>0.17-0.21</b>	<b>0.29-0.40</b>	<b>11-15</b>	12-30
<i>U. telekiae</i>	<b>0.32-0.38</b>	<b>2.00-2.38</b>	0.13-0.17	0.22-0.25	<b>20-26</b>	6-25
<i>U. tortuosissimae</i>	<b>0.28-0.38</b>	1.25-1.67	<b>0.12-0.15</b>	<b>0.30-0.40</b>	11-18	7-19

BLACKMAN & EASTOP (*op. cit.*) only recorded one *Uroleucon* species on *Lapsana* spp.: *U. cichori* (Koch, 1855), but HOLMAN (2009) also listed *U. picridis* (Fabricius, 1775). The “Key to apterae on *Lapsana*” by BLACKMAN & EASTOP (pp. 581-582) can be modified to include *U. teheranense* n. sp. and *U. picridis* as follows, respecting terminology, abbreviations and expressions and taking the disjunctive *cichorii/picridis* from the “Key to apterae on *Crepis*” (p. 318):

5. SIPH black with polygonal reticulation on distal 0.21–0.43 of length. Dorsal hairs arising from dark scleroites, and well-developed postsiphuncular sclerite present. Thoracic spiracles similar in size to abdominal ones ..... 6  
— [without modifications] ..... *Nasonovia ribisnigri*
6. First tarsal segments with 3 hairs. Crescent shaped antesiphuncular sclerite absent. Cauda dusky. R IV+V 1.30x HT II at most and cauda with 17 hairs at most ..... *Uroleucon teheranense*  
— First tarsal segments with 5 hairs. Crescent-shaped antesiphuncular sclerite present, sometimes subdivided. Cauda pale ..... 7
7. R IV+V 1.45–1.85x HT II. Coxae pale like basal part of femora ..... *Uroleucon picridis*  
— R IV+V 1.04–1.35x HTII. Coxae dusky or dark, darker than the basal part of femora ..... *Uroleucon cichorii*

***Uroleucon ariegense* n. sp.**

Types. Holotype: Apterous viviparous female, FRANCE, Ariège department, Sinsat, 6-VI-1983, on *Campanula* sp., G. Remaudière leg. Paratypes: 5 apterous viviparous females and 12 alate viviparous females, same data. Collection of the *Muséum National d’Histoire Naturelle*, Paris, France.

Etymology. The type locality is in the Ariège department (France), and the specific name refers to the name of this department.

Apterous viviparous females (Table I; Fig. 1: B, D, F; Fig. 2: B, D, F, H, I, K, M)

Description based on 6 specimens. Metric and meristic features in Table I. Colour in life unknown. Mostly pale yellowish brown when mounted; cuticular ornamentation in general absent; other pigmentation or ornamentation will be indicated. Setae very thick, pale and with pointed or evanescent apex. Head brown, and with very slight dorsal striae. Frontal sinus deep

and fronto-medial tubercle small. Antennae dark brown, darker than head. Ventro-proximal portion of antennal segment III with 2–4 rows of small spinulae, other antennal segments more or less imbricated. Secondary sensoria only on antennal segment III, disperse on ventral face of at least 62% of segment length; circular, protruding and with single lined margin. Rostrum extending beyond hind coxae; brown; ultimate rostral segment subrectangular and darker than other rostral segments; proximal segments with spinules. Thorax membranous with marginal, setiferous and intersegmental light brown sclerites. Sometimes small prothoracic marginal papillae. Coxae brown, as dark as head at least; distal 1/4–1/3 of femora, very proximal portion and distal 1/5–1/4 of tibiae, and tarsi brown to dark brown. Abdomen membranous with light brown spiracular sclerites and small light brown to brown dorsal setiferous and postsiphuncular sclerites; antesiphuncular sclerites absent; intersegmental sclerites inconspicuous. Marginal papillae frequently present on abdominal segments 2<sup>nd</sup>, 3<sup>rd</sup>, and sometimes 4<sup>th</sup>, smaller than the socket of immediate hairs. Siphunculi dark brown (like antennae and portion distal of hind femora), cylindrical with enlarged base and small flange; reticulated over 17–27% of their length, and pre-reticulated part ornamented. Genital plate light brown to brown, as pigmented as anal plate. Cauda lanceolate, dark brown, like siphunculi; caudal setae erect.

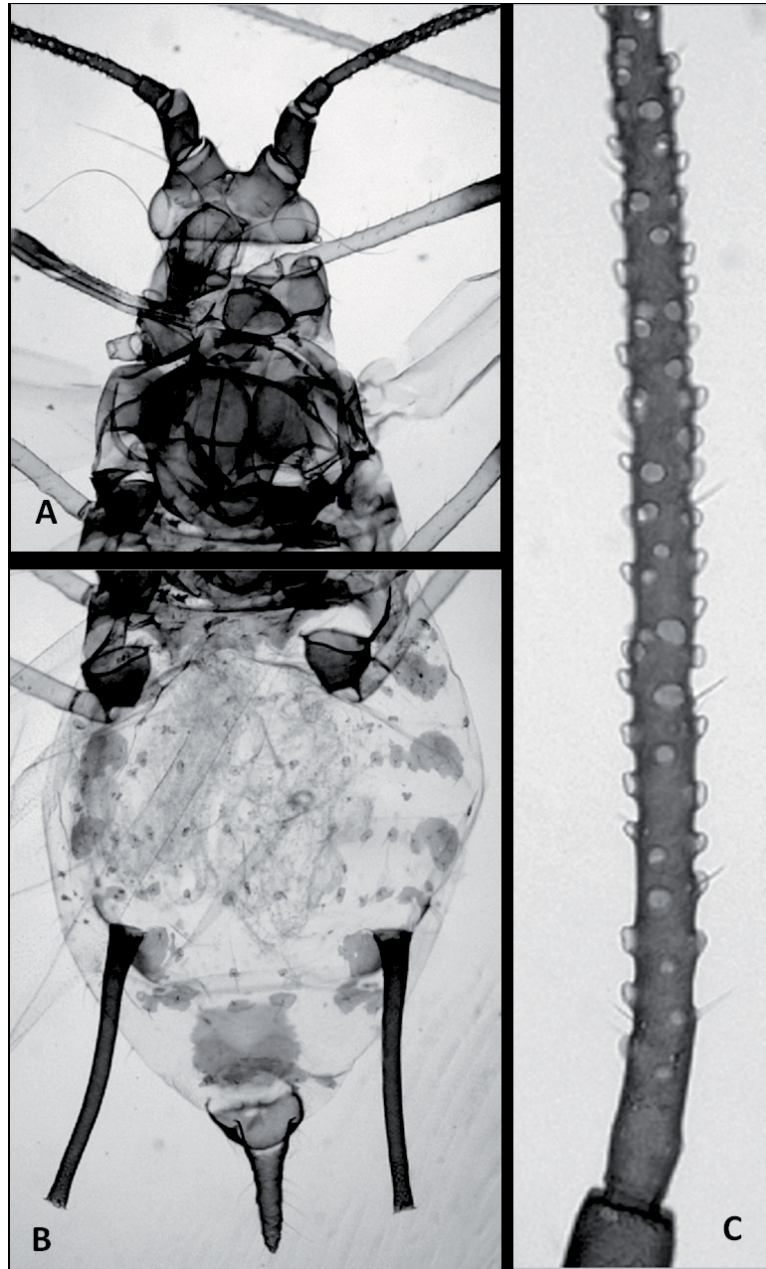
Alate viviparous females (Table I; Fig. 3). Description based on 12 specimens. Metric and meristic features in Table I. Similar to the apterous viviparae, with dark brown head and thorax, and antennae and legs more intense and extensively pigmented. Presiphuncular crescent sclerites also present, but paler than the postsiphuncular or abdominal marginal sclerites. Wing venation as usual in the genus.

Bionomics. The only known host plant of this aphid is an unidentified species of *Campanula* (Campanulaceae).

Geographical distribution. The new species is known only from one locality in the South of France, Pyrenean region. It must be infrequent because it is only represented with one sample in the very large collection of French aphids in the Paris Museum.

Taxonomic discussion. *Uroleucon ariegense* must be included in the genus *Uroleucon* due to criteria identical to those mentioned above for *U. teheranense*, and in the subgenus *Uromelan* Mordvilko, 1914 because the cauda is as dark as the siphunculi, tarsi and portions of the femora and tibia, which are black or dark brown.

Nine species of *Uroleucon*, including the new one, live on *Campanula* (BLACKMAN & EASTOP, *op. cit.*); five of them belonging to subgenera *Uromelan*: *U. campanulae* (Kaltenbach, 1843) (including *U. c. longius* Börner, 1950), *U. minosmartelli* Barbagallo & Patti, 1994, *U. neocam-*



**Fig. 3.** Alate viviparous female of *Uroleucon (Uromelan) ariegense* n. sp.; head and thorax (A), abdomen (B) and antennal segment III (C).

**Fig. 3.** Hembra vivípara alada de *Uroleucon (Uromelan) ariegense* n. sp.; cabeza y tórax (A), abdomen (B) y antenómero III (C).

*panulae* (Takahashi, 1962), *U. nigrocampanulae* (Theobald, 1928) and *U. rapunculoidis* (Börner, 1939), and three ones to the nominotypical subgenus: *U. gredinae* (Pashchenko, 2000), *U. kashmiricum* (Verma, 1966) and *U. kikioense* (Shinji, 1942). In addition, *U. (U.) cichorii* (Koch, 1855) and *U. (Uromelan) solidaginis* (Fabricius, 1979) have been recorded on *Campanula* spp. by HOLMAN (2009).

The differences between *U. ariegense* and the above-mentioned species are shown in the following key, which is a modification of the “Key to apterae on *Campanula*” by BLACKMAN & EASTOP (pp. 197-198) to include *U. cichorii*, *U. solidaginis* and *U. ariegense*, respecting terminology, abbreviations and expressions.

2. Cauda pale or dusky ..... 3  
 — Cauda dark like SIPH ..... 4 B
3. R IV+V shorter than HT II, and bearing only 2 accessory hairs ....  
 ..... *Uroleucon kikioense*  
 — R IV+V longer than HT II, and bearing 7 accessory hairs at least  
 ..... 3 B
- 3 B. First tarsal segments with 5 hairs. Crescent antesiphuncular sclerites present. ANT III with 50 secondary sensoria at least ..... 3 C  
 — First tarsal segment with 3 (–4) hairs. Crescent antesiphuncular sclerites absent. ANT III with 30 secondary sensoria at most.....  
 ..... *Uroleucon kashmiricum*
- 3 C. Tibiae wholly dark ..... *Uroleucon gredinae*  
 — Middle part of tibiae pale ..... *Uroleucon cichorii*
- 4 B. Primary sensoria on ANT V long and protruding .....  
 ..... *Uroleucon solidaginis*  
 — Primary sensoria on ANT V shorter and not protruding ..... 5
5. [without variation] ..... *Uroleucon campanulae*  
 — [without variation] ..... 6
6. ANT III 4.4x R IV+V at most ..... 7  
 — ANT III 4.4x R IV+V at least ..... 8
7. [without variation] ..... *Uroleucon minosmartelli*  
 — [without variation] .....  
 ..... *Uroleucon* sp. on *C. peregrina*, Lebanon (BMNH colln.)

8. [without variation] ..... *Uroleucon neocampanulae*  
 — Longest hair on outer side of hind tibia 0.0–1.2> its diameter at mid-length. Longest hairs on ANT III 0.8–1.3x BD III ..... 8 B
- 8 B. Cauda with 11–14 hairs and longest hairs on ABD TERG 3–5 2.0x times BD III at least. ANT PT/B 5.3–6.2. ANT III 5.7–7.1x ANT VI BASE ..... *Uroleucon ariegense*  
 — Cauda with 14–21 hairs, but if 14 or 15 than longest hairs on ABD TERG 3–5 1.9 times BD III at most. ANT PT/B 6.2–8.3, but if less of 6.4 than cauda with 16–21 hairs. ANT III 7.0–8.0x ANT VI BASE ..... 9
9. [without variation] ..... *Uroleucon rapunculoidis*  
 — [without variation] ..... *Uroleucon nigrocampanulae*

*U. (Uromelan) adenophorae* (Matsumura, 1918), *U. (Uromelan) phyteumae* (Bozhko, 1950) and *U. (Uromelan) triphyllae* (Miyazaki, 1966) have been recorded from the Palaearctic on *Adenophora*, *Asyneuma*, *Jassione* and *Platycodon*, which also belong to Campanulaceae. The ratio between the ultimate rostral segment and the 2<sup>nd</sup> segment of hind legs allows discerning these species from *A. ariegense*; this ratio is 1.6–1.9 in the new species and 1.1–1.3, 0.8–1.1 and 1.0–1.3 in *U. adenophorae*, *U. phyteumae* and *U. triphyllae*, respectively. In addition: dorsal setae on abdominal segments 2<sup>nd</sup>–4<sup>th</sup> are spatulate and equal to or just longer than the basal diameter of antennal segment III in *U. adenophorae* (from Mongolia); marginal papillae on prothorax and abdominal segments 2<sup>nd</sup>–4<sup>th</sup> are large (with diameter up to 60 µm) and distinctly lobulate in *U. phyteumae* (from Czech Republic and Ukraine); and the terminal process on antennal segment VI is 2.8–5.1 times base of this segment in *U. triphyllae* (from Asiatic east of Russia, Mongolia and Japan).

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